

Scarcity means that society has limited resources and therefore cannot produce all the goods and services people wish to have

Economics is the study of how society manages its scarce resources

Chapter 1 Ten Principles of Economics

How People Make Decisions

Principle #1 People Face Tradeoffs

Making decisions requires trading off one goal against another

Examples of tradeoffs:

- “guns for butter” - spending national money on defence or consumer goods
- Study time between subjects
- Efficiency vs. equity
 - **Efficiency**- the propensity of society getting the most it can from its scarce resources
 - **Equity**- the property of distributing economic prosperity fairly among the members of society
 - “when government tries to slice pie into equal slices, the pie gets smaller”
- It is important to acknowledge tradeoffs because people are likely to make good decisions only if they understand the options they have available

Principle #2: The Cost of Something Is What You Give Up to Get It

Opportunity cost of an item is what you give up to obtain the item

E.g. the cost of going to university is often the time you could have put into a job and the wages you would have earned

Principle #3: Rational People Think at the Margin

Rational people systematically and purposefully do the best they can to achieve their objectives, given the opportunities they have

Marginal changes- small incremental adjustments to a plan of action

- Most rationalizations/ decisions occur at the smaller level- people often make decisions by comparing *marginal benefits* and *marginal costs*
- Examples:
 - spending the extra hour reviewing or watching TV
 - If airline company has empty seats, and a passenger is willing to pay a lower price to board, it is worth it for them- they are *thinking at the margin*
Cost of flying the passenger may be \$500 (\$100 000/ 200 seats), but the *marginal* cost is merely what the food costs for the passenger
 - People are willing to pay more for diamonds than water because the *marginal* benefit of one diamond is greater than the benefit of a cup of water which is more plentiful (even though more vital to life)

A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost

Principle #4: People Respond to Incentives

Incentive- something (such as the prospect of punishment or a reward) that induces a person to act

People respond to incentives because they often make decisions by comparing costs and benefits

Examples:

- Supply and demand: low price → incentive to buy an item, high price → incentive to sell an item
- Seatbelt law- since people feared prosecution, they wore seatbelts more , but accidents increased because they drove less carefully

How People Interact

Principle #5: Trade Can Make Everyone Better Off

Although countries, families, companies, etc. compete with each other, they can all benefit from trade

Trade allows each person (or country, company, etc.) to specialize in the activities they do best and by trading with others, they get a greater variety of goods of a higher quality

E.g. American and Canadian Economy compete but trade with each other

Principle #6: Markets Are Usually a Good Way to Organize Economic Activity

In a **market economy**, the decisions of a central planner are replaced by the decisions of millions of firms and households

Firms decide whom to hire and what to make and households interact in the marketplace, where prices and self-interest guide their decisions

As a result of decisions made by buyers and sellers, market prices reflect both the value of a good to society and the cost to society of making the good

Prices adjust to guide buyers and sellers to reach outcomes that maximize welfare of society as a whole

Governments impede on the invisible hand

- E.g. taxes effect price
- Why communism fell?

Principle #7: Governments Can Sometimes Improve Market Outcomes

Market economies still require the influence of the government to enforce the rules and maintain the institutions that are key to a market economy

Governments must enforce **property rights**, the ability of an individual to own and exercise control over scarce resources

Governments need to **promote efficiency**

- **Market failure**- situation in which a market left on its own fails to allocate resources efficiently
 - Causes:
 - **externality**, the impact of one person's actions on the well-being of a bystander
E.g. pollution
 - **Market power**- ability of a single person (or small group of people) to unduly influence market prices (i.e. monopoly)
E.g. if there is only one well in a town

Government needs to **promote equity**

- E.g. welfare systems, healthcare, etc.

How the Economy as a Whole Works

Principle #8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services

Almost all variation in living standards between countries is attributable to differences in countries' productivity

Productivity- the quantity of goods and services produced from each hour of a worker's time
Nations with more goods and services produced per unit of time → high standard of living

Growth rate of productivity= growth rate of average income

Examples of implications:

- Increasing min. wage → more produced → higher standard of living
- More competition from Japan → less produced → income growth slows

Policy makers need to find ways to boost productivity to indirectly improve standard of living, education, health, etc.

Principle #9: Prices Rise When the Government Prints Too Much money

Inflation- an increase in the overall level of prices in the economy

high inflation leads to increased costs for society, so economic policy makers try to keep it at a low level

inflation is often caused by the growth in the quantity of money- when a government creates large quantities of the nation's money, the value of the money falls

Principle #10: Society Faces a Short-Run Tradeoff between Inflation and Unemployment

reasons for why governments produce more money ("short -term injections") in the first place

- more money stimulates spending → more demand for goods and services
- higher demand → encourages firms to increase quantity of goods and services they produce and hire more workers to produce the goods and services
- more hiring → lower unemployment

Leads to short-run tradeoff between inflation and unemployment- economic policies push inflation and unemployment in opposite directions

Business cycle- the irregular and largely unpredictable fluctuations in economic activity, as measured by the production of goods and services or the number of people employed

policymakers can influence the combination of inflation and unemployment that the economy experiences by changing the amount that the government:

- spends
- taxes
- Prints money

Chapter 2 Thinking like an Economist

Economists use a language of terms to view the world in a certain way

The Economist as a Scientist

Economists try to address their subject with a scientist's objectivity

The Scientific Method: Observation, Theory, and More Observation

Like scientists, economists develop theories and then test them

Since they study people and interactions, they have to use historical data and events to back up their theories

- E.g. hypothesis that printing more money results in inflation could be tested by collecting data on inflation and amount of money produced from different countries
- E.g. war in middle east gives opportunity to study affect on oil prices

The Role of Assumptions

Economists use assumptions to simplify the complex world and make it easier to understand

- E.g. when studying trade, pretend that there are only two countries

Use different assumptions based on situation and time scale

- E.g. for short term, you can assume prices of goods are fixed, for long term, you assume that they change

Economic Models

Economists often use models consisting of equations and diagrams

The models often omit many details to allow us to see what is truly important

All models are built with assumptions- they simplify reality in order to improve our understanding of it

Circular Flow Diagram

Circular-flow diagram- a visual model of the economy that shows how dollars flows through markets among households and firms

Assumptions: 2 types of decision makers that interact in 2 market types

Decision-makers:

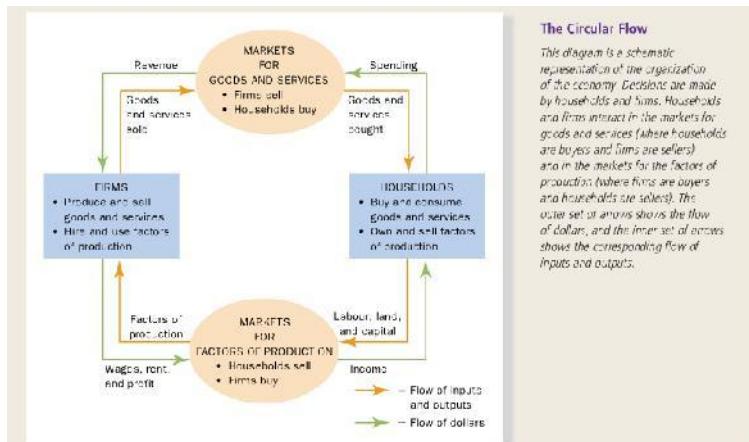
- Households
- Firms

Markets:

- Markets for goods and services- households buy outputs produced by sellers
- Markets for the factors of production- households provide inputs that firms use to produce outputs

Two types of resource flow going in opposite directions

- Inputs and outputs
- Money



Production Possibilities Frontier

Production possibilities frontier- a graph that shows the combinations of output that the economy can possibly produce given the available factors of production and the available production technology

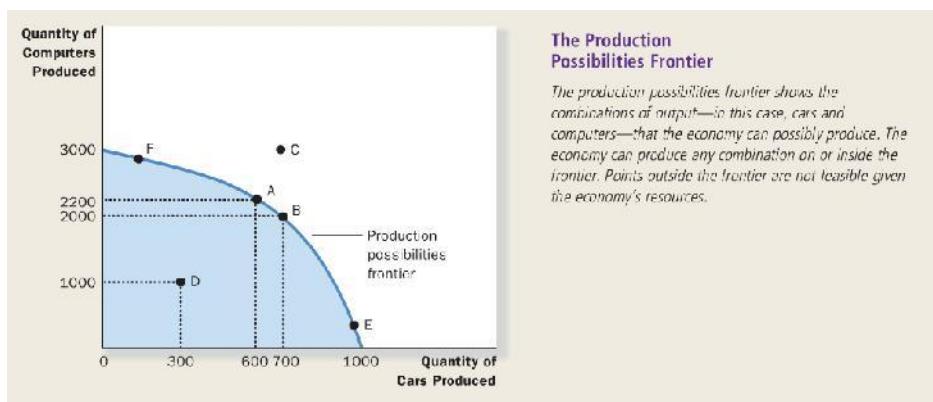
Based on the idea that an economy can use resources to produce combinations of two goods

- Principle #1: people face tradeoffs
- Principle #2: the cost of something is what you give up to get it (opportunity cost)
 - To make more of one product, they have to give up making a certain product
 - Opportunity cost= slope of PPF

Points inside the frontier- possible, but not completely efficient

Points on the line- possible and 100% efficient based on the resources and technology available

Points outside the frontier- not possible with resources and technology available



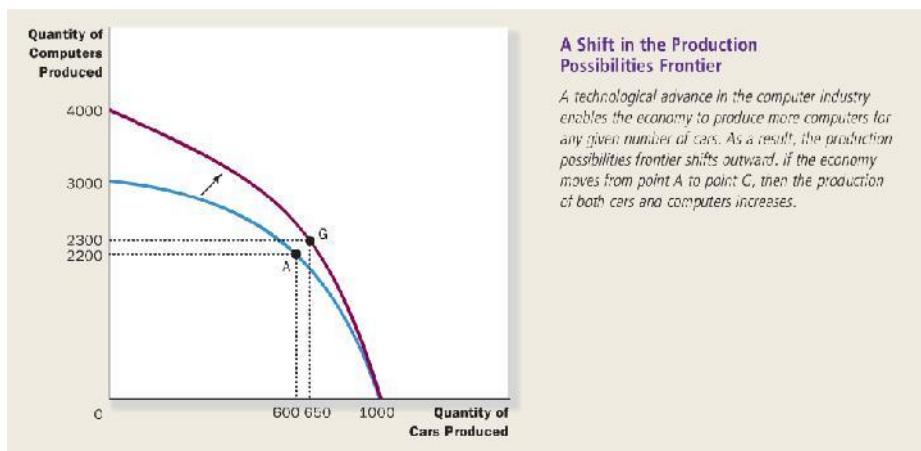
PPF is bowed out (and not a straight line) because some resources can make one product better than the other

- i.e. opportunity cost/ slope becomes flatter or steeper as you move along curve
- E.g. if the economy shifted to making only computers, it would require more automakers to perform a job that they are less proficient at

The shape of the bowed out graph reflects the relative ability for the economy to make one product compared to another

a technological advance expands the society's set of opportunities

- e.g. in the computer industry raises the number of computers that a worker can produce per week → PPF shifts in the direction of computers
- represents economic growth of the economy



Microeconomics and Macroeconomics

like other sciences, economics is studied at different levels

microeconomics- the study of how households and firms make decisions and how they interact in specific markets

- e.g. study of rent control on housing in Toronto, impact of foreign auto industry on Canadian auto markets

macroeconomics- the study of economy-wide phenomena, including inflation, unemployment and economic growth

- e.g. effects of borrowing by federal government, country's rate of unemployment
- each field has its own set of models to explain economy at the particular level

microeconomics and macroeconomics are closely related because changes in the overall economy arise from decisions of many individuals

- e.g. a national tax cut has an effect on the decisions made by individual consumers

The Economist as a Policy Adviser

Economists often responsible for explaining the cause of economic events or recommending policies to improve economic outcomes

When economists try to explain the world, they act as scientists, but when they try to improve it, they are policy advisers

Positive versus Normative Analysis

Positive statements are claims that attempt to describe the world as it is

- E.g. "minimum-wage laws cause unemployment"- based on recorded statistics

Normative statements are claims that attempt to prescribe how the world should be

- E.g. "the government should raise the minimum wage to help the economy"- a suggestion that involves an opinion

Positive statements can be evaluated by looking at evidence, while normative statements involve looking at people's *values* as well as facts

Deciding what is good or bad policy is not an exact science, it requires an opinion/ set of beliefs
most of economics involves positive statements that explain how economy works, but when economists act as policy advisers, they often use normative statements

Economists in Ottawa

the policy decisions made or advised by economists often involve trade-offs

- equity vs. efficiency
- current generation vs. future generations

Government of Canada relies on advice of economists:

- Finance Canada- tax policy
- Industry Canada- antimonopoly laws
- Human Resources and Social Development Canada- labour-market policies
- Environment Canada- environmental regulations

Economists outside the government also give policy advice through publications by other organizations

- E.g. C.D. Howe Institute, Fraser Institute, Institute for Research on Public Policy

Why Economists Disagree

Often economists give conflicting advice to policymakers

Differences in Scientific Judgements

Economists may disagree about the validity of alternative positive theories about how the world work

Economists sometimes disagree because they have different hunches about the validity of alternative theories or about the size of important parameters

E.g. economists disagree about whether the government should tax people based on how much they spend or on how much they make

- Different sides of argument have different *positive* views about the responsiveness of savings to tax incentives
 - Those that think we should adopt tax based on consumption model believe it would result in more saving due to the incentive

Differences in Values

Economists may have different values and, therefore, different normative views about what policy should try to accomplish

E.g. One economist may value equity and thus be an advocate of social programs that would reduce efficiency

Perception versus Reality

Often policies overwhelmingly endorsed by economists are not adopted by governments or the general public

E.g. Almost all economists believe that there should be no barriers to free trade, but many barriers still remain

Why? Economists have yet to convince the general public

Cause and Effect

Economists use graphs to illustrate that one variable is directly related to another variable

This is difficult to do because you have to hold everything else constant except the two variables in question

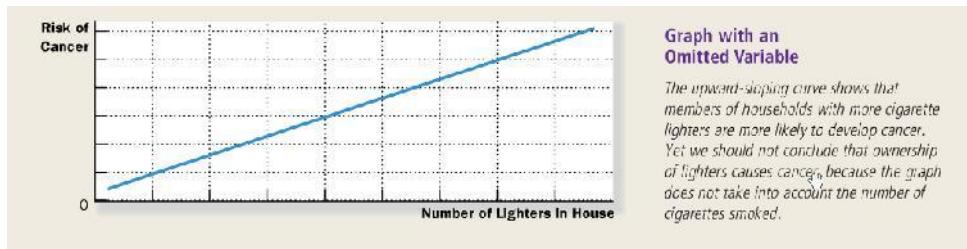
This can lead to two key errors: omitted variable and reverse causality

Omitted Variable

Omitted variable- when a third variable on a graph of A and B causes the changes on A and B

- i.e. both variables don't actually effect each other, but instead are effected by a third unrepresented variable

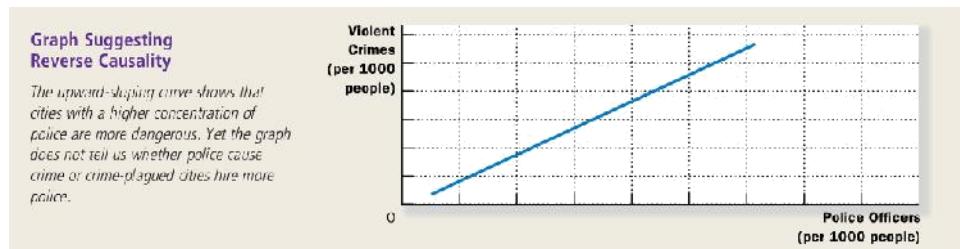
E.g. number of cigarette lighters in house is related to the number of instances of lung cancer ○ in reality, smoking (the omitted variable) is what causes the cancer, and people to have lighters



Reverse Causality

Reverse Causality- when we believe that variable A causes B, when in fact variable B causes A

E.g. thinking that the number of police officers cause more crime, when it is the other way around



Chapter 3 Interdependence and the Gains from Trade

Today we rely on a variety of goods produced in countries all over the world that trade with Canada

People provide consumers with the goods and services they produce because they get something in return

A Parable for the Modern Economy

To understand why people choose to depend on others for goods and services, look at a simple economy:

- Two goods- meat and potatoes
- Two people- cattle rancher and potato farmer

Production Possibilities

Both members of the economy can produce both goods, but not equally well

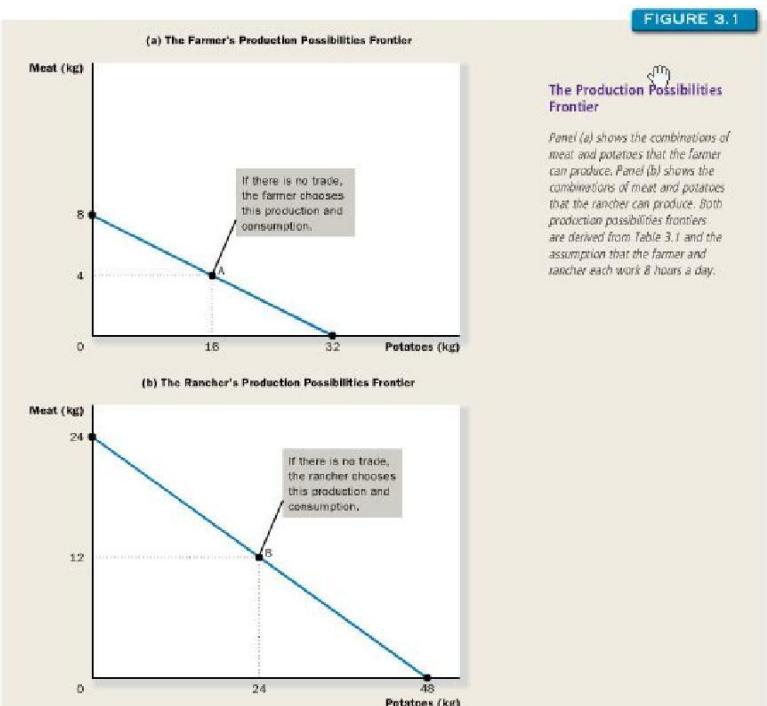
- Cattle rancher's land may not be fertile enough to make quality potatoes
- Potato farmer not good at raising cattle properly

Each person spends a different amount of time producing each good:

	Minutes Needed to Produce 1 kg of:		Available Hours
	Meat	Potatoes	
Farmer	60 min/kg	15 min/kg	8 kg
Rancher	20 min/kg	10 min/kg	24 kg

A production possibilities frontier illustrates the different production options each person has

- Each faces a tradeoff between producing meat or producing potatoes



- PPFs are straight lines because they can switch between producing meat and producing potatoes at a constant rate (regardless of what they are already producing)

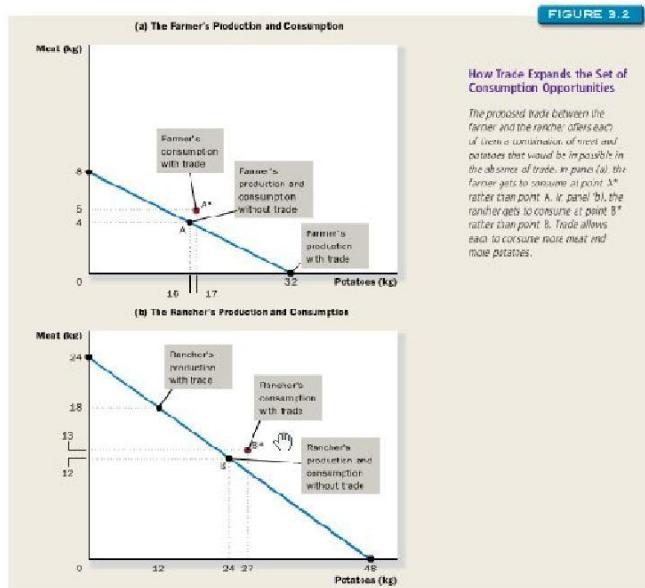
If the farmer and rancher are self-sufficient and don't trade, they consume the amount they produce, and would likely produce a combination of both products

Specialization and Trade

If the farmer trades potatoes for meat from the rancher, it would allow each person to do what they do best

Example scenario: the farmer trades 15kg potatoes for 5kg meat

		Farmer		Rancher	
		Meat	Potatoes	Meat	Potatoes
Without Trade:					
Production and Consumption		4 kg	16 kg	12 kg	24 kg
With Trade:					
Production		0 kg	32 kg	18 kg	12 kg
Trade		Gets 5 kg	Gives 15 kg	Gives 5 kg	Gets 15 kg
Consumption		5 kg	17 kg	13 kg	27 kg
Gains from Trade:					
Increase in Consumption		+1 kg	+1 kg	+1 kg	+3 kg



The farmer would produce more potatoes and the rancher would produce more meat
Since they trade, each would end up consuming more of each product

Comparative Advantage: The Driving Force of Specialization

Based on the graphs, the rancher can produce both potatoes and meat at a better rate than the farmer- so how can the farmer ever benefit from specialization?

The answer has to do with the principle of **comparative advantage**

Absolute Advantage

Absolute advantage- the comparison among producers of a good according to their productivity

- Based on the amount of *inputs* required (i.e. time, money, etc.)

The producer that requires a smaller quantity of inputs to produce a good is said to have an *absolute advantage* in producing that good

E.g. the rancher has an absolute advantage both in producing meat and potatoes because she requires less time than the farmer to produce a unit of either good

Opportunity Cost and Comparative Advantage

Another way to look at it: rather than comparing inputs required, compare *opportunity costs*

Opportunity costs of some item is what we give up to get that item

Comparative advantage- the comparison among producers of a good according to their opportunity cost

the producer who gives up less of other goods to produce good X has the smaller opportunity cost of producing good X and is said to have a *comparative advantage* in producing it

e.g. Rancher and farmer:

TABLE 3.3

The Opportunity Cost of Meat and Potatoes	Opportunity Cost of:	
	1 kg of Meat	1 kg of Potatoes
Farmer	4 kg potatoes	0.25 kg meat
Rancher	2 kg potatoes	0.50 kg meat

- farmer has a *comparative advantage* in producing potatoes → has a lower opportunity cost (0.25kg meat) of producing it than the rancher
- rancher has a *comparative advantage* in producing meat → has a lower opportunity cost of producing it (2kg potatoes) and thus has to give up less than the farmer

it is impossible for one person to have a comparative advantage in both goods → if O.C. of one good is high, cost of other good is low

Comparative Advantage and Trade

the gains from specialization and trade are not based on absolute advantage, but on comparative advantage

when each person specializes in producing the good for which he or she has a comparative advantage, total production in the economy rises → increase in size of "economic pie"

when trading, members of the economy are able to obtain goods for a lower price than the opportunity cost otherwise

- e.g. farmer is able to buy 5kg meat for 15kg potatoes → cost of 1kg meat is 3kg potatoes, less than the regular opportunity cost of 4kg potatoes without trade

for both parties to gain from trade, the price at which they trade must lie between the two opportunity costs

- e.g. farmer and rancher traded 1kg meat for 3kg potatoes → less than O.C. of farmer (4kg potatoes) and more than O.C. for rancher (2kg potatoes)
- trade can benefit everyone in society because it allows people to specialize in activities in which they have a comparative advantage*

Applications of Comparative Advantage

Should Mike Weir Mow His Own Lawn?

Mike Weir can mow his lawn faster than most people, so why doesn't he get someone who does it less efficiently to do it for him?

In the 2 hours it takes Weir to mow a lawn, he could do a commercial and make \$10,000
 In the 4 hours it takes a kid to mow the lawn, he could make \$20 at McDonald's

Since the opportunity cost for Weir is higher, the kid mows the lawn
 as long as Weir pays the kid less than \$10,000, but greater than \$2,000, both parties benefit
 i.e. Weir has *absolute advantage*, but the kid has *comparative advantage*

Should Canada Trade with Other Countries

many of the goods and services enjoyed by Canadians are produced abroad
 many of the goods and services produced in Canada are sold abroad
 trading with other countries gives Canadians access to a greater variety of goods and services
imports- goods and services produced abroad and sold domestically
exports- goods and services produced domestically and sold abroad

e.g. a worker in Japan and Canada each produce 1 car per month, but a Canadian worker can produce 2 tonnes of food per month (due to better land), while those in Japan can only produce 1 tonne of food per month

- opportunity cost of car for Canada- 2 tonnes of food
- opportunity cost of car for Japan- 1 tonne of food
- therefore Japan has a comparative advantage in producing cars, and should thus produce more than it needs to consume
- Japan trades cars to Canada while Canada trades food to Japan

Chapter 4 The Market Forces of Supply and Demand

Supply and *Demand* are the forces that make market economies work- they determine the quantity of each good produced and the price at which it is sold

Markets and Competition

A **market** is a group of buyers and sellers of a particular good or service

Buyers as a group determine the demand for the product

Sellers as a group determine the supply of the product

What is a Market?

Market can be highly organized

E.g. in markets for agricultural commodities, buyers and sellers meet at specific time and place where auctioneer helps set prices

Market can be less organized

- E.g. market for ice cream in a town- buyers do not meet together at one time, and ice cream is sold in different places all over the town

What is Competition

Competitive market- a market in which there are many buyers and many sellers so that each has a negligible impact on the market price

- e.g. each seller and buyer of ice cream has little impact on the market price

assume that markets are **perfectly competitive**- must have two characteristics:

- the goods offered for sale are all exactly the same
- the buyers and sellers are so numerous that no single buyer or seller has any influence over the market price

buyers and sellers in perfectly competitive markets are said to be **price takers**- they must accept the price determined by the market

monopoly- when a market has one seller that sets the price

- e.g. local cable company may have monopoly because they provide cable for the entire town

Demand

The Demand Curve: The Relationship between Price and Quantity Demanded

quantity demanded- the amount of a good that buyers are willing and able to purchase
the *price of the good* plays a central role in determining the quantity of good demanded

quantity demanded is *negatively related* to price- the lower the price, the more demanded

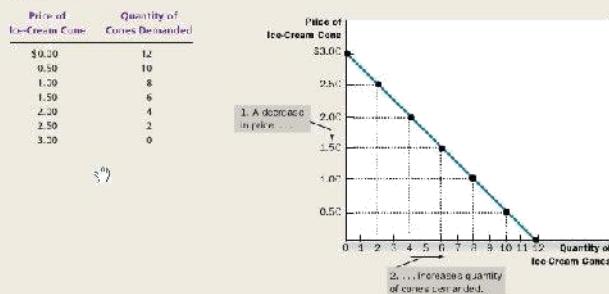
demand schedule- a table that shows the relationship between the price of a good and the quantity demanded

demand curve- a graph of the relationship between the price of a good (y-axis) and the quantity demanded (x-axis)

e.g. Catherine's demand schedule and demand curve for ice cream:

FIGURE 4.1

Catherine's Demand Schedule and Demand Curve
The demand schedule shows the quantity demanded at each price. The demand curve, which graphs the demand schedule, shows how the quantity demanded of the good varies as its price varies. Because a lower price increases the quantity demanded, the demand curve slopes downward.



Market Demand versus Individual Demand

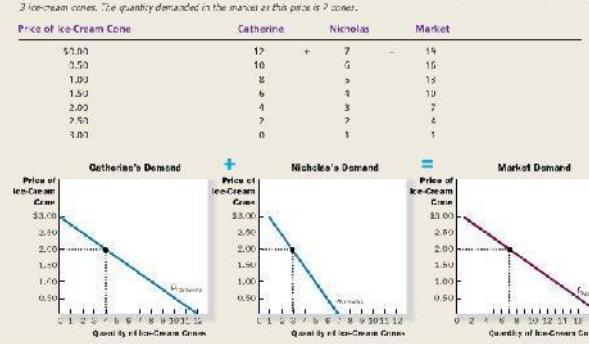
market demand- the sum of all the individual demands for a particular good or service

sum individual demand curves *horizontally* to obtain market demand curve- add individual quantities demanded at each price

e.g. adding Catherine and Nicholas's Demand for ice cream

FIGURE 4.2

Market Demand as the Sum of Individual Demands
The quantity demanded in market is the sum of the quantities demanded by all the buyers at each price. Thus, the market demand curve is found by adding horizontally the individual demand curves. At a price of \$2, Catherine demands 4 ice-cream cones, and Nicholas demands 3 ice-cream cones. The quantity demanded in the market at this price is 7 cones.



Shifts in the Demand Curve

market demand curve shows how the total quantity demanded of a good varies as the price of the good varies, while all the other factors that affect how much consumers want to buy are held constant

if some of these constant factors change, the demand curve *shifts*

increase in demand- any change that increases the quantity demanded at every price → shifts curve to right

decrease in demand- any change that reduces the quantity demanded at every price → shifts curve to left

FIGURE 4.3



most important variables that shift demand curve: income, prices of related goods, tastes, expectations, number of buyers

Income

lower income → less to spend → effects what you buy

normal good- a good for which, other things equal, an increase in income leads to an increase in demand

- e.g. an expensive car- when income falls, demand increases, when income increases, demand increases

inferior good- a good for which, other things equal, an increase in income leads to a decrease in demand

- e.g. bus rides- as income falls you are more likely to ride the bus than take a cab because it is cheaper; if income rises- you are less likely to take the bus

Prices of Related Goods

substitutes- two goods for which an increase in the price of one leads to an increase in the demand for the other

- substitutes are often pairs of goods that are used in place of each other ○
e.g. if price of hot dogs increases, demand for hamburgers will increase

complements- two goods for which an increase in the price of one leads to a decrease in the demand for the other

- complements are often pairs of goods that are used together
○ e.g. if gasoline price drops, demand for cars increases

Tastes

the particular tastes of an individual or group of individuals can effect amount demanded

- e.g. fashion trends- a certain item may peak the taste of a market at one point in time, but not in another point

tastes are based on historical and psychological forces that are beyond the realm of economics

Expectations

your expectations about the future may affect your demand for a good or service today

expectations regarding future income

- e.g. If you know you are going to make more money next year, you may spend more now to buy ice cream

expectations of future prices

- know price is going to go up → demand more now
- know price is going to go down → demand less now

Number of Buyers

since market demand is derived from individual demand, the more individuals there are, the greater the total demand for a product

- e.g. if the population of a muskoka town rises in the summer → more buyers → more demand → higher price

Summary

change in price → movement *along curve*

change in other factor → *shift of curve*

TABLE 4.1

Variables That Influence Buyers

This table lists the variables that affect how much consumers choose to buy of any good. Notice the special role that the price of the good plays: A change in the good's price represents a movement along the demand curve, whereas a change in one of the other variables shifts the demand curve.

Variable	A Change in This Variable ...
Price	Represents a movement along the demand curve
Income	Shifts the demand curve
Prices of related goods	Shifts the demand curve
Tastes	Shifts the demand curve
Expectations	Shifts the demand curve
Number of buyers	Shifts the demand curve

Case Study: Smoking

two ways to reduce the quantity of smoking demanded:

- develop policies to discourage smoking → changes the consumer's "tastes" for smoking → *shifts* demand curve to the left
- create a tax that raises the price of cigarettes → *movement* along curve decreases quantity supplied

cigarettes and marijuana are *complements*

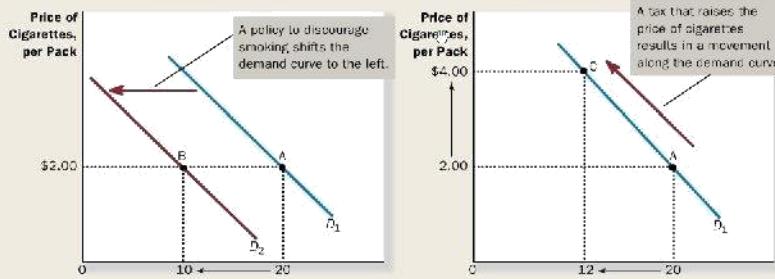
- decrease cigarette prices → more marijuana usage

FIGURE 4.4

Shifts in the Demand Curve versus Movements along the Demand Curve

If warnings on cigarette packages convince smokers to smoke less, the demand curve for cigarettes shifts to the left. In panel (a), the demand curve shifts from D_1 to D_2 . At a price of \$2 per pack, the quantity demanded falls from 20 to 10 cigarettes per day, as reflected by the shift from point A to point B. By contrast, if a tax raises the price of cigarettes, the demand curve does not shift. Instead, we observe a movement to a different point on the demand curve. In panel (b), when the price rises from \$2 to \$4, the quantity demanded falls from 20 to 12 cigarettes per day, as reflected by the movement from point A to point C.

(a) A Shift in the Demand Curve (b) A Movement along the Demand Curve



Supply

The Supply Curve: The Relationship between Price and Quantity Supplied

quantity supplied- the amount of a good that sellers are willing and able to sell

when the selling price of a product is high, the sellers are making more money and are thus more motivated to produce a greater quantity of the product

law of supply- the claim that, other things equal, the quantity supplied of a good rises when the price of the good rises

supply schedule- a table that shows the relationship between the price of a good and the quantity supplied

supply curve- a graph of the relationship between the price of a good and the quantity supplied

- slopes upward → quantity supplied is *positively related* to the price of the good

Market Supply versus Individual Supply

Just as market demand is the sum of the demands of all buyers, market supply is the sum of the supplies of all sellers

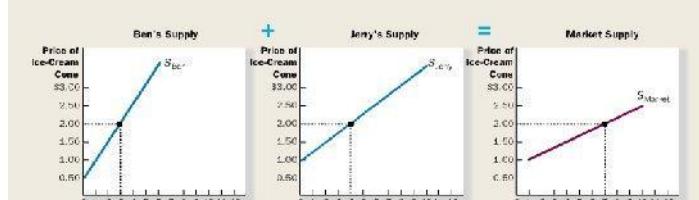
E.g. adding up supply curves of different ice cream vendors on a beach produces the curve for total ice cream supplied on the beach

FIGURE 4.6

Market Supply as the Sum of Individual Supplies

The quantity supplied in a market is the sum of the quantities supplied by all the sellers at each price. Thus, the market supply curve is found by adding horizontally the individual supply curves. At a price of \$2, Ben supplies 3 ice cream cones, and Jerry supplies 4 ice cream cones. The quantity supplied in the market at this price is 7 cones.

Price of Ice-Cream Cone	Ben	Jerry	Market
\$0.00	0	1	0
0.50	0	0	0
1.00	1	0	1
1.50	2	2	4
2.00	3	4	7
2.50	4	6	10
3.00	5	8	13



Shifts in the Supply Curve

market supply curves show how much suppliers of a product offer for sale at any given price, holding constant all the other factors beyond price that influence producers' decisions about how much to sell

if some of these constant factors change, the supply curve *shifts*

increase in supply- any change that increases the quantity supplied at every price → shifts curve to right

decrease in supply- any change that reduces the quantity supplied at every price → shifts curve to left

most important variables that can shift supply curve: input prices, technology, expectations, number of sellers

Input Prices

the prices of the materials/ inputs used to produce a product affect how much the supplier can sell and ultimately, the good's price

- price of inputs increases → seller supplies less at every price → supply curve shifts left
- price of inputs decreases → seller supplies more at every price → supply curve shifts right

e.g. to make ice cream, suppliers need cream, sugar, machines, buildings in which ice cream is made, etc. If the price for sugar goes up, the suppliers supply less

Technology

an advent in technology used to produce a good can allow a seller to supply more

e.g. invention of the mechanized ice-cream machine allows supplier to make more ice cream → equilibrium price goes down

Expectations

the expectations a seller has regarding future prices/ demand of a product affect how much it will produce

e.g. winter jacket company would expect greater demand in winter, so supplies less in the summer

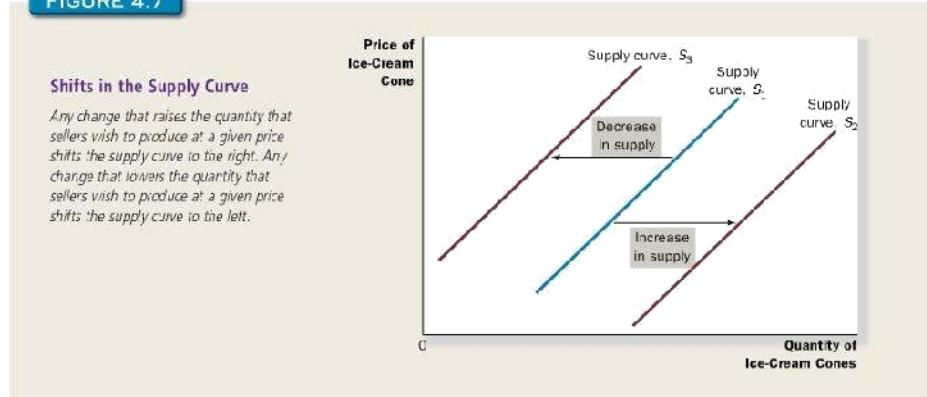
e.g. ice cream seller expects price of ice cream to rise in the future, so it will put some of its current production into storage and supply less to the market today

Number of Sellers

the other factors influence the supply of *individual* sellers, but the total number of sellers also affects market

e.g. if a major auto company shut down, less would be supplied at each price → supply curve would shift to the left

FIGURE 4.7



Supply and Demand Together

supply and demand can be combined to determine the quantity of a good sold in a market and its price

Equilibrium

equilibrium- a situation in which the price has reached the level where quantity supplied equals quantity demanded

- i.e. intersection of supply and demand curves at particular price

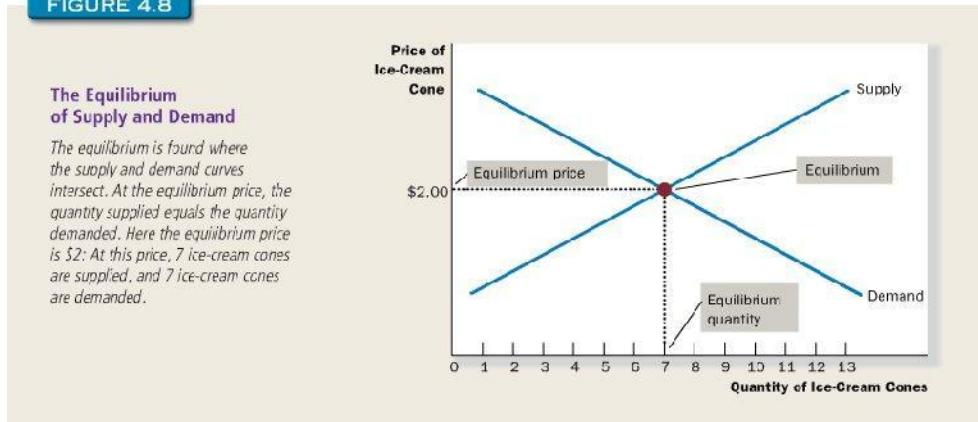
equilibrium price- the price that balances quantity supplied and quantity demanded

equilibrium quantity- the quantity supplied and the quantity demanded at the equilibrium price at the equilibrium price, the quantity of the good that buyers are willing to buy exactly balances the quantity that sellers are willing to sell

- aka *market-clearing price* because everyone in the market has been satisfied

actions of buyers and seller naturally move markets toward the equilibrium of supply and demand

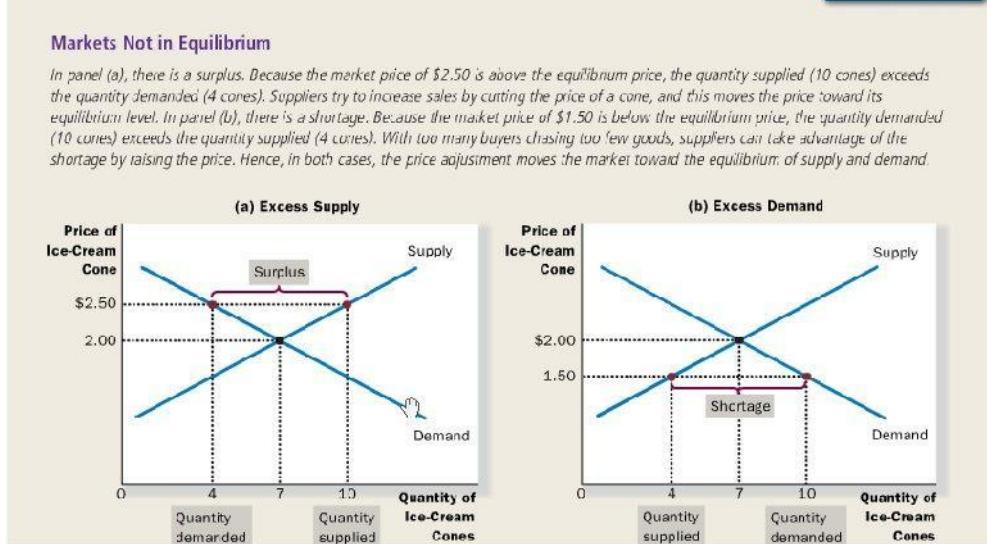
FIGURE 4.8



if market price above equilibrium (*excess supply*) → **surplus**- situation in which quantity supplied is greater than quantity demanded → sellers respond by decreasing prices → quantity demanded increases and quantity supplied decreases → returns to equilibrium

if market price is below equilibrium (*excess demand*) → **shortage**- situation in which quantity demanded is greater than quantity supplied → buyers “bid up” prices → quantity supplied rises while quantity demanded falls → returns to equilibrium

FIGURE 4.9



activities of the many buyers and sellers automatically push the market price toward the equilibrium price- “Invisible Hand”

how quickly equilibrium is reached varies from market to market

- happens more quickly in “free” markets where prices fluctuate more readily (surpluses and shortages are more temporary)

law of supply and demand- the claim that the price of any good adjusts to bring the quantity supplied and quantity demanded for that good into balance

Steps to Analyzing Changes in Equilibrium

TABLE 4.3

A Three-Step Program for Analyzing Changes in Equilibrium

1. Decide whether the event shifts the supply or demand curve (or perhaps both).
2. Decide in which direction the curve shifts.
3. Use the supply-and-demand diagram to see how the shift changes the equilibrium price and quantity.

In different scenarios, compare two different positions of demand/supply curve- *comparative statics*

terminology

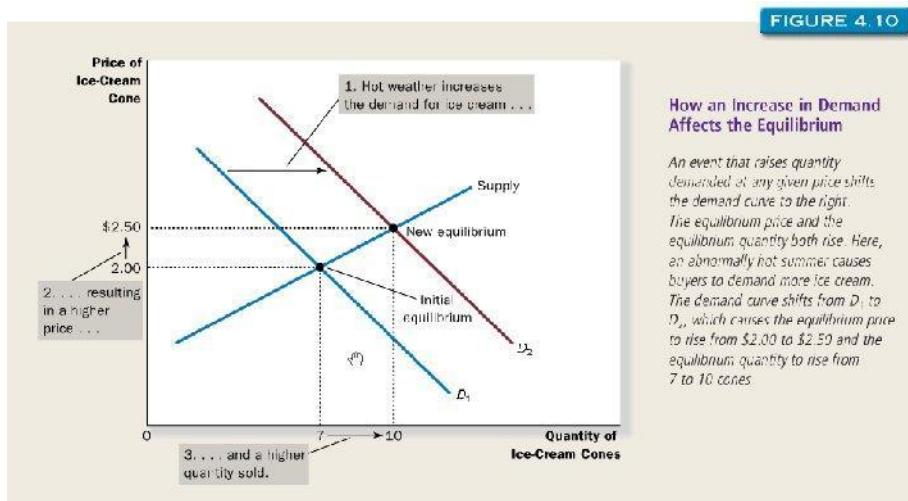
- Change in “supply”/ “demand”= shift of curve itself (change in quantity supplied at *every price*)
- Change in “quantity supplied”/ “quantity demanded”= movement along curve
- i.e. a change in “quantity supplied” could relate to movement along curve

Examples

consider market for ice cream

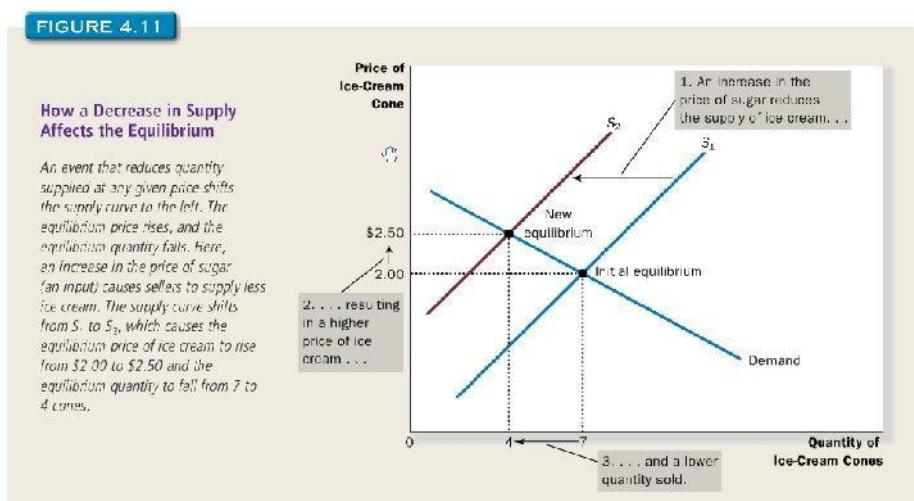
Change in Demand Only

E.g. weather is very hot in summer



Change in Supply Only

E.g. effect of hurricane destroying sugar cane crops



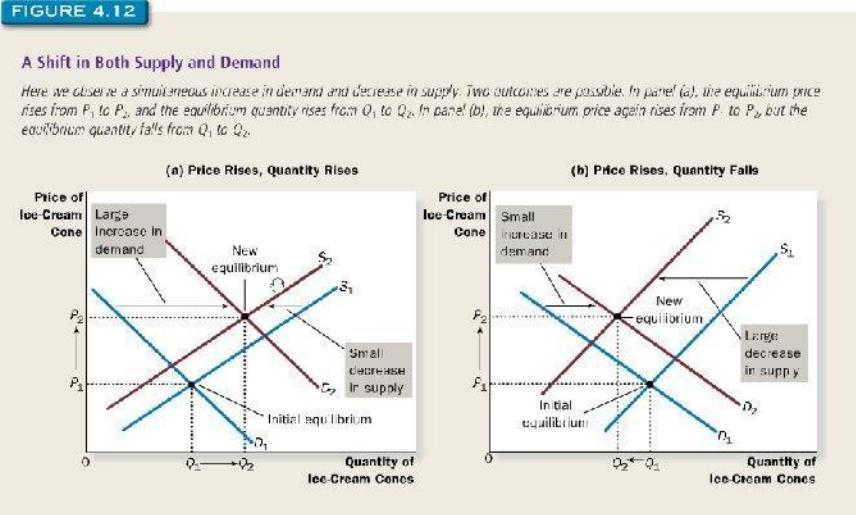
Change in Both Supply and Demand

E.g. heat wave and hurricane occur during same summer

FIGURE 4.12

A Shift in Both Supply and Demand

Here we observe a simultaneous increase in demand and decrease in supply. Two outcomes are possible. In panel (a), the equilibrium price rises from P_1 to P_2 , and the equilibrium quantity rises from Q_1 to Q_2 . In panel (b), the equilibrium price again rises from P_1 to P_2 , but the equilibrium quantity falls from Q_1 to Q_2 .



Chapter 5 Measuring a Nation's Income

The Economy's Income and Expenditure

On an individual level, the amount of income a person makes is related to the amount they spend and their quality of living → same with a country as whole

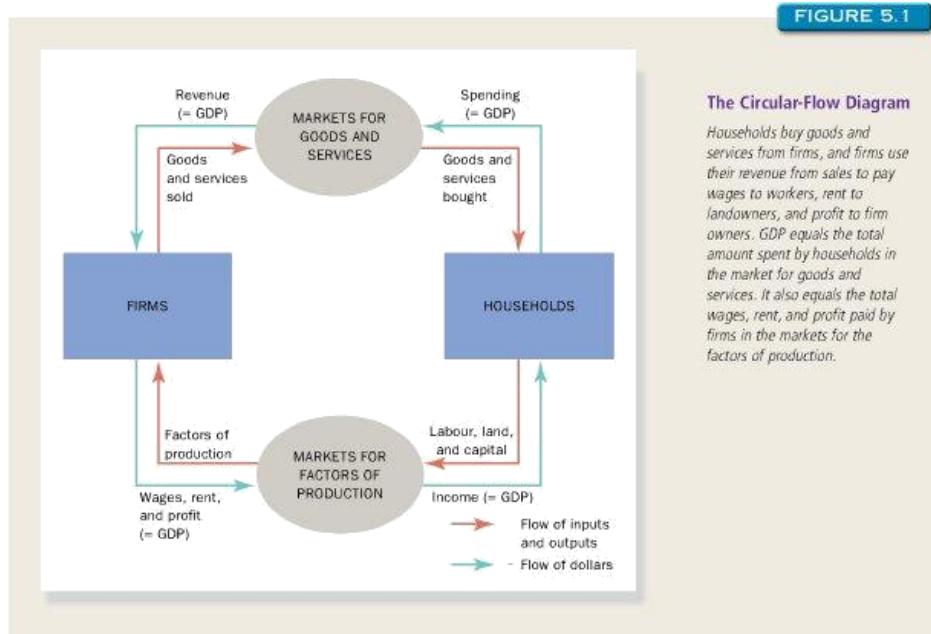
For economy as a whole income must equal expenditure

Any economy's income is the same as its expenditure because every transaction has two parties- a buyer and a seller

- E.g. if Doug buys a service from Karen for \$100, both total income and total expenditure increase by \$100

Recall: circular flow diagram → circular flow of money through economy

FIGURE 5.1



The Circular-Flow Diagram

Households buy goods and services from firms, and firms use their revenue from sales to pay wages to workers, rent to landowners, and profit to firm owners. GDP equals the total amount spent by households in the market for goods and services. It also equals the total wages, rent, and profit paid by firms in the markets for the factors of production.

Therefore compute GDP in two ways:

- Add up total expenditure by households
- Add up total income paid by firms

Actual economy is more complicated

- Households don't spend all of income
- Some income goes to government as taxes
- Some goods and services bought by government

The Measurement of Gross Domestic Product

Gross domestic product- the market value of all final goods and services produced within a country in a given period of time

- It is important to analyze each phrase of definition

"the Market Value..."

GDP uses *market* prices of the many items to measure value of economic activity

The amount people are willing to pay for different goods reflects the *value* of the goods and is therefore the best measurement

E.g. if price of apple is twice the price of an orange, then the apple contributes twice as much to GDP as does an orange

"...Of All..."

GDP includes all items produced in the economy and sold legally in markets

GDP also includes the market value of the housing services provided by the economy's stock of housing

- Rental housing → tenant expenditure=landlord's income
- People who own homes- government estimates rental value
 - Like assuming home owner pays rent to themselves

GDP includes some products that are too difficult to measure

- Items produced and sold illicitly (i.e. on black market)
 - E.g. illegal drugs
- Items produced and consumed at home
 - E.g. vegetables bought at grocery store count, vegetables grown at home don't

Marriages can reduce GDP because services are done for each other that don't involve monetary transaction

- E.g. if a man is married, he would likely spend less time eating out than he did as a bachelor- does not need to pay for this food making service any more

There are many ways in which measures of GDP can underestimate the true amount of productive activity taking place in the economy

"Final"

GDP includes only the value of the *final* goods, not intermediate products required to make the goods- this way products are not counted more than once

- E.g. the paper used to make greeting cards is not included

Exception: if an intermediate good is produced, and rather than being used, is added to a firm's inventory of goods to be used or sold at a later date

- Intermediate good is taken to be "final" and value as inventory investment added to GDP
- When the good is used later on, it is subtracted

"...Goods and Services..."

GDP includes both tangible goods (food, clothing, cars) and intangible services (haircuts, housecleaning, dentists visits)

"...Produced..."

GDP includes goods and services currently produced, not transactions involving items produced in the past

E.g. When General Motors produces and sells a new car, the value of the car is included in GDP, but not included if the car is resold

"Within a Country"

GDP measures the value of production within the geographic confines of a country

Based on *where* good is produced, not nationality of investor/ producer

E.g. if British citizen works temporarily in Canada, his production is part of Canadian GDP

"... In a Given Period of Time..."

GDP measures the value of production that takes place within a specific interval of time

Interval is usually one year or a quarter (3 months)

When reported for a quarter, the value (of expenditure and income) is multiplied by 4 to give an annual rate

- *Seasonal adjustment* done to account for peaks at certain times of the year (such as holiday season)
- This way the value can be compared to annual rates

The Components of GDP

To understand how the economy is using its scarce resources, economists are often interested in studying the composition of GDP among various types of spending

GDP (Y) is divided into four components: consumption (C), investment (I), government purchases (G) and net exports (NX):

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

The equation is an *identity*- an equation that must be true by the way the variables in the equation are defined

Consumption

Consumption- spending by households on goods and services

Examples of goods:

- Durable goods: automobiles, appliances, furniture, computers, etc.
- Nondurable goods: food, clothing

Examples of services:

- Haircuts, dental care, postsecondary education

Investment

Investment- the purchase of goods that will be used in the future to produce more goods and services

- i.e. spending on capital equipment, inventories, and structures, including household purchases of new housing

Inventories are considered an investment, and when goods are sold from it, it is a negative investment

- e.g. if Future Shop buys computers to sell to the public
 - when bought- regarded as a positive investment

- when sold- subtracted from investment category and added to consumption category

Government Purchases

government purchases- spending on goods and services by local, territorial, provincial and federal governments

E.g. salaries of government workers, publicly funded projects, healthcare facilities, military spending etc.

Transfer payment- when government gives back money to people (e.g. pension)

- not considered government purchases or part of GDP, because it does not reflect economy's production (like negative taxes)

Net Exports

net exports (trade balance)- the value of a nation's exports minus the value of its imports

e.g. household buys a \$30,000 car from Volkswagen, a German company

- increases consumption by \$30,000
- decreases net exports by \$30,000 because it counts as an import
- GDP is unaffected

Real versus Nominal GDP

If total spending (i.e. GDP) increases from one year to the next, one of two things must be true:

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

Economists want to separate these two effects- want a measure of 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 real GDP instead of nominal GDP

Nominal GDP- the production of goods and services valued at current prices

Real GDP- the production of goods and services valued at constant prices (of a year in the past)

- i.e. in base year, real GDP= nominal GDP
- a measure of solely the economy's production of goods and services → better gauge of economic well being
- used when measuring growth from year to year

GDP Deflator

Measure change in both prices and quantity produced/ sold → nominal GDP

Measure change in just quantity produced → real GDP

Measure change in prices over time → GDP deflator

GDP deflator- a measure of the price level calculated as the ratio of nominal GDP to real GDP times 100

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

The GDP deflator measures the current level of prices relative to the level of prices in the base year

- reflects changes in nominal GDP that do not affect real GDP
 - reflects what's happening to *prices* not quantities
- e.g. quantities produced in the economy rise over time, but prices remain the same → both nominal GDP and real GDP rise together → GDP deflator stays at 100
- e.g. quantities produced stay the same, but prices rise over time → nominal GDP increases but real GDP stays constant → GDP deflator increases

Numerical Example: Hot Dogs and Hamburgers

Compare the calculations of nominal and real GDP for hamburgers and hot dogs for the years 2004, 2005 and 2006

Measuring nominal GDP:

- For each year, multiply number of product sold that year by the price that year and add up all values
- Result: Total spending rises over the years- due to increase in prices *and* increase in quantity sold

Measuring real GDP

- For each year, multiply number of product sold that year by the *price in 2004* (the base year)
- Result: values increase, but not as much as nominal GDP
 - Shows that quantity sold does increase

Prices and Quantities					Real and Nominal GDP	
Year	Price of Hot Dog	Quantity of Hot Dogs	Price of Hamburger	Quantity of Hamburgers		
2004	\$1	100	\$2	50		
2005	2	150	3	100		
2006	3	200	4	150		
Year	Calculating Nominal GDP				<i>This table shows how to calculate real GDP, nominal GDP, and the GDP deflator for a hypothetical economy that produces only hot dogs and hamburgers.</i>	
2004	$(\$1 \text{ per hot dog} \times 100 \text{ hot dogs}) + (\$2 \text{ per hamburger} \times 50 \text{ hamburgers}) = \200					
2005	$(\$2 \text{ per hot dog} \times 150 \text{ hot dogs}) + (\$3 \text{ per hamburger} \times 100 \text{ hamburgers}) = \600					
2006	$(\$3 \text{ per hot dog} \times 200 \text{ hot dogs}) + (\$4 \text{ per hamburger} \times 150 \text{ hamburgers}) = \1200					
Year	Calculating Real GDP (base year 2004)					
2004	$(\$1 \text{ per hot dog} \times 100 \text{ hot dogs}) + (\$2 \text{ per hamburger} \times 50 \text{ hamburgers}) = \200					
2005	$(\$1 \text{ per hot dog} \times 150 \text{ hot dogs}) + (\$2 \text{ per hamburger} \times 100 \text{ hamburgers}) = \350					
2006	$(\$1 \text{ per hot dog} \times 200 \text{ hot dogs}) + (\$2 \text{ per hamburger} \times 150 \text{ hamburgers}) = \500					
Year	Calculating the GDP Deflator					
2004	$(\$200/\$200) \times 100 = 100$					
2005	$(\$600/\$350) \times 100 = 171$					
2006	$(\$1200/\$500) \times 100 = 240$					

Measuring GDP deflator:

- For each year, divide nominal GDP with real GDP
- Result: 2005- 171, 2006- 240
 - i.e. in 2005 prices rose by 71% from base year

GDP and Economic Well Being

GDP per person tells us the income and expenditure of the average person in the economy

More income and spending per person would theoretically mean a better life

But what about other important things in life not necessarily measured by GDP?

- E.g. Healthcare, stress level, arts, sports, loyalty to country, intelligence, political freedom, integrity, leisure etc.

GDP does not directly measure those things that make life worthwhile, but it does measure our ability to obtain the inputs into a worthwhile life

However GDP is not a perfect measure

Examples:

- Leisure- if we worked all day, GDP would rise, but quality of life wouldn't
- Producing products for home- if we paid for child care, food preparation, GDP would go up, but some would argue that it is more valuable if we make food for each other and take care of our own children
- Volunteering- GDP is not affected, but it helps community in a different way
- Quality of the environment- without environmental regulations, firms would be able to produce more, but it would be detrimental to public health
- GDP does not account for income distribution- a country could have a high GDP per capita, but many impoverished people

Chapter 6: Measuring the Cost of Living

E.g. gas prices were significantly cheaper in 1957 than today

- Was this because gas is worth more or is it because money is worth less?
 - We need to develop a way of measuring purchasing power

The Consumer Price Index

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

CPI is used to monitor changes in the cost of living over time

Calculated and reported by Statistics Canada every month

How the Consumer Price Index is calculated

1. **Determine the basket**

- determine which prices are the most important to the typical consumer and assign weights accordingly
- if the price of one good is more important, it has a stronger weight as part of the "basket"
- Stats Can sets weights by surveying consumers

2. **Find the Prices**

- Find prices of each goods and services in basket at each point in time

3. **Compute the basket's cost**

- Use data of prices at the year in question to compute the cost of the basket for that year
 - Keep the weights constant for each year calculated
4. **Choose a base year and compute the index**
- Designate one year as the base year, which is the benchmark against which other years are compared
 - Use formula:
- $$= \frac{\text{Current Year Price Index}}{\text{Base Year Price Index}} \times 100$$
- E.g. if CPI is 175, it means price of basket is 175% more in the current year than the base year
5. **Compute the inflation rate**
- **Inflation rate**- the percentage change in the price index from the preceding period
 - Use formula:

1

Example: Hot Dogs and Hamburgers

Statistics Canada uses data on the prices of over 600 different goods and services to calculate CPI

For simplification, consider how CPI is calculated using a basket of only two goods: Hot Dogs and Hamburgers

- Hot dog is more important so has a higher weight

Step 1: Survey Consumers to Determine a Fixed Basket of Goods		
4 hot dogs, 2 hamburgers		
Step 2: Find the Price of Each Good in Each Year		
Year	Price of Hot Dog	Price of Hamburger
2005	\$1	\$2
2006	2	3
2007	3	4
Step 3: Compute the Cost of the Basket of Goods in Each Year		
2005	$(\$1 \text{ per hot dog} \times 4 \text{ hot dogs}) + (\$2 \text{ per hamburger} \times 2 \text{ hamburgers}) = \8	
2005	$(\$2 \text{ per hot dog} \times 4 \text{ hot dogs}) + (\$3 \text{ per hamburger} \times 2 \text{ hamburgers}) = \14	
2007	$(\$3 \text{ per hot dog} \times 4 \text{ hot dogs}) + (\$4 \text{ per hamburger} \times 2 \text{ hamburgers}) = \20	
Step 4: Choose One Year as a Base Year (2005) and Compute the Consumer Price Index in Each Year		
2005	$(\$8/\$8) \times 100 = 100$	
2005	$(\$14/\$8) \times 100 = 175$	
2007	$(\$20/\$8) \times 100 = 250$	
Step 5: Use the Consumer Price Index to Compute the Inflation Rate from Previous Year		
2005	$(175 - 100)/100 \times 100 = 75\%$	
2007	$(250 - 175)/175 \times 100 = 43\%$	

Calculating the Consumer Price Index and the Inflation Rate: An Example

This table shows how to calculate the consumer price index and the inflation rate for a hypothetical economy in which consumers buy only hot dogs and hamburgers.

Types of CPI

In addition to consumer price index for overall economy, Stats Can calculates several other prices indexes

Calculates standard of living for different parts of the country- index for each province and 16 different cities

Calculates the rate for narrow categories of goods and services (e.g. cost of food, clothing, shelter)

Core inflation- the measure of the underlying trend of inflation

Problems in Measuring the Cost of Living

The goal of the CPI is to measure changes in the cost of living, and thus how much incomes must rise to maintain a certain standard of living, but it isn't perfect

Three main problems are widely acknowledged with CPI: *substitution bias, introduction of new goods, and unmeasured quality change*

Substitution Bias

When prices change from one year to the next, the prices of some goods rise more than others→ people start buying the goods whose prices stayed lower instead of the goods that went up in price

If a price index is computed assuming a fixed basket of goods, it ignores the possibility of consumer substitution→ overstates the increase in the cost of living from one year to the next

Example:

- in base year apples are cheaper than pears→ people buy more apples→ apples have higher weight in basket
- 5 years later, pears are cheaper than apples→ people buy more pears→ apples still have higher weight→ CPI is higher than it should be

Introduction of New Goods

New good is introduced→ consumers have more variety to choose→ their money becomes more valuable→ they need fewer dollars to maintain standard of living

Example:

- When VCR introduced, people could watch movies at home→ cost of living was less
- CPI still counted going to the movies→ over valued CPI
- Eventually Stats Can does adjust basket to include VCRs

Unmeasured Quality Change

If a good deteriorates in quality over time, dollar is worth less

If a good increases in quality, dollar is worth more

This is not always accounted for in CPI's fixed basket of goods

E.g. over time, the same amount of money can buy you a much better computer, but this isn't included in CPI

The GDP Deflator vs. the Consumer Price Index

GDP deflator- based on: current prices/ base year prices → also measures change in price
Economists measure both CPI and GDP deflator to evaluate rises in prices

They usually tell a similar story, but there are important differences that cause them to diverge:

1. GDP Deflator reflects the prices of all goods and services **produced domestically**, whereas CPI reflects prices of all goods and services **bought by consumers**
 - o E.g. if the price of an airplane that is produced by Bombardier and sold to the Canadian Forces rises, it is included in GDP deflator but not CPI because it is not bought by a typical consumer
 - o E.g. if German company Volkswagen raises the price of its cars, it increases CPI, but not GDP deflator because it is an import
2. CPI uses **fixed basket** of goods and services, while GDP deflator compares prices of **currently produced** goods and services
 - o Group of goods used to compute GDP deflator change, while the goods and their weightings for CPI are fixed

Correcting Economic Variables for the Effects of Inflation

Dollar Figures from Different Times

To compare prices from different times, we need to use the CPI from the two years and set up a ratio to determine how much the product would be worth in a different year

Example: Comparing Price of Gas

Price of gas in 1957: 9.5 cents/ L
How much is it in 2003 dollars?

CPI (base year 1992):
1957: 17.6 2003: 122

Since actual price of gas in 2003 was 65 cents/ L, it shows that the gas itself isn't worth more, but money is worth less

1957	=	1957
2003	<u>122</u>	
9.5		= 0.74
2003 =	122	
2003 = 65.8		17.6 × 9.5

Indexation

Indexation- the automatic correction of a dollar amount for the effects of inflation by law or contract

Cost of living allowance (COLA)- long term contracts between firms and unions that include indexation of wages to CPI

- As inflation goes up, the wages are automatically adjusted
- Canada Pension Plan and Old Age Security benefits are also adjusted every year to compensate the elderly for increases in prices

Real and Nominal Interest Rates

Correcting economic variables for the effects of inflation is particularly important when considering interest rates

Interest represents payment in the future for a transfer of money in the past

- E.g. paying interest to bank for mortgage for a house, interest paid to bank
- The value of what you earn or what you pay based on interest depends on inflation

E.g. Sally Saver

- Has \$1000 that she puts in a bank account that pays 10% interest/ year
- Buys CDs that are \$10 each today
- The amount of CDs she can buy(the value of her money) is dependent on inflation:

Inflation rate	New price of CD	Amount of money in bank after one year and 10% interest	# CDs she can buy	Purchasing Power
-2%	\$9.80	\$1100	112	Increases by 12%
0%	\$10.00	\$1100	110	Increases by 10%
6%	\$10.60	\$1100	104	Increases by 4%
10%	\$11	\$1100	100	Stayed same
12%	\$11.20	\$1100	98	Decreased by 2%

- Higher rate of inflation → smaller increase in purchasing power
- Purchasing power decreases if inflation exceeds interest

Need to consider both the interest rate and change in prices

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

- Tells you how fast the number of dollars in your bank account rises over time

Real interest rate- the interest rate corrected for the effects of inflation

- Tells you how fast the purchasing power of your bank account rises over time



To keep real interest rates reasonable, nominal interest rates rise and fall with inflation rates

Chapter 7 Production and Growth

Between “rich” countries and “poor” countries, there is a tremendous variation in average income and quality of life

Even within a country there are large changes in the standard of living over time

- Average income in African countries has been stagnant for many years
- Average income in Canada has grown by 2% per year
- Some East Asian countries such as Singapore, South Korea and Taiwan have had their average incomes go up by about 7% per year

What determines *long term* economic growth and prosperity?

Economic Growth around the World

Real GDP growth of world countries:

Country	Period	Real GDP per Person at Beginning of Period*	Real GDP per Person at End of Period*	Growth Rate (per Year)	The Variety of Growth Experiences
Japan	1890-2003	\$1794	\$40 110	2.79%	Sources: Robert J. Barro and Xavier Sala-i-Martin, <i>Economic Growth</i> (New York: McGraw-Hill, 1995), Tables 10.2 and 10.3; <i>World Bank World Development Report 2005</i> , Table 1, and authors' calculations.
Brazil	1960-2003	929	10 463	2.88	
Mexico	1970-2003	1385	12 543	2.16	
China	1950-2003	855	6 993	2.06	
Germany	1870-2003	2605	38 484	2.05	
Canada	1870-2003	2834	41 629	2.04	
United States	1870-2003	4782	52 555	1.82	
Argentina	1950-2003	2736	15 504	1.89	
India	1950-2003	806	4 056	1.58	
United Kingdom	1870-2003	5738	38 750	1.45	
Indonesia	1970-2003	1064	4 479	1.41	
Pakistan	1950-2003	880	2 887	1.16	
Bangladesh	1990-2003	744	2 621	1.16	

*Real GDP is measured in 2003 Canadian dollars.

Gone ahead- Japan and Brazil

Fallen behind- United Kingdom

The world's richest countries have no guarantee they will stay the richest and the world's poorest countries are not doomed to stay in poverty forever

Productivity: Its Role and Determinants

Productivity can be used to explain the large variation in the world → what factors influence productivity?

Why Productivity Is So Important

Productivity- the amount of goods and services produced from each hour of a worker's time
Recall real GDP → economy's income = economy's output

the more a country produces, the more it has for itself to consume, allowing for specialization and a higher standard of living

- e.g. Robinson Crusoe stranded on an island- the better he is able to fish, make clothes, grow vegetables, the better life he will have

How Productivity Is Determined

different determinants of productivity: *physical capital, human capital, natural resources, and technological knowledge*

Physical Capital (K) per Worker

physical capital (or just *capital*)- the stock of equipment and structures that are used to produce goods and services

the more advanced tools to produce goods, the more workers can produce per hour of labour
physical capital is itself produced using capital which is also produced

- so physical capital is also important in that it allows for the production of more physical capital
- it is a *produced* factor of production (from CFD)

Human Capital (H) per Worker

human capital- the knowledge and skills that workers acquire through education, training and experience

includes knowledge/ skills acquired through early childhood programs, grade school, high school, college/ university, and on-the-job training

human capital is also a *produced* factor of production

- can think of students as “workers” producing human capital, much like workers producing machinery which is physical capital

Natural Resources (N) per Worker

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*
 - e.g. forest (can re-grow)
- *non-renewable*
 - e.g. oil- only a limited supply available

natural resources make some countries like Canada (land for agriculture, minerals, forests, etc.) and Saudi Arabia (oil) rich

countries like Japan have become rich without many natural resources because of international trade- they trade manufactured goods for natural resources

Technological Knowledge (A)

technological knowledge- society’s understanding of the best ways to produce goods and services

e.g. in the past most Canadians worked on farms, but with current technologies, only a few people are needed to produce food for the entire country

technology can be *common knowledge*- everyone becomes aware of it when discovered

- e.g. assembly line discovered by Ford → other carmakers followed suit

technology can be *proprietary*- owned by one organization

- e.g. Coke knows secret recipe

technology can be proprietary for short time

- e.g. drug companies have full ownership of new drug for a fixed period of time

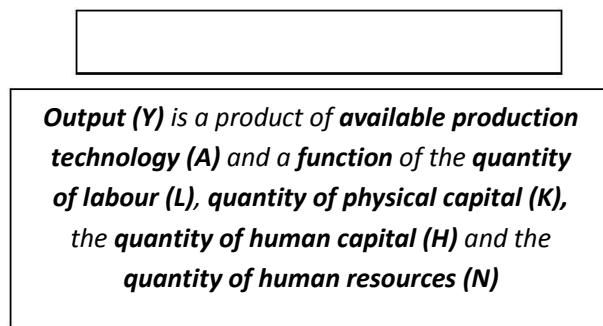
technological knowledge refers to society's understanding of how world works, while human capital refers to resources expended transmitting this understanding to the labour force

- analogy: technological knowledge is the quality of the society's textbooks while human capital is the amount of time the society has spent reading the textbooks

****is technological knowledge the same for all countries?

The Production Function

economists use the *production function* to describe the relationship between the quantity of inputs used in production and the quantity of output from production:



many production functions have *constant returns to scale*- if all inputs doubled, the output doubles as well:

$$= \times (, , ,)$$

where x is a constant

if x is $1/L$

—

$$= \times , , ,$$

- output per worker (productivity) in terms of physical capital per worker, human capital per worker, and natural resources per worker

Economic Growth and Public Policy

What can government policy do to raise productivity and living standards?

The Importance of Saving and Investment

One way to raise future productivity is to invest more current resources in the production of capital (physical capital and human capital)

- More capital goods produced today → larger stock for tomorrow

Trade-off: consume more now or produce capital for the future?

- Classic trade-off between "capital goods" and "consumer goods"- we must sacrifice now for a better future

Diminishing Returns and the Catch-Up Effect

If a country produces more capital goods now for the future, its economy will grow; but how long will this growth last?

Diminishing returns (diminishing marginal product)- the property whereby the benefit from an extra unit of an input declines as the quantity of the input increases

- i.e. when workers already have a large amount of capital stock, the extra output from an additional unit of capital falls

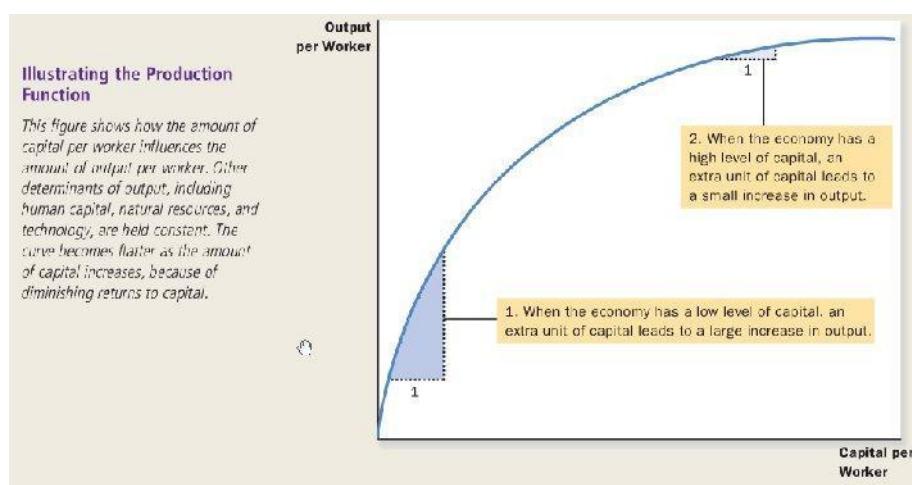
different from *constant returns to scale*, where there is a linear relationship between inputs and productivity

e.g. one kilogram of seed applied to a plot of land of a fixed size produces one ton of crop- if one more kg of seed used:

- if constant returns to scale → two tons of crop produced
- if diminishing returns → *less than* two tons of crop produced

due to diminishing returns: higher saving rate → more capital accumulated → benefits of additional capital become less over time → 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



implication- easier for a country to grow fast if it starts off relatively poor

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

e.g. from 1960 to 1990, Canada and South Korea devoted the same % of GDP to investment, but South Korea grew much more

- S. Korea had a GDP 1/10 of Canada's to begin with

Investment from Abroad

In addition to domestic saving, investment by foreigners can also increase long term economic growth

Foreign direct investment- a capital investment that is owned and operated by a foreign entity

- E.g. Canadian company Nortel builds an assembly plant in Mexico

Foreign portfolio investment- an investment that is financed with foreign money but operated by domestic residents

- E.g. a Canadian buys stock of a Mexican company

Foreigners invest in another country because they expect a return on their investment

Foreign investment does not have same effect on all measures of economic prosperity

- GDP goes up

- GNP does not go up as much because some of investment flows back to foreigners

Economists encourage poorer countries to allow foreign investment to help them grow

World Bank- takes funds from advanced countries and uses these resources to make loans to less developed countries so that they can invest in infrastructure, education and other types of capital

- Lesson from WWII that economic instability can cause political turmoil

Education

Education represents an investment in human capital, which like an investment in physical capital, leads to economic growth

Government policy can enhance standard of living by providing good schools (all levels of education) and encourage the population to take advantage of them

More years of education → higher personal income

- Gap between income of uneducated and educated is even higher in developing countries

Opportunity cost involved- students in school forgo wages that they would earn if they were working

- This is why the average person in poorer countries is less educated

Human capital conveys *positive externalities*

- An educated person does not only help themselves, but if they come up with a new idea, start a new company (and thus hire people), etc., then they are helping *third parties*

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

- E.g. Canada attracts educated foreigners, but loses its own highly educated workers to the US where they are attracted to higher paying jobs

Health and Nutrition

Making the right investments in the health of the population is one way for a nation to increase productivity and raise living standards → investment in *human capital*

Over time, increased prosperity → better nutrition and health → better productivity

Poor health and malnutrition in poorer countries is a reason why they are less productive

- Vicious cycle- they are poor because they are unhealthy and unhealthy because they are poor

Property Rights and Political Stability

Many transactions take place in the economy in which people sell what they own

The millions of interactions are coordinated by market prices

For market prices to work however, there must be regulations in place to protect the property of the sellers

Property rights- the ability of people to exercise authority over the resources they own

E.g. a mining company won't make effort to mine ore if they know it will be stolen

The justice system enforces property rights and ensures that buyers and sellers live up to their contracts

In a lot of developing countries, lack of property rights can make economic activity difficult

In several cases, firms are expected to bribe government officials → impedes coordinating power of markets and discourages saving and foreign investment

Political instability is a threat to property rights because people don't know if their resources will be protected

- E.g. after communist revolutions, government confiscated capital of companies

Free Trade

Inward-oriented policies- policies aimed at raising productivity and living standards within the country by avoiding interaction with the rest of the world- usually involve tariffs and trade restrictions

Outward-oriented policies- policies that integrate countries into the world economy- usually through free trade

Some of the world's poorest countries have tried inward oriented policies because they feel it would protect domestic companies, but many economists believe they should adopt outward-oriented policies to allow for foreign investment

Eliminating trade restrictions is analogous to a technological advance- if you can trade wheat for oil, it is like inventing a machine that can convert wheat to oil

Countries with good natural seaports find trade easier, and landlocked countries tend to have lower income levels

- E.g. NYC, London, Hong Kong

Research and Development

Living standards are higher today than they were a century ago because technological knowledge has advanced

Most technological advance comes from private research by firms and individual inventors, but the government and the general public also promote them

- E.g. government of Canada has several research councils

Knowledge is a *public good*- once one person discovers an idea, it enters society's pool of knowledge and other people can freely use it

Government policy encourages research through patent system → incentive for firms to engage in research because they can keep the idea as a *private good* for a number of years

Population Growth

Economists have debated the effect of population growth on productivity

A higher population means a larger workforce, but also means more people to consume the goods and services produced

Stretching Natural Resources

Robert Malthus: ever-increasing population would strain society's ability to provide for itself, leading to more poverty

- Attempts of government to alleviate poverty just allowed the poor to have more children, thus making the situation worse

Malthus turned out to be wrong- population of world has grown, but average incomes are also higher

Economic growth and growth of technology has allowed people to produce more food than before

Nowadays, hunger and malnutrition are more the consequence of unequal food distribution than lack of food production

Diluting the Capital Stock

Theoretically, a higher population results in the capital spread more thinly

Less capital per worker results in lower productivity and lower GDP per worker

Poor countries- population growing too quickly

- Problem- difficult to provide workers with physical and human capital (tools, education, etc.) they need to achieve high productivity

Rich countries- population growing too slowly

- Problem- population unable to maintain growth rates- not enough tax revenue to support retiring population

Countries can prevent population growth or promote it by using incentives

Promoting Technological Progress

Economists suggest that world population growth has been an engine for technological progress and economic prosperity

More people → more engineers, scientists, inventors to make discoveries that benefit everyone

Michael Kremer: more growth when population is higher because of technological progress

- More growth if land area is bigger

Chapter 8: Saving, Investment and the Financial System

To start a business, you need money to purchase the capital you need (computers, tools, desks, etc.)

Various ways to finance investment- use other people's savings:

- Borrow money from bank and pay interest for using the money
- Promise investors a share of profits

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

Saving and investment important for long-run growth of economy

- Country saves portion of GDP → more resources available for investment in capital → higher capital raises country's productivity and living standard

Financial Institutions in the Canadian Economy

Financial system moves the economy's scarce resources from savers (people who spend less than they earn) to borrowers (people who spend more than they earn)

- Savers invest money in hope that they will get paid interest and grow their savings
- Borrowers use money to buy capital to start businesses, buy house, etc.

Financial system is made up of various financial institutions that help coordinate savers and borrowers

- Two main categories: financial markets and financial intermediaries

Financial Markets

Financial markets- the institutions through which a person who wants to save can directly supply funds to a person who wants to borrow

Two most important financial markets in Canada: bond market and stock market

The Bond Market

Bond- a certificate of indebtedness that specifies the obligations of the borrower to the holder of the bond

Large corporations and governments issue bonds to finance capital such as buying a new factory, building a school, etc.

Key characteristics

- *Date of maturity*- time at which the loan will be repaid
- *Principal*- amount to be repaid when bond matures
- *Term*- the length of time until bond matures
- *Default*- failure of borrower to pay some of the interest or principal
- *Credit risk*- the probability that the borrower will default
 - Influenced by debt carried by issuer, stability of revenues, etc. (government of Canada bonds are considered low credit risk)

People who buy bonds can either wait until they mature to collect principle or they can sell it to someone else

Long term bonds have more risk and thus pay higher interest

The Stock Market

Companies can also raise funds by selling ownership of the company

Stock- a claim to partial ownership in a firm

Equity finance- sale of stock to raise money

Debt finance- sale of bonds to raise money

Stocks offer higher risk but potential for higher return

- Get paid after bond holders if company has financial problems, but earn greater profit if company does well

Stock is traded between investors on *stock exchanges*

The prices at which shares trade on stock exchanges are determined by the supply and demand for the stock in these companies

- Prices reflect people's perception of the corporation's future profitability

Stock index- an average of a group of stock prices

○ e.g. S&P/ TSX composite index- based on prices of over 200 major firms listed on TSX since they reflect profitability, stock prices are considered possible indicators of future economic conditions

Financial Intermediaries

financial intermediaries- financial institutions through which savers can indirectly provide funds to borrowers

Banks

primary job of banks is to take in deposits from people who want to save and use these deposits to make loans to people who want to borrow

the interest banks charge to people who loan from them is higher than the interest they pay to people who save with them, so they make money

it makes more sense for smaller businesses and individuals to borrow from banks than to issue stock or bonds

second role of bank- provide *medium of exchange*

- Cheques issued by banks make it easier for people to make transactions and access savings

Mutual Funds

Mutual fund- an institution that sells shares to the public and uses the proceeds to buy a selection, or *portfolio* of various types of stocks, bonds, or both stocks and bonds

Shareholder of mutual fund accepts all the risk and return associated with the portfolio

Advantage of mutual funds is that they allow people with small amounts of money to diversify

- More diverse portfolio is less risky than "putting all eggs in one basket"

Company operating mutual fund charges shareholders a fee, usually between 0.5 and 3.0 % of assets each year

Mutual funds give ordinary people access to skills of professional money managers

- Does not necessarily mean a better return because it is hard to “beat the market”

Saving and Investment in the National Income Accounts

Saving and investment are important determinants of long run growth, so macroeconomists need to understand how financial markets work and how various policies affect them

Accounting- refers to how various numbers are defined and added up

- National income accountants help add up country's income and expenses, including GDP and related statistics

Some Important Identities

GDP (Y) is a value of both total income in an economy and total expenditure on economy's output of goods and services

- Divided into 4 components: Consumption (C), Investment (I), Government spending (G) and Net exports (NX)

$$= + + +$$

Closed economy- economy that does not interact with other economies (no trade)

Open economy- economies that interact with other economies around world through trade

For simplification, assume that economy we are considering is *closed*

- Net exports= 0

$$= + +$$

- i.e. each unit of output sold in closed economy is consumed by a household, invested by a firm or a household, or bought by government

$$- - =$$

- **national saving (saving)**- the total income in the economy that remains after paying for consumption and government purchases (denoted S)
 - left-hand side of equation: $(Y-C-G)$

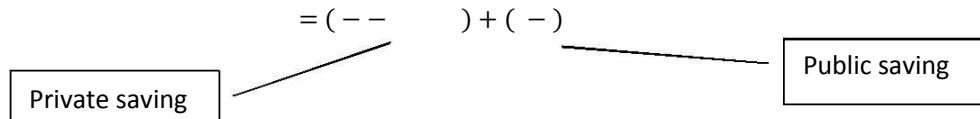
i.e. after making income, we either pay taxes which is spent by the government (G) or spend it ourselves (C) → remaining amount is what we save

substitute S for $Y-C-G$:

$$=$$

Describe saving in terms of private saving and public saving

- T - amount government collects from households in taxes minus the amount it pays back to households in the form of transfer payments (such as Employment Insurance and welfare)



Private saving (Y-T-C)- the income that households have left after paying for taxes and consumption

Public saving (T-G)- the tax revenue that the government has left after paying for its spending

- If T exceeds G , the government runs a **budget surplus**
- If G exceeds T , the government runs a **budget deficit**

overall:

For the economy as a whole, saving must be equal to investment.

- financial markets and intermediaries stand between two sides of equation- they take nation's saving and direct it to nation's investment

The Meaning of Saving and Investment

Saving is referred to as not spending excess income and putting it in a bank or buying a bond
Investment is referred to as purchasing new capital, such as equipment or buildings

E.g. if Larry puts his money in the bank, it adds to national *saving*, but when Moe borrows money from the bank to buy a new house, it adds to national *investment*

Although $S=I$ shows that saving and investment are equal for the economy as a whole, this is not necessarily true for every individual household or firm

- Some households save more than they invest, and some invest more than they save

The Market for Loanable Funds

Building a model for financial markets gives us a tool to explain how financial markets coordinate the economy's saving and analyze the effect of government policies

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

- Assume that this is the only financial market of the economy
- *Loanable funds*- all income that people have chosen to save and lend out
- Assume that there is one interest rate that serves as both the return to saving and the cost of borrowing

Supply and Demand for Loanable Funds

The economy's market for loanable funds is governed by supply and demand like other markets in the economy

Saving is the source of the supply of loanable funds

- people who have extra income they want to save and lend out
- Directly- buying a bond
- Indirectly- putting money in the bank

Investment is the source of the demand for loanable funds

- Households or firms that want to borrow to make investments
- E.g. taking mortgage to buy house

Interest rate is the price of a loan

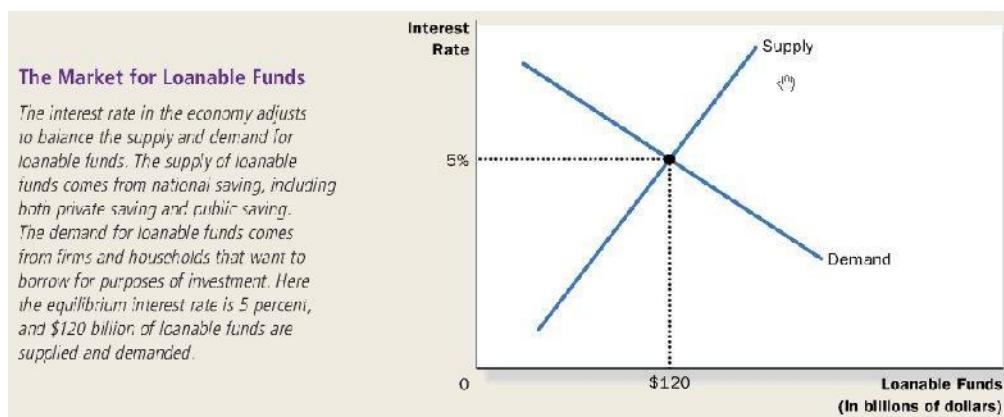
- Represents the amount that borrowers pay for loans and the amount that lenders receive on their saving

interest rate rises → supply of loanable funds available increases → demand for loanable fund decreases

- i.e. supply of loanable funds is positively related to interest rate and demand for loanable funds is negatively related to interest rate

Adjustment of interest rate to equilibrium occurs like other markets

- if interest rate lower than equilibrium → shortage of loanable funds → lenders would increase interest rate they charge
- if interest rate higher than equilibrium → surplus of loanable funds → lenders would decrease interest rate



supply and demand for loanable funds depend on the real (rather than nominal) interest rate

- recall: real interest rate = nominal interest rate – inflation

when interest rate adjusts to balance supply and demand in the market for loanable funds, it coordinates the behaviour of people who want to save and the behaviour of people who want to invest

Policy 1: Saving Incentives

Although Canadians save more than Americans, they save less than counterparts of many other countries

Why? Economists argue that Canadian tax laws discourage saving

- Federal and provincial governments collect revenue by taxing income, including interest and dividend income
 - E.g. a long term bond that would pay 9% interest pays only 6% after taxes

Economists favour changes to the tax system that provide incentive for greater saving

E.g. introduction of GST, a *consumption* tax in 1991

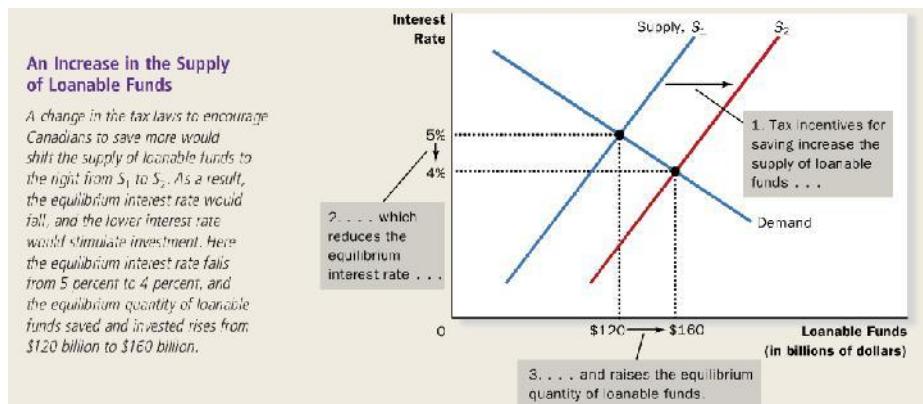
- Income that is not spent is not taxed, so it provides incentive for people to save

Increase the amount that people can contribute to registered retirement savings plan (RRSP)

- When buying an RRSP, people reduce the amount of their income that is subject to income tax → saving is encouraged

Consider effect of saving initiatives on market for loanable funds

- *at any given interest rate*, saving incentive would increase the quantity of loanable funds supplied at each interest rate → supply of loanable funds shifts outward → raises equilibrium quantity of loanable funds and lowers interest rate
- demand of loanable would stay the same because tax change has no effect on the amount borrowers are willing to borrow



Thus, if a reform of the tax laws encouraged greater saving, the result would be lower interest rates and greater investment

Criticisms:

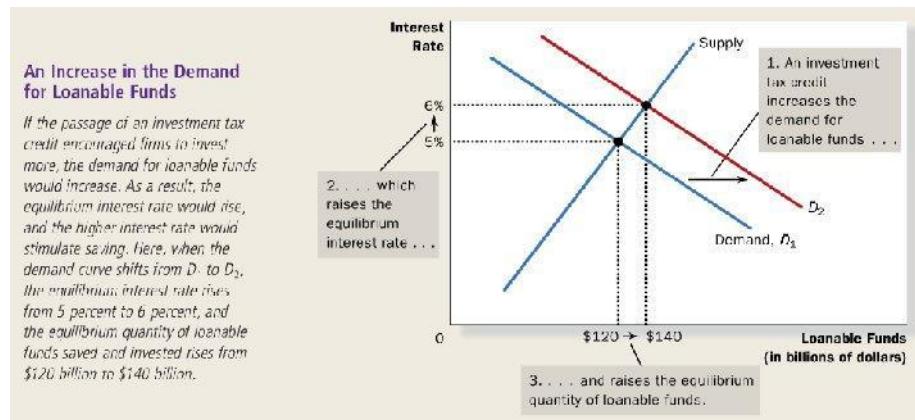
- What kind of tax reforms should be imposed to encourage saving?
- Equity of reforms is doubted- tax incentives that encouraging saving help wealthier people that have more money to save

Policy 2: Investment Incentives

Parliament could pass a tax reform that makes investment more attractive

- E.g. *investment tax credit*- gives tax advantage to any firm building a new factory or buying a new piece of equipment

Incentive for investment → demand for loanable fund increases at every interest rate → demand curve shifts outward → raises interest rate and raises equilibrium quantity of loanable funds



Thus, if a reform of the tax laws encouraged greater investment, the result would be higher interest rates and greater saving

Policy 3: Government Budget Deficits and Surpluses

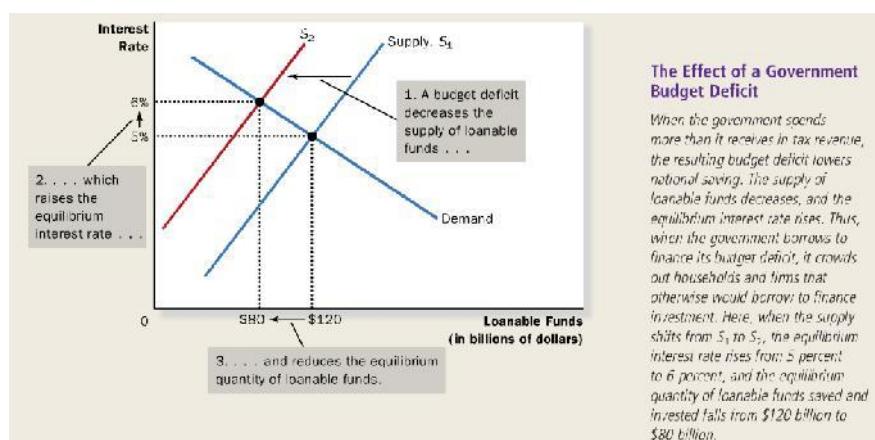
Many policy issues in Canada have arisen due to large government deficits and accumulated debt due to deficits

- Between 1975 and 1997, federal government ran large budget deficits, resulting in growing debt

When government runs deficit → less public saving (more public spending) → less loanable funds supplied at every interest rate by government → supply curve shifts inward → equilibrium quantity of loanable funds decreases and interest rate increases

Crowding out- a decrease in investment that results from government borrowing

- i.e. 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 economic growth→ lower tax revenue→ higher spending on income-support programs→ even higher budget deficits
- E.g. 1975-1997 in Canada- government needed to raise taxes and cut spending on health care, defence, social services and education to get out of debt

Surplus has the opposite effect of a deficit

A budget surplus increase 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 economic growth→ higher tax revenue→ lower spending on income-support programs→higher budget surpluses
- E.g. late 1900s and early 2000s in Canada- elections fought over choices that virtuous circle provides: tax cuts vs. spending increases vs. debt reduction

Chapter 9: Unemployment and Its Natural Rate

Like saving, employment is a significant determinant of productivity and thus standard of living and economic prosperity

- More people employed→higher productivity in country→higher standard of living

Some level of unemployment is inevitable in every economy, but levels fluctuate over time

Fluctuations of unemployment are related to up and downs of economic activity

Identifying Unemployment

How is Unemployment Measured?

Every month Stats Can produces data on unemployment and on other aspects of the labour market, such as types of employment, length of the average workweek, and the duration of unemployment

Data comes from survey of about 50 000 households- Labour Force Survey

Stats Can places each adult (aged 15 and older) in each surveyed household into one of three categories:

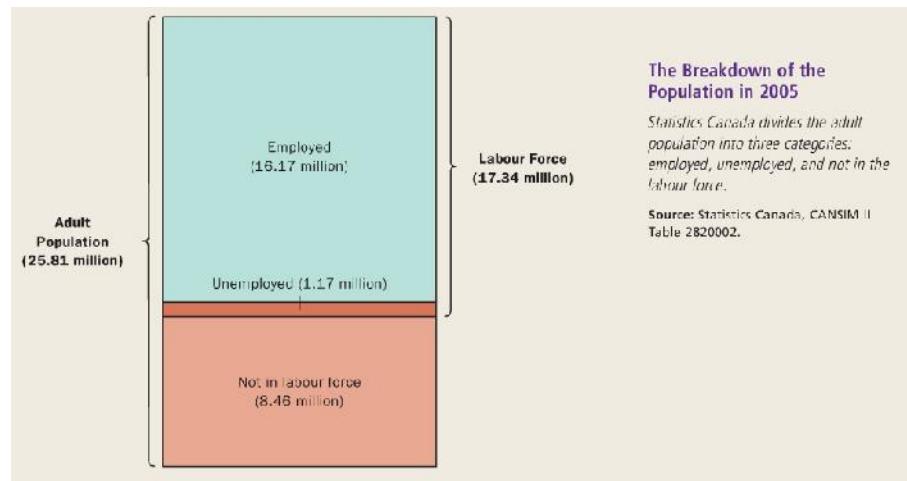
- Employed
- Unemployed
- Not in the labour force

A person is **employed** if they spent some of the previous week working at a paid job

A person is **unemployed** if they are on temporary layoff or are looking for a job

If a person does not have a job and are not looking for one, they are considered to be ***not in the labour force***

- e.g. a homemaker or full-time student may be above 15 but is not considered unemployed if they are not looking for a job



Once Stats Can has placed all the individuals covered by the survey in a category, it computes various statistics to summarize the state of the labour market

labour force- the total number of workers, including both the employed and the unemployed

- Does not include people not in labour force
- Unemployment rate**- the percentage of the labour force that is unemployed
- Unemployment rate computed for entire adult population and for more narrowly defined groups- young, old, men, women, etc.

Labour-force participation rate- the percentage of the adult population that is in the labour force

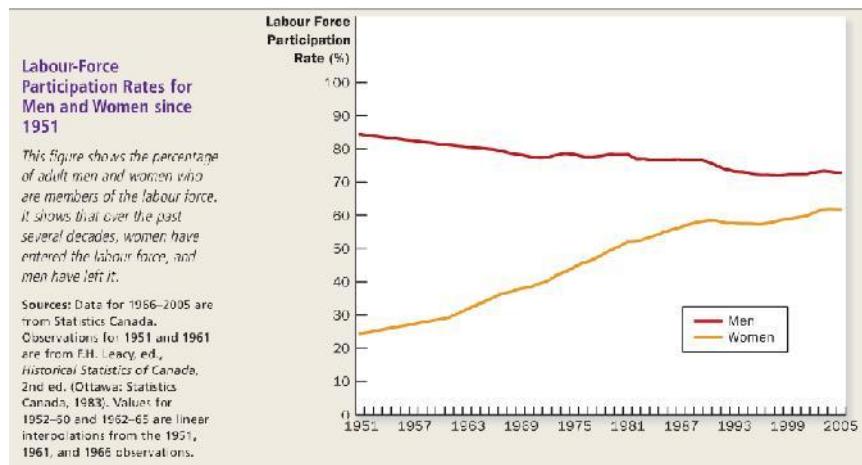
i.e. labour force participation illustrates what fraction of the adult population participates in the labour market and the unemployment rate gives the fraction of these participants that are without work

comparison of statistics between different demographic groups:

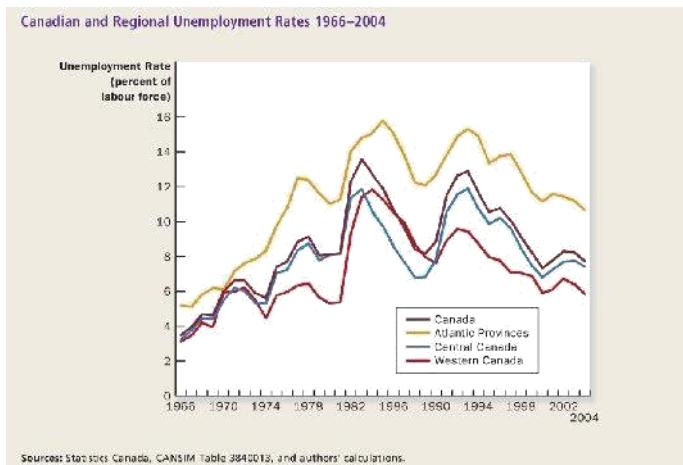
The Labour-Market Experiences of Various Demographic Groups	Demographic Group	Unemployment Rate	Labour-Force Participation Rate
<i>This table shows the unemployment rate and the labour-force participation rate of various groups in the population for 2005.</i>	Both sexes, 15 years and over	6.8%	67.2 %
<i>Source: Statistics Canada, CANSIM II Table 2820002.</i>	Males, 15-24 years	14.2	66.1
	Males, 25-44 years	6.1	92.3
	Males, 45-64 years	5.3	80.2
	Females, 15-24 years	10.6	65.8
	Females, 25-44 years	6.0	81.8
	Females, 45-64 years	5.2	67.0

- women have lower rates of labour-force participation than men of same age group, but once in labour force, unemployment rates are similar between genders
- younger people have higher rates of unemployment than older people

Since 1950s, number of women in labour force has increased considerably, while number of men in labour force has decreased a little



comparison of unemployment in different regions of Canada:



- Atlantic provinces have higher unemployment overall
- Western Canada's unemployment is lower than average, but in 1980s it increased due to dropping oil prices (which helped the rest of the country)
- Central Canada's unemployment is close to average, because it represents over 60% of Canadian labour force

Does the Unemployment Rate Measure What We Want It To?

It is hard to distinguish between a person with a full-time job and a person who is not working at all

Because people move into and out of the labour force so often and for a variety of reasons, statistics on unemployment can be difficult to interpret

- People who report being unemployed may not be trying hard to find a job
 - may be waiting to be recalled from work after temporary layoff
 - may call themselves unemployed to qualify for employment insurance
- People who report being out of the labour force may in fact want to work
 - **Discouraged searchers**- individuals who would like to work but have given up looking for a job
 - Some workers may be working part time when they want to work full time

Overall, unemployment rate is a useful but imperfect measure of joblessness

How Long Are the Unemployed without Work?

Average spell of unemployment in Canada: 15.5 weeks

Average hides the fact that there is a lot of variation

- Alberta- 11.5 weeks
- Quebec- 20.2 weeks

As a whole, one-third of those suffering from unemployment are unemployed for a month or less and two-thirds are unemployed for less than three months

Measure and Description	Percentage of the Labour Force
Unemployed 1 to 4 weeks	2.5%
Unemployed 5 to 13 weeks	1.9
Unemployed 14 to 25 weeks	1.0
Unemployed 26 to 52 weeks	0.8
Unemployed more than 52 weeks	0.6
Official Unemployment Rate	6.8
Discouraged searchers	0.1
Those awaiting recall	0.5
Involuntary part-time workers	1.5
Official rate + discouraged searchers + those awaiting recall – involuntary part-time workers	8.9

Sources: Statistics Canada, CANSIM II Tables 2820048 and 2820086, and authors' calculations.

It is important to consider the length of unemployment spells when analyzing unemployment because policies should be directed at helping people that are unemployed for longer periods of time, not those that will soon find jobs

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 → adjustment in wages would theoretically ensure that workers are fully employed

- Reality does not always resemble this ideal

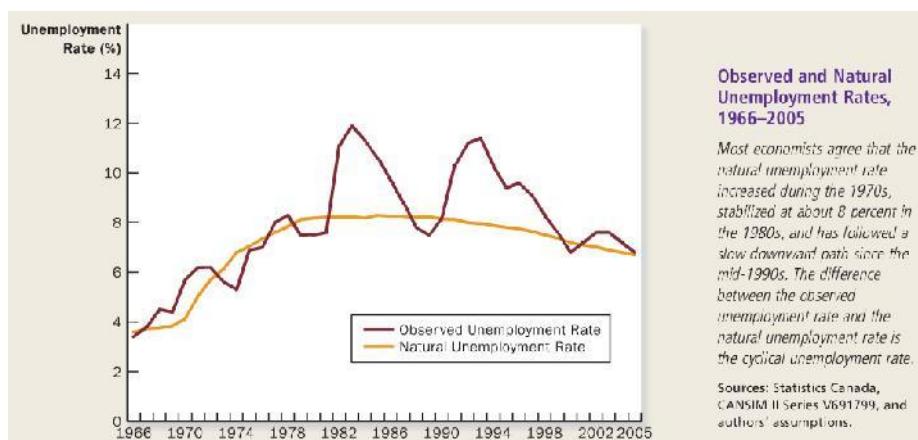
Natural rate of unemployment – the rate of unemployment to which the economy tends to return in the *long run*

Exact value of natural rate is unknown- economists estimate it to be between 6 and 8 percent in Canada

Economists estimate natural unemployment rate based on variables they believe are underlying determinants

Cyclic unemployment- the deviation of unemployment from its natural rate

- Arises due to short run fluctuations
- Often due to business cycles- recessions, etc.



Frictional unemployment- unemployment that results because it takes time for workers to search for the jobs that best suit their tastes and skills

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

- i.e. quantity of labour supplied exceeds quantity demanded

Four main reasons why there is always unemployment over the long term:

- **Job search**→ creates frictional unemployment
- **Minimum-wage laws**→ creates structural unemployment
- **Unions**→ creates structural unemployment
- **Efficiency wages**→ creates structural unemployment

Job Search

one reason why economies always experience some unemployment involves the fact that workers spend time looking for jobs

job search- the process by which workers find appropriate jobs given their tastes and skills

Why Some Frictional Unemployment Is Inevitable

Frictional unemployment is often the result of changes in the demand for labour among different firms

- e.g. when consumers decide that they prefer HP over Dell computers, HP increases employment and Dell lays off workers→ period of transition in which former Dell employees look for work and HP looks for people to employ

sectoral shifts- changes in the composition of demand among industries or regions

- e.g. If oil price falls
 - unemployment in Alberta
 - people drive more and buy more cars→increased employment in Ontario's auto sector

Economy is always changing- jobs created in some industries but destroyed in others

- E.g. shift from agriculture in early 1900s to manufacturing and service industries today
- Estimates for Canada indicate that one out of eight people unemployed suffer from frictional unemployment

Public Policy and Job Search

Public policy may play a role in reducing the time it takes unemployed workers to find new jobs and consequently reduce natural rate of unemployment

Government programs try to facilitate job search

- Government-run employment agencies give out information about job vacancies
- Public training programs that help ease the transition of workers from declining to growing industries and help disadvantaged groups escape poverty
 - Conducted through federal government's employment insurance program

Advocates argue that government training programs:

- Keep labour force employed

- Provide help to people that private sector cannot provide
- Are particularly important in situations such as natural disasters and when people are forced to change industries
 - E.g. collapse of cod industry in Newfoundland → fishers had to find different jobs, sometimes elsewhere in the country

Critics of government training programs argue that it is better to let private market match workers and jobs

Employment Insurance

Employment Insurance (EI)- a government program that partially protects workers' incomes when they become unemployed by providing money to unemployed people

Length of time EI received by an unemployed worker depends on the number of hours worked in past year and unemployment rate in area

- Higher unemployment rate in area → requires less hours worked in past year

Critics argue that EI causes unemployment rate to be higher by increasing amount of frictional unemployment

- People respond to incentive of EI and put less effort into looking for a job and turn down unattractive job offers
- Often people only hold their job until they can qualify for EI, and are more likely to get a job when their EI benefits are near their end

Unemployment insurance does allow people more time to look for jobs more suitable to them

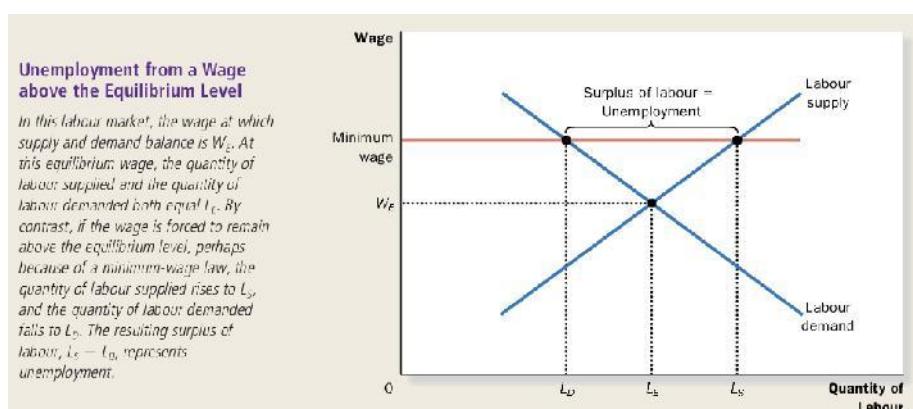
The design of Canada's unemployment insurance has become more stringent over time, leading to lower unemployment rates

Overall, EI reveals that unemployment rate is an imperfect measure of economic well being

- Eliminating EI would likely reduce unemployment, but would it improve economic well being?

Minimum-Wage Laws

When a minimum-wage law forces the wage 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 → creates surplus of labour → structural unemployment



If the wage is kept above the equilibrium level for any reason, the result is unemployment

Minimum-wage laws are not a predominant reason for unemployment in the economy, because most workers in the economy earn wages well above the legal minimum

Compared to frictional unemployment where people are *searching* for jobs that best suit their tastes and skills, in structural unemployment (like what is caused by min. wage), people are *waiting* for jobs to open up because not enough are available

Unions and Collective Bargaining

Union- a worker association that bargains with employers over wages and working conditions
As of 2005, 25% of all Canadian workers belonged to unions (number is less in US)

- Unionization is highest in public sector (education, public admin., health care, etc.) compared to private sector

The Economics of Unions

Like any cartel, a union is a group of sellers acting together in the hope of exerting their joint market power

Collective bargaining- the process by which unions and firms agree on the terms of employment

Strike- the organized withdrawal of labour from a firm by a union if its demands are not met

- Since strikes reduces production, sales and profit, a firm facing a strike threat is likely to agree to pay higher wages than it otherwise would

Union raises wage above equilibrium level → quantity of labour supplied exceeds quantity of labour demanded → unemployment

Workers who remain employed are better off, but people who were previously employed are now unemployed

- Conflict between *insiders* and *outsiders*
- Wages of parts of economy with unions stays high, but wages are forced to go down for sectors that don't have unions due to surplus

For most markets, cartels are illegal because they destroy competition, but unions are exempt from these laws

- Based on the theory that workers deserve more market power over employers
- Most of these laws cover public sector employees

In private sector, unions must approach workers in nonunionized companies and try to convince a majority of those workers of the union membership

- These are often unsuccessful but influence firms to improve working conditions

Are Unions Good or Bad for the Economy?

Critics of unions argue that:

- Unions are merely a type of cartel that raise wages above equilibrium, reducing quantity of labour demanded and increase unemployment

- Unions are inequitable because some workers (who have jobs and are part of union) benefit while others (who don't have jobs) don't

Advocates of unions argue that:

- Unions are an "antidote" to market power of firms that hire workers
 - E.g. in a small town with one firm, the workers have no choice but to accept the wages they are given and may be subject to poor working conditions
 - Therefore makes sense for public sector, where government has monopoly over workers
- Unions are important for helping firms respond efficiently to workers' concerns → create happy and productive workforce

The Theory of Efficiency Wages

Efficiency wages- above-equilibrium wages paid by firms in order to increase worker productivity

Like unions and minimum-wage laws, efficiency wages cause unemployment by forcing wages above the equilibrium price

While unions and minimum-wage laws prevent firms from lowering wages, efficiency wage theory suggest that it unnecessary to lower wages to equilibrium because firms are better off if wages are higher

Firms would want to keep wages high because they feel it would improve efficiency for a variety of reasons such as *worker health, worker turnover, worker effort* and *worker quality*

Worker Health

Better paid workers have more nutritious diet and are thus healthier and more productive
This theory is not as relevant for richer countries like Canada

In poorer countries, this theory may explain why firms may not cut wages, as they fear it would be bad for the health and productivity of the workers

Worker Turnover

The more a firm pays workers, the less often they choose to leave

They pay more in wages, but don't end up having to pay as much to hire more workers and train them

In addition, newly hired workers are not as productive as those who have been trained and have experience

Worker Effort

Firms often monitor efforts of workers and fire those caught shirking their responsibilities, but monitoring can be costly

Higher wages make workers more eager to keep their jobs and therefore gives workers an incentive to put forward their best effort

Similar to Marxist idea of “reserve army of unemployed”- employers benefited from unemployment because the threat of unemployment helped to discipline those workers that had jobs

- In efficiency-wage theory, if wage were at level that balanced supply and demand, workers would have less reason to work hard because they could find a new job with same wage if they were fired

Worker Quality

All firms want workers who are talented, and will sometimes offer a higher wage to attract a better pool of applicants

If they gave the equilibrium wage, better candidates who may have more options for work would be less likely to take the job

Case Study: Henry Ford and \$5 a Day Wage

In 1914, Henry Ford offered workers \$5 a day, which was very generous at the time

The wage was far above wage that balanced supply and demand creating a surplus of workers who wanted the jobs

The higher wage proved very beneficial because it reduced turnover and absenteeism and caused productivity to rise

The tactic was particularly useful for his business, which involved assembly lines in which workers were dependent on each other

- If a small number of workers were inefficient, it would affect the entire production
- A higher wage provided incentive for all workers to be productive

Chapter 10: The Monetary System

The social custom of using money for transactions is extraordinarily useful in a large, complex society

To rely on barter, trade must rely on *double coincidence of wants*- the unlikely occurrence that two people each have a good or service that the other wants

Existence of money makes trade easier- it facilitates production and allows each person to specialize, raising everyone's standard of living

The Meaning of Money

Money- the set of assets in an economy regularly used to buy goods and services from other people

- Based on economists definition, money only includes only the few types of wealth that are regularly accepted by sellers in exchange for goods and services

The Functions of Money

Money has three functions in the economy, it is:

- *A medium of exchange*
- *A unit of account*
- *A store of value*

Medium of exchange- an item that buyers give to sellers when they want to purchase goods and services

- E.g. when you buy a shirt at a store, the store gives you the shirt and you give them the money- the money is the *medium of exchange*

Unit of account- the yardstick people use to post prices and record debts

- i.e. the value of goods are measured in dollars, not in terms of other goods

Store of value- an item that people can use to transfer purchasing power from the present to the future

- E.g. when a seller sells a shirt they can save the money and use it to buy something later
- Money is not the only way to store value, as you transfer purchasing power from present to the future by holding other assets
- *Wealth*- referred to as total store of value
 - Includes money and nonmonetary assets

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

- Money is the most liquid asset because it is the medium of exchange
- Other assets vary widely in their liquidity- stocks are more liquid than bonds

When people decide in what form to hold their wealth, they have to balance the liquidity of each possible asset against the asset's usefulness as a store of value

- Money is very liquid, but due to inflation, it can decrease in value over time

The Kinds of Money

Commodity money- money that takes the form of a commodity with *intrinsic value*

- i.e. would have value even if it were not used as money
 - e.g. gold was used historically as a common form of money, cigarettes in prisoner of war camps

when an economy uses gold as money (or uses paper money that is convertible into gold on demand), it is said to be operating under a *gold standard*

fiat money- money without intrinsic value that is used as money because of government decree

- *fiat*- decree
- e.g. paper Canadian dollars can be used but Monopoly dollars cannot because the government has decreed its dollars to be valid money
 - "this note is legal tender"

The acceptance of fiat money depends on:

- Government's ability to establish and regulate system
 - E.g. by prosecuting counterfeiters
- Expectations and social convention

- E.g. people in Zimbabwe may have lost confidence in country's currency

Money in the Canadian Economy

Money stock - quantity of money circulating economy

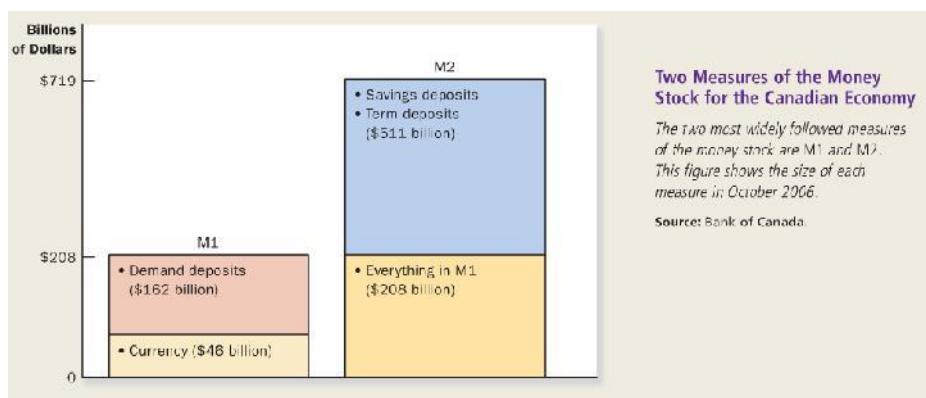
Components of money stock

- Currency**- the paper bills and coins in the hands of the public
- Demand deposits**- balances in bank accounts that depositors can access on demand simply by writing a cheque or using a debit card
- Other accounts at banks and other financial institutions

It is difficult to draw a line between assets that can be considered "money" and assets that cannot → various measures of money stock available for the Canadian economy

Two most important measures:

- M1**- demand deposits + currency
- M2**- everything in M1 + savings deposits + term deposits



The Bank of Canada

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

Bank of Canada- the central bank of Canada

Other central banks: Federal Reserve of US, Bank of England, Bank of Japan, European Central Bank

The Bank of Canada Act

Until Great Depression in 1930s, there was no central bank

- Bank notes were issued by commercial banks, which acted in concert with the Department of Finance
- Gold standard ensured that bank notes could normally be exchanged for a fixed quantity of gold

Gold standard collapsed during Depression → government set up a royal commission to study issues → commission recommended that a central bank be set up

1934 Bank of Canada Act- laid down responsibilities of the Bank of Canada

- Bank of Canada established in 1935 and nationalized in 1938

Bank of Canada is managed by a board of directors which are appointed by the minister of finance for a seven year term

- Board of directors: 12 directors, governor, senior deputy governor

The Bank of Canada is largely independent and insulated from the Canadian government (like the Supreme Court), but the government can issue a written directive to the governor of the BOC as a last resort

Unlike commercial banks, Bank of Canada is owned by government and hands to the government any profits it earns

- “Big 5” commercial banks in Canada: Bank of Montreal, Royal Bank, Toronto-Dominion Bank, Canadian Imperial Bank of Commerce (CIBC) and Bank of Nova Scotia

Four main jobs of Bank of Canada:

- *Issue currency*
 - Bank of Canada Act gives Bank of Canada a monopoly over the right to issue notes for circulation in Canada
- *Act as a banker to commercial banks*
 - major commercial banks have demand deposits at the Bank of Canada
 - allows these banks to make payments with each other
 - Bank of Canada may occasionally lend money to commercial banks when they are in financial trouble to maintain stability in financial system
- *Act as a banker to the Canadian government*
 - Government of Canada has a demand deposit at the Bank of Canada as well as at major commercial banks
 - Bank of Canada manages the government’s bank accounts, foreign exchange reserves and national debt
- *Control 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

Monetary Policy

The Bank of Canada has the power to increase or decrease the number of dollars in the economy

Recall: two principles:

- Prices rise when the government prints too much money
- Society faces a short-run trade-off between inflation and unemployment

By controlling how much money is printed, Bank of Canada can thus influence inflation in the long run and economy’s employment and production in the short run

Commercial Banks and the Money Supply

The Bank of Canada can only control the supply of money through its influence on the entire banking system

Commercial banks play an important role

The Simple Case of 100-Percent-Reserve Banking

Reserves- deposits that banks have received but have not loaned out

Imagine an economy with only one bank, "First national Bank" which accepts deposits but does not make loans

- i.e. it operates on a *100-percent-reserve banking* system because all deposits are held as reserves

Assume that there is only \$100 of currency in economy and this is all deposited in the bank financial position of First National Bank expressed with T-account:

		FIRST NATIONAL BANK		
		Assets	Liabilities	
Reserves in vaults		Reserves \$100.00	Deposits \$100.00	
				Amount it owes to depositors

- money supply before deposit: \$100 in currency
- money supply after deposit: \$100 in demand deposits

Thus, ***if banks hold all deposits in reserve, banks do not influence the supply of money***

Money Creation with Fractional-Reserve Banking

If First National Bank wants to loan money to other people or firms, it can only keep a fraction of the deposits made

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

- Determined by a combination of government regulations and bank policy
- *Reserve requirement*- a minimum on the amount of reserves that banks hold
- Banks may hold reserves above the legal minimum (*excess reserves*) to be more confident that they will not run short on cash

Suppose First National has reserve ratio of 10%

- i.e. it keeps 10% of its deposits in reserve and loans out the rest

T- account:

		FIRST NATIONAL BANK		
		Assets	Liabilities	
Reserves	\$10.00	Deposits	\$100.00	
Loans	90.00			

- Money supply before lending: \$100 in demand deposits
- Money supply after: \$100 in demand deposits + \$90 in currency let out = \$190

Thus, ***when banks hold only a fraction of deposits in reserve, banks create money***

As bank creates asset of money, it also creates a corresponding liability for its borrowers

- Economy becomes more *liquid* because there is a greater medium of exchange, but *wealth* does not increase

The Money Multiplier

If the money borrowed from one bank is then deposited in another, the money supply increases even more

Suppose the borrower from First National uses the \$90 to buy something from someone who then deposits the currency in "Second National Bank", which also has a 10% reserve ratio:

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

If the additional \$81 created by Second National is eventually deposited in "Third National Bank" (which also has 10% reserve ratio), even more money is created:

THIRD NATIONAL BANK			
Assets		Liabilities	
Reserves	\$ 8.10	Deposits	\$81.00
Loans	72.90		

Process continues- each time that money is deposited and a bank loan is made, more money is created

Add up money eventually created in the economy:

Original deposit	= \$	100.00
First National lending	= \$	90.00 [= .9 × \$100.00]
Second National lending	= \$	81.00 [= .9 × \$90.00]
Third National lending	= \$	72.90 [= .9 × \$81.00]
•		•
•		•
•		•
Total money supply	= \$	1000.00

- The process does not create an infinite amount of money
- If you start with 10%, the max money created is \$1000

Money multiplier- the amount of money the banking system generates with each dollar of reserves

$$= \frac{1}{\text{Reserve Ratio}}$$

- Examples:
 - If reserve ratio is 100% (or 1), the multiplier is 1
 - If reserve ratio is 5% (or 1/20), the multiplier is 20
 - If the reserve ratio is 10% (or 1/10), the multiplier is 10

The higher the reserve ratio, the less of each deposit banks loan out, and the smaller the money multiplier

The Bank of Canada's Tools of Monetary Control

Over its history, the Bank of Canada has used different methods of controlling the money supply
Three main “tools” to control money supply:

- Open-market operations
- Changes in reserve requirements
- Changes in the overnight rate

Open-Market Operations

Central banks can increase the supply of money in circulation by buying something

- E.g. if bank buys a computer for \$1000 using newly minted money, it adds \$1000 to circulation

Central banks can decrease supply of money by selling something

- E.g. selling used computer for \$200 cash, the quantity of currency in economy decreases by \$200

Buying and selling smaller items such as computers has a negligible effect, so Bank of Canada buys and sells to public a large quantity of Canadian government bonds

Open-market operations- the purchase or sale of government bonds by the Bank of Canada

To increase the money supply, Bank of Canada can buy government bonds or Treasury bills (short-term bonds)

- Some new dollars used to buy bonds are held as currency- each \$1 held as currency increases money supply by \$1
- Some new dollars are put in bank → increases money supply further because banks can lend it out

To reduce money supply, Bank of Canada can sell government bonds to the public

- Public buys bonds with currency and demand deposits → decreases money supply of currency and bank reserves

Bank of Canada can also purchase and sell foreign money

Foreign exchange market operations- the purchase or sale of foreign money by the Bank of Canada

- e.g. if Bank of Canada buys \$100 million US dollars for \$150 Canadian dollars, the Canadian money supply increases immediately by \$150 million

buying foreign currency using Canadian currency → increases money supply

selling foreign currency for Canadian currency → decreases money supply

To sell foreign currency in the foreign exchange market to support the Canadian dollar's exchange rate, but prevent money supply from falling:

- Sell foreign currency for Canadian currency → (??increases value of Canadian dollar??) → decreases money supply
- Buy Canadian government bonds using Canadian currency → increases money supply

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

Changing Reserve Requirements

Reserve requirements- regulations on the minimum amount of reserves that banks must hold against deposits

Some central banks (not Bank of Canada) change the regulations regarding reserve requirements to manipulate the amount of money the banking system can create with each dollar of reserves

Regulations that force banks to increase reserves → banks must loan out less → raises reserve ratio → lowers money multiplier → decreases money supply

Regulations that allow banks to decrease reserves → banks can loan out more → lowers reserve ratio → raises money multiplier → increases money supply

Bank of Canada rarely uses changes in reserve requirements to control money supply, because frequent changes would disrupt the business of banking

- phased out reserve requirements to create level playing field with other financial institutions
- requires that banks that run out of reserves and are forced to borrow from the BOC to cover withdrawals pay a penalty

As a result, Canadian banks choose a very low reserve ratio (around 2%) so multiplier is really high

Changing the Overnight Rate

Central banks like Bank of Canada act as bankers to the commercial banks

Transfers between banks are done by the Bank of Canada

- E.g. if Muriel, who has a chequing account at the Bank of Montreal, buys a car for \$5000 from Julia, who has a chequing account at the Bank of Nova Scotia
 - Bank of Montreal will deduct \$5000 from Muriel's chequing account and pay \$5000 to the Bank of Nova Scotia so that it can credit Julia's chequing account
 - Bank of Canada will deduct \$5000 from Bank of Montreal's demand deposit and add \$5000 to the Bank of Nova Scotia's deposit

If a bank does not have enough in its demand deposit at Bank of Canada, it is charged interest on a loan

Bank rate- the interest rate charged by the Bank of Canada on loans to the commercial banks
Since 1998, BOC has allowed commercial banks to borrow freely at the bank rate, and has paid commercial banks the bank rate, minus half a percent on their deposits

- E.g. if bank rate is 5%, it means RBC must pay 5% interest if it borrows from BOC and is paid 4.5% interest if it has a positive balance in its demand deposit
 - *Operating band: 4.5%- 5%*

The **operating band** sets the pattern for all short-term interest rates in Canada

- Commercial banks never need to pay more than the bank rate for short-term loans, because they can always borrow from BOC instead

- Banks never need to accept less than bank rate minus half a percent when they give short-term loans, because they can always lend to the BOC instead
- This affects the interest rates the banks themselves can charge

Overnight rate- the interest rate on very short-term loans between commercial banks

- Stays very close to middle of operating band- usually about $\frac{1}{4}$ less than bank rate
- BOC can alter money supply by changing bank rate
- Raise bank rate → causes increase in overnight rate → discourages banks from borrowing reserves from BOC → less reserves in banking system → reduces money supply
 - Lower bank rate → decreases in overnight rate → encourages banks to borrow reserves from BOC → more reserves in banking system → increases money supply

BOC uses open-market operations for long-run control of the money supply and changes in the overnight rate for short-run control of the money supply

BOC has fixed 8 dates a year when they announce whether it will raise, lower, or keep the same overnight rates

Problems in Controlling the Money Supply

Bank of Canada's control of the money supply is not precise- it deals with two main problems

BOC does not control the amount of money that households choose to hold as deposits in banks

- The fractional-reserve banking system operates based on the idea that people deposit their money into banks, but if people don't deposit money, the system doesn't work
- E.g. if people lost confidence in banking system and stopped depositing money, the money supply would decrease without action from BOC

BOC does not control the amount that commercial bankers choose to lend

- Money supply is created when banks loan out money, so system is dependent on the amount they loan out
- E.g. if banks become more cautious about lending out money and decide to keep more in reserve, money supply decreases without action from BOC

Hence, in system of fractional-reserve banking, amount of money in economy depends in part on the behaviour of depositors and bankers

BOC collects data on deposits every week so it is aware of changes and adjusts accordingly

- E.g. if BOC discovers that money supply is growing too slowly due to banks not lending enough, it can lower overnight rates

Chapter 11: Money Growth and Inflation

Inflation- increase in overall level of prices

Over the past 70 years, prices have risen on average about 4% per year → 16-fold price increase overall

- 1970s- 7%
- 1990s- 2%

Deflation occurred in Canada in the 1900s and in Japan recently

Hyperinflation- extraordinarily high rate of inflation

- E.g. Germany pre- WWII, Zimbabwe currently

Questions to consider

- What causes inflation?
- Why is inflation a problem?
- What exactly are the costs that inflation imposes on a society?

The Classical Theory of Inflation

The inflation theory based on quantity of money is considered “classical” because it was developed by some of the earliest thinkers about economic issues

Most economists today rely on this theory to explain the long-run determinants of the price level and the inflation rate

The Level of Prices and the Value of Money

Economy's overall price level can be viewed in two ways

- Price of a basket of goods and services
 - i.e. coffee price went up, so it means coffee is more valuable
- Measure of the value of money
 - i.e. coffee price went up, so it means the money used to buy coffee is less valuable

Mathematically

- P = number of dollars needed to buy a basket of goods and services → price of goods and services
- $1/P$ = the quantity of goods and services that can be bought with \$1 → value of money measured in terms of goods and services
- Therefore, when the overall price level rises (P), the value of money ($1/P$) falls

Money Supply, Money Demand, and Monetary Equilibrium

Just like any commodity, the value of money is determined by supply and demand

Money supply- a policy variable that is controlled by Bank of Canada

- Controlled by open market operations, changing overnight rate, etc.

Money demand- reflects how much wealth people want to hold in liquid form- “liquidity preference”

- Influenced by many variables: how much people rely on credit cards, interest rate person could earn by using money to buy bond, etc.

- Main factor: *average level of prices in economy*

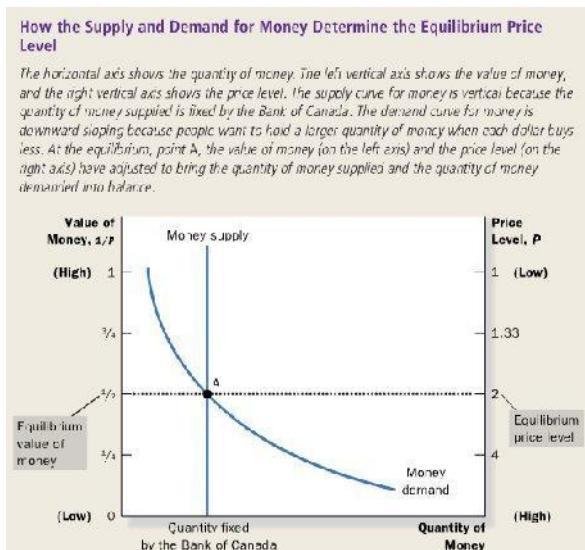
Higher prices → more money in typical transaction → more money people will choose to hold in their wallets and chequing accounts

- i.e. a higher price level (a lower value of money) increases quantity of money demanded
- movement along the demand curve for money

In the long run, the overall level of prices adjusts to the level at which the demand for money equals the supply

- If price level is above the equilibrium level (value of money is too low) → people will want to hold more money than the Bank of Canada has created → price level must fall to balance supply and demand
- If price level is below equilibrium level (value of money too high) → people will want to hold less money than the Bank of Canada has created → price level must rise to balance supply and demand
- At the equilibrium price level, quantity of money that people want to hold = quantity of money supplied by Bank of Canada

Supply and Demand for money:



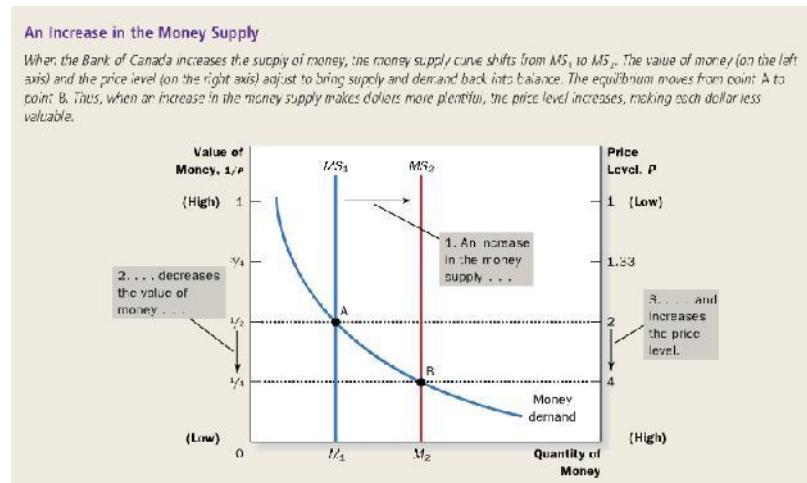
- On vertical axis: when price level is high (goods cost more money), value of money ($1/P$) is low
- The supply curve is vertical because the Bank of Canada has fixed the quantity of money available

The Effects of a Monetary Injection

When Bank of Canada injects money into the economy, the supply curve shifts outward

- i.e. 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

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



A Brief Look at the Adjustment Process

How does the economy get from the old to the new equilibrium?

When price level is at equilibrium, people have as much money as they want

When money is injected, they have an *excess supply* of money and try to get rid of it in various ways

- Buy goods and services
- Make loans to other by buying bonds or depositing money into savings account

Injection of money increases demand for goods and services

Since the quantity of goods and services supplied does not change, the greater demand for them causes the prices to increase → causes quantity of money demanded to increase because people need money for each transaction

Eventually, quantity of money demanded will reach a new equilibrium

The Classical Dichotomy and Monetary Neutrality

How do monetary changes affect other variables like production, employment, real wages and real interest rates?

Nominal variables- variables measured in monetary units

Real variables- variables measured in physical units

E.g. nominal GDP is a nominal variable because it measures the dollar value of economy's output, but real GDP is a real variable because (although it is measured in dollars) is unaffected by current prices

Classical dichotomy- the theoretical separation of nominal and real variables

Real variables are measured using relative prices

- E.g. real interest rate is a real variable because it measures the rate at which the economy exchanges goods and services produced today for goods and services produced in the future

Different forces influence real and nominal variables- developments in monetary system influence nominal variables much more than real variables

E.g. when the central bank increases money supply

- Price level, dollar wages increase
- Production, employment, real wages and real interest rates are unchanged

Monetary neutrality- the proposition that changes in the money supply do not affect real variables

Analogy: if we suddenly change the meter from 100cm to 50cm, all *measured* distances would change but the *actual* distances would not

- In short run, this would cause mistakes and confusion, but people would adjust in the long run

Over short periods of time, monetary changes do have important effects on real variables, but not so much over long periods of time (the monetary neutrality theory)

Velocity and the Quantity Equation

Velocity of money- the rate at which money changes hands

Velocity of Money Equation

$$= \frac{Y}{M} = V$$

V= velocity of money

Y= nominal value of output (nominal GDP)

P= price level (GDP deflator)

M= quantity of money

E.g. economy that produces only pizza

1. Produces 100 pizzas in a year that sell for \$10 and quantity of money is \$50
2. Velocity of money= $(\$10 * 100) / \$50 = 20$

- Each dollar must change hand on average of 20 times per year

Rearrange formula:

Quantity Equation

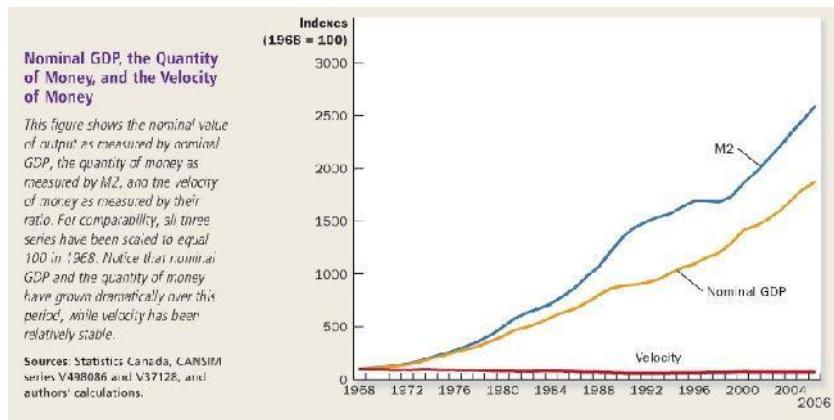
$$Y = P \times M$$

The quantity equation shows that an increase *in the quantity of money (M)* in an economy must be reflected in one of the other three variables:

1. the price level (P) must rise
2. the quantity of output (Y) must rise
3. the velocity of money (V) must fall

Elements necessary to explain the equilibrium price level and inflation rate:

1. The velocity of money is relatively stable over time (an assumption based on history)
2. Because velocity is stable, when the central bank changes the quantity of money (M), it causes proportionate changes in the nominal value of output ($P * Y$)
3. The economy's output of goods and services (Y) is primarily determined by factor supplies (labour, physical capital, human capital, and natural resources)
4. With output (Y) determined by other factors such as supplies and technology, when the central bank alters the money supply (M) and induces proportional changes in the nominal value of output ($P * Y$), these changes are reflected in changes in the price level (P)
5. Therefore, when the central bank increases the money supply rapidly, the result is a high rate of inflation



The Inflation Tax

If inflation is easy to explain, why do countries experience hyperinflation?

- Governments use money creation as a way to pay for their spending- simply print the money it needs

Inflation tax- the revenue the government raises by creating money

When the government prints more money, price level rises, and the dollars in your pocket are less valuable

- *The inflation tax is like a tax on everyone who holds money*

The inflation ends when the government institutes fiscal reforms- such as cuts in government spending- that eliminate the need for the inflation tax

In Canada, inflation tax is currently a trivial source of revenue- less than 1% of government revenue

US government used inflation tax to pay for military spending during American Revolution

The Fisher Effect

Interest rates are important variables for macroeconomists to understand because they link the economy of the present and the economy of the future through their effects on saving and investment

Nominal interest rate- tells you how the number of dollars in your account will raise over time

Real interest rate- corrects the nominal interest rate for the effect of inflation to tell you how fast the purchasing power of your savings account will rise over time

- E.g. if bank gives 7% interest rate, and inflation rate is 5%, then the real value of the deposits grows by 5% a year

Re-write equation to isolate nominal interest rate:

- Different economic forces determine each of the two variables on right side
 - Real interest rate- determined by supply and demand of loanable funds
 - Inflation rate- determined by growth of money supply

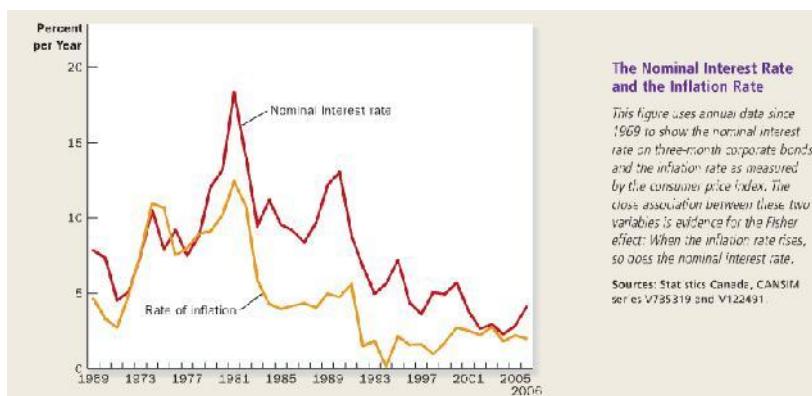
Real interest rate is not effected by change in money supply in the long run (monetary neutrality), so nominal interest rate is directly effected

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 effect- the one-for-one adjustment of the nominal interest rate to the inflation rate

The fisher effect only works for the long-run, and is not necessarily true in the short-run

- E.g. if inflation catches the borrower and lender by surprise, the nominal interest rate they set will fail to reflect the rise in prices
- i.e. Fisher effect states that the nominal interest rate adjusts to *expected inflation*, which moves with *actual inflation* in the long run, but not necessarily in the short run



The Costs of Inflation

Inflation is closely watched because it is considered an economic problem. Is it a problem? And if so, why?

A Fall in Purchasing Power? The Inflation Fallacy

It may seem that inflation robs people of the purchasing power of their money, because when prices rise, each dollar buys fewer goods and services

However: when prices rise, buyers pay more, but sellers also receive more for what they sell

Since most people earn their incomes by selling their services, inflation in incomes goes hand in hand with inflation in prices

- i.e. nominal incomes keep up with rising prices- if you get a 5% raise, but inflation is 5%, then your real income did not increase

Inflation does not in itself reduce people's real purchasing power

People don't appreciate the principle of monetary neutrality, so are misled to believe that inflation is bad

However, there are costs of inflation that do exist

Shoeleather Costs

Like what they would do to avoid taxes, people do things to avoid inflation that is a cost to society

Since, inflation erodes the real value of the money in your wallet, you can avoid the "inflation tax" by going to the bank more often

- If you take out \$50 every week rather than \$200 every 4 weeks for example, it allows more money to sit in your bank account where it earns interest→ these extra trips to the bank costs time and inconvenience

Shoeleather costs- the resources wasted when inflation encourages people to reduce their money holdings

- more trips to the bank "makes your shoes wear out more quickly"

Shoeleather costs of inflation can be substantial if the inflation rate is high

- E.g. in places like Bolivia, people rush to convert pesos to US dollars when they are paid

Menu Costs

Firms usually don't change prices for weeks, months or years because it costs money to change the prices

Menu costs- the costs of changing prices

- Include cost of deciding on new prices, printing new price lists and catalogues, costs of advertising new prices, and dealing with customer annoyance over price changes

Higher inflation→ firms must change menu costs more frequently→ costs money

Relative-Price Variability and the Misallocation of Resources

If a firm didn't bother to change prices, but inflation increased, the *real* cost of the goods they produce would decrease

- E.g. if Eatabit Eatery prints new menu every January, but inflation is 12%, its relative prices will drop by 1% each month

Since firms change prices only once in a while, inflation causes relative prices to vary more than they otherwise would

This change in relative prices causes a distortion in the decisions of consumers → distorts supply and demand → markets are less able to allocate resources to their best use

Inflation-Induced Tax Distortions

Taxes distort incentives, cause people to alter their behaviour and lead to a less efficient allocation of the economy's resources

Taxes become even more problematic in the presence of inflation because law makers often fail to take inflation into account when writing tax laws

It has been found that inflation tends to raise tax burden on income earned from savings

The tax treatment on **capital gain** is affected by inflation, because you are taxed on your *nominal* gain, not *real* gain

- E.g. If you buy Microsoft stock in 1980 for \$10 and sell in 2006 for \$50, but inflation is 10%
 - *Nominal* capital gain from selling stock: $50-10 = \$40$
 - *Real* capital gain from selling stock: $50 - (10 \times 1.1) = \$30$
 - You are taxed on the \$40 gain rather than the \$30 gain
- Inflation exaggerates the size of capital gains and inadvertently increase the tax burden on this type of income

The tax treatment on **interest income** is affected by inflation, because you are taxed on the *nominal* interest you earn, not the *real* interest

- E.g. comparing economy with tax interest income of 25% and one with 4%:

	Economy A (price stability)	Economy B (inflation)	How Inflation Raises the Tax Burden on Saving
Real interest rate	4%	4%	
Inflation rate	0	8	
Nominal interest rate (real interest rate + inflation rate)	4	12	
Reduced interest due to 25 percent tax (.25 × nominal interest rate)	1	3	<i>In the presence of zero inflation, a 25 percent tax on interest income reduces the real interest rate from 4 percent to 3 percent. In the presence of 8 percent inflation, the same tax reduces the real interest rate from 4 percent to 1 percent.</i>
After-tax nominal interest rate (.75 × nominal interest rate)	3	9	
After-tax real interest rate (after-tax nominal interest rate – inflation rate)	3	1	

- Government taxes nominal interest rate, which leaves you with a lower real interest rate

Tax treatment of capital gains and interest income are just two ways inflation discourages saving

Ideally, government should *index* tax laws with inflation so that only real interest is taxed

- Currently, some taxes are indexed, but the system is not perfect

Confusion and Inconvenience

Since money is used as a *unit of account*, changing it can cause confusion

Money is like a measuring stick for economics, so the more we change it, the less reliable it becomes

E.g. accountants can incorrectly measure earnings of different firms because inflation causes dollars at different times to have different real values

- This makes it difficult to compare the success of different firms and allocate resources efficiently

A Special Cost of Unexpected Inflation: Arbitrary Redistributions of Wealth

Unexpected inflation can cause a redistribution of wealth, especially when considering loans and interest

E.g. if Sam takes out a \$20,000 loan at 7% interest rate from Bigbank,

- Bigbank uses this interest rate because it is what supply and demand dictates and is higher than the inflation rate
- In 10 years he owes \$40,000, and real value of debt will depend on inflation over the decade
- If there is hyperinflation, the \$40,000 will be paid off easily → wealth redistributed to Sam
- If there is deflation, it will cost Sam relatively more to pay it → wealth redistributed to Bigbank

Chapter 12: Open-Economy Macroeconomics: Basic Concepts

When you buy a Japanese car or a foreign stock, you are participating in economies around the world

Recall principle #5: trade can make everyone better off

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

The International Flows of Goods and Capital

Open economy interacts with other economies in two ways:

- Buys and sells goods and services
- Buys and sells capital assets such as stocks and bonds

The Flow of Goods: Exports, Imports, and Net Exports

Exports- domestically produced goods and services that are sold abroad

Imports- foreign produced goods and services that are sold domestically

Net exports (trade balance)- the value of a nation's exports minus the value of its imports

$$(\text{Exports}) - (\text{Imports}) = \text{Net Exports}$$

Trade surplus- an excess of exports over imports

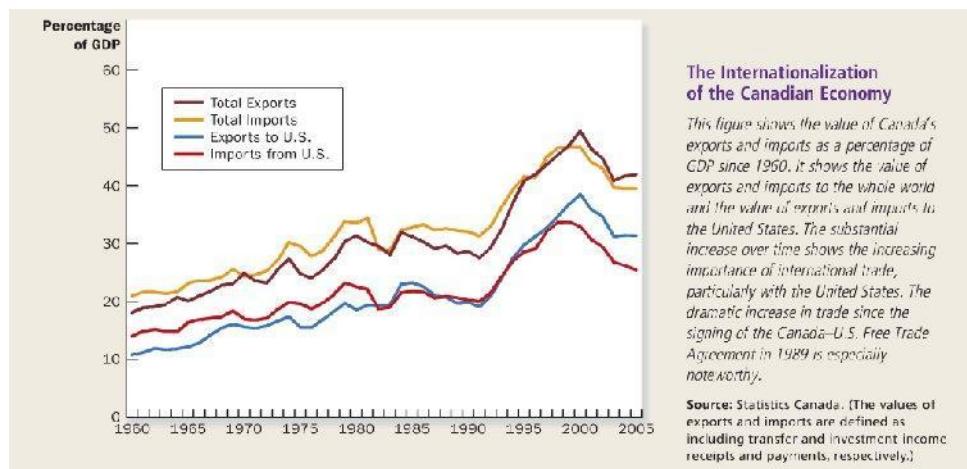
Trade deficit- an excess of imports over exports

Balanced trade- a situation in which exports equal imports

Factors influencing exports, imports and net exports:

- 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 transporting goods from country to country
- Policies of the government toward international trade

Case Study: The Increasing Openness of the Canadian Economy



The Flow of Financial Resources: Net Capital Outflow

Residents of an open economy also participate in world *financial markets*

- E.g. buying stock of foreign company

Net capital outflow (NCO)- the purchase of foreign assets by domestic residents minus the purchase of domestic assets by foreigners:

$$= -$$

- E.g. if a Canadian buys Japanese stock, it raises Canadian net capital outflow but lowers Japanese net capital outflow

Foreign direct investment- a capital investment that is owned and operated by a foreign entity

- E.g. Canadian company Nortel builds an assembly plant in Mexico

Foreign portfolio investment- an investment that is financed with foreign money but operated by domestic residents

- E.g. a Canadian buys stock of a Mexican company

Important variables that influence net capital outflow:

- Real interest rates being paid on foreign assets
 - E.g. if US companies are paying better interest, Canadians may be more inclined to invest in them
- Real interest rates being paid on domestic assets
- Perceived economic and political risks of holding assets abroad
 - E.g. fear that an unstable government will *default* on a bond

Government policies that affect foreign ownership of domestic assets

The Equality of Net Exports and Net Capital Outflow

Net exports- measures imbalance between exports and imports

Net capital outflow- measures imbalance between amount of foreign assets bought by domestic residents and amount of domestic assets bought by foreigners

For an economy as a whole, the two imbalances must offset each other

- i.e. net capital outflow (NCO) always equals net exports (NX):

=

- e.g. if Canadian company Bombardier sells planes to a Japanese airline
 - Canada is exporting goods to Japan → Canadian NX goes up
 - Canada has gained some foreign assets (Japanese Yen) → Canadian NCO goes up by same amount
 - Bombardier can then go on to exchange this Yen with a different Canadian company that buys financial assets from Japan (increasing NCO) or buys capital assets from Japan (decreasing NX equal to the amount it went up when planes were sold)

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 → it then must use foreign currency to buy foreign assets → capital also flows out of the country ($NCO > 0$)

When a nation is running a trade deficit ($NX < 0$), it is buying more goods and services from foreigners than it is selling to them → to finance the purchase of these assets, it must sell assets abroad → capital also flows into the country ($NCO < 0$)

Saving, Investment, and Their Relationship to the International Flows

How is a nation's saving and investment related to NCO and NX?

NX is part of GDP- total expenditure on economy's output:

$$= + + +$$

National saving is the income of the nation that is left after paying for current consumption and government purchases ($S=Y-C-G$):

- Rearrange GDP equation:

$$\text{○ Substitute } Y-C-G=S \quad - - = +$$

$$= +$$

Net exports (NX) also equals net capital outflow (NCO)

- Substitute NX=NCO:

$$= +$$

$$= +$$

i.e. the amount people in an open economy save is equal to how much they invest in their own country plus the net amount they invest in other countries

- Each dollar saved can be used to finance accumulation of domestic capital or purchase of capital abroad
- E.g. a family uses excess income to buy a mutual fund → the mutual fund company then buys Canadian stock (I) and Japanese stock (NCO)

If saving exceeds domestic investment → net capital outflow is positive
If domestic investment exceeds saving → net capital outflow is negative

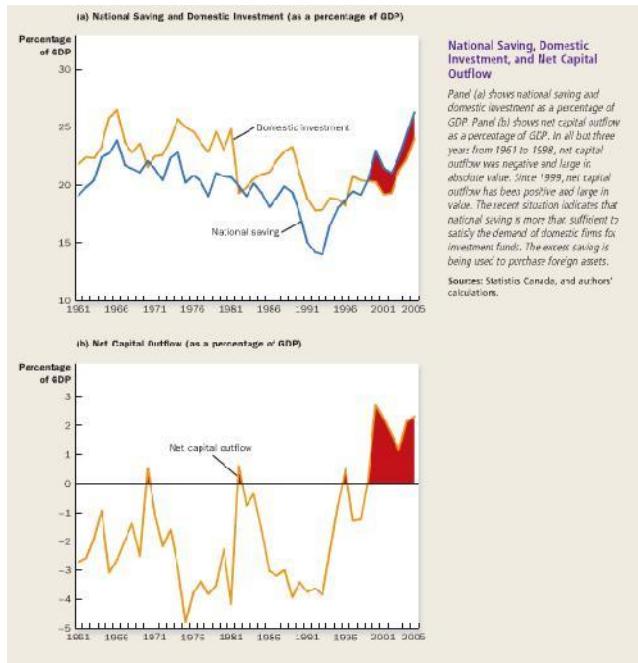
Summary

Deficit: NX is negative → domestic spending ($C+I+G$) is less than national income (Y)

Surplus: NX is positive → domestic spending ($C+I+G$) is greater than national income (Y)

	Trade Deficit	Balanced Trade	Trade Surplus
International Flows of Goods and Capital: Summary	Exports < Imports	Exports = Imports	Exports > Imports
<i>This table shows the three possible outcomes for an open economy.</i>	Net exports < 0	Net exports = 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

Case Study: Saving, Investment, and Net Capital Outflow in Canada



Recently, Canada has had a net positive exports:

- Canada is a *debtor* in world financial markets (other countries owe it money)
- Positive NCO
- Domestic investment < national saving

Governments made an effort to reduce deficits

Canadians have had more than enough savings to meet investment demands of Canadian firms → have used additional funds to support foreign investment

In the past, the deficit was a *symptom* of reduced national saving

- Canada was putting away less for future, and thus had to borrow more from other countries
 - E.g. budget deficit → reduced public saving → reduced national saving
 - This wasn't that bad however, because it meant that domestic investment (I) did not fall

Is a surplus a problem?

- If surplus due to reduced domestic investment → bad because it means Canadian firms may have had trouble developing investment opportunities, forcing Canadians to save elsewhere
- If surplus due to increased national saving (as was the case) → good because it means Canadians are saving more, and thus investing in other economies

The Prices for International Transactions: Real and Nominal Exchange Rates

Just as the price in any market serves the important role of coordinating buyers and sellers in that market, international prices help coordinate the decisions of consumers and producers as they interact in world markets

Two most important international prices: nominal and real exchange rates

Nominal Exchange Rates

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

- e.g. exchanging one Canadian dollar for 80 Japanese Yen

Can express exchange rate in two ways:

- *Yen per dollar*: 1 dollar = 80 Yen
- *Dollars per Yen*: 1 Yen = 1/80 = 0.0125 Dollars

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

- i.e. dollar buys more of a foreign currency
- Currency *strengthens*

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

- i.e. dollar buys less of a foreign currency
- Currency *weakens*

Exchange rates are relative to the currency you are comparing it to

- E.g. if the dollar can buy more Yen, the dollar *strengthens* compared to the Yen while the Yen *weakens* compared to the dollar

Economists use indices (consisting of average values of different nominal exchange rates) to study changes in the exchange rates

Real 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

- Express real exchange rate as units of foreign item per unit of domestic item
- e.g. if German beer is twice as expensive as Canadian beer when converting exchange rates → real exchange rate: half a case of German beer per case of Canadian beer

Real and nominal exchange rates are closely related

$$\frac{=}{\times}$$

- e.g. If bushel of Canadian wheat sells for \$200 and a bushel of Russian wheat sells for 1600 rubles, nominal exchange rate is 4 rubles per dollar
 - in this case, Russian rubles are the foreign price (because exchange rate is *per dollar*):

$$\begin{aligned}
 h &= \frac{(4 \text{ } h) \times (200 \text{ } h) \text{ } h}{(800 \text{ } h) \text{ } h} \\
 h &= \frac{1600 \text{ } h^3}{1600 \text{ } h^2} \\
 h &= 12 \text{ } h
 \end{aligned}$$

real exchange rate is a key determinant of how much a country exports and imports

- e.g. when a company is deciding whether to buy Canadian or Russian wheat, they look at the nominal exchange rate

Macroeconomists uses price indices to calculate real exchange rates, rather than the prices of individual goods:

e = nominal exchange rate between the domestic currency and foreign currency

P = price of basket of goods in domestic currency

P^* = price of basket of goods in foreign currency

Depreciation (fall) in real exchange rate → goods have become cheaper relative to foreign goods → discourages imports, encourages exports

Appreciation (rise) in Canada's real exchange rate → goods have become more expensive relative to foreign goods → encourages imports, discourages exports

A First Theory of Exchange-Rate Determination: Purchasing-Power Parity

Different theories are used to explain why currencies rise or fall relative to each other

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

The Basic Logic of Purchasing-Power Parity

Purchasing-power parity theory based on the idea that prices should be the same everywhere
law of one price- asserts that a good must sell for the same price, otherwise opportunities for profit would be left unexploited

- **arbitrage**- process of taking advantage of differences in prices in different markets based on the law of one price, price discrepancies between countries will eventually balance out

- e.g. if a dollar can buy more coffee in Japan than Canada, then people will buy more in Japan than in Canada → price in Canada goes down and price in Japan goes up
i.e. a unit of all currencies must have the same real value in every country

Implications of Purchasing-Power Parity

According to purchasing-power parity, the nominal exchange rate between the currencies of two countries should depend on price levels

- e.g. if the price level in Canada is twice as high as Japan, the dollar should be worth half as much as the Yen, and if Canadian prices rise faster than Japanese prices, its dollar is worth relatively less

Purchasing power (value of dollar) at home ($1/P$) should equal purchasing power abroad (e/P^*):

Rearrange equation:

$$= *$$

$$= *$$

- i.e. real exchange rate is equal to 1

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

Solve for nominal exchange rate:

$$= *$$

- i.e. nominal exchange rate is equal to the ratio of the price levels

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

demanded in each country, which itself is controlled partially by the central bank

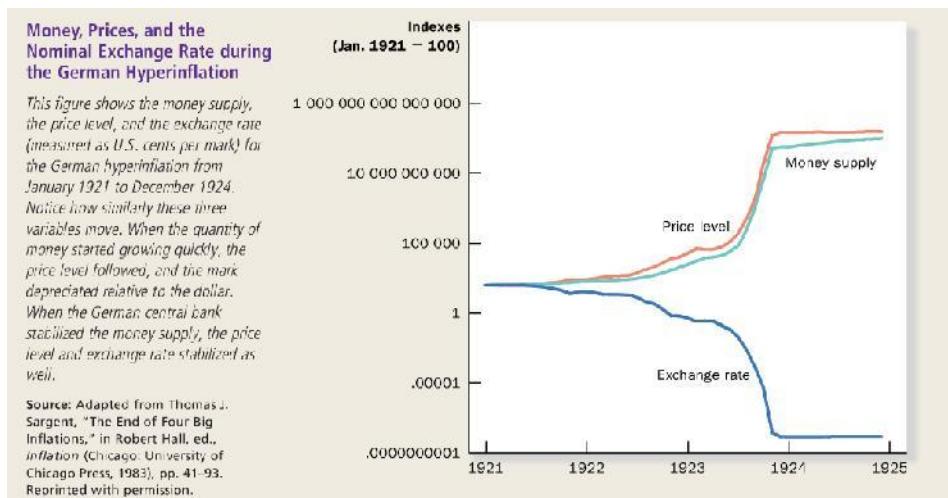
- i.e. central bank influences *money supply* → money supply influences *price level* → differences in price level between countries influences *nominal exchange rate*

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.

E.g. if the Canadian government pursues a more inflationary monetary policy than Japan but less inflationary monetary policy than US, the Canadian dollar will weaken compared to the Yen but strengthen compared to the US dollar

Case Study: The Nominal Exchange Rate during a Hyperinflation

Germany in 1920s: government increased money supply → prices rose rapidly (hyperinflation) → value of German mark compared to US cents (nominal exchange rate) declined rapidly



Limitations of Purchasing-Power Parity

The purchasing-power parity theory is not completely accurate- exchange rates do not always move to ensure that a dollar has the same real value in all countries all the time

Two main reason for why the theory does not always hold in practice

1. Many goods are not easily traded

- E.g. a haircut in Montreal may be cheaper than Paris, but there is no way for the French to buy haircuts in Montreal without actually going there → therefore the real price in Paris would remain higher

2. Tradable goods are not always perfect substitutes when they are produced in different countries

- E.g. if German beer is more popular than Canadian beer, people will be more willing to pay for it and its price will remain higher
No possibility for arbitrage because consumers do not view the two beers as equivalent

Since purchasing power-parity is not perfect, real exchange rates fluctuate over time (don't remain at 1)

However, the theory is enough to think that deviations of the real exchange rate are small and temporary → therefore, changes in *nominal* exchange rate can be explained by changes in price levels at home and abroad

Case Study: The Hamburger Standard

Since it is sold around the world by McDonald's, the Big Mac is often used to compute the exchange rate predicted by the theory of purchasing-power parity

Predicted exchange rate is the one that makes the cost of the Big Mac the same in the two countries

- E.g. if a Big Mac is \$2 in US and 200 Yen in Japan, it means that the exchange rate should be 100 Yen/ USD ($e = P/P^*$)

Country	Price of a Big Mac	Predicted Exchange Rate	Actual Exchange Rate
Canada	3.29 \$CDN	1.07 \$CDN/\$US	1.25 \$CDN /\$US
South Korea	2500 won	817 won/\$US	1004 won/\$US
Japan	250 yen	82 yen/\$US	107 yen/\$US
Sweden	31 kronor	10.1 kronor/\$US	7.4 kronor/\$US
Mexico	28 peso	9.2 peso/\$US	10.8 peso/\$US
Euro area	3.21 euro	1.05 euro/\$US	0.90 euro/\$US
Britain	1.88 pounds	0.61 pounds/\$US	0.55 pounds/\$US

Interest Rate Determination in a Small Open Economy with Perfect Capital Mobility

Why do Canadian interest rates rise and fall along with US interest rates

Must modify model when considering market for loanable funds

- Instead of closed economy, assume Canada is a *small open economy with perfect capital mobility*

A Small Open Economy

Small open economy- an economy that trades goods and services with other economies and, by itself, has a negligible effect on world prices and interest rates

e.g. an increase in the demand for computer chips in Canada will not affect world prices

e.g. an increase in the supply of Canadian bonds (supply of loanable funds) also has a negligible effect on overall interest rates

Perfect Capital Mobility

Perfect capital mobility- full access to world financial markets

- Canadians have full access to world financial markets and people in the rest of the world have full access to Canadian financial markets

Due to perfect capital mobility, real interest rate in Canada should equal the real interest rate prevailing in world financial markets:

$$r = \text{real interest rate in Canada}$$

$$w = \text{real interest rate in world}$$

Since Canadians have access to earning interest from around the world, if an interest rate is higher somewhere else, it will eventually balance with interest rate in Canada

- E.g. if r^W is 8% and r is 5%, Canadians will sell their own assets and buy foreign assets instead → forces Canadian borrowers to match 8% interest

As long as Canadian and foreign assets are close substitutes, arbitrage prevents a price difference

- Similar to law of one price and purchasing-power parity, except the “price” is the real interest rate in the market for loanable funds

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

Limits to Interest Rate Parity

Just as there are limitations to the purchasing-power parity theory, there are also limitations to interest rate parity explaining how real interest rates are determined

Two key reasons why r does not always equal r^W

1. **Financial assets carry the possibility of default, and some carry more risk than others**

- A financial asset such as bond from a less stable country may be considered more risky so would have to charge higher interest

E.g. between 1984 to 2006, Canadian interest rate was 1% higher than in US because of perceived higher risk → this difference decreased as people developed more confidence in Canadian borrowers

2. **Financial assets offered for sale in different countries are not always perfect substitutes for each other**

- E.g. the Canadian government may tax returns on financial assets more than US government → Canadian assets may be pay more interest pre-tax, but is worth the same after-tax

Chapter 13: A Macroeconomic Theory of the Open Economy

Key macroeconomic variables: net exports, net capital outflow, real and nominal exchange rates
Need a macroeconomic theory of open economy to understand what factors determine a

country's trade balance and exchange rate, and how government policies can affect it

Assumptions of model

- Economy's *GDP* is given- determined by economy's supply of factors of production and production technology
- Economy's *price level* is given- price level adjusts to bring supply and demand for money into balance
- Economy's *real interest rate (r)* is given- equal to world interest rate because of perfect capital mobility

Supply and Demand for Loanable Funds and for Foreign-Currency Exchange

Focus on two markets:

- **Market for loanable funds**- coordinates economy's saving, investment and the flow of loanable funds abroad (net capital outflow)
- **Market for foreign-currency exchange**- coordinates people who want to exchange the domestic currency for the currency of other countries

The Market for Loanable Funds

In closed economy model (ch.8), we made assumption that in market for loanable funds, quantity of funds supplied (saving)=quantity of funds demanded (investment) at interest rate
In open economy model:

$$\text{Saving (S)} = \text{Domestic investment (I)} + \text{Net capital outflow (NCO)}$$

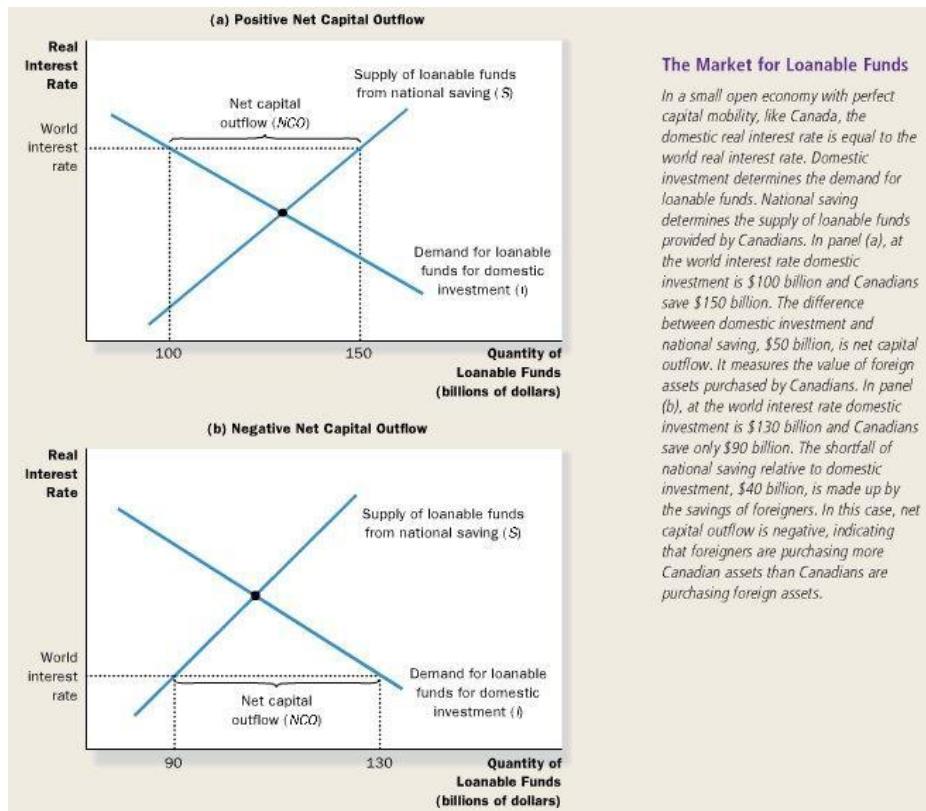
- If national saving exceeds domestic investment: excess money used to fund foreign investment (NCO is positive)
- If domestic investment exceeds national saving: excess investment funded by foreign saving (NCO is negative)

Since Canadian interest rate must equal the world interest rate, the quantity of loanable funds supplied and demanded are not always equal

- If r^W above equilibrium → supply exceeds demand → positive NCO (Canadians buy more foreign assets than vice versa)
- If r^W below equilibrium → demand exceeds supply → negative NCO (foreigners buy more Canadian assets than vice versa)

Recall: Net capital outflow is related to net exports:

$$\text{Net Capital Outflow (NCO)} = \text{Net Exports (NX)}$$



The Market for Foreign-Currency Exchange

Market for foreign exchange exists because people want to trade goods with people in other countries but want to be paid in their own currency

- i.e. if Canadian wants to buy a Japanese good, they must first convert their \$CAD to Yen
- derive expression for net exports:

$$NCO = NX$$

$$S = I + NCO$$

$$\text{Net Exports (NX)} = \text{Saving (S)} - \text{Investment (I)}$$

Each side of identity represents each side of the market for foreign-currency exchange

- Net capital outflow (NCO)- represents quantity of dollars **supplied** in the market for foreign-currency exchange for the purpose of buying foreign assets
 - E.g. when Canadian company wants to buy Japanese bond, it needs to exchange \$CAD for Yen → *supplying* \$CAD to market for foreign-currency exchange
- Net exports (NX)- represents quantity of dollars **demanded** in that market for the purpose of buying Canadian net exports of goods and services
 - E.g. when Japanese airline wants to buy a Bombardier plane, it needs to exchange Yen for \$CAD → *demanding* \$CAD to market for foreign currency

Real exchange rate is the “price” that balances the supply and demand in market for foreign currency

- RER= *relative* price of domestic goods

Demand for dollars (NX) *slopes downward*

- If \$CAD appreciates (RER increases) → Canadian goods are more expensive to foreigners → net exports fall → fewer Canadian dollars demanded to buy goods
- If \$CAD depreciates (RER decreases) → Canadian goods are less expensive to foreigners → net exports rises → more Canadian dollars demanded to buy goods

Supply curve is *vertical*

- amount Canadians want to invest in foreign assets (NCO) is not influenced by the prices of Canadian goods

If RER above equilibrium: quantity of dollars supplied by Canadians (NCO) exceeds quantity demanded by foreigners (NX) → RER pushed downward

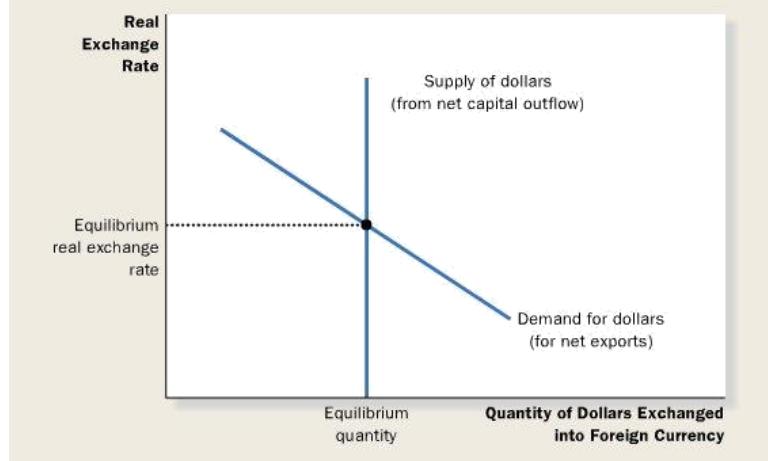
If RER below equilibrium: quantity of dollars demanded by foreigners (NX) exceeds quantity demanded by Canadians (NCO) → RER pushed upward

At the equilibrium real exchange rate, the demand for dollars to buy net exports exactly balances the supply of dollars to be exchanged into foreign currency to buy assets abroad

Transactions involving financial assets affect NCO, and transactions involving goods affect NX

The Market for Foreign-Currency Exchange

The real exchange rate is determined by the supply and demand for foreign-currency exchange. The supply of dollars to be exchanged into foreign currency comes from net capital outflow. Net capital outflow, in turn, equals the difference between the demand for loanable funds (domestic investment) and the supply of loanable funds made available by the savings of Canadians. Because neither domestic savings nor domestic investment depends on the real exchange rate, the supply curve is vertical. The demand for dollars comes from net exports. Because a lower real exchange rate stimulates net exports (and thus increases the quantity of dollars demanded to pay for these net exports), the demand curve is downward sloping. At the equilibrium real exchange rate, the number of dollars people supply to buy foreign assets exactly balances the number of dollars people demand to buy net exports.



Equilibrium in the Open Economy

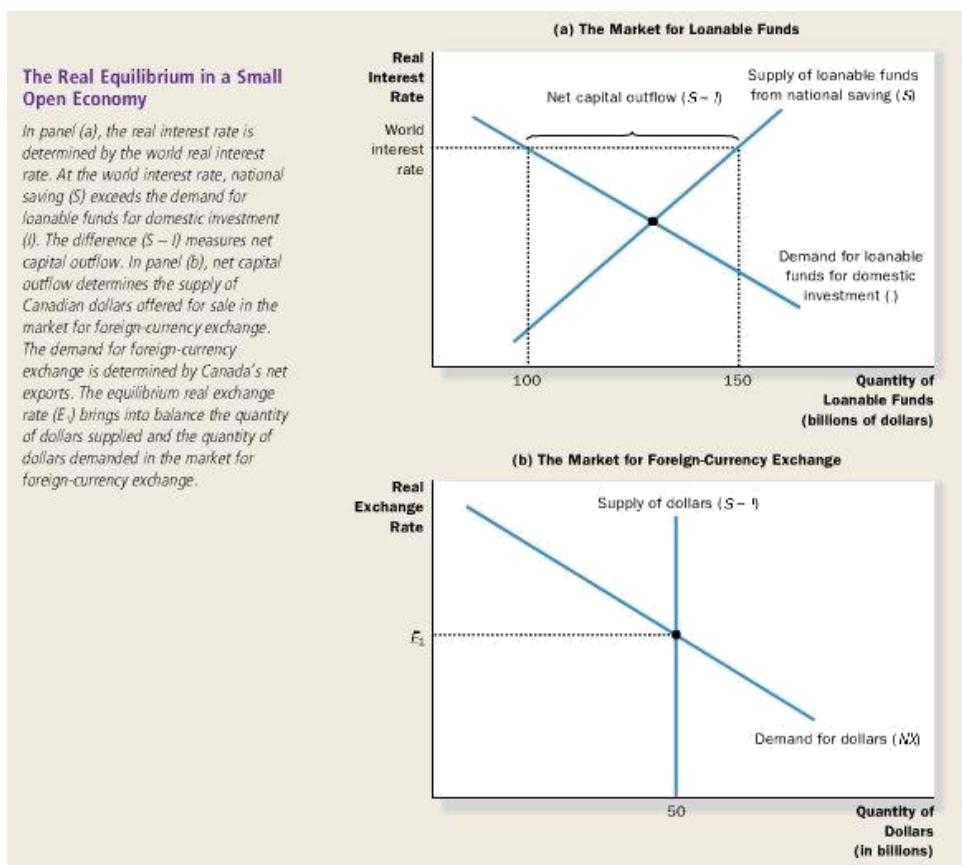
Net Capital Outflow: The Link between the Two Markets

Net capital outflow is the variable that links the market for loanable funds in and the market for foreign-currency exchange in an open economy

Change in domestic investment (I), national saving (S) or world interest rate (r^W) → changes NCO
($S-I$) → shifts quantity of dollars supplied in market for foreign-currency exchange

Simultaneous Equilibrium in Two Markets

Put the two pieces of the model together- the market for loanable funds and the market for foreign-currency exchange jointly determine the important macroeconomic variables of an open economy: national saving, domestic investment, net foreign investment (NCO), net exports real exchange rate



How Policies and Events Affect an Open Economy

Policies and events affect the key open economy variables by causing shifts in the various curves

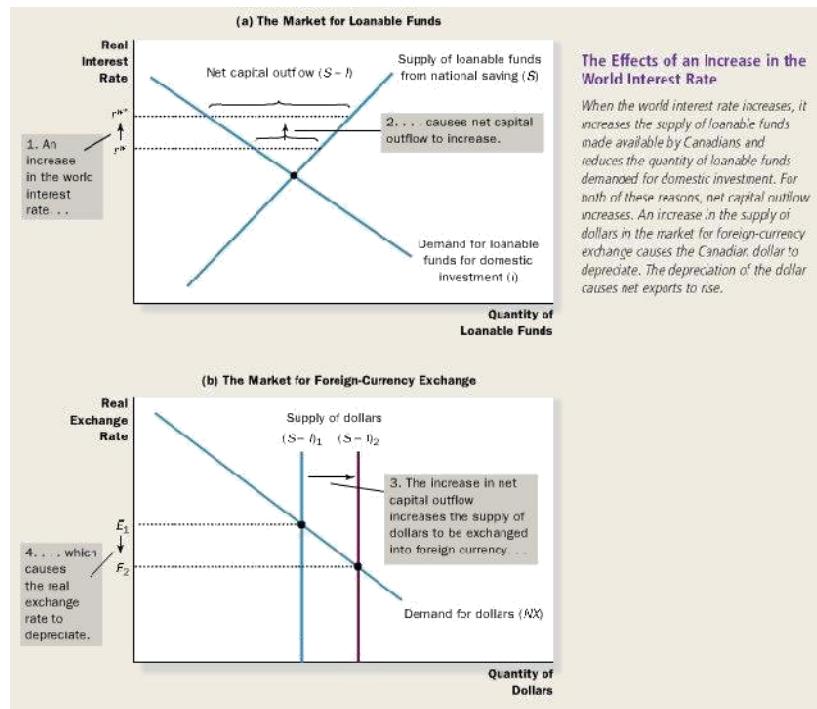
Increase in World Interest Rates

Since world interest rate must equal Canadian interest rate, events outside Canada that cause the world interest rate to change can have important effects on the Canadian economy

- E.g. change in US interest rate

Market for loanable funds: Increase in world interest rate → less loanable funds demanded and more loanable funds supplied at new rate → NCO increases

Market for foreign-currency exchange: increased NCO → increase in dollars supplied to foreign exchange market → supply of dollars curve shifts outward → real exchange rate decreases (\$CAD depreciates) → people buy more Canadian goods → net exports rise



In a small open economy with perfect capital mobility, an increase in the world interest rate crowds out domestic investment, causes the dollar to depreciate and causes net exports to rise

Therefore, rise in world interest rates and corresponding depreciation of dollar....

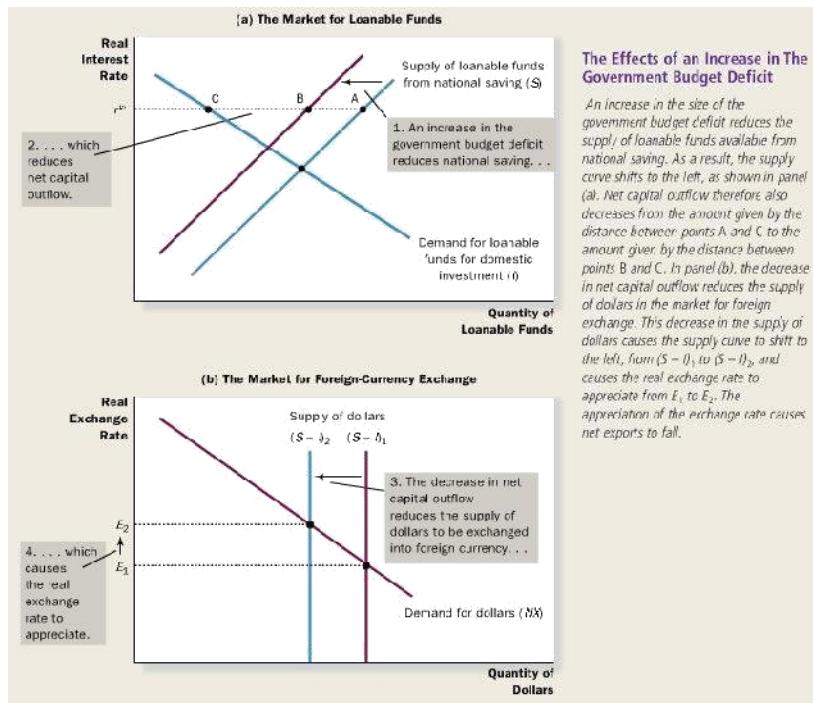
- Benefits: exporters
- Hurts: importers, consumers buying foreign goods, investors

Government Budget Deficits and Surpluses

Deficit: government spending exceeds government revenue → negative public saving → reduces national saving

Market for Loanable Funds: Increase in government budget deficit (or decrease in surplus) → national saving reduced → supply of loanable funds shifts inward → NCO reduced

Market for Foreign-Currency Exchange: reduced NCO → decrease in dollars supplied to foreign exchange market → supply of dollars curve shifts inward → real exchange rate increases (\$CAD appreciates) → people buy fewer Canadian goods → net exports decreases



The Effects of an Increase in The Government Budget Deficit

An increase in the size of the government budget deficit reduces the supply of loanable funds available from national saving. As a result, the supply curve shifts to the left, as shown in panel (a). Net capital outflow therefore also decreases from the amount given by the distance between points A and C to the amount given by the distance between points B and C. In panel (b), the decrease in net capital outflow reduces the supply of dollars in the market for foreign exchange. This decrease in the supply of dollars causes the supply curve to shift to the left, from $(S - l_1)$ to $(S - l_2)$, and causes the real exchange rate to appreciate from E_1 to E_2 . The appreciation of the exchange rate causes net exports to fall.

In a small open economy with perfect capital mobility, an increase in government budget deficit causes the dollar to appreciate and causes net exports to fall

The opposite is true if there is an increase in government surplus or decrease in deficit: *In a small open economy with perfect capital mobility, a decrease in government budget deficits causes the dollar to depreciate and causes net exports to rise*

- E.g. Canada for much of the late 90s → lower dollar hurt importers but benefitted exporters

Trade Policy

Trade policy- a government policy that directly influences the quantity of goods and services that a country imports or exports

Examples of trade policies:

- **Tariff**- a tax on goods produced abroad and sold domestically
- **Import quota**- a limit on the quantity of a good that is produced abroad and sold domestically
- Both tariffs and import quotas reduce imports → increase net exports?

E.g. Canadian auto industry wants to reduce competition from Japan and lobbies to restrict import of Japanese cars

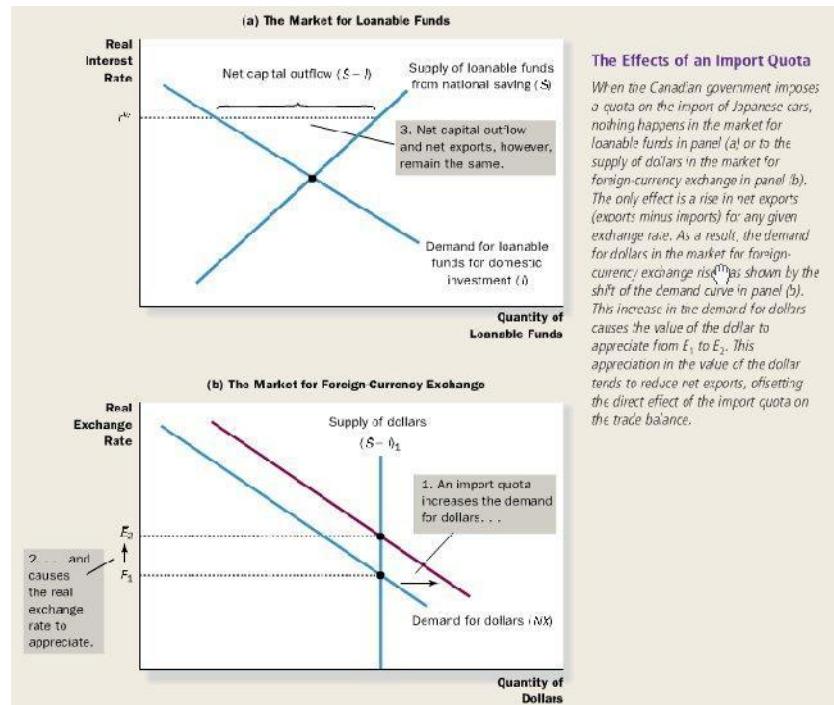
Market for foreign currency exchange: Import quota reduces imports → net exports rise for each real exchange rate → demand for dollars curve shifts outward → real exchange rate increases, but quantity of \$CAD demanded remains the same

Net capital outflow is not affected → no change in net exports

Trade policies do not affect the trade balance because they do not alter domestic saving or investment

Although trade policies do not affect overall trade balance, these policies do affect specific firms, industries and countries

- E.g. Japan would be hurt with policy, but Canadian automakers like GM would benefit
- Appreciation of dollar would hurt exporters
- So effect of trade policies is more *microeconomic* than *macroeconomic*



Chapter 14: A Macroeconomic Theory of the Open Economy

Economic activity fluctuates from year to year

In most years, the production of goods and services rises → creates higher standard of living

- Due to increases in the labour force, increases in the capital stock and advances in technological knowledge

Some years, this normal growth does not occur

- **Recession-** a period of declining real incomes and rising unemployment
- **Depression-** a severe recession

Questions:

- What causes short-run fluctuations?
- What can public policy do to prevent periods of falling incomes and rising unemployment?
- How can policymakers reduce the length and severity of recessions and depression?

Answering the question involves the same variables as those involved in the long run: GDP, unemployment, interest rates, exchange rates and price level

Most economists use the *model of aggregate-demand and aggregate-supply*

Three Key Facts about Economic Fluctuations

Most important properties of the year-to-year fluctuations that occur in all countries

Fact 1: Economic Fluctuations Are Irregular and Unpredictable

Fluctuations in the economy are often called the *business cycle* because they involve changes in business conditions

- Real GDP goes up → business is good (customers are plentiful and profits are growing)
- Real GDP goes down → business is bad (declining sales and profits)

These ups and downs are irregular and don't follow a set pattern

Fact 2: Most Macroeconomic Quantities Fluctuate Together

Real GDP is the variable that is most commonly used to monitor changes in the economy

Most macroeconomic variables that measure some type of income spending or production fluctuate closely together

- E.g. when real GDP falls in a recession, so do personal income, corporate profits, consumer spending, investment spending, etc.

The macroeconomic variables fluctuate by different amounts

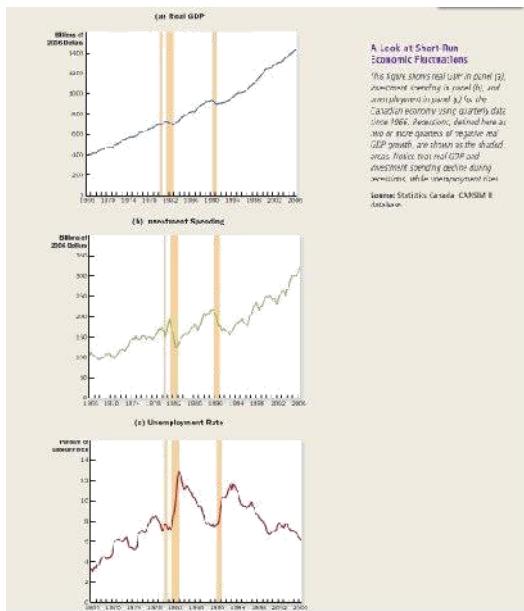
- E.g. a drop in investment spending may account for 80% of drop in GDP as less is spent on new factories, housing, inventories, etc.

Fact 3: As Output Falls, Unemployment Rises

As real GDP declines → rate of unemployment rises

When firms choose to produce a smaller quantity of goods and services, they lay off workers, expanding the pool of unemployed

Although unemployment rate will decline when economy improves production, it never approaches 0; it fluctuates around its natural rate



Explaining Short-Run Economic Fluctuations

The Assumptions of Classical Economics

Classical dichotomy- separation of variables into real variables (those that measure quantities or relative prices) and nominal variables (those measured in terms of money)

When studying productivity and real GDP (Ch.7), saving and investment (Ch.8) unemployment (Ch.9) in the *long run*, we assumed that changes in these variables were not affected by price

- In this sense, changes in money supply (Ch.11-12) are not influential in a *classical* economic world

The Reality of Short-Run Fluctuations

Most economists believe that classical theory describes the world in the long run, but not in the short run

When studying year-to-year changes in the economy, the assumption of monetary neutrality is no longer appropriate

- In the short-run, changes in money supply/ price can influence push real variables such as real GDP away from their long-run trend

To understand how the economy works in the short run, we need a new model that uses many of the tools developed in previous chapters but abandons the classical dichotomy and neutrality of money

The Model of Aggregate-demand and Aggregate-supply

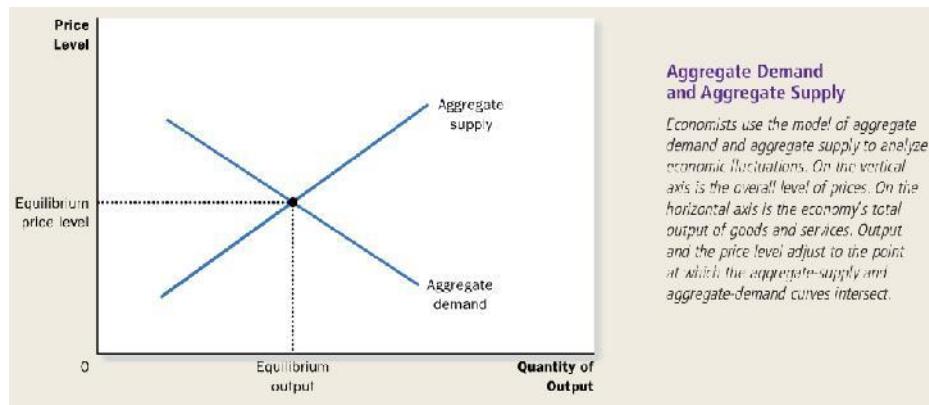
Model of aggregate-demand and aggregate-supply- the model that most economists use to explain short-run fluctuations in economic activity around its long-run trend

Aggregate-demand curve- a curve that shows the quantity of goods and services that households, firms, and the government want to buy at each price level

Aggregate-supply curve- a curve that shows the quantity of goods and services that firms choose to produce and sell at each price level

The price level and the quantity of output adjust to bring aggregate-demand and aggregate-supply into balance

Note that the model focuses on the behaviour of output (real GDP) and price level- a real and a nominal variable



The model should not be confused as the sum of the supply and demand curves of each individual market

- The model of a specific market relies on *microeconomic* substitution from one market to another and this is not possible with aggregate curves
 - E.g. if the price of ice cream goes up, less people buy because they buy something else instead

The Aggregate-demand Curve

The aggregate-demand curve is downward sloping

- all other things equal, a fall in the economy's overall level of prices ($P_1 \rightarrow P_2$) tends to raise the quantity of goods and services demanded ($Y_1 \rightarrow Y_2$)

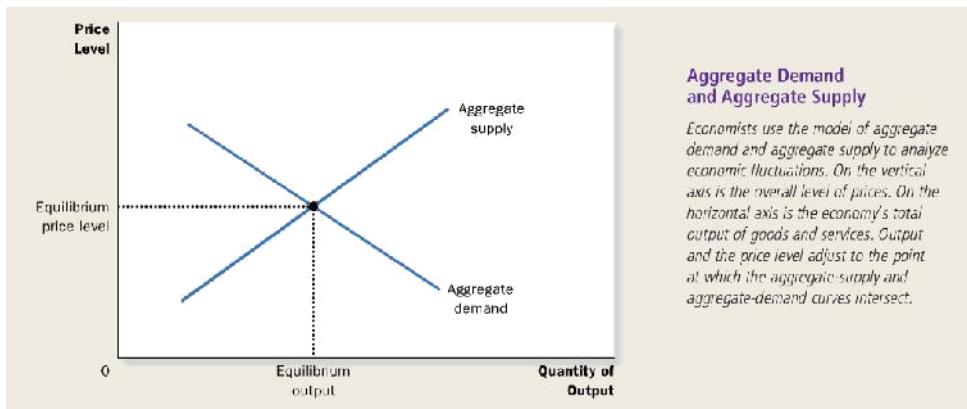
Why the Aggregate-Demand Curve Slopes Downward

recall: GDP (from an expenditure perspective) is the sum of consumption (C), investment (I), government purchases (G) and net exports (NX)

= + + +

Since we are looking at how much people an economy want to spend on goods and services and are measuring output (real GDP) on the x-axis, we need to consider these components

- Assume government expenditure is fixed by policy, but examine the other variables



The Price Level and Consumption: The Wealth Effect

When the price level falls, goods and services become cheaper, but you have the same number of dollars in your wallet- temporarily you become more wealthy and your demand for goods and services increases

Decrease in price level → temporarily increases value of real money → consumers are wealthier → consumers spend more (C up) → larger quantity of goods and services demanded

Increase in price level → temporarily decreases value of real money → wealth decreases → consumers spend less (C down) → smaller quantity of goods and services demanded

The Price Level and Investment: The Interest Rate Effect

Recall: decreasing price level decreases demand for money (Ch.11); as prices go down, people have excess money and can lend it to firms

Greater quantity of loanable funds supplied causes interest rate to go down, allowing firms to invest more

Decrease in price level → consumers save more → interest rates decrease → firms invest more (I up) → larger quantity of goods and services demanded

Increase in price level → consumers save less → interest rates increase → firms invest less (I down) → smaller quantity of goods and services demanded

The Price Level and Net Exports: The Real Exchange-Rate Effect

Recall: real exchange rate measures the rate at which a person can trade Canadian-produced goods and services for the goods and services of other countries.

= *

A higher price level means that the real exchange rate is higher- Canadian goods are more expensive to foreigners

Decrease in price level → real exchange rate decreases → Canadian goods relatively cheaper compared to foreign goods → Canadians and foreigners substitute away from foreign goods → Net exports increases (NX up) → Quantity demanded of Canadian goods increases
 Increase in price level → real exchange rate increases → Canadian goods more expensive compared to foreign goods → Canadians and foreigners substitute in favour of foreign goods → net exports decreases (NX down)

Summary

There are three distinct but related reasons why a fall in the price level increases the quantity of goods and services demanded:

1. Consumers are wealthier, which stimulates the demand for consumption goods
2. Interest rates fall, which stimulates the demand for investment goods
3. The exchange rate depreciate, which stimulates the demand for net exports

The reverse effect occurs when the price level decreases

Assume that money supply is fixed when considering these curves

Movement along the curve is due change in *price level*, but when money supply is constant

Why the Aggregate-Demand Curve Might Shift

Downward slope of the aggregate-demand curve shows that a fall in the price level raises the overall quantity of goods and services demanded

Many other factors affect the quantity of goods and services demanded at a *given price level*

- A change in these factors causes a shift in the curve

Categorize events that would shift demand curve by component of spending

Shifts Arising from Changes in Consumption

Any event that changes how much people want to consume at a given price level shifts the aggregate-demand curve

- E.g. drop in stock prices → people feel less wealthy → spend less at each price → aggregate-demand curve shifts outward

Taxation is a policy variable that can influence this

- Cut taxes → people spend more at each price level → aggregate-demand curve shifts outward
- Raise taxes → people spend less at each price level → aggregate-demand curve shifts inward

Shifts Arising from Changes in Investment

Any event that changes how much firms want to invest at a given price level shifts the aggregate-demand curve

- E.g. faster type of computer comes out → firms want to invest in it → firms spend more at each price level → aggregate-demand curve shifts outward

Tax policy can also influence aggregate-demand through investment

- Introduction of investment tax credit → firms demand more loanable funds at each price level → aggregate-demand shifts outward

- Repeal of investment tax credit → firms demand less loanable funds at each price level → aggregate-demand shifts inward

Shifts Arising from Changes in Government Purchases

The most direct way that policymakers shift the aggregate-demand curve is through government purchases

- E.g. parliament decides to purchase new equipment for armed forces → increased demand for these goods at each price level → aggregate-demand shifts outward
- E.g. provincial government decides to spend less on highway construction → decreased demand for these goods at each price level → aggregate-demand shifts inward

Shifts Arising from Changes in Net Exports

Any event that changes net exports for a given price level also shifts aggregate-demand

- E.g. US experiences recession → fewer goods bought from Canada → net exports reduced at each price → aggregate-demand curve for the Canadian economy shifts to the left

Net exports sometimes change because of movements in the exchange rate

- Value of Canadian dollar increases (appreciates) → Canadian goods more expensive compared to foreign goods → depresses net exports → shifts aggregate-demand curve inward

Summary

The Aggregate-Demand Curve: Summary	Why Does the Aggregate-Demand Curve Slope Downward? <ol style="list-style-type: none"> 1. <i>The Wealth Effect:</i> A lower price level increases real wealth, which encourages spending on consumption. 2. <i>The Interest Rate Effect:</i> A lower price level reduces the interest rate, which encourages spending on investment. 3. <i>The Real Exchange-Rate Effect:</i> A lower price level causes the real exchange rate to depreciate, which encourages spending on net exports. Why Might the Aggregate-Demand Curve Shift? <ol style="list-style-type: none"> 1. <i>Shifts Arising from Changes in Consumption:</i> An event that makes consumers spend more at a given price level (a tax cut, a stock market boom) shifts the aggregate-demand curve to the right. An event that makes consumers spend less at a given price level (a tax hike, a stock market decline) shifts the aggregate-demand curve to the left. 2. <i>Shifts Arising from Changes in Investment:</i> An event that makes firms invest more at a given price level (optimism about the future, a fall in interest rates due to an increase in the money supply) shifts the aggregate-demand curve to the right. An event that makes firms invest less at a given price level (pessimism about the future, a rise in interest rates due to a decrease in the money supply) shifts the aggregate-demand curve to the left. 3. <i>Shifts Arising from Changes in Government Purchases:</i> An increase in government purchases of goods and services (greater spending on defence or highway construction) shifts the aggregate-demand curve to the right. A decrease in government purchases of goods and services (a cutback in defence or highway spending) shifts the aggregate-demand curve to the left. 4. <i>Shifts Arising from Changes in Net Exports:</i> An event that raises spending on net exports at a given price level (a boom experienced by a major trading partner, an exchange rate depreciation) shifts the aggregate-demand curve to the right. An event that reduces spending on net exports at a given price level (a recession experienced by a major trading partner, an exchange-rate appreciation) shifts the aggregate-demand curve to the left.
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The Aggregate-Supply Curve

The aggregate-supply curve shows a relationship that depends crucially on the time horizon being examined

In the long run, the aggregate-supply curve is vertical, whereas in the short run, the aggregate-supply curve is upward sloping

Why the Aggregate-Supply Curve is Vertical in the Long Run

Recall: long run production is a function of many factors:

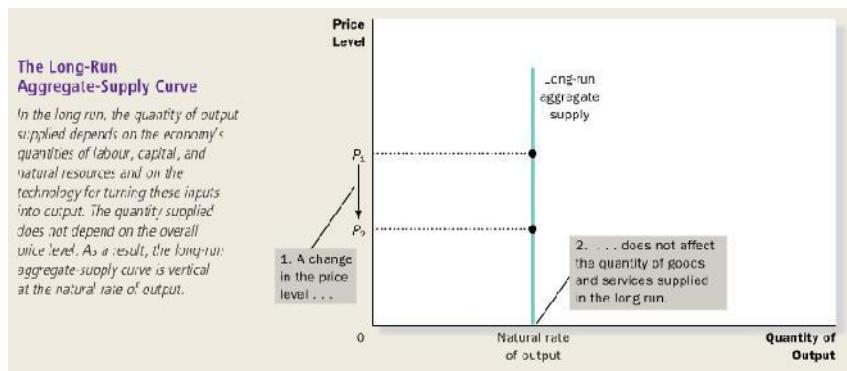
$$= \times (,,)$$

Output (Y) is a product of available production technology (A) and a function of the quantity of labour (L), quantity of physical capital (K), the quantity of human capital (H) and the quantity of human resources (N)

In the long run, an economy's production of goods and services (its real GDP) depends on its supplies of **labour, capital and natural resources** and on the **available technology** used to turn these factors of production into goods and services

These factors that determine long run productivity and growth are *independent of the price level* → the long run aggregate-supply curve is vertical

- E.g. if two economies were identical except that one had twice as much money, the output of goods and services in the long run would be the same between the two countries



Why the Long-Run Aggregate-Supply Curve Might Shift

Natural rate of output- the production of goods and services that an economy achieves in the long run when unemployment is at its nominal rate

Any change in the economy that alters the natural rate of output shifts the long-run aggregate-supply curve

Since output in the long run depends on labour, capital, natural resources, and technological knowledge, shifts in long-run aggregate-supply curve arise from these sources

Shifts Arising from Changes in Labour

Changes in employment affect labour supply

- Increase in *immigration* → increases labour supply → increases output → aggregate-supply curve shifts inward
- Decrease *immigration* → decreases labour supply → decreases output

Position of the long-run aggregate-supply curve also depends on the natural rate of unemployment which is influenced by several factors (Ch.9)

- Provincial governments increase minimum wage → natural rate of unemployment rises → less labour supplied → decreases output → aggregate-demand curve shifts inward
- Less generous employment insurance system → encourages unemployed workers to search harder for new jobs → natural rate of unemployment falls → long-run aggregate-supply curve shifts inward

Shifts Arising from Changes in Capital

Increase economy's capital stock → increase productivity → increases quantity of goods and services supplied → shifts supply curve outward

Decrease in economy's capital stock → decrease productivity → decreases quantity of goods and services supplied → shifts supply curve inward

Applies to both *human capital* (e.g. more university degrees given out) and *physical capital* (e.g. more machines used)

Shifts Arising from Changes in Natural Resources

Examples of how natural resources can be affected and how this shifts aggregate-supply:

- Discovery of mineral deposit → more minerals available → more goods produced → shifts aggregate-supply curve outward
- Bad weather patterns → farming is difficult → less goods produced → shifts aggregate-supply curve inward

Important natural resources are often imported from abroad, so changes in the supply of these resources can also shift aggregate-supply curve

- E.g. oil imported from Middle East

Shifts Arising from Changes in Technological Knowledge

Our technology has advanced over time, allowing us to produce more and shifting the aggregate-supply curve outward

- E.g. invention of computer → more produced for any given amount of labour, capital and natural resources → long-run aggregate-supply curve shifted to the right

Many other non-technological events that improve productivity can act like changes in technology

- Opening up international trade → countries can specialize in high-productivity industries → shifts aggregate-supply curve outward
- Government restrictions on production methods → inward shift in aggregate-supply curve

An increase in the economy's capital stock increases productivity and, thereby, the quantity of goods and services supplied

Summary

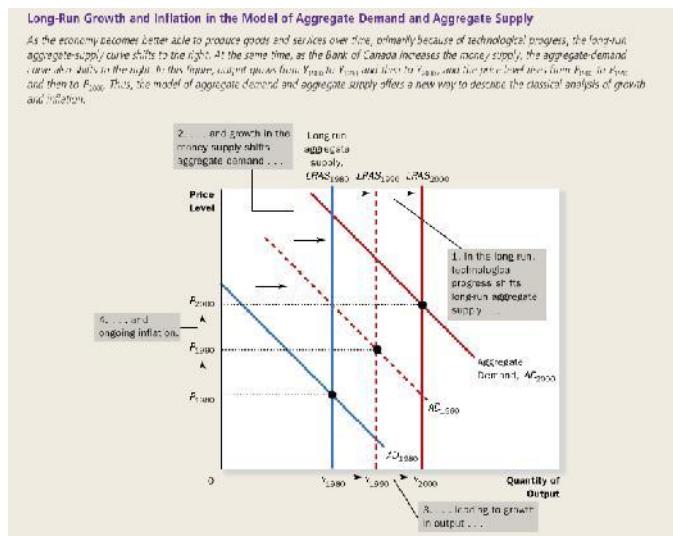
Any factor that increases productivity shifts aggregate-supply curve outward

Any factor that decreases productivity shifts aggregate-supply curve inward

Using Aggregate Demand and Aggregate Supply to Depict Long-Run Growth and Inflation

Two most important forces that causes shifts in the long run:

- **Technology**- technological progress enhances the economy's ability to produce goods and services→ continually shifts aggregate-supply curve outward
- **Monetary policy**-since Bank of Canada increases the money supply over time→aggregate demand curve also shifts outward→ price level rises (inflation)



If shift in demand (due to increase in money supply) is greater than shift in supply (due to technology), there is an increase in output and inflation

Short-run fluctuations in output and the price level should be viewed as deviations from the continuing long-run trends

Why the Aggregate-Supply Curve Slopes Upward in the Short Run

The different behaviour of aggregate supply is the key difference between the economy in the short run and the economy in the long run

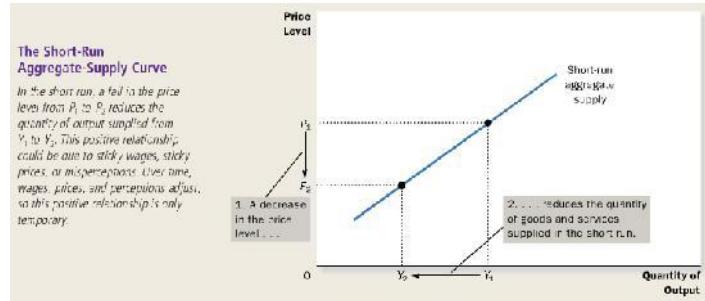
- Unlike in the long-run, the price level *does* affect the economy's output

Macroeconomists have proposed three theories for the upward slope of the short-run aggregate-supply curve

- Each theory based on imperfection in the market that causes supply curve to differ in the short run than in the long run

The quantity of output supplied deviates from its long-run, or "natural" level when the actual price level deviates from the price level that people expected to prevail

- Price level rises above expected level → output rises above natural rate ○
- Price level drops below expected level → output drops below natural rate ○
- These trends account for positive sloping supply curve



The Sticky-Wage Theory

The short-run aggregate-supply curve slopes upward because nominal wages are slow to adjust to changing economic conditions

- Wages are “sticky” in the short run- they don’t adjust to price changes right away
If firm thought price level was going to be *higher than* actual price level → firm decrease production → output increases
 - E.g. if a firm thought that price level was going to be 100 and signed a contract with workers agreeing to pay them \$20/ hour, but actual price level is 95 → firm gets 5% less for each unit it sells → the firm has to reduce output at that price level by hiring fewer workers or investing less
- if firm thought that price level was going to be *lower than* actual price level → firm can increase production → output increases

The Sticky- Price theory

the sticky-price theory emphasizes that the prices of some goods and services adjust slowly in response to changing economic conditions

prices are not adjusted immediately because there is a cost to doing so- *menu costs*

if price set by firms is lower than expected → lag behind in decreasing prices → sales decline → firms cut back on production and employment → output decreases

The Misperceptions Theory

changes in overall price level can temporarily mislead suppliers about what is happening in the individual markets in which they sell their output

suppliers respond to changes in the level of prices and this response leads to an upward-sloping aggregate-supply curve

price level goes down → firms think that the price of their good went down relative to other goods → cut production/ lay off workers → quantity of output decreases

price level goes up → firms think that the price of their good went up relative to other goods → improve production → quantity of output increases

e.g. when price level drops, wheat farmers may think that wheat has become less popular and produce less, when in actual fact, all prices have fallen so the demand for their product is the same

Summary

All three theories suggest that output deviates from its natural rate when price level deviates from the price level that people expect:

$$\text{Quantity of output} = \text{Natural rate of output} + a (\text{Actual price} - \text{Expected price level})$$

$$\text{supplied} = * + (-\text{level})$$

a= number that determines how much output responds to unexpected changes in price level

In the long run, prices become “unstuck” and misperceptions corrected- the mathematical statement becomes:

$$\text{Quantity of output supplied} = \text{Natural rate of output}$$

Why the Short-Run Aggregate-Supply Curve Might Shift

The short-run aggregate-supply curve is affected by all the same variables as the long-run vertical curve, except it is also affected by changes in price level

The factors that cause the supply curve to be sloped upward (sticky wages, sticky prices and misperceptions) are based on *expectations* of the price level

- if expectations change, the curve shifts

workers and firms expect high price level → negotiate higher nominal wages → high wages raise firms' costs → reduces quantity of goods and services supplied at any given price level → short-run supply curve shifts inward

workers and firms expect lower price level → negotiate lower nominal wages → lower wages reduce firms' costs → increases quantity of goods and services supplied at any given price level → short-run supply curve shifts outward

An increase in the expected price level reduces the quantity of goods and services supplied and shifts the short-run aggregate –supply curve to the left. A decrease in the expected price level raises the quantity of goods and services supplied and shifts the short-run aggregate-supply curve to the right

This shift due to change in expectations helps move the economy to equilibrium between aggregate-demand curve and long-run aggregate-supply curve

The Short-Run Aggregate-Supply Curve: Summary

Why Does the Short-Run Aggregate-Supply Curve Slope Upward?

- The Sticky-Wage Theory:** An unexpectedly low price level raises the real wage, which causes firms to hire fewer workers and produce a smaller quantity of goods and services.
- The Sticky-Price Theory:** An unexpectedly low price level leaves some firms with higher-than-desired prices, which depresses their sales and leads them to cut back production.
- The Misperceptions Theory:** An unexpectedly low price level leads some suppliers to think their relative prices have fallen, which induces a fall in production.

Why Might the Short-Run Aggregate-Supply Curve Shift?

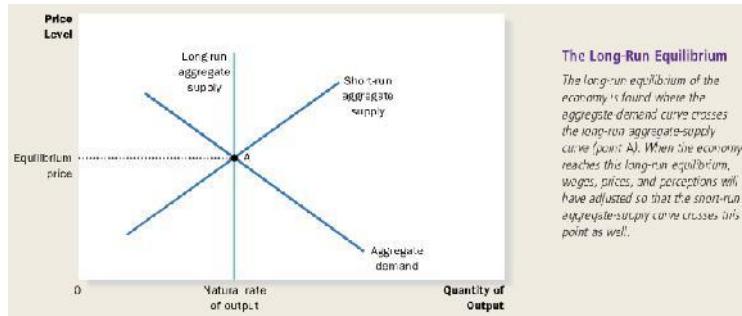
- Shifts Arising from Changes in Labour:** An increase in the quantity of labour available (perhaps due to a fall in the natural rate of unemployment) shifts the aggregate-supply curve to the right. A decrease in the quantity of labour available (perhaps due to a rise in the natural rate of unemployment) shifts the aggregate-supply curve to the left.
- Shifts Arising from Changes in Capital:** An increase in physical or human capital shifts the aggregate-supply curve to the right. A decrease in physical or human capital shifts the aggregate-supply curve to the left.
- Shifts Arising from Changes in Natural Resources:** An increase in the availability of natural resources shifts the aggregate-supply curve to the right. A decrease in the availability of natural resources shifts the aggregate-supply curve to the left.
- Shifts Arising from Changes in Technology:** An advance in technological knowledge shifts the aggregate-supply curve to the right. A decrease in the available technology (perhaps due to government regulation) shifts the aggregate-supply curve to the left.
- Shifts Arising from Changes in the Expected Price Level:** 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.

Two Causes of Economic Fluctuations

Two basic causes of short-run fluctuations: shifts in aggregate demand and shifts in aggregate supply

Assume economy begins in *long-run equilibrium*

- intersection of aggregate-demand curve and long-run aggregate supply curve
- output is at its natural rate
- short-run aggregate-supply curve also passes through equilibrium point
 - indicates that wages, prices and perceptions must have adjusted so that the intersection of aggregate demand with short-run aggregate supply is the same as the intersection of aggregate demand with long-run aggregate supply



When there is a shift, we start by moving either the short-run or long run aggregate supply curve → the new equilibrium that is reached between AD and SRAS is away from LRAS

We must then shift the one of the curves so that all three curves intersect at one point
Summary of steps:

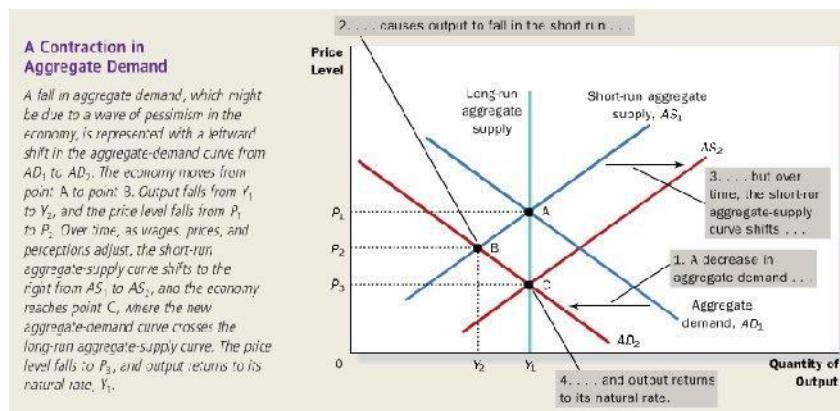
Four Steps for Analyzing Macroeconomic Fluctuations

1. Decide whether the event shifts the aggregate-demand curve or the aggregate-supply curve (or perhaps both).
2. Decide in which direction the curve shifts.
3. Use the diagram of aggregate demand and aggregate supply to see how the shift changes output and the price level in the short run.
4. Use the diagram of aggregate demand and aggregate supply to analyze how the economy moves from its new short-run equilibrium to its long-run equilibrium.

The Effects of a Shift in Aggregate Demand

E.g. suppose that the stock market crashes and a wave of pessimism suddenly overtakes the economy

- Aggregate demand curve shifts inward as people spend less
 - Output falls (Y_1 to Y_2)
 - Price level falls (P_1 to P_2)
 - Lower sales → more unemployment
 - Recession
- Transition from short-run equilibrium to long-run equilibrium: over time, SRAS curve shifts outward as expectations of price level decrease
 - Firms bargain for lower minimum wages, allowing them to produce more
 - Allows for intersection of all three curves



What should policy makers do when faced with sudden fall in aggregate demand?

- As soon as aggregate demand shifts inward, they can try to increase it again by increasing spending or increasing money supply
- This can prevent the painful period of depressed output and employment

Main points:

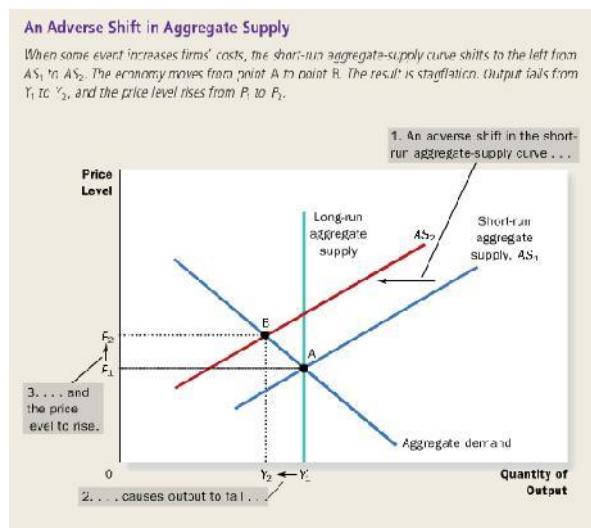
- In the short run, shifts in aggregate demand cause fluctuations in the economy's output of goods and services
- In the long run, shifts in aggregate demand affect the overall price level but do not affect output
- Policymakers who influence aggregate demand can potentially mitigate the severity of fluctuations

The Effects of a Shift in Aggregate Supply

E.g. suppose there is an increase in production costs

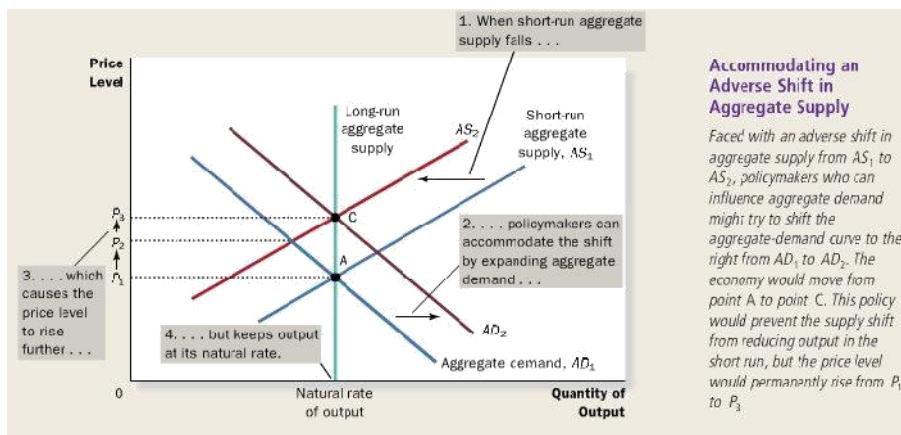
- Aggregate supply curve shifts inward because higher costs make selling goods less profitable, forcing firms to supply less
 - Output falls (Y_1 to Y_2)
 - Price level increases (P_1 to P_2)

- **Stagflation**- a period of falling output (stagnation) and rising prices (inflation)
- Expectations of prices decrease, shifting SRAS curve inward even more
 - Firms respond to higher prices by set higher nominal wages, rising their costs
 - This reduces how much they produce, raising prices even more → causes more unemployment
 - Called **wage-price spiral**
- Transition from short-term to long-term equilibrium: over time, SRAS will shift back to original position
 - Unemployment is high → workers lose bargaining power → wages can be reduced → producing goods and services is more profitable → SRAS shifts outward back to old equilibrium
 - Price level falls
 - Output returns to natural rate



Policymakers might attempt to offset some of the effects of the shift in the SRAS curve by shifting the AD curve

- Increase government spending enough to shift AD outward so that all curves interest again
- Price level rises
- Output returns to natural rate
- Policymakers are said to **accommodate** the shift in aggregate supply
 - Higher prices, but maintains higher level of output and employment



Main points:

- Shifts in aggregate supply can cause stagflation- a combination of recession (falling output) and inflation (rising prices)
- Policymakers who can influence aggregate demand can potentially mitigate the adverse impact on output, but only at the cost of exacerbating the problem of inflation

Chapter 15: The Influence of Monetary and Fiscal Policy on Aggregate Demand

Fiscal policy- relates to government expenditure- controlled by government (minister of finance)

Monetary policy- relates to money supply- controlled by Bank of Canada
in long run:

- fiscal policy affects saving and investment (market for loanable funds-Ch.8)
- monetary policy affects price level (market for money- Ch.11)

fiscal policy and monetary policy also have effects in the short run

monetary and fiscal policymakers sometimes use the policy levers at their disposal to offset shifts in aggregate demand

to start, assume that we are dealing with a *closed* economy

How Monetary Policy Influences Aggregate Demand

Three phenomena work simultaneously to make the aggregate-demand curve slope downward:

- *The wealth effect*: A lower price level raises the real value of household's money holdings, and a higher real wealth stimulates consumer spending.
- *The interest-rate effect*: 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

- *The real exchange-rate effect:* 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.

Real exchange-rate effect not relevant in a closed economy

Wealth-effect- not as important because money holdings are only a small part of household wealth

Therefore, focus on interest-rate effect

Theory of liquidity preference- Keynes's theory that the interest rate adjusts to bring money supply and money demand into balance

The Theory of Liquidity Preference

When using the theory of liquidity preference, we refer to both *real interest rate* and *nominal interest rate*, because inflation is fixed

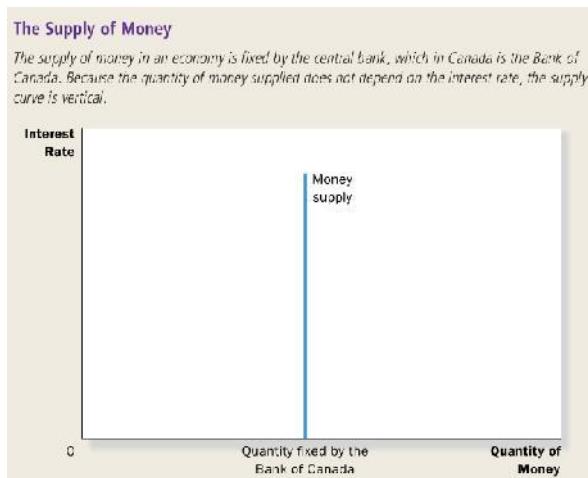
Consider supply and demand in this model and how each depends on interest rate

Money Supply

Bank of Canada controls money supply using two methods

- *Open market operations-* buying and selling government bonds in the bond market or foreign currencies in the market for foreign-currency exchange
 - Buying- increases money supply
 - Selling-decreases money supply
- *Changing bank rate-* changing the amount charged to commercial banks for loans forces them to hold more or less reserve, thus affecting money supply by changing the money multiplier
 - Increasing bank rate- decreases money supply
 - Decreasing bank rate- increases money supply

Assume BOC controls money supply directly (not affected by changes in interest rate) → money-supply curve is a vertical line



Money Demand

Liquidity- ease with which an asset can be converted into the economy's medium of exchange
People want to hold money because it is the most liquid asset

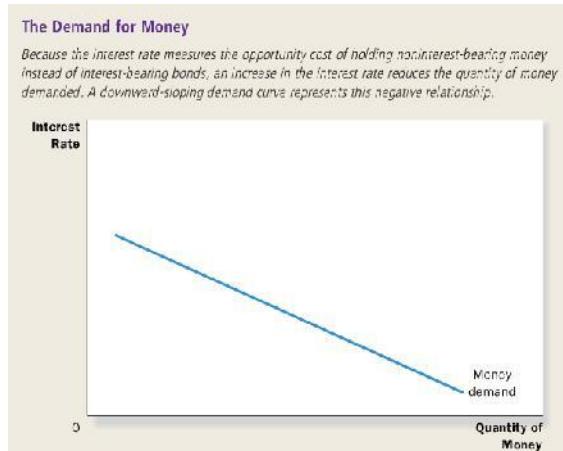
The interest rate determines the quantity of money demanded because it is the opportunity cost of holding money

- Hold more wealth in wallet → lose money you would have earned from interest that a bond pays

Higher interest rate → cost of holding money goes up → reduces quantity of money demanded

Lower interest rate → cost of holding money goes down → increases quantity of money demanded

Since higher interest rates relate to lower demand for money, money demand curve slopes downward



Since money is used to buy goods and services, the goods and affects demand for money

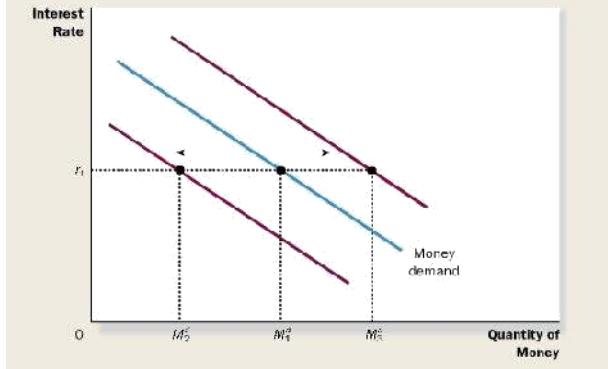
used to buy goods and quantity and price of services available also

- Dollar value of transactions = price index * real GDP

For given interest rate, value of transactions increases → money demand curve shifts outward
For given interest rate, value of transactions decreases → money demand curve shifts inward

Shifts in the Demand for Money

People hold money in order to buy goods and services. If the dollar value of transactions increases because of an increase in either prices or GDP, then for any interest rate (r), people will hold more of their assets as money (increasing from M_d^1 to M_d^2). As a result, the money-demand curve shifts to the right. If the dollar value of transactions decreases because of a decrease in either price or GDP, then for any interest rate (r) people will hold less of their assets as money (decreasing from M_d^1 to M_d^3). As a result, the money-demand curve shifts to the left.



Equilibrium in the Money Market

According to the theory of liquidity preference, the interest rate adjusts to balance the supply and demand for money

Equilibrium interest rate - interest rate at which quantity of money supplied equals quantity of money demanded

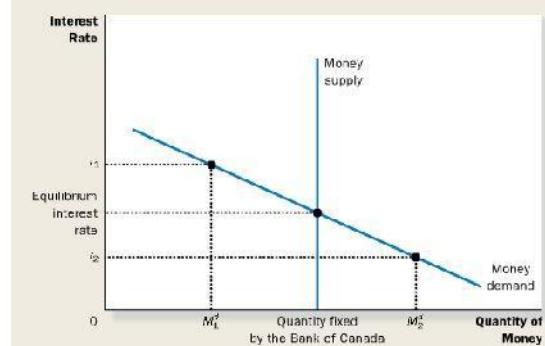
If interest rate is above equilibrium level → quantity of money that people want to hold < quantity of money BOC supplies

(surplus of money) → people try to get rid of money by buying bonds → firms can lower interest rates

Interest rate below equilibrium level → quantity of money people want to hold > quantity of money BOC supplies
(shortage of money) → people try to obtain more money by buying less bonds → firms have to raise interest rates

Equilibrium in the Money Market

According to the theory of liquidity preference, the interest rate adjusts to bring the quantity of money supplied and the quantity of money demanded into balance. If the interest rate is above the equilibrium level (such as at r_2), the quantity of money people want to hold (M_d^2) is less than the quantity the Bank of Canada has created, and this surplus of money puts downward pressure on the interest rate. Conversely, if the interest rate is below the equilibrium level (such as at r_1), the quantity of money people want to hold (M_d^3) is greater than the quantity the Bank of Canada has created, and this shortage of money puts upward pressure on the interest rate. Thus, the forces of supply and demand in the market for money push the interest rate toward the equilibrium interest rate, at which people are content holding the quantity of money the Bank of Canada has created.



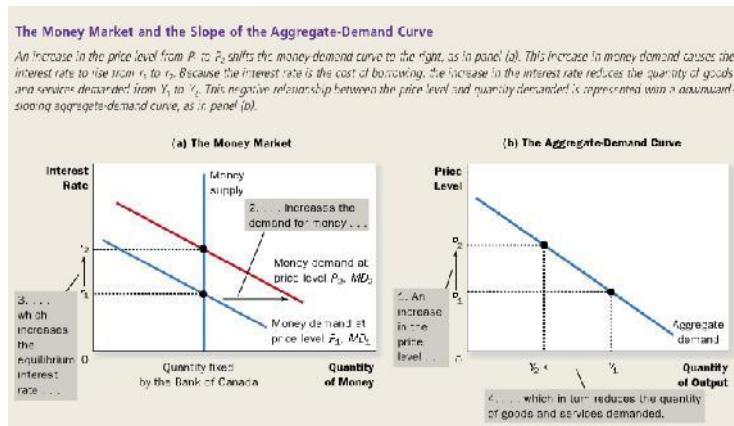
The Downward Slope of the Aggregate-Demand Curve

Theory of liquidity preference has implications for the aggregate demand for goods and services

Prices in economy rise → money demand curve shifts outward as people demand more money at each interest rate → interest rate rises → at higher interest rate cost of borrowing and return

of saving are greater → people demand fewer goods and services → movement up aggregate-demand curve → quantity of output decreases

- This is an application of the interest-rate effect



In open economy, the same phenomenon occurs with the real exchange rate effect

- Prices rise → real exchange rate (eP/P^*) rises → Canadians and foreigners buy less Canadian goods → net exports falls → output falls → movement along aggregate-demand curve

Changes in the Money Supply (Closed Economy)

Whenever the quantity of goods and services demanded changes for a given price level, the demand curve shifts

If Bank of Canada increases the money supply by buying government bonds in open-market operations → money supply curve shifts outward → interest rates drop to balance money supply and money demand (interest rate must fall to induce people to hold new money created) → aggregate demand curve shifts outward (consumers demand more goods, investors demand more funds) → output increases → money demand curve shifts outward (increased expenditure causes people to want more money) → interest rate increases slightly (shift in aggregate demand curve is smaller than it would otherwise have been)

Decreasing the money supply has the opposite effect

Unlike in long-run, money injection does not change price level in the short-run

Summary: When the Bank of Canada increases the money supply, it lowers the interest rate and increases the quantity of goods and services demanded for any given price level, shifting the aggregate-demand curve to the right. Conversely, when the bank of Canada contracts the money supply, it raises the interest rate and reduces the quantity of goods and services demanded for any given price level, shifting the aggregate-demand curve to the left.

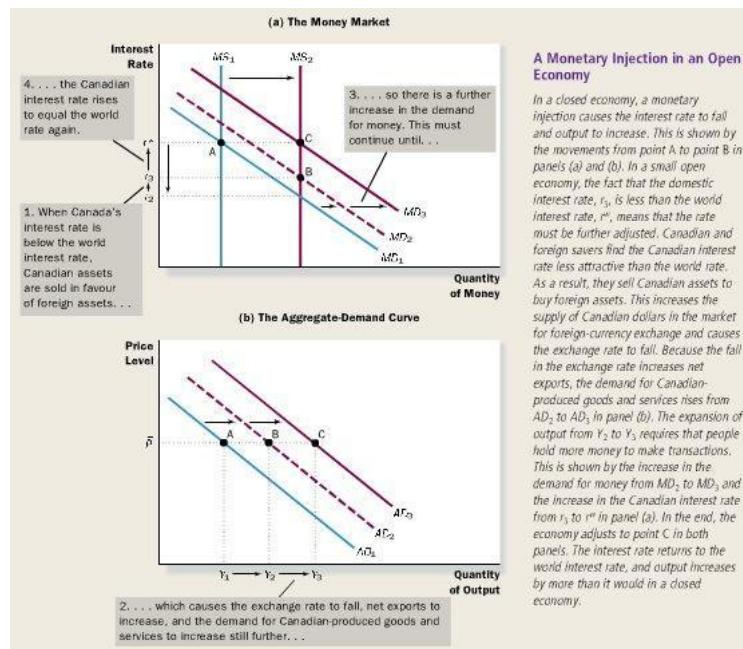
Changes in the Money Supply (Open Economy)

Recall that Canada is a small open economy with perfect capital mobility; Canada's interest rate must move up and down with changes in the world interest rate

- Ignore differences in tax treatment and assume Canadian interest rate (r) = world interest rate (r^W)

BOC increases money supply → money supply curve shifts outward → Canadian interest rate (r) drops → firms invest more → aggregate demand curve shifts outward → output increases → money demand curve shifts outward a little (because people need money for increased output) → Canadian interest rate increases a little

Since it dropped overall, Canadian interest rate (r) is lower than world interest rate (r^W) → Canadian and foreign savers find Canadian assets less attractive and sell these assets → they demand more of foreign currencies to buy foreign assets instead → value of Canadian dollar depreciates and real exchange rate falls → Canadian goods are now cheaper → net exports increases → aggregate demand curve shifts outward → money demand curve shifts outward until $r=r^W$



In a small open economy, a monetary injection by the Bank of Canada causes the dollar to depreciate in value. Because this depreciation of the dollar causes net exports to rise, there is an additional increase in demand for Canadian-produced goods and services that is not realized in a closed economy. In the end, a monetary injection in an open economy shifts the aggregate-demand curve farther to the right than it does in a closed economy

If BOC wanted to keep exchange rates fixed, it would have to sell foreign currency and purchase Canadian dollars

This would involve reducing the money supply, which would counter-act its initial intention to increase money supply

Therefore: *The Bank of Canada cannot simultaneously choose the size of the money supply and the value of the Canadian dollar*

- If it wants to affect aggregate demand, it must keep exchange rate flexible

How Does a Monetary Injection Shift the Aggregate-Demand Curve in a Closed Economy?

1. An increase in money supply causes the interest rate to fall.
2. The fall in the interest rate stimulates investment and consumption of durable goods. The increase in spending increases the demand for money, causing a partial reversal of the fall in the interest rate.
3. The increase in spending shifts the aggregate-demand curve to the right.

The Effects of a Monetary Injection: Summary

How Does a Monetary Injection Shift the Aggregate-Demand Curve in an Open Economy?

1. Due to perfect capital mobility, and ignoring differences in default risk and taxes, Canada's interest rate must equal the world interest rate. We begin with $r = r^w$.
2. An increase in the money supply causes Canada's interest rate to fall below r^w .
3. The fall in the interest rate stimulates investment and consumption of durable goods. The increase in spending increases the demand for money causing a partial reversal of the fall in the interest rate. Canada's interest rate remains below r^w .
4. With $r < r^w$, Canadian assets are sold in favour of buying foreign assets. The switch from Canadian to foreign assets requires that dollars be sold in the market for foreign-currency exchange. The real exchange rate falls.
5. The fall in the real exchange rate increases net exports, causing the aggregate-demand curve to shift even farther to the right.
6. This additional stimulus to spending increases the demand for money until $r = r^w$.
7. It makes sense for the Bank of Canada to cause a monetary injection only if it allows the exchange rate to be flexible.

How Fiscal Policy Influences Aggregate Demand

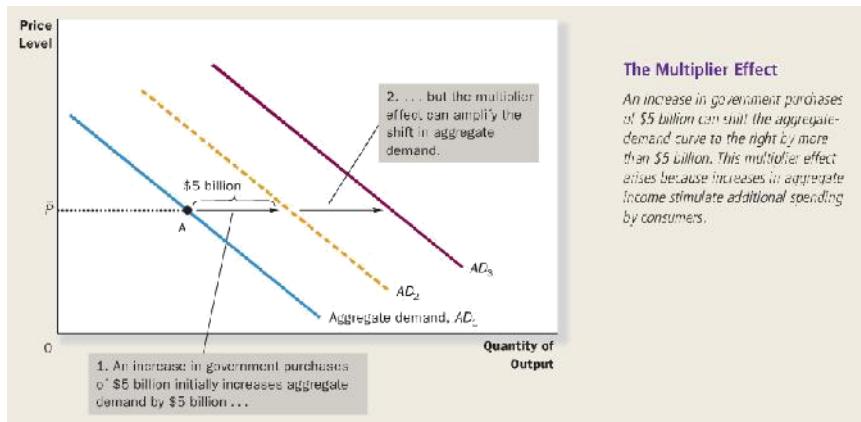
Fiscal policy- the setting of the level of government spending and taxation by government policymakers

The Multiplier Effect

When government spends a certain amount of money, this causes people's income to go up, allowing them to spend even more money

Multiplier effect- the additional shifts in aggregate demand that result when expansionary fiscal policy increases income and thereby increases consumer spending

- E.g. \$5 billion spent on construction work → construction workers spend more on food and entertainment → food and entertainment workers spend more → etc.
- i.e. final impact of government spending is greater than what they actually spent
increased consumer spending can also increase investment
 - E.g. construction firms that now have more money may invest in more equipment
 - *Investment accelerator*- positive feedback from demand to investment



A Formula for the Spending Multiplier

Marginal propensity to consume (MPC)- the fraction of extra income that a household consumes rather than saves

- e.g. if MPC= 0.75, it means that we consume \$0.75 and save \$0.25 for every dollar we earn

formula for multiplier:

- $$\text{multiplier} = \frac{1}{1 - \text{MPC}}$$
- e.g. if MPC=0.75 and government spends \$5 billion
 - multiplier= $1/(1-0.75)= 4$
 - total increase in aggregate demand= $\$5 \text{ billion} * 4= \20 billion

Marginal propensity to import (MPI)- fraction of extra income that average household spends on *imported* goods

- does not propagate consumption because income goes to a foreign country
- formula including MPI:

- $$\text{multiplier} = \frac{1}{1 - (\text{MPC} + \text{MPI})}$$
- e.g. if MPI= 0.25, MPC=0.75 and government spends \$5 billion
 - multiplier= $1/ (1-0.75+0.25)= 2$
 - total increase in aggregate demand= $\$5 \text{ billion}*2= \10 billion
 - higher MPI → smaller multiplier

Other Applications of the Multiplier Effect

although we are only using it to illustrate the effect of government spending, the multiplier effect can be applied to other factors that shift aggregate demand

recession in US decreases *net exports* by \$10 billion → decreases aggregate demand by more due to multiplier

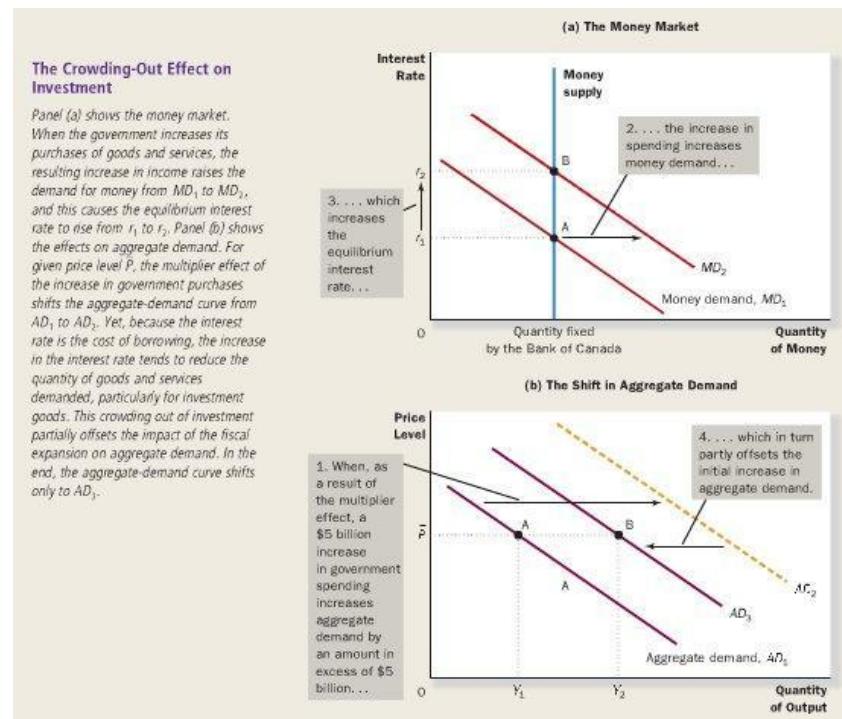
boom in stock market increases *consumption* spending by \$20 billion → increases aggregate demand by more due to multiplier

The Crowding-Out Effect on Investment

Crowding-out effect on investment- the offset in aggregate demand that results when expansionary fiscal policy raises the interest rate and thereby reduces investment spending

- crowding-out counter-acts the multiplier effect

government spends \$5 billion → aggregate demand curve shifts out \$5 billion → multiplier effect propagates consumption spending → aggregate demand curve shifts out even more → increased demand for money → money demand curve shifts outward → interest rate rises → investment spending drops → aggregate demand curve shifts back in



Open Economy Considerations

in a small-open economy, the real interest rate in Canada must equal the world interest rate

- the effects of the multiplier and crowding out are the same, but because the interest rate must change, something else must happen
- whether or not the aggregate demand curve will remain shifted outward depends on whether or not the exchange rate is flexible

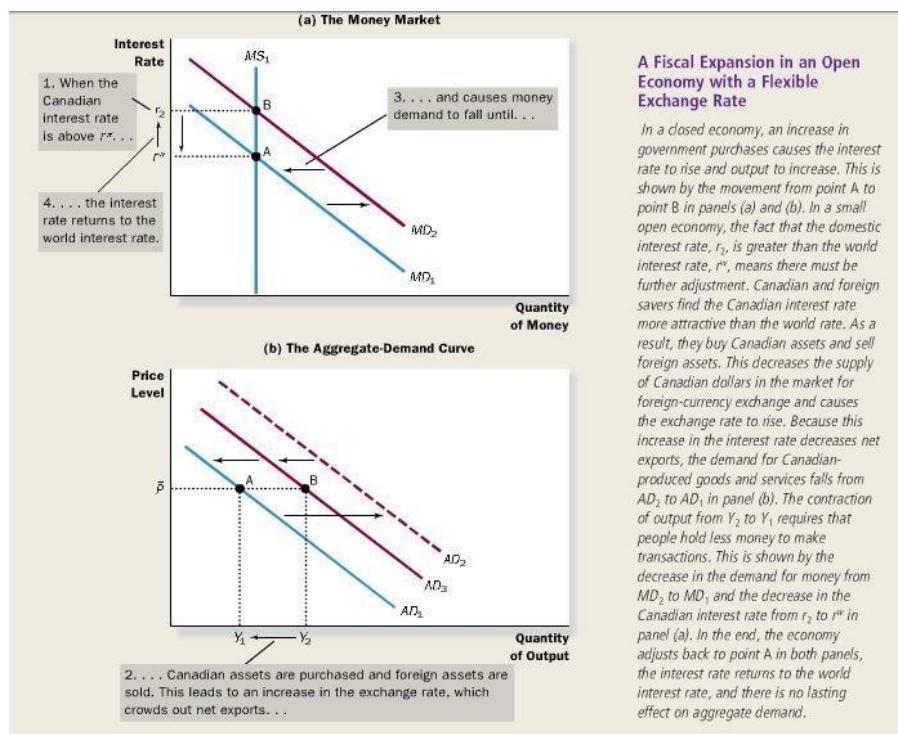
Flexible Exchange Rate

Like in closed economy:

- government spends more → multiplier effect → aggregate demand curve shifts outward
- crowding out: money supply curve shifts outward → interest rate increases → investment falls → aggregate demand curve shifts back a bit

When interest rate rises, it increases *above world interest rate* ($r > r^W$) → increase in demand for Canadian financial assets → real exchange rate increases (Canadian dollar appreciates) → net exports decrease → aggregate demand curve shifts back in → money demand curve also shifts back until $r = r^W$

- **Crowding-out effect on net exports**- the offset in aggregate demand that results when expansionary fiscal policy in a small open economy with a flexible exchange rate raises the real exchange rate and thereby reduces net exports



In a small open economy, an expansionary fiscal policy causes the dollar to appreciate. Because this appreciation of the dollar causes net exports to fall, there is an additional crowding-out effect that reduces the demand for Canadian-produced goods and services. In the end, fiscal policy has no lasting effect on aggregate demand.

Fixed Exchange Rate

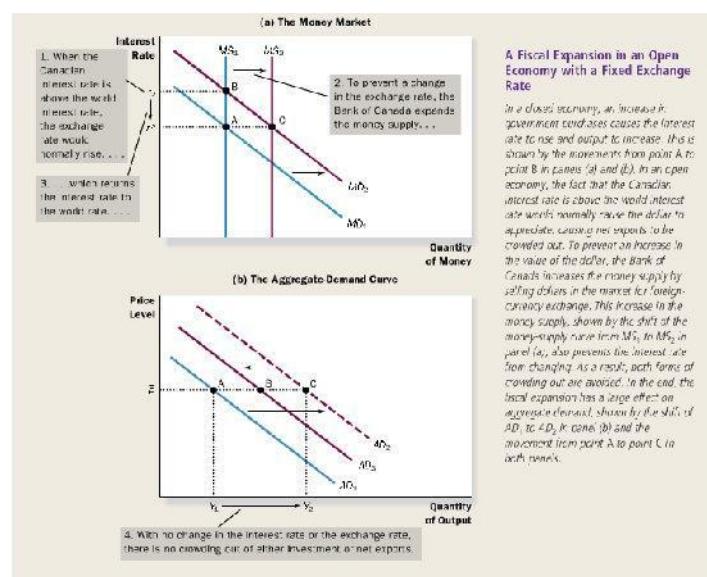
Like in closed economy:

- government spends more → multiplier effect → aggregate demand curve shifts outward
- ~~crowding out: money supply curve shifts outward → interest rate increases → investment falls → aggregate demand curve shifts back a bit~~

When interest rate rises, it increases *above world interest rate ($r > r^W$)* → increase in demand for Canadian financial assets → BOC prevents increase in real exchange rate by buying more foreign currency (open-market operations) → money supply increases → interest rate lowered back to world interest rate ($r = r^W$)

- No crowding out of investment because interest rate remains constant
- No crowding out of net exports: net exports does not change, keeping aggregate demand shifted outward

If the Bank of Canada chooses to prevent any change in the exchange rate, expansionary fiscal policy will have no crowding-out effects and will therefore cause a very large increase in the demand for goods and services



The Coordination of Monetary and Fiscal Policy

For fiscal policy to have a lasting effect on the position of the aggregate-demand curve, the Bank of Canada must choose the appropriate exchange rate policy

- i.e. some coordination required between parliament and BOC

e.g. Coyne Affair, 1961: government tried to increase incomes and expenditure by lowering taxes and increasing government spending, but the Bank of Canada governor (James Coyne) was intent on keeping exchange rate flexible

Changes in Taxes

the other important instrument of fiscal policy, besides the level of government purchases is taxation

- raise taxes → decrease spending → shifts AD curve in
- lower taxes → increases spending → shifts AD curve out

The size of the shift in aggregate demand resulting from a tax change is also affected by the multiplier and crowding-out effects

Also depends on exchange rate

- Flexible exchange rate → does not have lasting effect on position of AD curve
- Fixed exchange rate → does have lasting effect on position of AD curve

Deficit Reduction

Many governments are making efforts to reduce government deficits by increasing taxes or reducing expenditure

Some argue that this causes the AD curve to shift (because $C \downarrow$ and $G \downarrow$)

However, as we have discussed, if the exchange rate varies freely, this won't have an effect