Chapter 5

February-01-11
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Gross Domestic Product(GDP) - the market value of all final goods and services produced within a country in a given period of time

- Measures two things at once: total income of everyone in the economy and total expenditure on the economy's output of goods and services
    - For the economy as a whole, income must equal expenditure
        - Can be visualized using circular flow diagram(See Figure 5.1, pg. 99)

GDP is the market value

- Market prices measure the amount people are willing to pay for different goods or, in essence, **the value of these goods**

Of All

- Tries to be comprehensive; all goods/services produced in the economy and sold legally in the markets
- Also includes market value of the housing services provided by the economy
    - Government estimates rental value of owner-occupied housing
        - Assumption that owner pays rent to himself(both income and expenditure)
- Excludes items sold illicitly or at home; underground/informal economy
    - GDP often underestimates true amount of productive activity taking place in the economy

Final

- Does not measure intermediate goods, only final goods
    - Value of intermediate good is already included in price of final good
    - Avoids counting same item multiple times
- Exception arises when an intermediate good is produced and stored, rather than being used(inventory accumulation)
    - Intermediate good is taken as "final" for the moment, added to investment
    - When later sold/used, GDP for the later period is reduced accordingly

Goods and Services Produced

- Includes goods/services **currently** produced
- Does not include transactions involving items produced in the past
    - Example: Selling used car to another person

Within a Country

- Measures value of production within the geographic boundaries of the country
    - Whatever is produced in Canada, regardless of the nationality, is counted towards GDP
    - Foreign Canadian's inputs do not count towards GDP, only GNP

In a Given Period of Time

- Takes place within a specific interval of time, usually a year or a quarter(3 months)
- Flow variable
- When government reports GDP for a quarter, it presents GDP at an annual rate
    - Figure reported for quarterly GDP is the amount of income/expenditure during the quarter multiplied by 4
        - Helps in comparison with annual figures
    - Figures are usually take seasonal adjustments into account

GDP = Y = C+ I + G + NX
GDP = Y = Consumption + Investment + Government Purchases + Net Exports

Consumption

- Spending by households on goods and services
    - Includes durable and nondurable goods
- Does NOT include purchases of new housing

Investment

- Purchase of goods that will be used in the future to produce more goods and services
    - Spending on capital equipment, inventories and structures, including household purchases of new housing
    - Also includes intermediate goods that produced and stored(inventory accumulation), rather than being used

Government Purchases

- Spending on goods and services by bodies of government
    - Includes salaries of government workers and spending on public works
    - Does not include transfer payments such as Canada Pension plan
        - Although transfer payments alter household income, they do not reflect the economy's production

Net Exports

- The value of a nation's exports minus the value of its important; also known as trade balance
- Purchases of domestically produced goods by foreigners(exports) minus the domestic purchases of foreign goods(imports)34
- "Net" refers to the fact that imports are subtracted from exports
    - Imports of good/services are already included in other components of GDP(consumption, investment or government purchasing)
    - Hence, purchase of goods/services from abroad does not affect GDP(increases 1 of 3 categories but ends up reducing net exports)

Canadian GDP in 2005 was around $1.371 trillion dollars

Real GDP vs. Nominal GDP

- If total spending rises from one year to the next, then either
    - The economy is producing a larger output of goods
    - Goods and services are being sold at higher prices
- Economists want to separate these effects and measure the total quantity of goods and services the economy is producing that is not affected by changes in the prices of those goods and services
    - Use a measure called Real GDP
        - The production of goods and services valued at constant prices
        - "What would be the value of the goods and services produced this year if we valued these goods and services at the prices from some year in the past?"
        - By using fixed prices from past levels, real GDP shows how the economy's overall production of goods/services changes over time
        - Differentiated from Nominal GDP, or the production of goods and services valued at current prices
        - See Table 5.3 (pg. 107) for how to calculate
        - For chosen base year, nominal GDP = real GDP
        - Nominal GDP uses current prices to place a value on the economy's production of goods and services; Real GDP uses constant base-year prices to place a value on the economy's production of goods and services
        - Real GDP only affects changes in the amounts being produced
            - Not affected by changes in prices
            - Thus, a measure of the economy's production of goods and services

GDP Deflator

- Nominal GDP reflects both prices of good/services and the quantities of good/services the economy is producing
- Real GDP reflects only the quantities produced, by keeping prices consistent
- **GDP Deflator - a measure that reflects the prices of goods and services but not the quantities produced**
    - GDP Deflator = Nominal GDP/Real GDP * 100
        - Hence, GDP Deflator for base year always equal 100
    - Measures the change in nominal GDP from the base year that cannot be attributed to the change in real GDP
        - Nominal GDP(quantity produced + price) increases, Real GDP(quantity produced) stays the same, hence GDP deflator(price) must have increased
    - Measures the current level of prices relative to the level of prices in the base year
        - Reflects what's happening to prices

Recession is usually defined as two consecutive quarters of falling real GDP

Flaws of GDP as a means of measuring standard of living

- Does take into account underground/formal economy
- Does not measure wide income disparities(90 percent of the wealth in 10 percent of the population in certain countries)
- Does not take into account ethical aspects(e.g environment)
    - Production may increase, but at what cost?

Chapter 6

February-01-11
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Consumer price index (CPI) - a measure of the overall cost of the goods and services bought by a typical consumer

- Shows the cost of a basket of goods and services relative to the cost of the same basket in the base year
- Used to monitor changes in the cost of living over time
- Calculated monthly by Statistics Canada
    - Uses data on the prices of over 600 different goods and services

Inflation - describes a situation in which the economy's overall price level is rising

- Inflation rate is the percentage change in the price level from the previous period

How the Consumer Price Index Is Calculated

Determine the Basket

- Determine which prices are most important to the typical consumer and weigh them accordingly in measuring the cost of living

Find the Prices

- Find price of each of the good and services in the basket for each point in time

Compute the basket's cost

- Use the data on prices to calculate the cost of the basket of goods and services at different
- Isolate price changes from any quantity changes

Choose a base year and compute the index

- Designate one year as the base year, serves as a benchmark
    - Use quantity/amount in basket from BASE year
- Choice of the base year doesn't matter since the index is used to measure **changes** in the cost of living
- **CPI = Price of baskets of goods/services in one year/Price of the basket in base year * 100**
    - Hence, index is always 100 in base year

Compute the inflation rate

- The percentage change in the price index from the preceding period
- (CPI in year 2 - CPI in year 1)/CPI in year 1 * 100

Core inflation - the measure of the underlying trend of inflation

- Useful in predicting the underlying trend of changes in the CPI

Problems in Measuring the Cost of Living

- The CPI measures changes in the cost of living
    - In other words, CPI tries to gauge how much incomes must rise in order to maintain a costant standard of living
- Substitution bias
    - Consumers substitute towards goods that have become relatively less expensive
    - If price index is computed assuming a fixed basket of goods, it ignores the possibility of consumer substitution and, therefore, overstates the increase in the cost of living from one year to the next
- Introduction of new goods
    - When a new good is introduced, consumers have more variety
    - Greater variety, in turn, makes each dollar more valuable, so consumers need fewer dollars to maintain any given standard of living
    - Because the CPI is based on a fix basket of goods and services, it does not reflect the increase in the value of the dollar that arises from the introduction of new goods

- Unmeasured quality change
    - If the quality of a good deteriorates from one year to the next, the value of a dollar falls, even if the price of the good stays the same (and vice versa)
    - Statistics Canada adjusts the price of the good to account for quality changes but changes in quality are hard to measure
        - Attempting to compute the price of a basket of goods of constant quality

GDP Deflator VS. the CPI

- GDP deflator is the ratio of nominal GDP to real GDP
    - Reflects the level of prices relative to prices in the base year
- Usually similar, but there are two important differences
    - GDP deflator reflects prices of all goods and services **produced domestically** while CPI reflects the prices of all goods and services **bought by consumers**
        - Example: Airplane sold by Bombardier increases in price
            - Increases GDP deflator, but not CPI -> not in the basket of goods
        - Example: Volkswagen raises the price of its car
            - Increases CPI, but not GDP deflator -> not produced domestically
    - CPI compares the price of a **fixed** basket of goods/services to the price of the basket in the base year; GDP deflator compares the price of **currently produced** goods and services to the price of the same gods and services in the base year
        - Thus, the group of goods and services used to compute the GDP deflator change over time
        - Difference not important when all prices are changing proportionately but if prices of different goods/services are changing by varying amounts, the way we weight various prices matter for the overall inflation rate

Dollar Figures from Different Times

- Use cross-multiplication
- **Indexation: automatic correction of a dollar amount for the effects of inflation by law or contract**
    - Example: COLA or Cost of Living Allowance, Canada Pension Plan, Old Age Security Benefits

Real and Nominal Interest Rates

- Real interest Rate = Nominal Interest Rate - Inflation Rate
    - Real interest rate: the interest rate corrected for the effects of inflation
        - **Tells you how fast the purchasing power rises**
    - Nominal interest rate: the interest rate as usually reported without a correction for the effects of inflation

Price indexes allow us to compare dollar figures from different points in time, allowing us to better see how the economy is changing

Chapter 7

February-24-11
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Productivity is linked to a country's standard of living
Productivity - the amount of goods or services that a worker can produce for each hour of work

How Productivity is Determined

- Physical capital per worker
  - Workers are more productive if they have tools with which to work
  - Stock of equipment/structures used to produce goods/services is known as physical capital, or simply capital
  - While it is a factor of production, it is also a produced factor of production
    - The equipment that is being used to produce something had to be produced itself first using other capital
- Human capital per worker
  - The knowledge and skills that workers acquire through education, training and experience
  - Like physical capital, it is a produced factor of production
    - Requires inputs in the form of teachers, time and libraries
- Natural resources per worker
  - The inputs into production of goods and services that are provided by nature, such as land, rivers and mineral deposits
  - Two forms: renewable(unlimited supply, plant more trees etc) and non-renewable(limited supply)
- Technological knowledge
  - **The understanding of the best ways to produce goods and services**
  - Can be common knowledge(once person uses it, everyone becomes aware of it), proprietary(only known by the company that discovers it)
  - Technological knowledge refers to society's understanding of how the world works while human capital refers to the resources used to transmit this information to the labour force
    - Knowledge is the quality of society's textbooks, and human capital is the amount of time the population devotes to reading them

Production Function

$Y = A * f(K, L, H, N)$

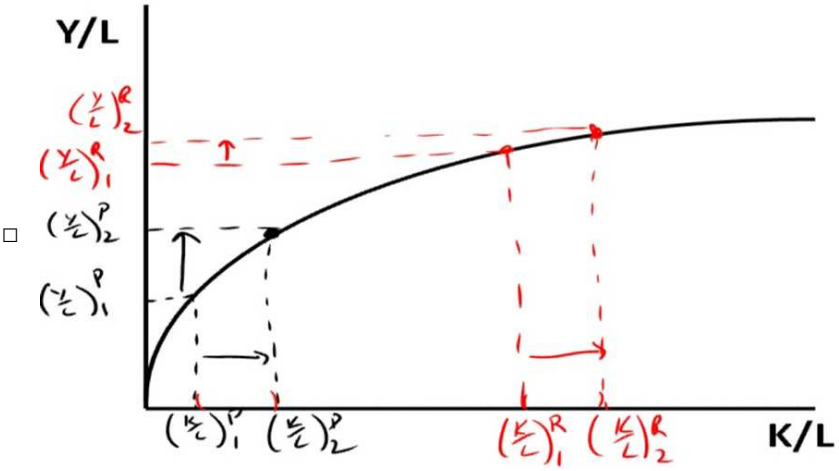
- A=technology, K = physical capital, L = labour, H = human capital, N= natural resources
- Used to describe the relationship between the quantity of inputs used in production and the quantity of output from production
- Make two assumptions with this production function that will allow us to do certain things:
  1. Production function has constant returns to scale. If we double all the inputs, then we get twice as much output. If you multiply inputs by x, then we get x as much inputs.
     - Allowing x = 1/L, production function can be written in per capita terms. This production function talks about how much output per worker, capital per worker, etc.
  2. The original production function was aggregate output. Output in the entire economy depends on how much capital, labour, human capital, natural resources in the entire economy.

What can Governments do?

- Encourage saving and investment(e.g impose a consumption tax)
  - Since capital is a produced factor of production, a society can change amount of capital
    - Raise productivity by increasing current resources in the production of capital
    - More saving in the economy = more investment in the economy. Investment =

purchases in new capital goods. More investment = more capital stock in the future

- Diminishing Returns and the Catch Up Effect
  - As the stock of capital rises, the extra output produced from an additional unit of capital falls
  - Increase in the saving rate leads to higher growth only for a while
    - As higher saving rates allow more capital to be accumulated, the benefits from additional capital become smaller over time, and so growth slows down
    - In long run, higher saving rate leads to a higher level of productivity and income but not to higher growth in these variables
  - Easier for a country to grow fast if it starts out relatively poor
    - Catch-up effect: countries that start off poor tend to grow more rapidly than countries that start off rich



    - A poor country would have low per capita GDP (blue dot)
    - Rich country would have high per capita GDP (red dot) What happens if both countries increase output per worker
    - We want to increase capita per worker by the same amount for both rich and poor countries. Increase (K/L) -> (K/L)2. There's a lot of room for improvement for poorer people (i.e. like people with lower marks) and there's a lot less room for improvement for people with higher marks

- Foreign investment can also lead to increased capital
  - Capital investment that is owned and operated by a foreign entity: foreign direct investment
  - Capital investment that is financed with foreign money but operated by domestic residents: foreign portfolio investment
  - In both cases, foreign saving is being used to finance local investment
    - Affects GDP and GNP differently(in foreign direct investment, GNP is increased by less than GDP as some money goes to foreign owners)
  - Allowing foreign company to come in an build a factory is good for the economy b/c it increases capital stock. It is not a good thing for poor countries to do b/c profits of the operation will leave the country; it would be better for a domestic company to build a factory. BUT if only option is: foreign country invest or nobody else invests, you would rather have the foreign country invest
    - Able to learn state-of-art technology from richer countries
- Education
  - Investment in human capital
    - Leads to many positive externalities -> new ideas
      - Effect of one person's actions on the well-being of a bystander
    - Brain drain: emigration of most highly educated workers to rich countries
- Health and Nutrition
  - Healthier workers are more productive
- Property Rights and Political Stability

    - Property rights: the ability of people to exercise authority over the resources they own
    - Political instability leads to doubt about whether property rights will be respected in the future
    - More investment, more capital, improvements in technology. People won't invest in a country if they think someone can come along and take profits. - They need a strong legal system in place and contracts need to be enforced so that people are willing to take risks and invest.
    - Affects technology and physical capital
- <u>Free Trade</u>
    - Can be a substitute for technology
    - Can help with technology (i.e. a lot of growth after WWII in Japan and Korea, they imported goods from the states and learned how to build them, then exported them back)
    - Inward(no trade) vs outward(trade) oriented policies
- <u>Research and Development</u>
    - Knowledge is a *public good*
        - Once one person discovers an idea, everyone is able to use it
    - Governments give grants to people in universities to fund research and development to improve and increase technology
    - Patent system = allows profit from the new invention to go to the researcher/discoverer/inventor gives people incentive for doing research and therefore improve technology

Chapter 8

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Financial System

- The group of institutions in the economy that help to match one person's saving with another person's investment
- **Financial markets: the institutions through which savers can directly provide funds to borrowers**
    - Debt finance: sales of bonds to raise money
    - Equity finance: sales of stock to raise money
    - <u>The Bond market</u>
        - Bond: a certificate of indebtedness
            - "I O U"
            - Identifies date of maturity(the time at which loan will be repaid) and rate of interest that will be paid until loan matures
            - Buyer gives money in exchange for this promise of interest and eventual repayment of the principal(original amount borrowed)
            - Buyer can hold bond till maturity or sell it to someone else
            - Two important characteristics of a bond:
                - Bond's term: length of time until the bond matures
                    - Long term bonds are riskier as they have to wait longer for repayment of principal
                        - Thus, pay higher interest rates
                - Credit Risk: the probability that the borrower will fail to pay some of the interest or principal
                    - Default: failure to pay
                    - Default on loans by declaring bankruptcy
                    - If probability of default is high, there is a higher interest rate
                    - Affected by level of debt carried by the issuer of the bond, recent changes in the amount of debt carried, and the stability of the issuer's revenue
                        - Risk: federal government < provincial government < corporations < financially shaky corporations(issue *junk bonds* -> higher interest rate)
    - <u>The Stock Market</u>
        - Stock represents ownership in a firm and is, therefore, a claim to the profit that the firm makes
            - Unlike bonds where issuer of the bond is a creditor of the corporation, not owner
        - Shareholders benefit from high profits(dividend) whereas bond holders only get interest on their bond
        - **If company runs into financial difficulty, bondholders are paid before stockholders**
        - Compared to bonds, stock offers holder both higher risk and potentially higher return
        - After corporation issues stock by selling shares to the public, these shares are traded among stockholders on organized stock exchanges
            - Corporation itself receives no money when its stock changes hands
            - New York Stock Exchange(NYSE), American Stock Exchange, NASDAQ(National Association of Securities Dealers Automated Quotations system), Toronto Stock Exchange(TSX), TSX Venture Exchange
            - Supply and demand for the stock determine prices
                - Demand, and hence price, of a stock reflects people's perception of the

corporation's future profitability
        - Stock index: computed average of a group of stock prices
            - Dow Jones Industrial Average: 30 major US companies
            - S&P/TSX Composite Index: 200 major firms listed on the TSX

- **Financial Intermediaries: financial institutions through which savers can indirectly provide funds to borrowers**
    - Banks
        - Take in deposits from people who want to save and use these to make loans to people who want to borrow
            - Banks pay depositors interest on their deposit and charge borrowers slightly higher interest on their loans to make profit
        - Also play second role in economy by allowing people to write cheques against their deposit
            - Create a special asset(cheque) that people can use as a medium of exchange
    - Mutual fund
        - Institution that sells shares to the public and uses the proceeds to buy a portfolio of stocks and bonds
        - Shareholder of the mutual fund accepts all risk and returns associated with stocks and/or bonds
        1. Allow people with small amounts of money to diversify
            - Don't put eggs in one basket
            - Become part owner or creditor of hundreds of major companies
            - Company operating the mutual fund charges shareholders a fee, usually 0.5 and 3.0 percent of assets each other
        2. Gives ordinary people access to the skills of professional money managers
            - Managers have increased know-how
            - Economists are skeptical as *index funds*, which buy all the stocks in a given index, perform better on average than mutual funds that take advantage of active management
                - Keep costs low by not buying/selling regularly and not having to pay salary of money manager

Saving and Investment in the National Income Accounts

- National Income Accounting Identity
    - Assume that economy is closed, hence GDP equation becomes Y = C + I + G
    - Y - C - G = I
        - Total income in the economy that remains after paying for consumption and government purchases, known as *saving* or *national saving,* denoted as S
        - Therefore, S = I, or savings equals investment
    - T = amount that the government collects from households in taxes minus the amount it pays back to households in the form of transfer payments(welfare, employment insurance)
        - S = Y - C - G or S = (Y - T - C) + (T - G) or S = private saving + public saving
        - Private saving: amount of income that households have after paying their taxes and paying for their consumption
        - Public saving: the amount of tax revenue that the government has left after paying for its spending
            - T > G, then government has budget surplus
            - T < G, then government has budget deficit
    - For the economy as a whole, saving = investments
    - As long as income exceeds consumption for a person, they are saving
        - Even when buying stocks/bonds
    - Investment only refers to the purchase of new capital, or equipment/buildings
        - Sells stock and uses proceeds to build a new factory

- **S = I identity is true for the economy as a whole, not for every individual household/firm**

Market for Loanable Funds

- Assume one financial market
- The market in which those who want to save supply funds and those who want to borrow to invest demand funds
- Loanable funds: all income that people have chosen to save and lend out, rather than use for their own consumption
- Supply of loanable funds come from those people who have extra income they want to save and lend out; **saving is the source of loanable funds**
  - National saving, including both private and public saving
- Demand for loanable funds come households and firms who wish to borrow to make investments; **investment is the source of demand for loanable funds**
- Interest rate is the price of the loan
  - Depends on real rather than nominal interest rate
- **Policy 1: Saving Incentives**
  - Lower taxes
    - Introduce consumption taxes(such as GST, PST) rather than income taxes
      - Income that is saved is not taxed, so encourages greater saving
  - Increase in the amount that people can contribute to registered retirement saving plans(RRSP)
    - By buying an RRSP, people reduce the amount of income that is taxed
  - If a reform of tax laws encouraged greater saving, the result would be lower interest rates and greater investment(supply shift to the right)
- **Policy 2: Investment Incentives**
  - Introduce investment tax credit
    - Tax advantage to any firm building a new factory, buying new equipment
  - If a reform of tax laws encouraged greater investment, the result would be higher interest rates and greater saving
- **Policy 3: Government Budget Deficits and Surpluses**
  - Sum of all budget deficits minus the sum of all budget surpluses is called the government's debt
  - Government deficit leads to reduced national saving, leading to decreased supply(supply shift left, decreased quantity, increased interest rate)
  - Results in **crowding out**: a decrease in investment that results from government borrowing
    - When government borrows to finance its budget deficit, it crowds out private borrowers who are trying to finance investment
  - When the government reduces national saving by running a budget deficit, the interest rate rises, and investment falls
  - **Vicious circle**: cycle that results when deficits reduce the supply of loanable funds, increase interest rates, discourage investment, and result in slower economic growth; slower growth leads to lower tax revenue and higher spending on income-support programs, and the results can be even higher budget deficits
    - Must raise tax rates and cut spending on government programs
  - Budget surplus, or public saving, contributes to national saving
    - A budget surplus increases the supply of loanable funds, reduces the interest rate and stimulates investment
  - **Virtuous cycle:** cycle that results when surpluses increase the supply of loanable funds, reduce interest rates, stimulate investment, and result in faster economic growth; faster growth leads to higher tax revenue and lower spending on income-supporting programs, and the result can be even higher budget surpluses

Chapter 9

March-04-11
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Unemployment

Economy's **natural rate of unemployment** refers to the amount of unemployment that the economy normally experiences

- Does not imply that this rate is desirable, constant over time, or unchangeable by economic policy
- Composed of **frictional and structural employment**(discussed further down)

Cyclical unemployment refers to the year-to-year fluctuations in unemployment around its natural rate

- Associated with short-run

For people who are unemployed, it is bad (i.e. during a recession), but all unemployment is not necessarily bad for the economy as a whole

Identifying Unemployment

How is Unemployment Measured?

- Measured by Statistics Canada
- Monthly survey, known as **Labour Force Survey**,
    - Produces data on unemployment, length of the average workweek and the duration of unemployment
    - Surveys around 50,000 households
    - Separates adults(aged 15 and older) into:
        i. Employed
            - A person is considered employed if he spent some of the previous week working at a **paid job**
        ii. Unemployed
            - A person is unemployed if he is on **temporary layoff or <u>is looking for work, able to work, and unable to find a job</u>**
        iii. Not in the labour force
            - A person who fits neither of the first two categories, such as full-time student, homemaker, or retiree is not in the labour force

    ☆ <u>Exception</u>

    - Not in the adult population = people in some form of institution where they would not be able to find a job even if they wanted to (i.e. people in the armed forces, prison, mental hospital, etc.)

    - Labor force = number of employed + number of unemployed
    - Unemployment rate = number of unemployed/labour force * 100
        - Percentage of labour force that is unemployed
    - Labour force participation rate(LFPR) = labour force/adult population * 100
        - Measures percentage of the total adult population of Canada that is in the labour force
    - Employment rate = number of employed/adult population x 100 (NOT 100 – unemployment rate as denominator is different)

Does Unemployment Rate Measure What We Want It To?

- Movements in and out of labour force are common
    - Almost half spells of unemployment end when then the unemployed person leaves the labour force
- <u>Unemployment Rate can be understated(worse than actually is):</u>
    - Discouraged workers/searchers: people who were looking for a job, but think that prospect

of finding a job is so slim that they have exited labour force.
    - Thus, when Stats Can asks them "are you working?" they say No and when Stats Can asks them "are you looking for a job?" they say No; this means they are not included in the unemployed; they would be counted as being not in the labour force. BUT if given an offer days later, they would gladly take the job
    - Existence of discouraged workers means that the problem of unemployment may actually be worse than what the figures indicate.
  - Underemployment can occur in two ways:

1. Someone working part-time, but would really prefer to be working full-time (30+ hours a week = full-time). Someone working 32h is considered working full-time, but what if individual would really prefer working 40h/wk.
2. People working below their skill level (i.e. if you have a software engineer who is laid off and that person goes to become a shift manager at McDonalds)
    - Both #1 and 2, that the calculated unemployment rate may not be capturing the picture as bad as it really is (reality may be worse).

<u>Unemployment Rate can also be overstated</u>**:**

- Due to people lying to Stats Can, saying that they are unemployed (actively looking), when they are not actively looking for a job
  - Lie to collect employment insurance benefits; to collect person needs to be actively looking
  - Unemployment rate value may be over-estimating the unemployment problem

- **Average spell of unemployment in Canada lasted 15.5 weeks**

<u>Types of Unemployment:</u>

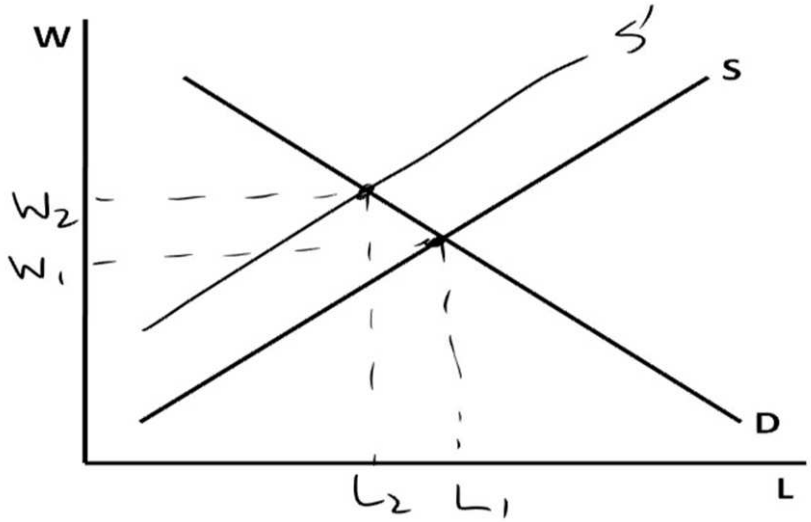
1. <u>Frictional unemployment</u>
   - takes time for workers to search for a job that suits them the best and time for employers to hire the best workers
   - Inevitable because economy is always changing
     - The precise amount is not inevitable
     - The more information spreads about job openings and worker availability, the more rapidly the economy can match workers and firms
     - Internet, government programs such as government-run employment agencies, public training programs can help facilitate job search, leading to decreased frictional unemployment
   - Pros:
     i. occurs because you have people entering and leaving labour force (i.e. when graduate from university and spend time looking for career job that would match you = unemployed during that period
        - this unemployment is good for the economy b/c it allows firms and workers to make a good match with each other.
        - During Soviet Union, they prided themselves on having zero unemployment in the country – this is b/c gov told people where they were going to work (no matching, no freedom of choice to find a job that is perfect for you).
          - **Not good for economy b/c not good matches = not efficient**
          - **Frictional employment is good for economy b/c gives more efficient outcome and decisions**

     ii. Sectoral shifts in the economy: changes in the composition of demand among industries or regions
        - Canada use to be primarily manufacture based and now most GDP is produced from services sectoral shift; losing manufacturing jobs, gaining service jobs).
        - Bad for people who become unemployed, but good for the overall economy (i.e. 100 years ago, if people had argued to keep agricultural jobs b/c that is what they are comfortable with, then would not have progressed).

- Shift in economy can help increase/improve standard of living.

- Cons:
  i. Employment insurance benefits can also cause frictional unemployment
     - raises the cost of going to work (i.e. get paid if looking for a job)
     - bad for the economy b/c more people would want to stay unemployed and collect EI.

2. Structural unemployment
   - quantity of labour supplied > quantity of labour demanded
   - occurs when wage is higher than eqm wage.
   - due to the government setting a legal minimum (price floor), union (negotiation b/w workers and firms), or efficiency wages (firms setting above to attract high-skilled workers)
   - Employment Insurance (EI)



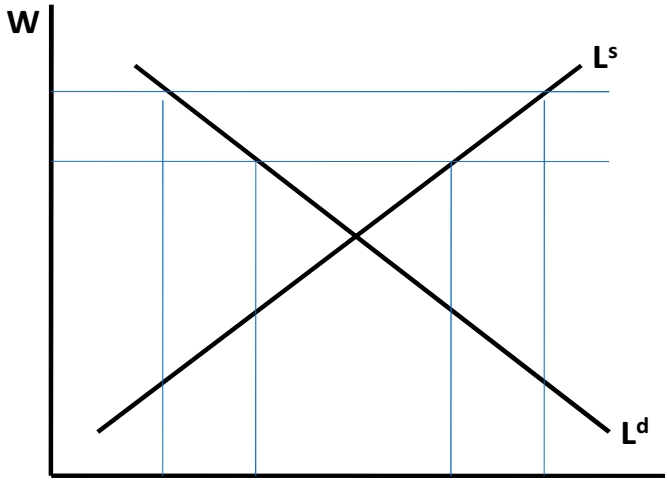
     - When go from having no EI to providing EI, the cost of going to work goes up (b/c if don't go to work, can collect money from the gov – the opp cost of going to work therefore goes up).
     - Supply curve shifts to the left. Wage increases (W1 to W2, where W = wage). Number of people working decreases (L1 to L2, where L = labour).
     - Can be good, but not as many people with jobs
   - Benefit replacement in various countries = how much of your previous income from work do you get paid by the gov (i.e. if unemployed in France, you get paid 75% of your wage @ previous job for almost two years)
     - Thus, the higher the benefit replacement and benefit duration, the higher the unemployment rate. The opportunity cost of going to work increases! As compensation increases, more unemployment.
   - Benefit duration = how long get to collect that benefit for
     - i.e. in France, you get 75% of the wage of where you were working before for two years.
     - i.e. Look at unemployment rates of countries; there is not a perfect correlation, but unemployment rate of France, Germany and Spain (where have generous EI programs) is higher than unemployment rate of UK and US, where unemployment rate not nearly as generous.

3. Cyclical unemployment
   - when the economy is in a recession, workers are laid off

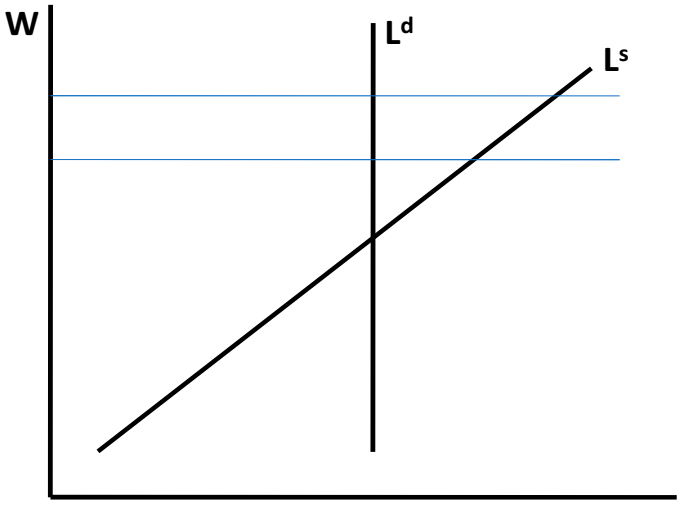
- unemployment associated with business cycle (i.e. when economy goes into recession, unemployment increases; when economy goes into boom, unemployment decreases). But booms and recession = short run, only deal with long-run for this course

Causes of Structural Unemployment

1. Minimum wage is a price floor – legally mandated price floor
   - Illegal to pay someone or work for someone lower than the minimum.
   - If the minimum wage is above eqm wage, the minimum wage is binding b/c it affects what goes on in the market place. When have a binding price floor, Qs > Qd = excess supply/surplus of labour/unemployment.
   - Unemployment measured by taking the horizontal distance b/w Q of labour supplied and the Q of labour demanded.
   - Minimum Wage: Economic Theory



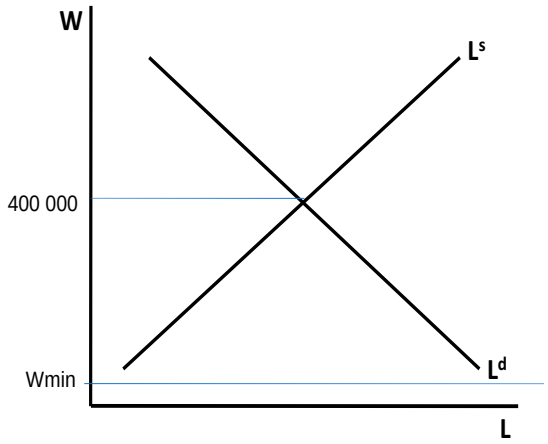
   - If start with binding minimum wage and the minimum wage increases. What happens? Qs increases; Qd decreases = number of people unemployed increases b/c larger horizontal distance at the new higher minimum wage.
   - argument made by small businesses b/c will say that increasing minimum wage will just increase unemployment in the economy
   - BUT when look at real world data, don't actually find a drop in the number of people working when increase minimum wage. This is because…see next slide.
   - Minimum Wage: Real World



   - Vertical labour demand curve.
   - When dealing with minimum wage jobs, usually dealing with low-skilled positions (i.e.

running a McDonald's franchise – will always need a certain amount of workers to run the restaurant; someone cooking, handling money, etc.
- Regardless of how high minimum wage goes, can't really cut back on the number of employees when get to a certain point)
- Shown by the graph above.
- When the minimum wage increases, we technically increase in unemployment b/c at a higher wage, more people want those jobs = the Qs increases BUT the Qd does not decrease (no drop in the number of these jobs even though the wage has gone up). Small business argument is valid to a certain extent – unemployment increases only because more low-skilled workers are willing to work and would therefore increase the number of people wanting to work à there is NO decrease in the demand for quantity of labour.
- **City with the highest unemployment: Windsor, ON**
- Impact of minimum wage legislation on other labour markets (i.e. if not low-skilled labour – market for lawyers)
  - Minimum wage compared to what lawyers make is lower than the equilibrium and is therefore not binding and does not affect equilibrium. It is illegal to pay a lawyer less than $8/hr, but lawyers cost $400 000. This means that lawyers won't become unemployed as a result of the minimum wage legislation.

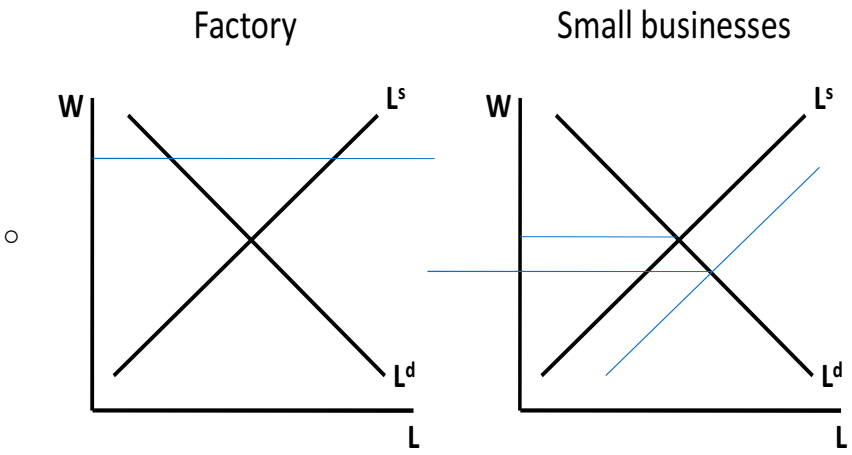
Minimum wage: market for lawyers



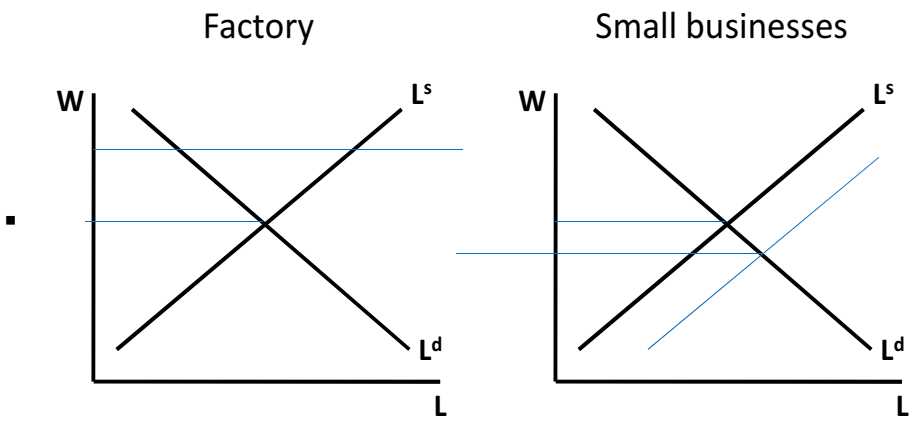
- Minimum wage has to be above eqm to be binding. Canada min wage > US min wage.
- **Not a predominant reason for unemployment as most works in the economy earn wages well above the legal minimum**
  - **Minimum wage laws are binding most often for the least skilled and least experienced members of the labour force**

2. Unions
- Union is a group of workers who band together and try to bargain for higher wages from the firm
- Have power using the threat to strike.
- If workers strike, firm makes no product and therefore no profits
  - Collective Bargaining: the process by which unions and firms agree on terms of employment
  - Cause conflict between *insiders*, who benefit from high union wages, and *outsiders*, who do not get the union jobs due to higher wages
  - Workers in unions reap the benefit of collective bargaining, while workers not unions bear some of the cost
- Example:
  - Consider a small town that has one factory and many small businesses. Why would you expect the wage to be the same in both industries?

- What would happen if the wage wasn't the same in both industries? Smaller industry -> factory -> people switch from factory to industry, but eventually…industry wage is driven down and factory wage is driven up.



- In both graphs, the wage is the same.
- If wage was higher in one sector, more workers would enter that sector and drive the wage down and drive the wage in the other sector up. This explains why the wages start out the same (W1).
- Suppose workers in the factory unionize. What happens?



- If the workers convince the firm to pay them a higher wage, the wage is above eqm in the factory. Qs > Qd; when most union contracts are written, there is a provision in the contract to protect jobs, but if you think about what the firm does over time, they would probably try not to hire more workers as they increase output and have workers just produce more stuff. At some point, the firm will cutback on workers.
- In the factory sector, there is unemployment. Some of these workers will go look for jobs in the other sector (small businesses). This causes the Ls curve to shift out to the right
- **New union wage is always higher than non-union wage.**
  - **Unions cause unemployment (some may go back to school, sit home, etc.)**
    - **Unemployed people will leave sector and enter a new one, leading to increased labour supply which , in turn, reduces wages in industries that are not unionized**

3. <u>Efficiency Wages</u>
   - Firms may operate more efficiently if firms offer a higher than equilibrium wage
     - Worker Health – only true in poor countries; their eqm wages are so low that it doesn't provide a healthy diet for workers. If you increase their pay, they can actually afford to eat enough calories to be productive workers.
       - **Not the case in developed countries.**
     - Worker Turnover – will decrease – fewer people leaving; it costs money to hire and

train new employees. Profitability may increase.
        - Worker Effort – workers will work harder b/c don't want to get fired. If get fired, they will earn a lower wage at a competing firm.
        - Worker Quality – may increase as well
    - When workers are looking for a job, they have a reservation wage: the minimum wage they are willing to accept in order to take a position
    - Depends on things only the worker knows (i.e. how hard working they are, how intelligent they are)
        - Someone who is a hard worker and very smart is likely to have a higher reservation wage than someone who is lazy and not so smart
    - If the firm offers a wage that is higher than the high quality worker's reservation wage then both workers will apply for the job. The firm stands a chance of getting the high quality worker.
        - If the wage that the firm is offering is only higher than the low quality worker's wage, then only the low quality worker applies for the job.
    - This idea of efficiency wages was first introduced by Henry Ford when he started offering $5/day to work in his factory. Henry Ford is known for introducing the assembly line method of production. There is a reason why efficiency wages were first introduced to an assembly line setting.
    - Prior the introduction of an assembly line, you would have one group of workers building a car in one corner of the factory from start to finish and another group building another car. If one member was sick, then the rest of the group members could work on building the car OR it was only the production of one car put in jeopardy. When there is an assembly line, however, you have the car moving along and if first worker in the assembly line is sick, then the entire assembly line is stopped. Henry Ford figured that if he paid them higher than eqm wage (he paid them double the going rate), then his workers would work harder, wouldn't quit as much, wouldn't be sick as often. This made his profits increase.
- <u>Summary</u>
    - All three cases (minimum wage, union, efficiency wage) are about the same
    - Wage is higher than eqm, which results in a surplus of workers, resulting in unemployment. Difference is what the driving force is behind each of these three causes of structural unemployment.
        - Minimum wage = government that is causing the wage to be higher than eqm
        - Union = workers are causing higher wage
        - Efficiency wages = firm causing higher wage
    - Same diagram and same result, but with different people causing structural unemployment
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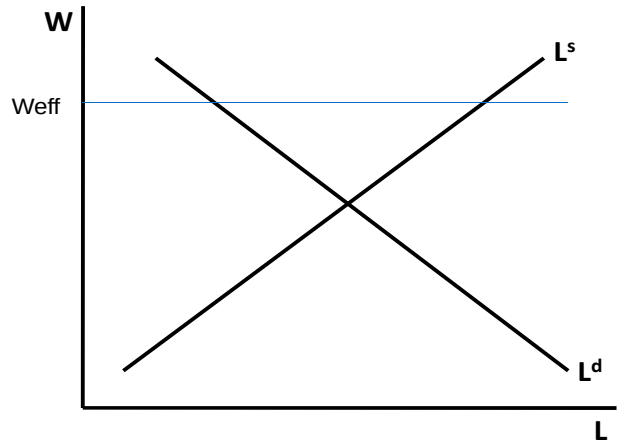

Chapter 10

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Money

Money is an asset that is regularly used to buy goods and services
- financial assets: money, stocks and bonds, savings account
- physical assets: diamonds, house, gold, baseball card
- Better than barter as it does not require *double coincidence of wants*
    - The unlikely occurrence that two people each have a good or service that the other wants
- Not the same as *wealth*

How can we tell an asset qualifies as worth money?
- **Medium of exchange** – people generally willing to accept it in exchange for goods and services; an item that buyers give to sellers for purchasing goods and services
- **Unit of account** – what most prices are measured in; in Canada, prices are set in Can dollars; thus, the unit of account is the Canadian dollar
- **Store of value** – an asset is a store of value
    - it retains its value and over a period of time, the asset can be sold
    - an item that people can use to transfer purchasing power from the present to the future
    - money is not the only store of value as person can transfer purchasing power from the present to future by holding other assets
        - **Wealth**: the total of all stores of value, including both money and nonmonetary assets

Credit card and debit card both measure in dollars (both fulfill #2). #1 and #3 fulfilled by debit card, NOT credit card. When use debit card to buy something, you are exchanging money for a G/S. When use credit card to buy something, you haven't actually paid for it yet; there hasn't been an exchange. It has been deferred – let someone else pay the store keeper and later, you will pay that person back. Debit card is an asset/money.

Liquidity: the ease with which an asset can be converted into the economy's medium of exchange
- money is the most liquid asset available
    - Currency > stocks > fine art
        - Currency is a medium of exchange. Why are stocks more liquid than fine arts? Bigger market, more people willing to buy and sell; can call broker fine and sell. Fine arts only in a special auction; not that many people can buy, therefore not as liquid.
- money is the not the perfect store of value
- when prices rise, the value of money falls, meaning when goods and services become more expensive, each dollar you have can buy less
    - If you have $10 in wallet, but the next day prices double. $10 would only buy ½ as much as before -> this means that the value of money has decreased as prices increase; purchasing power has decreased

Commodity vs. Fiat Money
- Commodity money: money that takes the form of a commodity with intrinsic value (eg. gold, cigarettes)
    - Has value other than the fact that it is used as money
    - Precious metals have intrinsic value b/c can used to make jewellery/use it to make other goods.
        - Have uses other than the fact that it can be used as money.
    - Prisoners use cigarettes as commodity money (can smoke it or trade it).

        - Easy to get (not illegal to have on you) and easy to count

- Barter economy (chicken for vegetables). Reason why have money so we don't have to barter. Money is convenient. Does not require double coincidence of wants

- Fiat money: established as money by government decree, with no intrinsic value
    - Government says this bill is legal tender, meaning that people have to accept it in exchange for G/S. This isn't what gives fiat money its value! **What gives fiat money its value is that businesses are willing to accept in exchange for G/S.**
        - Even though government says that people have to accept a certain currency, it does not mean that the money has value
            - Example: Zimbabwe: they now print currency/bills in billions of dollars – it's not worth the paper it's printed on; can't do anything with fiat money other than use it as money.

Money in the Canadian Economy

M1 = Currency + Demand deposits + travellers cheques + other chequable deposits
M2 = M1 + money market account + savings account + sometimes deposits

- **Currency**: the most widely accepted medium of exchange in the economy, which includes the paper bills and coins ***in the hands of the public***
    - It does NOT include the currency in the bank vault.

- **Demand deposits (D)** : the balances in bank accounts that depositors can access on demand by writing a cheque or using a debit card larger component of money in Canada
    - You write a cheque -> person takes it to their bank -> money transferred immediately (no 24h/3 day waiting period to get access to your deposits)

- The amount of currency in Canada per person is $1500-1600
    - But we don't carry this amount, so who is carrying all the currency?
        - Criminals because crime is a cash business.
        - In order to be untraceable, your drug dealer doesn't accept cheques or credit cards
    - US average is even higher
        - Crime but also:
            - US is considered a safe asset in the world hence people from different countries convert money into US currency

Gold System

- When economy uses gold as money(or uses paper money that is convertible into gold on demand), it said to be operating under a gold standard
    - Not a lot of countries in the metallic standard anymore (transactions via gold, silver, etc.)
        - The last time used was before WWII.
- The international financial system established for a duration after WWII was called the **Bretton Woods system**
    - NOT a gold standard
    - Key currency system (key currency being US dollars) – most countries in the world, fixed exchange rate with respect to the US dollars.
- At the same time, US gov agreed to buy/sell gold in an unlimited quantity at a price of $35/ounce. BUT the amount of gold in the US had nothing to do with the money supply in the US. In order to print currency, the central bank has to take in gold.
- Bretton Woods system officially ended in 1970s and the dollar became fully 'fiat currency,' backed by nothing but the promise of the federal government
    - No countries are on the gold standard, after having been replaced with the fiat currency

How do banks create money?

- Create money only in **fractional reserve banking system**
    - a banking system in which a bank holds only a fraction of deposits as reserves(deposits that banks have received but have not loaned out)
        - hence, use deposits to create money
        - As opposed to 100 percent reserve banking -> purpose was to only give depositors a safe place to keep their money
            - *If banks hold all deposits in reserve, banks do not influence the supply of money*
    - a bank is a business that wants to make profit
        - makes a profit by loaning out funds at a higher interest rate than it pays on its deposits
            - when you make a deposit in the bank, the bank will loan out a portion of that deposit to earn an interest payment from borrowers.
    - **reserve ratio:** the fraction of total deposits that a bank holds as reserves; what it keeps in the bank vault; ratio of reserves to deposits
- Example: Classroom is a closed economy.
    - I have $100,000 in currency and there is no banking system.
        - Current money supply, M = C + D = $100 000(currency) + $0 deposits = $100 000
    - Now, I deposit my $100,000 into a bank. The reserve ratio is 50%. If kept going and going, eventually reach $200 000
        - Current money supply = M = C + D = 3125 + (6250 + 12500 + 25000 + 50000 + 100 000) = $196 875
- T-account = balance sheet of a bank
    - Assets on the left; liabilities on the right
    - Bank assets are its reserves (the cash that it has in the bank vault, ATM, or teller's drawers) and loans (money that is owed to the bank)
        - From the perspective of a household, asset = deposit; liability = loan -> REVERSED
        - Reserve ratio = Bank's reserves/Bank's deposits
        - Ex. Reserve ratio = $100/$500 = 20% -> this leaves the bank with $400 to loan out to borrowers.
        - **Note: Assets always equal liabilities**
        - **When banks hold a fraction of deposit in reserve, banks create money, not wealth**
- **Money multiplier:** the amount of deposits the banking system generates with each dollar of reserves
    - Money multiplier = 1/reserve ratio
        - Ratio of deposits to deserves
        - In the special case of 100 percent reserve ratio, the reserve ratio is 1, the money multiplier is 1 and banks do not make loans or create money
- **Currency ratio:** the fraction of the total money supply that people want to hold in the form of currency
    - Since Canada's money system has very low bank reserve ratio, currency ratio is much more important
        - In economy where banks hold zero reserves against deposits, the money supply will be the reciprocal of the currency ratio times the quantity of currency
    - If currency ratio is 10 percent, meaning that everyone wants to hold money in form of currency, there will be no bank deposits at all and the money supply will equal the quantity of currency
    - If the currency ratio is 10 percent, meaning that people want to keep 1$ in their currency for every 9$ they hold in bank deposits, the total money supply in equilibrium would equal 10 times the quantity of currency

What is the Bank of Canada?

- Established in 1935

- Bank of Canada is Canada's central bank: an institution designed to regulate the quantity of money in an the economy
    - Owned by government
        - Appoints board of directors but can also issue a written directive to the governor with which they must comply
        - Governors serve 7 year terms, while other board directors serves 3 year terms
    - Managed by board of directors
    - Primary responsibility is not to maximize profits but to act in national interest
- Most countries have a central bank, not smaller countries though
        - Bank of England
        - The Central Bank of the Islamic Republic of Iran
        - Bank of Japan
        - Board of Governors of the Federal Reserve System
            - US valued state power over central authority
- Bank of Canada has four main areas of responsibility
    - Monetary Policy – influences the **money supply**: quantity of money available in the economy
        - BoC strongly influences the money supply; it doesn't control the money supply; there are limits to its control
            - <u>See problem 1 and 2 (it cannot control behaviour of depositors and bankers)</u>
    - Currency – designs, produces, and issues currency
        - Issues currency
            - least important function that the central bank does
    - Financial System – facilitates cheque-clearing and acts as a "lender of last resort"
        - At the end of the day, when there has been a cheque written on Royal bank for $100 and $400 on TD bank -> the BoC helps cheques get transferred b/w commercial banks.
        - Acts as a lender of last resort in that the Bank of Canada prevents commercial banks from going bankrupt by lending to it, in order to stop a "run on the bank"
        - Transfers funds to other big companies
    - Funds Management – acts as a banker for the Canadian government
        - BoC controls where the Can gov funds are held
            - Manages government bank accounts, Canada's foreign exchange reserves and national debt on behalf of the government
        - Government has money in the commercial banks and in the BoC
            - BoC controls where the money is and it can move between accounts
                - Take money to/from the commercial banks to BoC and vice versa

Bank of Canada's tools of monetary control

- The BoC controls/influences the money supply by:
    1. Open-market operations: buying and selling government bonds
        i. When the BoC buys bonds from the public, it gives the public money in exchange for the bonds. Thus, money supply increases; more currency in the hands of the public. If the BoC sells bonds to the public, money in the hands of the public (money in circulation) decreases as money goes into the BoC.
        ii. BoC also buys and selling things in the foreign exchange market
            - Purchases and sales of foreign moneys are called **foreign exchange market operations**
            - If BoC buys $100 million USD for $150 million CAD, the Canadian money supply increases by $150 million
            - Sometimes BoC wants to sell foreign currency in the foreign exchange market to support Canadian dollar's exchange rate but does not want money supply to fall
                - It uses CAD it acquires in the foreign exchange market to buy Canadian government bonds, thus putting the CAD back into operation

- ◇ **Sterilization:** the process of offsetting foreign exchange market operations with open-market operations so that the effect on the money supply is cancelled out

2. Changing the overnight rate: the government can change the bank rate, which equally changes the overnight rate
    - □ Remember: cheque-clearing happens at the end of everyday. What happens when a bank doesn't have enough funds to cover all the cheques that were drawn out of its account that day?
    - □ They can either borrow money from other commercial banks or from the BoC.
        - ◆ Bank, or discount, rate: interest rate that the BoC charges commercial banks to borrow overnight
            - ◇ BoC pays commercial banks the bank rate, minus half a percent on their deposits at BoC
            - ◇ Range between is known as the **operating band**
                - ▸ Sets pattern for all short-term interests in Canada
        - ◆ Overnight rate: interest rate that commercial banks charge each other to borrow and lend overnight
            - ◇ Stays very close to middle of the operating band
        - ◆ Two rates are linked and both move in the same direction (i.e. if bank rate increases, overnight rate increases).
        - ◆ If bank rate is high, borrowing is expensive for banks, meaning that the reserves are lower -> let less loans out-> money supply decreases.
        - ◆ If the bank rate is low, banks can afford to borrow more, giving them more reserves -> more loans out -> money supply increases.
        - ◆ BoC has fixed eight days each year on which it announces how it will influence bank rate
3. Changing the minimum reserve requirement
    - Not used in Canada
        - □ there is no MRR in Canada, yet there is in US
    - If the Board of Governors of the Federal Reserve System (US's central bank) increase MRR, then a higher fraction of deposit has to be kept back in reserve and money supply would decrease.
    - If MRR was lower, less money held in reserves, more in loans and money supply increases

Problems and Bankruns

1. BoC does not control the amount of money that households choose to hold as deposits in bank
    - Increased money in deposit, increased reserves, increased money that bank can create, increased money supply and conversely as well
        - If people lose confidence and withdraw deposits and hold more currency, banking system loses reserves and creates less money
            - □ Money supply falls even without any action of BoC
2. BoC does not control the amount that commercial bankers choose to lend
    - Once money is deposited in a bank, **it creates more money only when the bank loans it out**
        - Bank can choose simply to hold extra money as reserves
            - □ Hold greater reserves, decide to make fewer loans, money supply falls

- Remember: BoC is a lender of last resort.
- **Bank run**: depositors think that a bank may go bankrupt. If all banks kept 100% of deposits in reserves, then bank runs wouldn't occur. If depositors went to the bank to get money in the form of cash, the bank would have this in supply/the cash.
    - BUT fractional-reserve banking **does not** have all the deposits in the safe.
        - If everyone shows up at the bank to take money out, the bank may not have enough and could end up bankrupt

        - BoC may step in and lend the commercial bank enough to keep these depositors happy and hopefully save the bank from bankruptcy
    - Bank runs don't happen that often anymore due to CDIC
        - Each person is insured up to $100 000 at each financial institution
        - If person's bank went bankrupt, the government of Canada would give you all of your deposit at a single financial institution (up to $100 000).
        - Last fall, when financial markets were very shaky in the US; they increased Federal Deposit Insurance Corporation from $100 000 to $250 000 per person per bank**.**

Chapter 11

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Classical Theory of Inflation

- Explanation of how money markets operate in the long run
- Supply and demand model of money markets
- price of a good – reflects value
    - When look at market for usual goods (i.e. pizza), we're looking at price of the good on the y-axis which reflects the VALUE of the good
    - Inflation is more about the value of money
- as the price level rises:
    - Money value decreases
    - demand for money (from households) increases –need more money to buy the same goods
    - Demand curve is reflection of the value that households place on the good
    - Supply curve is relationship b/w price and costs.
    - **Eqm price of a good reflects value on the demand side and cost on the supply side**
    - When talking about money, its value falls as price lvl rises. If all prices were to double overnight, the money that we have buys less and therefore it is worth less
    - The demand for money increases when prices increase, but doubling price will cause us to need twice the amount of money to buy the same goods

- the demand for money curve has a negative slope
    - Need a demand curve with a negative slope. Money on the horizontal axis, price on the vertical axis would yield a positive slope -> not what we want!
    - Want something to capture the idea that when prices increase, households would want more money -> 1/P

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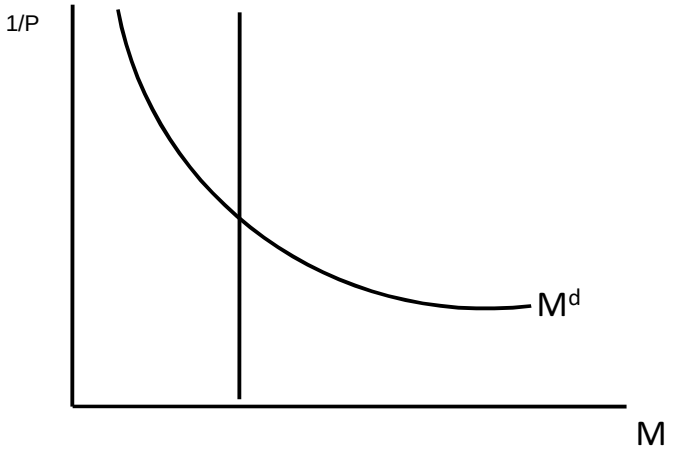


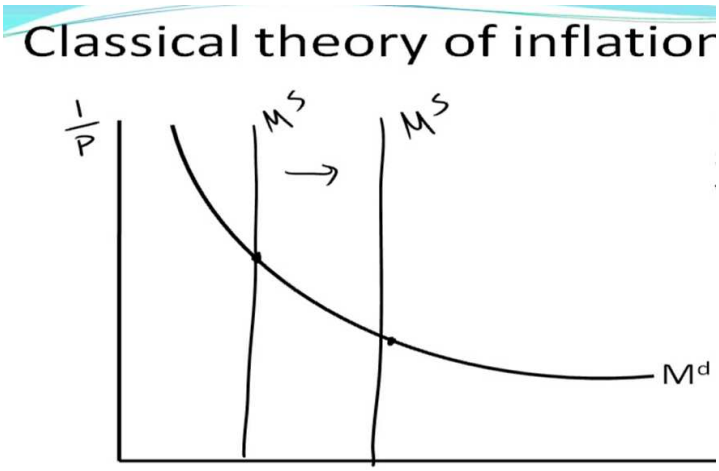
    - This variable captures the idea that the value of money, so that when P, price level, increases, 1/P, decreases
    - Value of money = 1/P: the value of money measured in terms of goods and services

- Md - shift out if income, GDP rise or if households decide to increase their money holdings for some other reason
    - Fundamentally, the demand for money reflects how much wealth people want to hold in liquid form
    - When income increases, you want to consume more, buy more stuff, need more money
        - Be careful of the money definition here! M = Currency + Chequing account deposits.
            - General public definition of money is different! Think that money is identical to

income. So when ask, “how much money do you make?”, you are asking in terms of income BUT...Income is what you bring home from working at a job or interest income in your savings account -> FLOW variable!

- If consumption is less than income, you get savings.
- Assets or wealth is the STOCK variable that is the sum of all past savings
  - How we hold this stock of wealth/assets is a decision based on several factors:
    - Part of wealth made, may be held as money, stocks or bonds. If want to consume more, need more money in order to buy goods and services.
    - Households could also decide to hold more or less money for some other reason in their savings account (i.e. Canadian and US are fearful of financial markets; people have sold mutual funds/stocks and put money in a savings account -> if money was in chequing accounts, it would be included in money in Canada (M=C+D)

- Ms vertical – position determined by the central bank
  - Assume that money supply is vertical and position is determined by the central bank. Central bank actually doesn’t control the quantity of money in the economy. Assume it does b/c makes model easier to understand. There are two things limiting the central bank’s control:
    i. Central bank can set a legal minimum reserve requirement, but if bank chooses to hold excess reserve, there is nothing that the central bank can do about it.
    ii. Households decide what share of money to hold as currency or the form of deposits. The larger the share of deposits in total money holdings, the larger the money supply will be.



  - Central bank increases the money supply. The money supply shifts out, quantity of money in the economy increases, the value of money decreases and the price level would increase.
  - **Injection of money increases demand for goods and services**
    - Does not affect supply of goods and services, or productivity
    - Leads to increased price level, in turn, increasing quantity of money demanded

Quantity Theory of Money

- The quantity of money determines the price level
- The growth rate of the money determines the inflation rate
- **Classical dichotomy:** the separation of real(physical quantity, measured in units, **relative**) and nominal(dollar amount, measured in monetary units) variables
- **monetary neutrality:** changes in Ms affect nominal variables, but not real variables
- Generally true for **long-run**, not necessarily short-run

Velocity

- the rate at which money changes hands; rate that links stock and flow variables
    - example:
        - produce 2000 cups of hot chocolate / week
        - $2 per cup
        - $500 of currency in the economy
        - How many times must each dollar change hands for all the hot chocolate to be purchased?
        - Total spending in the economy is $2 x 2000 = $4000.
            - If we have $500 of currency in the economy. How many times must each dollar change hands for all hot chocolate to be purchased; 4000/500 = velocity = 8 times
- Quantity theory of money can be expressed as an equation:
    - M X V = P X Y
    - Nominal GDP is price level, or GDP deflator, x real GDP (P x Y), M = money, V = Velocity
    - **Make sure units are the same(all billions not trillions, etc)**
- Stock of money is flowing through the economy in order to pay for all expenditures
    - Increase in the quantity of money in an economy must be reflected in either price level(increase), quantity of output(increase) or velocity of money(decrease)
        - Can sometimes assume that velocity stays constant and output of goods/services(Y) is primarily determined by 5 productivity factors
            - Hence, when bank alters the money supply, it induces proportional changes in the price level(P)
                - Therefore, when central bank increases money supply rapidly, the result is a high rate of inflation
                - This, in essence, is the quantity theory of money
- the growth rate of the product of two variables is (approximately) equal to the sum of the growth rates of the individual variables
    - Equation rewritten in terms of growth variables:
        - $$\frac{\Delta M}{M} + \frac{\Delta V}{V} = \frac{\Delta P}{P} + \frac{\Delta Y}{Y}$$

Inflation Tax

- Inflation is generally caused by governments as a way to pay for their spending
- ***Three ways for the government to raise revenue***
    1. *Direct taxes: sales tax or income tax*
        i. Favourite way
    2. *Borrowing - future tax*
        i. When government borrows, they are taxing the future
            - At some point, if that debt is going to be repaid, the future government that is in power then will have to raise taxes. **When borrow today, we are raising taxes on future generations**
    3. *Printing money - tax on money - **inflation tax***
        i. Government is the only legal one allowed to print money, meaning that if they want to pay teacher salaries or buy computers, they could just print more money and pay for those goods and services
            - BUT increasing money supply leads to higher prices and would eventually reduce the money value in our wallets/chequing accounts
                - **Inflation tax is like a tax on everyone who holds money**

Hyperinflation

- Hyperinflation is a problem
    - Generally caused by government high spending, inadequate tax revenue and limited ability

to borrow
    - Thus, prints more money(inflation tax), leading to increased inflation
    - **Ends when government institutes fiscal reforms - such as cuts in government spending - that eliminate the need for inflation tax**
- It is greater than 50% per month or higher
    - Zimbabwe has this
- Two problems:
    1. Hard to decide what to buy due to disproportionate rise in prices.
        - When prices go up this rapidly in a week, spending power still very high
        - Difficult to make decisions about what to buy because prices will not be raised by exactly the same percentage every week/month
            - Relative prices are changing which influences which goods and services we actually purchase.

    2. Resources and time wasted when spending income.
        - As soon as you get paid, need to use the money right away b/c if wait a couple of days, you'll get less than before with the paycheque
            - People waste resources and time just trying to spend their income.

Fisher Effect

- nominal interest rate = real interest rate + inflation rate
    - Interest rates are important to understand because they link the economy of the present and the economy of the future through their effects on saving and investment
- in the long run, a change in money growth does not affect the real interest rate
- **Fisher effect:** the one-for-one adjustment of the nominal interest rate to the inflation rate, in the long-run
    - Changes in the money supply affect nominal but not real variables. It increases the price level. It increases the price supply. Nominal interest rates, but not real
    - If inflation catches borrower/lender by surprise, the nominal interest rate originally set will fail to reflect the rise in price
        - Fisher effect states that the nominal interest rate adjusts to expected inflation
        - In long run, not necessarily in short run

Why is inflation bad for the economy?

- **Higher prices is NOT the problem with inflation. It is true that everything costs more now, but it is also true that years ago, people's income are higher now**
- **Inflation does not in itself reduce people's real purchasing power**
- *Instead there are other costs of inflation*

Costs of Inflation

- Shoeleather costs
    - When inflation rate is high, money its loses value/worth less over time
        - Don't want to keep assets in money form; change it/keep it in another form that isn't losing value b/c of rising prices. But if going to hold less money and we are purchasing the same quantity of goods and services, then need to transfer from other forms of money more frequently.
        - Idea first discussed when people actually had to walk to the bank to get money; if you had high inflation, make more frequent trips to the bank to transfer money from your savings account to chequing account OR to withdraw cash. The high number of trips caused you to wear out the bottom of your shoes.
            - **Still imposes a cost today, because we have to take the time to transfer these monies around**
        - **The resources wasted when inflation encourages people to reduce their money**

holdings

- Menu costs
  - relate to businesses that print their price lists (i.e. restaurants)
  - high inflation will cause menus to be printed more frequently, which costs the firm real resources
  - **The costs of changing prices**
- Relative price changes
  - Suppose that the money growth rate is 12% per year. So that over the course of the year, prices will go up by 12% just b/c of the change in money supply/money supply growth; NOT b/c of the change in tastes, input costs, etc.
  - Suppose that firm A increases price by 1% each month and firm B increases price by 12% in December. Over the course of the year, good A becomes more relatively expensive than B, but nothing real has changed! (tastes haven't changed, costs of producing goods haven't changed, and yet relative price is changing -> this causes people to buy more of good B!
    - **This is fine as long as price changes capture REAL underlying changes**
    - **Because prices change only once in a while, inflation causes relative prices to vary more than they otherwise would**
    - **When inflation distorts relative prices, consumer decisions are distorted and markets are less able to allocate resources to their best use**
- Tax distortions
  - Problem arises not because interest income is taxed, but because nominal interest income is taxed
    - People often fail to take inflation into account in tax laws
  - One problem is **tax treatment of capital gains:**
    - Buy stock for 10$ in 1980, sell for 50$ in 2006
      - Capital gain(profit) of $40 which you must include in your income
      - But suppose price level doubled from 1980 to 2006
        - When you sell your stock for 50$, you only have a capital gain/increase in purchasing power of 30$, since 10$ in 1986 is equivalent to 20$ in 2000
        - Tax does not take inflation into account and assesses you a tax on a gain of 40$
  - **Tax treatment of interest income:**
    - Income tax treats the **nominal** interest earned on savings as income, including the inflation
  - If didn't know inflation rate or real interest rate, it would seem like you would want to buy a bond from economy B b/c that bond would pay you more in return. BUT when look at inflation rate, we find that before-tax real interest rate is the same. Remember: nominal interest rate is taxed! If tax rate is 25%, then in A, gov will take 25% of 4% return, leaving you with 75% of your 4% return. Thus, after-tax nominal rate = 3% -> 3% is 75% of your 4% return (portion of interest income you get to keep). In economy B, government takes 3% and you get to keep 9% of return (9 is 75% of 12%).
  - What we really want to find out is the after-tax real interest rate. This is achieved by: After-tax real interest rate = After-tax nominal interest rate – inflation rate.
  - In A, (3 – 0 = 3). In B, (9 – 8 = 1). This distortion is introduced not because of the existence of the tax, but because the nominal interest is taxed as opposed to the real interest rate.
  - **This explanation is confusing, read textbook pg. 256, 257 for better table**
  - **In essence, higher inflation tends to discourage people from saving**
    - **Since saving=investment and investment = essential to long-run growth, raising the tax burden on saving leads to lower saving and retards long-run growth**
    - One solution, other than eliminating inflation, is to index the tax system
      - Tax laws could take into account inflation
    - Another solution is to tax only real interest income by excluding that portion of the interest income that merely compensates for inflation

- Confusion and inconvenience
    - If prices are rising that rapidly, it would be very difficult to make good decisions because everyday faced with different set of prices that **it's hard to keep up with what the actual price of things are**
        - Hard to make smart investment decisions, hinders growth

Costs of Unexpected Inflation

- Redistribution of wealth
- if inflation is unexpectedly high, wealth is transferred from lenders to borrowers
    - Wages and prices will rise so high loan can be paid easily/out of pocket change
- if inflation is unexpectedly low, wealth is transferred from borrowers to lenders
    - Wages and prices will fall and loan will be harder to pay off
- If inflation were predictable, then the loans could have taken inflation into account when setting the nominal interest rate but if it is hard to predict, it imposes risk on lender/borrower that they do not want
- **Cost of unexpected inflation is important because inflation is especially volatile and uncertain when the average rate of inflation is high**
- If a country pursues high-inflation monetary policy, it will have to bear nonoly the costs of high expected inflation but also the arbitrary redistributions of wealth associated with unexpected inflation
- Example of unexpected cost:
    - During 60s, inflation was low and banks were lending to borrowers for mortgages at low nominal interest rates. Let's say you signed a deal to buy a house in 1970 and you are paying 6% per year nominal interest.
        - There was oil shock in 1970, leading to very high inflation rates (i.e. 16-18% inflation). If inflation rate is 16% and nominal is 6%. Then, real interest rate was negative 10% ß as if bank was paying households 10% for loaning them money. If inflation is unexpectedly low, money is transferred in the other direction; people borrowing money have to pay more to the banks.

Chapter 12

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Macroeconomic issues arise in an **open** economy

- An economy that interacts freely with other economies around the world
    - Interaction includes:
        1. Buying and selling goods and services in world product markets
        2. Buying and selling capital assets such as stocks and bonds in world financial markets

The International Flows of Goods and Capital

- Exports are domestically produced goods and services that are sold abroad
- Imports are foreign-produced goods and services that are sold domestically
- Net exports(trade balance) = exports - imports
    - If net exports are positive, exports are greater than imports, indicating that the country sells more goods and services abroad than it buys from other countries
        - Known as trade surplus
        - NCO > 0 [explained later in notes]
    - If net exports are negative, exports are less than imports, indicating that the country sells fewer goods and services abroad than it buys from other countries
        - Known as trade deficit
        - NCO < 0 [explained later in notes]
    - If net exports are zero, its exports and imports are exactly equal
        - Known as balanced trade
        - NCO = 0 [explained later in notes]
    - Factors that influence export/imports/net exports/international trade include:
        - **Tastes** of consumers for domestic and foreign goods
        - **Prices** of goods at home and abroad
        - **Exchange rates** at which people can use domestic currency to buy foreign currencies
        - **Incomes** of consumers at home and abroad
        - **Cost of transport**ing goods from one country to another
        - **Government policies** toward international trade

The Flow of Financial Resources: Net Capital Outflow

- Net capital outflow (NCO): the purchase of foreign assets by domestic residents minus the purchase of domestic assets by foreign residents
    - Assets include stocks, bonds, currencies
    - also called net foreign investment (NFI)
    - Both *foreign direct investment* and *foreign portfolio investment* raise net capital outflow
    - Factors that influence net capital outflow:
        - Real interest rates being paid on domestic/foreign assets
            - If foreign assets pay a higher rate of interest than domestic asset, one would rather by a domestic asset
        - Perceived economic and political risks of holding assets abroad
            - Political stability fosters more foreign investment
        - Government policies that affect foreign ownership of domestic assets
            - Restrictions in foreign ownership have decreased investment
                - Governments often don't want banks, defense industries, etc. to be dominated by foreign institutions.

Types of Foreign Investment

- Foreign Direct Investment: capital investment that is owned and operated by a foreign company

    - Ford plant making cars in Oakville
    - Involves day-to-day control over decision making
- Foreign Portfolio Investment: an investment that is financed by a foreign country, but operated by domestic
    - Buying shares in a foreign company

The Equality of Net Exports and Net Capital Outflow

- NCO = NX
    - When a firm sells a good to a foreigner, the firm receives a good or an asset of equal value in return
    - If you import a pen and pay in Canadian dollars, technically NCO goes up since the foreign company bought that currency
    - If you import and pay in US Dollars, technically NCO goes down since you are returning that US currency
    - If NX changes, NCO must also change
        - When nation is running a trade surplus(NX > 0), it is selling more goods/services to foreigners than it is buying from them. The foreign currency it receives from the net sale of goods/services abroad are used to buy foreign assets
            - Hence, capital is flowing out of country(NCO>0)
        - When nation is running a trade deficit(NX<0), it is buying more goods/services from foreigners than it is selling to them. It is financing the net purchase of these goods/services by selling assets abroad. Capital is flowing into the country(NCO<0)

Saving, Investment, and Their Relationship to the International Flows

Saving and Investment in Open Economy:

- Y = C + I + G + NX
- Y – C – G = I + NX
- Recall: Y – C – G = S
    - S – I = NX
    - NCO = NX
- Domestic Saving (Household + Government) – I (domestic investment, borrowing in order to get more capital stock) = Net Exports
    - Since 1999, Canada has had NX > 0 and thus, NCO > 0
    - National savings in Canada : 14% of GDP in 1993 and 22% of GDP in 02
    - The increase in national saving has been mostly due to the provincial and federal governments eliminating deficits

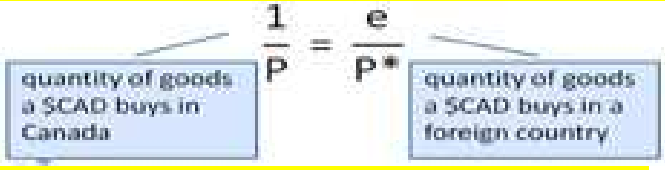
The Prices for International Transactions: Real and Nominal Exchange Rates

Exchange Rates

- Nominal exchange rate is the rate at which you can exchange one currency for another
- “e” is how much foreign currency you can purchase with 1$ Canadian dollars
    - if e increases, the Canadian dollar appreciates
        - Nominal exchange rate increases
    - if e decreases, the Canadian dollar depreciates
        - Nominal exchange rate decreases
    - Exchange rate index turns many exchange rates into a single measure of the international value of currency
- Real exchange rates are the rate at which you can exchange goods and services between countries
    - involves the nominal exchange rate and foreign & domestic prices
    - Real exchange rate = (Nominal exchange rate x domestic price) / foreign price
    - RER= e x P/P*
        - Where E= nominal exchange rate between the canadian dollar and foreign currencies, P = price index for a canadian basket, P* = price index for a foreign basket

*means foreign

How are exchange rates determined?

- Purchasing power parity (PPP) is the idea that a unit of currency should buy the same quantity of goods in any country
    - Unit of all currencies must have the same real value in every country
    - Based on the law of one price
    - if a good(e.g coffee) is cheaper in Canada than in Japan, people would buy coffee in Canada and sell it in Japan. This would then cause the demand for coffee in Canada to increase, DRIVING THE PRICE UP, and the supply to increase in Japan, DRIVING THE PRICE DOWN
    - Therefore, in the end, the prices are the same
    - Arbitrage: taking advantage of differences in prices in different markets AT THE SAME TIME to make a profit (not the same as buying a stock hopng for capital gain – speculation – hoping price goes up)
    - 1/P is the quantity of goods a Canadian $ buys in Canada
    - 

    - Rearrange this to get: e x P/P* = 1 and thus RER = 1
    - Furthermore, nominal exchange rate(e) = P*/P
        - Which means that the nominal exchange rate between the currencies of two countries must reflect the different price levels in those countries.
            - Since this is true, the nominal exchange rate is also dependent on money supply and demand
            - Inflation of a currency decreases its value in purchasing goods/services and other currencies
    - **PPP tends to "work" (explain movements in nominal exchange rates) in the long run or in countries with very different price levels**
    - Note: If the purchasing power of the dollar is always the same at home and abroad, then the real exchange rate – the relative price of domestic and foreign goods – CANNOT CHANGE

Limitations of PPP

- PPP doesn't always work because of three factors:
    1. **Some goods are not easily traded**
        - When arbitrage is too limited to change the supplies/demands and thus, prices
    2. **Traded goods are not perfect substitutes**
        - Depends on tastes of buyers and what is "in" that affects demand/supply, which ultimately affects price
    3. **There are transportation costs**

(read the case study on 287-288 about the bic mac index)

Chapter 13

This is a complex chapter - I recommend reading the textbook

Interest rates in a small open economy

- Open economy: allows goods, services and capital to flow across boarders freely
  - Large open economy is the economy that is big enough to influence world interest rates and prices
  - Small open economy (SOE): not large enough to affect world interest rates or world prices
- Perfect capital mobility: full access to world financial markets for consumers
  - No restrictions on foreigners owning domestic assets
  - No restrictions on Canadians owning foreign assets
- Example: Canada

Interest Rates in a Small Open Economy

- Interest rate parity: the real interest rate (in Canada) should equal real interest in world financial markets in the LONG RUN
  - $r = r^w$
  - If they were not equal, and the world interest rate was greater than the domestic interest rate, domestic savers would sell their domestic assets and purchase foreign assets where they would receive a larger rate of return
  - Not realistic but need a simple model
  - Most models are SOE
    - LOE = US, Japan, Europe, maybe China & India
  - Interest rate parity is NOT always perfect for two reasons
    - Risk of Default
      - Higher the default risk, the higher the interest rate, but the less likely one will get their payment and vice versa
      - Example: Zimbabwe bond may give 20 percent interest rate, but how likely is it that you'll actually get your money back?
      - Therefore, interest rate differences MAY persist
  - Tax treatment
    - The tax on interest-based income is different in different countries and thus, if two countries have the same interest rate, but different tax rates, the 'investor' will most likely put their money in low-tax
      - Care about only after-tax real rate of return

Model of a Small Open Economy

- Two markets include:
  1. Market for loanable funds
     - Coordinates economy's saving, investment and the flow of loanable funds abroad(net capital outflow)
  2. Market for Foreign-Currency Exchange
     - Coordinates people who want to exchange the domestic currency for the currency of other countries
- Supply vs. Demand: interest rate vs quantity of loanable funds
  - World market for loanable funds
  - Demand is sum of individual demands in countries(demand from firms)
  - Supply is of all countries (savings of households/govt)
    - If there is an increase in demand in Canada, shifts demand out (in Canada)

    - Very little change in world interest rate
- S – I = NCO (open)
- S = I (closed)
- In a closed economy, the interest rate adjusts to bring S into line with I
    - Closed economy only focuses on savings of Canadians
- In a SOE, we take the world interest rate as given - > $r = r^w$
    - **Likely never reach equilibrium in a SOE**
    - Because we need to consider the role played by the savings of foreigners
- If S > I, thus NCO > 0
    - Therefore, lending to foreigners
    - If world interest rate is above eqm. Qs > Qd -> lending the excess saving to foreigners
    - Since 1999, Canada has shifted towards this
    - **Amount of NCO is distance between the supply and demand curve at r^w**

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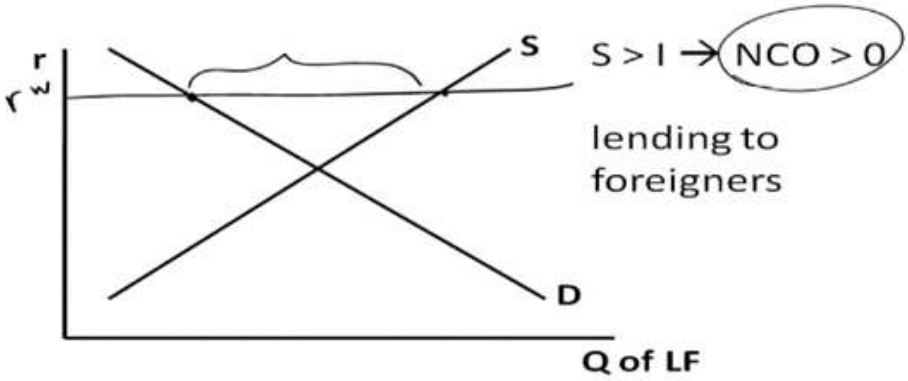

- If S < I, thus NCO < 0

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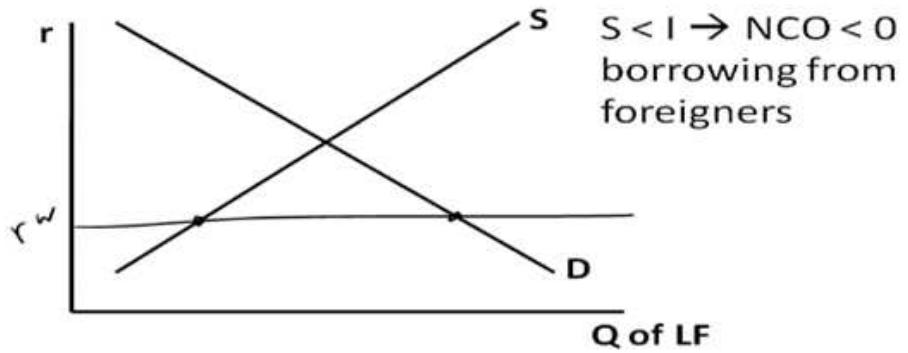


- Situation in Canada for much of the past 40 years

Market for Foreign Currency

- Supply and demand of $CAD on foreign currency market
    - Artificially divide foreign exchange transactions
    - We try to determine RER (real exchange rate)
    - The RER is on the vertical access (eP/P*)
    - The reason that someone would want to buy CAD$ is because they want to buy CAD good or asset with foreign currency

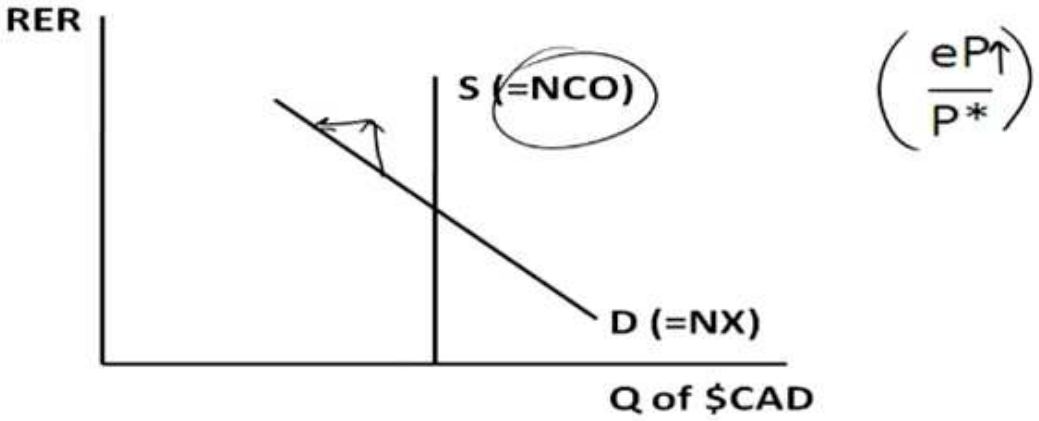
Deriving the supply and demand curves for Canadian currency

- **Supply – from NCO, a Canadian purchase of foreign assets (we are supplying $CAD, demanding for currency)**
    - Buying foreign currency and supply Canadian dollars
    - Factors that affect NCO are interest rates, risk and government policies

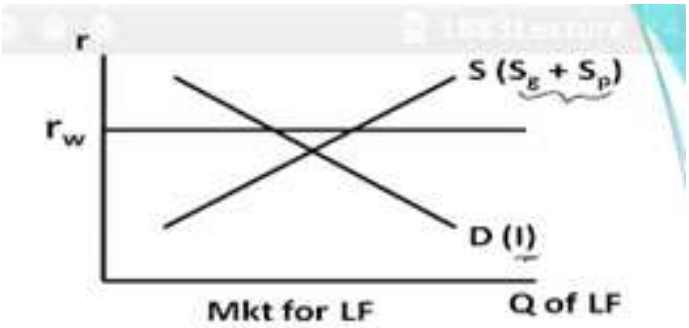
- NCO – RER does not affect it so **supply is vertical**

- **Demand – from NX, foreigners wanting to buy $CAD (because they want to purchase Canadian goods)**
  - Factors that affect NX are tastes, prices, nominal exchange rate, government policies and transportation costs
  - Demand is negative slope b/c a rise in domestic price level
    - Imports go up and exports go down. NX goes down. QD goes down. RER goes up. Less demand

? - Note: that there is no factor that determines the supply of a currency (consider eP/P*) but the nominal exchange rates and prices affect demand and thus demand influences exchange rate



- We always start rw above equilibrium
  - **The world interest rate will NEVER fall below the equilibrium**



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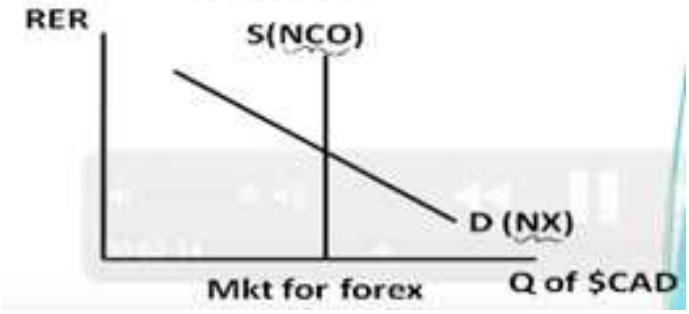
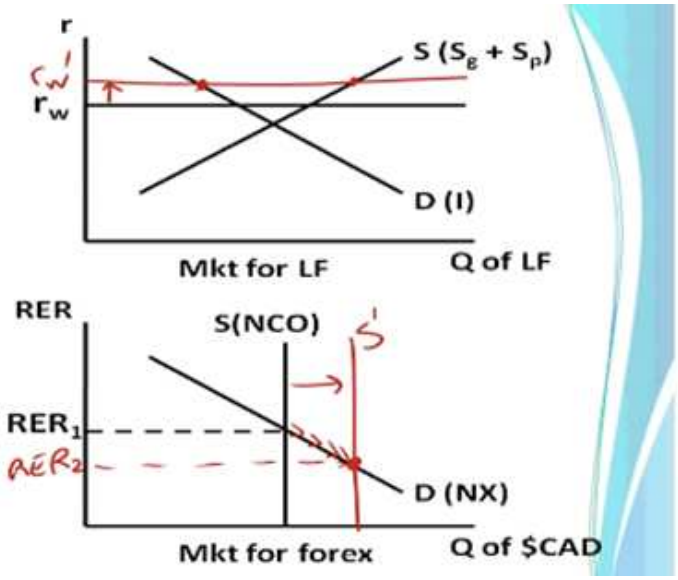


- Key: Difference between QS and QD of market for LF determines (S)NCO
- Increase in world interest rate
  - Bigger increase in QS ans QD and NCO to increase and S increase
  - Causing real interest rate falls
  - NX is higher b/c real exchange rate goes down. (move along D curve)



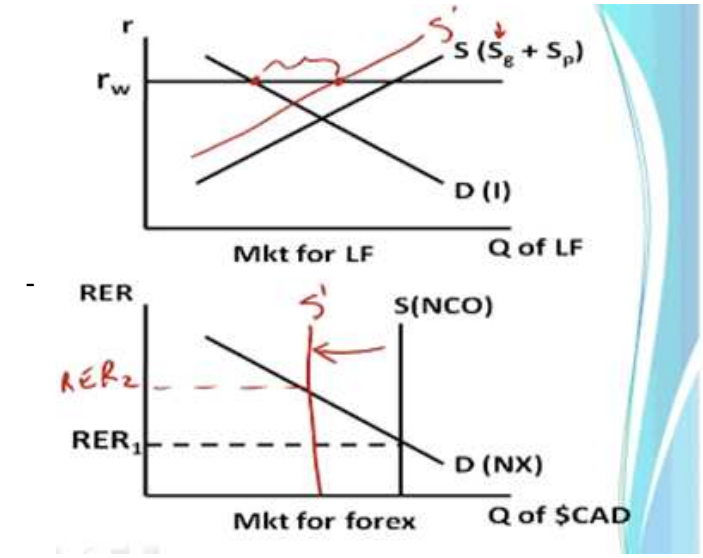
Effects of an increase in the world interest rate

NCO ↑ (NX=NCO)

NX ↑

$\frac{eP}{P^*}$

- Increase in govt budget deficit
  - Public savings falls, shifts S inwards,
  - **We always want rw above equilibrium**
  - Difference between QS and QD decreases, NCO decreases
  - S decreases, RER increases, and NX decreases



NCO > 0

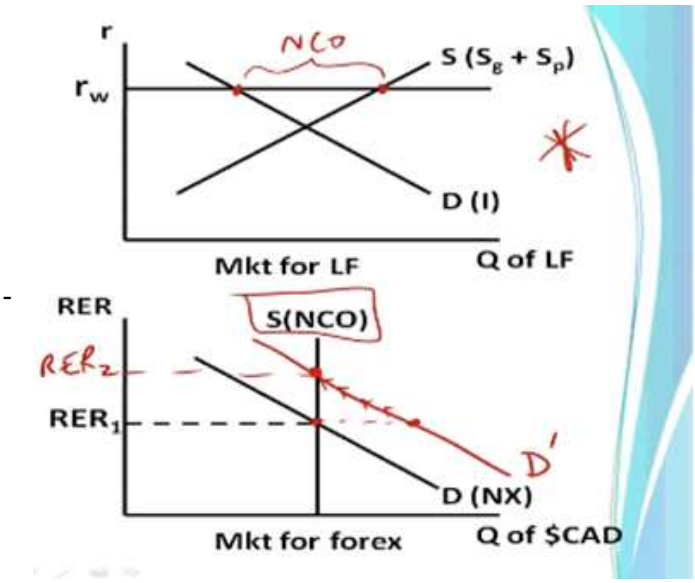
Effects of an increase in the government budget deficit S_g↓

NCO ↓

NX ↓

RER ↑

- Imposing an import quota – imports go down initially
  - Shift demand curve to right as NX goes up
  - QD is greater then QS putting upward pressure on price. Excess demand for CAD$, which means value goes up RER goes upto equilibrium
  - At high RER, Exports shrink and imports rise again, so same NX
  - S (NCO) is vertical thus NX does not change
  - **If we don't change anything in top diagram NX will not change**
  - **THE ONLY WAY TO AFFECT NX IN AN ECONOMY IS TO CHANGE NCO SOMEHOW**



NX = exports − imports

Imposing an import quota

↑ NX

RER↑ → NX↓

Chapter 14 and 15

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- Economy's output of goods services(real GDP) vs overall price level(CPI or GDP deflator)
- Aggregate supply/demand has no substitutes because everything already included
- Aggregate demand: defined by who buys it Y = C + I +G +NX
    - Has negative slope for 3 reasons
        1. Wealth effect
            - **A lower price level raises the real value of household's money holdings, and higher real wealth stimulates consumer spending, which results in a larger quantity of goods and services demanded. Hence Y increases**
            - Money holdings are a small part of wealth
                - Hence, wealth effect is least important of the three
        2. Interest rate effect
            - Money markets in SHORT RUN. Assume there are 2 assets – money and bonds
            - Money – no interest only hold money to make transactions (buy)
            - Money supply held by bank and demand is by consumers. (negative because increase in interest rate, demand less money (save more in bonds)
            - Bonds – positive interest
            - Therefore with decrease price, people buy same physical quantity and therefore require less money. Money demand curve shifts into left, interest rate falls, investment goes up and income goes up
            - **A lower price level lowers the interest rate as people try to lend out their excess money holdings, and the lower interest rate stimulates investment spending, thereby increasing the quantity of goods/services demanded**
            - Most important reason for downward slope of aggregate-demand curve
        3. Real exchange rate effect
            - When prices go down, real exchange rate goes down, Canadian goods are relatively cheap, NX increase, and output goes up
            - **A lower price level reduces the real exchange rate. This depreciation makes Canadian-produced goods and services cheaper relative to foreign-produced goods and services. As a result, Canadian net exports rise, increasing quantity of goods and services demanded**
            - In a closed economy, real exchange rate is in nonexistent
- **Which has a flatter AD curve, open economy or closed?**
    - **Open economy**
        - More availability of substitutes
- Shift factors for AD curve
    - Anything other then a change in P that affects C, I, G or NX will cause the AD curve to shift
    - People become more optimistic and shopping goes up AD increase

- Aggregate Supply
- LRAS(Long-run aggregate supply) = real GDP = Y= AF (KLHN)
    - Classical Dichotomy – in long run, changes in supply affect nominal variables but not real variables
    - Slope: A, K,L,H,N do not depend on price (recall the classical dichotomy – the long run separation of real and nominal variables)
    - **Long run aggregate supply is vertical in the long run, whereas in the short run, aggregate supply curve is upward sloping**
    - Shift – any change in A, K,L,H or N will cause LRAS to shift (any factor increases- shift to right, any factor decreases – shift to left)

- Ex: L – decrease in birthrate – LRAS would shift to left b/c labour is smaller
    - Immigration – LRAS shifts to right

- SRAS: Y = ystar + a (P-Pe)
    - a is a parameter (positive number) with no economic value
    - P – price level
    - Pe – expected price level
    - Y star = natural level of output = output when there is natural rate of unemployment
    - Eventually in long run, this equation would become y = ystar, or quantity of output supplied = natural level of output
- Slope is positive because:
    1. Sticky wage theory
        - Nominal wages do not change frequently (are sticky)
        - Real wage is ***W/P*** (nominal wage over Price level)
        - If prices fall, real wage increases, and labour is relatively more costly for firms and thus, they decrease SUPPLY. If ALL firms experience this, Y decreases (vice versa)
    2. Sticky Price theory
        - The prices of some goods and services do not adjust immediately
            - Incur *menu cost*s as well
        - As other firms adjust their prices, the firms that have not yet done so will experience losses until they do so
            - Causes them to decrease production, supply
    3. Misperceptions theory
        - Idea that workers and firms are more familiar with the industry that they work in than they are in the overall economy
        - If the overall price level decreases, a firm would immediately see a fall in the prices of their products and not others. They feel as though they need to cut back on production, and so they do.
            - They should cut back if the demand for teddy bears goes down, but they shouldn't if the overall money supply/demand goes down. This is because when that happens, nothing real actually changes in the economy.

In essence, for all three situations, when the price level rises above expected level, output rises above its natural rate and when the price falls below the expected level, output falls below its natural rate

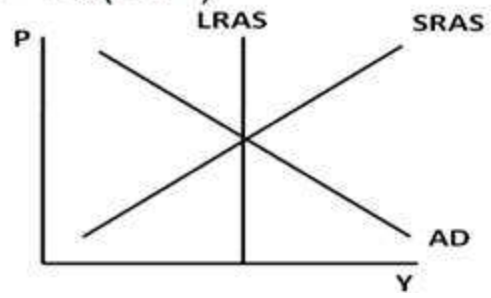
- Shift: the SRAS curve will shift when the LRAS curve shifts or when people's expectations of the price level changes
    - If the LRAS curve shifts it will drag the SRAS curve with it by the exact same horizontal amount
    - **A decrease in the *expected* price level shifts the short-run aggregate supply curve to the right. An increase in the *expected* price level shifts the short-run aggregate-supply curve to the left.**

Review

AD: $Y = C + I + G + NX$

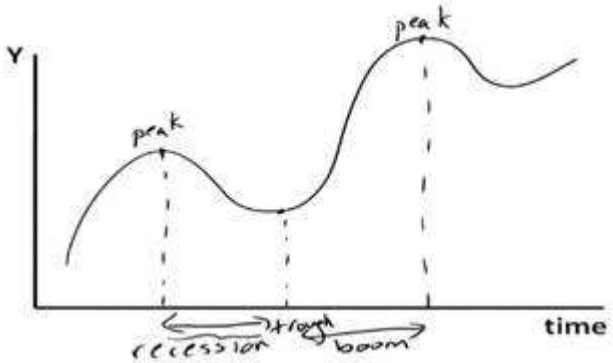
LRAS: $Y = A \cdot F(K, L, H, N)$

SRAS: $Y = Y^* + a(P-P^e)$

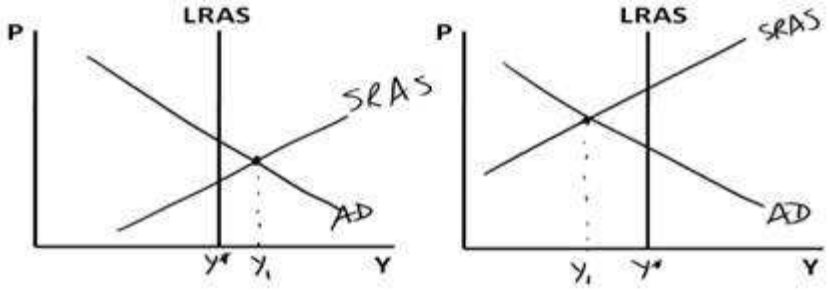


Lecture 26

- Business Cycle:
  - Economic fluctuations are irregular and unpredictable
  - Economic variables fluctuate together
  - General upward trend. Economy tends to grow over time
  - There are peaks and valleys (ups and downs)
  - Stylized Business cycle
  - Recession – moving from peak to trough on stylize business
    - **Two consecutive quarters of declining real GDP**



- **Model is in equilibrium at the intersection of AD and SRAS**
- If this point coincides with LRAS curve, this economy is in **long run equilibrium**
- <u>If real GDP is less then y star then economy is in recession</u>
- <u>If real GDP is more then y star then economy is in boom`</u>
-

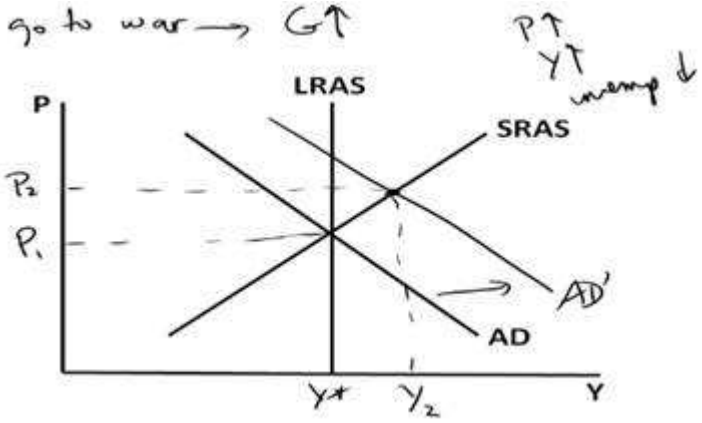


Which economy is in a boom?
(a) Left or (b) Right

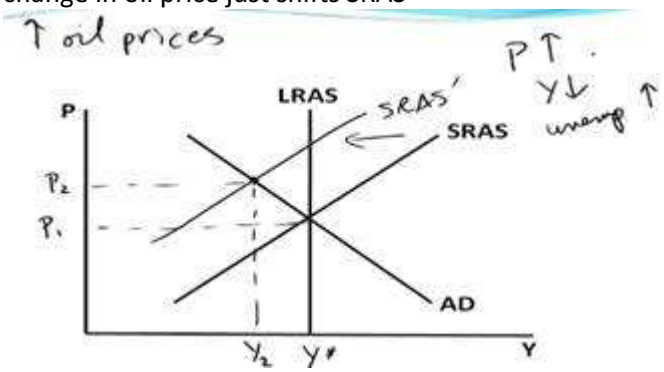
- If real GDP = y star , neither recession or boom
- When an economy is in LR equilibrium, no pressure to change
- Anything that causes a shift in any curve leads us away from this

Shift in Aggregate Demand

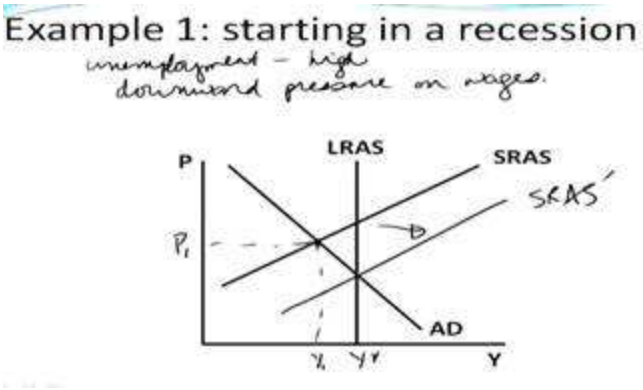
- In the short run, shifts in aggregate demand cause fluctuations in the economy's output of goods and services
- In the long run, shifts in aggregate demand affect the overall price level but do not affect output
- When real GDP goes up, unemployment goes down
- Any change caused by a change in AD – price and output move in same direction



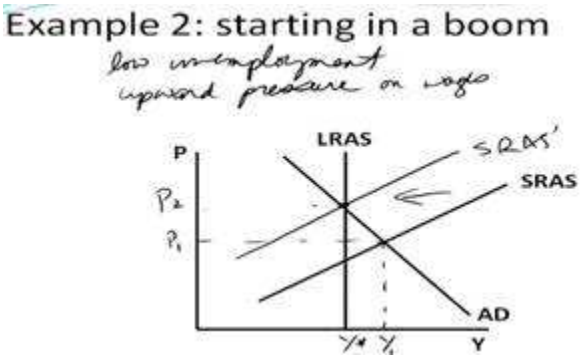
- Shift in Aggregate Supply
  - **Supply shock – price and output move in opposite direction**
    - Causes stagflation: high unemployment and high inflation
  - If the price of oil increases, this causes the factor costs for all firms to increase, and thus, **SRAS decreases** and shifts
  - change in oil price just shifts SRAS



- **Returning to Long-Run Equilibrium Automatically**
- If the economy is not in long run equilibrium, there is an automatic adjustment mechanism that beings to work through the labor markets
  - Eventually, the economy will return to long run equilibrium even without government intervention (through a shift in SRAS)
- Example: starting in a recession
  - Equilibrium GDP is low below LRAS
  - Unemployment tends to be high
    - Pressure on wages to fall (many free workers)
  - Both factors shift SRAS out
    - Firms hire more workers – more output
      - W/P and so there is a decrease in real wages. Labour becomes relatively cheaper and thus, firm's costs decrease and they can produce more
      - If wages fall, prices are expected to fall



- Example: starting in a boom
  - low unemployment – puts upward pressure on wages
    - Shift in SRAS due to:
      - Real wage goes up, labor is expensive, and firms cut back production, decreasing SRAS until stopping at long-run eqm
      - Upward pressure on expected price level
        - Prices are going to rise even more



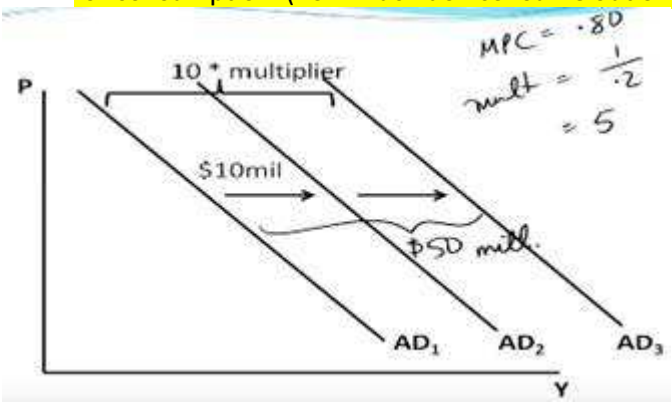
Fiscal and Monetary Policies

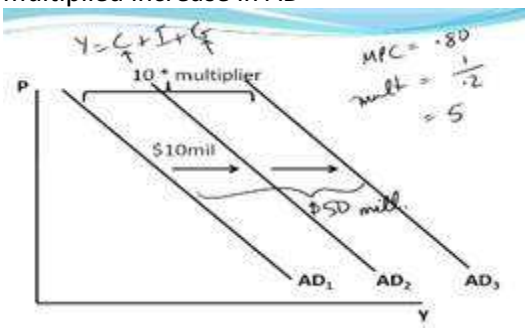
- Government involvement in business cycles
- Government can use policy in CLOSED economy
  - Fiscal policy: change in government spending or taxing (so households change spending behavior)
    - Y = C + I + G
    - Government spending affects G, taxation affects C
    - Increased G –> increased AD
    - Decreased taxes -> increased C, increased AD
  - Monetary policy: change in money supply
    - Shifting the position of the money supply curve, which affects interest rates, which affects investment, which changes AD

Fiscal Policies

- Multiplier effect
  - Suppose government spends $10 million.
  - The AD will shift out by MORE than $10 million
  - This results because of the affect of income on consumption
  - As the government spends money, it is paying for the wages of the individuals who are being paid by the government to build whatever they want.
  - As a result, the people who get paid more, will spend more and there are consecutive rounds of increased spending and causes C to increase as well
  - **Multiplier = 1 / 1 - MPC**
  - MPC – marginal propensity to consume is the fraction of every extra dollar of income that is used

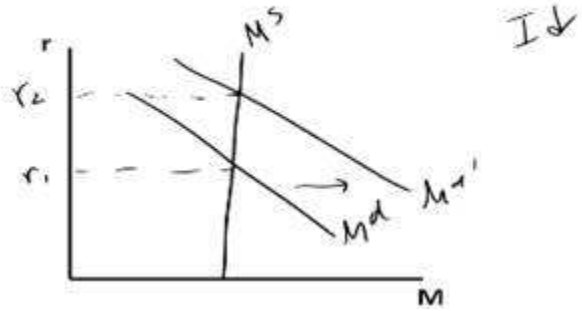
for consumption. (how much do I consume out of every extra dollar of income)



- Gov't spends money -> people who work for them get money -> buy stuff from other people etc. thus multiplied increase in AD
- 

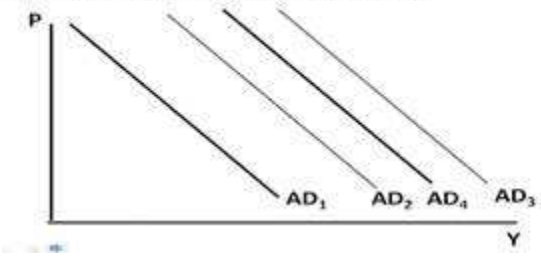
- **Crowding Out is when Y increases and C increases, people NEED MORE MONEY (demand for money increases)**
  - When they need more money, interest rates increase, and investment decreases and thus, AD decreases, but not the full amount(only slightly)

When Y ↑ and C↑ people need more money.

- 

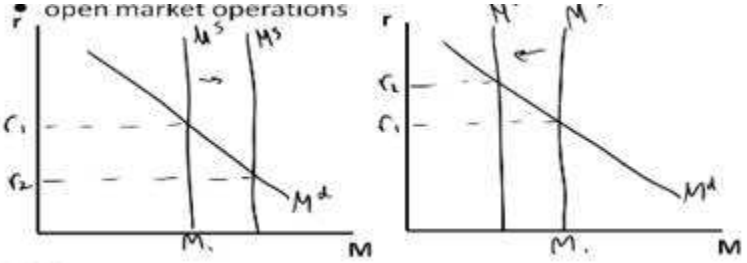
- AD increases -> increase even more because of multiplier, crowding out decreases AD slightly
  - But AD will always still shift to right with spending – multiplier bigger then crowding out

•higher interest rates – investment declines --
AD curve shifts back to the left



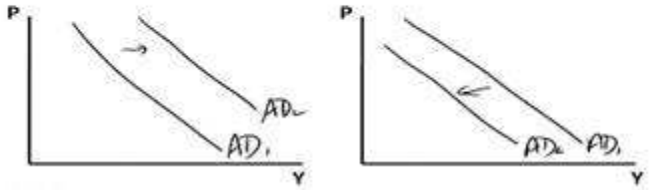
<u>Monetary policy</u>

- Central bank will either increase or decrease the money supply using open market operations
- Effects of increase or decrease of money supply:

- 

  - Correspondingly

- interest rate falls, investment rises, AD shifts right
- interest rate rises, investment falls, AD shifts left

- 

  - Changing the money supply (in first diagram) is changing interest rates changing investment
  - *Note: these policies are usually implemented instead of letting the economy naturally go back to equilibrium because it will result in inflation/deflation*

<u>Small-Open Economy + Government Policy:</u>

- SOE: $r=r^w$
- Government can only use one of the policies
  - Fiscal or monetary depending on exchange rate regime (fixed/flexible)
- Monetary policy, flexible exchange rates
  - If interest rate is below world rate, people don't want Canadian assets/currency, so they buy foreign currency
    - Downward pressure on RER, and thus goods are relatively cheap -> NX increases, and AD increases, and Y increases, and thus income increases, and then Md increases
      - This stops when $r = r^w$
- Fiscal Policy, Fixed Exchange Rates
  - Increase in government spending, AD increases, etc.
  - Interest rates ends up being more than world rate
  - People want to buy Canadian assets, and thus need to buy Canadian currency
    - Central bank will supply this, and will continue to sell until interest rates drop to world rate (this done by shifting supply curve right)