

Unit 2: Macroeconomics



Assessment Objectives

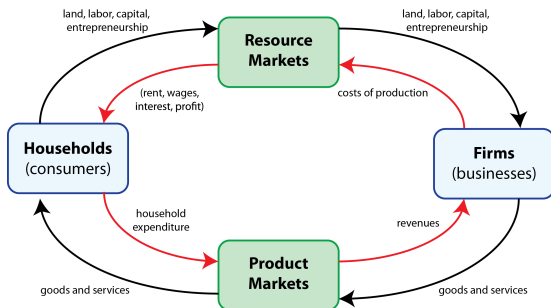
Specific Expectations

AO1	Define how GDP is measured and its components.
AO2	Review the circular flow of income model and draw a diagram of this model.
AO2	Explain the expenditure, income, and output approaches to measuring GDP in national income accounting, and show their equivalence using the circular flow of income model.
AO2	Explain nominal gross domestic product (GDP), nominal gross national income (GNI), real GDP and real GNI per person (per capita), real GDP and real GNI per person (per capita) at purchasing power parity (PPP).

Circular flow of income

- **Circular flow of income model** is a model showing the flow of resources from consumers (households) to firms, and the flow of products from firms to consumers.
 - ▶ Demonstrates how an entire country's economy operates at the most basic level.
 - ▶ Shows that in any given time period, the **value of output** produced in an economy is equal to the **total income generated** in producing that output, which is equal to the **expenditure** made to purchase that output.
 - ▶ In the model two agents interact in the factor and the product market.
 1. Households as the owners of the factors of production (land, labour, capital, and entrepreneurship) sell these to firms and buy the products that firms produce.
 2. Firms buy the factors of production, and sell the goods and services they produce to consumers

Circular flow of income (Continued)



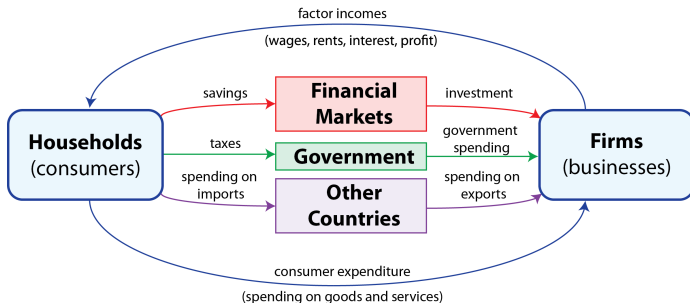
- ▶ The outer flow of the model depicts the exchange of factors of production and goods and services between households and firms. The inner flow illustrates the flow of money between households and firms.
- ▶ Households receive income when they sell their factors of production to firms in the form of rent (for land), wages (for labour), interest (for capital) and profit (for entrepreneurship).

Circular flow of income (Continued)

- ▶ Consumers then have **household expenditures** which is the money they spend to buy goods and services.
- ▶ Firms on the other hand have **costs of production** when they buy the factors of production, and they receive **revenues** when they sell their goods and services.
- ▶ The **income flow** from firms to households is equal to the **expenditure flow** from households to firms.

Circular flow of income: Leakages and injections

- **Leakages/Withdrawals** from the circular flow of income (saving, taxes, and imports) are matched by **injections** into the circular flow of income (investment, government spending, and exports), though these need not be equal to each other.
 - ▶ If injections are smaller than leakages, the income flow becomes smaller
 - ▶ If injections are larger than leakages, the income flow becomes larger



Gross domestic Product (GDP)

- **National income accounting** involves measuring an economy's national income or value of output. The output of an economy is referred to as **national output** or **aggregate output**.
 - ▶ Assess an economy's performance over time
 - ▶ Make cross-section comparisons of income and output performance with other economies
 - ▶ Establish a basis for making policies that will meet economic objectives
- **Gross Domestic Product (GDP)** is a measure of the value of aggregate output on an economy, it is the market value of all final goods and services produced within a country during a given period, usually a year.
 - ▶ One of the most commonly used measures of the value of **aggregate output (national income)**.

Measures of economic activity

- There are three ways to measure the value of national output (or aggregate output) suggested by the circular flow of income model, all giving right to the same result.
1. **Expenditure approach:** adds up all spending to buy final goods and services produce within a country over a time period.
 - ▶ $GDP = C + I + G + (X - M)$
 - ▶ **Consumption (C)** purchases by households on final goods and services in a year.
 - **Durables** are generally goods bought and used on a ongoing basis over months or years
 - **Non-durables** are bought and consumed over a short time.
 - ▶ **Investment (I)** includes all business spending on capital equipment and technology and household spending on new housing or real estate.

Measures of economic activity (Continued)

- ▶ **Government spending (G)** includes all public sector (national, regional, local) spending on final goods and services in the economy.
- ▶ **Net exports (X – M)** refers to the value of all exports minus the value of all imports.
 - Exports are goods and services produced within the country and so must be included in the measurement of aggregate output.
 - Imports involve domestic spending on goods and services that have been produced in other countries, and so must be subtracted from expenditures measuring aggregate output.

2. **Output approach:** calculates the value of all final goods and services produced in a country over a time period.

- ▶ Measures the amount spent during each stage of the production of an economy's output, adding up the value added at each stage of production.

Measures of economic activity (Continued)

3. **Income approach:** adds up all income earned by the factors of production that produce all goods and services within a country over a time period.

▶ $GDP = W + I + R + P$

▶ **Wages (W) + Interest (I) + Rental income (R) + Profits (P)**

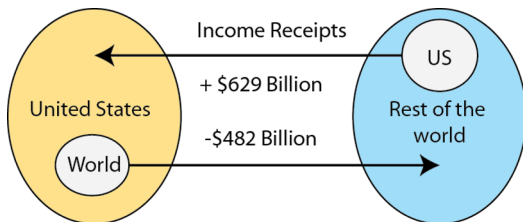
Distinction between GDP and GNP/GNI

- **GDP** is the total value of all final goods and services produced within a country over a time period (usually a year), regardless who owns the factors of production.
 - ▶ GDP is sum of all economic activity within the geographical boundaries of a country.
 - ▶ It includes the output and incomes generated by foreign firms operating there.
- **GNI** is the total income received by the residents of a country, equal to the value of all final goods and services produced by the factors of production supplied by the country's residents regardless where the factors are located.
 - ▶ GDP focuses on incomes made in a country while GNP focuses on earnings of the countries firms, both abroad and domestically

Distinction between GDP and GNP/GNI

- ▶ GNP incorporates income of foreign owners of property. Foreign companies will send interest, rent and profit payments to shareholders abroad.
- ▶ Likewise, property income earned abroad has to be added to domestic income, GNP.
 - **$\text{GNP} = \text{GDP} + \text{Net property income from abroad}$**
- ▶ The term “net property income from abroad”, takes the sum of income from domestically owned assets abroad, minus the income from foreign-owned assets within the country.
- ▶ Countries with higher GNP than GDP may have significant foreign presence, in either workers or companies.
- ▶ They suffer a net income loss when GDP is compared to their GNP
- ▶ Net income is reduced by the outflow of foreign-earned income on the county's soil

Distinction between GDP and GNP/GNI



- ▶ If $GDP > GNP$ then there is a strong foreign presence, in either workers or companies, in the domestic market.
- ▶ If $GDP < GNP$ then there is a strong foreign presence abroad, in either workers or companies.

Distinction between nominal values and real values

- **Nominal GDP** measures how much is spent on a country's output in a year.
 - ▶ Is measured in terms of current output valued at current prices, which does not account for changes in prices.
 - ▶ Nominal GDP increases when either the quantity of output increases or when prices increase.
 - ▶ Because nominal GDP can change when prices change, it is not a very good indicator of how much a country's real output of goods and services changes from year to year.
 - ▶ The nominal GDP growth rate (the rate of increase in nominal GDP) is the percentage change between two years being measured.
- **Real GDP** measures the value of a nation's output in prices from a base year.

Distinction between nominal values and real values

- ▶ It measures the value of current output valued at constant prices so a relative comparison can be made to the base year.
 - ▶ By doing so, changes in the price level are ignored and the GDP figure only reflects whether actual output has increased or decreased over time.
 - ▶ It is a measure of economic activity that eliminates the influence of changes in price.
 - ▶ When a variable is being compared over time, it is important to use real values.
 - ▶ The real GDP growth rate (the rate of increase in real GDP) is the percentage change between two years being measured.
1. If the price level increases (inflation), real GDP will be lower than the nominal GDP.
 2. If the price level decreases (deflation), real GDP will be higher than nominal GDP.

Example: Nominal GDP

Example: The table below provides price and output data for Dairyland in 2019 and 2020:

Output in 2019	Quantity produced in 2019	Price in 2019	Total value of output in 2019
Butter	10	\$2	\$20
Cheese	20	\$2	\$40
Yogurt	5	\$10	\$50
Nominal GDP in 2019			\$110

Output in 2020	Quantity produced in 2020	Price in 2020	Total value of output in 2020
Butter	12	\$2.50	\$30
Cheese	25	\$3	\$75
Yogurt	5	\$11	\$55
Nominal GDP in 2020			\$160

Example: Real GDP

Example: The table below provides price and output data for Dairyland in 2019 and 2020:

Output in 2020	Quantity produced in 2020	Price in 2019	Total value of output in 2020
Butter	12	\$2	\$24
Cheese	25	\$2	\$50
Yogurt	5	\$10	\$50
Real GDP in 2020			\$124

GDP Deflator

- **GDP Deflator price index** is a measure of the inflation indicating how much the average price level has change since the base year.

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

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

- ▶ The GDP deflator price index can be used to adjust a nation's nominal GDP for changes in the price level.
- ▶ The deflator is an indicator of how much prices have changed between two years.
- ▶ For the base year, the deflator always equals 100, since the real GDP is the nominal GDP in the base year.

Distinction between total and per capita values

- **GDP per capita** is the gross domestic product divided by the number of people in the population. It is an indicator of the amount of domestic output per person in the population.
 - ▶ Total measures of the value of output and income (such as GDP and GNI), provide a summary statement of the overall size of an economy.
 - ▶ Per capita figures are useful as a summary measure of the standard of living in a country, because they provide an indication of how much of total output or total income in the economy corresponds to each person in the population on average.
 - ▶ The distinction between total and per capita measures is important for two reasons:
 1. **Differing population sizes across countries**
 2. **Population growth:** changes in the size of GDP (or GNI) per capita over time depend on the relationship between growth in total GDP (or GNI) and growth in the population).

Real GDP/GNI per capita at purchasing power parity (PPP)

- **Purchasing power parity (PPP)** allows for economists to compare economic productivity and standards of living between countries.
 - ▶ Different countries have different price levels which means the same amount of money in a low-price country has greater purchasing power (can buy more things) than in a high-price country.
 - ▶ Comparisons of GDP per capita (or GNI per capita) across countries require measurement of per capita output or income based on conversions of national currencies into US\$ by use of purchasing power parities (PPPs).
 - ▶ Eliminates the influence of price differences on the value of output or income.

- **Enduring Understanding**

- ▶ An economy's performance can be measured by different indicators such as gross domestic product (GDP), the inflation rate, and the unemployment rate.

- **Essential Knowledge**

- ▶ GDP is a measure of final output of the economy.
- ▶ GDP as a total flow of income and expenditure can be represented by the circular flow diagram.
- ▶ There are three ways of measuring GDP: the expenditures approach, the income approach, and the value-added approach.
- ▶ Nominal GDP is a measure of how much is spent on output. Real GDP is a measure of how much is produced.
- ▶ Nominal GDP measures aggregate output using current prices. Real GDP measures aggregate output using constant prices, thus removing the effect of changes in the overall price level.

Summary

- ▶ One way of measuring real GDP is to weigh final goods and services by their prices in a base year. Because this can lead to overstatement of real GDP growth, statistical agencies actually use different methods.
- ▶ Nominal GDP can be converted to real GDP by using the GDP deflator.

Business Cycles



Assessment Objectives

Specific Expectations	
2.A	Define (using graphs and data as appropriate) turning points and phases of the business cycle.
2.A	Explain (using graphs and data as appropriate) turning points and phases of the business cycle.

Business Cycles

- **Business cycles** fluctuations in an economy's aggregate output and employment can be illustrated in an economic model known as the business cycle.
 - ▶ **Business cycles** consist of short-term fluctuations in the growth of real output, which are alternating periods of expansion (increasing real output) and contraction (decreasing real output).
 - ▶ The business cycle shows how a country's real GDP fluctuates over time because of changes in aggregate supply and/or aggregate demand.
- 1. An **expansion** is a phase of the business cycle during which GDP increases
 - During expansions, employment of resource increases, and the general price level of the economy (which is an average over all prices) usually begins to rise more rapidly.

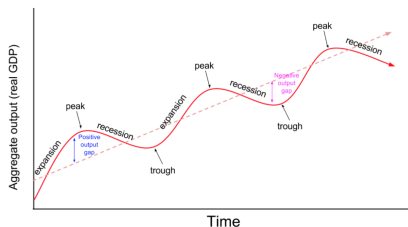
2. A **peak** is the turning point at which GDP stops increasing and begins decreasing.
 - A peak represents the cycle's maximum real GDP, and marks the end of the expansion.
 - When the economy reaches a peak, unemployment of resources has fallen substantially, and the general price level may be rising quite rapidly; the economy is likely experiencing inflation.
3. A **contraction** is the phase of the business cycle during which GDP decreases.
 - If the contraction lasts six months (two quarters) or more, it is termed a **recession** characterized by falling GDP and growing unemployment of resources.
 - Increase in the price level may slow down a lot, and it is even possible that prices in some sectors may begin to fall.

Business Cycles

4. A **trough** is the turning point at which GDP stops decreasing and begins increasing. A trough represents the cycle's minimum level of GDP, or the end of the contraction.
 - There is now widespread unemployment. A trough is followed by a new period of expansion (also known as a recovery), marking the beginning of a new cycle.
- ▶ Expansions and recession can lead to positive and negative output gaps, which occurs when an economy is producing at a level of output that is above or below what it would be achieving if it produced on its long-run growth trend line.
- ▶ Positive output gaps occur in an economy that is overheating and are resolved when the business cycle reaches a peak and enters a recession.
- ▶ Negative output gaps occur in an economy that is producing below its full employment level of output because of a recession.
- ▶ Potential output is also called the full-employment level of output. It is the level of GDP where unemployment is equal to the natural rate of unemployment.

Business Cycles: Short-term fluctuations

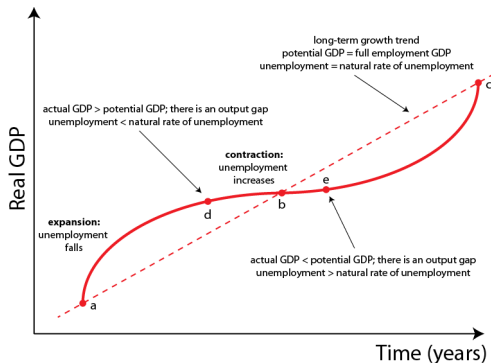
- The **Long-term growth trend** in the business cycle diagram, refers to the line that runs through the business cycle curve, representing average growth over long periods of time.
 - ▶ Shows how output grows over time when cyclical fluctuations are ironed out.
 - ▶ The output represented by the long-term growth trend is known as **potential output**.



Relation between Unemployment and Potential Output

- When GDP fluctuates it does so together with other macroeconomic variables.
 - ▶ When GDP grows in the **expansion phase**, unemployment falls.
 - Real GDP increase because firms produce more output; to do this, they hire more labour (and other resources) and unemployment falls.
 - ▶ In the **contraction phase** when GDP falls, unemployment increases.
 - In a contraction, real GDP falls because firms cut back on production; as they lay off workers, unemployment increases
- For every economy, there is a level of GDP at which the economy experiences “**full employment**” .
 - ▶ This is the full employment level of output, or full employment level of real GDP.
 - ▶ Whenever an economy produces its “full employment level of output”, there is still some unemployment, known as the “natural rate of unemployment” .

Relation between Unemployment and Potential Output



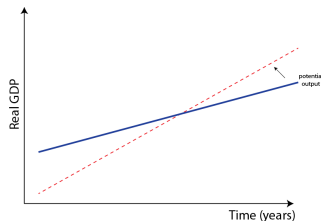
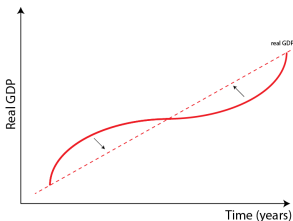
- ▶ When the economy's actual GDP is at points **a**, **b** and **c**, actual GDP is equal to potential GDP and the economy is achieving full employment, when unemployment is equal to the natural rate of unemployment (NRU).

Relation between Unemployment and Potential Output

- ▶ When the economy's actual GDP is greater than potential GDP, such as at point **d**, there is an output gap, and unemployment falls to less than the natural rate.
- ▶ When actual GDP is less than potential GDP, such as at point **e**, there is an output gap where unemployment is greater than the natural rate.

Business Cycle

- Using the business cycle, we can understand macroeconomic objectives to include:
 - ▶ Reducing the intensity of expansions and contractions; this is aimed at making output gaps as small as possible, by flattening the cyclical curve. This would lessen the problems of rising price levels or inflation expansions and unemployment contractions.
 - ▶ Increasing the steepness of the line representing potential output, by achieving more rapid economic growth over long periods of time.



Summary

- **Enduring Understanding**

- ▶ The economy fluctuates between periods of expansion and contraction in the short run, but economic growth can occur in the long run.

- **Essential Knowledge**

- ▶ Business cycles are fluctuations in aggregate output and employment because of changes in aggregate supply and/or aggregate demand.
- ▶ The phases of a business cycle are recession and expansion.
- ▶ The turning points of a business cycle are peak and trough.
- ▶ The difference between actual output and potential output is the output gap.
- ▶ Potential output is also called full-employment output. It is the level of GDP where unemployment is equal to the natural rate of unemployment.

Limitations of GDP



Assessment Objectives

Specific Expectations	
1.B	Define the limitations of GDP.

Evaluating national income statistics

- **National income statistics** are statistical data used to measure national income and output and other measures of economic performance.
- GDP is a useful indicator of nation's economic performance. It is widely used by economists, politicians, policy-makers, and the media.
 - ▶ GDP allows for the comparison of relative size of different economies.
 - ▶ Dividing GDP by the population results in GDP per capita. This figure tells use how many good and services the average person consumes.
 - ▶ Does not accurately measure the “true” value of output produced.
 - ▶ Economic well-being is closely related to a variety of factors that GDP and GNI are unable to account for.
 - ▶ Per capita figures of GDP and GNI may be misleading when used to make comparisons over time or comparisons between countries.

Limitations of GDP & GNI

- GDP is a useful measure for means of international comparisons of average incomes. However, GDP does have limitations:

1. GDP and GNI do not include non-marketed output

- ▶ Does not include labour of home-makers and value added to an asset by volunteer work in the community or elsewhere.
- ▶ Non-marketed output is likely to be far greater in developing countries compared to more developed ones.

2. GDP and GNI do not include output sold in the underground (parallel) markets.

- ▶ “Underground markets” (also known as “parallel” or an “informal market”) exist where buying/selling transaction are unrecorded.
- ▶ Black market transactions are not included in GDP.
- ▶ Some economies have large informal sectors in which transaction are not reported in order to evade taxes.

Limitations of GDP & GNI (Continued)

3. **GDP & GNI do not account for quality improvements in goods**

- ▶ While a country's GDP increases, the living standards of its households could increase by even more if the quality of the country's output is improving faster than its GDP increases.
- ▶ Technological advances often permit improved products to be sold at lower prices.

4. **GDP and GNI do not account for the value of negative externalities, such as pollution, toxic wastes and other undesirable by-products of production.**

- ▶ High GDP may be accompanied by environmental degradation, which may diminish the quality of life while increasing incomes.

5. **GDP and GNI do not take into account the depletion of natural resources**

- ▶ The depletion of natural resources (rainforests, wildlife, agricultural soil, etc.)

Limitations of GDP & GNI (Continued)

6. GDP and GNI and differing domestic price levels.

- ▶ Goods and services often sell for very different prices in different countries.
- ▶ If international comparisons of GDP do not account for differing price levels across countries, the result is a highly misleading picture of standard of living in different countries.
- ▶ Conversion to a single common currency by using **purchasing power parities** to take into consideration differing price levels allows for international comparisons.

7. GDP and GNI make no distinction about the composition of output

- ▶ The GDP figure will not distinguish between “good” output and “bad” output, limiting its effectiveness for communicating information about social welfare.
- ▶ GDP and GNI include the value of all without any distinction about the degree to which they contribute to standard of living.

Limitations of GDP & GNI (Continued)

8. **GDP and GNI cannot reflect achievements in levels of education, health, and life-expectancy.**

- ▶ Countries may achieve higher or lower levels of health and education with a given amount of GDP/GNI per capita
- ▶ Increased life expectancy (the number of years one can expect to live, on average) is another benefit of technological improvements, improved health and higher income levels, but not accounted for in GDP and GNI figures.

9. **GDP and GNI provide no information on the distribution of income and output.**

- ▶ How equally or unequally income and output are distributed is another factor underlying society's well-being.
- ▶ Measures of GDP and GNI per capita only provide an indication of average output or average income per person.

Limitations of GDP & GNI (Continued)

10. **GDP and GNI do not take into account increased leisure.**

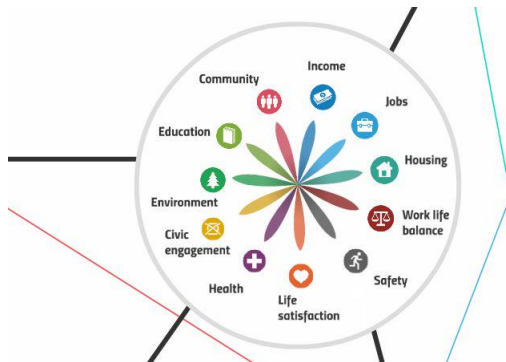
- ▶ In many countries around the world the average number of hours worked per week has declined significantly, with the number of hours of leisure correspondingly increasing.

11. **GDP and GNI do not account for quality of life factors.**

- ▶ Ignores all social aspects of human life including income distribution, access to healthcare and education, life expectancy, gender equality, religious freedom, and human rights.

Alternatives measures of well-being

- Several alternative measures have been developed that try to capture more factors that affect well-being and quality of life.
 1. **OECD Better Life Index:** an alternative measure of standard national income accounting that measures economic-well being in a number of different dimensions that take into account quality of life.



Alternatives measures of well-being (Continued)

2. **Happiness Index:** an alternative method to national income accounting that measures economic well-being using numerous quality of life dimensions in addition to real GDP per capita.
 - ▶ Real GDP per capita
 - ▶ Social support
 - ▶ Healthy life expectancy
 - ▶ Freedom to make life choices
 - ▶ Perceptions of corruption
3. **Happy Planet Index (HPI):** an alternative method to standard national income accounting that takes into account environmental sustainability and inequalities.
 - ▶ It is a measure of sustainable well-being based on four dimensions, life expectancy, well-being, inequality of outcomes, ecological footprint.
 - ▶ **Life expectancy** – is the average number of years a person expects to live, based on United Nations data.

Alternatives measures of well-being (Continued)

- ▶ **Well-being** – is taken to be a population's satisfaction measured by data collected by the Gallup World poll
- ▶ **Inequality of outcomes** – refers to inequalities between people with regard to life expectancy and well-being.
- ▶ **Ecological footprint** – is the impact on the environment of each individual in a society on average. The higher the ecological footprint, the lower the HPI.
- ▶ The HPI is calculated for 140 – 150 countries, depending on data availability. Each country receives a score from 0 to 100.

$$\text{Happy Planet Index (HPI)} = \frac{\text{Life expectancy} \times \text{Well-being} \times \text{Inequality of outcomes}}{\text{Ecological footprint}}$$

Summary

- **Enduring Understanding**

- ▶ An economy's performance can be measured by different indicators such as gross domestic product (GDP), the inflation rate, and the unemployment rate.

- **Essential Knowledge**

- ▶ GDP is a useful indicator of a nation's economic performance, but it has some limitations, such as failing to account for non-market transactions.

Aggregate Demand



Assessment Objectives

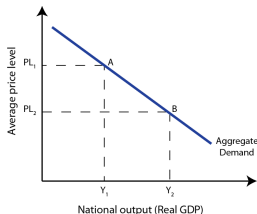
Specific Expectations	
2.A	Define (using graphs as appropriate) the aggregate demand (AD) curve.
2.A	Explain (using graphs as appropriate) the slope of the AD curve and its determinants.

Aggregate Demand (AD)

- **Aggregate Demand (AD)** is the total amount of real output (real GDP) that consumers, firms, the government and foreigners want to buy at each possible price level, over a particular time period.
- The difference between microeconomics “demand” and macroeconomics “aggregate demand (AD)” is that AD considers:
 - ▶ All consumers domestic and foreign, of a nation’s output of all goods and services.
 - ▶ The general, or average price level (APL). Not just the price of a particular good.
 - ▶ The quantity of output produced by all firms in all industries in a nation, not just the quantity produced of a particular good.

Aggregate Demand Curve

- **Aggregate Demand (AD) Curve** shows the relationship between the total amount of real output demanded by the four components and the economy's price level over a particular time period.
 - ▶ It is downward sloping, indicating a negative relationship between the price level and aggregate output demanded.
 - ▶ The negative slope of the AD curve shows that at lower price levels more of a nation's output is demanded, while at higher price levels less output is demanded.



Aggregate Demand: Movement Along the Curve

- Households, firms, the government, and foreigners will demand more of a country's goods and services as their average prices fall, and less as their prices rise.

The aggregate demand (AD) curve slopes downward for three reasons:

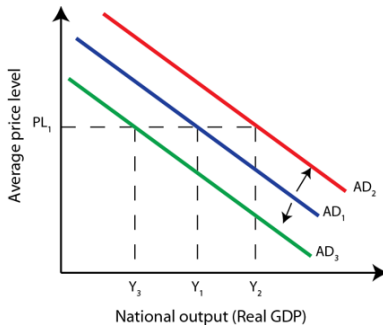
- Wealth effect:** higher price levels reduce the purchasing power or the real value of households' wealth and savings.
 - ▶ The public feels poorer (richer) at higher (lower) price levels, thus demand at a lower (higher) quantity of the country's output when price levels are high (low).
- Real interest rate effect:** in response to a rise in the price level, banks will raise the interest rates on loans to households and firms who wish to consume or invest.
 - ▶ At higher (lower) interest rates, the quantity demanded of products and capital for which households and firms must borrow money decreases (increases), as buyers face higher (lower) borrowing costs.

Aggregate Demand: Movement Along the Curve

3. **Net export effect (Exchange rate effect):** looks at how a change in a country's average price levels affects the flow of exports and imports
- ▶ As the price level falls (rises), all else equal, goods and services produced in that country become more (less) attractive to foreign consumers.
 - ▶ Domestic consumers find imports less (more) attractive as they now appear relatively more (less) expensive. As a result, the net expenditures on the nation's goods rise (fall) as price level falls (rises).

Aggregate Demand: Curve Shifts

- When a determinant of one or more of the components of AD changes, the entire AD curve will shift in or out, and the quantity of output demanded at every price level will change.



Determinants of Aggregate Demand (AD)

- **Determinants of Aggregate Demand (AD)** are factors that cause shifts in the aggregate demand curve; includes factors that influence **consumption spending (C)**, **investment spending (I)**, **government spending (G)**, and **net exports (X – M)**.
 - ▶ A rightward shift from AD_1 to AD_2 means that aggregate demand increases: for any price level, a larger amount of real GDP is demanded.
 - ▶ A leftward shift from AD_1 to AD_3 means that aggregate demand decreases; for any price level, a smaller amount of real GDP is demanded.
- 1. **Causes of changes in consumption spending, ΔC**
 - ▶ **Changes in consumer confidence:** the sentiment among consumers around future income levels and the state of the economy
 - ▶ **Changes in interest rates:** some consumer spending is financed by borrowing, and so influenced by interest rate changes.

Determinants of Aggregate Demand (AD)

- ▶ **Changes in wealth:** where wealth is the value of assets that people own minus debt to banks and other financial institutions.
- ▶ **Change in income taxes:** if the government increases income taxes, then consumer disposable income falls and consumption will fall. While, lower taxes will result in more consumption.
- ▶ **Changes in the level of household indebtedness:** lower household debt and expectations of increases in future income will increase aggregate demand.
- ▶ **Expectations of future price levels:** when higher (lower) prices are anticipated, households tend to consume more (less) today.

2. Causes of changes in investment spending, ΔI

- ▶ **Changes in business confidence:** the degree of optimism among firms about their sales and economic activity.
- ▶ **Changes in interest rates:** there is an inverse relationship between the interest rate and the level of investment in a country.

Determinants of Aggregate Demand (AD)

- ▶ **Changes (improvements) in technology:** Improvements in technology stimulate investment spending.
- ▶ **Changes in business taxes:** the level of government intervention in the form of taxation and regulation can influence the level of investment in a country.
- ▶ **The level of corporate indebtedness:** if business have high levels of debt due to past borrowing, they will be less willing to make investments.
- ▶ **Legal/institution changes:** the legal and institutional environment in which businesses operate may impact investment spending.

3. Causes of changes in government spending, ΔG

- ▶ **Changes in political priorities:** government's have many expenditures which may change in response to changes in its priorities.
- ▶ **Fiscal policy:** refers to the government's use of taxation and government spending to either stimulate or contract the level of economic activity in a country

Determinants of Aggregate Demand (AD)

4. Causes of changes in net exports, $\Delta (X - M)$

- ▶ **Changes in national income abroad:** when foreign incomes rise, a country can expect its net exports to increase as foreigners are likely to demand more of the country's exports.
- ▶ **Changes in exchange rates:** a decrease in the exchange rate of a country's currency will cause net exports to increase.
- ▶ **Changes in trade policies or the level of trade protection:** where trade protection refers to restrictions to free international trade often imposed by governments.
- ▶ **Changes in relative price levels:** when a country's goods appear relatively cheap to potential trading partners, demand for its exports tends to increase.

Determinants of Aggregate Demand (AD): Summary

- Aggregate demand increases with the following:
 1. Increase in **consumer spending (C)** due to:
 - ▶ Higher consumer confidence
 - ▶ Lower interest rates (expansionary monetary policy)
 - ▶ Higher household wealth & Lower levels of household indebtedness
 - ▶ Lower personal income taxes (expansionary fiscal policy)
 2. Increase in **investment spending (I)** due to:
 - ▶ Higher business confidence
 - ▶ Lower interest rates & business taxes (expansionary monetary policy)
 - ▶ Improvements in technology
 - ▶ Lower levels of corporate indebtedness
 - ▶ Favourable legal/institutional changes
 3. Increase in **government spending (G)**
 - ▶ Expansionary fiscal policy
 4. Increase in **net exports (X-M)**
 - ▶ Increased national income abroad
 - ▶ Lower exchange rate
 - ▶ Export promotion and import substitution

Determinants of Aggregate Demand (AD): Summary

- Aggregate demand decreases with the following:
 1. Decrease in **consumer spending (C)** due to:
 - ▶ Lower consumer confidence
 - ▶ Higher interest rates (contractionary monetary policy)
 - ▶ Lower household wealth & Higher levels of household indebtedness
 - ▶ Higher personal income taxes (contractionary fiscal policy)
 2. Decrease in **investment spending (I)** due to:
 - ▶ Lower business confidence
 - ▶ Higher interest rates & business taxes (contractionary monetary policy)
 - ▶ Higher levels of corporate indebtedness
 - ▶ Unfavourable legal/institutional changes
 3. Decrease in **government spending (G)**
 - ▶ Contractionary fiscal policy
 4. Decrease in **net exports (X-M)**
 - ▶ Lower national income abroad
 - ▶ Higher exchange rate

Test your understanding

Question: Using diagrams, show the impact of each of the following on the aggregate demand curve; explain what happens to aggregate demand in each case; and identify the component(s) of aggregate expenditure involved.

1. Consumer confidence improves as consumers become more optimistic about economic conditions.
2. The government decides to increase taxes on firms' profits.
3. Firms become fearful that a recession is about to begin.
4. The government decides to increase its spending on health care services.
5. There is a decline in the real estate market (average house prices fall).
6. The central bank (a government organization) decides to increase interest rates.

Test your understanding (Continued)

7. There is an increase in the level of indebtedness of consumers and firms.
8. Real incomes in countries that purchase a large share of country A's exports fall; examine the impact on aggregate demand in country A.
9. The government lowers personal income taxes (taxes on income of households).
10. New legislation makes property rights more secure.
11. There is an appreciation (an increase) in the value of the euro relative to the US dollar; examine the impact on aggregate demand in euro zone countries.
12. There is appreciation (an increase) in the value of the euro relative to the US dollar; examine the impact on aggregate demand in the United States.

Summary

- **Enduring Understanding**

- ▶ Economists use the aggregate demand–aggregate supply model to represent the relationship between the price level and aggregate output in an economy and to illustrate how output, employment, and the price level respond to macroeconomic shocks.

- **Essential Knowledge**

- ▶ The aggregate demand (AD) curve describes the relationship between the price level and the quantity of goods and services demanded by households (consumption), firms (investment), government (government spending), and the rest of the world (net exports).
- ▶ The negative slope of the AD curve is explained by the real wealth effect, the interest rate effect, and the exchange rate effect.
- ▶ Any change in the components of aggregate demand (consumption, investment, government spending, or net exports) that is not due to changes in the price level leads to a shift of the AD curve.

Short-Run Aggregate Supply (SRAS)



Assessment Objectives

Specific Expectations	
2.C	Define (using graphs as appropriate) the short-run aggregate supply (SRAS) curve.
2.C	Explain (using graphs as appropriate) the slope of the SRAS curve and its determinants.
2.D	Explain (using graphs as appropriate) how movement along the SRAS curve implies a relationship between the price level (and inflation) and unemployment.

Macroeconomics: Short-run versus Long-run

- The short-run and long-run in macroeconomics differ from the corresponding distinction in microeconomics.
 - ▶ **Short-run in macroeconomics:** is the period of time when prices of resources are roughly constant or inflexible, in spite of changes in the price level.
 - They do not change together with changes in the price level
 - This applies to wages or the price of labour
 - Wages are of special interest because they account for the largest part of firms' costs of production, and therefore strongly affect the quantity of output supplied by firms.
 - ▶ **Long-run in macroeconomics:** is the period of time when the prices of all resources, including the price of labour (wages), are flexible and change along with changes in the price level.

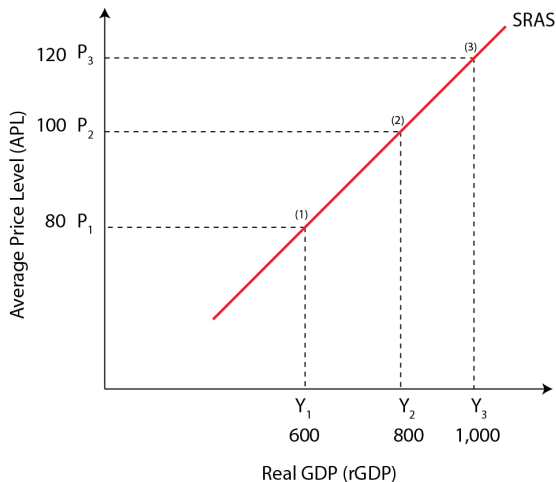
Short-run: Wage Inflexibility

- Wages do not change very much over relatively short periods of time.
 - ▶ The price of labor (wages) is often rigid (unchanging) because:
 1. **Labour contracts:** fix wage rates for certain periods of time, perhaps a year or two or more.
 2. **Minimum wage:** legislation fixes the lowest legally permissible wage
 3. **Unions:** workers and labour unions resist wage cuts
 4. **Morale:** wage cuts have negative effects on worker morale, causing firms to avoid them.
 - ▶ The SRAS curve is upward-sloping because of inflexible (sticky) wages and prices. The “short-run” is a time after a macroeconomic shock, during which firms cannot raise or lower wages quickly in response to the shock.
 - Workers are more likely to be hired or fired in the period following such a shock, rather than their wages simply adjusting to the level of demand in the economy.

Short-run Aggregate Supply (SRAS)

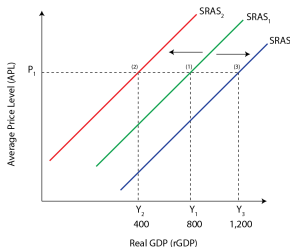
- **Aggregate supply**: is the total quantity of goods and services produced in an economy (real GDP) over a particular time period at different price levels.
- **Short-run aggregate supply (SRAS) curve**: shows the relationship between the price level and the quantity of real output (real GDP) produced by firms when resource prices (especially wages) do not change.
 - ▶ The positive relationship between price level and real output (real GDP) relates to firm profitability.
 - When there is an increase in the price level, this means that output prices have increased; but with unchanging resource prices, firms' profits increase.
 - As production becomes more profitable, firms increase the quantity of output produced, resulting in a positive relationship between the price level and the quantity of real GDP supplied.

Short-run Aggregate Supply (SRAS)



Short-run Aggregate Supply (SRAS): Shifts

- A shift in SRAS results in a larger or smaller amount of output being produced at every price level.
 - ▶ A rightward shift from $SRAS_1$ to $SRAS_3$ means that short-run aggregate supply increases: for any particular price level, firms produce a larger quantity of real GDP.
 - ▶ A leftward shift from $SRAS_1$ to $SRAS_2$ means that short-run aggregate supply decreases: for any particular price level, firms produce a smaller quantity of real GDP.



Short-run Aggregate Supply (SRAS): Shifts

- Over short periods of time, the short-run aggregate supply (SRAS) curve shifts to the left or to the right mainly as a result of factors that influence firms' costs of production, as well as supply shocks.
 - ▶ When any of the following factors change, SRAS will either decrease and shift inward or increase and shift outward.
 1. **Changes in wage rates:** higher wages causes SRAS to decrease; lower wages causes SRAS to increase.
 2. **Changes in non-labour resource prices:** when rent for land, interest rates, or raw materials increase, SRAS will decrease. Lower resource costs cause SRAS to increase.
 3. **Changes in indirect taxes:** taxes are a monetary cost imposed on firms by the government; so higher taxes will cause SRAS to decrease.
 4. **Changes in subsidies offered to businesses:** A tax cut or increased subsidies to produces reduce firms' costs and cause SRAS to increase.

Short-run Aggregate Supply (SRAS): Shifts

5. **Energy and Transportation costs:** higher oil and energy prices will cause SRAS to decrease. Cheaper energy and transportation cause SRAS to increase.
6. **Government regulation:** regulations impose costs on firms that cause SRAS to decrease. Reduced regulation makes it cheaper to produce output, increasing SRAS.
7. **Exchange rates:** If producers use imported raw materials, a weaker currency will cause these to become more expensive, reducing SRAS. A stronger currency makes imported raw materials cheaper and increases SRAS.
8. **Supply shocks:** events that have a sudden and strong impact on short-run aggregate supply. Negative supply shocks shift the SRAS curve leftward and positive supply shocks shift the SRAS curve rightward.

Test your understanding

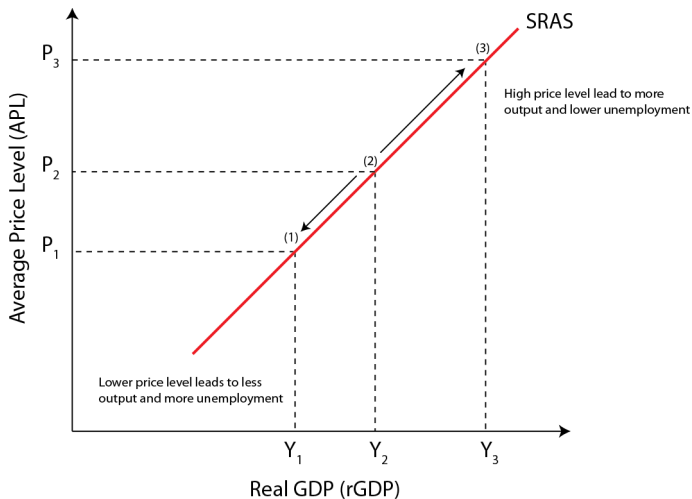
Question: Using diagrams, show the impact of the following on the SRAS curve; explain what happens to SRAS in each case.

1. The price of oil (an important input in production) increases
2. Below-zero temperatures destroy agricultural output.
3. The government lowers taxes in firms' profits
4. The government eliminates subsidies on agricultural products
5. There is an increase in minimum wage

Inflation and Unemployment

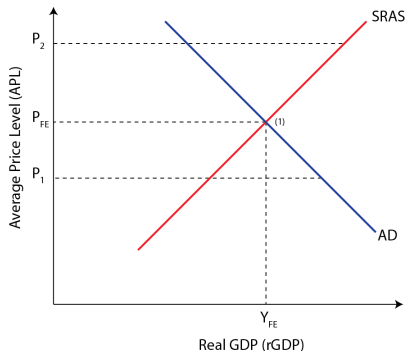
- Due to the inflexibility of wages and other input costs in the short-run, there is a short-run trade-off between inflation and unemployment.
 - ▶ The positive relationship between the price level and real output (real GDP) relates to firm profitability.
 - ▶ When the aggregate price level increases, output increases in the short-run.
 - At higher levels of output, firms employ more workers.
 - Unemployment decreases as the price level increases
 - ▶ When the aggregate price level decreases, output decreases in the short-run
 - At lower levels of output, firms employ fewer workers.
 - Unemployment increases as the price level decreases

Inflation and Unemployment



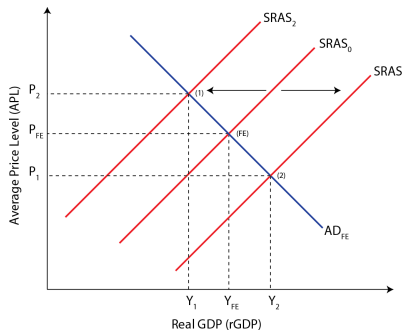
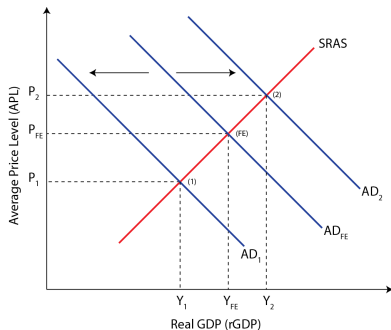
Short-run Equilibrium: AS-AD Model

- In the AS/AD Model the **equilibrium level of output** occurs where aggregate demand intersects aggregate supply.
 - ▶ **Short-run equilibrium** is given by the point of intersection of the AD and SRAS curves, and determines the price level, the level of real GDP and the level of employment.



Short-run Equilibrium Changes: AS-AD Model

- The short-run equilibrium of an economy changes whenever there is a change in aggregate demand or short-run aggregate supply.



Test your understanding

Question: Using diagrams, show the effects of each of the following on short-run equilibrium, explaining what happens to the equilibrium price level, output and unemployment.

1. The price oil (an important input in production) increases.
2. Firms are pessimistic about the future of the economy.
3. Below-zero temperatures destroy agricultural output.
4. The government lowers taxes on firms' profits.
5. There is a large rise in stock market prices.
6. The government eliminates subsidies on agricultural products.
7. A war destroys a portion of an economy's physical capital.
8. Consumer confidence improves.

Summary

- **Enduring Understanding**

- ▶ Economists use the aggregate demand–aggregate supply model to represent the relationship between the price level and aggregate output in an economy and to illustrate how output, employment, and the price level respond to macroeconomic shocks.

- **Essential Knowledge**

- ▶ The short-run aggregate supply (SRAS) curve describes the relationship between the price level and the quantity of goods and services supplied in an economy.
- ▶ The SRAS curve is upward-sloping because of sticky wages and prices.
- ▶ Any factor that causes production costs to change, such as a change in inflationary expectations, will cause the SRAS curve to shift.

Summary (Continued)

- ▶ Moving along the SRAS curve, an increase in the price level is associated with an increase in output, which means employment must correspondingly rise. With the labor force held constant, unemployment will fall. So, there is a short-run trade-off between inflation and unemployment.
- ▶ Moving along the SRAS curve, an increase in the price level is associated with an increase in output, which means employment must correspondingly rise. With the labor force held constant, unemployment will fall. So, there is a short-run trade-off between inflation and unemployment.

Long-run Aggregate Supply (LRAS)



Assessment Objectives

Specific Expectations	
2.E	Define (using graphs as appropriate) the short run and the long run.
2.F	Define (using graphs as appropriate) the long-run aggregate supply (LRAS) curve.

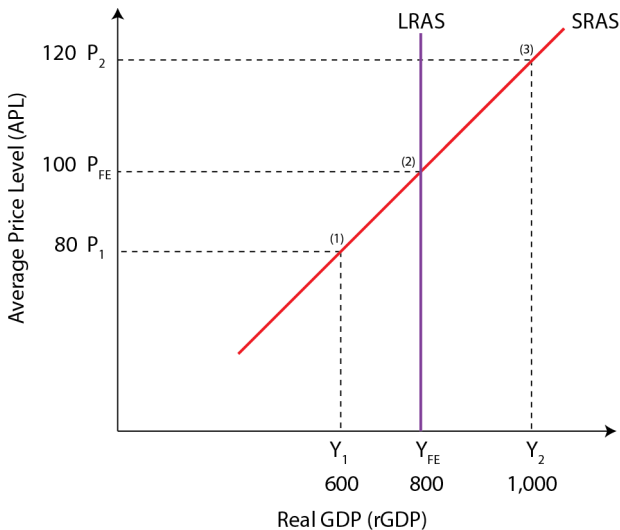
Long-run Aggregate Supply (LRAS): Monetarist View

- **Long-run aggregate supply (LRAS):** The total quantity of goods and services (real output or real GDP) produced in an economy in the long run (when wages and other resource prices change to reflect changes in the price level), *ceteris paribus*.
- **Long-run aggregate supply (LRAS) curve:** A curve showing the relationship between real GDP produced and the price level when wages (and other resource prices) change to reflect changes in the price level, *ceteris paribus*.
 - ▶ The LRAS curve is vertical at the full employment level of GDP, indicating that in the long-run output is independent of the price level.
 - ▶ There is no long-run trade-off between inflation and unemployment

Long-run Aggregate Supply (LRAS): Monetarist View

- The LRAS curve is vertical at a country's full employment level of output, or the real GDP that would be produced when all resources are fully utilized and wages have fully adjusted to the price level in the economy.
 - ▶ According to the **monetarist/new classical perspective**, the long-run aggregate supply (LRAS) curve is vertical at the full employment level of output, indicating that in the long-run the economy produces potential GDP, which is independent of the price level.
 - ▶ Wages (and other resource prices) change to match output price changes and firms' costs of production remain constant even as the price level changes.
 - ▶ With constant real costs, firms' profits are also constant, and firms no longer have any incentive to increase or decrease their output levels.

Long-run Aggregate Supply (LRAS): Monetarist View

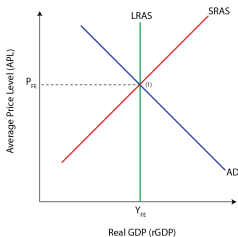


Short-run Equilibrium in the AS-AD Model

- The macroeconomic equilibrium real output and price level are what an economy achieves at a particular time given the level of AD and AS in the economy.
 - ▶ The **short-run equilibrium** is given by the point of intersection of the AD and SRAS curves, and determines the price level, the level of real GDP and the level of employment.
 - Short-run equilibrium occurs when the aggregate quantity of output demanded and the aggregate quantity of output supplied are equal.
 - When an economy's short-run equilibrium output is above or below the full-employment level, positive or negative output gaps are created.
 - Recessionary (deflationary) and expansionary (inflationary) gaps represent short-run equilibrium positions of the economy.
 - ▶ The **long-run equilibrium** occurs when the SRAS and AD curves intersect on the LRAS curve at the full employment or potential output.

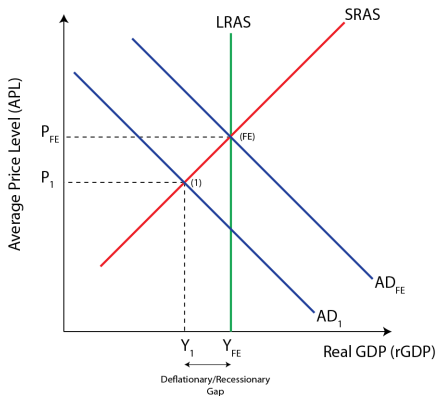
Long-run Equilibrium: AS-AD Model

- When an economy is at its full employment equilibrium level of GDP, the AD curve intersects the SRAS curve at the level of potential GDP.
 - ▶ There is no deflationary or inflationary gap.
 - ▶ This is the economy's **full employment level of output**, also known as the **potential output**.
 - ▶ A country's full employment level of output is its maximum sustainable output assuming all resources are efficiently employed, and unemployment is at its natural rate.



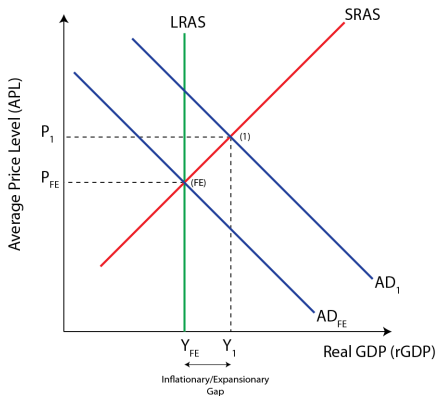
Short-run Equilibrium: Deflationary/Recessionary Gap

- A **deflationary (recessionary) gap** is a situation where real GDP is less than potential GDP (and unemployment is greater than the natural rate of unemployment) due to insufficient aggregate demand.



Short-run Equilibrium: Inflationary/Expansionary Gap

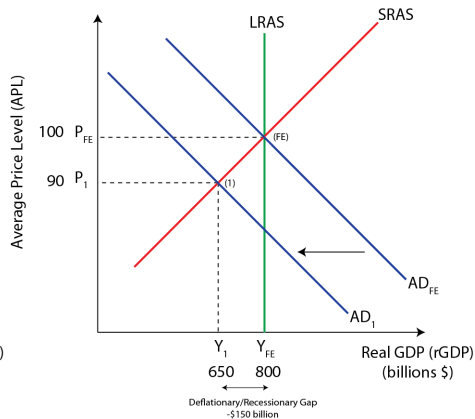
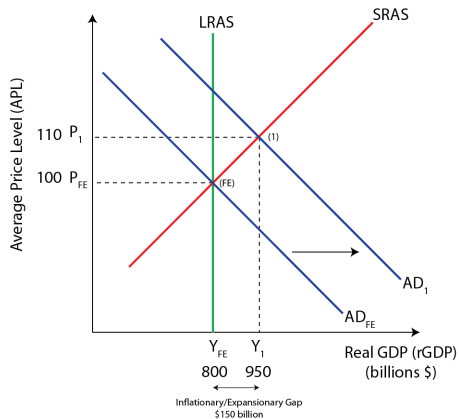
- A **inflationary (expansionary) gap** is a situation where real GDP is greater than potential GDP (and unemployment is smaller than the natural rate of unemployment) due to excess aggregate demand.



Aggregate Demand (AD) Shocks

- Output gaps are the result of shocks to either aggregate demand (AD) or aggregate supply (AS).
 - ▶ A shock occurs when one of the components of AD or the determinants of SRAS change.
 - ▶ This causes the level of total spending or production to increase or decrease and short-run equilibrium price level and real GDP to change.
- 1. **Positive aggregate demand (AD) shock:** causes output, employment, and the price level to rise in the short-run.
 - The economy will move from an equilibrium at full employment to one where both the price level and output increase in the short-run.
 - The gap between the equilibrium output and full employment level of output is called the inflationary gap.
 - The economy is essentially overheating; the unemployment rate is below the natural rate of unemployment and inflation is higher than desired.

Aggregate Demand (AD) Shocks



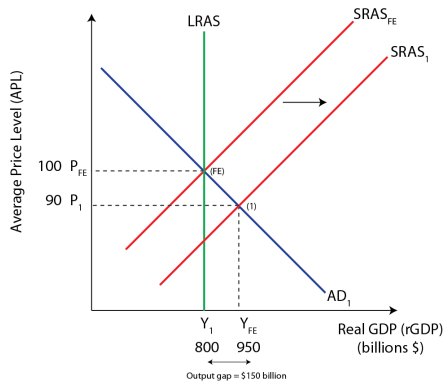
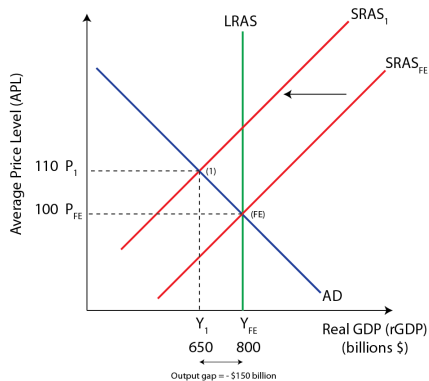
Aggregate Demand (AD) Shocks

2. **Negative aggregate demand (AD) shock:** causes output, employment, and the price level to fall in the short-run.
- The economy will move from an equilibrium at full employment to one where both the price level and output decrease in the short-run.
 - Costs must be cut in the face of falling prices, and the only way to reduce costs is to reduce output and employment since wages cannot be lowered in the short-run.
 - The gap between the equilibrium output and full employment level of output is called the deflationary (recessionary) gap.

Aggregate Supply (AS) Shocks

- A supply shock occurs when there is a change in a determinant of SRAS, causing output, employment, and the price level to change.
 1. **Negative supply shock:** a negative supply shock may lead to higher production costs, which are passed to consumers through higher prices
 - Because wages are sticky, firms must fire workers to compensate for the higher energy prices, so unemployment increases as inflation increases.
 - A negative output gap results along with a higher price level.
 2. **Positive supply shock:** occurs when the costs to businesses are reduced, shifting the SRAS curve to the right.
 - SRAS will shift outward, employment and output will increase and the price level will decrease.
 - There is a positive output gap and a lower price level due to the lower cost of doing business in the economy
 - Unemployment falls below its natural rate, as firms increase output.

Aggregate Supply (AS) Shocks



Long-run Self-Adjustment

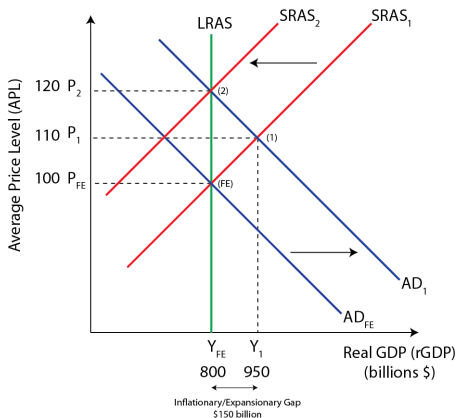
- A country's equilibrium level of output can be above or below its full employment output in the short-run, creating inflationary or recessionary gaps.
 - ▶ In the long-run, when wages and other input costs have been fully adjusted to the price level, national output will return to its full employment level.
 - ▶ In the monetarist/new classical perspective recessionary (deflationary) and expansionary (inflationary) gaps are eliminated in the long-run.
 - ▶ This ensures that in the long-run the LRAS curve is vertical at the level of potential GDP and there is no trade-off between unemployment and inflation.
 - ▶ The economy has a built-in tendency towards full employment equilibrium and the unemployment rate will always settle at the natural rate of unemployment.

Long-run Self-Adjustment: Inflationary Gap

- From a positive output gap, the inflationary gap is a short-run phenomenon.
 - ▶ The gap exists because wages are sticky and therefore, firms compete for the few available workers in order to increase output in response to rising prices.
 - ▶ While wages remain fixed, firms demand more labor and increase their output in the short-run.
 - ▶ In the long-run, nominal wages will begin to rise in response to the increased labour demand and limited labour supply.
 - Workers will have more bargaining power as the labour market tightens; they will begin to demand pay hikes to keep up with the rising cost of living.
 - ▶ As the nominal wage rate rises, firms will find it less attractive to continue employing more workers and some firms will be forced to cut back on output and employment.

Long-run Self-Adjustment: Inflationary Gap

- As the nominal wage rate is a determinant of short-run aggregate supply, the SRAS will decrease in the long-run, pushing prices up further and causing output to fall back to its full employment level.

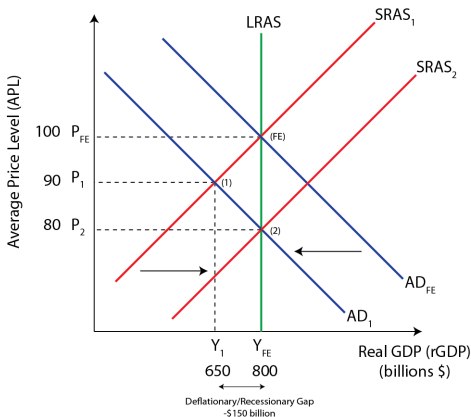


Long-run Self-Adjustment: Deflationary Gap

- From a negative output gap, the recessionary gap is a short-run condition that will be resolved in the long-run once wages have adjusted to the lower price level.
 - ▶ Assuming AD remains low and the unemployment rate remains higher than the natural rate, the excess supply of labour in the market will eventually lead to a fall in the nominal wage rate.
 - ▶ A government benefits for unemployed workers expire and labor unions lose their bargaining power, new contracts offering lower wages will eventually be accepted and firms will once again begin hiring workers and increasing output due to falling costs of production.
 - ▶ Wages become downwardly flexible during a recession, causing SRAS to increase in the long-run, and increasing output back to the full employment level

Long-run Self-Adjustment: Deflationary Gap

- While nominal wage rate falls, real income and output are restored to the full employment level as lower wages are offset by lower prices across the economy.



Economic Growth: Shifts in AD and SRAS

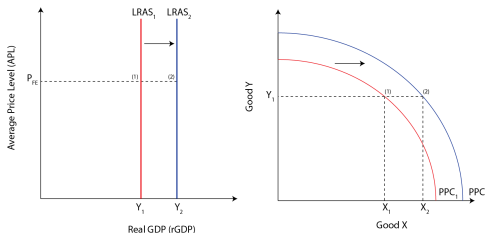
- In the monetarist/new classical perspective changes in aggregate demand can have an influence on real GDP only in the short-run.
 - ▶ In the long-run, the only impact of a change in aggregate demand is to change the price level, having no impact on real GDP, as this remains constant at the level of potential or full employment output.
 - ▶ Increases in aggregate demand in the long-run are therefore inflationary
 - A decrease in AD causes a recession in the short-run
 - An increase in AD causes demand-pull inflation in the short-run
 - In both cases, output returns to full-employment once wages and other input prices have fully adjusted.
 - ▶ Changes in SRAS can cause a short-run decrease in output (if resource costs increase) or increase in output (if resource costs decrease).
 - ▶ Shifts in AD and SRAS along will not cause an increase in an economy's potential output, only in its actual output (its short-run equilibrium real GDP).

Economic Growth: Shifts in LRAS

- Economic growth occurs when there is an increase in a country's actual and potential output of goods and services over time.
 - ▶ In order for potential output to increase, there must be an outward shift in the long-run aggregate supply (LRAS) curve.
 - ▶ LRAS will increase if there is an increase in the quantity of factors of production or if there is an increase in the quality of the factors of production.
 - ▶ Typically, such changes also result in increased AD and SRAS as well (due to new investment and consumption or increased government spending on human or physical capital.)

LRAS and the PPC

- The LRAS curve corresponds to the production possibilities curve (PPC) because they both represent maximum sustainable capacity or full employment output.
 - ▶ An increase in a country's maximum sustainable output will shift both the PPC and the LRAS curves outward.
 - ▶ An outward shift of LRAS and the PPC illustrates economic growth or an increase in the actual and potential output of goods and services in a country over time.



Long-run Aggregate Supply (LRAS): Shifts

- Full employment output increases when there is an increase in either the quality or the quantity of a country's factors of production, including:
 1. **Increase in the quantities of the factors of production:** if the quantity of the factors of production increases, the LRAS curve and the Keynesian AS curve shift to the right.
 2. **Improvements in the quality of the factors of production:** improvements in resource quality shift the LRAS and SRAS curves to the right.
 - **Labour:** an improvement in the productivity of labor or in the size of a country's workforce will increase a country's maximum sustainable capacity, shifting the PPC and LRAS curves outward.
 - **Land:** An improvement in the efficiency with which land resources are used through improved technology or an increase in the amount of land available to a country will increase the maximum sustainable capacity.

Long-run Aggregate Supply (LRAS): Shifts

- **Capital:** Technological improvements increase productivity in the manufacturing, service, and primary sectors of the economy and increase the maximum sustainable capacity, shifting the PPC and LRAS curves outward.
 - **Entrepreneurship:** is the willingness of individuals to pursue creative and risky ventures aimed at introducing unique products to the marketplace. An increase in entrepreneurship in a country will increase the economy's maximum potential capacity.
3. **Improvements in technology:** an improved technology of production means that the factors of production using it can produce more output and the AS curves shift to the right.
 4. **Increases in efficiency:** when an economy increases its efficiency in production, it makes better use of its scarce resources, and can as a result produce a greater quantity of output.

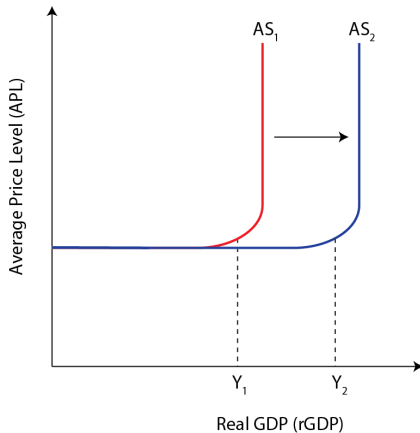
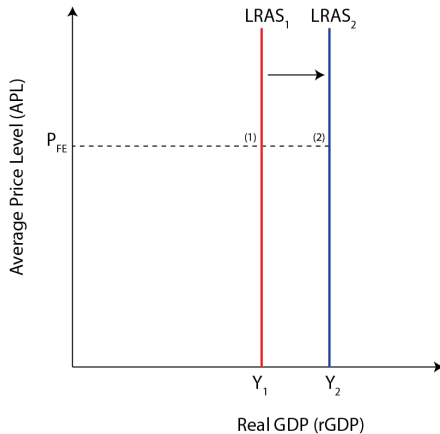
Long-run Aggregate Supply (LRAS): Shifts

5. **Institutional changes:** changes in institutions can sometimes have important effects of how efficiently scarce resources are used, and therefore on the quantity of output produced.
6. **Reduction in the natural rate of unemployment:** if the NRU decreases, the economy is making better use of its resources, and can therefore produce a larger quantity of output.

Note: Any factor that shifts the LRAS curve must, over the long-term, also shift the SRAS curve.

- There are certain events with only a temporary effect on aggregate supply, and these can shift the SRAS curve for a short while, leaving the LRAS curve unchanged.

Long-run Aggregate Supply (LRAS): Shifts



Test your understanding

Question: Illustrate diagrammatically the impacts on the economy's LRAS and the Keynesian AS curve of the following:

1. There is a widespread introduction of a new technology that increases labour productivity.
2. The government provides training programmes for workers to retrain and improve their skills.
3. A developing country receives large amounts of foreign aid, which allows it to purchase large quantities of capital goods.
4. An extensive nationwide public health campaign undertaken by the government improves levels of health of the population.
5. The government introduces anti-monopoly legislation, reducing market power of firms and increasing the economy's efficiency.

- **Enduring Understanding**

- ▶ Economists use the aggregate demand–aggregate supply model to represent the relationship between the price level and aggregate output in an economy and to illustrate how output, employment, and the price level respond to macroeconomic shocks.

- **Essential Knowledge**

- ▶ In the long run all prices and wages are fully flexible, while in the short run some input prices are fixed. A consequence of flexible long-run prices and wages is the lack of a long-run trade-off between inflation and unemployment.
- ▶ The LRAS curve corresponds to the production possibilities curve (PPC) because they both represent maximum sustainable capacity. Maximum sustainable capacity is the total output an economic system will produce over a set period of time if all resources are fully employed.

Summary

- ▶ The LRAS curve is vertical at the full-employment level of output because in the long run wages and prices fully adjust.
- ▶ Short-run equilibrium occurs when the aggregate quantity of output demanded and the aggregate quantity of output supplied are equal this occurs at the intersection of the AD and SRAS curves.
- ▶ Long-run equilibrium occurs when the AD and SRAS curves intersect on the LRAS, at the full-employment level of real output.
- ▶ A positive (negative) shock in AD causes output, employment, and the price level to rise (fall) in the short run.
- ▶ A positive (negative) shock in SRAS causes output and employment to rise (fall) and the price level to fall (rise) in the short run.
- ▶ In the long run, in the absence of government policy actions, flexible wages and prices will adjust to restore full employment and unemployment will revert to its natural rate after a shock to aggregate demand or short-run aggregate supply.

Summary

- ▶ Shifts in the long-run aggregate supply curve indicate changes in the full-employment level of output and economic growth.

Keynesian Model

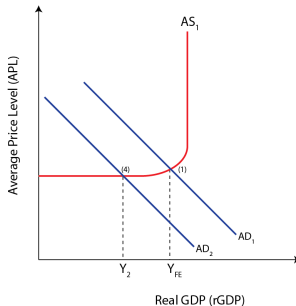
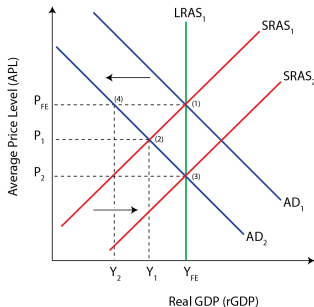


Assessment Objectives

Specific Expectations	
2.E	Explain the Keynesian perspective of the aggregate supply (AS) curve
2.F	Explain equilibrium in the Keynesian model
2.G	Draw a diagram showing equilibrium in the Keynesian model
2.H	Explain that in the Keynesian model deflationary/recessionary gaps may persist so that the equilibrium level of output may differ from the full employment level of output

Keynesian Model

- In the Keynesian model, inflexible wages and prices in the downward direction mean that the economy cannot move into the long run when experiencing a deflationary gap.
- ▶ Inflexible wages and prices are shown graphically by a horizontal section of the Keynesian aggregate supply (AS) curve.



Keynesian Model: Aggregate Supply Curve

- **Keynesian aggregate supply curve** is an aggregate supply curve that has a flat (horizontal) section, an upward sloping section and a vertical section.
 - ▶ It shows the relationship between real GDP and the price level on the assumption that prices and wages are inflexible downward.
 - ▶ Changes in the price level and/or real GDP depend on the level of aggregate demand and where the economy is producing relative to full capacity output.
- 1. **Section I (Keynesian Zone/Elastic):** real GDP is low, and the price level remains constant as real GDP increases.
 - In this range of real GDP, there is a lot of unemployment of resources and spare capacity.
 - Firms can easily increase their output by employing the unemployed capital and other unemployed resources, without having to bid up wages and other resource prices.

Keynesian Model: Aggregate Supply Curve

2. **Section II (Intermediate Zone):** real GDP increases are accompanied by increases in the price level.

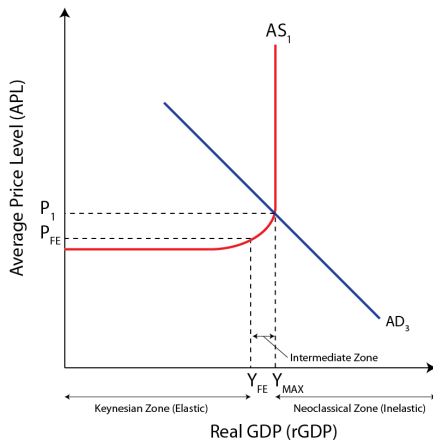
- As output increases, so does employment of resources, and eventually bottlenecks in resource supplies begin to appear as there is no longer spare capacity in the economy.
- Wages and other resource prices begin to rise, which means that costs of production increase.
- The only way firms will be induced to increase their output is if they can sell at higher prices.
- Therefore, growing output leads to an increase price level.

3. **Section III (Neoclassical Zone: Inelastic):** the aggregate supply (AS) curve becomes vertical at Y_{\max} .

- This indicates that real GDP reaches a level beyond which it cannot increase anymore; at this point, the price level rises rapidly.
- Real GDP can no longer increase because firms are using the maximum amount of labour and all other resources in the economy.

Keynesian Model: Aggregate Supply Curve

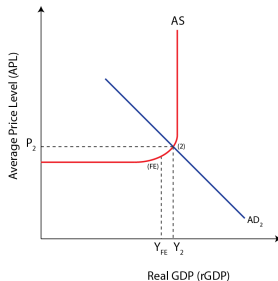
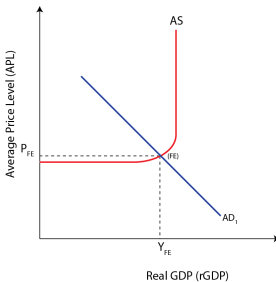
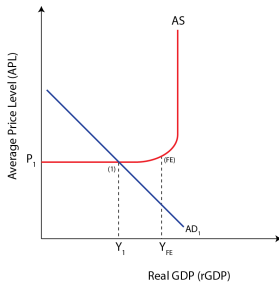
- Any efforts on the part of firms to increase their output only result in greater increases in the price level.



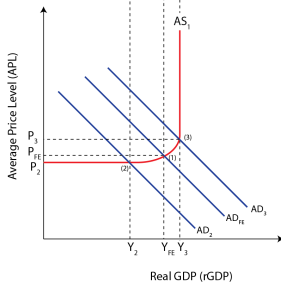
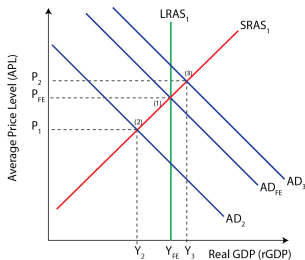
Keynesian Model: Aggregate Supply Curve

- ▶ The Keynesian model arrives at some conclusions that differ significantly from the conclusions of the monetarist (new classical) model.
 - The economy in the Keynesian model can remain indefinitely stuck in a deflationary gap, unlike in the monetarist (new classical) model where the economy automatically returns to full employment equilibrium.
 - Increase in aggregate demand in the Keynesian model need not necessarily result in increases in the price level, unlike in the monetarist (new classical) model where increase in aggregate demand always results in a higher price level.

Keynesian Model: Aggregate Supply Curve



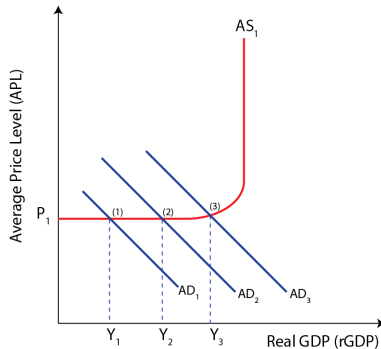
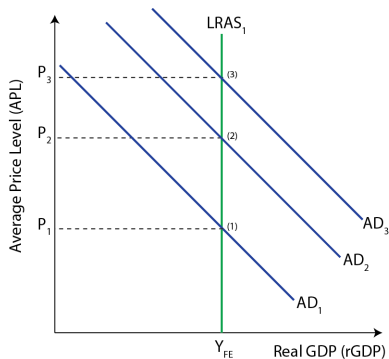
Keynesian Model: Aggregate Supply Curve



Implications of the Keynesian Model

- ▶ In contrast to the monetarist/new classical model, which automatically corrects for deflationary/recessionary gaps by returning to full employment, the Keynesian model shows that an economy can remain for long periods of time in an equilibrium where there is less than full employment, caused by insufficient aggregate demand.
- ▶ In the Keynesian view increases in aggregate demand need not result in a higher price level.
 - This is in contrast to the monetarist/new classical view where increases in aggregate demand always result in a higher price level.
 - Policies focusing on increasing aggregate demand are not only harmless, but in fact they are essential in order to both prevent and reduce the size of both deflationary and inflationary gaps.

Implications of the Keynesian Model



Unemployment



Assessment Objectives

Specific Expectations	
1.C	Define the labor force, the unemployment rate, and the labor force participation rate.
1.C	Explain how changes in employment and the labor market affect the unemployment rate and the labor force participation rate.
1.C	Calculate the unemployment rate and the labor force participation rate.
1.D	Define the limitations of the unemployment rate.
1.E	Define the types of unemployment and the natural rate of unemployment.
1.E	Explain changes in the types of unemployment.

Unemployment

- **Unemployment** refers to people of working age who are actively looking for a job but who are not employed.
 - ▶ The unemployment rate is the percentage of the total labour force (TLF) that is unemployed.

$$\begin{aligned}\text{Unemployment rate} &= \frac{\text{Number of workers unemployed}}{\text{Total labor force}} \\ &= \frac{\text{Number of workers unemployed}}{\text{Unemployed} + \text{Employed}}\end{aligned}$$

- ▶ The labor force is the number of people who are employed (working) plus the number of people of working age who are unemployed (not working but seeking work).

$$\text{Labour Force} = \text{Unemployed} + \text{Employed}$$

Unemployment

- ▶ The labour force includes non-institutionalized, civilian adult population who are working part-time or full-time or that are unemployed.
- ▶ Adults who are not seeking jobs or who are engaged in other activities such as pursuing education, volunteering, travelling, or voluntarily taking time off from work are not part of the labour force.
- ▶ **Underemployment** is the condition of a worker who is technically employed, but is either over-qualified for the type of work or is working part-time when full-time work is desired.
- ▶ **Discouraged workers** are unemployed workers who gave up looking for a job, because after trying unsuccessfully to find work for some time, they became discouraged and stopped searching.
 - These people in effect drop out of the labor force

Importance of Unemployment Rate

- A country's unemployment rate is a barometer of the economy's health.
 - ▶ A high unemployment rate could be the result of either a negative macroeconomic shock, or evidence that the economy is underutilizing its resources.
 - ▶ Rising unemployment usually accompanies falling GDP and indicates that an economy is in a recession.
 - ▶ A low unemployment rate is evidence the economy is utilizing its resources more efficiently or has experience a positive economic shock. Low unemployment indicates an economy is producing close to or on its PPC.
 - ▶ Falling unemployed usually accompanies rising GDP and either a recovery from a past economic downturn or economic growth.

Labor Force Participation Rate (LFPR)

- **Labor force participation rate (LFPR)** measure the percentage of the eligible population that is participating in the labour force.

$$\text{LFPR} = \frac{\text{Total Labor Force}}{\text{Eligible Adult Population}} = \frac{\text{Employed} + \text{Unemployed}}{\text{Eligible Adult Population}}$$

- ▶ When an economy is performing well people who might have chosen not to participate are drawn to the labour market by rising wages.
- ▶ During recessions, LFPR tends to decline as unemployed workers become discouraged & give up on the job search, or those who might have joined the labour force choose to stay in school or retire early.
- ▶ An increase in LFPR may also result from more opportunities for groups that were historically discriminated against by employers.

Difficulties measuring unemployment

- The unemployment rate is one of the most widely reported measures of economic activity, used extensively as an indicator of economic performance.
 - ▶ It is difficult to obtain an accurate measurement of unemployment.
- Official statistics often underestimate true unemployment because of **hidden unemployment** arising from the following:
 - ▶ Unemployed figures include unemployed persons who are actively seeking work. This excludes “discouraged workers”.
 - ▶ Unemployment figures do not make a distinction between full-time and part-time employment. This neglects the problem of underemployment.
 - ▶ Unemployment figures make no distinction on the type of work done.
 - ▶ Unemployment figures do not include people on retraining programmes who previously lost their jobs, as well as people who retire early although they would rather be working.

Difficulties measuring unemployment

- ▶ As output increases in a country coming out of a recession, it is possible that the unemployment rate increases due to eligible adults entering the labour force.
- Official statistics may overestimate true unemployment because:
 - ▶ Unemployed figures do not include people working in the underground economy or informal economy. This is the portion of the economy that is unregistered, legally unregulated and not reported to tax authorities.
- A disadvantage of the unemployment rate is that it is an average over the entire population and therefore does not account for differences in unemployment that often arise among different population groups
 - ▶ **Region**– regions with declining industries may have higher unemployment than other regions

Difficulties measuring unemployment

- ▶ **Gender**– women sometimes face higher unemployment rates than men
- ▶ **Ethnic groups**– some ethnic groups may be disadvantaged due to discrimination, or due to lower levels of education and training
- ▶ **Age**– youth often face higher unemployment rates than older populations, often due to lower skill levels
- ▶ **Occupation and education attainment**– people who are relatively less skilled may have higher unemployment rates than more skilled workers.

Costs of Unemployment

- Unemployment has the following economic consequences:
 - ▶ **A loss of real output (real GDP)**– Since fewer people work than are available to work, the amount of output produced is less than the level the economy is capable of producing.
 - ▶ **A loss of income for unemployed workers**– People who are unemployed do not have an income from work.
 - ▶ **A loss of tax revenue for government**– Unemployed people do not pay income tax which results in less tax revenue for government.
 - ▶ **Costs to the government of unemployment benefits**– Reduces the tax revenue left over to pay for government-provided goods and services such as public goods and merit goods.
 - ▶ **Costs to the government of dealing with social problems resulting from unemployment**

Costs of Unemployment

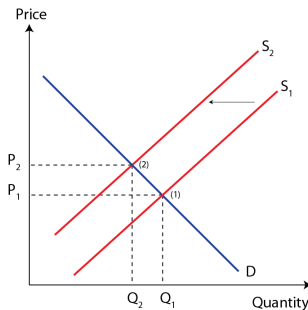
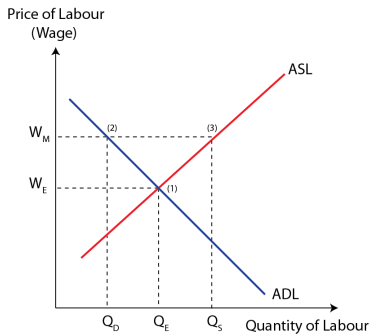
- ▶ **Larger budget deficit or small budget surplus**– Unemployment leads to a loss of tax revenue and greater expenditures for unemployment benefits.
- ▶ **More unequal distribution of income**– Some people (unemployed) become poorer while others are able to maintain their income levels.
- ▶ **Unemployed people may have difficulties finding work in the future**– When people remain out of work for long periods, they may not find work easily at a later time in the future.
- Unemployment has the following personal social consequences:
 - ▶ **Personal problems**: Being unemployed and unable to secure a job involves a loss of income, increased indebtedness as people must borrow to survive, as well as a loss of self-esteem.
 - ▶ **Greater social problems**– Including increased crime and violence, drug use and homelessness, arising from growing poverty.

Types of Unemployment

- There are several types of unemployment that economists measure:
 1. **Structural unemployment**– is a type of unemployment that occurs as a result of technological changes and changing patterns of demand (causing changes in demand for labour skills), as well as changes in the geographical location of jobs, and labour market rigidities (lack of labour market flexibility).
 - ▶ The two main causes of structural unemployment are improvements in production technologies and globalization of supply chains.
 - ▶ **Changes in demand for particular labour skills**– Mismatches between labour skills demanded by employers and labour skills supplied by workers.
 - ▶ **Changes in the geographical location of jobs**– Mismatches between labour demanded and labour supplied within a geographical region.
 - ▶ **Labour market rigidities**– Factors preventing the forces of supply and demand from operating in the labour market.

Types of Unemployment

- **Minimum wage legislation** – leads to higher than equilibrium wages
- **Labour union activities and wage bargaining with employers**
- **Employment protection laws** – make it costly for firms to fire workers (because they must pay compensation), thus making firms more cautious about hiring
- **Generous unemployment benefits** – increase the attractiveness of remaining unemployed and reduce the incentives to work



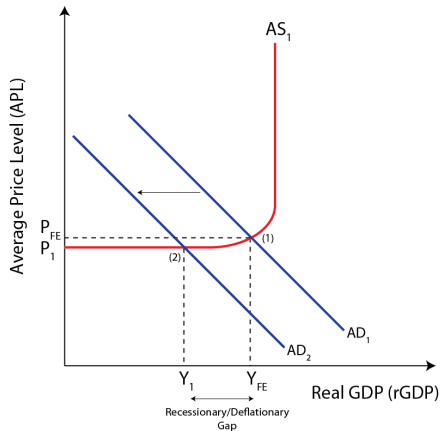
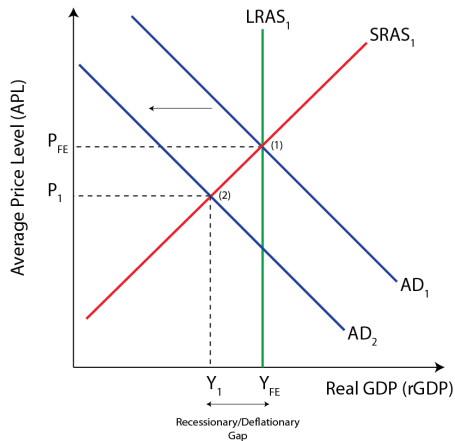
Types of Unemployment

- 2. **Frictional unemployment**– A type of unemployment that occurs when workers are between jobs; workers may leave their job because they have been fired, or because their employer went out of business, or because they are in search of a better job, or they may be waiting to begin a new job; tends to be short-term.
 - ▶ Frictional unemployment is typically short-lived and often voluntary.
 - ▶ A certain amount of frictional unemployment is inevitable in any growing, change economy.
- 3. **Seasonal unemployment**– A type of unemployment that occurs when the demand for labour in certain industries changes on a seasonal basis because of variation in need.
 - ▶ Some seasonal unemployment is unavoidable in any economy, as there will always be some industries with seasonal variations in labour demand.

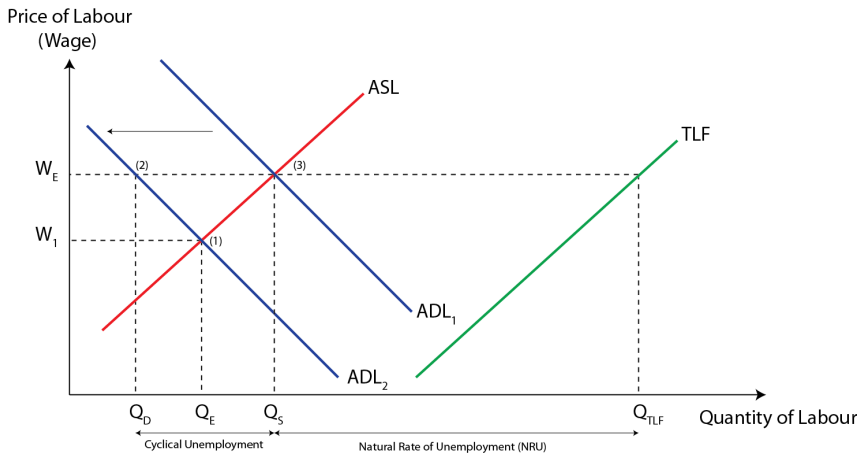
Types of Unemployment

4. **Cyclical unemployment**— A type of unemployment that occurs during the downturns in of the business cycle, when the economy is in a recessionary gap; the downturn is seen as arising from declining or low aggregate demand, and therefore is known as “demand-deficient” unemployment.
- ▶ Assuming labour markets were perfectly flexible, a fall in demand for labour would cause the wage rate workers are paid to fall, leading some workers to leave the labour market mitigating the decline in labour demand.
 - ▶ Wages tend to stabilize in the short-run , as a result a fall in labour demand does not always cause a fall in the wage rate, causing a disequilibrium in the labour market.

Types of Unemployment: Cyclical Unemployment



Types of Unemployment: Cyclical Unemployment



Natural Rate of Unemployment (NRU)

- **Natural rate of unemployment (NRU)**– Unemployment that occurs when the economy is producing at its potential or full employment level of output (real GDP), and is equal to the sum of structural, frictional, plus seasonal unemployment.
 - ▶ Even in a robust economy, a country will experience some unemployment. Full employment does not correspond with zero unemployment

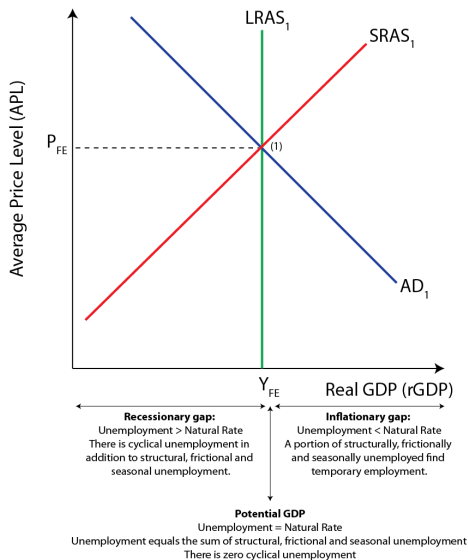
$$\text{NRU} = \frac{\text{Structural} + \text{Frictional} + \text{Seasonal Unemployment}}{\text{Total Labour Force (TLF)}}$$

- ▶ Cyclical unemployment is not part of the NRU. When workers lose their jobs because of a fall in aggregate demand and a recession, it is a sign that a country's economy is producing below its full employment level.
- ▶ The country suffers from a lack of demand and inflexible wages, meaning that there is a disequilibrium in the labour market.

Natural Rate of Unemployment (NRU)

- ▶ The “ideal” level of unemployment for a country to target is its NRU. The percentage varies from country to country.
- The natural rate of unemployment can gradually change over time.
 - ▶ Factors that cause the level of frictional or structural unemployment to change will cause the natural rate of unemployment to change.
 - ▶ Changes in the quality &/or quality of the factors of production (land, labour, capital, and entrepreneurship) will change the natural rate of unemployment.

Natural Rate of Unemployment (NRU)



- **Enduring Understanding**

- ▶ An economy's performance can be measured by different indicators such as gross domestic product (GDP), the inflation rate, and the unemployment rate.

- **Essential Knowledge**

- ▶ The unemployment rate is the percentage of the labor force that is out of work.
- ▶ The labor force participation rate is another measure of the labor market activity in an economy. The labor force participation rate is the percentage of the adult population that is in the labor force.
- ▶ The measured unemployment rate is often criticized for understating the level of joblessness because it excludes groups such as discouraged workers and part-time workers.
- ▶ Economists primarily focus on three types of unemployment: cyclical, frictional, and structural.

Summary (Continued)

- ▶ The natural rate of unemployment is the unemployment rate that would exist when the economy produces full-employment real output. It is equal to the sum of frictional and structural unemployment.
- ▶ The deviation of the actual unemployment rate from the natural rate is cyclical unemployment.
- ▶ The natural rate of unemployment can gradually change over time because of such things as changes in labor force characteristics.

Low and Stable rate of Inflation

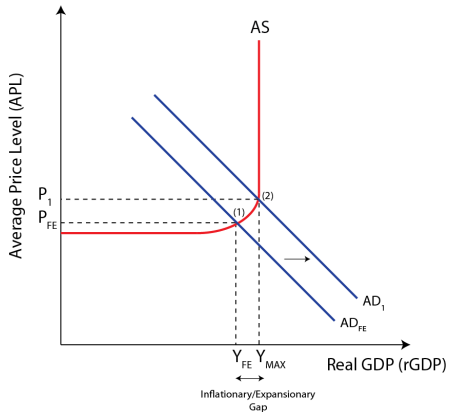
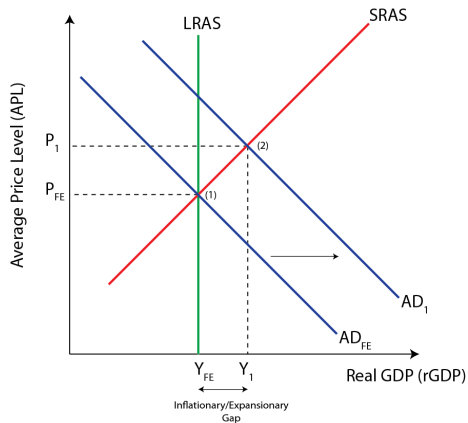


Assessment Objectives

Specific Expectations	
1.F	Define the consumer price index (CPI), inflation, deflation, disinflation, the inflation rate, and real variables.
1.F	Explain how price indices can be used to calculate the inflation rate and to compare nominal variables over time periods.
1.F	Calculate the CPI, the inflation rate, and changes in real variables.
1.G	Define the shortcomings of the CPI as a true measure of inflation.
2.H	Explain (using graphs as appropriate) the response of output, employment, and the price level to an aggregate demand or aggregate supply shock in the short run.

- **Inflation**, an increase in the general price level of a nation's output overtime, can be caused by changes in either AD or AS.
 - ▶ An analysis of demand and supply shocks reveals that inflation can result from either a positive demand shock or negative supply shock.
 - ▶ **Demand-pull inflation**: a type of inflation caused by an increase in aggregate demand, shown in the AD-AS model as a rightward shift in the AD curve.
 - Demand-pull inflation occurs when a component of AD increases in an economy already producing at or near its full employment level of output.
 - It involves an excess of aggregate demand over aggregate supply.
 - Resources become increasingly scarce and producers find that consumers are willing to pay more for their output.

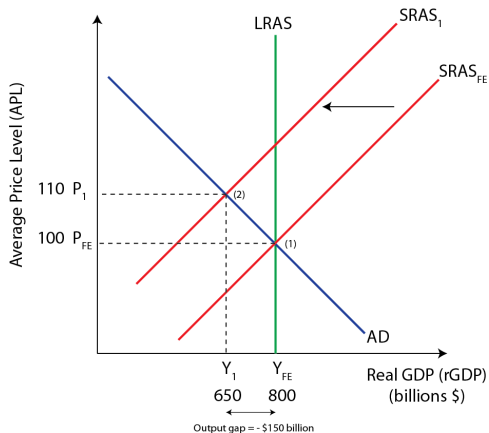
Demand-pull inflation



- ▶ **Cost-push inflation:** a type of inflation caused by a fall in aggregate supply, usually resulting from increases in costs of production, shown in the AD-AS model as a leftward shift of the AS curve.
 - Arises when a factor affecting SRAS causes the costs of production to increase.
 - Arises from increases in wages or prices of other inputs.

In the short-run firms will pass higher costs onto consumers through price increases.
 - Cost-push inflation is characterized by a negative output gap and an increase in unemployment.

Cost-push inflation



Costs of Inflation

- **Redistribution effects:** inflation redistributes income away from certain groups in the economy and towards other groups.
 - ▶ Redistribution arises in situations where certain groups lose some purchasing power and become worse off, while other groups gain purchasing power and become better off.
- 1. **People who receive fixed income or wages** – when individuals receive an income or wage that is fixed or constant, as the general price level increases they become worse off.
- 2. **People who receive income or wages that increase less rapidly than the rate of inflation** – when individuals' incomes do not keep up with a rising price level a fall in their real incomes results.
- 3. **Holders of cash** – as the price level increases, the real value or purchasing power of cash held falls

Costs of Inflation

4. **Savers** – people who save money may become worse off as a result of inflation. In order to maintain the real value of their savings, savers must receive a rate of interest that is at least equal to the rate of inflation.
 5. **Lenders (creditors)** – people (or financial institutions) who lend money may be worse off due to inflation. In general, lending at a lower interest rate than the rate of inflation makes the lender (creditor) worse off at the end of the loan period.
- Groups that gain from inflation include:
 1. **Borrowers (debtors)** – In general, borrowing at a lower interest rate than the rate of inflation makes the borrower (debtor) better off at the end of the loan period.
 2. **Payers of fixed incomes or wages** – as long as nominal wages, pensions, etc. are fixed while there is inflation, the payers' benefits as the real value of their payments falls due to inflation.

- 3. **Payers if income or wages that increase less rapidly than inflation**
 - as long as income of any kind increase less rapidly than the rate of inflation, the payers of these incomes benefit due to falling real value of their payments.
- **Uncertainty:** inability to accurately predict what inflation will be in the future means that people cannot predict future changes in purchasing power.
 - ▶ This causes uncertainty among economic decision makers.
 - ▶ Firms become more cautious about making future plans under uncertainty about future price levels, because they are unable to accurately forecast costs and revenues.
 - ▶ This uncertainty leads them to make fewer investments, which may lead to lower economic growth.

Costs of Inflation

1. **Effects on savings** – inflation lowers the incentive to save. If the inflation rate is high, people may spend more now in order to avoid higher prices in the future.
2. **International (export) competitiveness** – when the price level in a country increases more rapidly than the price level in other countries with which it trades, its exports become more expensive to foreign buyers, while its imports become cheaper to domestic buyers.
 - The result is that the quantity of exports falls, and the quantity of imports increases.
1. **Effects of economic growth** – high inflation does not favor economic growth.
 - The uncertainty among firms causes investment to fall. In addition, lower saving means that there are less available funds for investment
 - Inflation also leads to lower exports and higher imports, both contributing to a fall in net exports, which also causes a fall in GDP.

2. **Effects on resource allocation** – If prices are rising rapidly, the signalling and incentive function of prices do not work effectively.
 - Prices do not increase by the same proportion for all products, they rise more for some products than others, meaning that the signals and incentives they provide for consumers and producers become distorted and inaccurate.
 - This results in allocative inefficiency.
3. **Social and personal costs that are unequally distributed** – people on low incomes are more seriously affected by high rates of inflation than people on higher incomes.
 - People on low incomes are not in position to place their savings in assets that do not lose their value with inflation such as real estate, stocks in the stock market, or gold.
 - Rising prices of necessities such as energy and food can cut deeply into income of lower income people.

Price Index

- **Price Index** The price index measures changes in the general price level over time different price indices to measure how the price of different categories of a country's output change over time.
- **Consumer price index (CPI)** is measure of the cost of living for the typical household, and compares the value of a basket of good and service in one year with value of the same basket in a base year.
 - ▶ Inflation (and deflation) are measured as a percentage change in the value of the basket from one year to another.
 - ▶ **Inflation** is defined as a sustained increase in the general price level.
 - ▶ **Deflation** is defined as a sustained decrease in the general price level.
 - ▶ **Disinflation** refers to a fall in the rate of inflation; it involves a positive rate of inflation and should be contrasted with deflation.

Price Index

- **Weighted price index** a measure of average prices in one period relative to average prices in a reference period called a base period.
 - ▶ A weighted price index is a price index that “weights” the various goods and services according to their relative importance.
 - ▶ In the consumer price index (CPI), goods and services are weighed according to their relative importance for consumer spending.
 - ▶ To construct a weighted price index,
 1. Find the value of the basket in current prices for each year
 2. Divide the value of the basket for each year by the value of the basket in the base year and multiple by 100. This will give you the price index number for each year.

Price Index: Example

Example: Suppose there is a country that produces three goods: pizza, haircuts, and wine. The following table shows the prices of the three goods over three years.

Good or service	Price in 2019	Price in 2020	Price in 2021
Pizza	10	10.50	12
Haircuts	20	19	22
Wine	8	10	9
Total basket price	38	39.50	43

$$CPI_{2019} = \frac{\text{Price of the basket of goods in 2019}}{\text{Price of the basket in base year}} \times 100 = \frac{38}{38} \times 100 = 100$$

$$CPI_{2020} = \frac{\text{Price of the basket of goods in 2020}}{\text{Price of the basket in base year}} \times 100 = \frac{39.5}{38} \times 100 = 103.9$$

$$CPI_{2021} = \frac{\text{Price of the basket of goods in 2021}}{\text{Price of the basket in base year}} \times 100 = \frac{43}{38} \times 100 = 113.2$$

Calculating the rate of inflation

- The inflation rate is measured as the rate of change in the CPI between two periods of time.
 - ▶ While inflation can be measured quarterly or even monthly, it is standard to report inflation annually.

$$\text{Inflation rate} = \frac{\text{CPI in year 2} - \text{CPI in year 1}}{\text{CPI in year 1}} \times 100$$

- **Example:**

$$\text{Inflation rate}_{2019-2020} = \frac{103.9 - 100}{100} \times 100 = 3.9\%$$

$$\text{Inflation rate}_{2020-2021} = \frac{113.2 - 103.9}{103.9} \times 100 = 8.95\%$$

Nominal versus Real variable

- **Real income** also known as real wage, is how much money an individual or entity makes after adjusting for inflation.
 - ▶ If nominal income increases by the same percentage as the price level (measured in CPI), real income remains unchanged.
 - ▶ An inflation rate higher than that at which nominal incomes increase leads to a decreased standard of living.
 - ▶ The percentage change in a worker's real income is the percentage change in her nominal income minus the inflation rate.

$$\text{Real income} = \frac{\text{Nominal income}}{\text{CPI}} \times 100$$

- ▶ The **real interest rate** in an economy is the nominal interest rate minus the inflation rate. (The nominal interest rate is the actual interest rate before taking inflation into account)

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

Problems with the consumer price index (CPI)

- There are shortcomings associated with the consumer price index (CPI):
 1. **Different rates of inflation for different income earners** – different consumers have different consumption patterns depending on their income levels.
 2. **Different rates of inflation depending on regional or cultural factors**
 3. **Changes in consumption patterns due to consumer substitutions when relative prices change** – As some goods and services become cheaper or more expensive over time, consumers have substitutions, buying more units of the cheaper goods and less of the more expensive ones which changes the weights of CPI which were fixed.
 4. **Changes in consumption patterns due to increasing use of discount stores and sales**

Problems with the consumer price index (CPI)

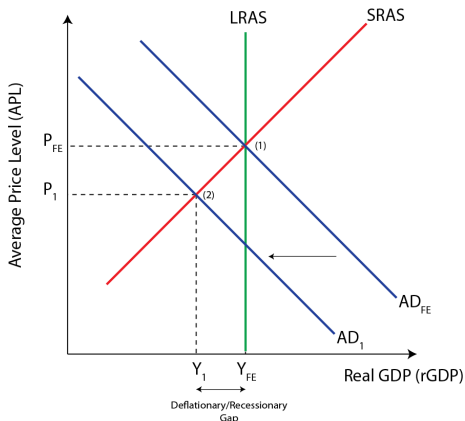
5. **Changes in consumption patterns due to the introduction of new products** – A fixed basket of goods and services cannot account for new products introduced into the market, as well as older products that become less popular or are withdrawn.
6. **Changes in product quality** – The CPI cannot account for quality changes over time.
7. **International comparisons** – The CPIs of different countries differ from each other with respect to the types of goods and services included in the basket and the weights used and methods of calculation.
8. **Comparability over time** – Price index numbers are comparable over short periods of time, but over longer periods comparability is lessened because of cumulative changes in the basket of goods and services.

Causes of Deflation

- Deflation, a falling price level on average, is not a common phenomena. Whereas it is often the case that the price of a particular good or service may fall over time, it is rare to see the general price level of an economy falling.
 - ▶ **Wages of workers do not ordinarily fall** – this means it is difficult for firms to lower the prices of their products, as this would cut into their profits, especially since wages represent a large portion of firms' costs of production.
 - ▶ **Large oligopolistic firms may fear price wars** – If one firms lowers its price, then others may lower theirs more aggressively in an effort to capture market share, and then all firms will be worse off.
 - Therefore, firms avoid cutting their costs.

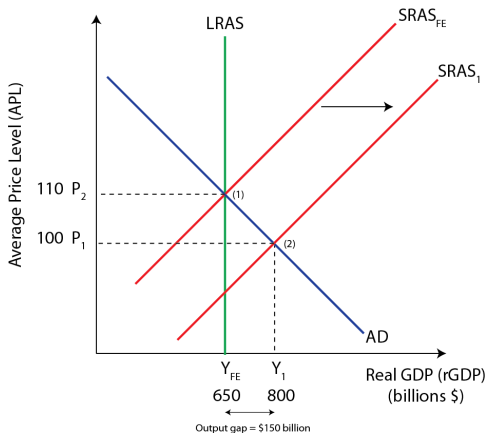
Causes of Deflation: Types

- **Demand deficient deflation** refers to the situation when aggregate demand (AD) is less than the aggregate supply (AS) corresponding to the full employment level of output in the economy.



Causes of Deflation: Types

- **Supply-side deflation** refers to the situation when aggregate supply (SRAS) is more than the aggregate demand (AD) corresponding to the full employment level of output in the economy.



Costs of Deflation

- It must be stressed that while it may be possible to make a theoretical distinction between “good” and “bad” deflation, no deflation is ever good.
 1. **Redistribution effects** – with a falling price level, individuals on fixed incomes, holders of cash, savers and lenders (creditors) all gain as the real value of their income or holdings increase.
 - By contrast, borrowers (debtors) and payers of individuals with fixed incomes lose with a falling price level, as they must pay out sums that have an increasing real value.
 2. **Increase in the real value of debt** – the real value of debt in terms of purchasing power increases when the price level falls.
 3. **Uncertainty** – deflation, creates uncertainty for firms, which are unable to forecast their costs and revenues due to declining price levels.

4. **Deferred consumption, high and increasing cyclical unemployment: risk of a deflationary spiral** – deferred consumption means consumers postpone spending. Consumers postpone making purchases when they see falling prices as they expect that prices will continue to fall. Therefore, deflation discourages spending.
 - Deflation also discourages borrowing by both consumers and firms, because the real value of debt increases as the price level falls.
 - The result is that consumer and business spending falls, causing aggregate demand to fall.
5. **Risk of bankruptcies and a financial crisis** – if an economy is in a recession, and incomes are falling while the real value of debt is increasing, the result will most likely be bankruptcies of firm and consumers who are unable to pay back their debts.
 - If such bankruptcies become widespread, banks and financial institutions will be affected, and a large risk of a major financial crisis arises.

Costs of Deflation

6. **Inefficient resource allocation** – in deflation, prices of all goods and services do not fall uniformly, with the result that the price signals and incentives get distorted, leading to resource misallocation.
7. **Policy Ineffectiveness** – it may be difficult for policy makers to deal with.
 - People's expectations of a falling price level become well established, and they get used to spending less in the expectation of falling prices, it may be difficult for them to change their mindset.
 - Also, expansionary monetary policy involves decreases in the rate of interest in order to encourage more borrowing and spending by consumers and firms, however once interest rates approach zero the cannot continue to fall. Therefore, monetary policy cannot be relied upon to solve the problem.

- **Enduring Understanding**

- ▶ An economy's performance can be measured by different indicators such as gross domestic product (GDP), the inflation rate, and the unemployment rate.

- **Essential Knowledge**

- ▶ The consumer price index (CPI) measures the change in income a consumer would need in order to maintain the same standard of living over time under a new set of prices as under the original set of prices.
- ▶ The CPI measures the cost of a fixed basket of goods and services in a given year relative to the base year.
- ▶ Inflation can be caused by changes in aggregate demand (demand-pull) or aggregate supply (cost-push).
- ▶ The inflation rate is determined by calculating the percentage change in a price index, such as CPI or the GDP deflator.

Summary (Continued)

- ▶ Real variables, such as real wages, are the nominal variables deflated by the price level.
- ▶ The CPI as a measure of inflation has some shortcomings, such as substitution bias, causing it to overstate the true inflation rate.

Phillips Curve



Assessment Objectives

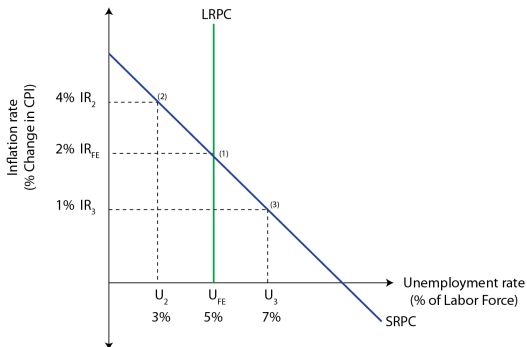
Specific Expectations	
3.A	Define (using graphs as appropriate) the short-run Phillips curve and the long-run Phillips curve.
3.A	Explain (using graphs as appropriate) short-run and long-run equilibrium in the Phillips curve model.
3.B	Explain (using graphs as appropriate) the response of unemployment and inflation in the short run and in the long run.

Phillips Curve

- **Phillips Curve** a curve showing the relationship between unemployment and inflation.
 - ▶ The **Short-run Phillips Curve (SRPC)** shows the negative relationship between the rate of inflation and the unemployment rate.
 - When aggregate demand shifts, there is a short-run trade-off between inflation and unemployment
 - Rising inflation is usually accompanied by a drop in unemployment
 - When unemployment increases, inflation tends to fall
 - In the short-run, policy-makers can choose between the competing alternatives of low inflation or low unemployment by using policies that affect aggregate demand.
 - ▶ The **Long-run Phillips Curve (LRPC)** is vertical at the natural rate of unemployment, indicating that there is no negative relationship between inflation and unemployment.

Phillips Curve

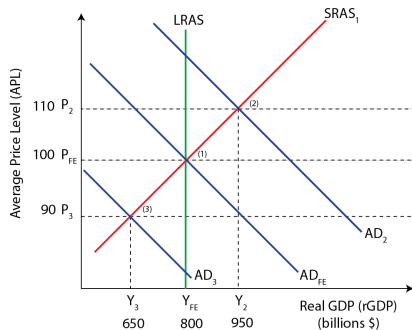
- In the long-run, wages and prices are perfectly flexible and a country's output will return to its full employment level following negative or positive demand shocks.
- In the long-run, the only impact of an increase in aggregate demand is to increase the rate of inflation, while the level of real output and unemployment remain unchanged at the natural rate of unemployment.



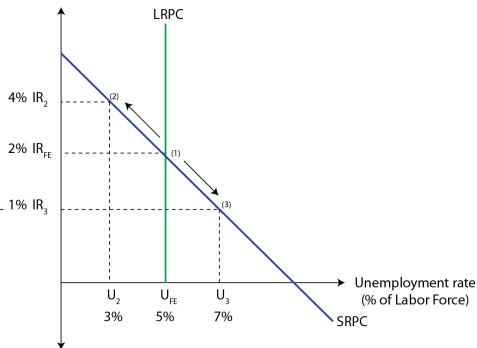
Phillips Curve: Changes in Aggregate Demand

- Changes in aggregate demand (AD) lead to movement along the Short-Run Phillips Curve (SRPC).
 - ▶ A negative demand shock will cause a decrease in output, employment and the price level. This leads to movement down and to the right along the SRPC.
 - $\downarrow AD \Rightarrow \downarrow \text{Inflation} \ \& \ \uparrow \text{Unemployment}$
 - ▶ A positive demand shock will cause output, employment and the price level to increase. This leads to movement up and to the left along the SRPC.
 - $\uparrow AD \Rightarrow \uparrow \text{Inflation} \ \& \ \downarrow \text{Unemployment}$

Phillips Curve: Changes in Aggregate Demand



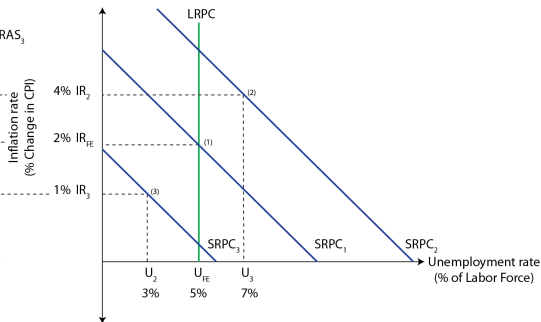
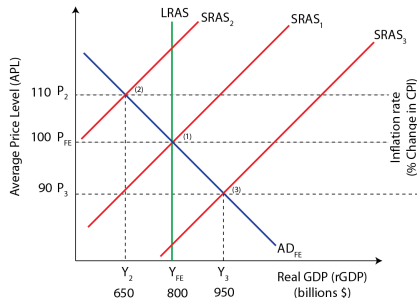
Inflation rate
(% Change in CPI)



Phillips Curve: Changes in Aggregate Supply

- Changes in Short-Run Aggregate Supply (SRAS) lead to shifts of the Short-Run Phillips Curve (SRPC).
 - ▶ A negative supply-side shock causes both higher inflation and higher unemployment. This leads to an outward and rightward shift of the SRPC.
 - $\downarrow \text{SRAS} \Rightarrow \uparrow \text{Inflation} \ \& \ \uparrow \text{Unemployment}$
 - **Stagflation** occurs when the country's economy stagnates while inflation increase.
 - ▶ A positive supply-side shock will cause output to increase and the price level to fall. More output means lower unemployment and a lower price level means lower inflation. This leads to an inward and leftward shift of the SRPC.
 - $\uparrow \text{SRAS} \Rightarrow \downarrow \text{Inflation} \ \& \ \downarrow \text{Unemployment}$

Phillips Curve: Changes in Aggregate Supply

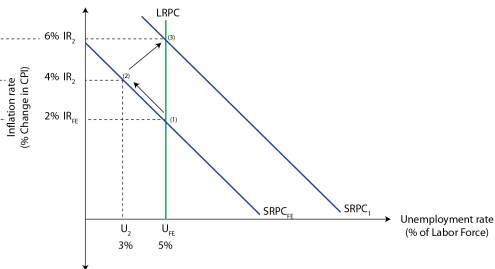
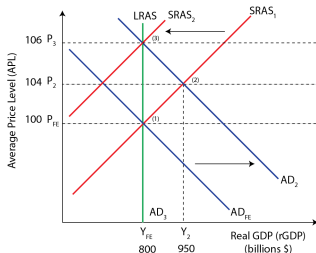


Phillips Curve: Self-Correction

- An increase in aggregate demand (AD) causes an increase in output, the price level, and employment. This is shown as **(1)** to **(2)** in the AD-AS model.
 - ▶ Unemployment decreases and inflation increases as shown as movement along the Phillips curve from **(1)** to **(2)**.
 - ▶ In the long-run, an economy producing beyond full employment, at point **(2)**, will experience rising wages and input costs, causing SRAS to decrease and output to return to the full employment level.
 - ▶ As this happens, inflation will increase and unemployment will return to the NRU in the Phillips curve model.
 - ▶ Rising wages and other input prices cause the SRAS to shift in, moving the economy from equilibrium at point **(2)** in the AS-AD model to a new equilibrium at point **(3)**.

Phillips Curve: Self-Correction

- ▶ Inflation has increase while unemployment has returned to its natural rate.
- ▶ In the Phillips curve, higher inflation and higher unemployment are shown as an outward shift of the SRPC while causes the equilibrium in the Phillips curve model to move from **(2)** to **(3)**
- ▶ As output returns to its full employment level in the AS-AD model, unemployment returns to its natural rate in the Phillips Curve Model.

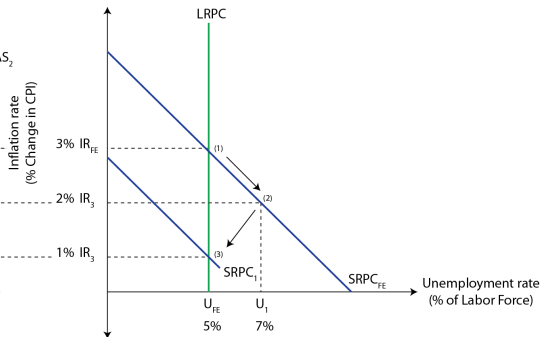
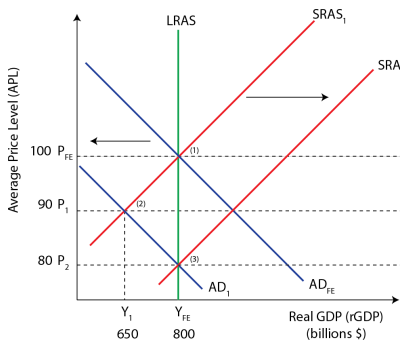


Phillips Curve: Self-Correction

- A negative demand-side shock will cause a decrease in output, employment, and the price level in the AS-AD model, and a movement down and to the right along the SRPC in the Phillips curve model.
 - ▶ A move from point **(1)** to **(2)** in the AS-AD model corresponds to a move from **(1)** to **(2)** in the Phillips curve model.
 - ▶ In the long-run, an economy producing below full employment, at point **(2)**, will experience falling wages and input costs, causing the SRAS to increase and output to return to the full employment level.
 - ▶ Inflation will decrease and unemployment will return to the NRU in the Phillips curve model.
 - ▶ Falling wages and other input prices cause SRAS to shift out, restoring full employment in the AS-AD model at a lower price level.

Phillips Curve: Self-Correction

- ▶ The outward shift of the SRAS corresponds with an inward shift of the SRPC, restoring the natural rate of unemployment (NRU) in the Phillips Curve model at a lower inflation rate.

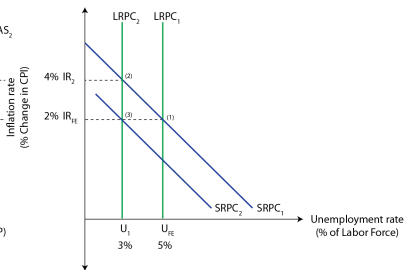
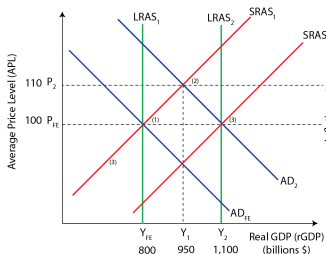


Natural Rate of Unemployment (NRU) and the LRPC

- Factors that cause the natural rate of unemployment (NRU) to change will cause a shift of the long-run Phillips curve (LRPC).
- Recall that the NRU consists of two types of unemployment:
 - ▶ **Structural unemployment** arises due to changing technology or other factors that result in a mismatch between the skills of a nation's workforce and the needs of employers.
 - ▶ **Frictional unemployment** arises from workers who are in between jobs and cannot quickly and easily be matched up with firms that demand labor.
- ▶ Increases in the NRU, although rare, result from shifts in society's attitudes toward work, changes in technology, or from policies that change the incentives around being unemployed.
- ▶ Decreases in the NRU may stem from improvements in the quality and/or quantity of the factors of production and economic growth.

Natural Rate of Unemployment (NRU) and the LRPC

- Changes in long-run aggregate supply (LRAS) lead to shifts of the Long-Run Phillips Curve.
- ▶ Increases in LRAS leads to an inward and leftward shift of the LRPC curve and a decrease in the NRU.
- ▶ Decreases in LRAS leads to an outward and rightward shift of the LRPC curve and an increase in the NRU.



- **Enduring Understanding**

- ▶ The Phillips curve model is used to represent the relationship between inflation and unemployment and to illustrate how macroeconomic shocks affect inflation and unemployment.

- **Essential Knowledge**

- ▶ The short-run trade-off between inflation and unemployment can be illustrated by the downward-sloping short-run Phillips curve (SRPC).
- ▶ An economy is always operating somewhere along the SRPC.
- ▶ The long-run relationship between inflation and unemployment can be illustrated by the longrun Phillips curve (LRPC), which is vertical at the natural rate of unemployment.
- ▶ Long-run equilibrium corresponds to the intersection of the SRPC and the LRPC.

Summary (Continued)

- ▶ Points to the left of long-run equilibrium represent inflationary gaps, while points to the right of long-run equilibrium represent recessionary gaps.
- ▶ Demand shocks correspond to movement along the SRPC.
- ▶ Supply shocks correspond to shifts of the SRPC.
- ▶ Factors that cause the natural rate of unemployment to change will cause the LRPC to shift.

Economic Growth



Assessment Objectives

Specific Expectations	
2.B	Define measures and determinants of economic growth.
2.B	Explain (using graphs and data as appropriate) the determinants of economic growth.
2.B	Calculate (using graphs and data as appropriate) per capita GDP and economic growth.
1.C	Explain (using graphs as appropriate) how the PPC is related to the long-run aggregate supply (LRAS) curve.

Economic Growth

- **Economic Growth** increases in total real output produced by an economy (real GDP) over time; may also refer to increases in real output (real GDP) per capital (or per person).
 - ▶ Economic growth is an increase in an economy's actual and potential output over time.
 - ▶ Growth is achieved when a country's full employment level of output increases.

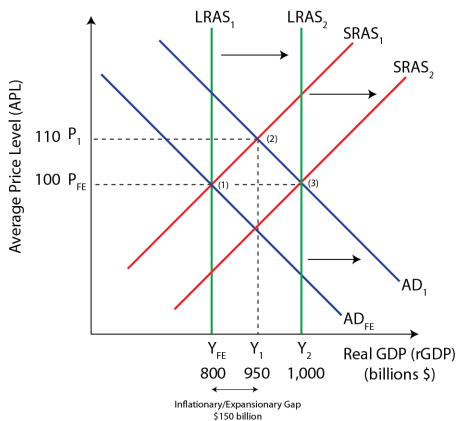
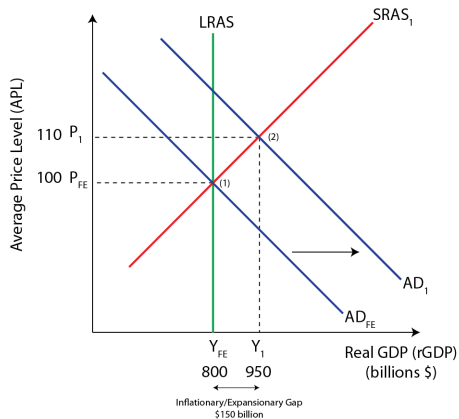
$$\% \Delta \text{Real GDP} = \frac{\text{Final Real GDP} - \text{Initial Real GDP}}{\text{Initial Real GDP}} \times 100$$

$$\% \Delta \text{Real GDP per Capita} = \% \Delta \text{Real GDP} - \% \Delta \text{Population}$$

Economic Growth

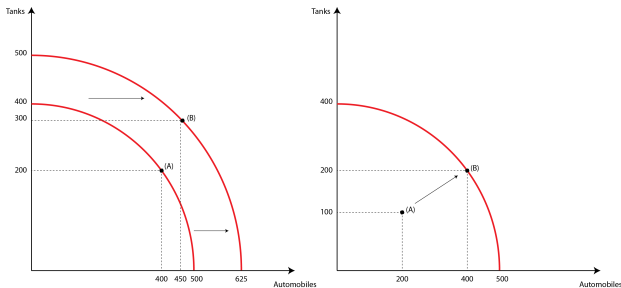
- **Short-term growth** growth of an economy (growth in real output) over relatively short periods of time.
 - ▶ Short-term growth mainly caused by increases in aggregate demand (and to a lesser extent increases in short-run aggregate supply).
 - ▶ Movement of a point inside the production possibilities curve (PPC) to a point closer to the PPC (**actual growth**)
 - ▶ By upturns in the business cycle usually due to increases in aggregate demand
- **Long-term growth** growth of an economy (growth in real output) over long periods of time.
 - ▶ Shown by rightward shifts of the long-run aggregate supply (LRAS) curve corresponding to long-term growth trend of the business cycle
 - ▶ Outward shifts of the production possibilities curve (PPC).

Economic Growth



Economic Growth

- ▶ Actual growth is **short-term growth**, because it can occur over short periods of time and is due to reductions in unemployment or inefficiency in production.
- ▶ Growth in production possibilities is **long-term growth**, because it usually requires long periods of time and is due to increases in quantity or improvements in quality of factors of production.



Long-term Economic Growth

- The factors that lead to long-term economic growth and increases in production possibilities are:
 - ▶ Increases in the quantity of resources (factors of production) or improvements in the quality of resources in the economy.
- The economic theory of an aggregate production function states that a country's rate of economic growth is a function of the allocation of the factors of production, including labour, capital, land, and technology.
 - ▶ According to the aggregate production function, real GDP is a function of the available input in a country including:
 1. **Physical capital:** the machines and tools entities use to produce goods and services.
 2. **Labor:** the amount of human work in the production of goods and services

Long-Term Economic Growth

3. **Human capital:** the level of skills and education of the country's workforce
 4. **Knowledge:** the availability and accessibility of scientific and other know-how
 5. **Social infrastructure:** the regulatory, business, legal, and cultural environment.
 6. **Natural resources:** the availability of raw materials (minerals, forest resources, energy resources, etc.)
- Increase in any of the preceding factors will bolster a country's real GDP and create economic growth' decreases in any of these will cause real GDP to fall.
1. **Productivity** is the amount of output attributable to a single unit of input (labour or capital)
 - **Labour productivity** is the output per worker and is directly related to income. The more productive a country's workers, the higher their real income.

2. **Human capital:** is generally the skills, knowledge, and experience of an individual or the people of a country
- For this reason, investments in human capital can contribute to economic growth and increase in a country's actual and potential output over time.
 - As human capital improves, productivity increases and the total output and income of a population will also rise.
 - Immigration can improve an economy's output by increasing the availability of labor.
 - The difference between economic growth from increases in the quantity of labor and growth from improvements in the quality of human capital is that while both will increase total output over time, only the latter will increase per capital real GDP.
 - Greater productivity will drive up average income while more workers who are no more productive will only increase total income.

Long-Term Economic Growth

- Increased quantities of labour are unlikely to be a source of economic growth over long periods, but improvements in the quality of labour arising from investments in human capital, are among the most important sources of growth.
3. **Physical capital:** investment in physical capital will make the tools, technologies, and machines employed in the production of a country's output more productive and increase the actual and potential output in the economy.
- **Physical capital** is the man-made factors of production employed in the production of other goods and services in the economy.
 - Technological advancements drive economic growth. So, when private firms invest in new and better capital equipment and technology, the potential and actual output of the economy should increase.
 - Increasing the ratio of capital-to-labour in an economy will drive is labour productivity, further fueling economic growth.

Long-Term Economic Growth

- Investments in new technologies increase not just aggregate demand and short-run output through rising expenditures, but aggregate supply and full employment output through increasing the quantity and the quality of an economy's man made factors of production.
- When private sectors investment in capital decreases or capital is allowed to depreciate without being replaced, the rate of economic growth can be expected to slow as the amount of capital or the productivity of capital is allowed to diminish over time.
- A sustained period of low capital investment can trigger a recession as potential output decreases due to diminished capital stock.
- **Research and development (R&D)** refers to the activities undertaken by private firms or by the government to improve existing technologies of products, or that lead to the introduction of new technologies or products.
- R&D may focus improving the means by which goods and services are produced or may investigate introducing new products.

Long-Term Economic Growth

- Development new or better products through R&D can open new markets for firms. When industries succeed in developing new products, it can lead to more employment and output.
- The development of better production methods can increase productivity in already existing industries and drive economic growth.
- Governments also undertake R& D, often in industries that are under-researched by the private sector such as transportation, defence, energy, and healthcare.
- Government-funded research can lead to breakthroughs that contribute to private-sector investment booms.
- There is a positive correlation between the level of private and public sector R&D and the extent of economic growth experienced in a country or region.
- The innovation resulting from R&D increases labor and capital productivity which in turn increases actual and potential output in the economy.

Long-Term Economic Growth

4. **Natural resources:** when thinking about the contribution of natural resources (natural capital) to economic growth, it is useful to make the distinction between **marketable commodities** (commodities bought and sold) and **common pool resources**.
- Marketable commodities can contribute to growth, but are not essential.
 - Common pool resources are crucially important to long-term growth.
 - Long-term economic growth depends critically on the ability of countries to maintain, and if possible improve, environmental quality, and therefore natural capital that includes common pool resources.

Consequences of Economic Growth

- Economic growth impact upon many aspects of the economy, and some of the possible consequences are positive while others are negative.
 1. **Standards of living:** refer to the levels of income, wealth and consumption of goods and services including healthcare and education.
 - A basic assumption of economics is that rising incomes lead to higher standards of living.
 - Important factors that allow economic growth to have a positive impact on standards of living include the following:
 - i. **The distribution of income** – the greater the share of income going to poorer households, the greater the potential for contributing to improvements in living standards as the poorer households are those with the greatest deprivations.
 - ii. **Household spending** – the greater the share of household income spent on goods and services such as food, education and healthcare, the greater the improvements in living standards.

Consequences of Economic Growth

- iii. **The share of income controlled by women** – the greater this is, the stronger the impact.
 - iv. **Government spending on merit goods** – this relates to the share of the government budget allocated to priority areas like education, health care and infrastructure.
 - vi. **Contributions by non-governmental organizations (NGOs)** – because of their poverty orientation and their general effectiveness in reaching the poor, NGOs contribute to increasing the impact of growth on higher standards of livings.
- However, while economic growth offers the potential to achieve improvements in the standards of livings, these improvements do not occur automatically as a result of economic growth, but require appropriate policies to make effective use of the resources growth makes available.
 - Economic growth is a driving factor in economic development, which is the general increase in standards of living over time.

Consequences of Economic Growth

2. **Increased Employment:** total output and employment are directly related because firms need to employ more workers in order to produce more output
 - Economic growth creates more jobs, which in a population that is growing over time is necessary to keep unemployment low and to ensure a typical household can sustain itself through work.
3. **High Income Levels:** per capita GDP measures income of the average resident of a country, a per capita growth is the best measure economists have of increased economic well-being.
 - If real GDP increases faster than a country's population, it will result in an increase in a country's per capita GDP and higher standards of living.

- **Enduring Understanding**

- ▶ The economy fluctuates between periods of expansion and contraction in the short run, but economic growth can occur in the long run.
- ▶ The production possibilities curve (PPC) model is used to demonstrate the full employment level of output and to illustrate changes in full employment.

- **Essential Knowledge**

- ▶ Economic growth can be measured as the growth rate in real GDP per capita over time.
- ▶ Aggregate employment and aggregate output are directly related because firms need to employ more workers in order to produce more output, holding other factors constant. This is captured by the aggregate production function.

Summary (Continued)

- ▶ Output per employed worker is a measure of average labour productivity.
- ▶ Productivity is determined by the level of technology and physical and human capital per worker.
- ▶ The aggregate production function shows that output per capita is positively related to both physical and human capital per capita.
- ▶ An outward shift in the PPC is analogous to a rightward shift of the long-run aggregate supply curve.

Sustainable level of government debt



Assessment Objectives

Specific Expectations

AO2	Define the government budget surplus (deficit) and national debt.
AO2	Explain the issues involved with the burden of the national debt.
AO2	Explain the relationship between a budget deficit and government (national debt).
AO2	Explain that government (national) debt is measured as a percentage of GDP.
AO2	Explain the costs of high government (national debt) on: debt servicing costs, credit ratings, future taxation and government spending.

Government Budget

- A **government budget** is a type of plan of a country's revenues and expenditures over a period of time (usually a year).
 - ▶ A government budget which records the balance of its expenditures and revenues can be in either a surplus or a deficit.
 - ▶ **Budget surplus** is the situation where government tax revenues are greater than government expenditures over a specific period of time (usually a year).
 - ▶ **Budget deficit** is the situation where government tax revenues are less than government expenditures over a specific period of time (usually a year).
 - Governments borrow by issuing bonds, which are form of debt.
 - When the government borrowers to finance a deficit, it issues a certificate called a bond that promises to pay interest at various intervals until a certain date when the money is to be repaid to the bond holder.

Effect of Fiscal Policy

- A government's fiscal policy has a direct and immediate impact on its budget balance.
 - ▶ **Expansionary fiscal policy** when taxes are cut or government spending is increased, move the budget toward deficit.
 - If the budget is in surplus, the surplus will shrink or move to deficit
 - If the budget is already in deficit, the size of the deficit will increase.
 - ▶ **Contractionary fiscal policy** when taxes are increased or spending is cut, move the budget toward surplus.
 - If the budget is in deficit, the deficit will shrink as tax receipts increase and spending is cut.
 - If the budget is already in surplus, the size of the surplus will grow.

Government Debt

- **Government Debt**, also known as **National Debt** refers to the government's accumulation of budget deficits minus budget surpluses.
 - ▶ It is the total amount owed by the government to all creditors (lenders)
 - ▶ It is the amount the government owes the public, including domestic and international lenders (bondholders), from all the borrowing the government has done to finance past budget deficits.
 - ▶ In years when a government has a deficit, its total debt increases.
 - ▶ When the budget is in surplus, the government has the opportunity to reduce its debt by paying back past lenders.
- **Sustainable debt** a level of debt where the borrowing government has enough revenues to meet debt obligations (payment of interest and repayment of borrowed amount) without overdue debt payments, while also allowing economic growth at an acceptable rate.

Measurement of Debt as a share of GDP

- The **Debt-to-GDP ratio**, is the ratio of a country's debt to its gross domestic product (GDP).
 - ▶ Expressed as a percentage, the ratio is used to gauge a country's ability to repay its debt.
 - ▶ Debt-to-GDP ratio compares a country's public debt to its annual economic output.
 - ▶ Once a country's total debt exceeds 100% of its GDP, fiscal policymakers must consider the future costs of further increases in spending or decreases in taxation.
 - ▶ As total debt grows, so to do total debt payments. The interest rate on the debt must increase to attract lenders willing to put their faith in the government's ability to repay its debts as the size of the debt grows relative to its income.

Debt-to-GDP Ratio

- ▶ The following is a table showing the Debt-to-GDP ratios in selected countries.

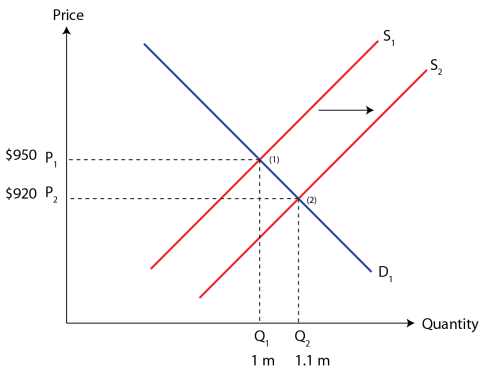
Country	Debt-to-GDP (% 2021)	Credit Rating
Japan	237.54%	A+
Venezuela	214.45%	B-
United States	106.70%	AA+
Canada	83.81%	AAA
China	55.36%	A+
Mexico	54.11%	BBB

Costs of High levels of Debt

- High levels of debt have a number of disadvantages for the economies of debtor countries.
 1. **Debt servicing costs:** refers to the payments that must be made in order to repay the principal (the amount of the loan) plus interest payments.
 - Large debt service payments have major opportunity costs because the government has fewer resources to spend on social services (health, education) and infrastructure.
 - As a government in deficit spends, more bonds must be issued to investors who lent it money.
 - Once the government increases the supply of bonds to finance a growing deficit, the interest rate the government must pay investors rises.
 - As total debt increases, the government, must pay interest on that debt just to maintain confidence among lenders that it is a reliable debtor.

Costs of High levels of Debt

- A government's total interest payments in a year can be roughly estimated by multiplying the total amount of debt by the interest rate expressed as a percentage.
- $\text{Interest payments} = \text{Total debt} \times \text{Interest rate}$



Costs of High levels of Debt

- In addition, the portion of debt that is from external (foreign) lenders must be repaid in foreign exchange (foreign currencies).
- This means the government is forced to use export earnings for debt servicing, resulting in less foreign exchange to pay for imports.
- The forgone imports are an additional opportunity cost with negative consequences for economic growth.

2. **Poor credit ratings:** a credit rating is an assessment of the ability of a borrower to pay back loans, usually carried out by agencies that are qualified to do this (Standard & Poor's, Fitch Ratings, and Moody's).

- A high credit rating received by a government means that it is expected to be able to pay back its loans in full and on time without difficulties.
- A low credit rating means that it is expected that the government may have difficulties servicing its debt.

Costs of High levels of Debt

3. **Impacts on future taxation and government spending:** if a government wants to decrease the size of its debt, it must have budget surpluses rather than budget deficits.
 - In order to achieve budget surpluses, it must either increase taxes, or it must decrease spending. Both of these are politically unpopular.
 - Contractionary fiscal policies result in lower GDP and a high debt-to-GDP ratio.
4. **Increase income inequality:** government debt is likely to increase income inequality.
 - Buyers of government bonds, who are lenders to the government, tend to be higher income people.
 - When government pays them interest, it does so through tax revenues.
 - Therefore, there is a transfer of income away from lower income taxpayers and toward higher income bond holders.

Costs of High levels of Debt

5. **Lower Private Investment:** fears that a government may be unable to service its debts create uncertainty regarding economic conditions and scares away private investors, both domestic and foreign.
 - Even if investment does take place, it is more likely to involve short-term investment projects with quick returns, rather than longer-term ones with greater potential to support economic growth.
6. **Possibility of a debt trap:** As levels of debt rise, there comes a point where the level of debt cannot be sustained.
 - Involves a situation where a country must keep taking out new loans in order to pay back the old ones.
7. **Lower economic growth:** The above factors may work to lower economic growth in countries with high levels of debt, due to lower government spending, increased taxes, reduced investment and fewer imports of capital goods.

- **Enduring Understanding**

- ▶ There are long-run implications of monetary and fiscal policy.

- **Essential Knowledge**

- ▶ The government budget surplus (deficit) is the difference between tax revenues and government purchases plus transfer payments in a given year.
- ▶ A government adds to the national debt when it runs a budget deficit.
- ▶ A government must pay interest on its accumulated debt, thus increasing the national debt and increasingly forgoing using those funds for alternative uses.

Inequality



Assessment Objectives

Specific Expectations

Specific Expectations	
AO2	Explain the relationship between equity and equality
AO2	Explain economic inequality as unequal distribution of income or wealth
AO2	Use the Lorenz curve and Gini Coefficient (index) to measure economic inequality
AO4	Draw Lorenz curve to show the distribution of income and changes in the distribution of income (redistribution)
AO4	Construct a Lorenz curve based on income quintile data

Equity and Equality

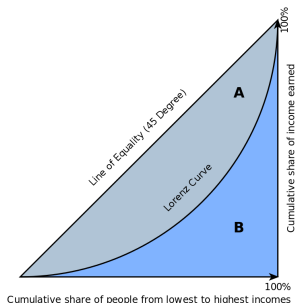
- **Equity** refers to the idea of being fair or just.
 - ▶ Fairness is a normative concept because ideas of what is fair vary according to beliefs, value judgements and ideologies.
 - ▶ Governments face a trade-off between equity and efficiency when intervening in markets.
- **Equality** refers to the state of being equal with respect to something.
 - ▶ Income equality means everyone receives the same income.
 - ▶ Equality is a positive concept because something may be equal or unequal on the basis of some measure.
 - ▶ Equity is interpreted as greater equality (less inequality)

Economic inequality

- **Economic inequality** the degree to which people in a population differ in their ability to satisfy their economic needs.
 - ▶ Economists focus on inequalities that result mainly from differences in income and wealth
 - ▶ **Income inequality** arises from differences in how evenly income is distributed in a population.
 - **Income** is the money received by owners of factors of production.
 - ▶ **Wealth inequality** arises from differences in the amount of wealth people own.
 - **Wealth** refers to the money, assets or things that people own.

Lorenz curve

- **Lorenz curve** a curve illustrating the degree of equality (or inequality) of income (or wealth) distribution in an economy.
 - ▶ It plots the cumulative percentage of income received by cumulative shares of the population.
 - ▶ The closer the Lorenz curve is to the diagonal line of perfect equality, the more equal the income distribution.

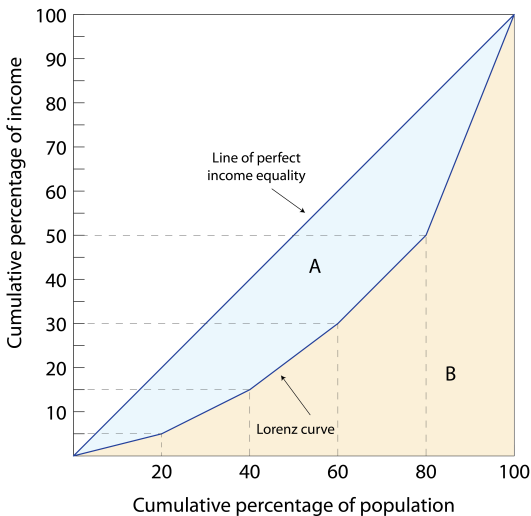


Lorenz Curve: Numerical example

- The data show how income is distributed by quintiles of the population.
 - ▶ **Quintile** is a 20% portion of a country's population.
 - ▶ We can divide the population into five quintiles, ranging from the lowest (the poorest 20% of the population) to the highest (the richest 20%).

Household quintiles	Percentage of total household income earned by each quintile
Lowest 20%	5%
2 nd lowest 20%	10%
3 rd lowest 20%	15%
2 nd highest 20%	20%
Highest 20%	50%

Lorenz Curve: Numerical example



Gini Coefficient

- ▶ **Gini coefficient (Gini index)** is a summary measure of income inequality and the information contained in the **Lorenz curve** of an economy.
 - ▶ Defined as the area between the diagonal and the Lorenz curve, divided by the entire area under the diagonal.

$$\text{Gini Coefficient} = \frac{\text{Area between diagonal and Lorenz curve}}{\text{Entire area under diagonal}} = \frac{A}{A + B}$$

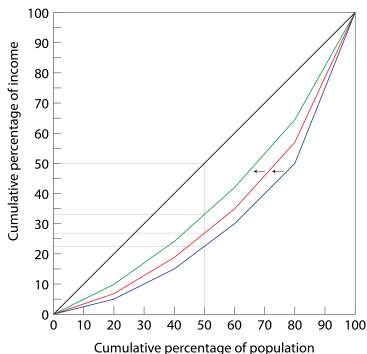
- ▶ The Gini coefficient has a value between 0 and 1.
- ▶ The closer the value is to 0, the greater the income equality.
- ▶ The larger the Gini coefficient, and the closer it is to 1, the greater is the income inequality.

Wealth inequality

- The distribution of wealth is generally far more unequal than the distribution of income in most countries in the world.
 - ▶ Everything for income inequality applies also to wealth inequality.
 - ▶ Limited growth in wages makes it difficult for low-income and middle-income people to save and accumulate wealth.
 - ▶ High-income people tend to consume a smaller fraction of their income than lower-income people therefore have greater possibilities of saving and accumulating wealth.
 - ▶ The greater the income, the more possibilities for accumulating wealth.

Income and wealth redistribution

- Income and wealth may be redistributed to make their distribution more equal.
- ▶ Graphically, this appears as a shift of the Lorenz curve closer to the diagonal line, and is reflected in a lower Gini coefficient.



Poverty



Assessment Objectives

Specific Expectations

AO2	Explain the difference between absolute and relative poverty
AO2	Explain how poverty is measured using single indicators (international poverty lines, minimum income standards) and composite indicators (multidimensional poverty index)
AO2	Explain difficulties in measuring poverty
AO2	Explain causes of economic inequality and poverty including: inequality of opportunity, different levels of resource ownership, different levels of human capital, discrimination, unequal status and power, government tax and benefits policies, globalization, technological change, market-based supply-side policies.
AO3	Evaluate the impact of income and wealth on: economic growth, standards of living, and social stability
AO2	Distinguish between progressive, proportional and regressive taxes.

Assessment Objectives

Specific Expectations

Specific Expectations	
AO2	Distinguish between direct taxes (personal income tax, corporate income tax, wealth) and indirect tax.
AO4	Calculate the amount of indirect tax paid from an amount of expenditure, given the indirect tax rate.
AO4	Calculate total and average tax rates from data provided.
AO2	Explain average and marginal tax rates.
AO3	Evaluate the role of different types of taxes in reducing income and wealth inequalities and poverty.
AO3	Explain and evaluate further policies to reduce income and wealth inequalities and poverty including: investment in human capital, transfer payments, targeted spending on goods and services, universal basic income, policies to reduce discrimination, and minimum wage.

Poverty

- **Poverty** refers to the inability of an individual or family to afford an adequate standard of goods and services.
- **Absolute poverty** refers to a situation where a person or family does not have enough income to meet basic human needs.
 - ▶ It is defined in relation to a nationally or internationally determined **poverty line**, which determines the minimum income that can sustain a family in terms of its basic needs.
- **Relative poverty** is the condition experience by people in a country whose incomes are considerably lower than the higher income groups in the same country.
 - ▶ Compares the income of individuals or households in society with medium incomes.
 - ▶ The more unequal the distribution of income, the greater the degree of relative poverty.

Minimum income standards (MIS)

- **Minimum income standards (MIS)** a method to measure poverty consisting of ongoing research on what people in a population believe are the essentials for a minimum acceptable standard of living that allows people to participate in society.
 - ▶ It is used to create a basket of goods needed to achieve this minimum.
 - ▶ The MIS reveals important information about:
 - The number of people living below the minimum income required to buy the essentials.
 - The relative contribution of each item in the basket to households' abilities to achieve.
 - ▶ This information can be helpful to government as a guide to making policies to deal with poverty.

Multidimensional Poverty Index (MPI)

- **Multidimensional poverty index (MPI)** a composite indicator that measures poverty in three dimensions.
 1. **Health** – measured by child mortality, nutrition
 2. **Education** – measured by years of schooling, school attendance
 3. **Living standards** – measured by cooking fuel, sanitation, drinking water, electricity, assets
 - ▶ Each country receives an MPI value from 0 to 1, where the higher the MPI value the greater the poverty.
 - ▶ In order to be counted as poor, people must be deprived in at least one-third of the indicators listed above.
 - ▶ MPI can be broken down by indicator so that for each country it is possible to determine which indicators make the most contributions to poverty.

Multidimensional Poverty Index (MPI)

- ▶ The world bank is in the process of developing another MPI based on the following indicators:
 - Income per capita
 - Child school enrolment
 - Adult school attainment
 - Limited-standard drinking water
 - Limited-standard sanitation
 - Electricity
 - Coverage of key health services
 - Malnourishment (child and adult)
 - Incidence of crime
 - Incidence of natural disaster

Difficulties in measuring poverty

- The measurement of poverty is a challenging task for several reasons.

1. Measurement problems

- Income measures of poverty do not take wealth or savings into consideration.
- Information provided by households that are surveyed is subjective
- Surveys do not include homeless people and people in institutions, resulting in underestimates of the extent of poverty.
- Urban areas have a higher cost of living, so national poverty lines often exclude poor in urban areas who cannot afford necessities.
- Underestimation results in a smaller proportion of a population with an income below the poverty line.

Causes of economic inequality and poverty

- Economic inequality and poverty have similar overlapping causes.
 1. **Inequality of opportunity** – is concerned with inequalities in potential outcomes in standards of living that arise from circumstances that are one's control.
 - Parents' level of education and occupation
 - Parents' level of income
 - Place of birth
 - Gender
 - Race and ethnicity
 2. **Different levels of human capital** – human capital refers to the skills, education and good health that people possess.
 - Low levels of education and skills translate into low incomes because there is generally a positive (direct) relationship between skill/educational attainment and income levels.

Causes of economic inequality and poverty

3. **Different levels of resource ownership** – some people inherit, or accumulate through savings from high incomes, financial capital or other forms of property, which gives them an income advantage as well as increased wealth.
4. **Discrimination** – some social groups (racial and ethnic groups, women) often face discrimination in the job market, with the result that they may receive lower wages than others for the same work, or may find greater difficulty finding work.
5. **Unequal status and power** – status refers to one's social or professional position within society.
 - People in positions of power may influence government policies favouring their interests and protecting their income and wealth, rather than policies that favour redistribution.

Causes of economic inequality and poverty

6. **Government tax and benefits policies** – people on low income rely heavily on transfer payments, social services, and merit goods (health care, education, housing) provided by or subsidized by government.

- Government tax policies play an important role in determining income and wealth distribution.

7. **Technological change** – increased automation has replaced human labour

- Wages of low skilled labour whose jobs are being eliminated do not rise much.
- New technologies have created demand for higher-level skills, meaning that wages of such workers rise faster than low-skill workers.
- Technological change leads to the replacement of labour by capital and increases incomes for owners of capital.

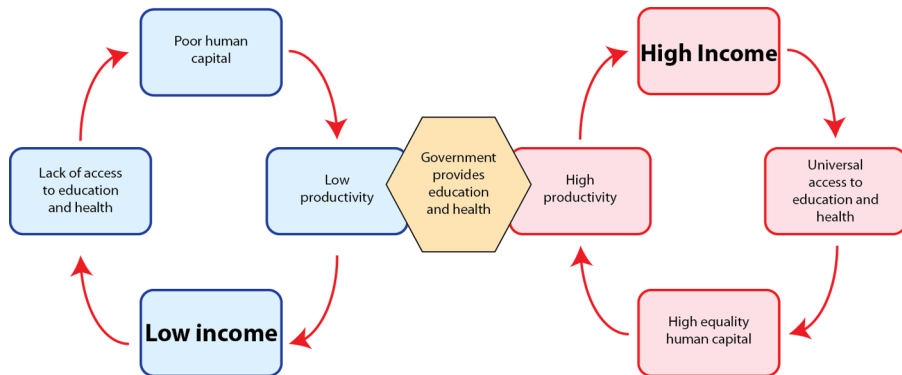
Causes of economic inequality and poverty

8. **Globalization** – refers to economic integration on a global scale, involving increasing interconnectedness throughout the world (trade, finance, investment, people, technology, ideas, knowledge).
 - Foreign direct investment (FDI) by multinational corporations (MNCs) tends to involve greater demand for skilled rather than unskilled workers, increasing the income difference between the two.
 - Developed economies offshore jobs (relocating to other countries with lower labour costs) resulting in lower domestic demand for certain skills.
9. **Market-based supply-side policies** – policies such as discouraging trade unions and reduction of minimum wage have been found to increase inequalities.
10. **High abnormal profits of firm with market power** – some large firms with market power make supernormal profits which transfer income and wealth away from consumers who have to pay higher prices and toward the owners of the firms.

Causes of economic inequality and poverty

11. **Increases in pay of certain occupations** – certain occupations, in particular executives and professionals have benefits from significant increases in pay.
12. **Unemployment** – An unemployed individual receives no income, but may receive some unemployment benefits which tend to be low relative to the income received from work and provided for limited periods.
13. **Geography** – some people live in remote, isolated geographical regions, with limited possibilities for employment.
14. **Age** – older people may receive pensions that are barely enough to cover minimum needs or they may receive no pension at all.

Causes of economic inequality and poverty



Impact on income and wealth inequality

- Income and wealth inequality negatively impacts social outcomes.

1. **Economic growth** – high levels of inequality has a negative impact on economic growth.

- Greater income inequality reduces the ability of lower income households to invest in human and physical capital.
- Countries with higher levels of income inequality have higher levels of inequality of opportunity in education which leads to intergenerational transmission.
- Wealthy spend a lower fraction of their incomes than lower income groups.
- Concentration of income and wealth results in political control and the ability of powerful groups to influence government policies for their own benefits.
- Poor may be unable to access credit, because they have no collateral, meaning fewer investments for people on lower incomes.

Impact on income and wealth inequality

- A more equal distribution of income leads to greater income and economic stability.
2. **Low living standards** – are associated with greater levels of stress, substance abuse, poor levels of health, all leading to poorer job and income-earning prospects.
- Lack of access to healthcare and education leads to lower human capital, lower productivity, and lower incomes.
 - The inability to access needed health services leads to higher infant, child and maternal mortality.
 - Higher crime rates, drug use, family breakdowns and homelessness.

Policies to reduce income and wealth inequalities

- One of the most important instruments for income and wealth redistribution is taxation.
 - ▶ Taxes are the most important source of government revenues and provide funds for public goods, transfer payments, merit goods, and many more.
 - ▶ **Direct tax** are taxes paid directly to the government tax authorities by the taxpayer.
 - **Personal income tax (PIT)** are taxes paid by households or individuals on all forms of income including wages, rental income, interest income, and dividends (income from ownership of shares in a company).
 - **Corporate income tax (CIT)** are taxes on the profits of corporations, which are businesses (firms) that have formed a legally body called a “corporation” that is legally separate from its owners.
 - **Wealth taxes** are taxes on ownership of wealth, most commonly property taxes, based on the value of property owned, and inheritance taxes, based on the value of the property inherited.

Policies to reduce income and wealth inequalities

- ▶ **Indirect tax** are taxes levied on spending to buy goods and services. They are paid to the government authorities by suppliers (firms).
 - All indirect taxes are regressive and are inconsistent with the objective of a more equal distribution of income.
 - **Sales tax (General expenditures tax)** are taxes on the spending or sales of goods and services. They are typically a fixed percentage of the retail price of goods and services.
 - “Value added tax” (VAT) differs from sales tax in that it is a tax paid on the value added by each producer in the production process.
 - **Excise taxes** are taxes paid on specific goods and services, such as cigarettes and gasoline.
 - **Tariffs (Customs duties)** are a type of tax applied on imports of foreign goods into a country.

Proportional, progressive, and regressive taxation

- Taxes can be classified as being proportional, progressive, or regressive according to the relationship between income and the fraction of income paid as tax.
 - **Proportional taxation** as income increases, the fraction of income paid as taxes remains constant; there is a constant tax rate.
 - **Progressive taxation** as income increases, the fraction of income paid as taxes increases, there is an increasing tax rate.
 - The more progressive a tax system, the more equal is the after-tax distribution of income compared to the pre-tax distribution of income.
 - **Regressive taxation** as income increases, the fraction of income paid as taxes decreases, there is a decreasing tax rate.
 - Regressive tax systems tend to make the distribution of income less equal.

Other policies to reduce income and wealth inequalities

- There are numerous further redistribution policies that governments can use to address economic inequalities and poverty.
 1. **Investment in human capital** – investment by government in human capital to ensure universal access to education and healthcare.
 - Inequality of opportunity is a major factor leading to income and wealth inequality.
 2. **Transfer payments** are payments made by the government to individuals specifically for the purpose of redistributing income, thus transferring income from those who work and pay taxes towards those that cannot work and need assistance.
 - Groups receiving transfer payments may include “vulnerable groups” such as: older people, sick people, very poor people, children of poor families, unemployed people.

Other policies to reduce income and wealth inequalities

3. **Targeted government spending on goods and services** – governments spend to provide **merit goods**, which are goods that are beneficial for consumers, often with positive consumption externalities, that are underprovided by the market and underconsumed.
 - In the absence of government intervention, two of the most important merit goods that would be underconsumed due to low incomes and poverty would be education and healthcare.
 - Governments may offer subsidize or free education and health care services.
4. **Universal basic income (UBI)** – a method intended to provide everyone in a country with a sum of money that they would receive regardless of any other income they may have; its purpose is to reduce income inequalities and poverty.
 - Financing would come partly from a tax and possibly too from savings from cutting other social service programmes.

Other policies to reduce income and wealth inequalities

5. **Policies to reduce discrimination** – most countries have legislation that forbids discrimination in the workplace. Governments must also ensure that employers are informed about laws on discrimination.
6. **Government intervention in markets** – price controls affect the distribution of income.
 - **Minimum wage legislation**, which sets a legal minimum wage, raises the lowest permissible wage above the equilibrium market level, thereby raising the wage of low-income (usually unskilled) workers.
 - **Food price ceiling** set a maximum for certain food products (prices below the market-determined equilibrium price), making food more affordable.
 - **Rent controls** set maximum rents to support low income people.
 - Price floors for farmers that set legal minimum prices for certain agriculture products, raising their prices above the equilibrium market price in order to support farmers' incomes.

Demand Management and Monetary Policy



Assessment Objectives

Specific Expectations

AO1	Outline the basic principles of demand-side and supply-side policies
AO2	Explain the goals of monetary policy: low and stable rate of inflation including inflation targeting, low unemployment, reduction of business cycle fluctuations, promotion of a stable economic environment for long-term growth, external balance.
AO2	Explain how equilibrium interest rates are determined.
AO4	Draw a diagram to show determination of equilibrium interest rates
AO2	Explain how commercial banks create money
AO2	Explain the tools of monetary policy: open market operations, minimum reserve requirements, changes in central bank minimum lending rate, quantitative easing.

Assessment Objectives

Specific Expectations

A02	Distinguish between real and nominal interest rates and calculate real interest rates from data
A03	Explain and evaluate expansionary and contractionary monetary policies to close inflationary and deflationary/recessionary gaps
A04	Draw AD/AS diagrams to show expansionary and contractionary monetary policy
A03	Discuss constraints on monetary policy including the limited scope of reducing interest rates when these are approaching zero, and consequences of low consumer/business confidence
A03	Discuss strengths of monetary policy including that it is incremental, flexible, easily reversible and has short time lags
A03	Evaluate monetary policy with respect to promoting low unemployment, low and stable rate of inflation and growth

Demand-side Policies

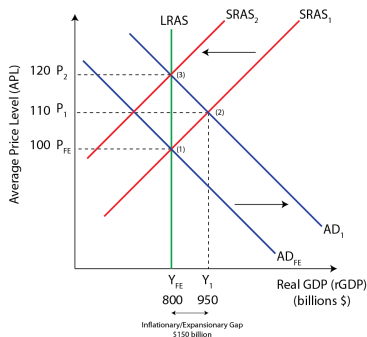
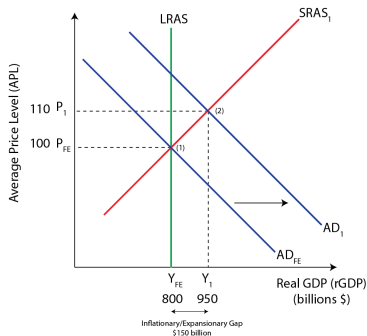
- **Demand-side Policies:** policies that attempt to change aggregate demand in order to achieve the goals of price stability, full employment and economic growth and minimize the severity of the business cycle.
 - ▶ A combination of fiscal and monetary policies may be used to restore full employment when the economy is in a recessionary/deflationary or expansionary/inflationary gap.
 - ▶ **Contractionary fiscal policy** refers to fiscal policy usually pursued in an inflationary period, involving a decrease in government spending or an increase in taxes (or both).
 - ▶ **Contractionary monetary policy** refers to monetary policy usually pursued in an inflationary period, involving an increase in interest rates, intended to lower investment and consumption spending.

Demand-side Policies

- ▶ **Expansionary fiscal policy** refers to fiscal policy pursued in a recession, involving an increase in government spending or a decrease in taxes (or both).
- ▶ **Expansionary monetary policy** refers to monetary policy usually pursued in a recession, involving a decrease in interest rates, intended to increase investment and consumption spending.
- ▶ If a government or central bank undertakes expansionary fiscal or monetary policy in an economy that was already producing at its full employment level of real output, there would be a short-run boost in output, employment, and the price level.
 - Following fiscal and monetary stimulus, the economy is producing beyond its full employment level of output.
 - However, in the long-run any economy's output is constrained by its available factors of production.

Demand-side Policies

- ▶ In the economy illustrated, land, labor and capital are overemployed where the demand for resources exceeds their supply, which in the long-run will drive up wages and other resource costs.
- ▶ As wages and other costs increase, firms will reduce output and further raise prices, causing output to return to its full employment level.



Demand-side Policies: Summary

- Demand-side policies are effective at closing output gaps, but not at achieving long-run economic growth.
 - ▶ Changes in aggregate demand alone will not impact the economy's potential output or its level of long-run aggregate supply. However, changes in aggregate demand (AD) impact equilibrium output and the price level.
 - ▶ In the long-run an economy will always return to its full employment level of output regardless of the demand-side policies of the government or central bank.
 - ▶ Changes in an economy's long-run output are made through the factors that create economic growth such as improving the quality &/or quality of the factors of production.

Supply-Side Policies

- **Supply-side policies** are a variety of policies focused on aggregate supply, namely factors aiming to shift the long-run aggregate supply curve (LRAS) to the right, in order to achieve long-term growth.
 - ▶ They do not attempt to stabilize the economy (to reduce the severity of the business cycle).
 - ▶ Supply-side policies increase productivity and reduce production costs, shifting SRAS and LRAS outward, increasing actual and potential output.
 - ▶ There are two major categories of supply-side policies: **market-based** and **interventionist**.
 1. **Market-based supply-side policies** are intended to reduce government intervention thereby allowing the free market to increase efficiency and improve incentives.
 2. **Interventionist supply-side policies** are government led attempts to increase the productive capacity of the country.

Monetary Policy: Central Banks

- **Monetary policy** is a central bank's manipulation of the money supply and nominal interest rates.
 - ▶ The central bank must be distinguished from commercial banks.
 - ▶ **Commercial banks** are financial institutions (which may be private or public) whose main functions are to hold deposits for their customers (consumers and firms), to make loans to their customers, to transfer funds between banks, and to buy government bonds.
 - ▶ Central banks implement monetary policy to achieve the macroeconomic objectives such as price stability, full employment, and economic growth.
 - ▶ A central bank is the institution in most modern market economies that controls the overall supply of money in a nation's economy.
 - ▶ Most central banks act independently of the nation's government and are thus, in theory, insulated from political agendas and influences.

Monetary Policy: Central Banks

- ▶ Most central banks act independently of the nation's government and are thus, in theory, insulated from political agendas and influences.
 - The Federal Reserve System, the “Fed”
 - The Bank of England (U.K.)
 - The People's Bank of China (China)
 - The Bank of Japan (Japan)
 - The European Central Bank (Eurozone)
 - The Bank of Canada
- ▶ The central bank is usually a government financial institution with several important responsibilities:
 1. **Banker to the government:** it holds the government's cash, receives payments for the government and makes payments for the government, and manages the government's borrowing by selling bonds to commercial banks and the public.

Monetary Policy: Central Banks

2. **Bank to commercial banks:** the central bank also acts as a banker to commercial banks by holding deposits for them and can also make loans to them in times of need
3. **Regulator of commercial banks:** the central bank regulates and supervises commercial banks, making sure they operate with appropriate levels of cash, according to rules that ensure the safety of the financial system
4. **Conduct monetary policy:** the central bank is responsible for monetary policy, based on its control of the supply of money and interest rates

Monetary Policy: Goals

- Monetary policy attempts to achieve the following goals:
 1. **Low and stable rate of inflation:** monetary policy attempts to achieve a low and stable rate inflation, which varies from country to country but is often around 2 – 3%.
 2. **Low unemployment:** monetary policy may try to maintain unemployment rate at relatively low levels.
 - The type of unemployment involved here is cyclical unemployment, arising from a deflationary gap due to insufficient aggregate demand.
 3. **Reduce business cycle fluctuations:** monetary policy tries to make fluctuations of the business cycle as small as possible.
 - Fluctuations around potential output are disruptive to the normal functioning of the economy, causing inflation when output is above potential output, and cyclical unemployment when it is below potential output.

Monetary Policy: Goals

4. **Promote a stable economic environment for long-term growth:** monetary policy helps create the macroeconomic environment that encourages activities impacting long-term economic growth.
5. **External balance:** external balance refers to a situation where a country's revenues from exports are balanced by spending on imports over an extended period of time.
 - This is partly the result of the value of the country's currency, or its exchange rate.
 - The central bank can influence exchange rates because of the close relationship between interest rates and exchange rates.

Monetary Policy: Inflation Targeting

- **Inflation targeting** a type of monetary policy carried out by some central banks that focuses on achieving a particular inflation target, rather than focusing on the goals of low and stable inflation and low unemployment.
 - ▶ More and more countries around the world are using monetary policy that aims at maintaining a particular targeted rate of inflation.
 - ▶ Many countries pursuing inflation targeting have targets between 1.5% and 2.5% with one percentage point above and below as a “tolerance” margin.
 - ▶ Inflation targeting is usually based on forecasts and predictions of future inflation based on CPI.
 - ▶ Inflation targeting offers a number of advantages including:
 - Achievement of a low and stable rate of inflation

Monetary Policy: Inflation Targeting

- Improved ability of economic decision-makers (firms, consumers) to anticipate the future rate of inflation and therefore plan their economic activities
 - Greater co-ordination between monetary and fiscal policy since knowledge about inflation targets allows the government to plan its fiscal policy to complement the central bank's monetary policy.
- Disadvantages of inflation targeting include:
- Reduced ability of the central bank to pursue other macroeconomic objectives, particularly the goal of full employment due to short-run trade-offs
 - Reduced ability of the central bank to respond to supply-side shocks; in the event of a supply-side shock, the central bank may need flexibility to pursue expansionary monetary policy to bring the economy out of a recession.
 - An inflation target that is too low may lead to higher unemployment; if it is too high, it could lead to problems resulting from high inflation.

Monetary Policy: Tools

- By increasing or decreasing the money supply, a central bank can cause interest rates to change, which can then influence the level of aggregate expenditures in the economy.
 - ▶ A central bank has four tools for increasing or decreasing the supply of money in an economy:
 1. **Open market operations:** a tool of monetary policy whereby the central bank buys and sells bonds to commercial banks in order to influence the money supply and interest rate.
 - Every commercial bank will invest some of its depositors money in illiquid government bonds.
 - If a central bank wishes to increase the supply of money in the economy, it can buy bonds from commercial banks.
 - If the goal is to reduce the money supply, a central bank can sell bonds to commercial banks, which results in less money in circulation and more illiquid government bonds on banks' balance sheets

Monetary Policy: Tools

2. **Changing the required reserve ratio (RRR):** the required reserve ratio is the percentage of a bank's total deposits it is required to keep in reserve.
 - By reducing the RRR, a central bank immediately increases commercial banks' excess reserves, which frees up money for new loans.
 - By increasing the RRR, a central bank immediately reduces the amount of excess reserves in the banking system and commercial banks must raise interest rates to meet the higher reserve requirement
3. **Changing the discount rate:** The discount rate is the interest rate the central bank charges commercial banks for short-term loans
 - If the rate is lowered, banks will be more willing to make loans to private borrowers and interest rates will fall.
 - If the discount rate is increased, banks will be less willing to loan to private borrowers and interest rates will increase.

Monetary Policy: Tools

4. **Quantitative easing:** a tool used by central banks to increase the money supply in the economy and facilitate commercial bank lending as part of expansionary monetary policy.
 - It involves the buying of bonds by the central bank on a large scale.

Monetary Policy: Open Market Operations

- **Open market operations:** refer to a central bank's buying and selling of bonds in the bond market and are the most commonly employed monetary policy tool.
 - ▶ Open market operations can be employed as either an expansionary monetary policy (one that increase the money supply and reduces interest rates) or as a contractionary monetary policy (one that reduces the money supply and increases interest rates).
 - ▶ In order to reduce interest rates, a central bank will buy bonds from commercial banks and the public.
 - An open market purchase of government bonds will cause the money supply to increase by a magnitude determined by the money multiplier.
 - ▶ To raise interest rates, the central bank must reduce the money supply.
 - To decrease the money supply, the central bank must sell bonds on the open market.

Monetary Policy: Open Market Operations

- There is an inverse relationship between bond prices and bond yields
 - As the central bank sells bonds, their prices fall and commercial banks are attracted to them
 - To buy higher-yield bonds, banks will take some of their customers' deposits and rather than make loans, will buy government bonds instead.
- ▶ The effect of an open market purchase or sale of government bonds by the central bank on the money supply is greater than the effect on the monetary base because of the money multiplier.

Open Market Operations: Example 1

Example: Assume the reserve requirement is 20% and the central bank seeks to reduce interest rates by increasing the money supply by \$10 billion.

- ▶ Money Multiplier = $1/RRR = 1/0.2 = 5$
- ▶ If the central bank wishes to increase the money supply by \$10 billion, it must purchase \$2 billion in government bonds from the public.
- ▶ $\Delta \text{Money Supply} = \Delta \text{Excess Reserves} \times \text{Money Multiplier} = \10 billion
- ▶ A \$2 billion purchase of government bonds by the central bank will increase the money supply by \$10 billion
- ▶ Banks will loan out the initial \$2 billion increase in their excess reserves
- ▶ This will create new deposits and new loans across the banking system.

Open Market Operations: Example 2

Example: Assume the central bank seeks to reduce the money supply by \$15 billion and the reserve requirement is 0.2

- ▶ Money Multiplier = $1/RRR = 1/0.2 = 5$
- ▶ Needed sale of bonds = $\Delta \text{ Money Supply} / \text{Money Multiplier} = -\3
- ▶ To reduce the money supply by \$15 billion, the central bank must sell \$3 billion of government bonds on the open market (reducing banks' reserves by \$ billion).

Target Interest Rates

- Most modern central banks target an interest rate that commercial banks charge one another for short-term loans.
 - ▶ Called the **interbank overnight lending rate** in some countries and the **federal funds rate** in the U.S.
 - ▶ Commercial banks continually borrow money from one another to meet their reserve requirements.
 - At the end of each business day, some banks will have made new loans that have resulted in their actual reserves falling below their required reserves, while others may have excess reserves that they were not able to loan out against.
 - To cover shortfalls, banks will borrow “overnight” from others that have excess reserves.
 - The interest rate banks charge one another for these short-term loans is known as the **federal funds rate**, and the central bank can manipulate this nominal interest rate through its open market operations, which in turn will affect investment and consumption

Target Interest Rates

- An open market bond purchase by the central bank will increase the overall reserves in the banking system and lead commercial banks to lower the rate they charge one another for short-term loans, and thus lower the rates they charge customers looking to borrow to finance investment and consumption.
- A bond sale by the central bank will reduce bank reserves and lead banks to charge one another higher nominal interest rates for their now limited reserves, driving up the market interest rate charged to borrowers.
- Through their interventions in the bond markets, central banks thus target a nominal interest rate between commercial banks, which in turn affects the commercial rates charged to households and businesses, affecting the level of aggregate expenditures in the economy.

Monetary Policy: Overview

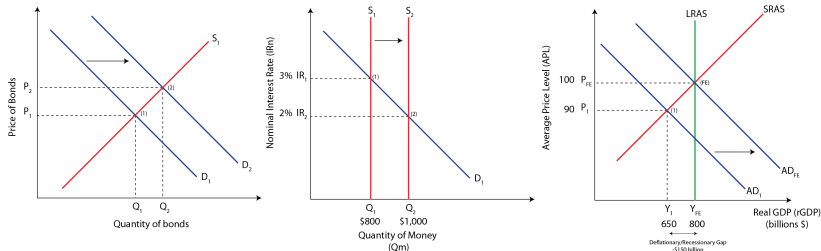
- Monetary policy is carried out by the central bank, which aims at changing interest rates to influence the investment (I) and consumption (C) components of aggregate demand.
 - ▶ In a deflationary (recessionary) gap, the central bank may pursue expansionary (easy/loose) monetary policy through lowering interest rates to encourage investment (I) and consumption (C) spending.
 - The objective being to shift the aggregate demand (AD) curve right leading to equilibrium at the full employment level of real GDP (potential GDP).
 - ▶ In an inflationary (expansionary) gap, the central bank can pursue a contractionary (tight) monetary policy through higher interest rates aimed at discouraging investment (I) and consumption (C) spending.
 - The objective being to shift the aggregate demand (AD) curve left leading to equilibrium at the full employment level of real GDP (potential GDP).

Expansionary (Easy/Loose) Monetary Policy

- ▶ Suppose the economy is experiencing a deflationary (recessionary) gap due to insufficient aggregate demand.
 - The central bank may increase the money supply causing a rightward shift in the supply of money curve from S_1 to S_2 .
 - With the demand for money constant, the interest rate drops from IR_1 to IR_2 .
 - The drop in interest rates means a lower cost of borrowing; therefore consumers and firms are likely to borrow more and spend more, so consumption spending (C) and investment spending (I) increase.
 - The effect is to increase aggregate demand and cause a rightward shift of the AD curve.

Expansionary (Easy/Loose) Monetary Policy

- The recessionary gap has been closed through the shift from AD_1 to AD_{FE} .



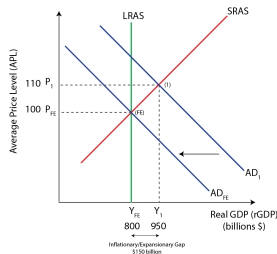
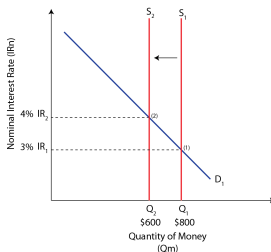
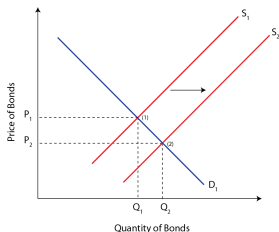
- Both the monetarist/new classical and the Keynesian models predict that an increase in AD increases real GDP.
- However, the size of the increase in real GDP will not be the same. It will be smaller in the monetarist/new classical model than in the Keynesian one, because of the upward-sloping SRAS curve.

Contractionary (Tight) Monetary Policy

- ▶ Suppose that the economy is experiencing an inflationary (expansionary) gap caused by excess aggregate demand.
 - The central bank may reduce the money supply causing a leftward shift in the supply of money curve from S_1 to S_2 .
 - With the demand for money constant, the interest rate increases from IR_1 to IR_2 .
 - The increase in interest rates means a higher cost of borrowing; therefore consumers and firms are likely to borrow less and spend less, so consumption spending (C) and investment spending (I) decrease.
 - The effect is to decrease aggregate demand and cause a leftward shift of the AD curve.
 - The inflationary gap has been closed through the shift from AD_1 to AD_{FE} .

Contractionary (Tight) Monetary Policy

- The effects of a fall in aggregate demand may be different depending on the model considered.
- If AD fall within the upward-sloping part of the SRAS curve in the Keynesian model the effects on the price level and real GDP are similar in the two models.
- But if AD were to decrease into the horizontal part of the SRAS curve, there would be a larger fall in real GDP and a smaller fall in the price level in the Keynesian model, compared with the monetarist/new classical model.



Evaluating Monetary Policy: Constraints

- Monetary policy is intended to achieve particular objectives, but it does not always work as expected. Constraints on monetary policy include:
 1. **Possible ineffectiveness in recession.** Whereas monetary policy can work effectively when it raises interest rates to fight inflation, it is less certain to be as effective in a deep recession, because:
 - i. **Interest rates cannot fall when approaching zero.** As interest rates approach zero, they cannot fall further to encourage spending by firms and consumers.
 - ii. **Low consumer and producer confidence.** If firms and consumers are pessimistic about future economic conditions, they may avoid taking out new loans, and may even reduce their investment and consumer spending, so that aggregate demand will not increase.
 - ii **Banks may be fearful of lending.** In a severe recession, banks may be unwilling to increase their lending, because they may fear that borrowers might be unable to repay the loans

Evaluating Monetary Policy: Constraints

2. **Conflict between government objectives.** Manipulation of interest rates affects not only variables in the domestic economy (consumption, investment spending, inflation, unemployment) but also variables in the foreign sector of the economy, such as exchange rates
 - The pursuit of domestic objectives may conflict with the pursuit of the goal of external balance in the foreign sector.
3. **May be inflationary.** If it lasts too long it may be inflationary, if aggregate demand increases beyond what is necessary to eliminate a deflationary (recessionary) gap.
4. **Problematic when dealing with stagflation or cost-push inflation.** Monetary policy is a demand-side policy, and is therefore unable to deal effectively with supply-side causes of instability.

Evaluating Monetary Policy: Strengths

- Strengths of monetary policy include:
 1. **Interest rate changes can be incremental.** Interest rates can be adjusted in very small steps, making monetary policy well suited to “fine tuning” of the economy.
 2. **Interest rate changes are reversible.** Interest rate changes can also be easily reversed if necessary.
 3. **Monetary policy is flexible.** Interest rates can be changed often according to needs.
 4. **Relatively short time lags (time delays.** While monetary policy can be implemented relatively quickly, it is subject to time lags as it takes time for interest rate changes to affect the economy, through though these are not as long as in the case of fiscal policy.

Evaluating Monetary Policy: Strengths

5. **Central bank intervention.** Independence from the government means the central bank can take decisions that are in the best longer-term interests of the economy, and therefore pursue policies that may be politically unpopular (such as higher interest rates making borrowing more costly).
6. **Limited political constraints.** Monetary policy does not face political pressures as fiscal policy does, since it does not involve making changes in the government budget.
7. **No budget deficits or debt.** Monetary policy does not lead to budget deficits or increased levels of debt as fiscal policy does in the case of expansionary policy.
8. **No crowding out.** Monetary policy does not lead to crowding out, which may be a weakness of expansionary fiscal policy.

- **Enduring Understanding**

- ▶ Fiscal and monetary policy have short-run effects on macroeconomic outcomes.

- **Essential Knowledge**

- ▶ A combination of expansionary or contractionary fiscal and monetary policies may be used to restore full employment when the economy is in a negative (i.e., recessionary) or positive (i.e., inflationary) output gap.
- ▶ A combination of fiscal and monetary policies can influence aggregate demand, real output, the price level, and interest rates.
- ▶ Central banks implement monetary policies to achieve macroeconomic goals, such as price stability.
- ▶ The tools of monetary policy include open-market operations, the required reserve ratio, and the discount rate. The most frequently used monetary policy tool is open-market operations.

Summary

- ▶ When the central bank conducts an open-market purchase (sale), reserves increase (decrease), thereby increasing (decreasing) the monetary base.
- ▶ When the central bank conducts an open-market purchase (sale), reserves increase (decrease), thereby increasing (decreasing) the monetary base.
- ▶ The effect of an open-market purchase (sale) on the money supply is greater than the effect on the monetary base because of the money multiplier.
- ▶ Many central banks carry out policy to hit a target range for an overnight interbank lending rate. (In the United States, this is the federal funds rate.)
- ▶ Central banks can influence the nominal interest rate in the short run by changing the money supply, which in turn will affect investment and consumption.

Summary

- ▶ Expansionary or contractionary monetary policies are used to restore full employment when the economy is in a negative (i.e., recessionary) or positive (i.e., inflationary) output gap.
- ▶ Monetary policy can influence aggregate demand, real output, the price level, and interest rates.
- ▶ A money market model and/or the AD–AS model are used to demonstrate the short-run effects of monetary policy.
- ▶ In reality, there are lags to monetary policy caused by the time it takes to recognize a problem in the economy and the time it takes the economy to adjust to the policy action.

Fiscal Policy



Assessment Objectives

Specific Expectations	
1.A	Define fiscal policy and related terms.
1.A	Explain (using graphs as appropriate) the short-run effects of a fiscal policy action.
1.A	Calculate the short-run effects of a fiscal policy action.
1.B	Define why there are lags to discretionary fiscal policy.
3.C	Define crowding out.
3.C	Explain (using graphs as appropriate) how fiscal policy may cause crowding out.
1.C	Define automatic stabilizers.
1.C	Explain how automatic stabilizers moderate business cycles.
2.B	Define the expenditure multiplier, the tax multiplier, the marginal propensity to consume, and the marginal propensity to save.

Assessment Objectives

Specific Expectations	
2.B	Explain how changes in spending and taxes lead to changes in real GDP.
2.B	Calculate how changes in spending and taxes lead to changes in real GDP.

Demand-side Policies

- **Demand-side Policies (Demand Management):** policies that attempt to change aggregate demand in order to achieve the goals of price stability, full employment and economic growth, and minimize the severity of the business cycle.
 - ▶ There are two types of demand-side policies:
 1. Monetary policy
 2. Fiscal policy
 - ▶ Monetary and fiscal policies attempt to reduce the short-term fluctuations of the business cycle
 - ▶ In the event of an inflationary (expansionary) or deflationary (recessionary) gap, they try to bring aggregate demand to the full employment level of real GDP, or potential GDP.
 - ▶ They can also impact on economic growth by contributing to increases in potential GDP

Sources of government revenue

- Government revenue consists of all the funds that flow toward the government from outsiders.
 1. **Taxes of all types** – both direct and indirect. Taxes are the most important source of government revenues.
 2. **From the sale of goods and services** – there are many services for which the users must make a payment, including transportation, electricity, water and many more.
 - The revenues from these sales usually go toward covering the government's costs of providing them.
 3. **Sale of government-owned (state-owned) assets, or property** – such sales are known as privatization, which involves the transfer of ownership from the government to private owners.

- **Fiscal policy:** manipulations by the government of its own expenditures and taxes in order to influence the level of aggregate demand
 - ▶ The goals of fiscal policy are the same as the goals of monetary policy, except that fiscal policy also has the goal of achieving equitable distribution of income.
- 1. **Low and stable rate of inflation:** fiscal policy tries to maintain a slow and stable rate of inflation by manipulating taxes and government spending to influence aggregate demand
- 2. **Low unemployment:** fiscal policy similarly may try to influence the aggregate demand and therefore unemployment
- 3. **Reduce business cycle fluctuations:** fiscal policy tries to reduce the size of the fluctuations of the business cycle to make inflationary and deflationary gaps as small as possible

4. **Promote a stable economic environment for long-term growth:** firms in particular need a stable economic environment in order to promote business confidence so that firms can carry-out activities needed for long-term economic growth.
5. **External balance:** fiscal policy can help achieve external balance (where a country's revenues from exports are roughly equal to its spending on imports) by influencing the level of imports through its effects of aggregate demand.
6. **Equitable distribution of income:** fiscal policy has major effects on the distribution of income by determining tax policies and government spending to produce and provide particular goods and services.

Role of Fiscal Policy: Demand Management

- Fiscal policy involves manipulations by the government of its own spending and taxes to influence aggregate demand.
 - ▶ $AD = C + I + G + (X - M)$
 - ▶ Fiscal policy can affect three of these components:
 1. **Level of government's own spending, G**
 2. **Level of consumption spending, C** can be influenced if the government changes taxes on consumers (personal income taxes), changing their level of disposable income (consumer income after income taxes have been paid)
 3. **Level of investment spending, I** : can be influenced if the government changes taxes on business profits.

Fiscal Policy: Tools

- The tools of fiscal policy are government purchases, transfers, and taxes.
 1. **Government purchases:** includes all public-sector expenditures on goods and services including **current** and **capital** expenditures
 - Infrastructure, schools and universities, national defense, healthcare services and hospitals, national parks, and fire and police protection
 2. **Transfers payments:** transfer income from one group in the country to another and thus do not count as government purchases
 - An increase in transfers, will increase AD as recipients of the transfers will use the income to increase their own consumption or investment
 - Social security payments, unemployment insurance, welfare spending, college financial aid, and producer subsidies
 3. **Taxes:** come in many form including direct taxes, such as the income tax and indirect taxes, such as sales and excise taxes.

Fiscal Policy: Tools

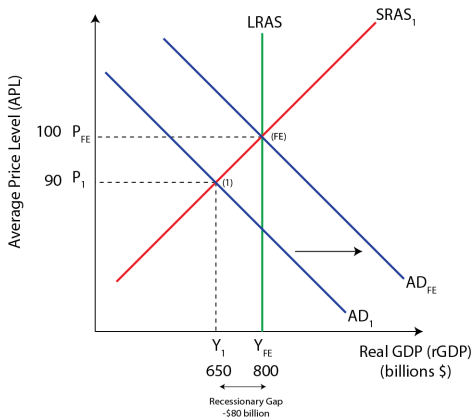
- Changes in government purchases affect AD directly, and changes in taxes and transfers affect AD indirectly.
 - ▶ Government purchases involves money being directly injected into a country's circular flow of income
 - ▶ When the government cuts taxes a smaller stimulus results as only a proportion of the tax cut or transfer will be spent on new goods and services, while a proportion will be saved by those who receive the money.

Expansionary Fiscal Policy

- Expansionary or contractionary fiscal policies are used to restore full employment when the economy is in a negative or positive output gap.
- **Expansionary fiscal policy:** refers to fiscal policy usually pursued in a recession, involving an increase in government spending or a decrease in taxes (or both).
 - ▶ It works to expand aggregate demand and the level of economic activity
 - Increasing government spending
 - Decreasing personal income taxes
 - Decreasing business taxes (taxes on profits)
 - ▶ Fiscal stimulus increases AD, the price level, and the level of real output
 - ▶ Unemployment falls as the recession ends, returning to its natural rate (NRU), and those who were cyclically unemployed are rehired.

Expansionary Fiscal Policy: Example

Example: Assume the country is in a recession and economists estimate its equilibrium real GDP is \$150 million below its full employment GDP and that the MPC is 0.5

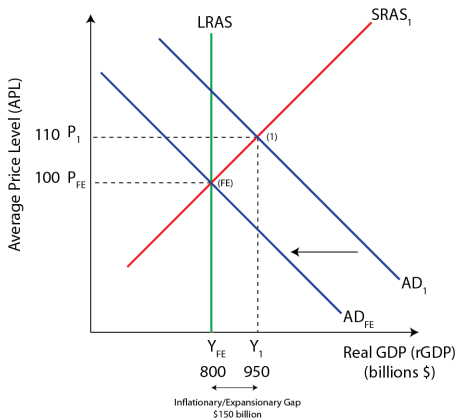


Contractionary Fiscal Policy

- **Contractionary fiscal policy:** refers to fiscal policy usually pursued in an inflationary period, involving a decrease in government spending or an increase in taxes (or both)
 - ▶ It works to contract aggregate demand and the level of economic activity.
 - Decreasing government spending
 - Increasing personal income taxes
 - Increasing business taxes (taxes on profits)
 - ▶ Contractionary fiscal policies can be employed to cool-down an overheating economy and close an inflationary gap.
 - ▶ Increasing income taxes leads to a decrease in disposable incomes and consumption among households, reducing AD, the price level, and the equilibrium level of national output.
 - ▶ Unemployment returns to its natural rate (NRU) at the full employment level of output.

Contractionary Fiscal Policy: Example

Example: Assume the country has an inflationary gap of \$150 million above its full employment GDP and that the MPC is 0.75.



Fiscal Policy: Constraints

- Fiscal policies do not always achieve the desired and expected impacts due to various factors.
 1. **Problems of time lags:** there are expected time lags to discretionary fiscal policy such as the time it takes to decide on and implement a policy action. There are a number of time delays until:
 - the problem is recognized by government authorities and economists
 - the appropriate policy to deal with the problem is decided upon
 - the policy takes effect in the economy
 2. **Political constraints:** government spending and taxation face numerous political pressures. Therefore, political factors may sometimes lead to unsuitable fiscal policies.
 3. **Sustainable debt:** refers to a level of debt where a borrowing government can meet its present and future debt obligations without accumulating overdue debt payments.

Fiscal Policy: Constraints

4. **Tax cuts may be ineffective during a recession:** tax cuts are less effective during a recession than increases in government spending because part of the increase in after-tax income is saved.
5. **Inability to “fine tune” the economy:** fiscal policy cannot be used to reach a precise target with respect to the level of output, employment, and the price level.
6. **May be inflationary:** if aggregate demand increases beyond what is necessary to eliminate a deflationary/inflationary gap then it made be inflationary.
7. **Inability to deal with cost push inflation or stagflation:** fiscal policy is a demand-side policy, and therefore unable to deal effectively with supply-side causes of instability.

7. **Crowding-out:** refers to the possible impact on real GDP of increased government spending (expansionary fiscal policy) financed by borrowing.
- If increased government borrowing results in a higher rate of interest, this could reduce private investment spending, thus reversing the impacts of the government's expansionary fiscal policy.

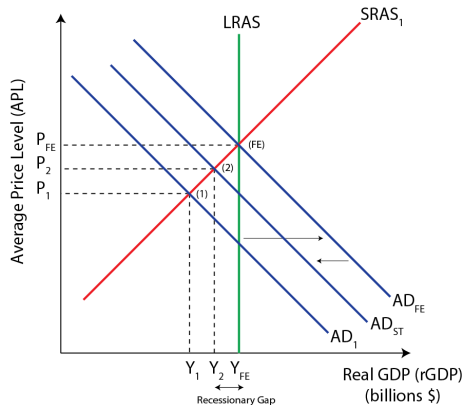
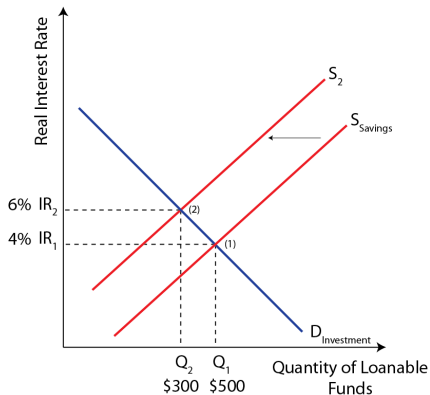
Crowding Out

- **Crowding Out** refers to the possible impact on real GDP of increased government spending (expansionary fiscal policy) financed by borrowing.
- If increased government borrowing results in a higher rate of interest, this could reduce private investment spending, thus reversing the impacts of the government's expansionary fiscal policy.
 - ▶ A government with an expansionary fiscal policy either increases spending or decreases taxes or does both simultaneously.
 - ▶ Such a policy would be aimed at stimulating aggregate demand to achieve an increase in output and employment.
 - ▶ This typically requires the government to borrow money to finance the resulting budget deficit (when tax revenues fall short of total government spending).

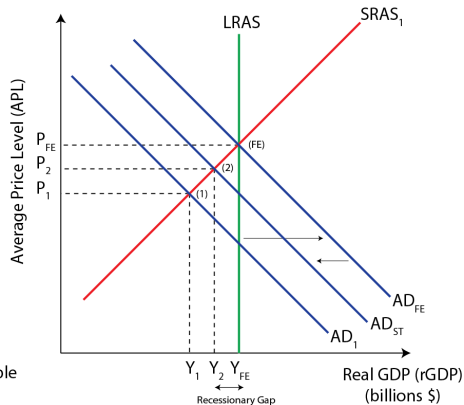
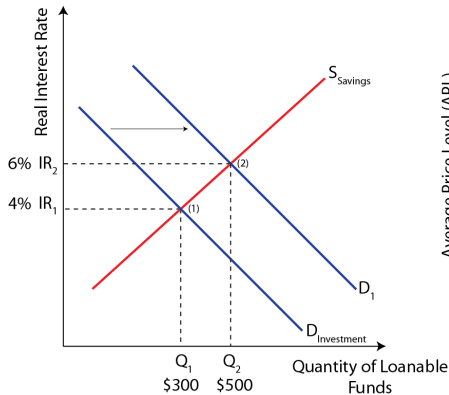
Crowding Out

- ▶ When a government borrows money to pay for a tax cut or an increase in government spending (or both), the supply of loanable funds in the economy decreases.
- ▶ The increased supply of government bonds needed to finance the deficit causes bond prices to fall and bond yields to increase, making bonds a more attractive asset for households to invest in relative to bank savings deposit.
- ▶ The corresponding decrease in the supply of private sector savings causes an increase in the real interest rate and a decrease in the quantity of investment demand in the economy.
- ▶ As more households invest their savings in government bonds, the supply of loanable funds in the private sector decreases, leading to higher interest rates.
- ▶ As borrowing costs are now higher, households and firms that may have been willing to invest at lower rates are now “crowded out” of the market, and overall private sector investment falls.

Crowding Out: Decreased Supply of Loanable Funds



Crowding Out: Increased Demand for Loanable Funds



Crowding Out: Consequences

- The crowding-out effect highlights a potential downside of government intervention in an economy in recession.
 - ▶ If crowding out occurs, then the expansionary effects of a fiscal stimulus will be smaller than forecast.
 - ▶ A potential long-run impact of crowding out is a lower rate of capital accumulation and less economic growth as a result.

Fiscal Policy: Strengths

1. **Pulling an economy out of a deep recession:** severe recessions and depressions with low levels of output and incomes and high-levels of unemployment over long periods of time may remain not be able to be resolved by market forces alone.
2. **Ability to target sectors of the economy:** fiscal policy can target spending in specific sectors according to government priorities.
3. **Direct impact of government spending on aggregate demand:** changes in government spending impact directly on aggregate demand.
4. **Dealing with rapid escalating inflation:** inflationary pressures arising when there is an inflationary gap can sometimes get out of hand, resulting in rapid increases in the price level.
 - Contractionary fiscal policy may then be used effectively to help bring the problem under control.

Fiscal Policy: Strengths

5. **Ability to affect potential output:** fiscal policy can affect potential output indirectly (by creating a stable macroeconomic environment) and directly through investments in human capital and physical capital (investment) and through offering incentives to firms to invest.
6. **Automatic stabilizers:** automatic stabilizers are factors that automatically, without any action by the government, work toward stabilizing the economy by reducing short-term fluctuations in the business cycle.
 - **Progressive taxation:** income taxes are progressive when the fraction of income that is taxed increases as income increases.
 - **Unemployment benefits:** are payments made by a government or a labour union to an unemployed person.

Automatic Stabilizers

- **Automatic Stabilizers:** are factors that automatically, without any action by the government authorities, work toward stabilizing the economy by reducing short-term fluctuations in the business cycle.
 - ▶ **Progressive taxation:** income taxes are progressive when the fraction of income that is taxed increases as income increases.
 - In the upswing of the business cycle, as real GDP and incomes rise, income taxes rise proportionately more than the rise in income, causing after-tax (disposable) income to be lower than it would be otherwise.
 - This means aggregate demand increases less, and this counteracts the economic expansion, making it smaller than it would otherwise be.
 - In a recession, the opposite occurs. With real GDP and incomes falling, income taxes fall proportionately more in a progressive tax system causing after-tax (disposable) income to be higher than it would otherwise be.
 - Therefore aggregate demand falls less, making the recession less severe.

Automatic Stabilizers

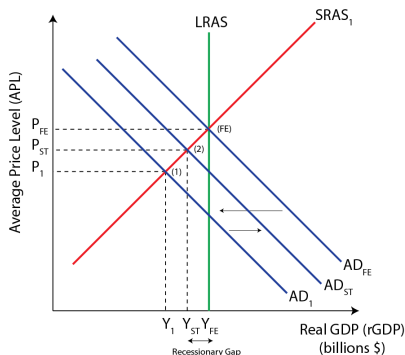
- The more progressive an income tax system, the greater the stabilizing effect on economic activity.
 - A progressive taxation system and unemployment benefits cannot by themselves stabilize the economy and eliminate inflationary and expansionary gaps on their own. They can only reduce fluctuations.
- **Unemployment benefits:** are payments made by a government or a labour union to an unemployed person.
- In a recession, as GDP falls and unemployment increases, unemployment benefits rise.
 - The presence of unemployment benefits means that as workers become unemployed, their consumption will be maintained to some extent as their benefits partially replace their lost income, thus lessening the downward pressure on aggregate demand.
 - In an expansion, unemployment benefits are reduced as unemployment falls; therefore consumption increases less than it would in the absence of unemployment benefits

Automatic Stabilizers: Negative Demand Shock

- Consider what happens following a negative demand shock resulting from a decrease in aggregate demand.
 1. As AD falls, workers are laid off due to inflexible wages and other input costs in the short-run.
 2. Unemployed workers who have lost their income stop paying income taxes, so there is an automatic decrease in the taxes collected by the government.
 3. As long as AD, remains weak, workers will remain unemployed and many will begin collecting unemployment benefits from the government; there is an automatic increase in transfers as AD falls.
 4. During a demand-deficient recession, tax revenues decrease automatically as GDP falls, preventing consumption and the economy from falling further.

Automatic Stabilizers: Negative Demand Shock

5. At the same time, transfers payments increase, helping maintain consumption among those who have lost their jobs.
6. The effect of these automatic stabilizers is to steady AD and prevent it from falling as much as it would if these effects had not contributed.

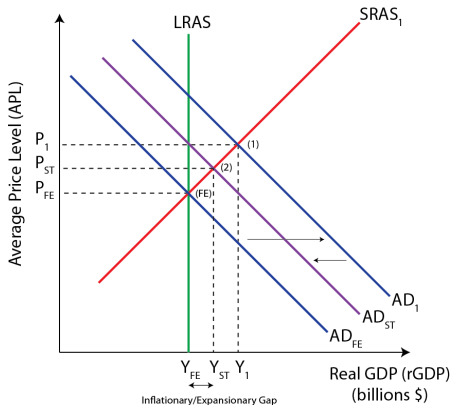


Automatic Stabilizers: Positive Demand Shock

- Consider what happens when an economy already producing at full employment experiences a positive demand shock resulting from a increase in aggregate demand.
 1. As AD increases, workers who were structurally or frictionally unemployed will be hired by firms producing capital goods, causing unemployment to fall below its natural rate.
 2. Newly employed workers start paying income tax, automatically increasing tax revenues for the government.
 3. Since they are no longer unemployed, the same workers will stop collecting unemployment benefits from the government, automatically reducing the amount the government pays in transfers.
 4. During an expansion, tax revenues increase automatically as GDP rises, slowing consumption and preventing the economy from overheating.

Automatic Stabilizers: Positive Demand Shock

- At the same time, transfer payments decrease, helping consumption from rising more than it otherwise would.



Expenditure (Spending) Multiplier

- **Keynesian spending multiplier:** tells us the amount by which a particular expenditure of consumption (C), government spending (G), investment (I), or net exports (X – M) will increase the nations total GDP.
 - ▶ Spending by one person represents income to another, so an expenditure leads to a more than proportional increase in GDP.
 - ▶ The expenditure multiplier quantifies the size of the change in AD as a result of a change in any of the components of AD.
 - ▶ To estimate the size of the expenditure multiplier, we must know how much of any change in income the typical household will use to buy goods and services.
 - **Marginal propensity to consume (MPC):** is the fraction of additional income that households spend on consumption of domestically produced goods and services. $MPC = \Delta C / \Delta Y$.

Expenditure (Spending) Multiplier

- **Marginal propensity to save (MPS):** is the fraction of additional income that households save. $MPC = \Delta S / \Delta Y$.
- **Marginal propensity to tax (MPT):** is the fraction of additional income taxes. $MPC = \Delta T / \Delta Y$.
- **Marginal propensity to import (MPM):** is the fraction of additional income that households spend on imported goods and services. $MPM = \Delta M / \Delta Y$.
- **Note:** $MPC + MPS + MPT + MPM = 1$

► The value of the expenditure multiplier is given by:

$$k_{\text{Expenditure}} = \text{Multiplier} = \frac{\Delta \text{Real GDP}}{\Delta \text{Expenditure}} = \frac{1}{1 - MPC} = \frac{1}{MPS + MPT + MPM}$$

$$\Delta \text{Real GDP} = \Delta \text{AD} = \text{Expenditure Multiplier} \times \Delta \text{Expenditure}$$

- The larger (smaller) the marginal propensity to consume (MPC), the greater the value of the multiplier. The smaller (larger) the leakages from the spending stream, the greater (smaller) the multiplier.

Expenditure (Spending) Multiplier

- ▶ The following table shows the multiplier calculations for different marginal propensities to consume:

MPC	Spending Multiplier (k)	Effect on GDP of \$1 billion rise in AD
0.9	$1/0.1=10$	$\$1 \times 10 = \10 billion
0.6	$1/0.4=2.5$	$\$1 \times 2.5 = \2.5 billion
0.5	$1/0.5=2$	$\$1 \times 2 = \2 billion
0.4	$1/0.6=1.67$	$\$1 \times 1.67 = \1.67 billion
0.2	$1/0.8=1.25$	$\$1 \times 1.25 = \1.25 billion

Tax Multiplier

- The tax multiplier quantifies the size of the change in AD as a result of a change in taxes.
 - ▶ The initial tax cut will result in increased consumption, which leads to an increase in incomes and a further increase in consumption.
 - Lower taxes mean more income which leads to more consumption and more income.
 - The initial change in taxes is “multiplied” throughout the economy by a factor determined by the amount by which households increase their consumption in response to a particular increase in disposable income.
 - The tax multiplier is a function of the marginal propensities to consume and save:

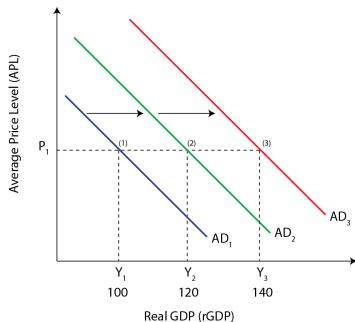
$$k_{\text{Tax}} = \text{Tax Multiplier} = \frac{-\text{MPC}}{\text{MPS}}$$

$$\Delta \text{Real GDP} = \Delta \text{AD} = \text{Tax Multiplier} \times \Delta \text{Taxes}$$

- The tax multiplier is negative because there is an inverse relationship between taxes and spending.

Expenditure & Tax Multipliers: AS/AD Model

- The impact of the expenditure and tax multipliers can be shown in an AS/AD model.
 - ▶ Assume the MPC is 0.5 and the multiplier is 2.
 - ▶ An increase in investment of \$20 billion will initially shift the AD curve out by \$20 billion. Ultimately, the AD curve shifts out by \$40 billion.



- **Enduring Understanding**

- ▶ Fiscal and monetary policy have short-run effects on macroeconomic outcomes.

- **Essential Knowledge**

- ▶ Governments implement fiscal policies to achieve macroeconomic goals, such as full employment.
- ▶ The tools of fiscal policy are government spending and taxes/transfers.
- ▶ Changes in government spending affect aggregate demand directly, and changes in taxes/transfers affect aggregate demand indirectly.
- ▶ The government spending multiplier is greater than the tax multiplier.
- ▶ Expansionary or contractionary fiscal policies are used to restore full employment when the economy is in a negative (i.e., recessionary) or positive (i.e., inflationary) output gap.

Summary (Continued)

- ▶ Fiscal policy can influence aggregate demand, real output, and the price level.
- ▶ The AD–AS model is used to demonstrate the short-run effects of fiscal policy.
- ▶ In reality, there are lags to discretionary fiscal policy because of factors such as the time it takes to decide on and implement a policy action.
- ▶ When a government is in budget deficit, it typically borrows to finance its spending.
- ▶ A loanable funds market model can be used to show the effect of government borrowing on the equilibrium real interest rate and the resulting crowding out of private investment.
- ▶ Crowding out refers to the adverse effect of increased government borrowing, which leads to decreased levels of interest-sensitive private sector spending in the short run.

Summary (Continued)

- ▶ Automatic stabilizers support the economy during recessions and help prevent the economy from being overheated during expansionary periods.
- ▶ Tax revenues decrease automatically as GDP falls, preventing consumption and the economy from falling further.
- ▶ Tax revenues increase automatically as GDP rises, slowing consumption and preventing the economy from overheating.
- ▶ Government policies, institutions, or agencies may also have social service programs whose transfer payments act as automatic stabilizers.
- ▶ A \$1 change to autonomous expenditures leads to further changes in total expenditures and total output.

Summary (Continued)

- ▶ The expenditure multiplier quantifies the size of the change in aggregate demand as a result of a change in any of the components of aggregate demand.
- ▶ The tax multiplier quantifies the size of the change in aggregate demand as a result of a change in taxes.
- ▶ The expenditure multiplier and tax multiplier depend on the marginal propensity to consume.
- ▶ The marginal propensity to consume is the change in consumer spending divided by the change in disposable income. The sum of the marginal propensity to consume and marginal propensity to save is equal to one.

Supply-side policies



Assessment Objectives

Specific Expectations	
4.A	Explain (using graphs as appropriate) public policies aimed at influencing long-run economic growth.
4.A	Define supply-side fiscal policies.

Supply-Side Policies

- **Supply-side policies** are a variety of policies focused on aggregate supply, namely factors aiming to shift the long-run aggregate supply curve (LRAS) to the right, in order to achieve long-term economic growth.
 - ▶ They do not attempt to stabilize the economy (to reduce the severity of the business cycle).
 - ▶ Supply-side policies increase productivity and reduce production costs, shifting SRAS and LRAS outward, increasing actual and potential output.
 - ▶ There are two major categories of supply-side policies: **market-based** and **interventionist**.
 1. **Market-based supply-side policies** are intended to reduce government intervention thereby allowing the free market to increase efficiency and improve incentives

Supply-Side Policies

2. **Interventionist supply-side policies** are government led attempts to increase the productive capacity of the country.

► The goals of supply-side policies include the following:

1. **Promote long-term growth by increasing the productive capacity of the economy:** the main objective is to increase potential output, shown by a steeper long-term growth trend in the business cycle diagram, or a rightward shift of the LRAS curve.
2. **Improve competition and efficiency:** the objective is to make the economy more responsive to the market forces of demand and supply so as to increase efficiency in production.
3. **Reduce costs of labour and reduce unemployment through greater labour market flexibility:** greater labour market flexibility means making the labour market more responsive to the market forces of demand and supply so as to reduce unemployment as well as labour costs.

Supply-Side Policies

4. **Increase incentives of firms to invest in innovation by lowering costs of production:** higher after-tax profits through lower costs of production as well as lower taxes provide firms with incentives to engage in research and development that increase the productive capacity of the economy resulting in greater increases in productive capacity and growth in potential output.
5. **Reduce inflation to improve international competitiveness:** increase in potential output reduce inflationary pressures in the economy, thus making exports more competitive in global markets.

Market-based Supply-Side Policies

- **Market-based Supply-side policies** any policy based on promoting well-function, competitive markets in order to influence the supply-side of the economy, usually to shift the LRAS curve to the right, increased potential output and achieve long-term economic growth.
 - ▶ **Market-based supply-side policies** can be grouped under:
 1. **Encouraging competition:** greater competition among firms forces them to reduce costs, contributing to greater efficiency in production and improving resource allocation.
 2. **Labour market reforms:** are intended to get rid of rigidities by making labour markets more competitive, making wages respond to the forces of supply and demand, lowering labour costs and increasing employment by lowering the natural rate of unemployment.
 3. **Incentive-related policies:** involve cutting various type of taxes, while are expected to change the incentives faced by taxpayers, whether consumers firms of consumers.

Supply-side policies: Encouraging Competition

- ▶ Greater competition among firms has the possible added benefit of improving the quality of goods and services.
 - ▶ These benefits will allow potential output to increase and the LRAS curve to shift to the right.
1. **Privatization:** involves transferring ownership of a firm from the public sector to the private sector, can increase efficiency due to improved management and operation of the privatized firm.
 2. **Deregulation:** involves the elimination or reduction of government regulation of private sector activities, based on the argument that government regulation stifles competition and increases inefficiency.
 - **Economic regulation** involves government control of prices, output and other activities if firms, offering them protection against competition.
 - **Social regulation** involves protecting consumers against undesirable effects of private sector activities (negative externalities).

Supply-side policies: Encouraging Competition

3. **Contracting out to the private sector:** this is a policy option whereby governments make a contractual agreement with private firms to provide goods and services for the government.
 - These result in increased competition as private firms compete with each other to get contracts with the government.
4. **Anti-monopoly regulation** increased competition can result from restricting market power of firms by anti-monopoly legislation.
 - Breaking-up large firms that have been found to engage in monopolistic practices into smaller units that will behave more competitive
 - Preventing mergers that might result in too much market power.
 - Greater scope for the forces of supply and demand may result in increased efficiency, lower costs and improved quality.
5. **Trade liberalization:** free or freer trade increases competition between firms both domestically and globally, which can result in greater efficiency in production and an improved allocation of resources.

Supply-side policies: Labour Market Reforms

- ▶ Lower labour costs reduce the costs of production and can lead to increased profits, which in turn may result in greater investment by firms, increased R&D, increased capital goods production, and therefore increases in potential output (economic growth).
- 1. **Abolishing minimum wage:** elimination or reduction of the legal minimum wage, reduces unemployment by allowing the equilibrium wage to fall.
 - The benefits would include lower unemployment; greater firm profits, as wages costs would be lowered; more investment and economic growth.
- 2. **Weakening the power of labour (trade) unions:** unionised labour frequently succeeds in securing high wage increases; if labour unions are weakened, wages will be more responsive to the forces of supply and demand, and will therefore be more likely to fall in if there is unemployment.

Supply-side policies: Labour Market Reforms

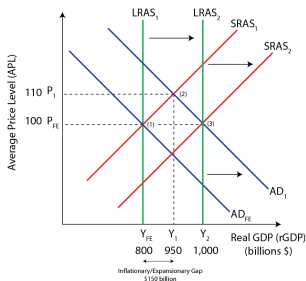
3. **Reducing unemployment benefits:** reducing unemployment benefits, is expected to lower unemployment, as it would encourage the unemployed to look for work.
 - The could work to reduce the natural rate of unemployment.
4. **Reducing job security:** reducing workers' job security may make it easier and less costly for firms to let go of workers.
 - May increase employment, because firms are more likely to hire new workers if they know they can fire them easily and without cost if they are no longer needed.
 - Reducing job security would decrease firms' labour costs because of the lower costs of firing and would therefore increase profits, investment and economic growth.

Supply-side Policies: Incentive-related policies

- ▶ **Incentive-related policies** involve cutting various types of taxes, which are expected to change the incentives faced by taxpayers, whether firms or consumers.
- 1. **Lowering personal income taxes:** reductions in personal income taxes lead to higher after-tax incomes, creating an incentive for people to provide more work.
 - Increase in the number of hours worked per week.
 - Increase in the number of people interested in finding work.
 - Increase in the years worked, as people decide to retire later.
 - Decrease in unemployment as unemployed workers choose to shorten the duration of their unemployment
- 2. **Lowering taxes on capital gains and interest income:** if taxes on capital gains and on income from interest on savings deposits are reduced, people may be more motivated to save, thus increasing the amount.

Supply-side Policies: Incentive-related policies

- Lowering business taxes:** lower taxes on business profits (corporation taxes) can work to increase aggregate demand by increasing investment spending.
 - Cutting taxes on firms' profits can be considered a supply-side measure because increases in the level of after-tax profits mean that firms have greater financial resources for investment and for pursuing technological innovations through more R&D, resulting in greater potential output.



Supply-side policies: Interventionist

- **Interventionist Supply-side policies** any policy based on government intervention in the market intended to affect the supply-side of the economy, usually to shift the LRAS curve to the right, increased potential output and achieve long-term economic growth.
 - ▶ Interventionist supply-side policies presuppose that the free market economy along cannot achieve the desired results in terms of increasing potential output, and therefore government intervention is required.
- 1. **Investment in human capital: education and health services**
 - **Training and education:** more and better training and education lead to an improvement in the quality of labour resources, increasing the productivity of labour, which is one of the key causes of growth.
 - **Improved health care services and access to these:** when workers have access to good quality health care services, they become healthier and more productive.

2. **Investment in new technology: research and development:** R&D is the fundamental activity behind the development of new technologies, resulting in new or improved capital goods (physical capital), which is another important cause of increases in potential output and economic growth.
 - R&D also has positive production externalities, thereby justifying government intervention.
 - Governments in many countries around the world are heavily involved in R&D.
3. **Investment in infrastructure:** more and better infrastructure increases efficiencies in production and improves labour productivity thereby lowering costs of production.

Supply-side policies: Interventionist

4. **Industrial policies:** are government policies designed to support the growth of the industrial sector of an economy.
 - **Support for small and medium-sized enterprises or firms (SMEs):** these measures provide support for the private sector, promoting efficiency, more capital formation, more employment possibilities and therefore increases in aggregate demand as well as potential output.
 - **Support for “infant industries”:** which are newly emerging industries in developing countries, which sometimes receive government support in the form of grants, subsidies, tax exemptions, and tariffs or other forms of protection against exports.

Overlaps between demand-side and supply-side policies

- **Demand-side policies** are focused on influencing the short-term fluctuations of aggregate demand while **supply-side policies** are intended to affect long run aggregate supply.
 - ▶ Some demand-side policies have not only demand-side but also supply-side effects, and can affect long-term economic growth by increasing potential output.
 - ▶ Their contribution to economic growth include creating a stable economic environment, as well as private investment spending and government spending.
 - ▶ This in turn leads to increases in potential output through new capital formation, increased R&D and technological improvements, and improvements in the quality of the labour force.

Evaluating supply-side policies: Constraints

1. **Time lags:** the policies work after significant time lags, making their effects on the supply-side of the economy (aggregate supply) over the longer term.
 - The activities set into motion (increased competition, labour market reforms, changing incentives) need time to materialize and affect potential output.
 - Policies work after significant time lags because of time needed for investments, new human and physical capital to be realized and to take effect.
2. **Possible unfavourable impact on unemployment:** market-based policies that focus on encouraging competition may well increase unemployment, at least over the short-run.
3. **Possible negative effects on equity:** changes to legislation and institutions that provide protection for workers with very low incomes may contribute to rising income inequalities.

Evaluating supply-side policies: Constraints

4. **Negative impact on the government budget:** incentive-related policies in the form of tax cuts negatively impact the budget as they reduce tax revenues.
 - Interventionist policies have negative effects on the government budget because they are heavily based on government spending. They can therefore create a budget deficit.
5. **Possible inference of vested interests:** market-based policies often affect particular stakeholders in ways which are not in their best interests, and these groups therefore oppose and may prevent the policies from being implemented.
6. **Possible negative effects on the environment:** market-based policies focused on increasing competition may have negative effects on the environment because of the increased scope for activities leading to negative externalities affecting the environment.

Evaluating supply-side policies: Strengths

1. **Improved resource allocation:** market-based supply-side policies focus on improving the workings of the market system based on the operation of demand and supply, and these are expected to result in improved efficiency in resource allocation.
2. **May not burden the government budget:** most market-based policies do not need government funds to be implemented as they are based on private initiatives (tax cuts are an exception).
3. **Ability to create employment:** market-based policies involving labour market reforms may also contribute to reducing the natural rate of unemployment by focusing on making the labour market more responsive to supply and demand.
4. **Ability to reduce inflationary pressure:** by increasing potential output supply-side policies are likely to reduce inflationary pressures over the longer term.

Evaluating supply-side policies: Strengths

5. **Direct support of sectors important for growth:** the government selects particular sectors or activities to promote, which may be important for growth.
6. **Ability to create employment:** interventionist policies involving investments in education and training can make a direct impact on a reduction of unemployment.
7. **Potential ability to reduce inflationary pressure:** interventionist policies may also reduce inflationary pressures by increasing potential output.
8. **Potential positive effects on equity:** interventionist policies that focus on investments in human capital that are broadly distributed throughout the population are likely to have positive effects on equity over the longer-term.

- **Enduring Understanding**

- ▶ Authorities and organizations institute policies that affect economic growth.

- **Essential Knowledge**

- ▶ Public policies that impact productivity and labour force participation affect real GDP per capita and economic growth.
- ▶ Government policies that invest in infrastructure and technology affect growth.
- ▶ Supply-side fiscal policies affect aggregate demand, aggregate supply, and potential output in the short run and long run by influencing incentives that affect household and business economic behaviour.