

ECN204 Final Exam Notes

Introduction to Macroeconomics

An overview of the Canadian economy: growth, unemployment, and inflation

- In assessing the health and development of an economy, macroeconomics focuses on:
 - Real GDP (real gross domestic product)
 - Measures the value of final goods and services produced within the borders of a given country during a given time period, typically a year
 - To calculate real GDP, nominal GDP must first be calculated
 - Unemployment
 - A failure of the economy to fully employ its labour force
 - Occurs when a person cannot get a job despite being willing to work and actively seeking work
 - Inflation
 - An increase in the overall level of prices
 - Can cause decreases in standards of living
 - Surprise jump in inflation reduces the purchasing power of people's savings

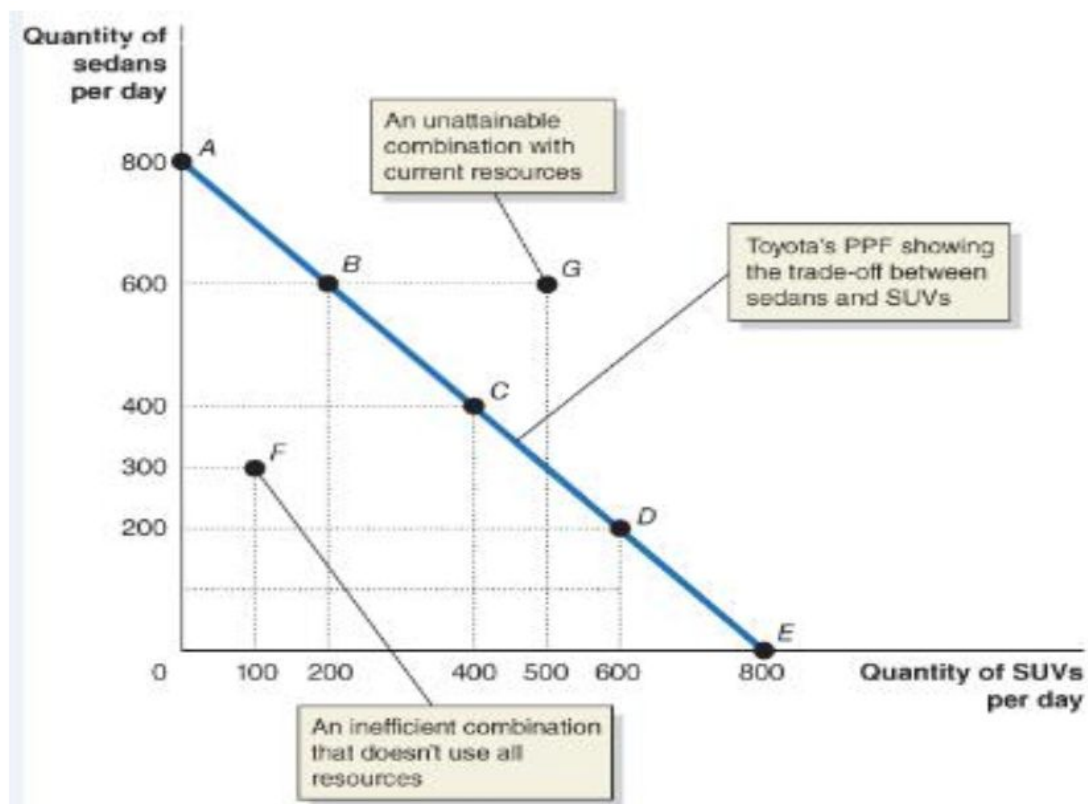
Basic economic concepts: production possibility frontier, circular flows

- Production possibilities model
 - Illustrates production choices
 - Production possibilities frontier (PPF): a curve showing the maximum attainable combinations of two products that may be produced with available resources and current technology
 - To represent the production possibilities curve we need to make the following assumptions:
 - Full employment (all labour is employed)

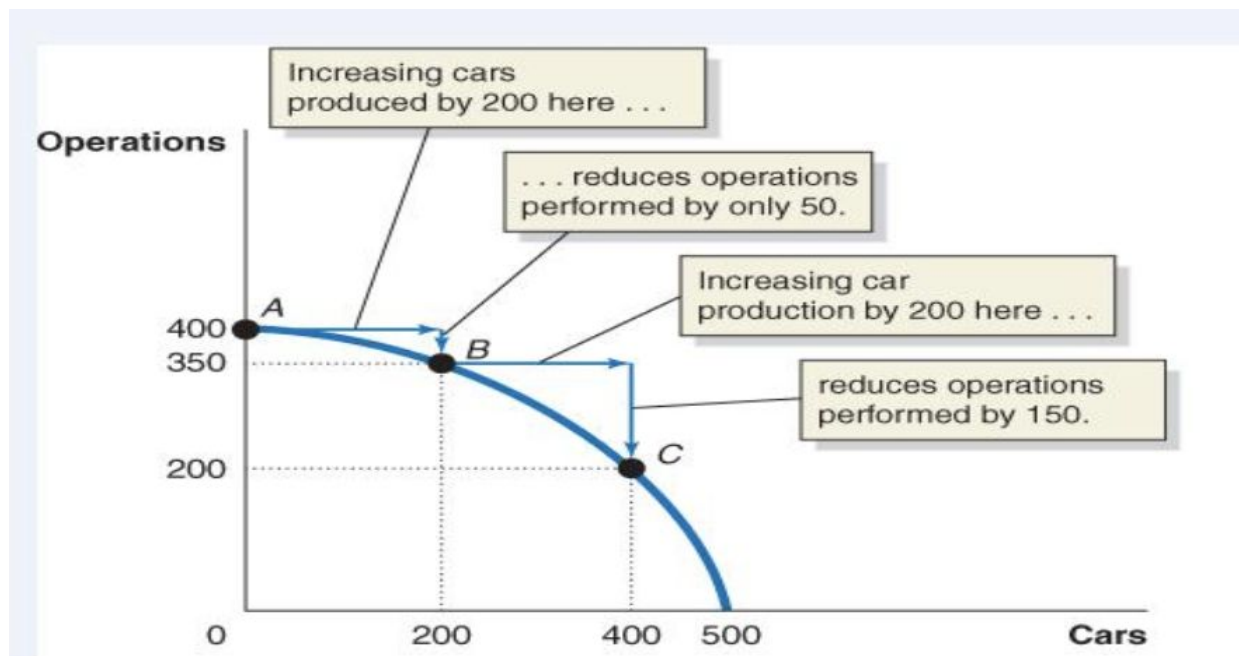
- Fixed resources (scarce resources are in limited supply and it is not possible to increase the amount)
 - Fixed technology (the technology used in the production process is fixed)
 - Two goods (there are only two goods produced)
- We start with a table that shows different combinations of quantities in which the two goods can be produced

Toyota's Production Possibilities at Its Cambridge Plant		
Choice	Quantity of Corolla Sedans Produced	Quantity of RX 350 SUVs Produced
A	800	0
B	600	200
C	400	400
D	200	600
E	0	800
F	300	100
G	600	500

- We can represent points A, B, C, D, E, F, and G graphically

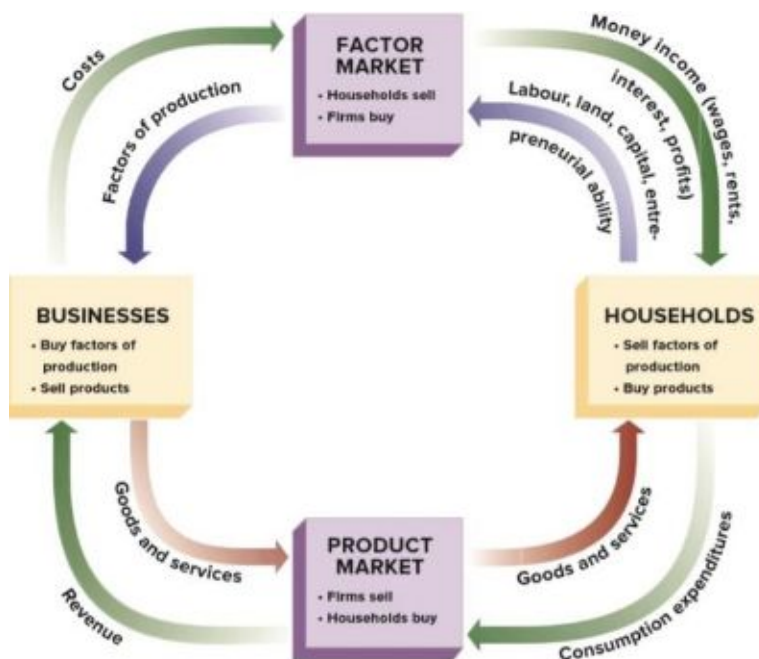


- PPF are not always straight lines
- Bowed out PPFs imply increasing marginal opportunity costs
 - Example: assume two types of goods: public goods provided by the government (operations) and private goods (cars) provided by private firms



- Circular flow model
 - Households
 - One or more persons occupying a housing unit
 - Buy the goods and services provided by businesses in the product market
 - Obtain the income needed to buy the products by selling resources in the factor market
 - Wages, rents, interest, and profits flows to households for their labour, land, capital, and entrepreneurial ability
 - Businesses
 - Economic entities that purchase factors of production in the resource market and sell goods and services in the product market
 - Sole proprietorship: an unincorporated business owned and operated by a single person

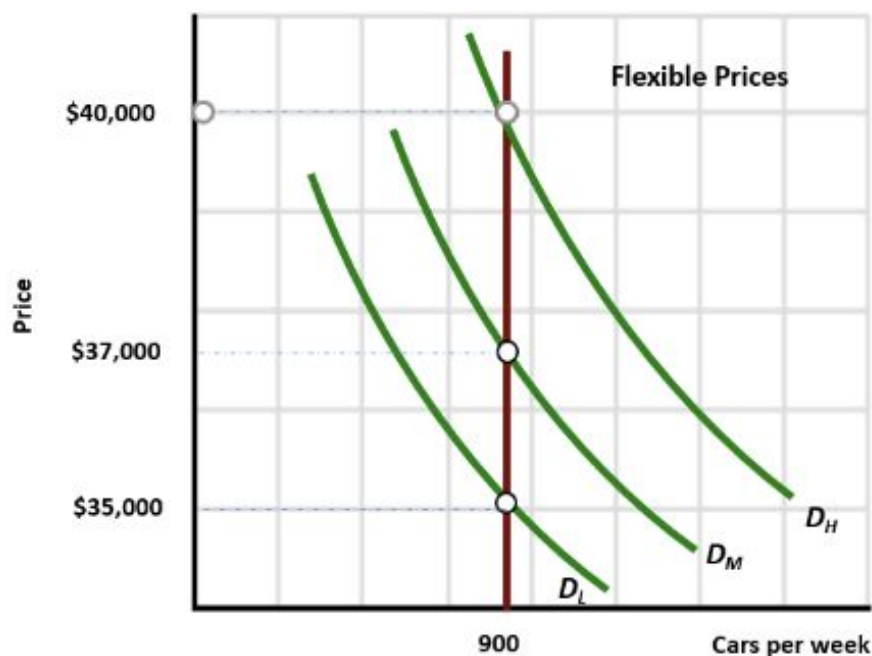
- Partnership: two or more individuals pool their financial resources and business skills to operate the business and share the profits/losses
- Corporation: an independent legal entity that can acquire resources, own assets, produce, sell, incur debts, extend credit, etc
- Product market
 - Where the goods and services produced by businesses are bought and sold
 - Households use the income they receive from the sale of resources to buy goods and services
 - The money spent on goods and services flows to businesses as revenue
- Factor market
 - Where households sell resources to businesses
 - Households sell resources to generate income
 - Businesses buy resources to produce goods and services
 - Productive resources flow from households to businesses
 - The money flows from businesses to households as wages, rents, interest, and profits



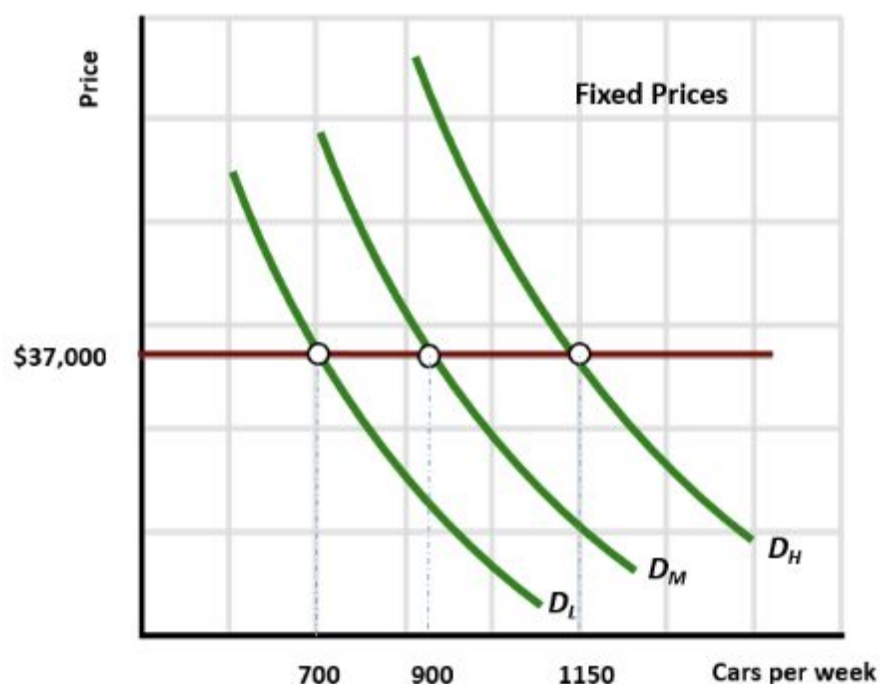
The counterclockwise flow of economic resources and finished product in the circular flow model is paid for by the clockwise flow of money income and consumption expenditure.

Uncertainty, expectations, and shocks

- The importance of expectations and shocks
 - Expectations: the anticipations of consumers, firms, and others about future economic conditions
 - Have a large effect on economic growth
 - Can become unmet due to shocks
 - Shocks: situations in which one thing is expected to occur but in reality something different occurs
 - Demand shocks: sudden, unexpected changes in demand
 - Supply shocks: sudden, unexpected changes in aggregate supply
 - Economists believe that most short-run fluctuations are the result of demand shocks
 - Full employment if there are no shocks
- Demand shocks and flexible prices
 - If the prices of goods and services could always adjust quickly to unexpected changes in demand, then the economy could always produce at its optimal capacity since prices would adjust to ensure that the quantity demanded for each good and service would always equal the quantity supplied
 - The effect of unexpected changes in demand under flexible prices:



- Demand shocks and sticky prices
 - In reality, many prices in the economy are inflexible and do not change rapidly when demand changes unexpectedly
 - Manufacturing firms typically attempt to deal with unexpected changes in demand by maintaining an inventory
 - Inventory: goods that have been produced but remain unsold
 - If demand falls for many goods and services across the entire economy for an extended period of time, then many firms will find inventories piling up and will be forced to cut production resulting in recession, with GDP falling and unemployment rising
 - If demand is unexpectedly high for a prolonged period of time, the economy will boom and unemployment will fall
 - The effect of unexpected changes in demand under fixed prices:



- Inflexible prices (sticky prices): product prices that remain in place (at least for a while) even though supply or demand has changed
 - Price war - a situation in which a firm may be afraid that cutting its price may be counterproductive because its rivals might simply match the price cut
- Flexible prices: product prices that react within seconds to changes in supply and demand

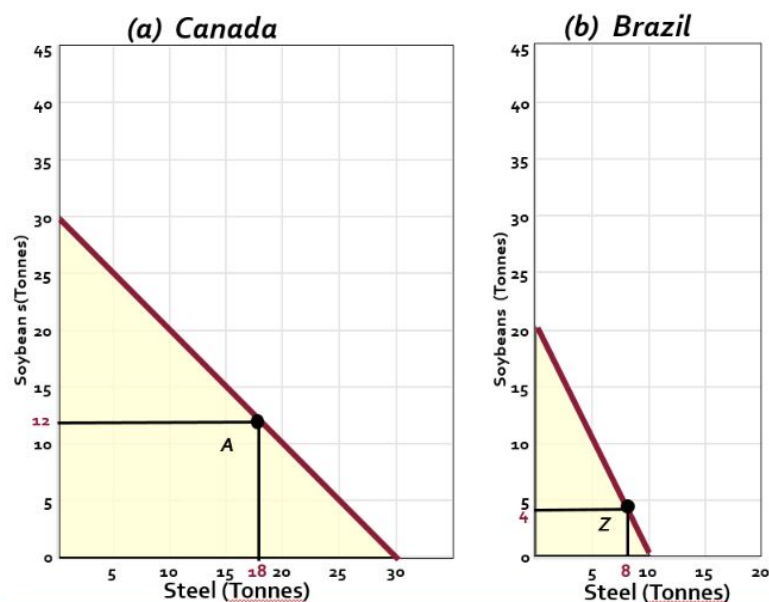
Open Economy Macroeconomics

Absolute and comparative advantage

- Absolute advantage
 - A country is said to have an absolute advantage over other producers of a product if it is the most efficient producer of that product
- Comparative advantage
 - A country is said to have a comparative advantage over other producers of a product if it can produce the product at a lower opportunity cost

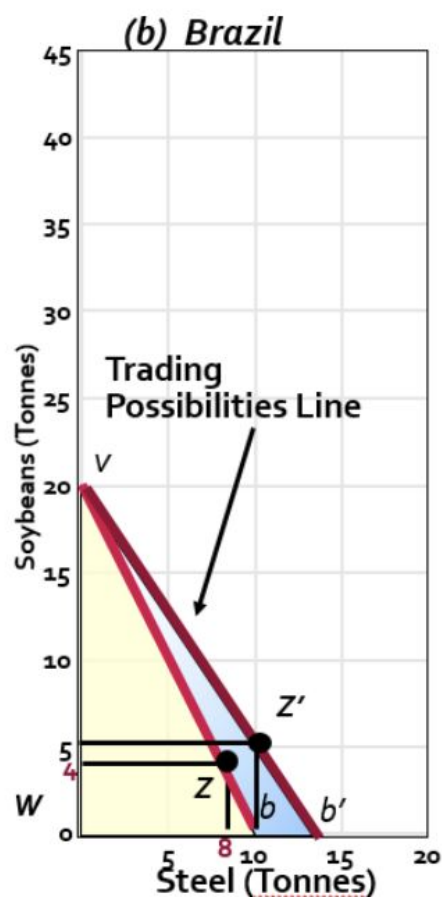
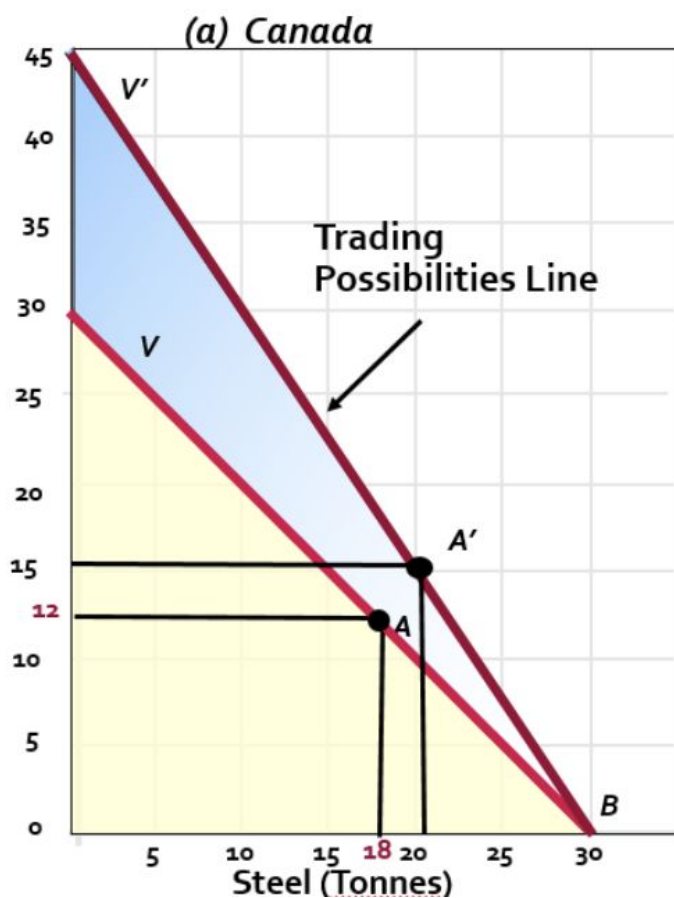
Specialization and Trade

- The basic principle
 - Specialization according to comparative advantage reduces costs
 - This is true even if a nation has an absolute advantage
- Specialization and comparative advantage
 - Example: two isolated nations (Canada and Brazil)



- Constant costs
 - Straight-line production possibilities curves
- Different costs
 - Different technology and resources

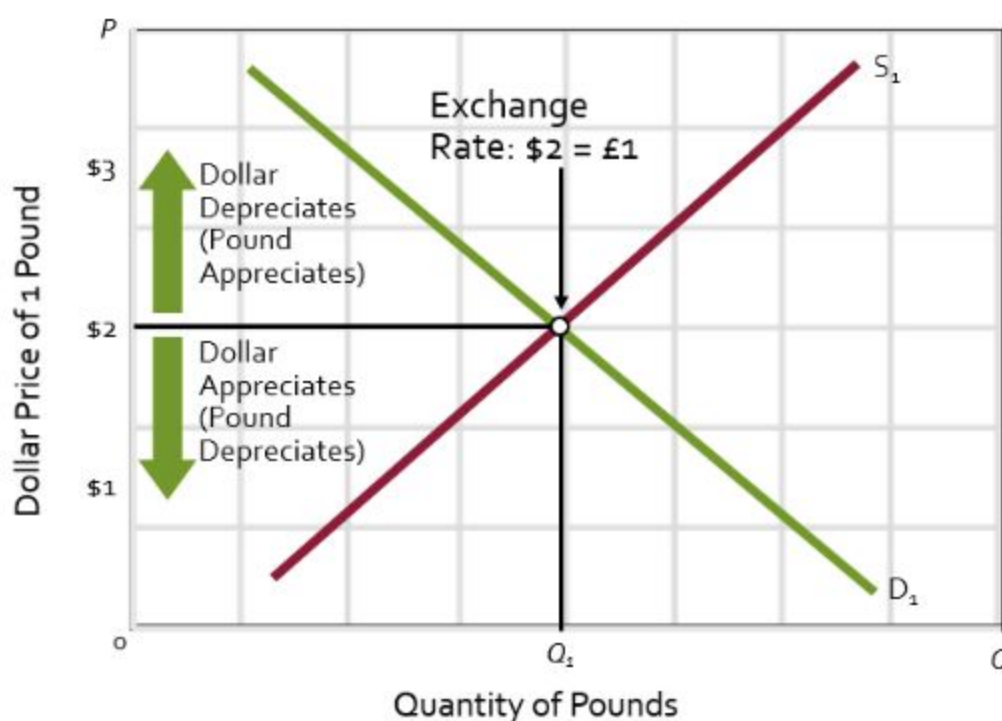
- Canada has absolute advantage in both steel and soybeans
- Specialization based on comparative advantage
 - Opportunity cost of 1 tonne of steel:
 - 1 tonne of soybeans in Canada (1St = 1Soy)
 - 2 tonnes of soybeans in Brazil (1St = 2Soy)
- Terms of trade
 - Canada 1St = 1Soy
 - Canada will sell 1St for more than 1Soy
 - Brazil 1St = 2Soy
 - Brazil will pay less than 2Soy for 1St
 - For trade to be mutually beneficial the terms of trade must be between each nation's opportunity costs
- Gains from trade
 - Trading possibilities line
 - Slope equals terms of trade



- The trading possibilities line shows that both countries end up better off with trade

Exchange rates and purchasing power parity

- Foreign exchange markets
 - International trade depends on the exchange rate
 - The exchange rate is the price of foreign currency
- Exchange rate systems:
 - Flexible (floating) exchange-rate system
 - Fixed exchange rate system
- Depreciation and appreciation
 - If the exchange rate increases, the Canadian dollar depreciates
 - If the exchange rate decreases, the Canadian dollar appreciates
- Determinants of exchange rate changes
 - Demand and supply analysis
- In flexible exchange rate systems, the price of foreign currency fluctuates according to the supply and demand
 - Example: the market for foreign currency (pounds)



- Determinants of exchange rates
 - Factors that shift demand/supply
 - Changes in tastes
 - Relative income changes

- Relative inflation rate changes
 - Purchasing-power-parity theory
- Relative interest rates
- Relative expected returns on assets
- Speculation

Measuring Domestic Output and the Price Level

Gross Domestic Product

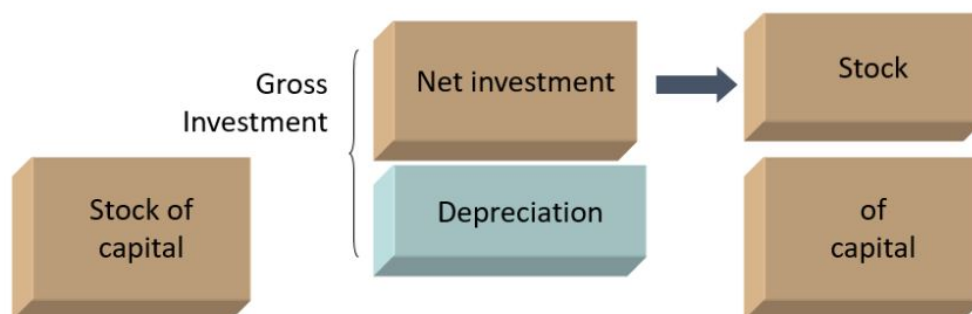
- The main measure of the economy's performance
- The total (aggregate) market value of all final goods and services produced within the borders of a country during a specific period of time
- GDP is a monetary measure
- Avoiding multiple counting
 - To avoid multiple counting, only final goods and services are counted
 - Final goods: goods and services purchased for final use and not for resale for further processing or manufacturing
 - Intermediate goods: products purchased for resale or further processing or manufacturing
- GDP excludes non production transactions
 - Two types of non production transactions:
 - Financial transactions
 - Public transfer payments
 - Private transfer payments
 - Stock-market transactions
 - Second-hand sales
- Two ways of calculating GDP
 - The expenditures approach:
 - The sum of all the money spent in buying final goods and services
 - By households, businesses, government, and buyers abroad
 - The income approach:
 - The income derived or created from producing final goods and services
 - Payments to the suppliers of factors of production as wages, rent, interest, and profit

The expenditure approach to GDP

- The expenditure approach: adds up all the expenditures made for final goods and services
- Adds up:
 - Personal consumption expenditures (C)
 - Gross investment (I_g)
 - Government purchases (G)
 - Net exports (X_n) = exports (X) - imports (M)
- Value added in a five-stage production process

	GDP	Percent of GDP
Personal consumption expenditures (C)	1073	54.3
Gross investment (I _g)	467	23.6
Government current purchases of goods and services (G)	417	21.1
Net exports (X _n)	+18	+1.0
Gross domestic product at market prices*	1975	100.0

- Gross investment (I_g) includes:
 - All final purchases of machinery, equipment, and tools by firms
 - All construction
 - Changes in inventories
 - Intellectual property products (R&D)
 - Net investment = gross investment - depreciation
 - Gross investment, depreciation, net investment, and the stock of capital



- GDP as the sum of all the money spent in buying final goods and services:
 - $GDP = C + I_g + G + X_n$

Other income measurements

- The income approach: adds up expenditures that are allocated as income to those producing the output
 - Wages, salaries, and supplementary labour income
 - Profits of corporations and government enterprises before taxes
 - Interest and investment income
 - Net income of farm and unincorporated businesses
 - Indirect taxes less subsidies on products
 - Depreciation: capital consumption allowances
 - Net domestic income at factor cost
 - All the income earned by Canadian-supplied factors of production as wages, interest, rent, and profit
 - Personal income (PI)
 - The earned and unearned income available to resource suppliers and others before the payment of personal income taxes
 - Disposable income (DI)
 - Personal income less personal taxes
- Calculating GDP with the income approach (example):

	GDP	Percent of GDP
Wages, salaries, and supplementary <u>labour</u> income	\$994	50.3
Profits of corporations and government enterprises before taxes	278	14.0
Interest and investment income	169	8.5
Net income of farm and unincorporated businesses	55	2.8
Taxes less subsidies on factors of production	77	3.9
Indirect taxes less subsidies on products*	121	6.1
Capital consumption allowances	280	14.1
Statistical discrepancy	1	0.3
Gross domestic product at market prices	1975	100

Measuring the price level

- Price index: a measure of the price of a specified collection of goods and services, called a “market basket”, in a specific year as compared to the price of an identical (or highly similar) collection of goods and services in a reference year
- Price index in specific year = (price of market basket in specific year)/(price of same market basket in base year) * 100

Nominal and real GDP

- Nominal GDP
 - GDP measured in terms of the price level at the time of measurement
 - Unadjusted for inflation
- Real GDP
 - Nominal GDP adjusted for inflation
- Dividing nominal GDP by the price index
 - Real GDP = (nominal GDP)/(price index) * 100
- GDP Deflator = (nominal GDP)/(real GDP) * 100
- Steps for deriving real GDP from nominal GDP
 - Method 1:
 - Final nominal GDP for each year
 - Compute a price index
 - Divide each year’s nominal GDP by that year’s price index, then multiply by 100 to determine real GDP
 - Method 2:
 - Break down nominal GDP into physical quantities of output and prices for each year
 - Find real GDP for each year by determining the dollar amount that each year’s physical output would have sold for if base-year prices had prevailed

GDP and economic well-being

- Shortcomings of GDP
 - Measurement shortcomings

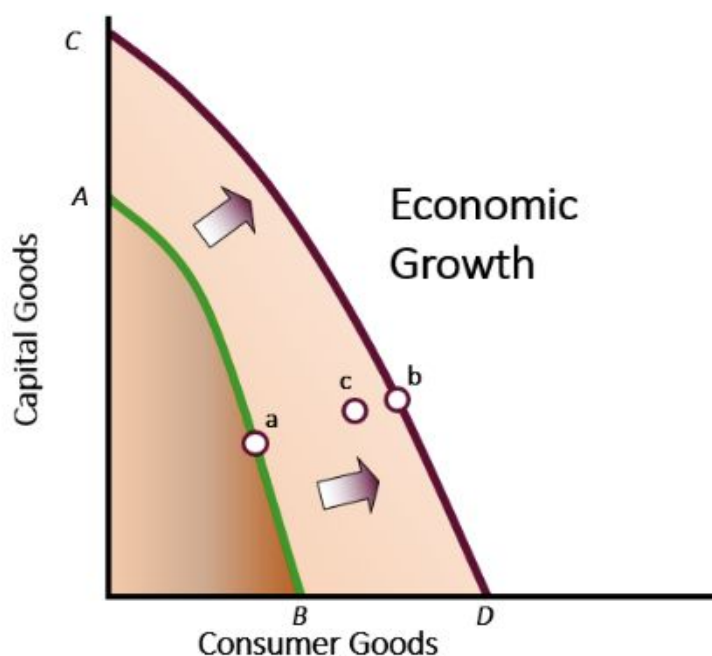
- Non-market activities
- GDP and the environment
- The underground economy
- Improved quality
- Shortcomings of the well-being measure
 - Leisure
 - Composition and distribution of output
 - Nonmaterial sources of well-being

Economic Growth and Macroeconomic Fluctuations: Unemployment and Inflation

Economic growth

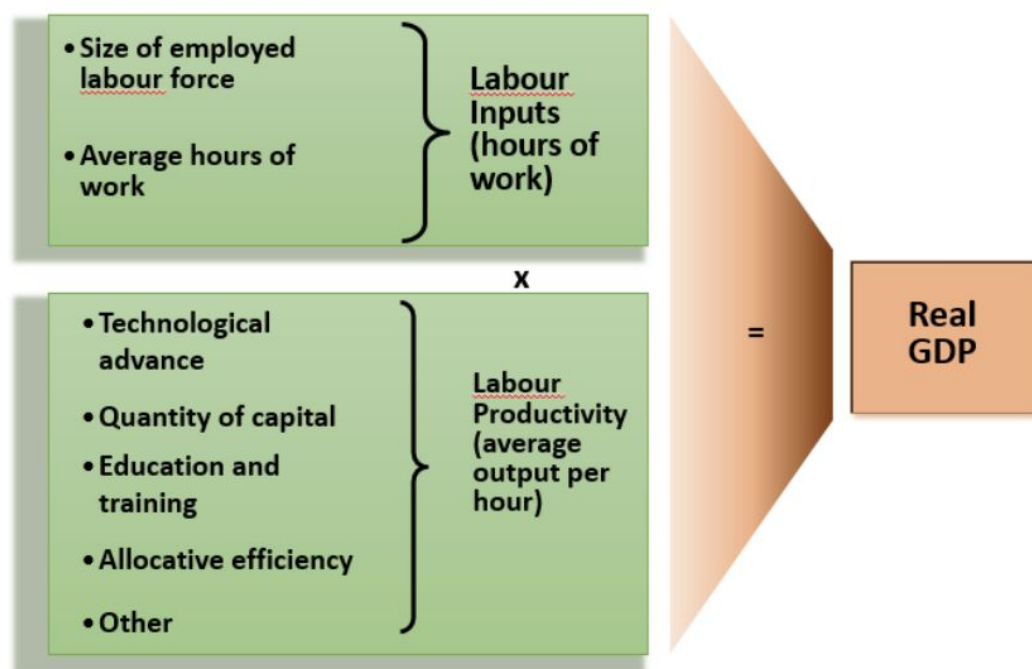
- Economic growth is defined as:
 - An increase in real GDP occurring over some time period
 - An increase in real GDP per capita occurring over some time period
 - $\text{Real GDP per capita} = \text{real GDP} / \text{population}$
- Growth as a goal
 - Growth is a widely held economic goal
 - Growth rises standards of living
 - Growth lessens the burden of scarcity
- Rule of 70
 - Approximate number of years required to double real GDP = $70 / \text{annual percentage rate of growth}$
- Growth in Canada - enables us to consume:
 - Improved products and services
 - More leisure
 - Other impact
- Leader countries: as it relates to economic growth, countries that develop and use advanced technologies, which then becomes available to follower countries
- Follower countries: as it relates to economic growth, countries that adopt advanced technologies that previously were developed and used by leader countries
- Six “ingredients” of economic growth
 - 4 supply factors

- Increases in the quantity and quality of natural resources
 - Increases in the quantity and quality of human resources
 - Increases in the supply (or stock) of capital goods
 - Improvements in technology
- Demand factor
 - The increase in the level of aggregate demand that brings about the economic growth made possible by an increase in the production potential of the economy
- Efficiency factor
 - The capacity of an economy to combine resources effectively to achieve growth of real output that the supply factors make possible
 - Least costly way (productive efficiency)
 - Maximum well-being (allocative efficiency)
- Economic growth and the production possibilities curve



- Labour and productivity
 - Real GDP = worker-hours * labour productivity
 - % change in GDP = % change in worker-hours + % change in productivity
 - Labour productivity
 - The average output of labour
 - Output per worker per hour
 - Labour force participation rate

- The percentage of the working age population that is actually in the labour force
- The supply determinants of real output

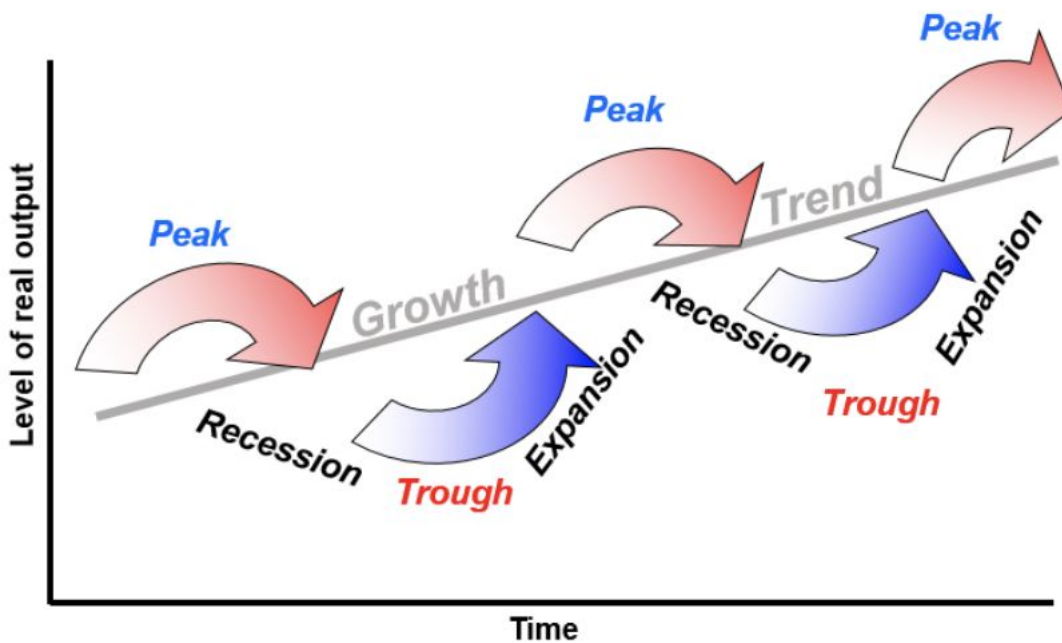


- Reasons for growth
 - Inputs versus productivity
 - Quantity of labour
 - Technological advances
 - Quantity of capital
 - Education and training
- Economies of scale and resource allocation
 - Economies of scale: reductions in the average total cost of producing a product as the firm expands the size of plant (its output) in the long run
 - Improved resource allocation: workers have moved over time from low-productivity employment to high-productivity employment
- The rise in average rate of productivity growth
 - Reasons for the productivity acceleration
 - The microchip and information technology
 - New firms and increasing returns
 - More specialized inputs
 - Spreading of development costs

- Simultaneous consumption
- Network effects
- Learning-by-doing
- Global competition

Overview of the business cycle

- The business cycle consists of alternating increases and decreases in economic activity over time
- Phases of the business cycle
 - Peak
 - Recession
 - Trough
 - Expansion

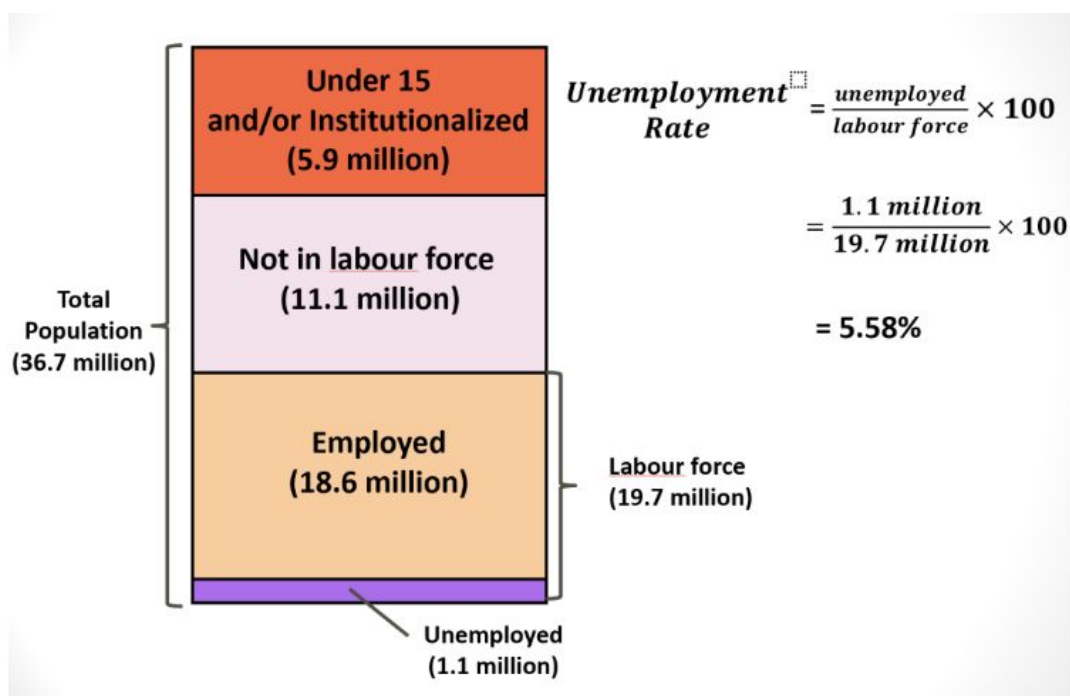


- Causation:
 - Irregular innovation
 - Productivity changes
 - Monetary factors
 - Political events
 - Financial instability

- Cyclical impact: durables and nondurables
 - Durable goods affected most
 - Capital goods
 - Consumer durables
 - Nondurable consumer goods affected less
 - Services
 - Food and clothing

Unemployment: types, measurement, and costs

- Measurement of unemployment
 - The unemployment rate is the percentage of the labour force that is unemployed
 - How the unemployment rate is understated:
 - Part-time employment statistics
 - Discouraged workers
 - Unemployment rate = (unemployed / labour force) * 100



- Types of unemployment
 - Frictional unemployment
 - Caused by workers voluntarily changing jobs and by temporary layoffs; unemployed workers between jobs

- Structural unemployment
 - Caused by changes over time in consumer demand and in technology alter the “structure” of the total demand for labour, both occupationally and geographically
- Cyclical unemployment
 - Caused by a decline in total spending (or by insufficient aggregate demand)
- Seasonal unemployment
 - Caused by seasonal factors
- Definition of full employment
 - Natural rate of unemployment (NRU)
 - At NRU, the economy is at potential GDP
 - NOT zero unemployment\
 - Occurs when there is no cyclical unemployment
 - Not automatic
 - Varies over time
- Economic costs of unemployment
 - GDP gap
 - $\text{GDP gap} = \text{actual GDP} - \text{potential GDP}$
 - Can be negative or positive
 - Okun's law
 - Every 1% of cyclical unemployment creates a 2% GDP gap
- Non-economic costs of unemployment
 - Unemployment means idleness
 - Increases poverty, heightens racial and ethnic tensions, and reduces hope for material advancement
 - Severe unemployment can lead to rapid and violent social and political change
 - Higher unemployment linked to increases in suicide, homicide, and physical and mental illness

Inflation: defined and measured

- Meaning of inflation
 - A rise in the general level of prices
- Consumer price index (CPI)
 - An index that measures the prices of a fixed market basket of goods and services that is bought by a typical consumer

$$\text{CPI} = \frac{\text{Price of the 2002 basket in the particular year}}{\text{Price of the same basket in the base year (2002)}} \times 100\%$$

- Measurement of inflation
 - Find as percentage change
 - Example: the CPI was 125.5 in 2014, up from 122.8 in 2013. The rate of inflation for 2014 is:
 - Rate of inflation = $(125.5 - 122.8) / 122.8 * 100\% = 2\%$
- Types of inflation
 - Demand-pull inflation
 - Excess demand
 - Cost-push inflation
 - Due to a rise in per-unit production costs
 - Supply shocks
 - Core inflation
 - The underlying increases in the CPI after volatile food and energy prices are removed
 - Policymakers become greatly concerned when core inflation is high and rising

Effects of inflation

- Redistribution effects of inflation
 - Nominal income and real income

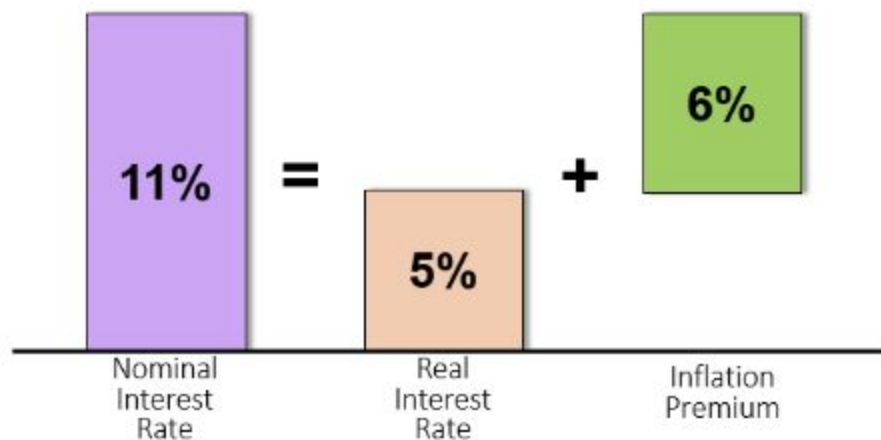
$$\text{Real Income} = \frac{\text{Nominal Income}}{\text{Price Index}} \times 100\%$$

$$\begin{array}{ccccc} \text{Percentage} & & \text{Percentage} & & \text{Percentage} \\ \text{change in} & \approx & \text{change in} & - & \text{change in} \\ \text{real income} & & \text{nominal income} & & \text{price} \end{array}$$

- Unanticipated inflation
 - Real income and wealth will be redistributed
- Anticipated inflation
 - People can avoid or lessen the redistribution effects

- Who is hurt by inflation?
 - Those with fixed incomes
 - Savers
 - Creditors
- Who is unaffected or helped by inflation
 - Those with flexible incomes
 - Debtors
- Anticipated inflation
 - Effects are lessened to the extent inflation is correctly anticipated
 - Cost-of-living adjustment clauses
 - Inflation premium on loans
 - Nominal interest rate = real interest rate + inflation premium

The inflation premium—the expected rate of inflation—gets built into the nominal interest rate.

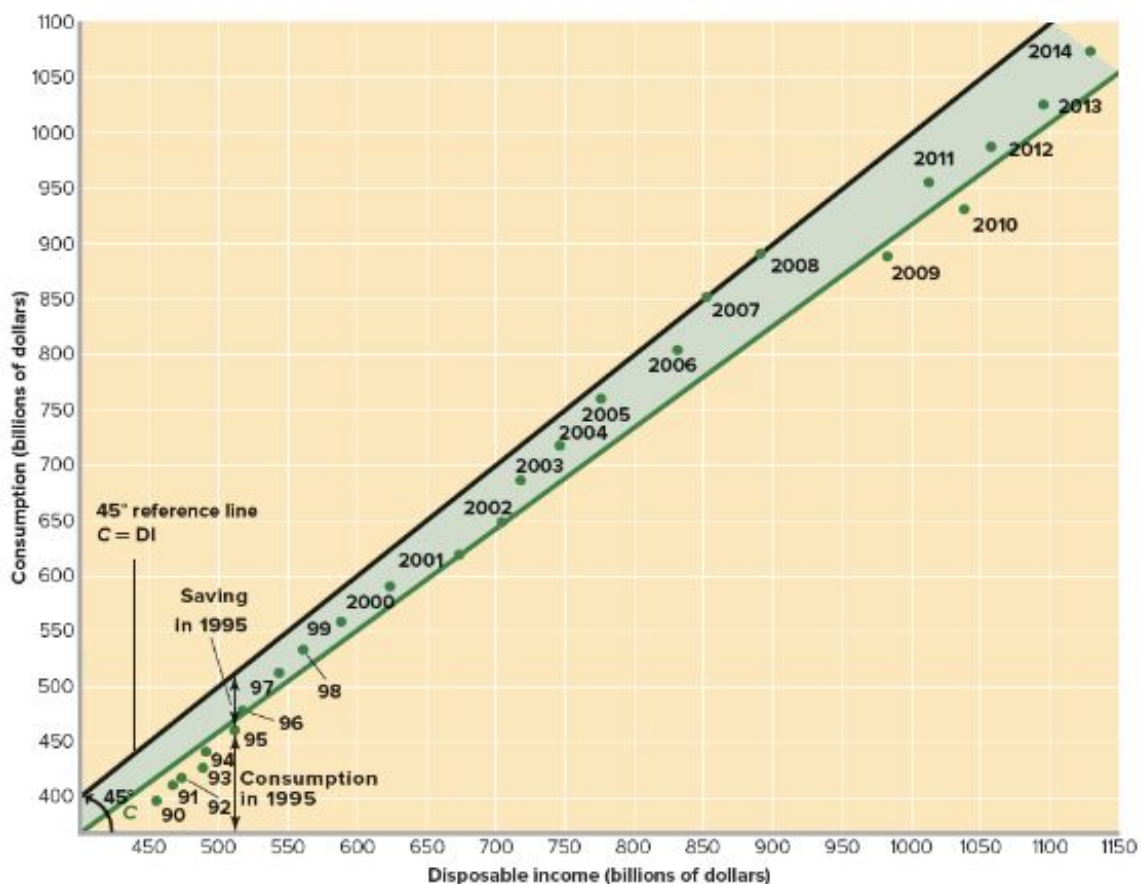


- Other redistribution effects
 - Deflation
 - Mixed effects
 - Arbitrariness

Basic Macroeconomic Relationships

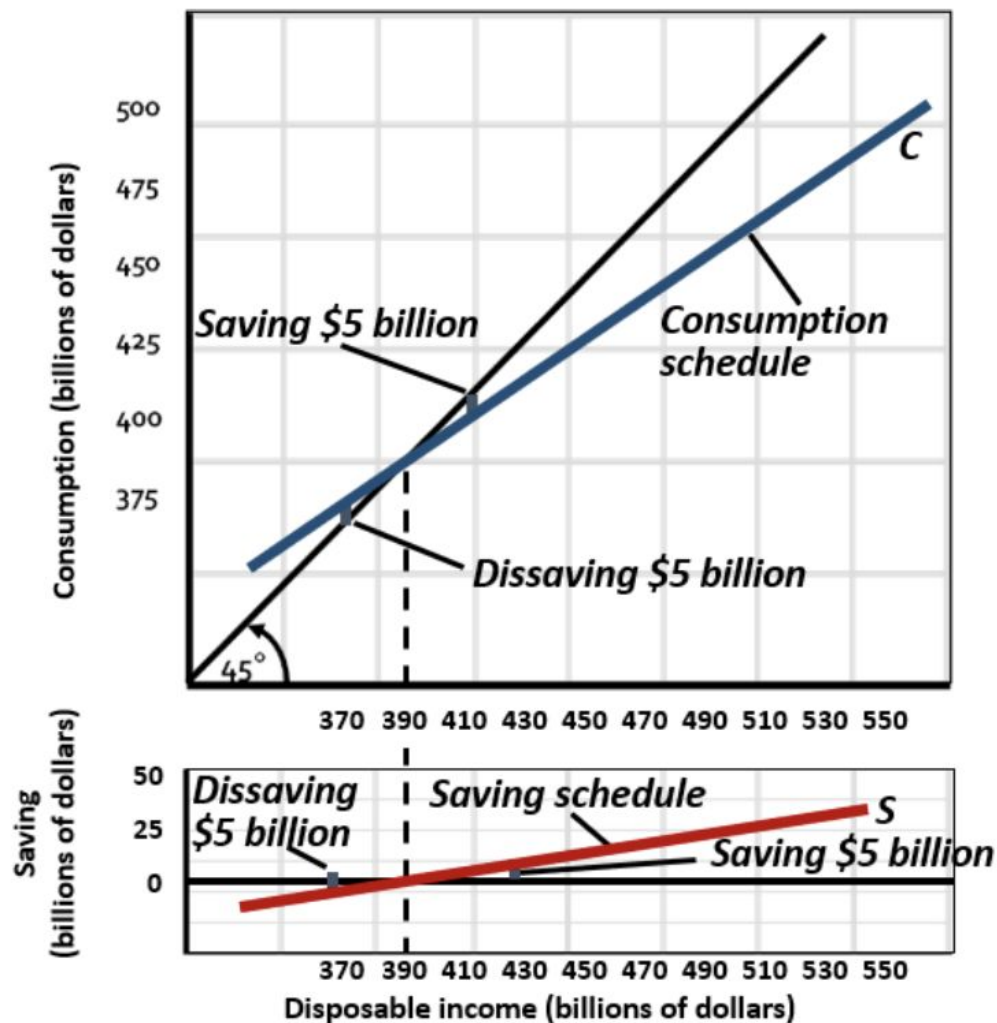
The Income-Consumption and Income-Saving Relationship

- Consumption and saving
 - Primarily determined by disposable income (DI)
 - Direct relationship
- Consumption schedule (C)
 - Planned household spending (in our model)
- Saving schedule (S)
 - DI minus C
 - Dissaving can occur



- The line C, which generalizes the relationship between consumption and disposable income, indicates a direct relationship and shows that households consume most of their income

- 45 degree line is a reference line
- At each point on the 45 degree line, consumption equals disposable income, or $C = DI$
- Vertical distance between the 45 degree line measures either consumption or income
- Graph - consumption and saving schedule:



- Consumption rises as income increasing
 - Saving is negative (dissaving occurs) when the consumption schedule is above the 45 degree line and saving is positive when the consumption schedule is below the 45 degree line
- Saving increases as income goes up
 - Saving schedule is found by subtracting the consumption schedule in the top graph vertically from the 45 degree line

- The income-consumption and income-saving relationship

Average and Marginal Propensities

$$APC = \frac{\text{consumption}}{\text{income}}$$

$$APS = \frac{\text{saving}}{\text{income}}$$

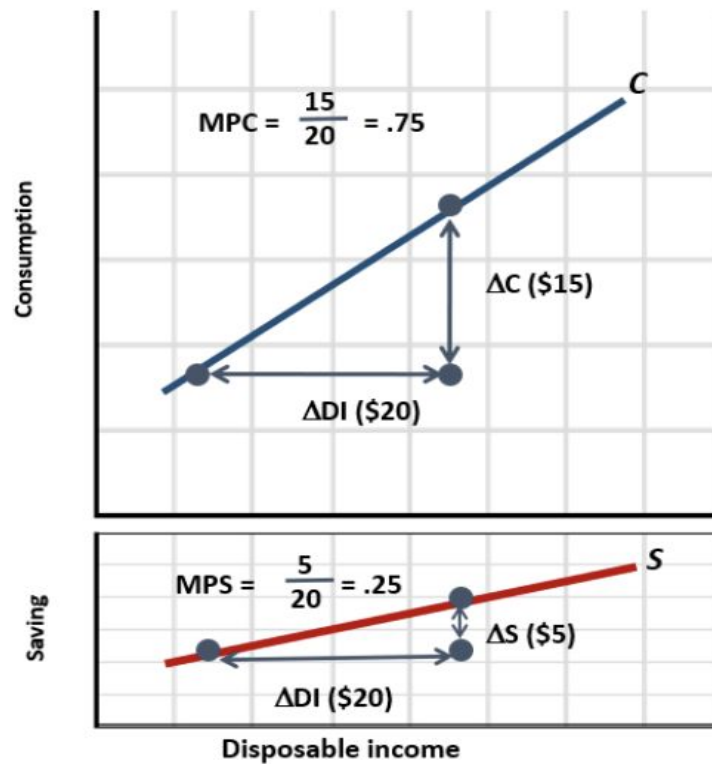
$$APC + APS = 1$$

$$MPC = \frac{\text{change in consumption}}{\text{change in income}}$$

$$MPS = \frac{\text{change in saving}}{\text{change in income}}$$

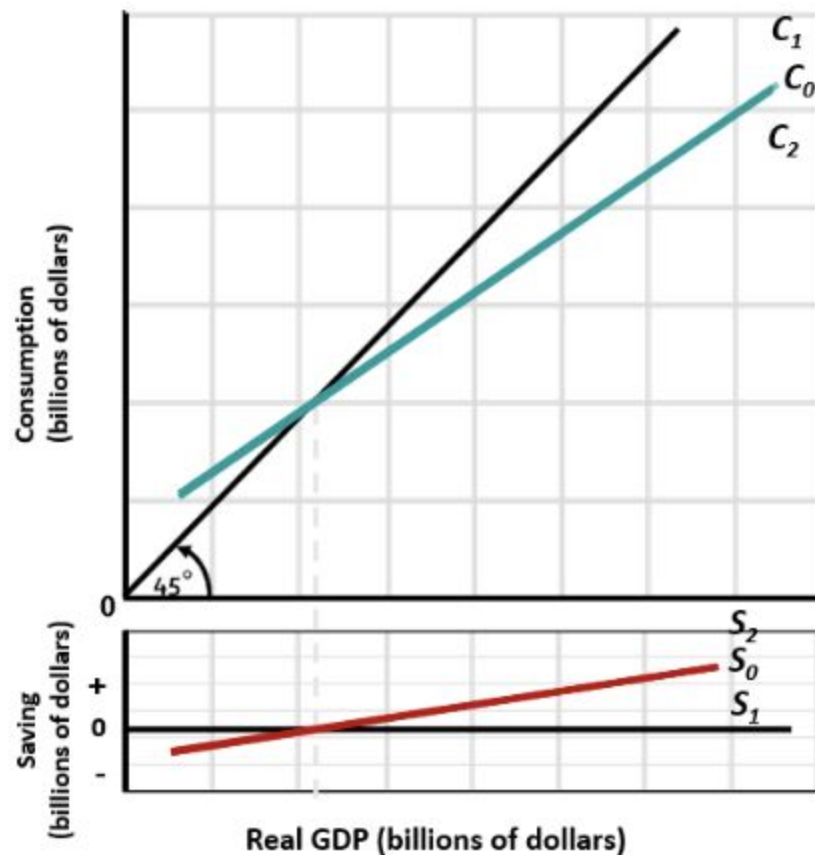
$$MPC + MPS = 1$$

- The marginal propensity to consume and the marginal propensity to save



- MPC is the slope of the consumption schedule
- MPS is the slope of the saving schedule

- Shifts in the consumption and saving schedules



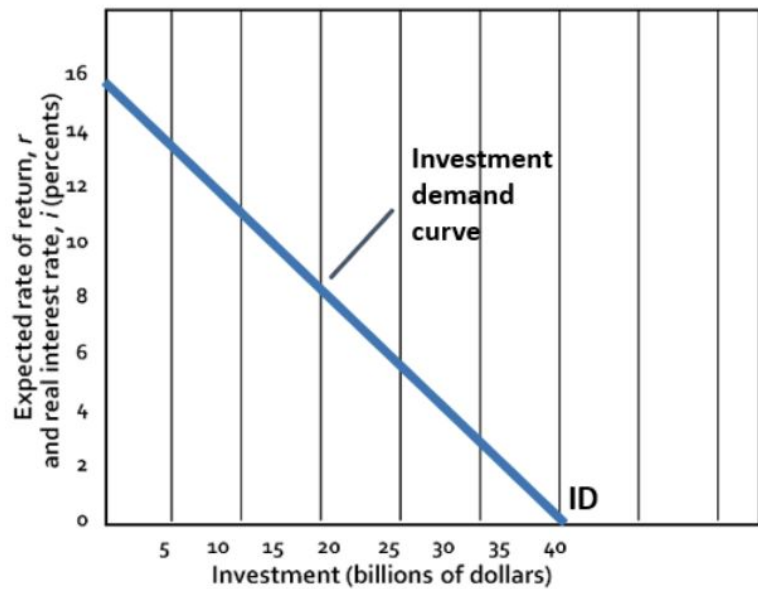
- An upward shift of the consumption schedule entails a downward shift of the saving schedule
 - If households consume more at each level of real GDP, they are saving less
- A downward shift of the consumption schedule is reflected in an upward shift of the saving schedule
 - If households consume less at each level of real GDP, they are saving more

The Interest Rate-Investment Relationship

- Expected rate of return, r
- The real interest rate
 - i = nominal rate - rate of inflation
 - Crucial in making investment decisions

- The investment demand curve

(r) and (i)	Investment (billions per year)
16%	\$ 0
14	5
12	10
10	15
8	20
6	25
4	30
2	35
0	40

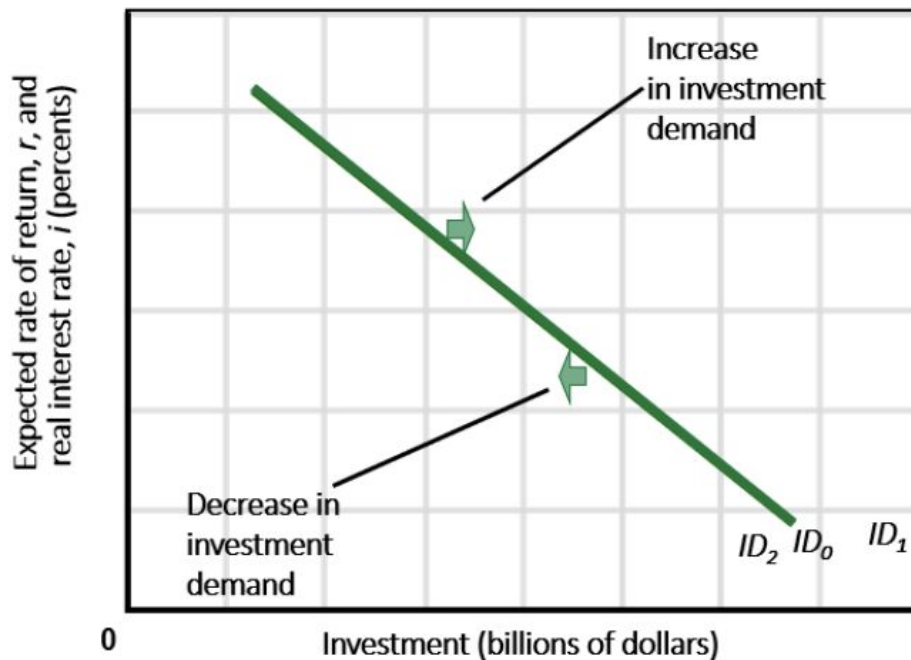


- Constructed by arraying all potential investment projects in descending order of their expected rates of return
- Curve slopes downward, reflecting an inverse relationship between the real interest rate and the quantity of investment demanded

Shifts in the Investment Demand Curve

- Acquisition, maintenance, and operating costs
- Business taxes
- Technological change
- Stock of capital goods on hand
- Planned inventory
- Expectations
- Fluctuations of investment
 - Variability of expectations
 - Durability
 - Irregularity of innovation
 - Variability of profits

Shifts in Investment Demand curve



- Increases in the investment demand are shown as rightward shifts of the investment demand curve
- Decreases in investment demand are shown as leftward shifts of the investment demand curve

The Multiplier Effect

- A change in spending changes real GDP more than the initial change in spending

$$\text{Multiplier} = \frac{\text{change in real GDP}}{\text{initial change in spending}}$$

$$\text{Change in GDP} = \text{multiplier} \times \text{initial change in spending}$$

- Changes in spending ripple through the economy to generate even larger changes in real GDP - this is called the multiplier effect

- The multiplier and marginal propensities
 - Multiplier and MPC directly related
 - Large MPC results in larger increases in spending
 - Multiplier and MPS inversely related
 - Large MPS results in smaller increases in spending

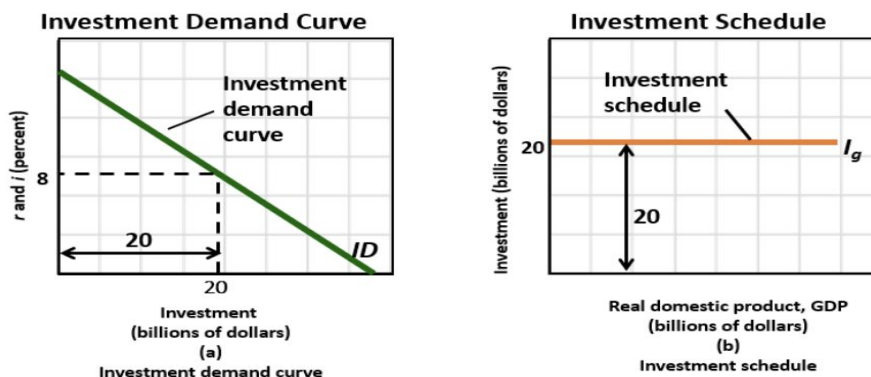
$$\text{Multiplier} = \frac{1}{1 - \text{MPC}}$$

$$\text{Multiplier} = \frac{1}{\text{MPS}}$$

Building the Aggregate Expenditures Model

Consumption and Saving

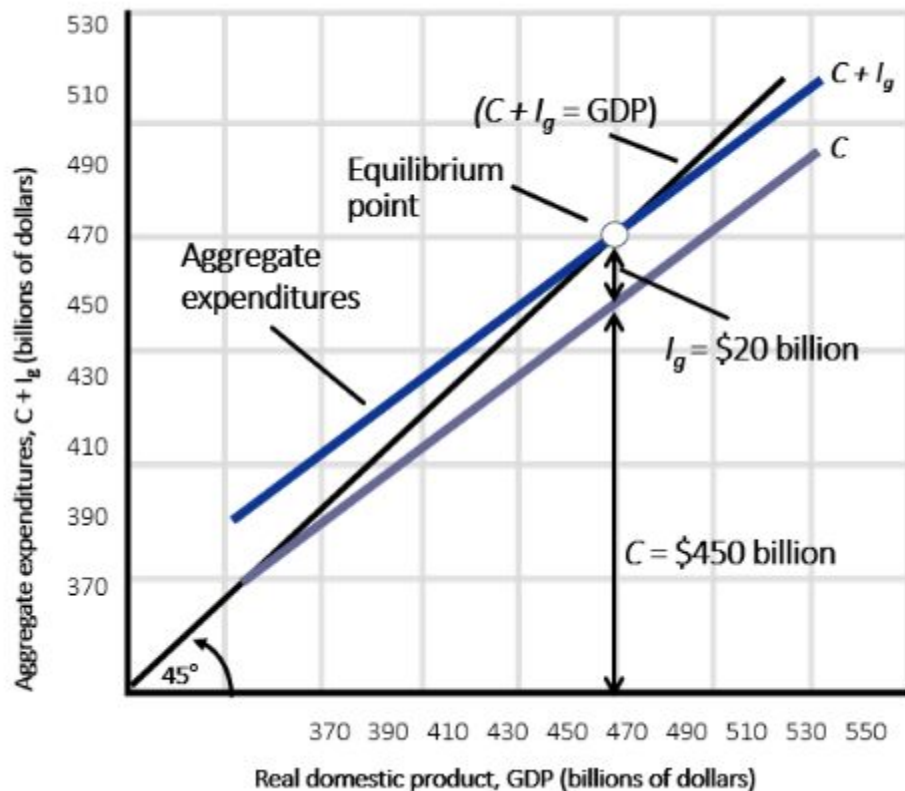
- Assumptions and simplifications
 - Use the Keynesian aggregate expenditures model
 - Prices are fixed
 - GDP = DI
 - Begin with private, closed economy - one without international trade or government
 - Consumption spending
 - Investment spending
- The investment demand curve and the investment schedule



- The level of investment spending is determined by the real interest rate together with the investment demand curve ID
- The investment schedule I_g relates the amount of investment to the various levels of GDP

Equilibrium GDP

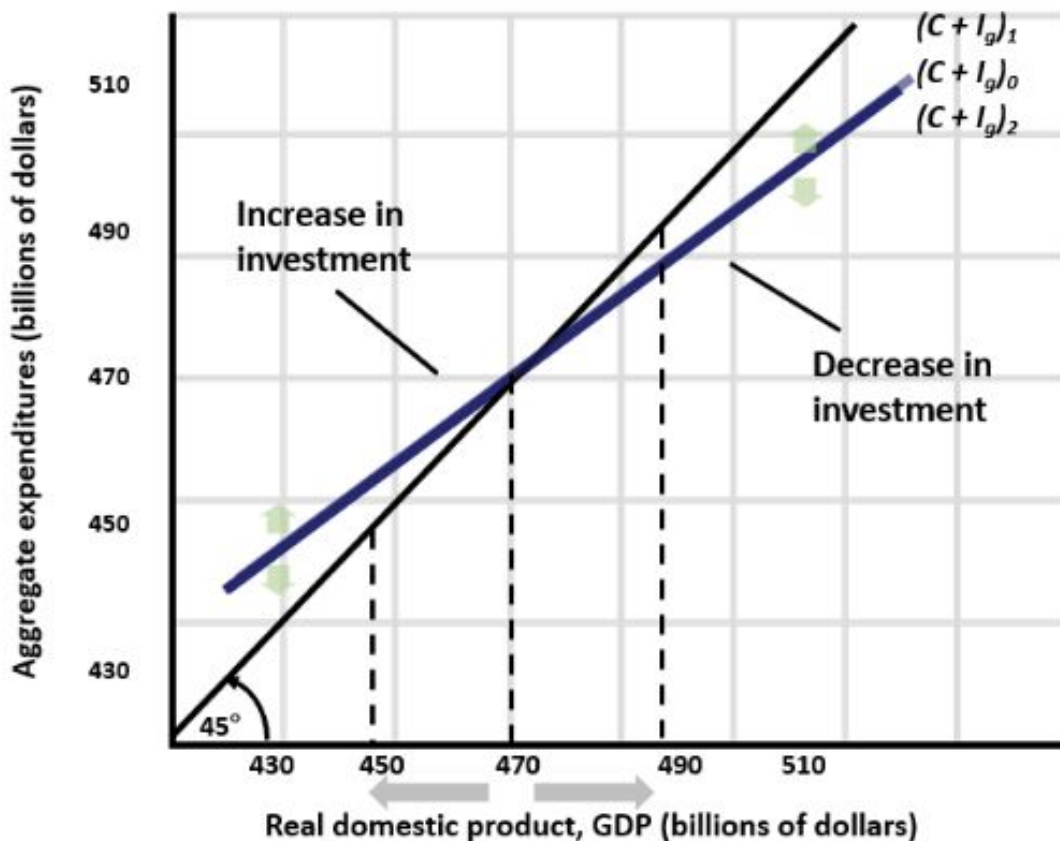
- Equilibrium GDP in a private closed economy



- Aggregate expenditures schedule, $C + I_g$, is determined by adding the investment schedule, I_g , to the upsloping consumption schedule, C
- Equilibrium GDP is determined where the aggregate expenditures schedule intersects the 45 degree line (in this case at \$470 billion)
- Other features of equilibrium GDP
 - Saving equals planned investment
 - Saving represents a leakage of spending
 - Investment can be thought of as an injection of spending
 - No unplanned changes in inventories
 - Unplanned increases in inventories result when firms produce above-equilibrium GDP output level
 - Unplanned decreases in inventories result when firms produce below-equilibrium GDP output level

Changes in Equilibrium GDP and the Multiplier

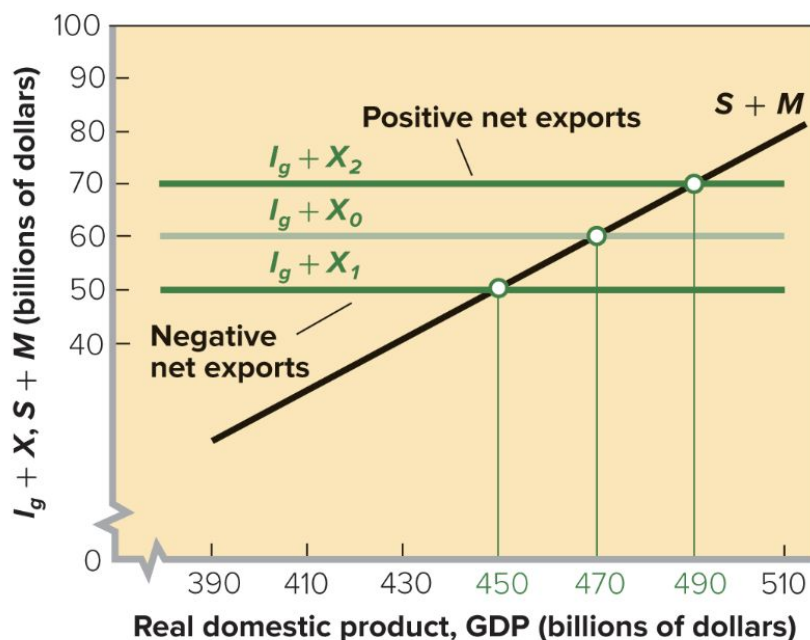
- In the private closed economy, the equilibrium GDP will change in response to changes in either the investment schedule or the consumption schedule
- Because changes in the investment schedule usually are the main source of fluctuations, we direct our attention to them
- Changes in the aggregate expenditure schedule and the multiplier effect



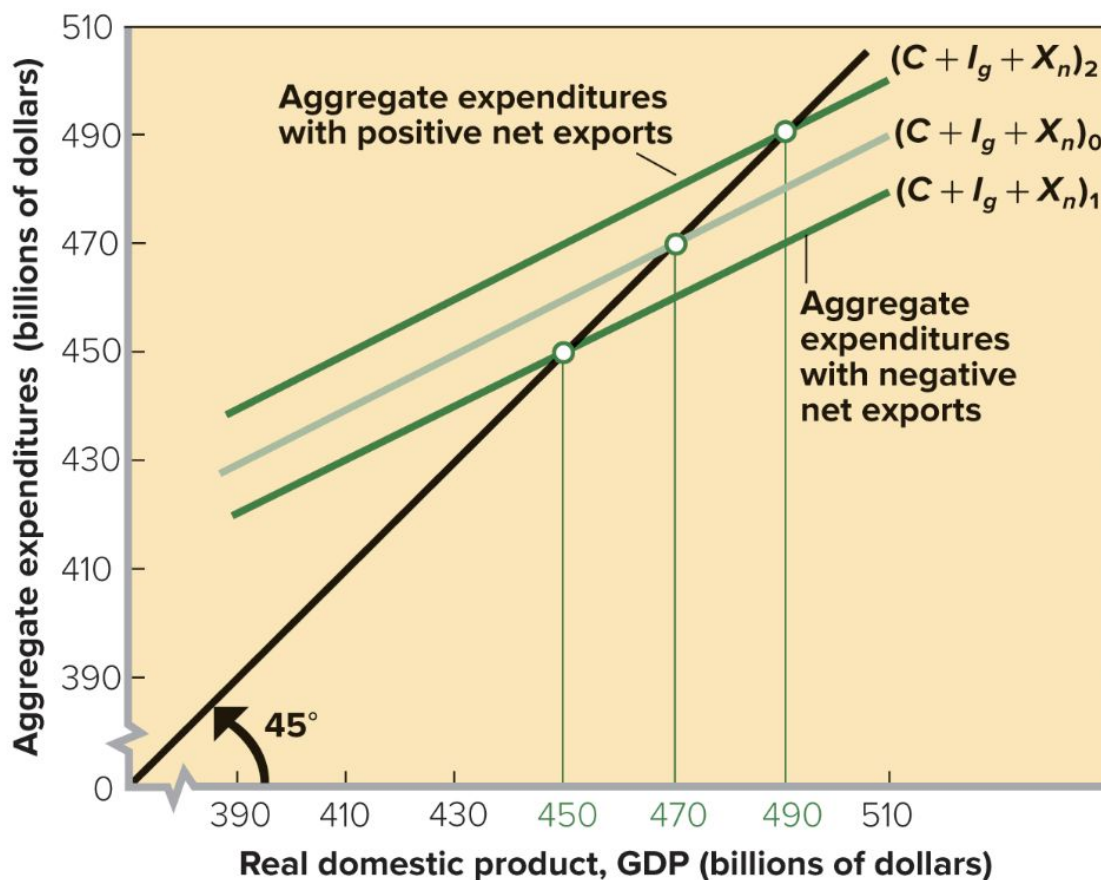
- An upward shift of the aggregate expenditure schedule will increase the equilibrium GDP
- A downward shift of the aggregate expenditure schedule will lower the equilibrium GDP
- The extent of the changes in equilibrium GDP will depend on the multiplier
- The multiplier is equal to $1/MPS$

Adding International Trade

- Net exports and aggregate expenditures
 - Exports (X) create domestic production, income and employment
 - Imports (M) represent goods and services produced abroad
 - In an open economy, aggregate spending is $C + I_g + X_n$, where $X_n = (X - M)$
 - X_n can be either positive or negative
- Determinants of net export
 - If GDP in other countries is growing, demand for our exports will increase
 - Our imports are independent on our own GDP
 - Both imports and exports are affected by the exchange rate
 - Depreciation
 - Appreciation
- Imports and the multiplier
 - Marginal propensity to import (MPM)
 - $MPM = \text{change in imports} / \text{change in GDP}$
 - MPM is the slope of the net export schedule
 - Open economy multiplier
 - The closed economy multiplier is $1/MPS$
 - Expenditure on imports is a leakage
 - Open economy multiplier = $1 / (MPS + MPM)$
- Net exports and the equilibrium GDP
 - Net exports can be either positive, as shown by the net export schedule X_{n1} , or negative, as shown by net export schedule X_{n2}



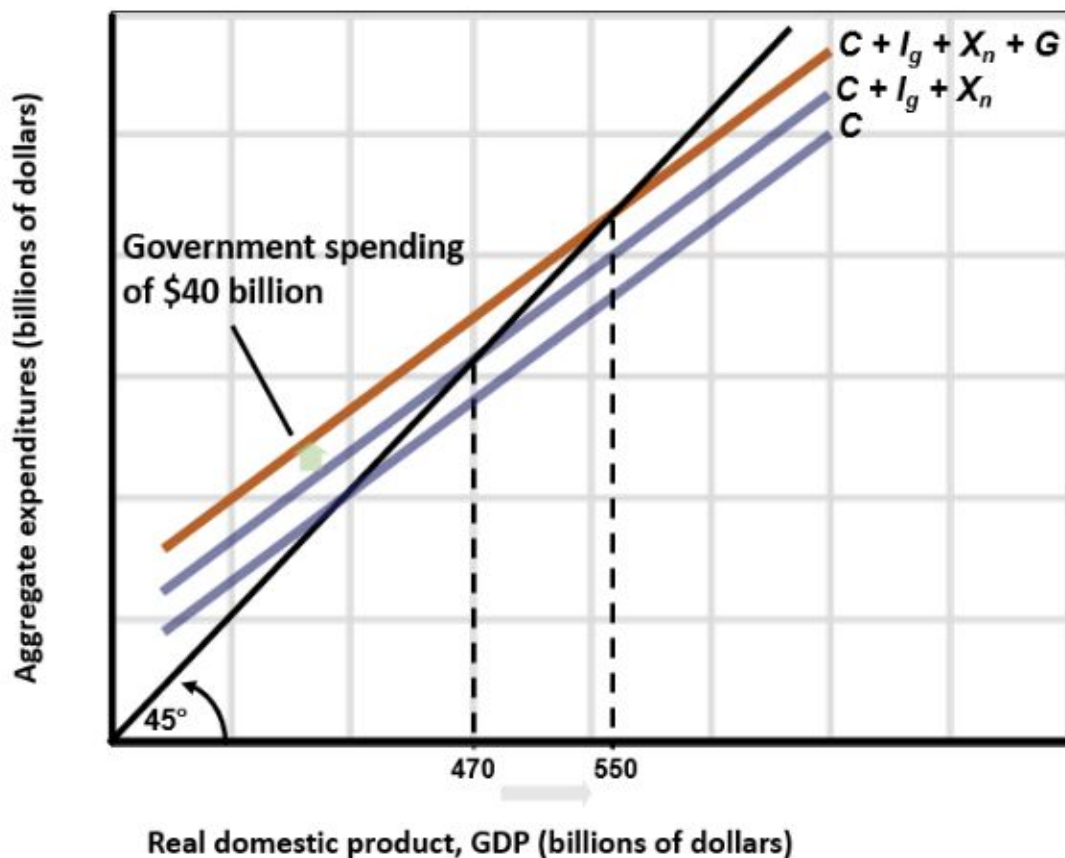
- Positive net exports elevate the aggregate expenditure schedule from the closed-economy level of $C + I_g$ to the open economy level of $C + I_g + X_n1$. negative net exports lower the aggregate expenditures schedule from the closed economy level of $C + I_g$ to the open economy level of $C + I_g + X_n2$



- A decline in net exports decreases aggregate expenditures and reduces GDP
- A rise in net exports increases aggregate expenditures and increases GDP
- International economic linkages
 - Prosperity abroad
 - Exchange rates
 - Tariffs and devaluations

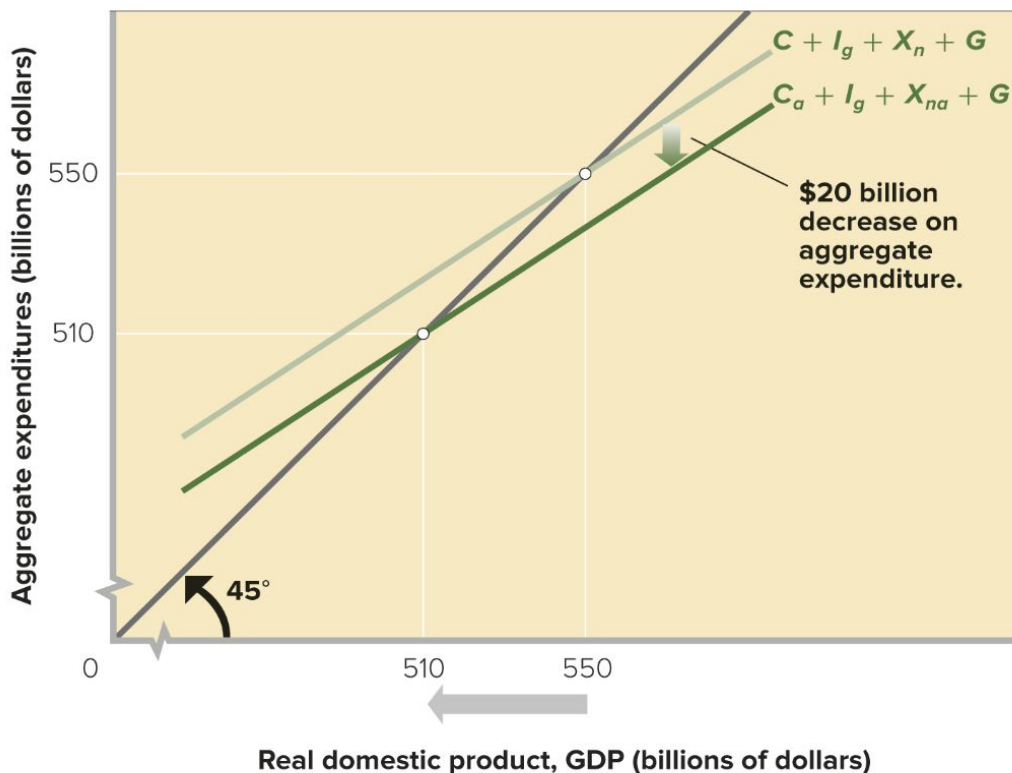
Adding the public sector: government purchases, taxation, and equilibrium GDP

- Simplifying assumptions
 - Government purchases do not cause any shift in consumption or investment schedules
 - Net tax revenues are derived totally from personal taxes
 - Taxes do not vary with GDP
- Government purchases and equilibrium GDP
 - Increases in public spending shift the AE schedule upward and result in higher equilibrium GDP



- The impact of government spending on equilibrium GDP
 - Addition of government expenditures, G , raises the aggregate expenditures ($C + I_g + X_n + G$) schedule and increases the equilibrium level of GDP
 - Multiplier is 4 ($80/20$)

- Taxes and the equilibrium GDP

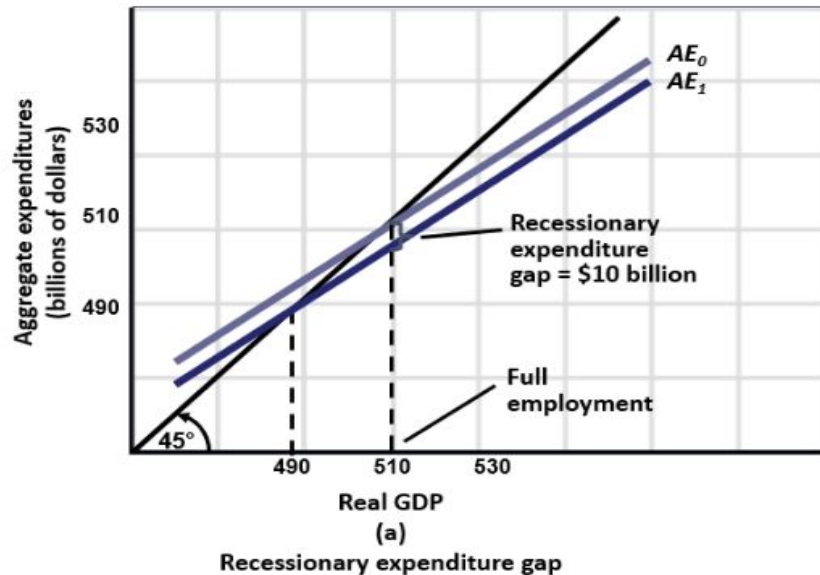


- If the MPC is 0.75, the \$40 billion of taxes will lower the domestic consumption schedule by \$20 billion and cause a decline in equilibrium GDP
- In the open economy with government, with C_a representing after-tax income, equilibrium GDP occurs where $C_a + I_g + X_n + G = \text{GDP}$
- Differential impacts
 - Equal changes in G and T do not have equivalent impacts on GDP
- Injections, leakages, and unplanned changes in inventories
 - $S_a + M + T = I_g + X + G$
 - S_a = amount of after tax saving

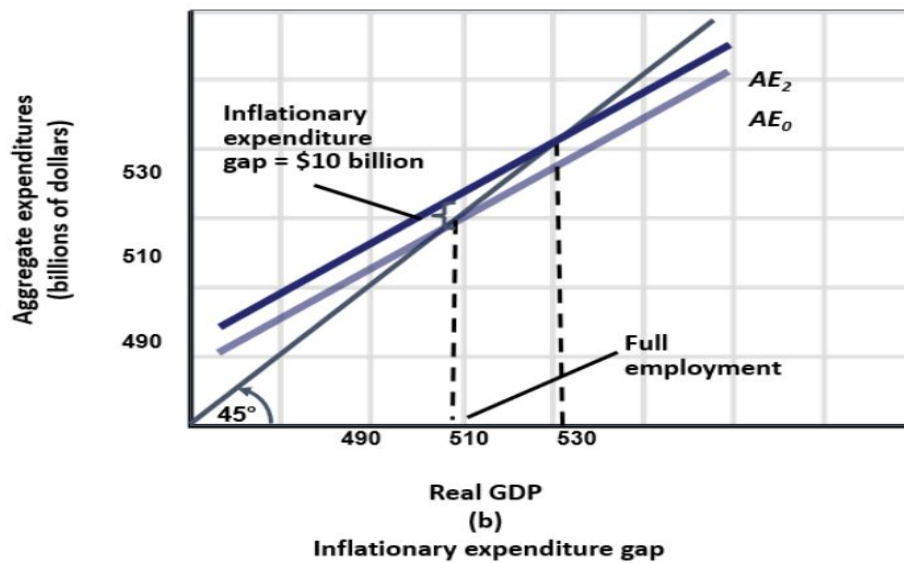
Equilibrium vs. full-employment GDP: recessionary and inflationary gaps

- Recessionary expenditure gap
 - Insufficient aggregate spending
 - Spending below full-employment GDP

- Increase G and/or decrease T



- A recessionary expenditure gap is the amount by which aggregate expenditures at the full-employment GDP fall short of those needed to achieve the full-employment GDP
- Inflationary expenditure gap
 - Too much aggregate spending
 - Spending exceeds full-employment GDP
 - Decrease G and/or increase T

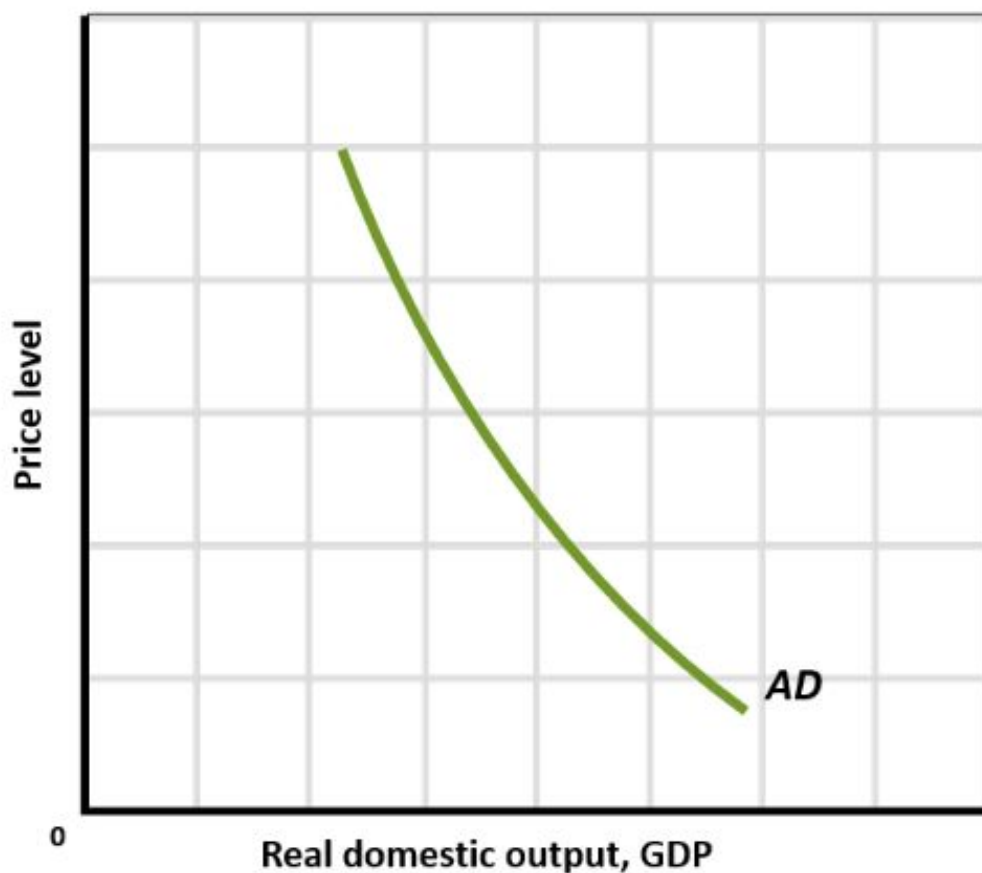


- An inflationary expenditure gap is the amount by which aggregate expenditures at the full-employment GDP exceed those just sufficient to achieve the full-employment GDP

Aggregate Demand and Aggregate Supply

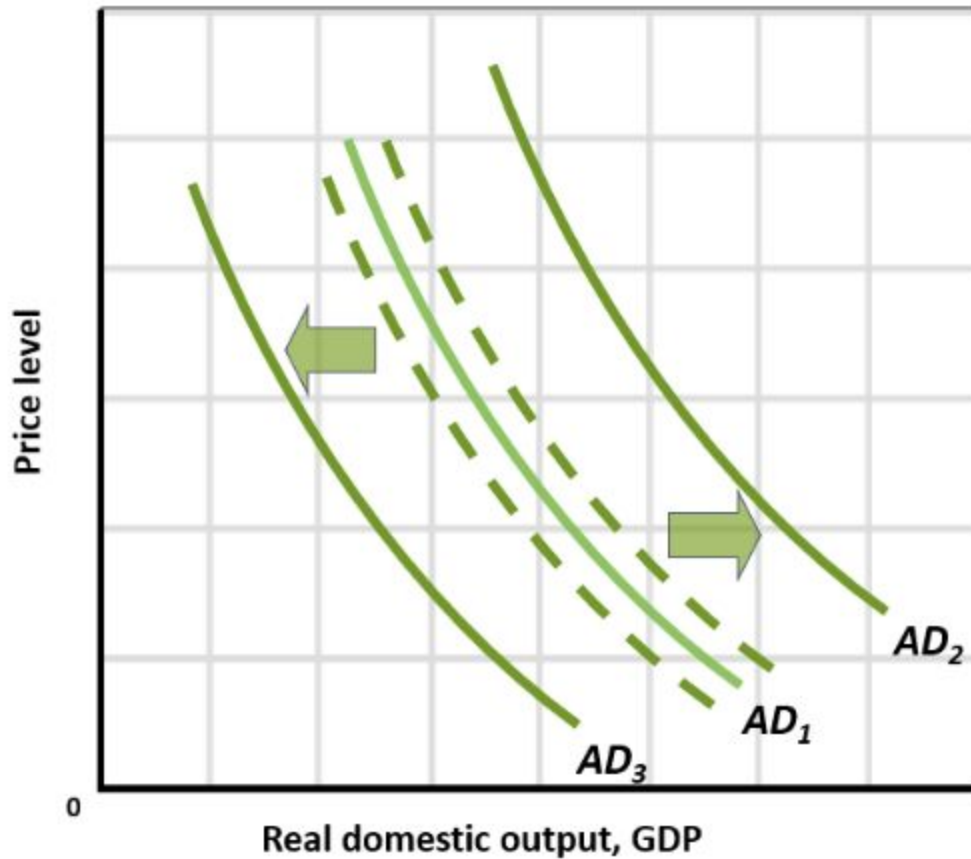
Aggregate demand curve: derivation, determinants, and shifts

- Aggregate demand is a schedule or curve that shows the amounts of real output (real GDP) that buyers collectively desire to purchase at each possible price level



- Slopes downward because of the following effects of a change in price level
 - Real-balances effect
 - A higher price level means less consumption spending
 - Interest-rate effect
 - A higher price level reduces the amount of real output demanded
 - Foreign trade effect
 - A higher price level reduces the quantity of Canadian goods demanded

- Changes in aggregate demand

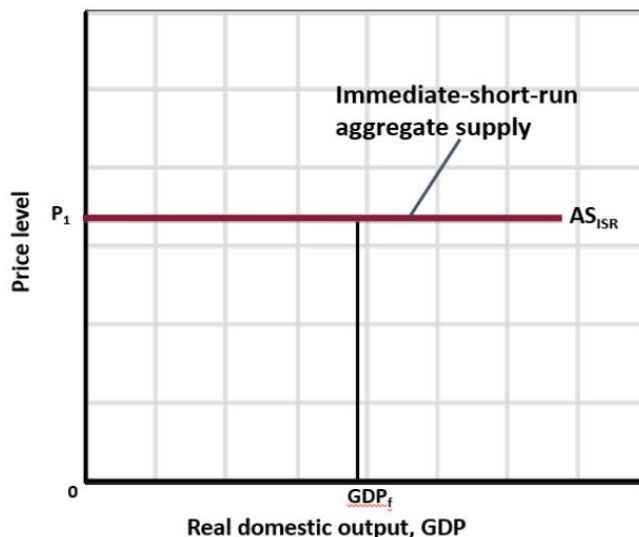


- The rightward shift from AD₁ to AD₂ represents an increase in aggregate demand
- The leftward shift from AD₁ to AD₃ shows a decrease in aggregate demand
- Vertical distances between AD₁ and the dashed lines represent the initial changes in spending
- Through the multiplier effect, that spending produces the full shifts of the curves
- Determinants of aggregate demand
 - Consumer spending
 - Consumer wealth
 - Household borrowing
 - Consumer expectations
 - Personal taxes
 - Investment spending
 - Real interest rates

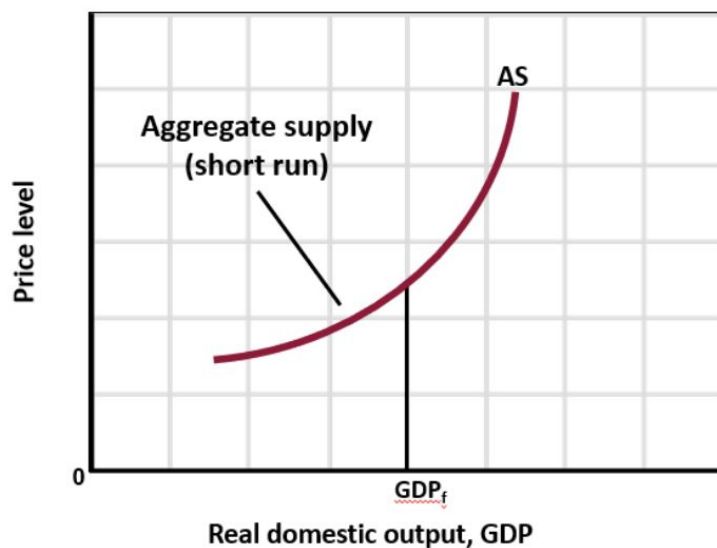
- Expected returns
 - Expectations about future business conditions
 - Technology
 - Degree of excess capacity
 - Business taxes
 - Government spending
 - Government spending increases, aggregate demand increases (as long as interest rates and tax rates don't change)
 - Government spending decreases, aggregate demand decreases
 - Net export spending
 - National income abroad
 - Exchange rates
 - Dollar depreciation
 - Dollar appreciation

Aggregate supply curve: shape, determinants, shifts

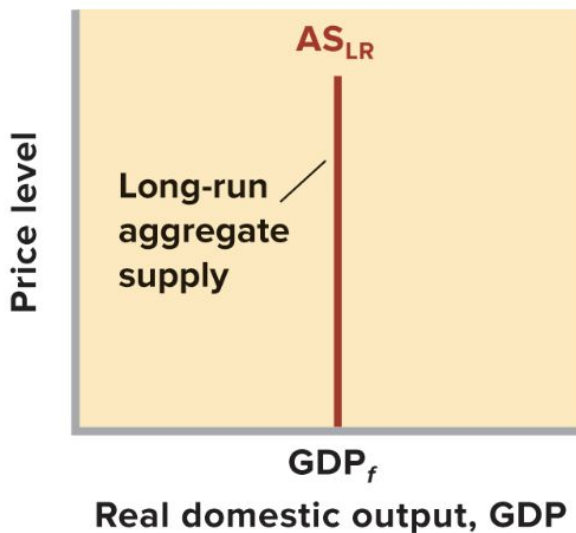
- Aggregate supply is a schedule or curve showing the relationship between the price level of output and the amount of real domestic output that firms produce
- Aggregate supply depends on three time horizons
 - The immediate short run
 - The short run
 - The long run
- Aggregate supply in the immediate short run
 - Both input prices and output prices are fixed
 - The aggregate supply curve is horizontal at an economy's current price level
 - With output prices fixed, firms collectively supply the level of output that is demanded at those prices



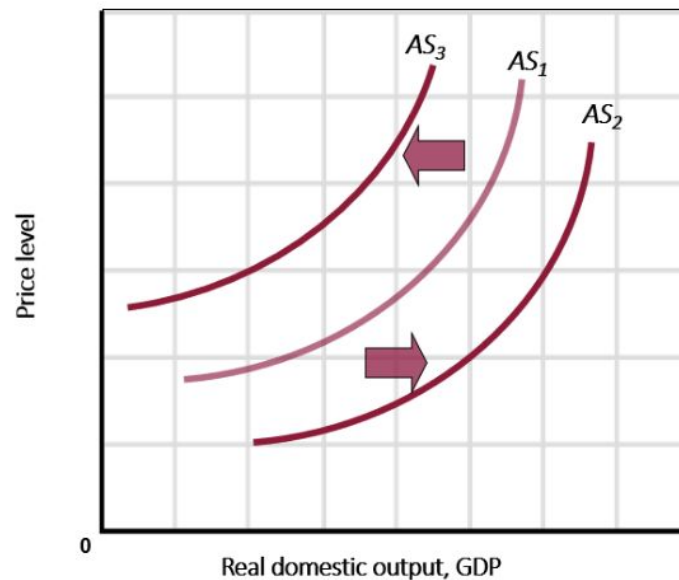
- Aggregate supply in the short run
 - The short run begins after the immediate short run ends
 - Period of time during which output prices are flexible but input prices are either totally fixed or highly inflexible
 - The upward sloping aggregate supply curve indicates a direct (or positive) relationship between the price level and the amount of real output that firms will offer for sale
 - The AS curve is relatively flat below the full-employment output
 - It is relatively steep beyond the full-employment output



- Aggregate supply in the long run
 - For the economy as a whole, it is the time horizon over which all output and input prices are fully flexible
 - It begins after the short run ends
 - Price-level changes do not affect firms' profits and thus they create no incentive for firms to alter their output



- Changes in aggregate supply
 - Determinants of short run aggregate supply
 - Input prices
 - Domestic factor prices
 - Price of imported resources
 - Productivity
 - Legal-institutional environment
 - Business taxes and subsidies
 - Government regulation

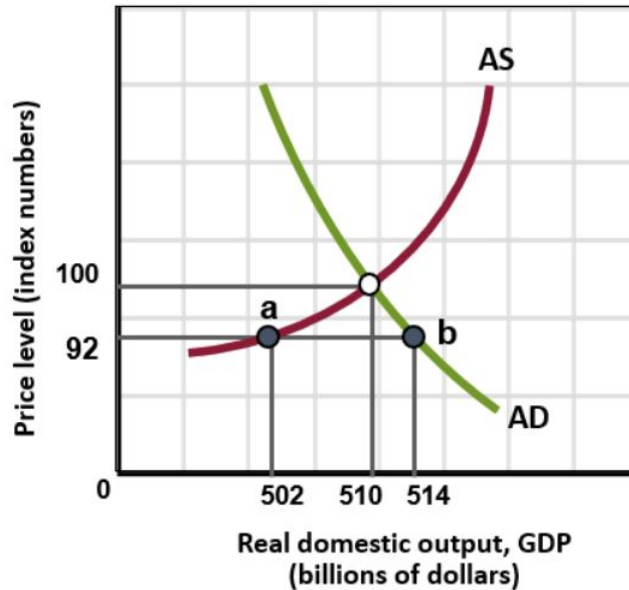


- Rightward shift of the aggregate supply curve from AS₁ to AS₂ represents an increase in aggregate supply
- Leftward shift of the curve from AS₁ to AS₃ shows a decrease in aggregate supply

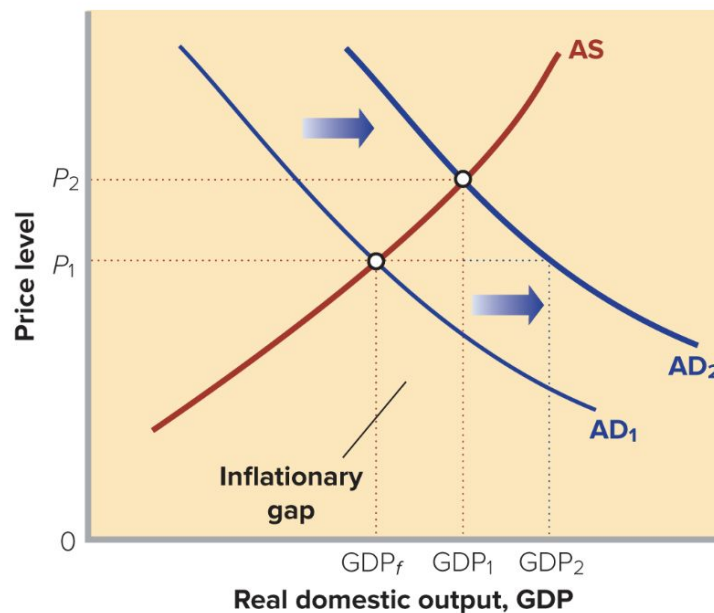
Equilibrium: real output and the price level

- Equilibrium occurs at the price level that equalizes the amount of real output demanded and supplied
- At the intersection of AD and AS:
 - Equilibrium price level
 - Equilibrium real output

- The equilibrium price level and equilibrium real GDP

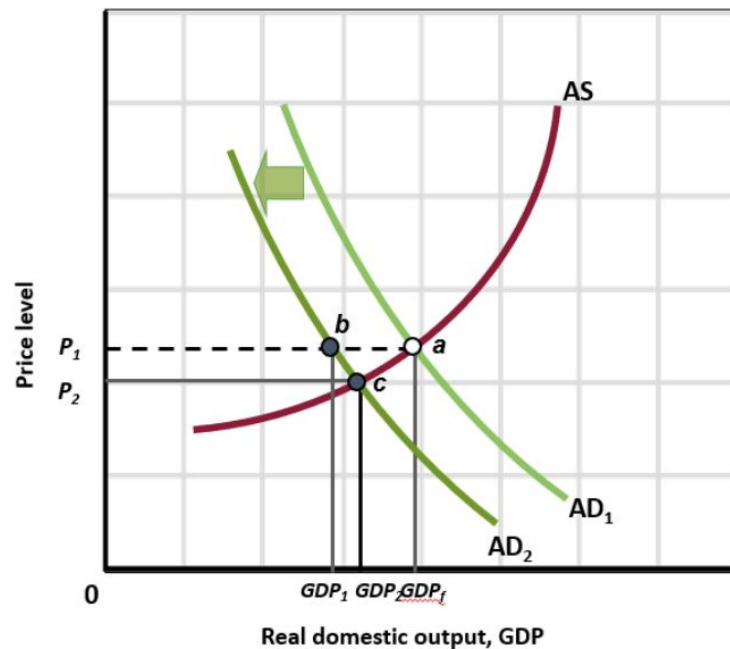


- Intersection of the aggregate demand curve and the aggregate supply curve determines the economy's equilibrium price level
- Changes in equilibrium
 - Increases in AD: demand-pull inflation
 - Inflationary (positive) GDP gap

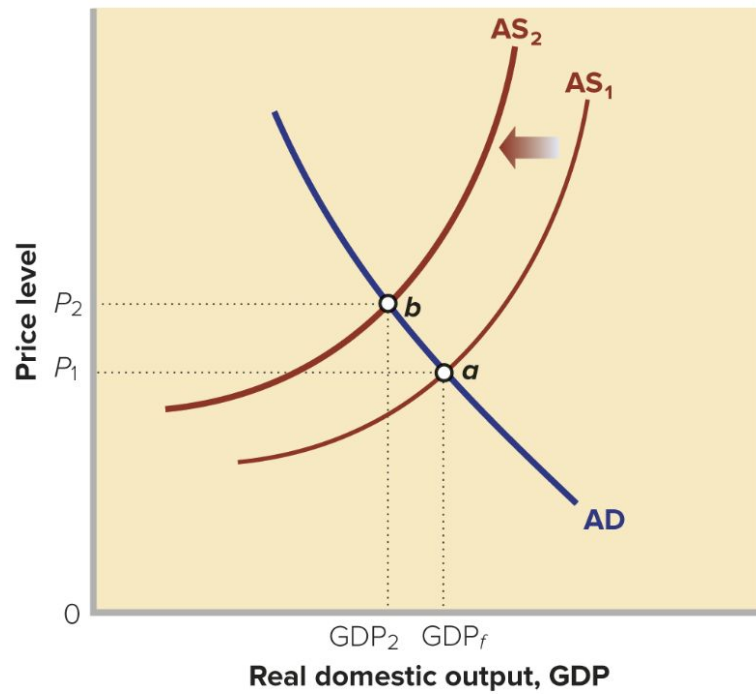


- Increase in aggregate demand from AD1 to AD2 causes demand-pull inflation, shown as the rise in the price level from P1 to P2

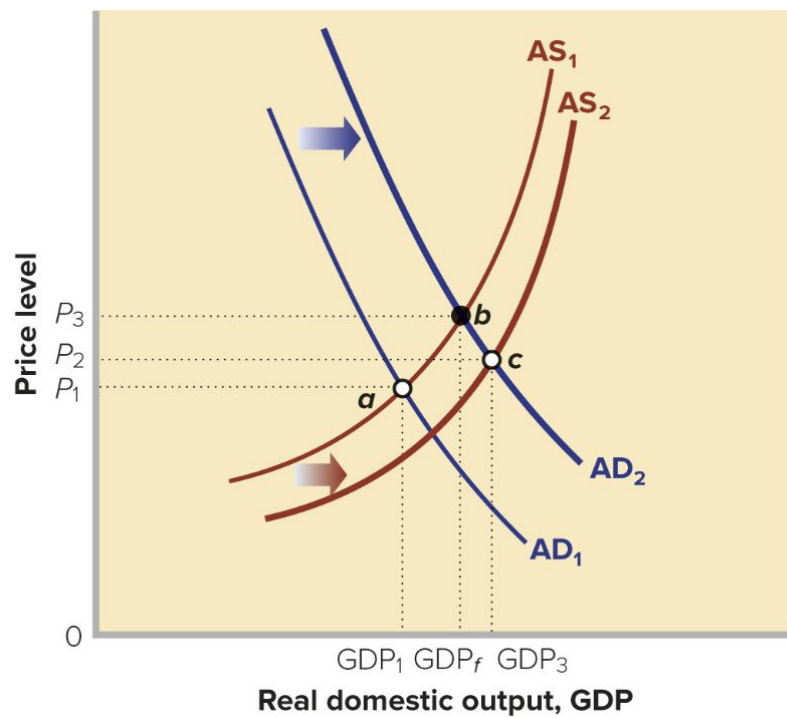
- Rise in price level reduces size of the multiplier effect
 - Decreases in AD: recession and cyclical unemployment
 - Deflation, a decline in the price level, is a rarity in the Canadian economy
 - Real output takes the full brunt of the decline in AD because product prices are “sticky” in the short run
 - Recessionary (negative) GDP gap
 - Reasons for downward price stickiness
 - Fear of price wars
 - Menu costs
 - Wage contracts
 - Morale, effort, and productivity
 - Minimum wage
 - Menu costs



- Decline of aggregate demand from AD1 to AD2 will move the economy leftward
 - Decreases in AS: Cost-push inflation
 - Output decreases
 - Price level increases



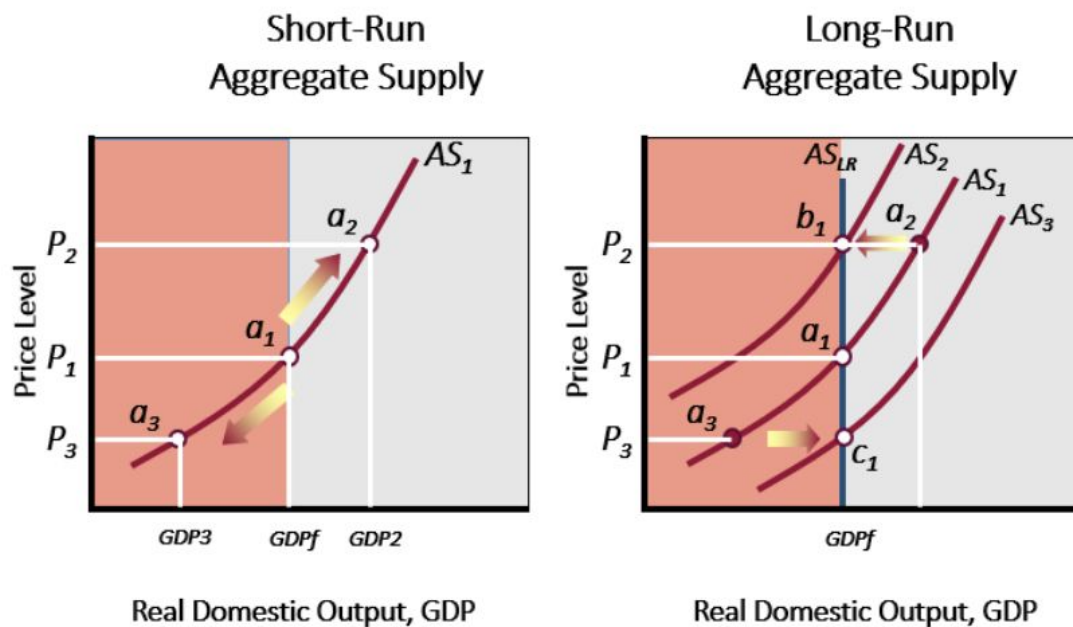
- Leftward shift of aggregate supply from AS₁ to AS₂ raises the price level from P_1 to P_2
- Real output declines and a negative GDP gap ($GDP_f - GDP_2$) occurs
- Increases in AS: full employment with price-level stability



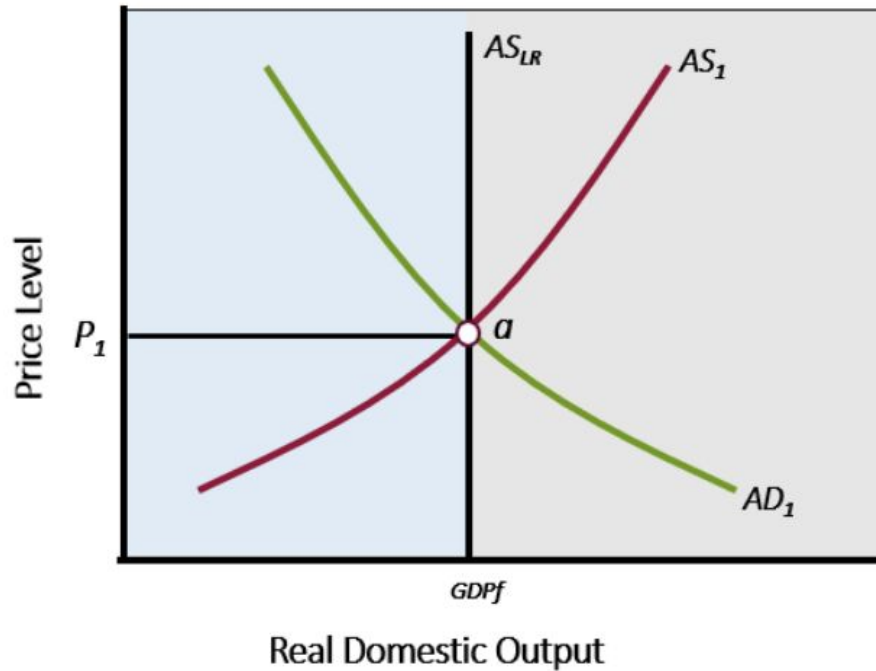
- In the late 1990s, increases in productivity shifted the aggregate supply curve from AS_1 to AS_2
 - Economy moved from a to c rather than from a to b
 - Strong economic (GDP1 to GDP3), full employment, and only very mild inflation (P_1 to P_2)

Short-run and Long-run

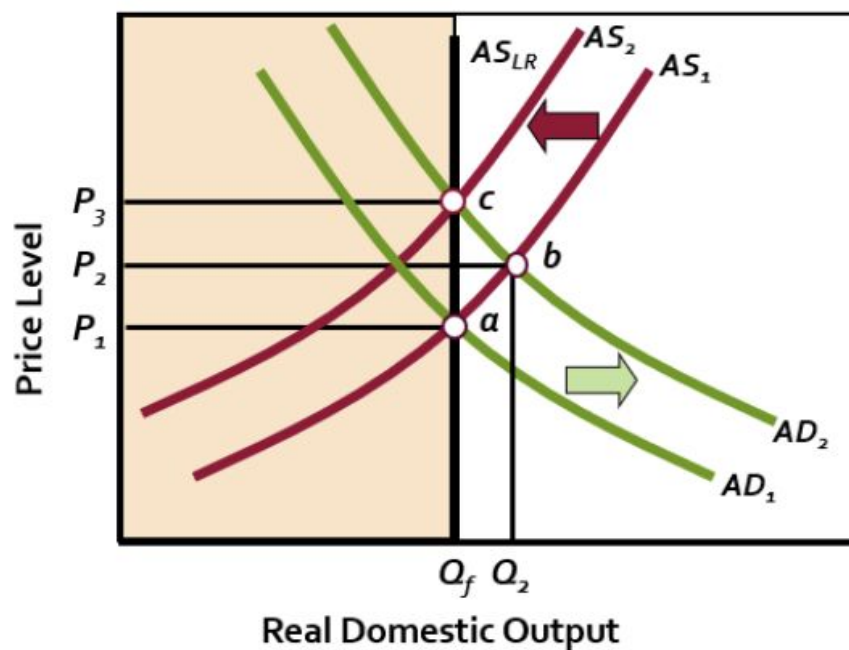
- From the short run to the long run
 - Short-run aggregate supply
 - Input prices are inflexible
 - Aggregate supply curve is upward sloping
 - Long-run aggregate supply
 - Input prices are fully flexible
 - Vertical aggregate supply
- From the short-run AS to the long-run AS
 - Production above potential output:
 - High demand for inputs
 - Input prices rise
 - Short run aggregate supply shifts left
 - Production below potential output:
 - Lower demand for inputs
 - Input prices fall
 - Short run aggregate supply shifts right
- Short-run and long-run aggregate supply



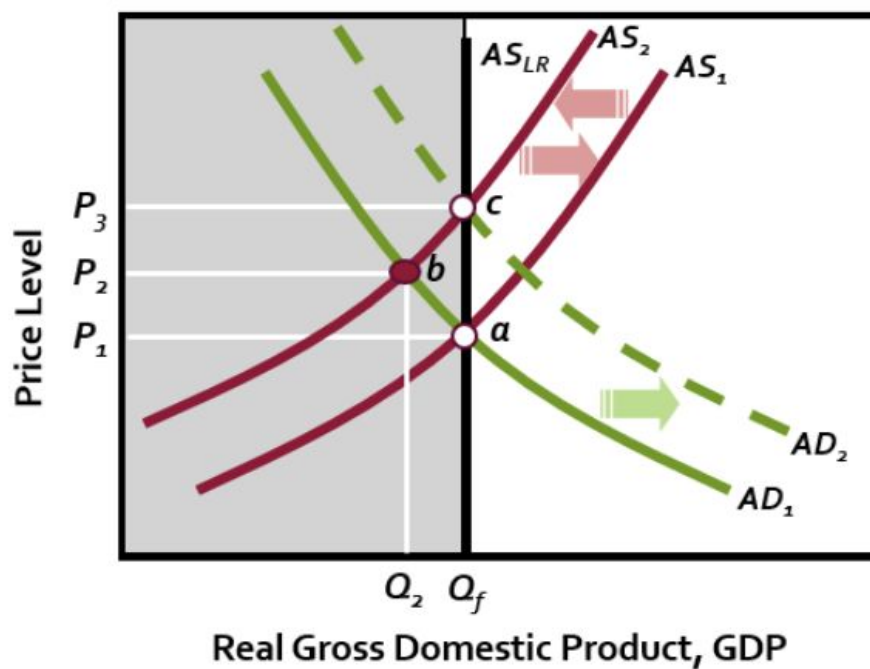
- Equilibrium in the long-run AD-AS model



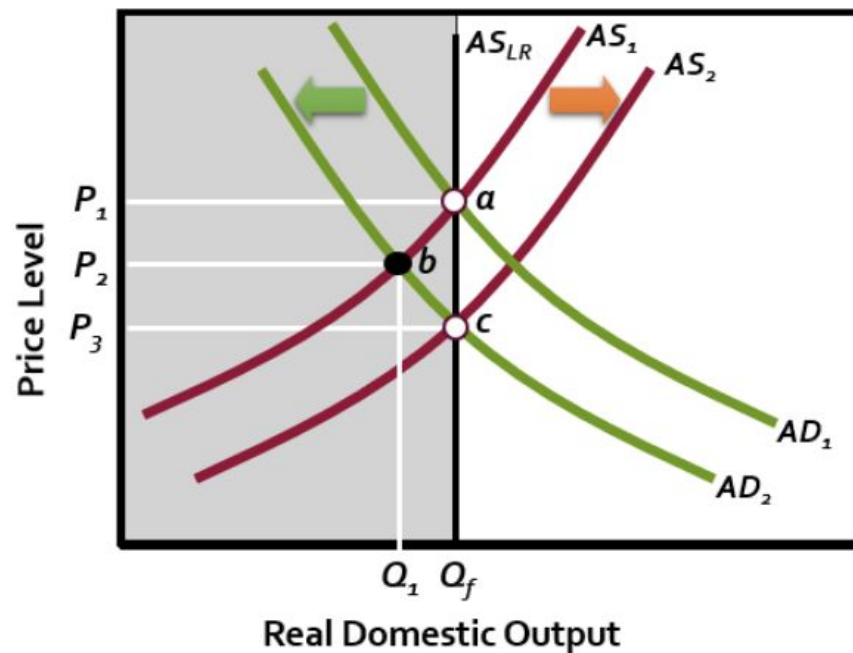
- Applying the long-run AD-AS model
 - Demand-pull inflation occurs when an increase in aggregate demand pulls up the price level
 - Demand-pull inflation in the long-run AD-AS model



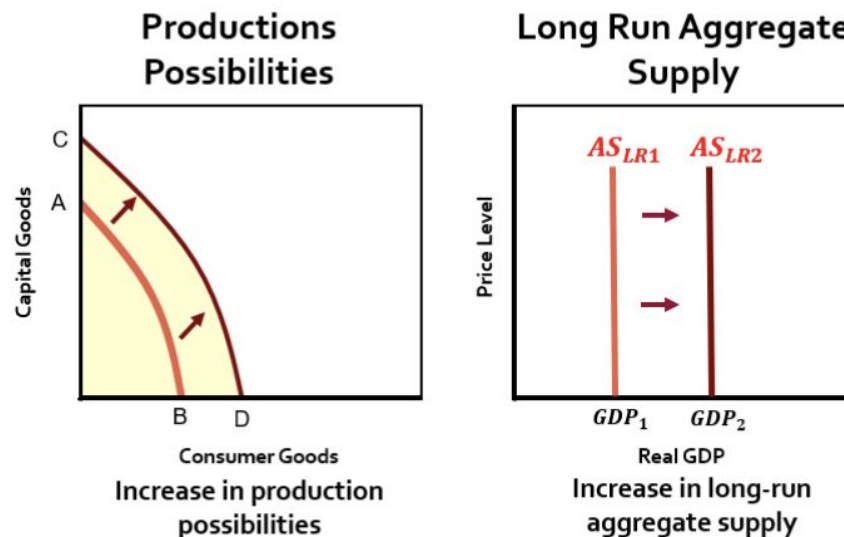
- Since the demand-pull inflation causes the aggregate demand curve to shift to the right, it causes the price level to increase, which expands output to a higher level
- Demand-pull inflation
 - In the short run, demand-pull inflation drives up prices and output
 - In the long run, output is restored to Q_f and only the price level is higher
- Cost-push inflation
 - Arises from factors that increase the cost of production at each price level
 - Cost-push inflation in the long-run AD-AS model



- Cost-push inflation: policy dilemma
 - If government attempts to maintain full employment, an inflationary spiral may occur
 - Otherwise, the recession will linger, with high unemployment and a loss of real output



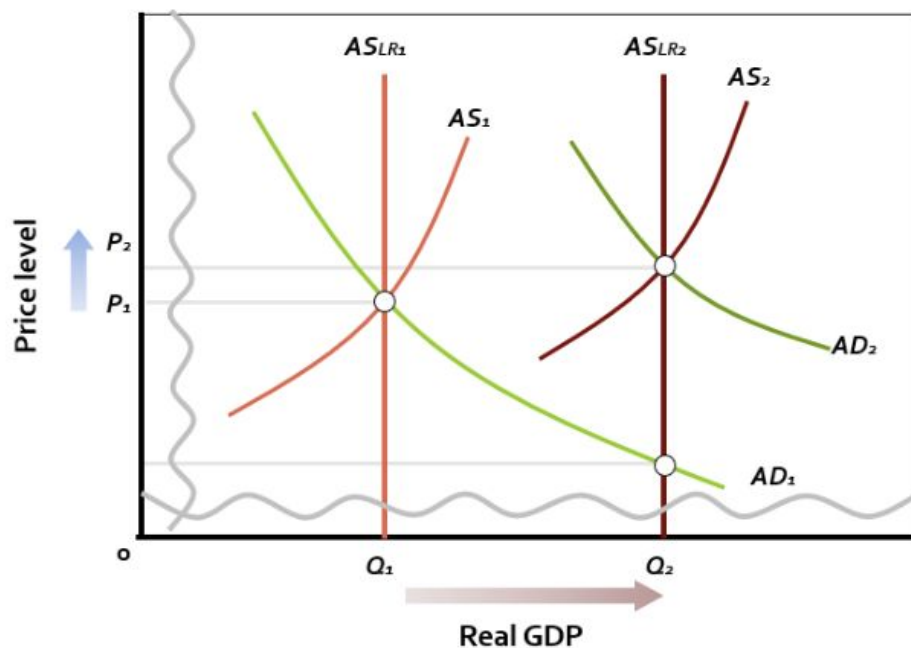
- Recession in the long-run AD-AS model
 - Aggregate demand declines and shifts left, which reduces prices
 - Demand for inputs will be low
 - Aggregate supply will decrease, which will decrease prices further
- Production possibilities and long-run aggregate supply



- Economic growth is illustrated by either an outward shift on the production possibilities curve or a rightward shift in the long run aggregate supply curve
- As the curves shift, they will lead to price increases at a new equilibrium level

Recessionary and inflationary gaps in the AD-AS model

- Ongoing inflation in the long-run AD-AS model
 - Modern economies tend to experience positive rates of inflation due to:
 - Economic growth causing rightward shifts of the AS curve
 - Central banks then cause rightward shifts of the AD curve so that it proceeds just a little faster than the deflationary rightward shifts of the AS curve
 - The net effect is (usually) a small positive rate of inflation
- Depicting Canadian growth in the long-run AD-AS model

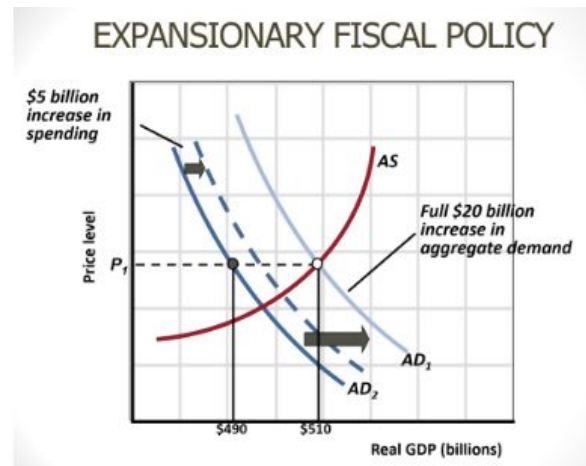


- To manage inflation, the Bank of Canada uses monetary policy to shift the aggregate demand curve to the right faster than the supply factors of economic growth shift the long-run aggregate supply curve to the right
- Long-run AD-AS model
 - Economic growth causes increases in long-run aggregate supply
 - Whether deflation, or inflation accompanies growth depends on the extent to which aggregate demand increases relative to aggregate supply
 - Any inflation that occurs is the result of growth of aggregate demand
 - It is not the result of the growth of real GDP

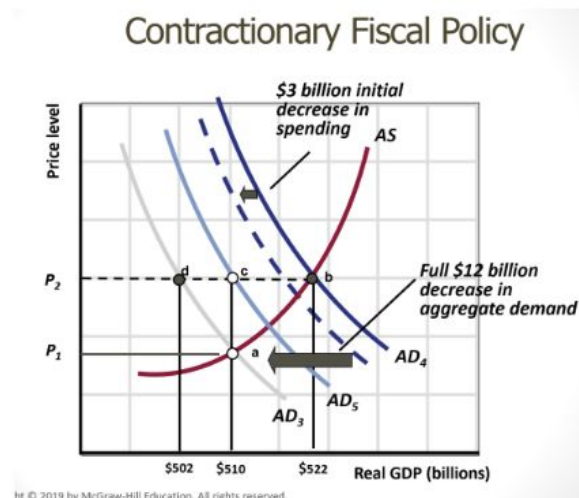
Fiscal Policy, Deficits, Surpluses, and Debt

Discretionary fiscal policy: expansionary and contractionary

- Expansionary fiscal policy
 - Used when recession occurs
 - Options:
 - Increased government spending
 - Tax reductions
 - Combined government spending increases and tax reductions
 - May create a budget deficit



- Contractionary fiscal policy
 - Used to combat demand-pull inflation
 - Options:
 - Decreased government spending
 - Increased taxes
 - Combined government spending decreases and tax increases

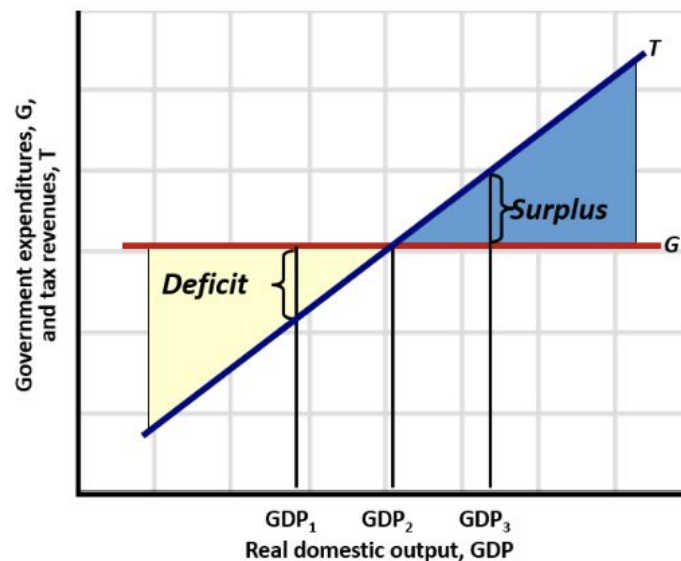


- Policy options: G or T?
 - To expand the size of government
 - If recession, then increase government spending
 - If inflation, then increase taxes
 - To reduce the size of government
 - If recession, then decrease taxes
 - If inflation, then decrease government spending

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Built in stabilizers

- Built-in stability
 - Net tax revenues vary directly with GDP
 - Taxes rise when GDP rises, and vice versa
 - Transfer payments fall when GDP rises, and vice versa
 - Leads to automatic stabilization over the business cycle
- Automatic or built-in stabilizers
 - A structure of taxation and spending that:
 - Increases the deficit (reduces the surplus) during recession
 - Increases the surplus (reduces the deficit) during inflation
- Economic importance
 - The stabilizers will automatically restrain economic expansion and cushion economic contraction
 - Taxes reduce spending and aggregate demand
 - Reductions in spending are desirable when the economy is developing inflationary pressures
 - Increases in spending are desirable when the economy is slumping
- Built-in stability



- Tax revenues, T, vary directly with GDP
- Government spending, G, is assumed to be independent of GDP
- As GDP falls in a recession, deficits occur automatically
- As GDP rises during expansion, surpluses occur automatically

Problems, criticisms, and complications

- Problems of timing
 - Recognition lag
 - Administration lag
 - Operational lag
- Political considerations
- Future policy reversals
- Offsetting provincial and municipal finance
- Crowding-out effect
 - Expansionary fiscal policy may lead to:
 - Higher interest rates
 - Reduction in interest-sensitive saving
 - May not be significant in a recession
 - Fiscal policy can be accommodated by increases in money supply

Money, Banking, and Monetary Policy

The functions of money

- Medium of exchange
- Measure of value
- Store of value
 - Liquidity: the ease with which an asset can be converted to cash with little or no loss of purchasing power

The supply of money

- Money supply called M1
- The components of the money supply
 - Currency: coins + paper money
 - Token money and Bank of Canada notes
 - Demand deposits
 - About $\frac{3}{4}$ of M1
 - Institutions that offer demand deposits
 - Chartered banks are the primary depository institutions

- Two qualifications:
 - Currency held by the Bank of Canada and chartered banks is excluded from M1 and other measures of the money supply
 - Also excluded from the money supply are any deposits of the federal government or the Bank of Canada that are held by chartered banks
- Money as debt
 - The major components of money - paper money and demand deposits - are debts
- Value of money
 - Acceptability
 - Legal tender
 - Relative scarcity

The Canadian financial system

- Canada's chartered banks
 - A multi-branched, privately owned, chartered financial intermediary that has received a charter by Act of Parliament
 - Fractional reserve banking system
 - A banking system with a reserve ratio that is less than 100 percent of the deposit liabilities of a chartered bank
- Making loans
 - Prime rate
- Other financial intermediaries
 - Trust companies, loan companies, credit unions, and caisses populaires
 - Insurance companies
- Two basic functions:
 - They hold the money deposits of businesses and households
 - They make loans to the public in an effort to make profits

Money creation: multiple-deposit expansion

- A single bank can lend one dollar for each dollar of excess reserves
- The situation is different for all chartered banks as a group
- The banking system can lend (create money) by a multiple of its excess reserves

- This multiple lending is accomplished even though each bank in the system can lend only “dollar for dollar” with its excess cash reserves
- Assumptions:
 - 20% desired reserves ratio
 - All banks “loaned up”
 - Banks lend all of their excess reserves
 - A \$100 bill is found and deposited
- Money deposits can be created
- The monetary multiplier

$$\text{Monetary multiplier} = \frac{1}{\text{Desired reserve ratio}} = \frac{1}{R}$$

- Maximum demand-deposit creation = excess cash reserves * monetary multiplier

Functions of the Bank of Canada

- Acting as the “Bankers’ Bank” (the lender of last resort)
- Issuing currency (fiat money)
- Acting as fiscal agent (to the federal government)
- Supervising the chartered banks (profitability, performance, etc)
- Regulating the supply of money (influence the interest rates) - policy decisions

The goals of monetary policy

- To keep inflation low, stable and predictable, to moderate the business cycle, and help the economy achieve full employment and sustained growth
- By altering the money supply to influence interest rates
- Inflation target of 1-3% annually

Transmission Mechanism

- Money supply impacts interest rates
- Interest rates affect investment
- Investment is a component of AD
- Equilibrium GDP is changed