

MACROECONOMICS

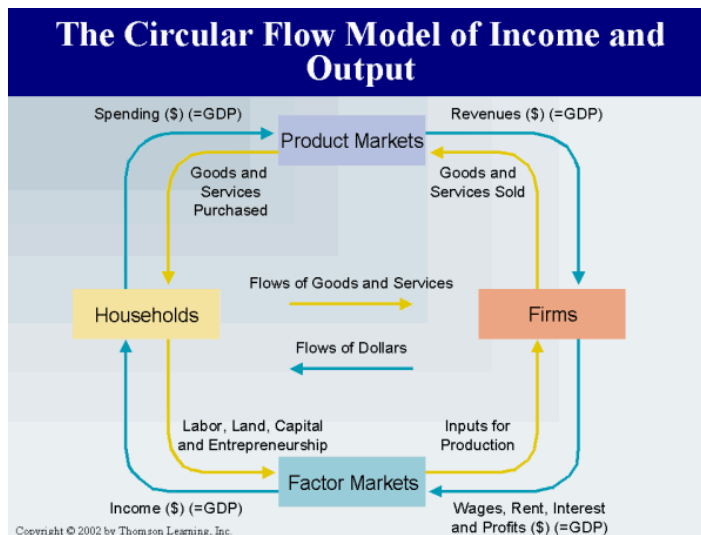
****STARTS AT CHAPTER 5 SINCE 1-4 IS COVERED IN MICROECONOMICS**

CHAPTER 5: MEASURING A NATION'S INCOME

Microeconomics: the study of how households and firms make decisions and how they interact in markets.

Macroeconomics: the study of economy-wide phenomena, including inflation, unemployment, and economic growth.

- Goal is to explain the economic changes that affect many households, firms, and markets simultaneously.
- Ex. Why is average income high in some countries while it is low in others?
- Why do prices rise rapidly in some periods of time while they are more stable in other periods?
- Because the economy as a whole is just a collection of many households and many firms interacting in many markets, microeconomics and macroeconomics are closely linked.
- People with higher incomes can more easily afford life's necessities and luxuries; they enjoy a



- higher standard of living. This can be applied to the nation's overall economy.
- GDP judges whether a nation is doing well or poorly.
- It measures two things at once: the total income of everyone in the economy and the total expenditure on the economy's output of goods and services.
- **INCOME MUST EQUAL EXPENDITURES**
 - Every transaction has two parties: a

buyer and a seller. Every dollar spent is income for someone else

- GDP can be computed in one of two ways: by adding up the total expenditure by households or by adding up the total income (wages, rent profit) paid by firms.

GDP: the market value of all final goods and services produced within a country in a given period of time.

- *GDP is the market value:* GDP adds together many different kinds of products into a single measure of the value of economic activity. Uses market prices (value of a good)
- *...Of All...:* GDP includes all items produced in the economy and sold legally in markets
 - GDP is based on the assumption that the owner pays rent to himself (expenditure)
 - GDP excludes items sold illicitly, items produced and consumed at home (do not enter the market place)
 - These exclusions from GDP can sometimes lead to paradoxical results
- *...Final...:* GDP only includes the value of final goods (card...vs intermediate good the paper that made the card). The value of intermediate goods is already included in the prices of the final goods.
 - Adding the market value of the paper to the market value of the card would double count the GDP.
 - Exception is when an intermediate good is produced and is added to a firm's inventory to be used or sold at a later date (is considered 'final')
- *...Goods and Services...:* GDP includes tangible (food) and intangible services (haircuts)
- *...Produced...:* GDP includes goods and services currently produced not those produced in the past.
- *...Within a Country...:* GDP measures the value of production within the geographic confines of a country.
 - When a British citizen works in Canada, his production is part of GDP
 - When a Canadian citizen owns a factory in Haiti, GDP is not Canada's

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- *...In a Given Period of Time...: GDP measures the value of production that takes place within a specific interval of time (one year or a quarter).*

THE COMPONENTS OF GDP

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

Consumption: Spending by households on goods and services, with the exception of purchases of new housing.

Investment: Spending on capital equipment, inventories, and structures, including household purchases of new housing.

- Purchase of goods that will be used in the future to produce more goods and services
- Sum of purchases of capital equipment, inventories and structures.
- *Structures:* expenditure on new housing
- Inventories are treated as positive expenditures if a company uses what it produces and then sells it later when it becomes a negative expenditure.

Government Purchases: Spending on goods and services by local, territorial, provincial, and federal governments.

- Includes salaries of government workers and spending on public works
- Transfer payments such as pension, are not counted as part of government purchases

Net Exports: The value of a nation's exports minus the value of its imports; also called the trade balance

- Purchase of domestically produced goods by foreigners minus the domestic purchases of foreign goods

REAL VERSUS NOMINAL GDP

If total spending rises from one year to the next, one of two things must be true:

1. The economy is producing a larger output of goods and services
2. Goods and services are being sold at higher prices

Real GDP measures 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.

Nominal GDP: the production of goods and services valued at current prices.
(price X quantity)

Real GDP: the production of goods and services valued at constant prices.
(price of base year X quantity)

GDP Deflator: a measure of the price level calculated as the ratio of nominal GDP to real GDP times 100.

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100 \quad \text{inflation rate} = \frac{\text{Deflator}_2 - \text{Deflator}_1}{\text{Deflator}_1} \times 100\%$$

Year	Price of Hotdogs	Quantity of Hotdogs	Price of Hamburgers	Quantity of Hamburgers
1	\$4	3	\$ 6	12
2	5	7	9	19
3	5	11	9	21
4	9	8	14	13
5	8	15	16	16

Year	Nominal GDP	Real GDP	GDP Deflator
1	\$ 84 (= \$ 4x3 + \$ 6x12)	\$ 84 (= \$4x3 + \$6x12)	100
2	206 (= 5x7 + 9x19)	142 (= 4x7 + 6x19)	145
3	244 (= 5x11 + 9x21)	170 (= 4x11 + 6x21)	144
4	254 (= 8x9 + 14x13)	110 (= 4x8 + 6x13)	231
5	376 (= 8x15 + 16x16)	156 (= 4x15 + 6x16)	241

GDP AND ECONOMIC WELL-BEING

GDP per person tells us the income and expenditure of the average person in the economy. Because most people would refer to receive higher income and enjoy higher expenditure, GDP per person seems a natural measure of the economic well being of the average individual.

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GDP is, however, not a perfect measure of well-being. Things left out of GDP:

- Leisure
- Omitting all activities outside of markets
- Quality of the environment
- Distribution of income

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CHAPTER 6: MEASURING THE COST OF LIVING

Consumer Price Index (CPI): a measure of the overall cost of the goods and services bought by a typical consumer.

How the Consumer Price Index Is Calculated:

1. **Determine the Basket:** Determine which prices are most important to the typical consumer. If the typical consumer buys more hot dogs than hamburgers, the price of hot dogs is more important.
2. **Find the prices:** The second step in computing the CPI is to find the price of each of the goods and services in the basket for each point in time.
3. **Compute the basket's cost:** The third step is to use the data on prices to calculate the cost of the basket of goods and services at different times.
4. **Choose a base year and compute the index:** Designate one year as the base year.

The CPI in any year equals

$$100 \times \frac{\text{cost of basket in current year}}{\text{cost of basket in base year}}$$

The percentage change in the CPI from the preceding period.

$$\text{Inflation rate} = \frac{\text{CPI this year} - \text{CPI last year}}{\text{CPI last year}} \times 100\%$$

Core inflation: a measure of the underlying trend of inflation.

PROBLEMS IN MEASURING THE COST OF LIVING

- Goal of CPI is to measure changes in the cost of living
- CPI tries to gauge how much incomes must rise in order to maintain a constant standard of living
- Problems with the index are widely acknowledged but difficult to solve:
 - Commodity substitution bias: prices change from one year to the next, they do not all change proportionally
 - Some prices rise more than others
 - Consumers respond to these differing price changes by buying less of the goods whose prices have risen by large amounts
 - Introduction of new goods: when a new good is introduced, consumers have more variety from which to choose
 - Greater variety makes each dollar more valuable, so consumers need fewer dollars to maintain any given standard of living
 - 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.
 - Similarly, if the quality of the good rises from one year to the next, the value of a dollar rises.

GDP DEFLATOR VS. CPI

- The GDP deflator is the ratio of nominal GDP to real GDP and reflects the current level of prices relative to the level of prices in the base year.
- GDP deflator reflects the prices of all goods and services produced domestically, whereas the CPI reflects the prices of all goods and services bought by consumers
- Second difference concerns how various prices are weighted to yield a single number for the overall level of prices. CPI compares the price of a fixed basket of goods and services to the price of the basket in the base year. By contrast, the GDP deflator compares the price of currently produced goods and services to the price of the same goods and services in the base year.
- The difference is not important when all prices are changing proportionately, but if the prices of different goods and services are changing by varying amounts, the way we weight the various prices matters for the overall inflation rate.

Correcting Economic Variables For the Effects of Inflation

$$\text{Amount in today's dollars} = \text{Amount in year } T \text{ dollars} \times \frac{\text{Price level today}}{\text{Price level in year } T}$$

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Indexation: price indexes are used to correct for the effects of inflation when comparing dollar figures from different times. Indexation is the automatic correction of a dollar amount for the effects of inflation by law or contract.

Real and Nominal Interest Rates

Interest rates always involve comparing amounts of money at different points in time

Nominal interest rate: the interest rate as usually reported without a correction for the effects of inflation

Real interest rate: the interest rate corrected for the effects of inflation.

- Difference that tells you how fast the number of dollars in your bank account rises over time.
- Tells you how fast the prices of things you want to buy with those dollars are rising

$$\text{Real interest rate} = \text{Nominal interest rate} - \text{Inflation rate}$$

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CHAPTER 7: PRODUCTION AND GROWTH

Economic Growth Around the World

- Because of differences in growth rates, the ranking of countries by income changes substantially over time. Data shows that the world's richest countries have no guarantee they will stay rich and that the world's poorest countries are not doomed forever to remain in poverty.

Productivity: its role and determinants

Productivity: the quantity of goods and services produced from each hour of a worker's time.

Why is productivity so important?

- The key role of productivity in determining living standards is as true for nations as it is for stranded sailors.
- To understand the large differences in living standards we observe across countries or over time, we must focus on the production of goods and services.

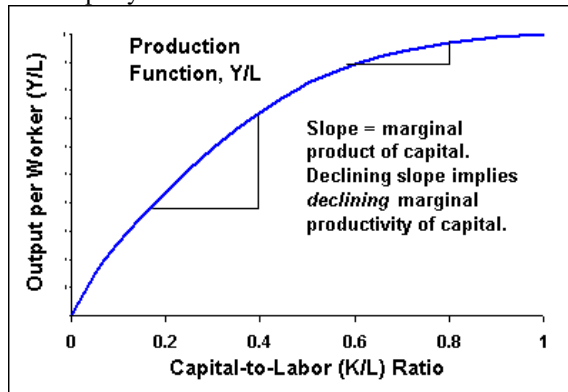
How Productivity is Determined

- **Physical Capital:** The stock of equipment and structures that are used to produce goods and services
 - Workers are more productive if they have tools with which to work. The stock of equipment and structures that are used to produce goods and services.
- **Human Capital:** The knowledge and skills that workers acquire through education, training, and experience.
 - Includes skills accumulated in early childhood programs, grade school, high school, college or university, and on-the-job-training
 - Although less tangible than physical capital, human capital raises a nation's ability to produce goods and services and is a produced factor of production.
- **Natural Resources:** The inputs into the production of goods and services that are provided by nature, such as land, rivers, and mineral deposits.
 - **Two forms:** renewable and nonrenewable
 - Although natural resources can be important, they are not necessary for an economy to be highly productive in producing goods and services.
- **Technological Knowledge:** Society's understanding of the best ways to produce goods and services.
 - The important difference between human capital and technological knowledge is that technological knowledge refers to society's understanding about how the world works and refers to the resources expended transmitting this under society's textbooks, whereas human capital is the amount of time that the population has devoted to reading them. Worker's productivity depends on both the quality of textbooks they have available and the amount of time they have spent studying them.

Economic Growth and Public Policy

- **The importance of saving and Investment:** because capital is a produced factor of production, a society can change the amount of capital it has. One way to raise future productivity is to invest more current resources in the production of capital.
- **Diminishing Returns and the Catch-Up Effect:** Diminishing returns is the property whereby the benefit from an extra unit of an input declines as the quantity of the input increases. As the stock of capital rises, the extra output produced from an additional unit of capital falls. In other words. When workers already have a large quantity of capital to use in producing goods and services giving them an additional unit of capital increase their productivity only slightly.
 - Because of diminishing returns, an increase in the saving rate leads to higher growth only for a while. As the higher saving rate allows more capital to be accumulated, the benefits from additional capital become smaller over time and so growth slows down. In the long run, the higher saving rate leads to a higher level of productivity and income, but not to higher growth in these variables.

- The catch-up effect is the property whereby countries that start off poor tend to grow more rapidly than countries that start off rich.



- **Investment from abroad:** Takes several forms
 - Foreign direct investment: a capital investment that is owned and operated by a foreign entity
 - Foreign portfolio investment: an investment that is financed with foreign money but operated by domestic residents.
 - Investment from abroad can still make a country grow as it can increase the economy's stock of capital leading to higher productivity and higher wages as well as enabling poor countries to learn the state-of-the-art technologies developed and used in richer countries.
- **Education:** investment in human capital with an opportunity cost. An externality is the effect of one person's actions on the well being of a bystander. An educated person might generate new ideas about how best to produce goods and services. These ideas can enter society's pool of knowledge so everyone can use them, then the ideas are an external benefit of education.
 - Poor countries face the brain drain: the emigration of many of the most highly educated workers to rich countries where these workers can enjoy a higher standard of living.
- **Health and nutrition:** Human capital can also be used to describe expenditures that lead to a healthier population. Other things equal, healthier workers are more productive.
 - Studies have found that height is an indicator of productivity
- **Property Rights and Political Stability:** An important prerequisite for the price system to work is an economy-wide respect for property rights: the ability of people to exercise authority over the resources they own.
 - Those living in less-developed countries understand that lack of property rights can be a major problem
 - One threat to property rights is political instability. When revolutions and coups are common, there is doubt about whether property rights will be respected in the future
- **Free Trade:** Some poor countries try to achieve more rapid economic growth by pursuing inward-oriented policies. These policies are aimed at raising productivity and living standards within a country by avoiding interactions with the rest of the world. Most economists today believe that poor countries are better off pursuing outward-oriented policies that integrate these countries into the world economy.
 - The amount that a nation trades with others is determined not only by government policy but also by geography. Countries with good natural seaports find trade easier than countries without this resource.
- **Research and development:** To a large extent, knowledge is a public good: once one person discovers an idea, the idea enters society's pool of knowledge
 - The government can fund research
 - Government policy also encourages research through the patent system where a person or firm invents a new product that gives them the exclusive right to cede product.
- **Population growth:** A large population means more workers to produce goods and services. At the same time, a large population means more people to consume those goods and services. While a large population means a larger total output of goods and services, it need not mean a higher standard for a typical citizen.

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- **Stretching Natural resources:** Thomas Robert Malthus argued that an ever-increasing population would continually strain society's ability to provide for itself. As a result, mankind was doomed to forever live in poverty. He noted that food is necessary to the existence of man and that the passion between the sexes is necessary and will remain nearly in its present state. He concluded that the power of population is infinitely greater than the power in the earth to produce subsistence for man. According to Malthus, the only check on population growth was misery and vices.
 - Malthus was wrong, since, although the population has grown to sixth fold of his time, our standard of living overall is better.
- **Diluting the Capital Stock:** Some modern theories of economic growth emphasize its effect on capital accumulation. According to these theories, high population growth reduces GDP per worker because rapid growth in the number of workers forces the capital stock to be spread more thinly. In other words, when the population growth is rapid, each worker is equipped with less capital.
- **Promoting Technological Progress:** Although rapid population growth may depress economic prosperity by reducing the amount of capital each worker has, it may also have some benefits. Some economists have suggested that world population growth has been an engine of technological process and economic prosperity. The mechanism is simple: if there are more people, then there are more scientists, inventors, and engineers to contribute to technological advance, which benefits everyone.
 - **Michael Kremer:** notes that over the broad span of human history, world growth rates have increased as world population has. Kremer compared regions of the world stating that if technological progress is more rapid when there are more people to discover things, then larger regions should have experienced more rapid growth. This was found to be true.

CHAPTER 8: SAVING, INVESTMENT, AND THE FINANCIAL SYSTEM

Financial system: the group of institutions in the economy that help to match one person's saving with another person's investment.

- At the broadest level, the financial system moves the economy's scarce resources from savers to borrowers. Savers supply money to the financial system with the expectation that they will get it back with interest at a later date. Borrowers demand money from the financial system with the knowledge that they will be required to pay it back with interest at a later date.
 - A number of government regulators oversee these financial institutions that help coordinate savers and borrowers.
 - Financial institutions can be grouped into two categories: financial markets and financial intermediaries.
- **Financial markets:** financial institutions through which savers can directly provide funds to borrowers
 - **The Bond Market:** a bond is a certificate of indebtedness that specifies the obligations of the borrower to the holder of the bond. It is an IOU that identifies the time at which the loan will be repaid, called the date of maturity, and the rate of interest that will be paid periodically until the loan matures. The buyer can hold the bond until maturity or can sell the bond at an earlier date to someone else.
 - First characteristic is a bond's term: the length of time until the bond matures.
 - Second characteristic is its credit risk: the probability that the borrower will fail to pay some of the interest or principal. Such a failure to pay is called a default. Borrowers can default on their loans by declaring bankruptcy.
 - When bond buyers perceive that the probability of default is high, they demand a higher interest rate to compensate them for this credit risk.
 - Such things affect credit risk as the 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 revenues.
 - Provincial and territorial governments also issue bonds but are considered more high risk than the federal government.
 - Corporate bonds pay higher rates of interest than provincial or territorial, as corporate revenues are likely to be more volatile than other revenues.
 - **The Stock market:** Stock represents ownership in a firm and is, therefore, a claim to the profits that the firm makes.
 - The sale of stock to raise money is called equity finance, whereas the sale of bonds is called debt finance.
 - Compared to bonds, stocks offer the holder both higher risk and potentially higher return.
 - The prices at which shares trade on stock exchanges are determined by the supply and demand for the stock in these companies. Because stock represents ownership in a corporation, the demand for a stock reflects people's perception of a corporation's future profitability.
 - **Financial Intermediaries:** financial institutions through which savers can indirectly provide funds to borrowers.
 - **Banks:** financial intermediaries with whom people are most familiar, that take in deposits from people who want to save and use these deposits 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.
 - Banks also facilitate the purchases of goods and services by allowing people to write checks against their deposit. In other words, banks help create a special asset that people can use as a medium of exchange. A medium of exchange is an item that people can easily use to engage in transactions
 - Stocks and bonds, like bank deposits, are a possible store of value of the wealth that people have accumulated in past saving, but access to this wealth is not as easy, cheap, and immediate as just writing a check.

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- **Mutual Funds:** an institution that sells shares to the public and uses the proceeds to buy a portfolio of stocks and bonds.
 - The shareholder of the mutual fund accepts all the risk and return associated with the portfolio. If the value of the portfolio rises, the shareholder benefits; if the value of the portfolio falls, the shareholder suffers the loss.
 - The primary advantage is that they allow people with small amounts of money to diversify. Buyers of stocks and bonds are well advised to heed the adage: don't put all your eggs in one basket.
 - Because the value of any single bond/stock is tied to the fortunes of one company, holding a single kind of stock or bond is very risky. Those who hold a diverse portfolio of stocks or bonds face less risk because they have only a small stake in each company.
 - Mutual funds make diversification easy.
 - Mutual fund companies also give ordinary people access to the skills of professional money managers who pay close attention to the developments and prospects of the companies in which they buy stock.
 - Mutual funds called index funds that buy all stocks in a given stock index, perform somewhat better on average than mutual funds that take advantage of active management by professional money managers.

Some Important Identities

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

This chapter assumes a closed economy in which the economy does not interact with other economies.

$$Y = C + I + G$$

$$I = Y - C - G$$

(Y-C-G) is called national savings: the total income in the economy that remains after paying for consumption and government purchases.

$$S = I$$

Savings = investments

National savings can be written as:

$$S = Y - C - G$$

Or

$$S = (Y - T - C)**\text{private savings} + (T - G)**\text{public savings}$$

Private savings: the income those households have left after paying for taxes and consumption

Public savings: the tax revenue that the government has left after paying for its spending.

When $T > G$ the government runs a budget surplus (an excess of tax revenue over government spending)

When $G > T$ the government runs a budget deficit (a shortfall of tax revenue from government spending)

The meaning of saving and investment

- **Investment:** the purchase of new capital, equipment, buildings.
- Although the accounting identity $S=I$ shows that saving and investment are equal for the economy as a whole, this does not have to be true for every individual household or firm. An individual's savings can be greater than their investment.

Market for loanable funds: the market in which those who want to save supply funds and those who want to borrow to invest demand funds.

- Loanable funds refers to all income that people have chosen to save and lend out, rather than use for their own consumption.

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Supply and Demand for Loanable Funds:

- The **supply** comes from those people who have some extra income they want to save and lend out. Lending can occur directly, such as when a household buys a bond from a firm, or indirectly, such as when a household makes a deposit in a bank, which in turn uses the funds to make loans. In both cases, saving is the source of supply of loanable funds.
- The **demand** for loanable funds comes from households and firms who wish to borrow to make investments. This demand includes families taking out mortgages to buy homes. It also includes firms borrowing to buy new equipment or build factories. In both cases, investment is the source of the demand for loanable funds.
- **Interest rate** is the price of a loan. It represents the amount that borrowers pay for loans and the amount that lenders receive on their saving. Because a high interest rate makes borrowing more expensive, the quantity of loanable funds demanded falls as the interest rate rises. Similarly, because a high interest rate makes saving more attractive, the quantity of loanable funds supplied rises as the interest rate rises.
- If the interest rate is lower than the equilibrium level, the quantity of loanable funds supplied is less than the quantity of loanable funds demanded. The resulting shortage of loanable funds would encourage lenders to raise the interest rate they charge. A higher interest rate would encourage saving and discourage borrowing for investment.
- Conversely, if the interest rate were higher than the equilibrium level, the quantity of loanable funds supplied would exceed the quantity of loanable funds demanded.

Policy 1: Saving Incentives

- Economists favor changes to the tax system that encourage greater saving.
- Tax incentives shift the supply right, as they increase incentives...
- Then the equilibrium interest rate decreases
- And raises the equilibrium quantity of loanable funds

Policy 2: Investment Incentives

- Parliament institutes an investment tax credit to make investment more attractive.
- An investment tax credit increases the demand for loanable funds, thus shifting the demand curve right.
- Then raises the equilibrium interest rate
- And raises the equilibrium quantity of loanable funds.

Policy 3: Government Budget Deficits and Surpluses

- When a government spends exactly what it receives in tax revenue, it is said to have a balanced budget. The sum of all past budget deficits minus the sum of all past budget surpluses is called the **government debt**.
- A budget deficit decreases the supply of loanable funds, shifting the supply curve left
- Which raises the equilibrium interest rate
- And reduces the equilibrium quantity of loanable funds

Crowding out: a decrease in investment that results from government borrowing.

- 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 result can be even higher budget deficits.

Virtuous circle: 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-support programs, and the result can be even higher budget surpluses.

Government net debt: the difference between the value of government financial liabilities and financial assets.

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CHAPTER 9: UNEMPLOYMENT AND ITS NATURAL RATE

How is unemployment measured?

- **Employed:** if someone spent some of the previous week working at a paid job
- **Unemployed:** temporary layoff or looking for a job
- **Not in the work force:** full-time student, homemaker, or retiree

$$\text{LABOUR FORCE} = \text{EMPLOYED} + \text{UNEMPLOYED}$$

$$\text{UNEMPLOYMENT RATE} = (\text{UNEMPLOYED}/\text{LABOUR FORCE}) \times 100$$

- Percentage of the labour force that is unemployed

$$\text{LABOUR-FORCE PARTICIPATION RATE} = (\text{LABOUR FORCE}/\text{ADULT POPULATION}) \times 100$$

- The percentage of the adult population that is in the labour force

- Women have lower rates of labour-force participation than men in the same age group
- Young people aged 15-24 have much higher rates of unemployment than older people
- Similarly aged men and women tend to have similar rates of unemployment
- It is sometimes misleading to make international comparisons. Differences in definitions make a significant difference.

Does the unemployment rate measure what we want it to?

- It is hard to distinguish between a person who is unemployed and a person who is not in the labour force.
- Movements into and out of the labour force are common as more than one-third of the unemployed are recent entrants into the labour force (young workers looking for their first jobs).
- They also include older workers who have previously left the labour force but have now returned to look for work. Moreover, not all unemployment ends with the job seeker finding a job
- **Discouraged searchers:** individuals who would like to work but have given up looking for a job

Why are there always some people unemployed?

- In an ideal labour market, wages would adjust to balance the quantity of labour supplied and the quantity of labour demanded. Here are always some workers without jobs even when the overall economy is doing well.
- **Natural rate of unemployment:** the rate of unemployment to which the economy tends to return in the long run.
- **Cyclical unemployment:** the deviation of unemployment from its natural rate
 - **Arises due to short-run** economic fluctuations
- **Frictional unemployment:** unemployment that results because it takes time for workers to search for the jobs that best suit their tastes and skills
 - Often explains relatively short spells of unemployment
 - It takes time for workers to search for the jobs that are best suited for them
- **Structural unemployment:** Unemployment that results because the number of jobs available in some labour markets is insufficient to provide a job for everyone who wants one.
 - When quantity of labour supplied exceeds the quantity demanded resulting when wages are set above the level that brings supply and demand into equilibrium.
- **Job search:** the process by which workers find appropriate jobs given their tastes and skills
- Frictional unemployment is often the result of changes in the demand for labour among different firms. Because different regions of the country produce different goods, employment can rise in one region while it falls in another.
- Changes in the composition of demand among industries or regions are called sectoral shifts.
- Because it takes time for workers to search for jobs in the new sectors, sectoral shifts temporarily cause unemployment.
- Even if some frictional unemployment is inevitable, the precise amount is not. Government programs try to facilitate job search in various ways. One way is through government-run employment agencies, which give out information about job vacancies. Another way is through public training programs, which aim to ease the transition of workers from declining to growing industries and to help disadvantaged groups escape poverty.

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- When job loss is the result of disasters, the private sector is incapable of helping those who lose their jobs.
- **Employment insurance:** a government program that partially protects workers' incomes when they become unemployed.
 - Two considerations have determined when and for how long someone can collect EI benefits: the number of hours worked in the past year and the unemployment rate in the area of residence
 - In regions of high unemployment rates, relatively few hours of work are needed to be eligible and the benefits can be collected for a long time. The opposite is also true.
 - The features of the program suggest that while EI reduces the hardship of unemployment, it can also increase the amount of unemployment.
 - As EI benefits stop when a worker takes a new job, we might expect that unemployed individuals would devote less effort to job search and be more likely to turn down unattractive job offers. The design of the program provides an incentive for people to enter the labor force when they might not otherwise have some.
 - The EI program means people not only earn a wage while working but also become eligible to collect EI benefits should they leave the job.
 - The likelihood of finding new employment increases as EI recipients near the end of their benefits
 - Joining the labour force is significantly influenced by the availability and the generosity of EI benefits.
 - Even though EI increases unemployment rate, it achieves its primary goal of reducing the income uncertainty faced by unemployed people. EI allows unemployed people to conduct a more thorough job search, resulting in a higher wage in their new job than would otherwise have been the case.
- **Minimum-wage laws:** Although minimum wages are not the predominant reason for unemployment, we begin by reviewing how unemployment arises from minimum wage laws.
 - When a minimum wage law forces wages to remain above the level that balances supply and demand, it raises the quantity of labour supplied and reduces the quantity of labour demanded compared to the equilibrium level. There is a surplus of labour because there are more workers willing to work than there are jobs.
 - Minimum-wage laws are binding most often for the least skilled and least experienced members of the labour force, such as teenagers. They are also not a predominant reason for unemployment in the economy because most workers in the economy earn wages well above the legal minimum.
 - *If the wage is kept above the equilibrium level for any reason, the result is unemployment.*
- **Union:** a worker association that bargains with employers over wages and working conditions.
 - The process by which unions and firms agree on the terms of employment is called **collective bargaining**.
 - If a union and firm do not reach an agreement for higher wages, better benefits, and better working conditions, the union can organize a withdrawal of labour from the firm called a **strike**.
 - When a union raises the wage above the equilibrium level, it raises the quantity of labour supplied and reduces the quantity of labour demanded, resulting in unemployment.
 - *Outsider's respond in two ways:* some remain unemployed and wait for the change to become insiders and earn the high union wage, others take jobs in firms that are not unionized.
 - *The increase in labour supply reduces wages in industries that are not unionized. Workers in unions reap the benefits of collective bargaining while workers not in unions bear some of the cost.*
 - 70% of public sector employees are unionized while private sectors have unions approach workers in nonunionized companies to convince a majority that joining their company will include benefits of membership.

MACROECONOMICS

- In the absence of a union, the firm could use its market power to pay lower wages and offer worse working conditions than would prevail if it had to compete with other firms for the same worker
- **Efficiency wages:** above-equilibrium wages paid by firms in order to increase worker productivity.
 - The unemployment that arises from efficiency wages is similar to the unemployment from minimum wages and unions. In all cases, unemployment that arises is the result of wages above the level that balances the quantity of labour supplied and the quantity of labour demanded. Yet there is also an important difference.
 - Minimum wage laws and unions prevent firms from lowering wages in the presence of a surplus of workers.
 - Efficiency-wage theory states that such a constraint on firms is unnecessary in many cases because firms may be better off keeping wages above the equilibrium level.
 - **Worker health:** Better-paid workers eat a more nutritious diet and workers who eat a better diet are healthier and more productive. This is not relevant for most workers in rich countries, as most are well above the level needed for an adequate diet.
 - **Worker turnover:** Workers quit jobs for many reasons- to take jobs in other firms, to move to other parts of the country, to leave the labour force. The frequency with which they quit depends on the entire set of incentives they face, including the benefits of leaving and the benefits of staying. Turnover is costly for firms as they have to train new workers.
 - **Worker effort:** in many jobs, workers have some discretion over how hard to work. As a result, firms monitor the efforts of their workers, and workers caught shirking their responsibilities are fired. Not all shirkers are caught immediately because monitoring workers is costly and imperfect. High wages make workers more eager to keep their jobs, giving workers an incentive to put forward their best efforts. If the wage were at the level that balanced supply and demand, workers would have less reason to work hard because if they were fired, they could quickly find new jobs at the same wage.
 - **Worker Quality:** all firms want workers who are talented, and they try to pick the best applicants to fill job openings. But because firms cannot perfectly gauge the quality of applicants, hiring has a degree of randomness to it. When a firm pays a high wage, it attracts a better pool of workers to apply for its job and thereby increases the quality of applicants.

MACROECONOMICS

CHAPTER 10: THE MONETARY SYSTEM

Money: the set of assets in an economy that people regularly use to buy goods and services from other people.

The cash in your wallet is money because you can use it to buy a meal at a restaurant or a shirt at a clothing store.

The functions of money: Money has three functions; it is a medium of exchange, a unit of account, and a store of value. These functions distinguish money from other assets in the economy, such as stocks, bonds, real estate and art.

A Medium of exchange: an item that buyers give to sellers when they purchase goods and services.

A unit of account: the yardstick people use to post prices and record debts. It records economic value.

A store of value: an item that people can use to transfer purchasing power from the present to the future.

Liquidity: the ease with which an asset can be converted into the economy's medium of exchange.

Commodity money: money that takes the form of a commodity with intrinsic value (the item would have value even if it were not used as money- gold).

Fiat money: money without intrinsic value that is used as money because of government decree.

Currency: the paper bills and coins in the hands of the public

Money stock: the quantity of money circulating in the economy that has a powerful influence on many economic variables.

Many stores accept personal cheques and debit cards; **demand deposit:** balances in bank accounts that depositors can access on demand by writing a cheque or using a debit card.

In a complex economy it is not easy to draw a line between assets that can be called "money" and assets that cannot.

Bank of Canada: the central bank of Canada

Central bank: an institution designed to regulate the quantity of money in the economy.

The bank of Canada is managed by a board of directors composed of the governor, the senior deputy governor, and 12 directors, including the deputy minister of finance. Ultimately the Canadian government controls the Bank of Canada as they appoint the board of directors. The bank of Canada has four related jobs:

1. Issue currency (the bank of Canada act gives the bank a monopoly over the right to issue notes for circulation in Canada)
2. Act as a banker to the commercial banks (deposits that enable banks to make payments to each other)
3. To act as a banker to the Canadian government.
4. Control the quantity of money that is made available to the economy, called the money supply.

Money supply: the quantity of money available in the economy.

Monetary policy: the setting of the money supply by policymakers in the central bank.

The bank of Canada has the power to increase or decrease the number of dollars in the economy. Although in practice the Bank of Canada's methods of controlling the money supply are more complex and subtle, the helicopter vacuum metaphor is a good first approximation of the meaning of monetary policy. Changes in the money supply can profoundly affect the economy.

Reserves: deposits that banks have received but have not loaned out.

In the economy where there is only \$100 of currency, and all deposits are held as reserves, it is called *100 percent-reserve banking*.

FIRST NATIONAL BANK	
Assets	Liabilities
Reserves \$100.00	Deposits \$100.00

- Each deposit in the bank reduces currency and raises demand deposits by exactly the same amount, leaving the money supply unchanged. This, *if the banks hold all deposits in reserve, banks do not influence the supply of money.*

If the flow of new deposits is roughly the same as the flow of withdrawals, the bank needs to keep only a fraction of its deposits in reserve.

Fractional-reserve banking: a banking system in which banks hold only a fraction of deposits as reserves.

Reserve ratio: the fraction of deposits that banks hold as reserves.

MACROECONOMICS

This ratio is determined by a combination of government regulation and bank policy. Some central banks place a minimum on the amount of reserves that banks hold, called a *reserve requirement*. In addition, banks may hold reserves above the legal minimum, called *excess reserves*, so they can be more confident that they will not run short of cash.

Ex: suppose that First National has a reserve ratio of 10%. This means that it keeps 10% of its deposits in reserve and loans out the rest.

FIRST NATIONAL BANK	
Assets	Liabilities
Reserves \$100.00	Deposits \$100.00
Loans \$90.00	

- It has \$10 of reserves in its value and \$90 loans. Assets still equal liabilities.
- The money supply is \$190 as \$100 is in deposits and the borrower holds \$90 in currency.
- *When banks hold only a fraction of deposits in reserve, banks create money.*
- It seems that money is created through fractional-reserve banking however no wealth is created through lending out reserves.

The creation of money does not stop with First National Bank. Suppose the borrower uses the \$90 to buy something from someone who then deposits the currency in Second National Bank.

SECOND NATIONAL BANK	
Assets	Liabilities
Reserves \$9.00	Deposits \$90.00
Loans \$81.00	

After the deposits, this bank has liabilities of \$90. If Second National also has a reserve ratio of 10%, it keeps assets of \$9 in reserve and makes \$81 in loans. In this way, Second National Bank creates an additional \$81 of money. If this \$81 is eventually deposited in Third National Bank, which also has a reserve ratio of 10%, this bank keeps \$8.10 in reserve and makes \$72.90 in loans.

THIRD NATIONAL BANK	
Assets	Liabilities
Reserves \$8.10	Deposits \$100.00
Loans \$72.90	

The process goes on and on. Each time that money is deposited and a bank loan is made, more money is created.

Original deposit	= \$100.00
First National lending	= \$90.00 [= 0.9 X \$100.00]
Second National lending	= \$81.00 [= 0.9 X \$90.00]
Third National lending	= \$72.90 [= 0.9 X \$81.00]
...	
<hr/> Total money supply	<hr/> = \$1000.00

Even though this process of money creation can continue forever, it does not create an infinite amount of money. If you laboriously add the infinite sequence of numbers in forgoing example, you find the \$100 of reserves generates \$1000 of money. The amount of money the banking system generates with each dollar of reserves is called the **money multiplier**= 10 (in this economy where reserve is 100 and generates 1000).

The money multiplier is the reciprocal of the reserve ratio. If R is the reserve ratio for all banks in the economy, then each dollar of reserves generates 1/R dollars of money. $R = 1/10, = 10$. This formula shows how the amount of money that banks create depends on the reserve ratio. If the reserve ratio was only 1/20 (5%), then the banking system would have 20 times as much in deposits as in reserves, implying a money multiplier of 20. Each dollar of reserves would generate \$20 of money. *The higher the reserve ratio, the less of each deposit banks loan out, and the smaller the money multiplier.*

MACROECONOMICS

Bank Capital, Leverage, and the Financial Crisis of 2007-09

More realistically, a bank gets financial resources not only from accepting deposits but also from issuing equity and debt. The resources that a bank obtains from issuing equity to its owners are called **bank capital**. A bank uses these financial resources in various ways to generate profit for its owners. It not only makes loans and holds reserves but also buys financial securities, such as stocks and bonds.

MORE REALISTIC NATIONAL BANK	
Assets	Liabilities
Reserves \$200	Deposits \$800
Loans \$700	Debt \$150
Securities \$100	Capital (owner's equity) \$50

By the rules of accounting, the reserves, loans, and securities on the left side of the balance sheet must always equal, in total, the deposits, debt, and capital on the right side of the balance sheet.

Leverage: the use of borrowed money to supplement existing funds for purposes of investment. Leverage is particularly important for banks, because borrowing and lending are the heart of what they do.

Leverage ratio: the ratio of assets to bank capital. Total assets/bank capital \rightarrow $\$1000/\$50 = 20$ (previous table). This means that for every dollar of capital that the bank owners have contributed, the bank has \$20 of assets. Of the \$20, \$19 is financed with borrowed money.

When the leverage is 20, a 5% increase in the value of assets increases the owners' equity by 100%.

When the leverage is 20, a 5% decrease in the value of assets decreases the owners' equity by 100%.

When the leverage is 20, a decrease above 5% results in bank assets falling below liabilities. The bank would be *insolvent*, and would be unable to pay off its debt holders and depositors in full.

Capital requirement: a government regulation specifying a minimum amount of bank capital.

This is to ensure that banks will be able to pay off their depositors. The amount of capital required depends on the kind of assets a bank holds. A *credit crunch* is a shortage of capital inducing banks to reduce lending.

Because banks create money in a system of fractional-reserve banking, the Bank of Canada's control of the money supply is indirect. When the bank of Canada decides to change the money supply, it must consider how its actions will work through the banking system.

Central banks like the Bank of Canada act as bankers to the commercial banks. These banks hold demand deposits at the Bank of Canada, which are part of their reserves. The rate of interest that central banks charge commercial banks for loans is called the *discount rate* in some countries. In Canada, it is called the **bank rate**.

Operating band is a **4.5-5** percent interest rate, which sets the pattern for all short-term interest rates in Canada.

Overnight rate: the interest rate on very short-term loans between commercial banks (always about one quarter of a percent below the bank rate).

The Bank of Canada can alter the money supply by changing the bank rate, which in turn causes an equal change in the overnight rate. A higher overnight rate discourages banks from borrowing reserves from the Bank of Canada. Thus, increasing overnight rates reduces the quantity of reserves in the banking system, which in turn reduced the moneys supply. Conversely, a lower overnight rate encourages banks to borrow from the Bank of Canada.

The bank of Canada lowers the overnight rate whenever it wants the money supply to expand, and raises the overnight rate whenever it wants the money supply to contract.

Open-market operations: the purchase or sale of Government of Canada bonds by the Bank of Canada. To increase the money supply, the bank of Canada periodically buys treasury bills (short-term government bond). The dollars the bank of Canada pays for the bonds increase the number of dollars in circulation. Some of these new dollars are held as currency, some are deposited in banks. Each new dollar held as currency increases the money supply by exactly \$1. Each new dollar deposited in a bank increases the

MACROECONOMICS

money supply by a greater extent because it increases reserves and, thereby, the amount of money that a fractional-reserve banking system can create.

To reduce money supply, the bank of Canada can do the opposite by selling government bonds to the public. The public pays for these bonds with its holdings of currency and bank deposits, directly reducing the amount of money in circulation.

While open-market operations are normally conducted using short-term government securities, there is no reason why the bank of Canada could not buy and sell government securities with longer maturities or even buy and sell nongovernment securities.

Quantitative easing: the purchase and sale by the central bank of nongovernment securities with long maturity terms.

Foreign exchange market operations: the purchase or sale of foreign money by the bank of Canada. Sometimes the Bank of Canada wants to sell foreign currency in the foreign exchange market to support the Canadian dollar's exchange rate, but does not want the money supply to fall. To do this, it uses the Canadian dollars it acquires in the foreign exchange market to buy Canadian government bonds, thus putting the Canadian dollars back into circulation. This process of offsetting a foreign exchange market operation with an open-market operation is called **sterilization**.

Some central banks around the world also influence the money supply with reserve requirements, which are regulations on the minimum amount of reserves that banks must hold against deposits. **Reserve requirements** influence how much money the banking system can create with each dollar of reserves, and can loan out less of each dollar that is deposited; as a result, it raises the reserve ratio, lowers the money multiplier, and increases the money supply. Conversely, a decrease in reserve requirements lowers the reserve ratio, raises the money multiplier, and increases the money supply. The Bank of Canada has rarely used changes in reserve requirements to control the money supply, because frequent changes would disrupt the business of banking.

The bank of Canada's control of the money supply is not precise. It must wrestle with two problems, each of which arises because much of the money supply is created by our system of fractional-reserve banking.

1. It does not control the amount of money that households choose to hold as deposits in banks. The more money that households deposit, the more reserves banks have, and the more money that banking system can create. And the less money that households deposit, the less reserves banks have, and the less money the banking system can create. If people lose confidence in the banking system, it loses reserves and creates less money.
2. It 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. Because banks choose to hold excess reserves, it cannot be sure how much money the banking system will create. If bankers become more cautious, less loans and greater reserves decrease created money.

The amount of money in the economy depends in part on the behaviour of depositors and bankers. Because the bank of Canada cannot control or perfectly predict this behaviour, it cannot perfectly control the money supply. But these problems need not be large. If the Bank of Canada discovers money supply is growing too fast, raise overnight rate. If the Bank of Canada discovers that the money supply is too slow, or falling, it can lower overnight rate to increase money supply.

CHAPTER 11: MONEY GROWTH AND INFLATION

Hyperinflation: an extraordinarily high rate of inflation.

The Quantity theory of money: prices rise when the government prints too much money.

The classical theory of inflation

- It is more about the value of money than about the value of goods
- Inflation is an economy-wide phenomenon that concerns the value of the economy's medium of exchange.
- When the price level rises, people have to pay more for the goods and services they buy. Alternatively we can view the price level as a measure of the value of money. A rise in the price level means lower value of money because each dollar in your wallet now buys a smaller quantity of goods and services.
- $P =$ price level
 - Ex. If a cone (P) is \$2, then the value of a dollar is $1/P = 1/2$.
- When the overall price level rises, the value of money falls
- Supply and demand determine the value of money
 - **Supply:** If the bank of Canada sells bonds in an open market operation, it receives dollars in exchange and contracts the money supply. If it buys bonds in an open-market operation, the Bank of Canada pays out dollars and expands the money supply.
 - **Demand:** Most fundamentally, the demand for money reflects how much wealth people want to hold in liquid form. The amount of currency people hold in their wallets depends on how much they rely on credit cards and on whether an automated teller machine is easy to find. The quantity of money demanded depends on the interest rate that a person could earn by using the money to buy an interest-bearing bond rather than leaving it in a wallet or low-interest chequing account.
 - The average level of prices in the economy mean people holds money as the medium of exchange. A higher price lever (a lower value of money) in creases the quantity of money demanded.
 - *In the long run, the overall level of prices adjusts to the level at which the demand for money equals the supply.*
 - If the price level is above the equilibrium level, people will want to hold more money than the Bank of Canada has created, so the price level must fall to balance supply and demand.
 - If the price level is below the equilibrium level, people will want to hold less money than the bank of Canada has created, and the price level must rise to balance supply and demand.
 - *When an increase in the money supply makes dollars more plentiful, the result is an increase in the price level that makes each dollar less valuable.*
 - The supply (vertical) shifts right and the value of money decreases.
- The quantity theory of money: a theory asserting that the quantity of money available determines the price level and that the growth rate in the quantity of money available determines the inflation rate.
- The injection of money increases the demand for goods and services, as extra cash provides incentive to buy goods, bonds, save in the bank.
- Hume says all economic variables should be divided into two groups:
 - **Nominal variables:** variables measured in monetary units.
 - Heavily influenced by developments in the economy's monetary system
 - **Real variables:** variables measured in physical units.
 - The quantity of money is largely irrelevant for understanding the determinants of important real variables.
 - **Classical dichotomy:** the theoretical separation of nominal and real variables.
 - When comparing the prices of any two goods, the dollar signs cancel, and the resulting number is measured in physical units.
 - **Monetary neutrality:** the proposition that changers in the money supply do not affect real variables.

MACROECONOMICS

- Over short periods of time, there is reason to think that monetary changes do have important effects on real variables.
- In the long run, monetary changes have important effects on nominal variables but only negligible effects on real variables
- **Velocity of money:** the rate at which money changes hands
 - $V = (P \times Y)/M$
 - P = The price level (GDP deflator)
 - Y = the quantity of output (real GDP)
 - M = the quantity of money
- **Quantity equation:** relates the quantity of money, the velocity of money, and the dollar value of the economy's output of goods and services.
 - $M \times V = P \times Y$
 - The quantity equation shows that an increase in the quantity of money in an economy must be reflected in one of the other three variables:
 - The price level must rise, the quantity of output must rise, or the velocity of money must fall.
- Elements necessary to explain the equilibrium price level and inflation rate:
 - The velocity of money is relatively stable over time
 - Because velocity is stable, when the central bank changes the quantity of money (M), it causes proportionate changes in the nominal value of output (P X Y)
 - The economy's output of goods and services (Y) is primarily determined by factor supplies and the available production technology. In particular, because money is neutral, money does not affect output.
 - With output (Y) determined by factor supplies and technology, when the central bank alters the money supply (M) and induces proportional changes in the nominal value of output (P X Y), these changes are reflected in changes in the price level (P).
 - Therefore, when the central bank increases the money supply rapidly, the result is a high rate of inflation

Why do countries experience hyperinflation? Governments use money creation as a way to pay for their spending. Expenses like salaries or transfer payments should be paid through taxes, but are sometimes paid by the creation of more money.

Inflation tax: the revenue the government raises by creating money. When the government prints money, the price level rises, and the dollars in your pocket are less valuable. *Inflation tax is like a tax on everyone who holds money.*

The fisher effect: an increase in the rate of money growth raises the rate of inflation but does not affect any real variable. The **nominal interest rate** is the interest rate you hear about at our bank. The **real interest rate** corrects the nominal interest rate for the effect of inflation in order to tell you how fast the purchasing power of your savings account will rise over time.

$$\text{Real interest rate} = \text{nominal interest rate} - \text{inflation rate.}$$

We can rewrite this equation to show that nominal interest rate is the sum of the real interest rate and the inflation rate.

$$\text{Nominal interest rate} = \text{real interest rate} + \text{inflation rate.}$$

This is useful because different economic forces determine each of the two terms on the right-hand side of this equation.

Definition: the one-for-one adjustment of the nominal interest rate to the inflation rate.

When the bank of Canada increases the rate of money growth, the result is both a higher inflation rate and a higher nominal interest rate. Fisher has maintained a long-run perspective. If inflation catches the borrower and lender by surprise, the nominal interest rate they set will fail to reflect the higher inflation. But if inflation remains high, people will eventually come to expect it, and loan agreements will reflect this expectation. The Fisher effect states that the nominal interest rate adjusts to expected inflation

MACROECONOMICS

The Cost of inflation

- When prices rise, buyers of goods and services pay more for what they buy. At the same time, however, sellers of goods and services get more for what they sell. Because most people earn their incomes by selling their services, such as their labour, inflation in incomes goes hand in hand with inflation in prices. Thus, *inflation does not in itself reduce people's real purchasing power*.
- People believe the inflation fallacy because they do not appreciate the principle of monetary neutrality. A worker who receives an annual raise of 10 percent tends to view that raise as a reward for her own talent and effort. When an inflation rate of 6 percent reduces the real value of that raise to only 4 percent, the worker might feel that she has been cheated of what is rightfully her due.
- **Shoe leather costs:** the resources wasted when inflation encourages people to reduce their money holdings.
- Inflation is like a tax on the holders of money that is not actually a cost to society. It is only a transfer of resources from households to the government. Yet most taxes give people an incentive to alter their behaviour to avoid paying tax, and this distortion of incentives causes deadweight losses for society as a whole.
- By making more frequent trips to the bank, you can keep more of your wealth in your interest-bearing savings account and less in your wallet, where inflation erodes its value.

Most firms do not change the prices of their products every day. Instead, firms often announce prices and leave them unchanged for weeks, months, or even years. **Menu costs:** the costs of changing prices. Menu costs include the cost of deciding on new prices, the cost of printing new price lists and catalogues, the cost of advertising the new prices, and even the cost of dealing with customer annoyance over price changes.

Market economies rely on relative prices to allocate scarce resources. Consumers decide what to buy by comparing the quality and prices of various goods and services. Through these decisions, they determine how the scarce factors of production are allocated among industries and firms. When inflation distorts relative prices, consumer decisions are distorted, and markets are less able to allocate resources to their best use.

Inflation exaggerates the size of capital gains and inadvertently increases the tax burden on capital gains (profits made by selling an asset for more than its purchase price). Interest income: income tax treats the nominal interest earned on savings as income, even though part of the nominal interest rate merely compensates for inflation. When inflation raises the tax burden on saving, it tends to depress the economy's long-run growth rate.

Inflation is bad, but deflation may be worse: Just as a rising price level induces menu costs and relative-price variability, so does a falling price level. Moreover, in practice, deflation is rarely as steady and predictable as Friedman recommended. More often, it comes as a surprise, resulting in the redistribution of wealth toward creditors and away from debtors. Because debtors are often poorer, these redistributions in wealth are particularly harmful.

MACROECONOMICS

CHAPTER 12: OPEN-ECONOMY MACROECONOMICS: BASIC CONCEPTS

Closed economy: an economy that does not interact with other economies in the world.

Open economy: an economy that interacts freely with other economies around the world.

Exports: goods and services that are produced domestically and sold abroad.

Imports: goods and services that are produced abroad and sold domestically.

Net exports: the value of a nation's exports minus the value of its imports; also called the trade balance.

$$\text{Net exports} = \text{Value of country's exports} - \text{Value of country's imports}$$

Trade balance: the value of a nation's exports minus the value of its imports; also called net exports.

Trade surplus: an excess of exports over imports.

Trade deficit: an excess of imports over exports.

Balanced trade: a situation in which exports equals imports.

Net capital outflow: the purchase of foreign assets by domestic residents minus the purchase of domestic assets by foreigners.

$$\text{Net capital outflow} = \text{purchase of foreign assets by domestic residents} - \text{purchase of domestic assets by Foreigners}$$

When a Canadian buys stock in Telmex, the Mexican phone company, and the purchase raises Canadian net capital outflow. When a Japanese resident buys a bond issued by the Canadian government, the purchase reduces Canadian net capital outflow.

Foreign direct investment: Tim Hortons opening a fast food outlet in Russia.

Foreign portfolio investment: a Canadian buying stock in a Russian corporation.

In both cases, Canadian residents are buying assets located in another country, so both purchases increase Canadian net capital outflow.

The **Net capital outflow** can be positive or negative. When it is **positive**, domestic residents are buying more foreign assets than foreigners are buying domestic assets. Capital is said to be flowing out of the country. When the net capital outflow is **negative**, domestic residents are buying less foreign assets than foreigners are buying domestic assets. Capital is said to be flowing into the country (a capital inflow).

Real interest rates being paid on foreign assets, real interest rates being paid on domestic assets, perceived economic and political risks of holding assets abroad, and government policies that affect foreign ownership of domestic assets all influence net capital flow.

$$\text{NCO} = \text{NX}$$

Always!!!! The equality of net exports and net capital outflow follows from the fact that every international transaction is an exchange. When a seller country transfers a good or service to a buyer country, the buyer country gives up some asset to pay for this good or service. The value of that asset equals the value of the good or service sold. When we add everything up, the net value of goods and services sold by a country (NX) must equal the net value of assets acquired (NCO).

- When a nation is running a trade surplus (NX>0), it is selling more goods and services to foreigners than it is buying from them. What is it doing with the foreign currency it receives from the net sale of goods and services abroad? It must be using it to buy foreign assets. Capital is flowing out of the country (NCO>0).
- When a nation is running a trade deficit (NX<0), it is selling more goods and services to foreigners than it is buying from them. How is it financing the net purchase of these goods and services in world markets? It must be selling assets abroad. Capital is flowing into the country (NCO<0).

$$\text{GDP: } Y = C + I + G + \text{NX}$$

(Y) GDP (C) Consumption (I) Investment (G) Government Purchases (NX) Net Exports

MACROECONOMICS

National saving (S) equals $Y - C - G$. If we rearrange the above equation,

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

$$S = I + NX$$

Because NX also equals NCO, we can write this equation as

$$S = \text{Domestic investment} + \text{Net capital outflow}$$

This equation shows that a nation's saving must equal its domestic investment plus its net capital outflow. In other words, when a Canadian citizen saves a dollar of their income for the future, that dollar can be used to finance accumulation of domestic capital or it can be used to finance the purchase of capital abroad.

In a closed economy, $NCO = 0$ and saving investment ($S = I$). By contrast, an open economy has two uses for its saving: domestic investment and net capital outflow.

Trade deficit	Balanced Trade	Trade Surplus
Exports < imports	Exports = Imports	Exports > imports
$NX < 0$	$NX = 0$	Net exports > 0
$Y < C + I + G$	$Y = C + I + G$	$Y > C + I + G$
Saving < investment	Saving = investment	Saving > Investment
Net capital outflow < 0	Net capital outflow = 0	Net Capital Outflow > 0

Nominal exchange rate: the rate at which a person can trade the currency of one country for the currency of another.

1/80 yen per dollar or 80 yen per dollar

Appreciation: an increase in the value of a currency as measured by the amount of foreign currency it can buy.

80 yen per dollar to 70 yen per dollar

Depreciation: a decrease in the value of a currency as measured by the amount of foreign currency it can buy.

80 yen per dollar to 90 yen per dollar

When a currency appreciates, it is said to strengthen because it can then buy more foreign currency. Similarly, when a currency depreciates, it is said to weaken. For any country, there are many nominal exchange rates.

Real exchange rate: the rate at which a person can trade the goods and services of one country for the goods and services of another.

$$\text{Real exchange rate} = (\text{Nominal exchange rate} \times \text{domestic price}) / \text{Foreign price}$$

Real exchange rate = (4 rubles/dollar X 4200 per bushel of Canadian wheat) / 1600 rubles per bushel of Russian wheat

= 1/2 bushel of Russian wheat per bushel of Canadian wheat.

Price index for a Canadian basket (P)

Price index for a foreign basket (P*)

Nominal exchange rate between the Canadian dollar and foreign currencies (e).

$$\text{Real exchange rate} = (e \times P) / P^*$$

This real exchange rate measures the price of a basket of goods and services available domestically relative to a basket of goods and services available abroad.

MACROECONOMICS

Purchasing-power parity: a theory of exchange rates whereby a unit of any given currency should be able to buy the same quantity of goods in all countries. Many believe it describes the forces that determine exchange rates in the long run.

- Based on the principle called *law of one price* that asserts that a good must sell for the same price in all locations otherwise, opportunities for profit would be left unexploited.
- The process of taking advantage of differences in prices in different markets is called *arbitrage*. By buying cheap coffee in Vancouver and selling it for a higher price in Halifax to make a profit, demand for coffee in Vancouver increases and supply in Halifax increases. The price of coffee would rise in Vancouver. This would continue until eventually the prices were the same in both markets.
- Tells us that the nominal exchange rate between the currencies of two countries depends on the price levels in those countries. If a dollar buys the same quantity in Canada as in Japan, then the number of yen per dollar must reflect the prices of goods in Canada and Japan. 500 yen/\$5 = 100 yen.
- Purchasing power at home is \$1, so $1/P$
- Purchasing power abroad can be exchanged into e units of foreign currency, e/P^* .

$$1/P = e/P^*$$

With rearrangement,

$$1 = eP/P^*$$

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.

$$E = P^*/P$$

According to the theory of purchasing-power parity, the nominal exchange rate between the currencies of two countries must reflect the different price levels in those countries. Nominal exchange rates change when price levels change, and the price level in any country adjust to bring the quantity of money supplied and the quantity of money demanded into balance. As the nominal exchange rate depends on the price levels, it also depends on the money supply and money demand in each country. When a central bank in any country's currency increases the money supply and causes the price level to rise, it also causes that country's currency to depreciate relative to other currencies in the world. *When the central bank prints large quantities of money, that money loses value both in terms of the goods and services it can buy and in terms of the amount of other currencies it can buy.*

Purchasing-power parity can explain many long-term trends such as the depreciation of the Canadian dollars against the German mark and the appreciation of the Canadian dollar against the Italian lira and can also explain the major changes in exchange rates that occur during hyperinflation. It is not accurate. Exchange rates do not always move to ensure that a dollar has the same real value in all countries all the time. There are two reasons why the theory of purchasing-power parity does not always hold in practice:

1. Many goods are not easily traded.
2. Purchasing-power parity does not always hold that even tradable goods are not always perfect substitutes when they are produced in different countries.

The model most economists prefer to use is one that describes Canada as a *small open economy with perfect capital mobility*. A small open economy is an economy that trades goods and services with other economies and, by itself, has a negligible effect on world prices and interest rates. An increase in demand for computer chips by Canadians is unlikely to have an effect on the world price for computer chips. Canada's share of total world demand for computer chips is too small for such a change to have anything but a negligible effect on the world price. An increase in the supply of Canadian bonds has a negligible effect on total world supply of bonds. Changes in Canadian financial markets therefore have negligible effects on world interest rates.

MACROECONOMICS

Perfect Capital mobility: full access to world financial markets. The implication of perfect capital mobility for a small open economy like Canada's is that the real interest rate in Canada should equal the real interest rate prevailing in world financial markets. If r is the Canadian real interest rate and r^w is the world real interest rate, then

$$R = r^w$$

With full access to world financial markets, Canadian savers would prefer to buy foreign assets that pay an interest rate of 8 percent than Canadian assets that pay an interest rate of just 5 percent. We would expect to see savers sell their Canadian assets and buy foreign assets instead. The logic by which the real interest rates in Canada should adjust to equal the real interest rate in the rest of the world should remind you that the price of borrowing (real interest rate) should equal the rest of the world.

Interest Rate parity: a theory of interest rate determination whereby the real interest rate on comparable financial assets should be the same in all economies with full access to world financial markets.

The real interest rate in Canada is not always equal to the real interest rate in the rest of the world:

1. Financial assets carry with them the possibility of default. While the seller of a financial set promises to repay the buyer at some future date, the possibility always exists that the seller may not do so. If the seller does renege on this agreement, the seller is said to be in default of the loan. The higher the default risk, the higher the interest rate that asset buyers demand from asset sellers. If the seller of one financial asset is perceived to be more likely to default than the seller of another otherwise similar asset, the difference in the rate of interest paid on these assets may not necessarily represent an arbitrage opportunity.
2. Financial assets offered for sale in different countries are not necessarily perfect substitutes for one another. While similar assets in two countries may pay the same rate of after-tax rates of return, different tax regimes in these two countries may pay different after-tax returns. While after-tax returns will be equalized internationally, differences in pre-tax rates of return will persist.