3.2 Variations in economic activity – aggregate demand and aggregate supply

Learning objectives

3.2 Variations in economic activity – aggregate demand and aggregate supply	Depth	Diagrams and calculations
Aggregate demand (AD) • Aggregate demand curve	AO2 AO4	Diagram: AD curve
Components of AD: • Consumption (C) • Investment (I) • Government spending (G) • Net exports (total exports [X] – total imports [M])	AO2	

Learning objectives

3.2 Variations in economic activity – aggregate demand and aggregate supply	Depth	Diagrams and calculations
Determinants of AD components • C: consumer confidence, interest rates, wealth, income taxes, level of household indebtedness, expectations of future price level • I: interest rates, business confidence, technology, business taxes, level of corporate indebtedness • G: political and economic priorities • X – M: income of trading partners, exchange rates, trade policies	AO2	
Shifts of the AD curve caused by changes in determinants	AO2 AO4	Diagram: shifts of the AD curve

Learning objectives

3.2 Variations in economic activity – aggregate demand and aggregate supply	Depth	Diagrams and calculations
Short-run aggregate supply (SRAS) curve and determinants of the SRAS curve • costs of factors of production • indirect taxes	AO2 AO4	Diagram: SRAS curve
Shifts of the SRAS curve	AO2 AO4	Diagram: shifts of the SRAS curve

Learning objectives

3.2 Variations in economic activity – aggregate demand and aggregate supply	Depth	Diagrams and calculations
Alternative views of aggregate supply (AS) • Monetarist/new classical view of the long-run aggregate supply (LRAS) curve • Keynesian view of the AS curve • Inflationary and deflationary/recessionary gaps	AO2 AO4	Diagram: alternative views of the AS curve
Shifts of the AS curve over the long-run (monetarist/new classical LRAS) or over the long term (Keynesian AS) • Changes in the quantity and/or quality of factors of production • Improvements in technology • Increases in efficiency • Changes in institutions	AO2 AO4	Diagram: shifts of the LRAS or Keynesian AS

Learning objectives

3.2 Variations in economic activity – aggregate demand and aggregate supply	Depth	Diagrams and calculations
Macroeconomic equilibrium Short-run equilibrium Equilibrium in the monetarist/new classical model • Determination of long-run equilibrium at full employment level of output (potential output) • Automatic adjustment to full employment equilibrium • Unemployment at full employment equilibrium is equal to the natural rate of unemployment Equilibrium in the Keynesian model • Persistence of deflationary/recessionary gaps: equilibrium level of output might not equal the full employment level of output	AO2 AO4	Diagram: macroeconomic equilibrium in both the short run and long run

Learning objectives

3.2 Variations in economic activity – aggregate demand and aggregate supply	Depth	Diagrams and calculations
Assumptions and implications of the monetarist/new classical and Keynesian models	AO3	

Introduction – aggregate demand

Aggregate demand (AD) refers to the total value of demand for all goods and services in an economy by all stakeholders at different price levels over a time period. AD has four components:

Consumer expenditure

Business investment

Government spending

Net exports (exports – imports)

Components of aggregate demand

In microeconomics, demand depicts consumers' willingness and ability to purchase goods and services in a single market at different prices.

In macroeconomics, **aggregate demand** represents the sum of demand in an economy from households, businesses, the government, and foreign stakeholders, and their willingness to consume goods and services at different **price levels**.

As a result, aggregate demand is equal to:

$$AD = \text{Consumption} + \text{Investment} + \text{Government spending} + (\text{Exports} - \text{Imports})$$

$$= C + I + G + (X - M) = C + I + G + Nx$$

Real world example

Video: [Economy suffers record-breaking GDP fall due to COVID-19]

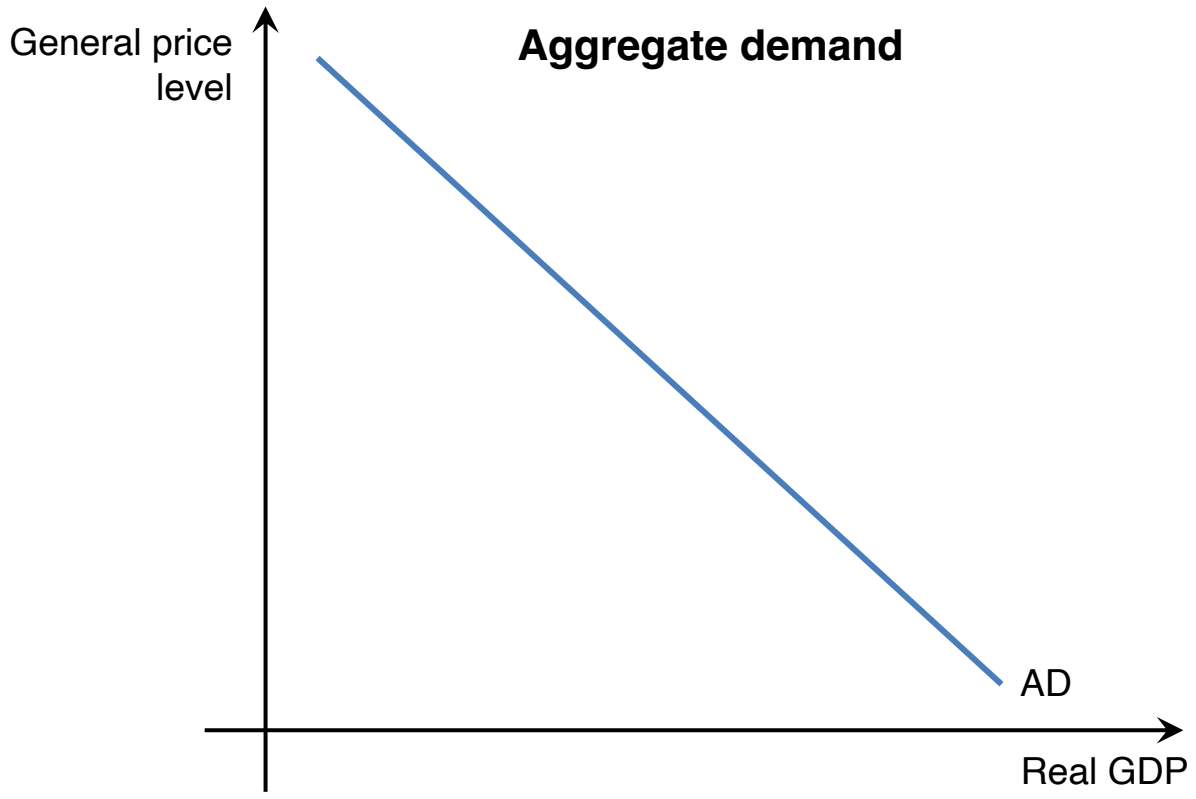
Using the video and your own knowledge, explain how the COVID-19 pandemic may impact the components of AD within an economy.

The aggregate demand curve

The **AD curve** shows the relationship between the general price level and real GDP of an economy.

The general price level is the average price of all goods and services in an economy.

Real GDP shows the total value of output of final goods and services in an economy.



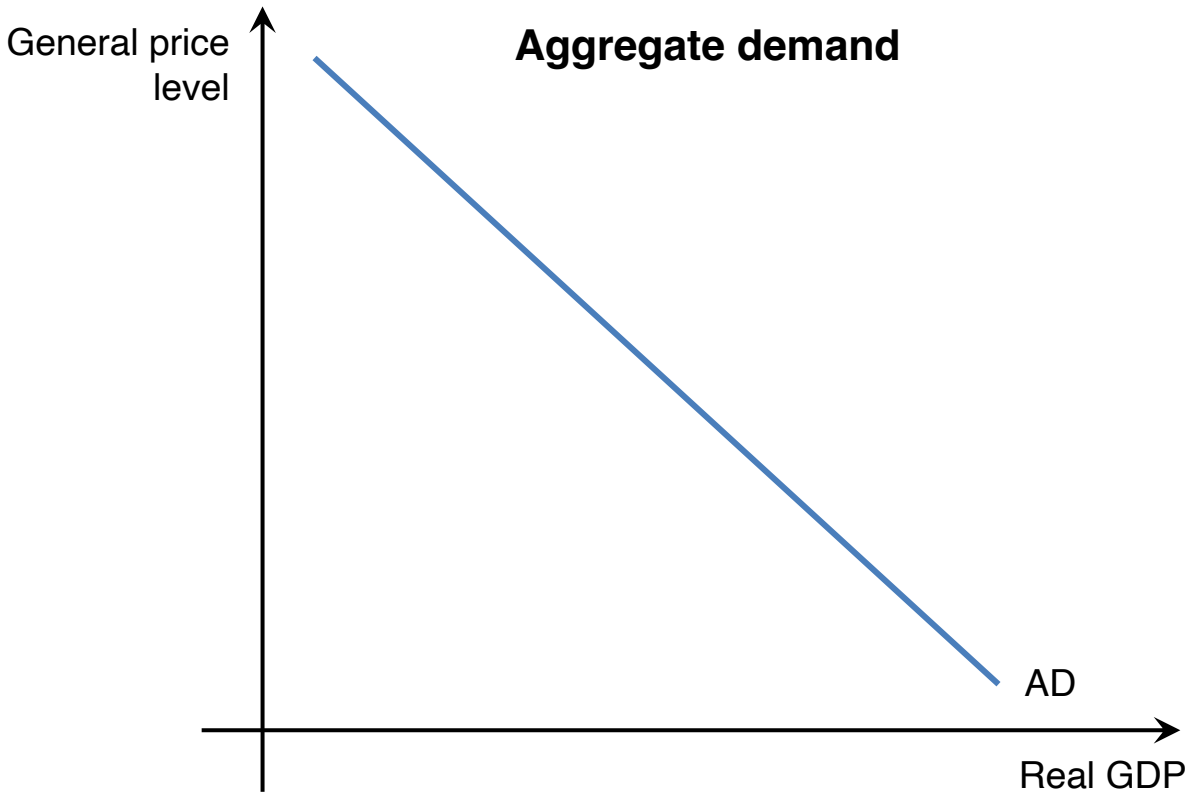
The aggregate demand curve

Real GDP vs AD

You may have noticed the formulae for real GDP and AD are both given as

C + I +G + (X – M).

What is the difference between real GDP and AD?



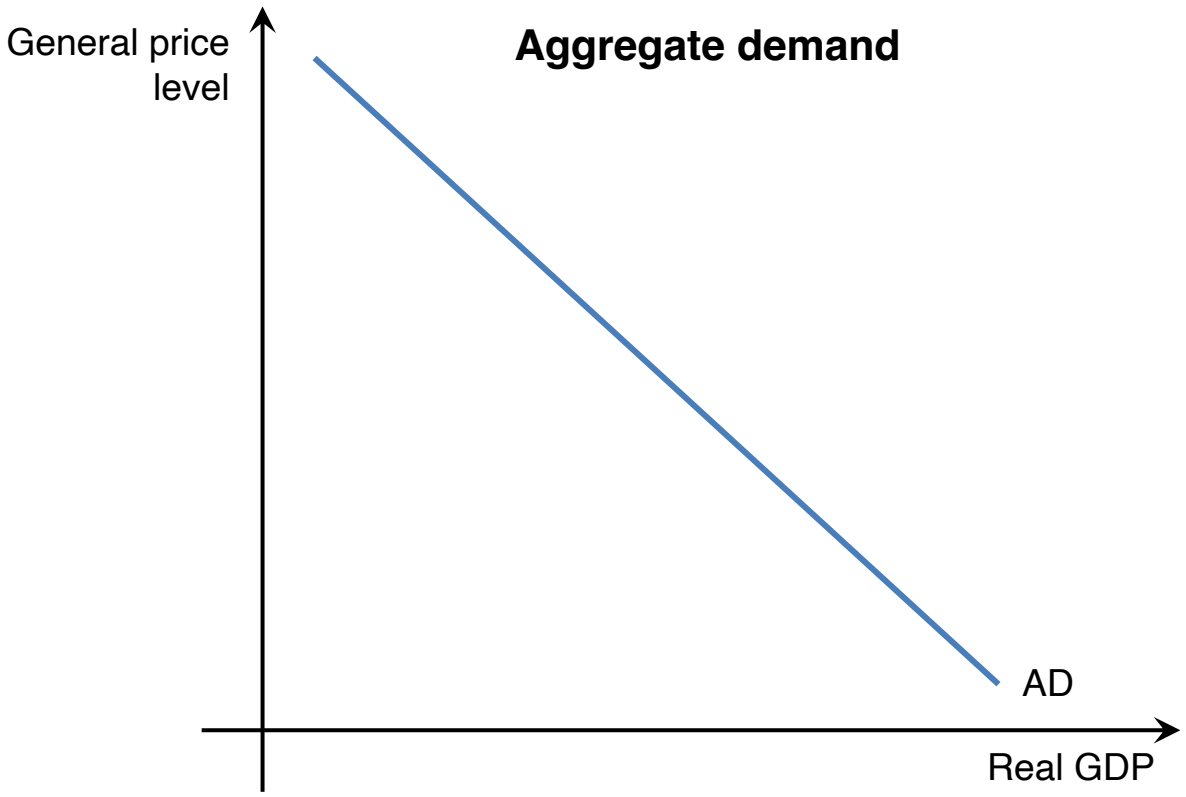
The aggregate demand curve

Real GDP vs AD

Comparing real GDP and AD is akin to comparing quantity demanded with demand.

Real GDP is specific point on the AD curve at a particular price level.

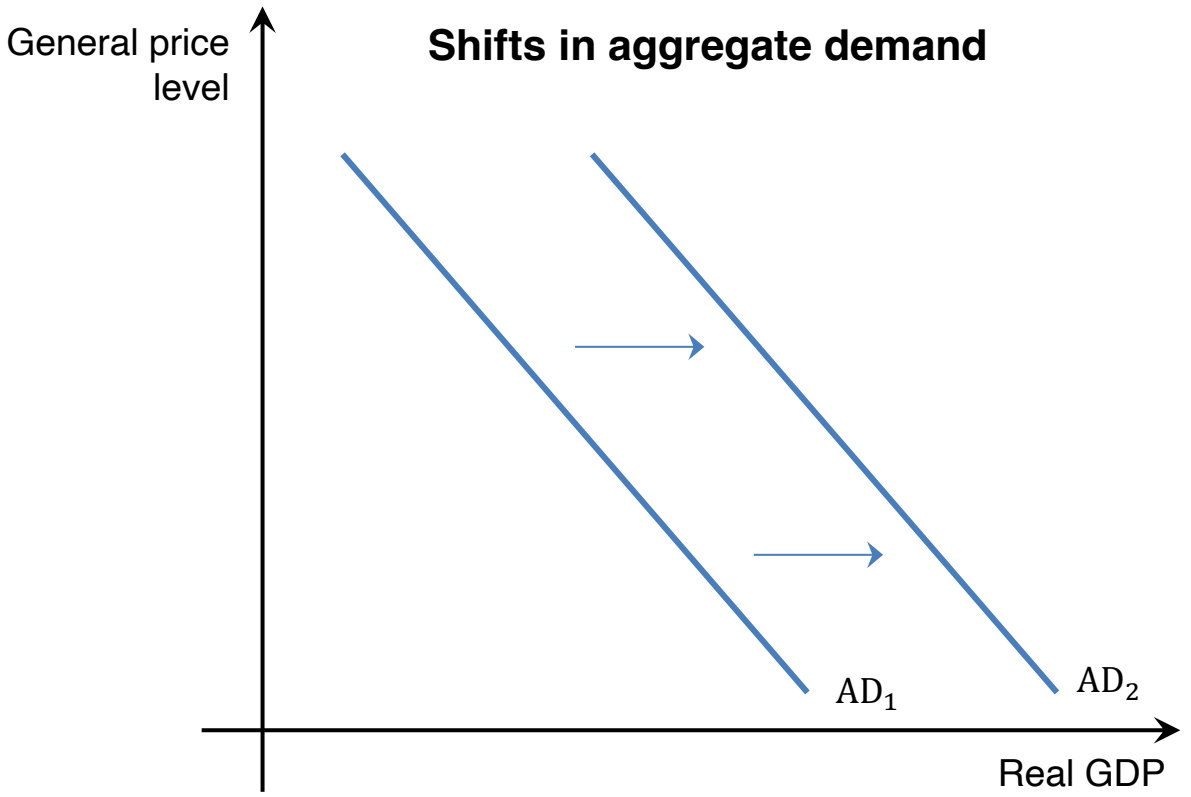
AD shows the real GDP of an economy across different price levels.



Shifts in aggregate demand

The components of AD include consumption, investment, government spending, and net exports.

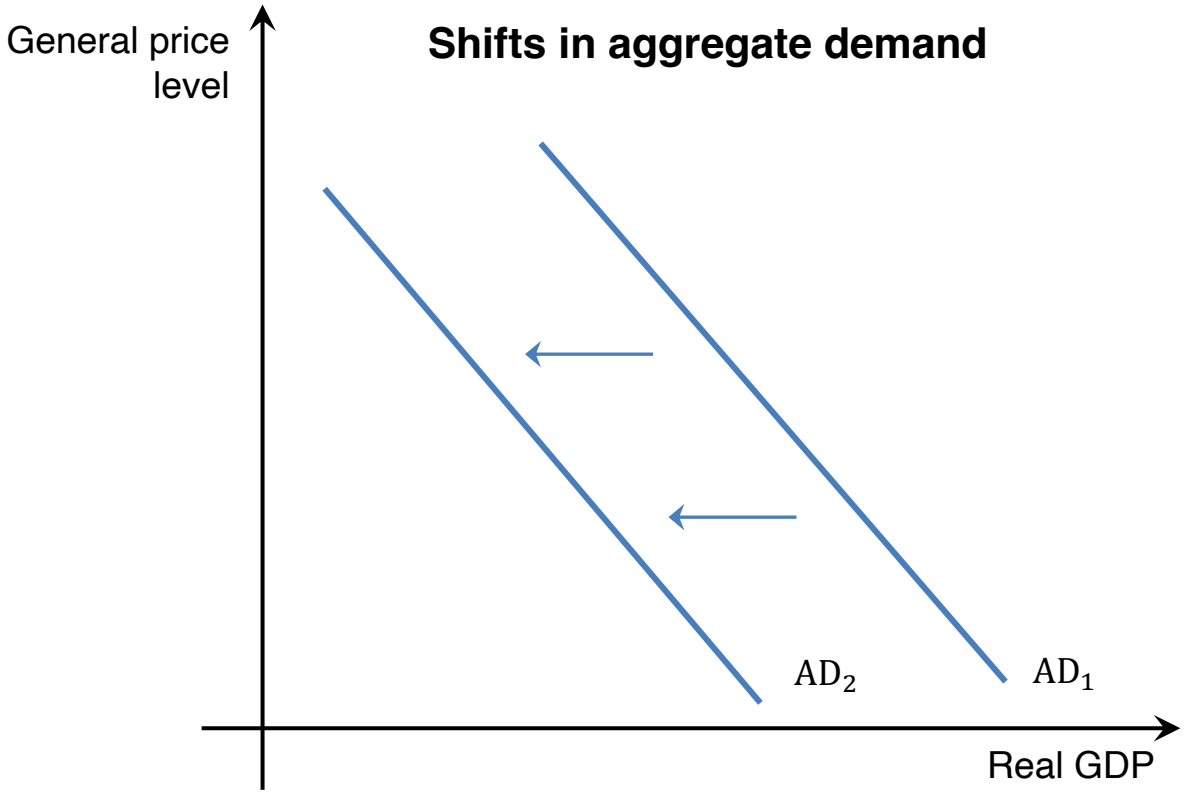
An **increase** in any component of AD will lead to an **outward shift** in AD, ceteris paribus.



Shifts in aggregate demand

The components of AD include consumption, investment, government spending, and net exports.

Conversely, a **fall** in any component of AD will lead to an **inward shift** in AD.



Determinants of AD components

There are many factors that affect the level of consumption, investment, government spending, and net exports in an economy. These determinants will **shift** the AD curve inwards or outwards.

<table>
<tr><th colspan="2">Consumption</th><th>Investment</th><th>Gov’t spending</th><th>Net exports</th></tr>
<tr><td colspan="2">Confidence (in the economy)</td><td rowspan="5"></td><td>Political priorities</td><td>Incomes of trading partners</td></tr>
<tr><td colspan="2">Interest rates</td><td>Economic priorities</td><td>Exchange rates</td></tr>
<tr><td colspan="2">The level of indebtedness</td><td rowspan="4"></td><td>Trade policies</td></tr>
<tr><td colspan="2">Taxation</td><td rowspan="3"></td></tr>
<tr><td>Wealth</td><td rowspan="2"></td></tr>
<tr><td>Expectations</td></tr>
</table>

Determinants of Consumption and Investment – confidence

Confidence refers to the degree of optimism and certainty surrounding the level of future economic activity.

In periods of low confidence, consumers are concerned about potential unemployment, therefore consumption tends to decrease, and savings tend to increase. During such times, businesses refrain from expansion and thus investment tends to fall.

Meanwhile, the opposite occurs during periods of high consumer and business confidence in the economy.

Determinants of Consumption and Investment – interest rates

Interest rates refers to the cost of borrowing and the reward for saving expressed as a percentage.

When interest rates increase, there is a greater cost for borrowing and a greater reward for saving. This discourages consumption and investment, resulting in an inward shift in AD. The opposite occurs when interest rates are lowered.

Determinants of Consumption and Investment – indebtedness

Debt refers to borrowed money.

A higher level of indebtedness will reduce households' propensity to consume and firms' propensity to invest.

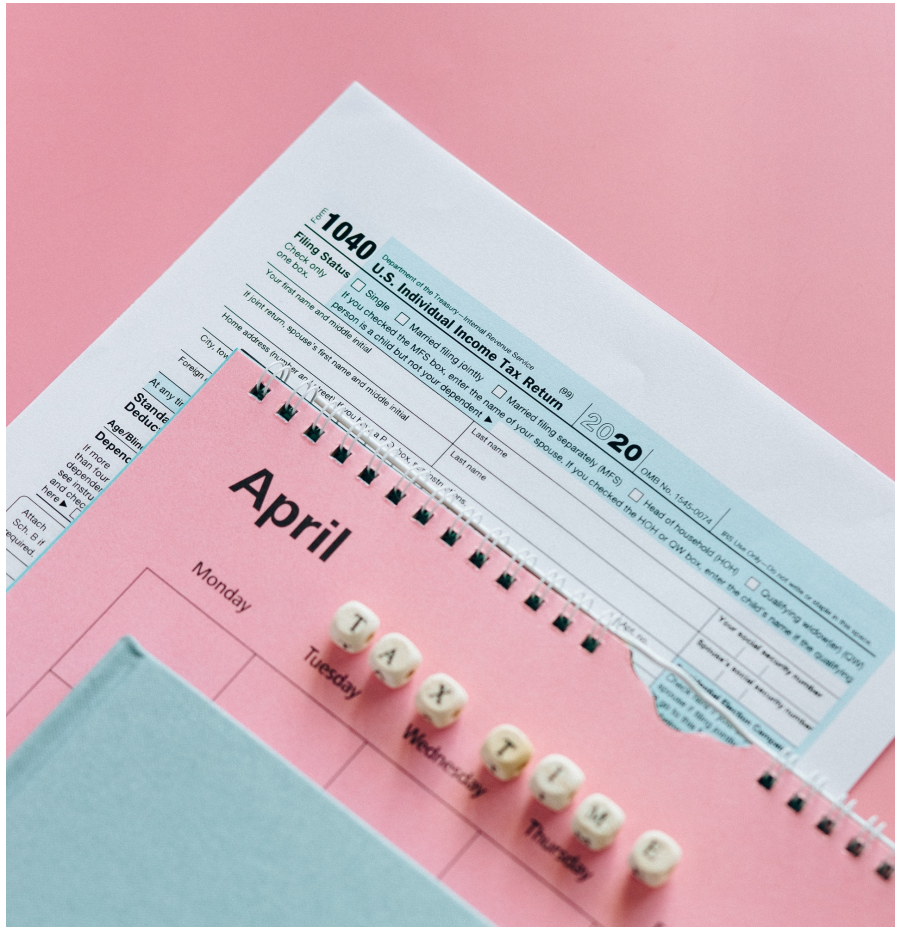
With high indebtedness, households will engage in less discretionary expenditure and firms may delay projects.

Determinants of Consumption and Investment – taxation

Direct tax refers to taxes that households and firms pay to the government via income and profits.

An increase in income (personal) taxes will reduce households' disposable income, leading to a fall in the level of consumption.

Similarly, an increase in corporate taxes will reduce retained profits for businesses, thereby leading to a fall in the level of investment. Furthermore, low taxation rates may attract inward investment from foreign businesses.



Determinants of Consumption – wealth

Wealth refers to the total value of valuable assets, e.g., property, owned by households.

As households become wealthier, they tend to consume more goods and services and vice versa.

Furthermore, wealthier households may consume goods and services of a higher value that make a greater contribution to real national output.

Determinants of Consumption – expectations

Expectations refer to the anticipated future prices of goods and services. Speculation about the future price level will affect current household consumption.

If households expect the price levels to increase in the future, they may increase their current consumption to enjoy lower prices.

Conversely, if households expect the price levels to fall in the future, they may delay current consumption to enjoy lower prices in the future.

Determinants of Government Spending – priorities

Government spending will vary depending on the **priorities** of a government.

Governments may increase public sector spending on education and healthcare for political reasons.

On the other hand, governments may impose austerity measures to improve economic prudence by reducing public sector spending.

Determinants of Net Exports – incomes of trading partners

Due to globalization and interdependence, when a large economy suffers from an economic downturn, there are negative impacts on its trading partners.

A fall in the income of trading partners leads to fewer export sales and therefore a fall in net exports.

A rise in the income of trading partners leads to greater export sales and therefore a rise in net exports.

Determinants of Net Exports – exchange rates

When the currency of an economy depreciates, its exports are relatively cheaper for foreign consumers. This improves a country's international competitiveness and hence increases net exports.

Conversely, when the currency of an economy appreciates, its exports are relatively more expensive for foreign consumers. This worsens a country's international competitiveness and hence decreases net exports.

Determinants of Net Exports – trade policies

Imposing trade barriers, such as tariffs and quotas, will cause the price of imports to rise, reducing demand for imports.

As such, restrictive trade policies will increase net exports. However, these policies may lead to retaliation from other countries, who may impose their own trade barriers.

Test your knowledge on this unit: Kahoot!

Aggregate supply

Aggregate supply refers to the total value of goods and services produced in an economy at different price levels, over a time period.

Aggregate supply

While there is consensus on the nature of the AD curve, there are different schools of thoughts on the nature of the AS curve. The two main schools of thought are:

- The New Classical / Monetarist Model
- The Keynesian Model

Monetarist Model

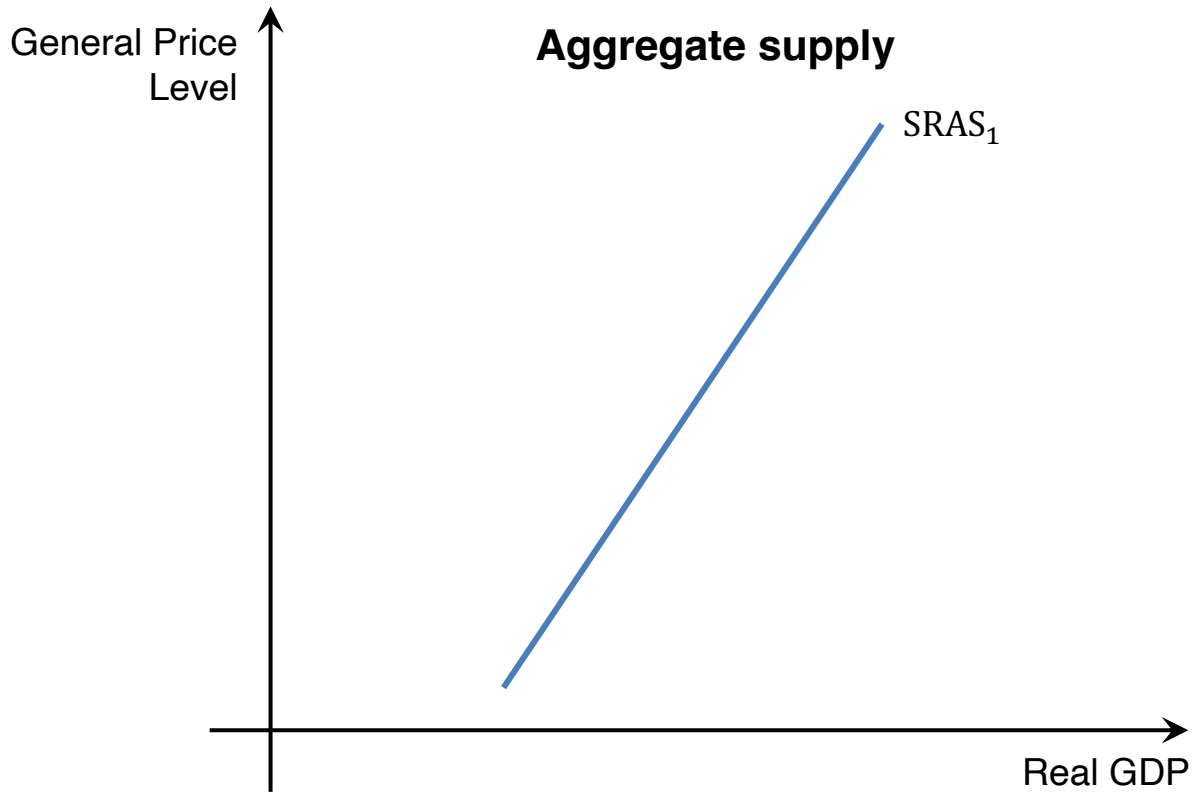
The Monetarist model separates aggregate supply into **short run aggregate supply (SRAS)** and **long run aggregate supply (LRAS).**

The key assumption of the monetarist model is that resource prices are flexible in the long run and eventually adjusts according to changes in the general price level.

Monetarist Model – short run aggregate supply

Short run aggregate supply (SRAS) shows the relationship between real GDP and the price level in the short run.

As price levels rise, in the short run (while resource costs are fixed), there is a greater profit margin and incentive for producers to increase output. Hence, the SRAS curve is upward sloping.



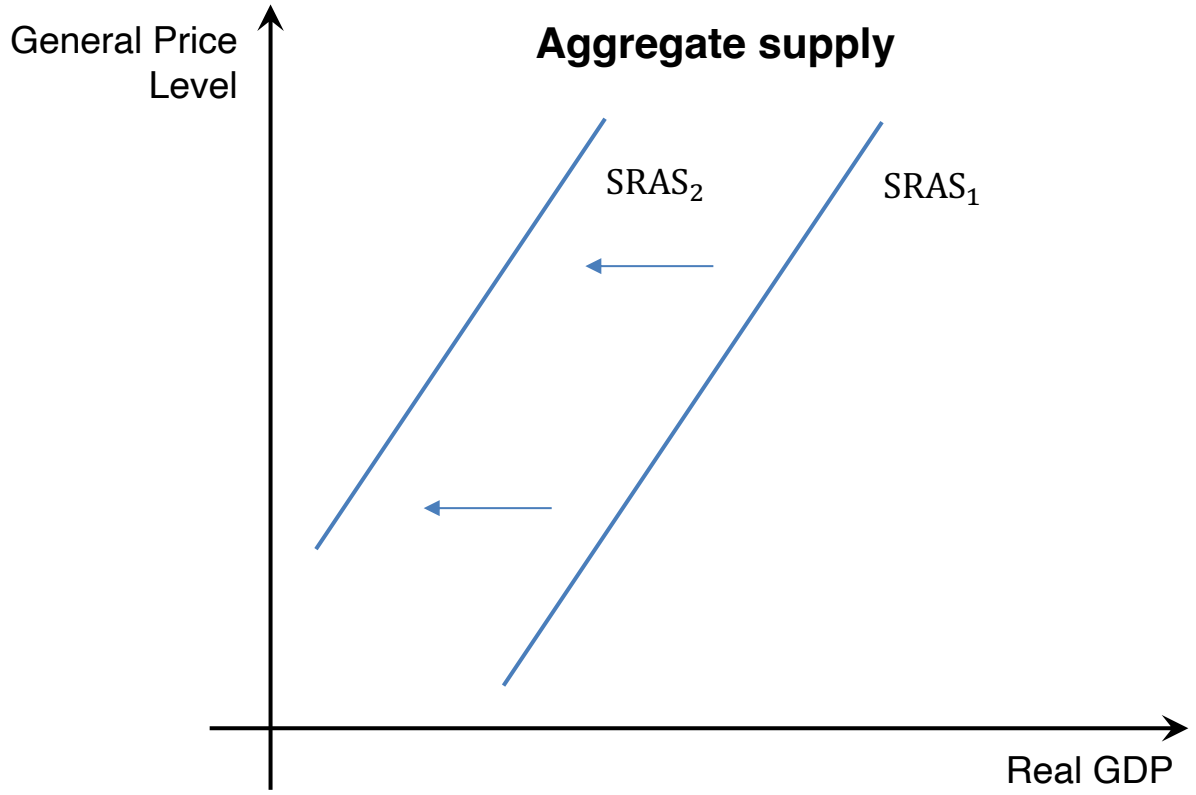
Monetarist Model – shifts of the SRAS curve

The determinants of SRAS include

- factors of production costs
- indirect taxation

An increase in the costs of production or a rise in indirect taxes will reduce the willingness and ability of firms to produce goods and services.

As such, the SRAS curve will shift inwards.



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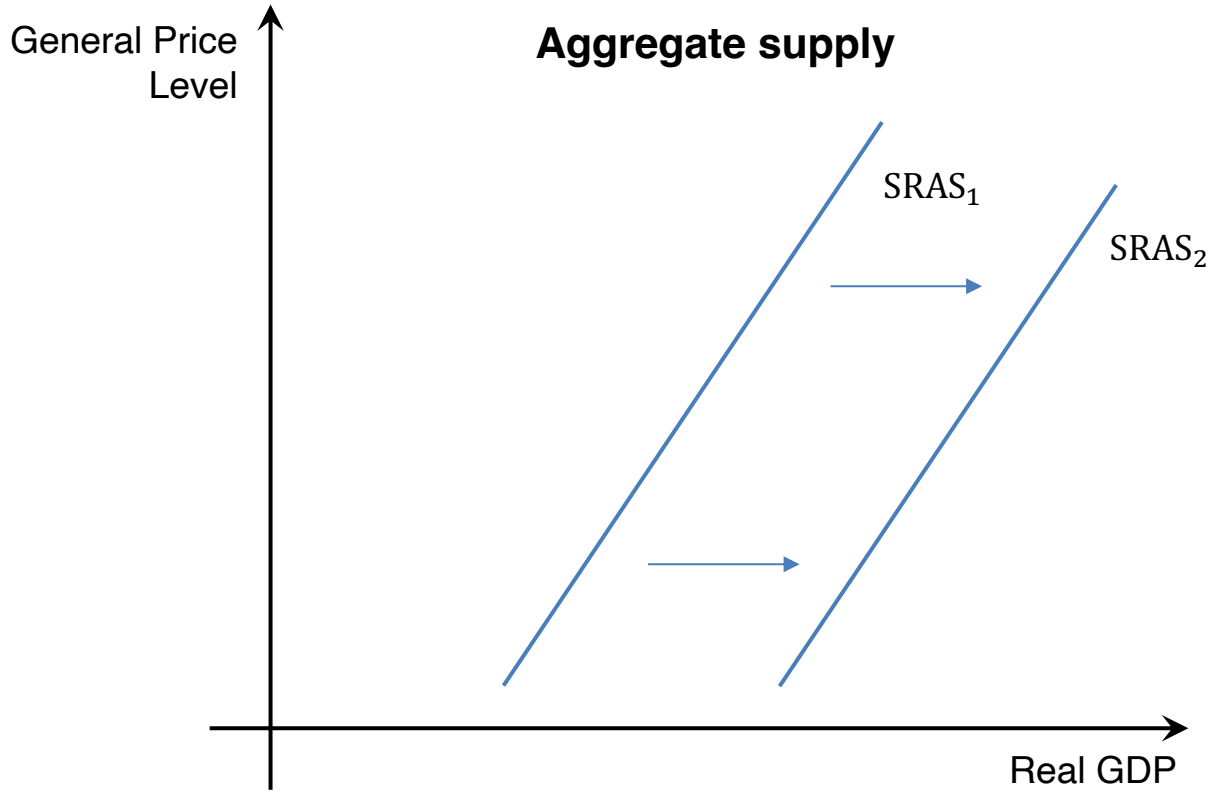
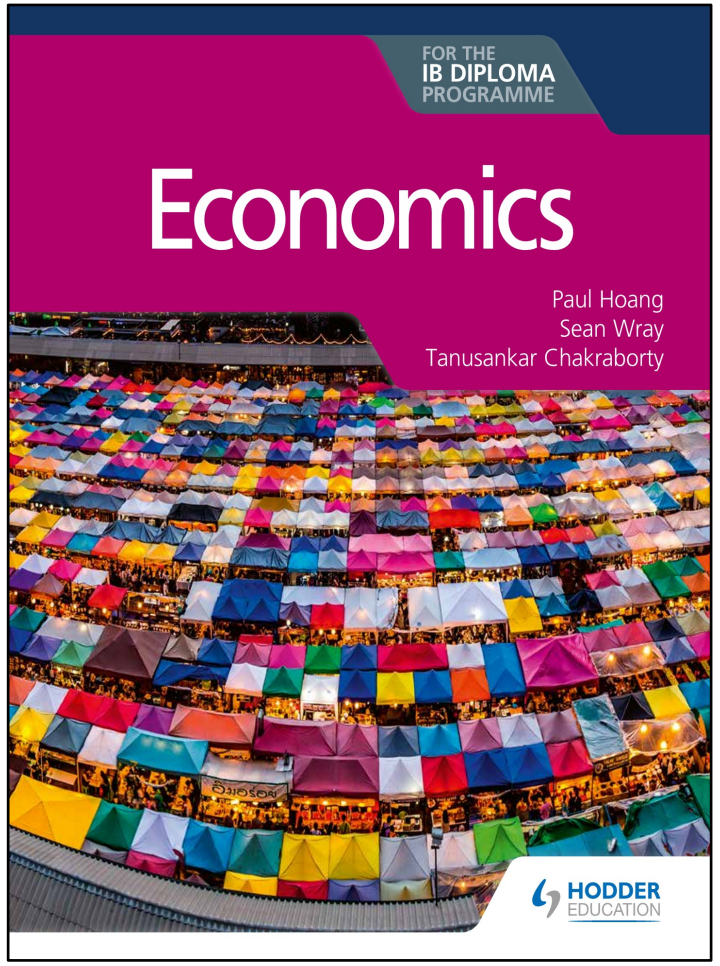


Over to you…

Hoang, Wray, & Chakraborty (2020)

Economics for the IB Diploma Programme

- Page 251-252
- Paper 2 and 3 Exam Practice Question 17.1+17.2
- [4 marks] + [4 marks]

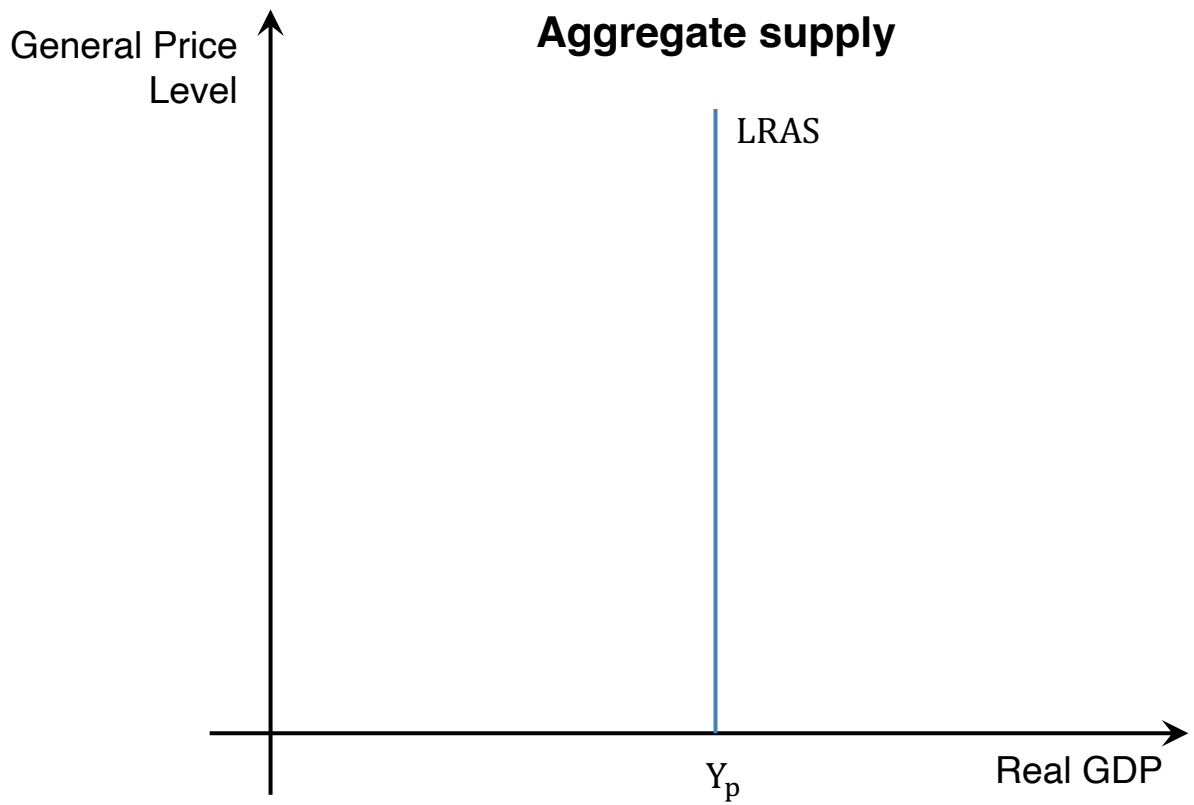


Monetarist Model – long run aggregate supply

Long run aggregate supply (LRAS)

shows the relationship between real GDP and the price level in the long run.

In the long run, resource prices change to match the general price level changes of goods and services. Therefore, there is no incentive to increase or decrease production with price level changes as profit margins remain constant.



Keynesian Model

The Keynesian model holds a different set of assumptions on resource cost and price flexibility.

Keynesians believe that resource prices, especially wages, do not fall in the long run due to:

- labour contracts
- minimum wage legislation
- worker and union resistance to wage cuts
- some firms may prefer to cut workers rather than wages

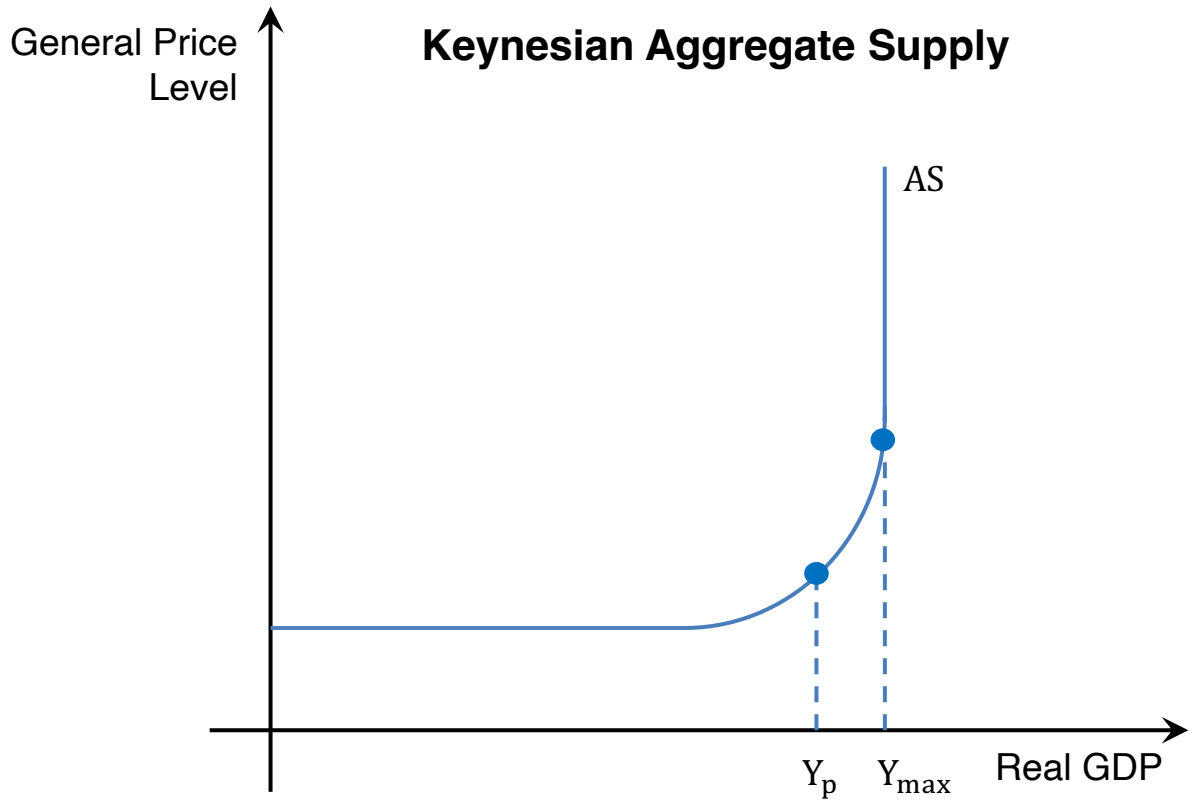
If wages are "*sticky downwards*", firms will avoid lowering prices beyond a certain point.

Keynesian Model – aggregate supply

In the Keynesian AS model, there is no distinction between the short run and long run.

Keynes famously stated, “In the long run, we are all dead!”

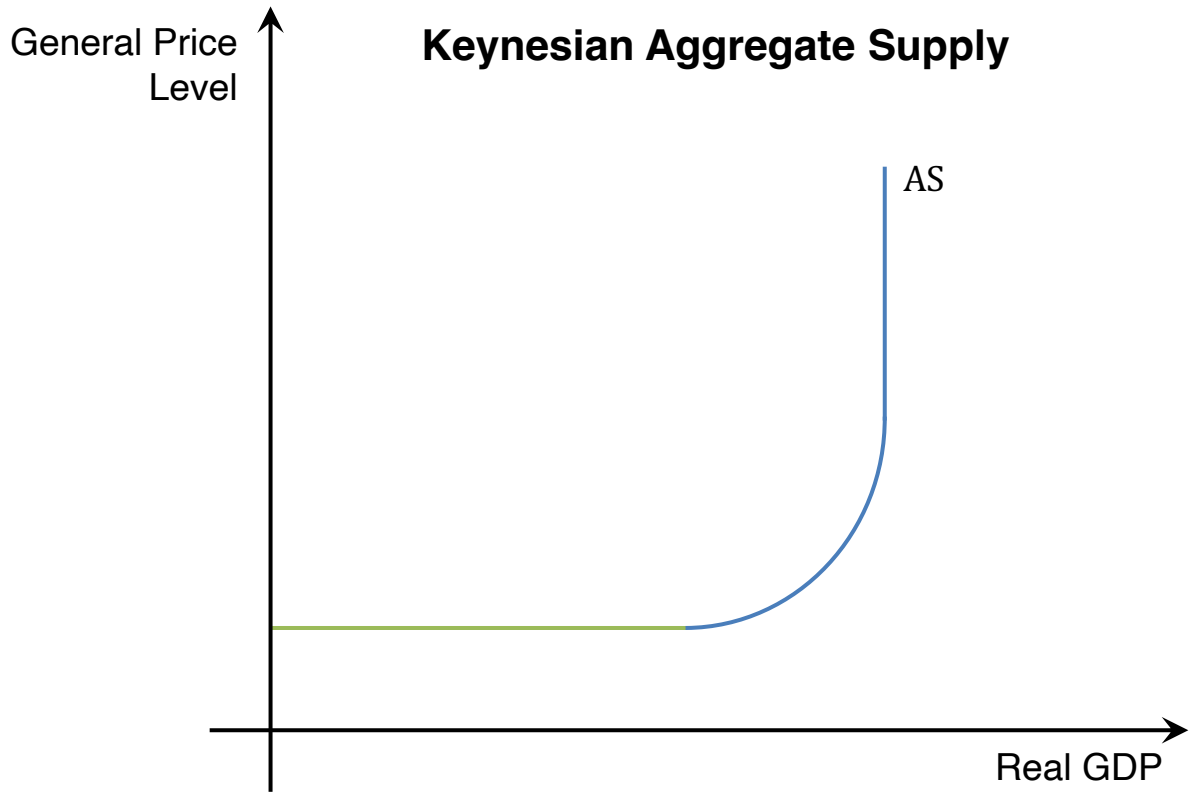
The Keynesian AS is split into three sections.



Keynesian Model – aggregate supply

In the perfectly elastic portion of AS, price levels do not fall beyond a certain point due to labour contracts, minimum wage legislation, and labour union resistance to wage cuts.

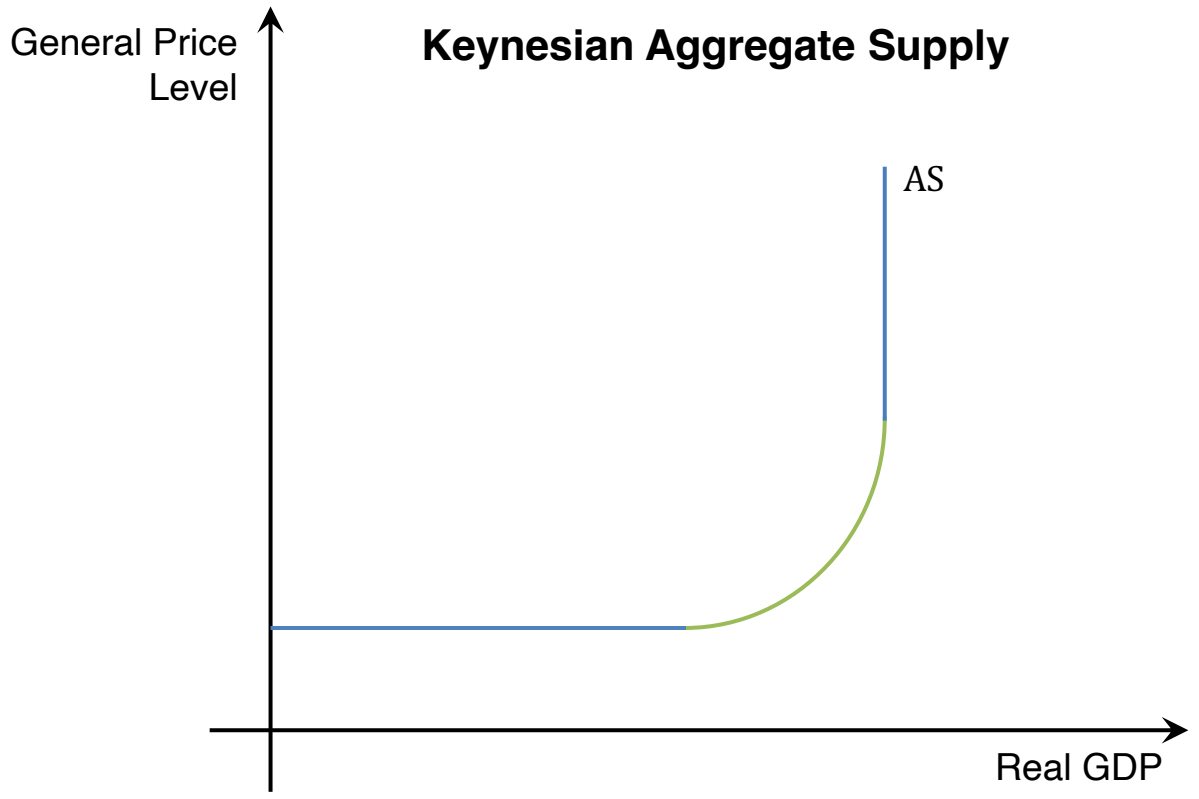
Increases in AD will not increase price levels due to **spare capacity**; firms can increase their output without needing to purchase additional resources.



Keynesian Model – aggregate supply

As spare capacity diminishes, firms need more resources to increase production e.g., hiring more workers and purchasing more raw materials.

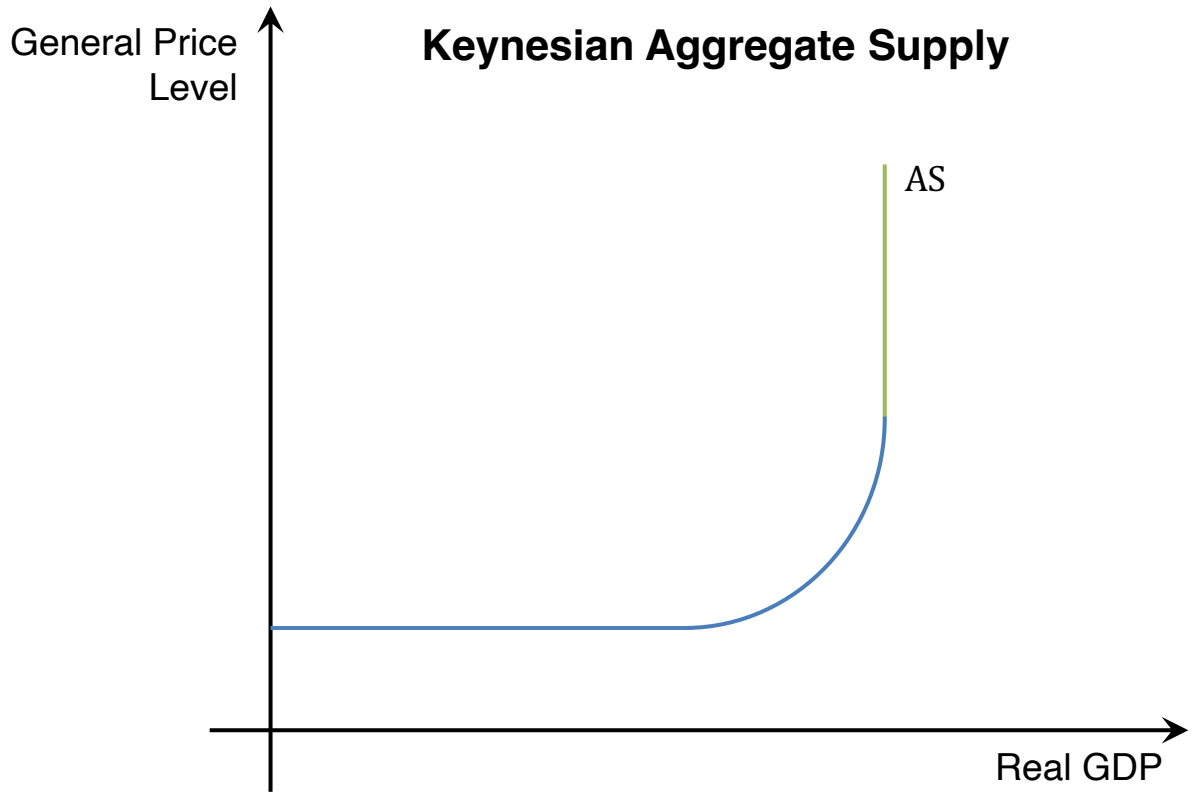
Hence, the AS curve is upward sloping and relatively price elastic, with the general price level increasing due to the increase in real GDP.



Keynesian Model – aggregate supply

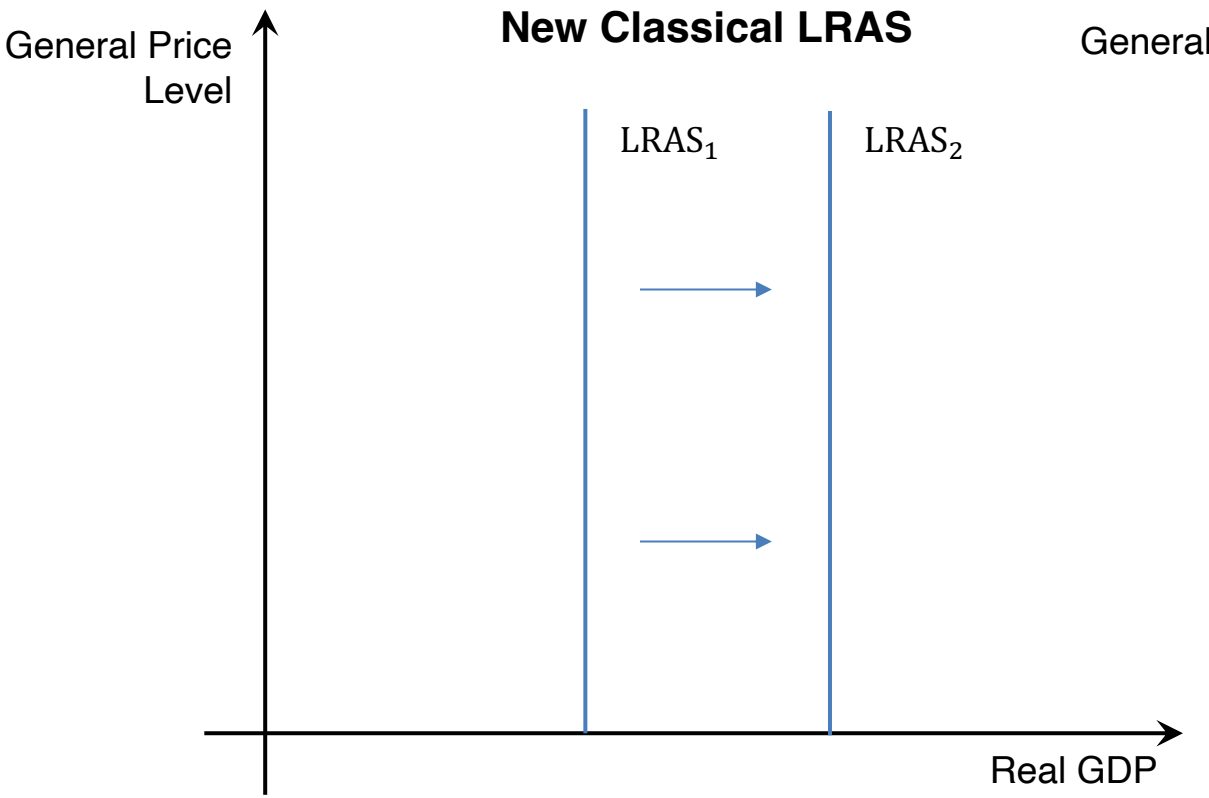
In the perfectly inelastic portion of the AS curve, the economy is fully utilizing all available resources, with no spare capacity.

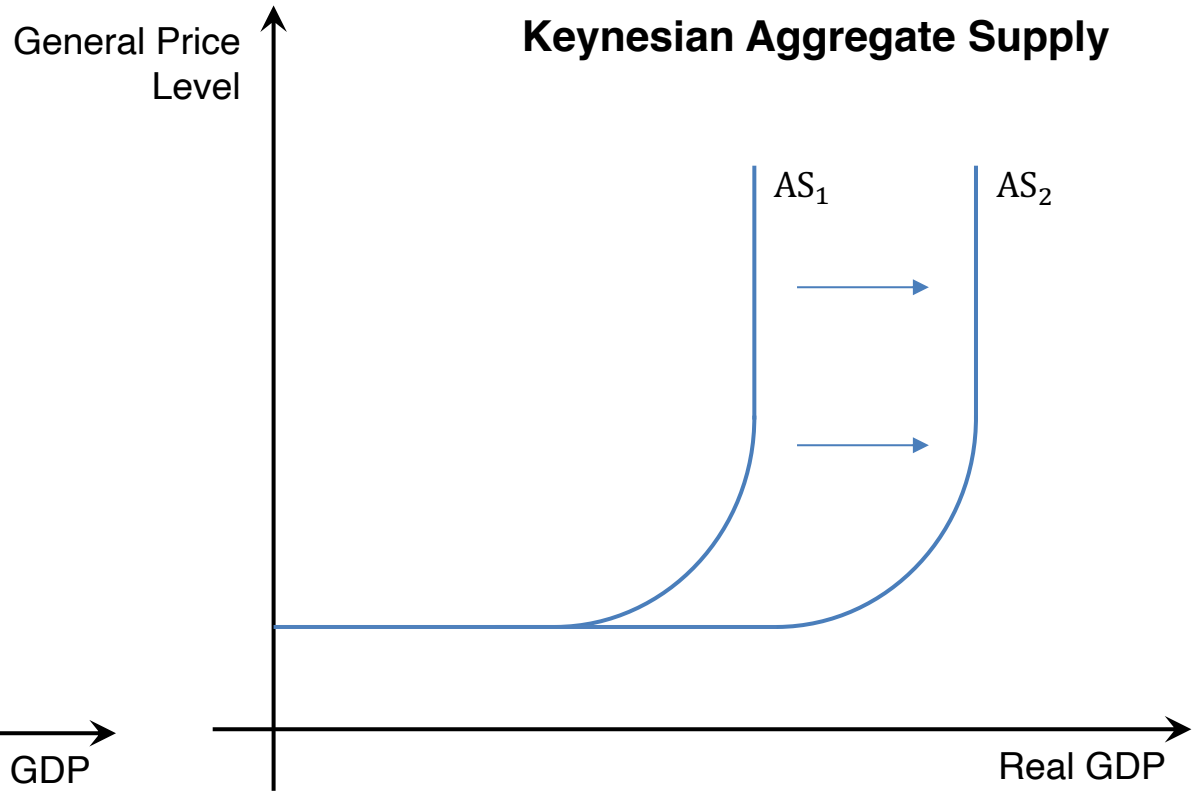
Any increases in AD will only lead to a higher general price level without any increase in real GDP.



Shifts in Aggregate Supply

LRAS or Keynesian AS may shift outwards due to improvements in the quantity and/or quality of the factors of production, improvements in technology, increases in efficiency, or changes in institutions.



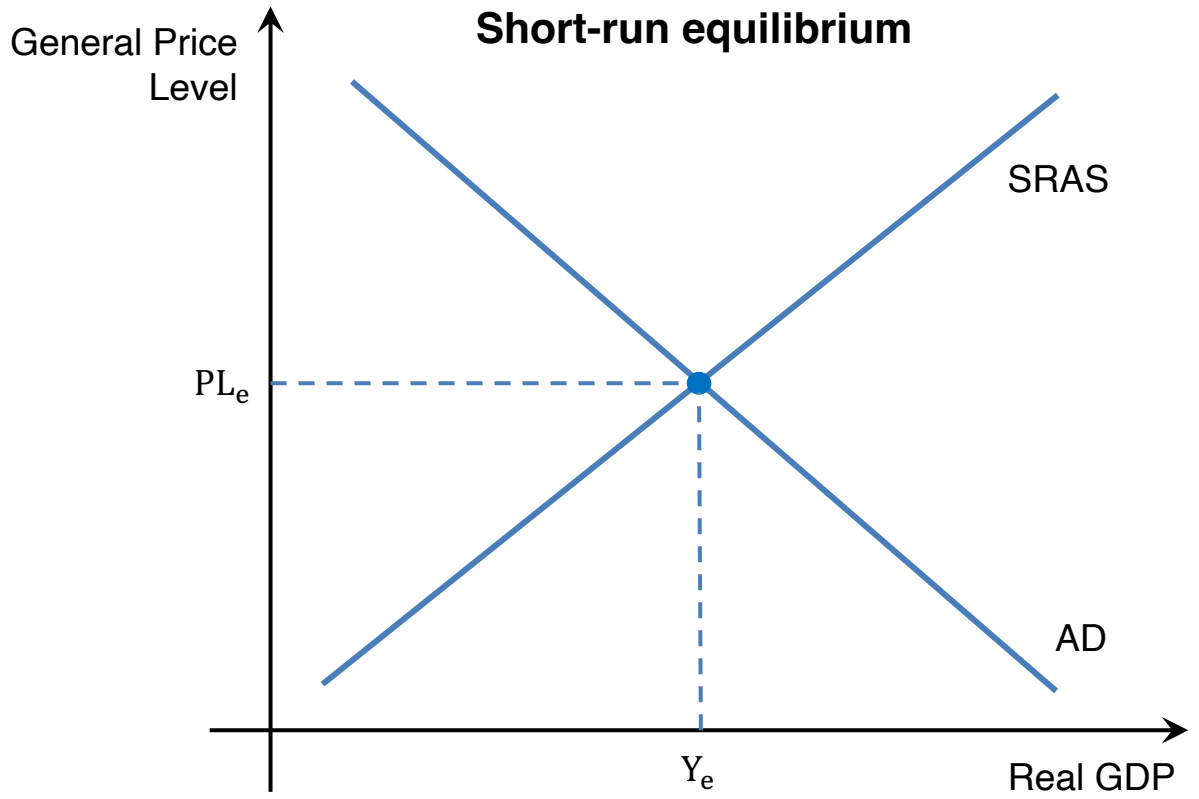


Test your knowledge on this unit: Kahoot!

Macroeconomic equilibrium

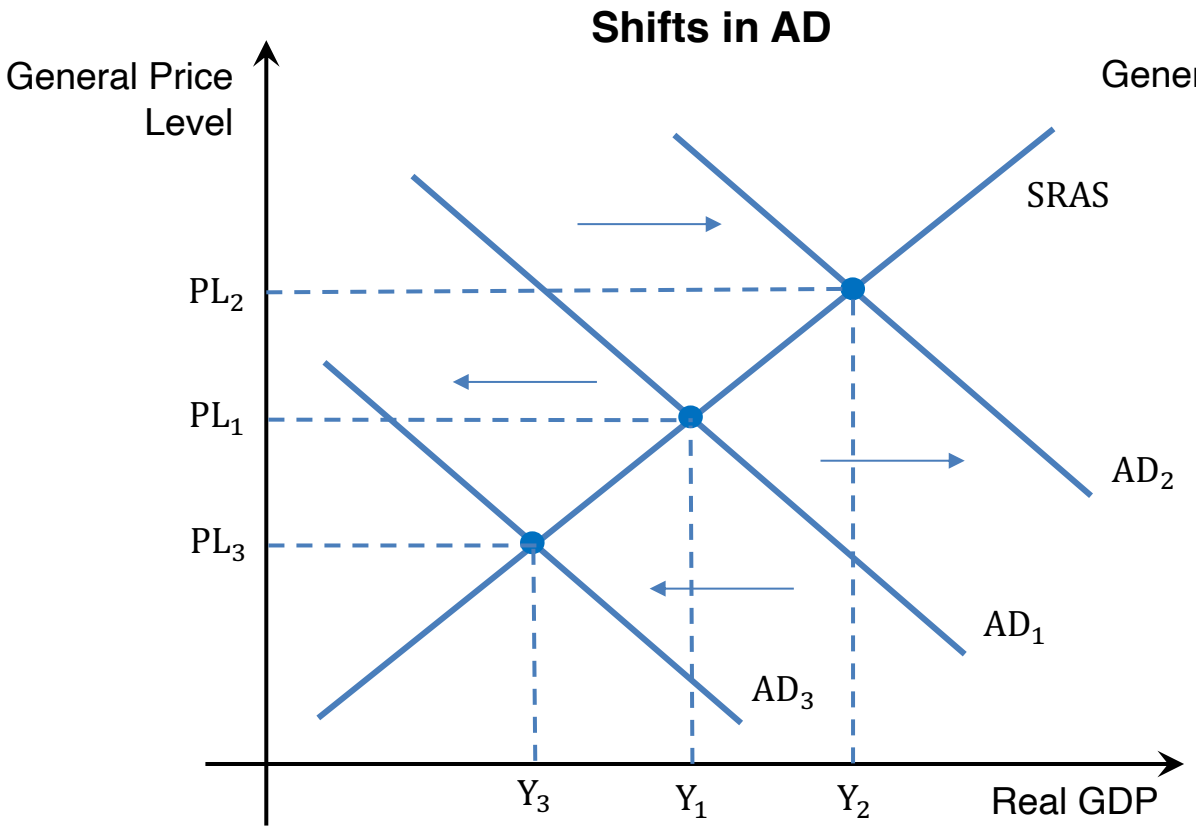
Monetarist Model – short run equilibrium

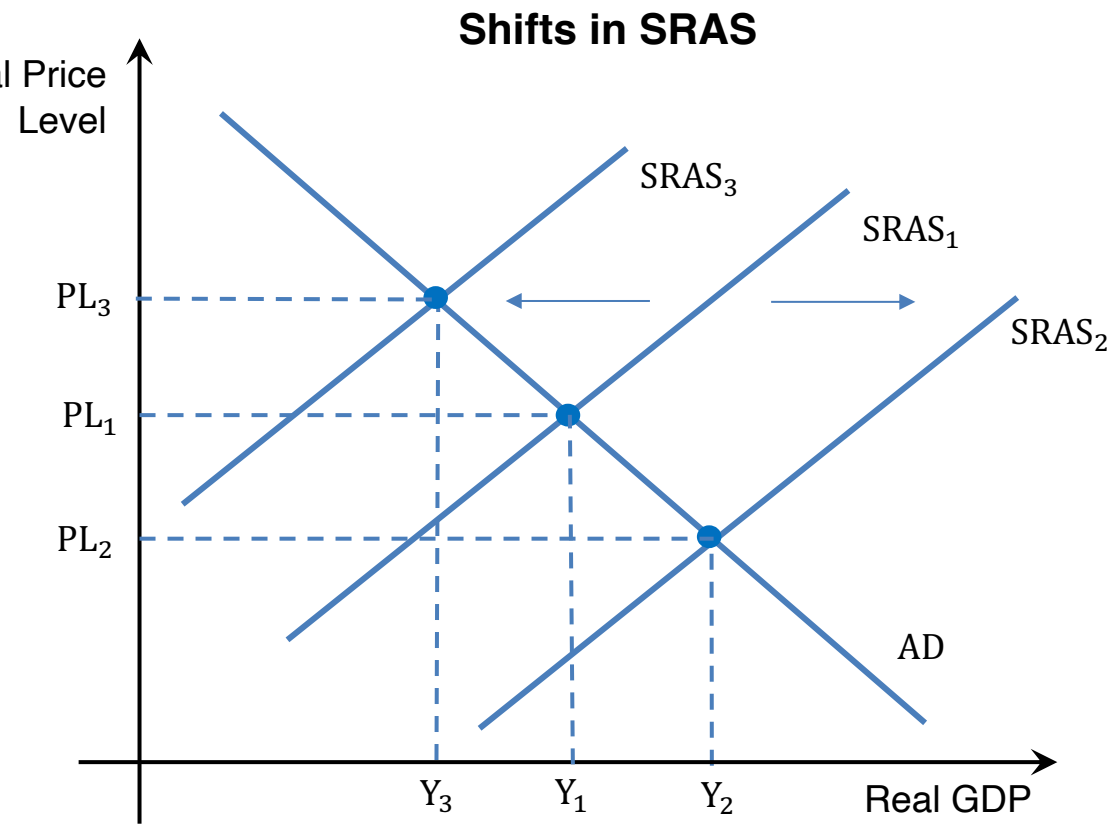
In the monetarist model, the **short run macroeconomic equilibrium** occurs when SRAS is equal to AD, resulting in the equilibrium price level PLe and real GDP Ye.



Macroeconomic Equilibrium – New Classical Model

Shifts in AD and SRAS may result in a new short run macroeconomic equilibrium with changes in the price level and real GDP.

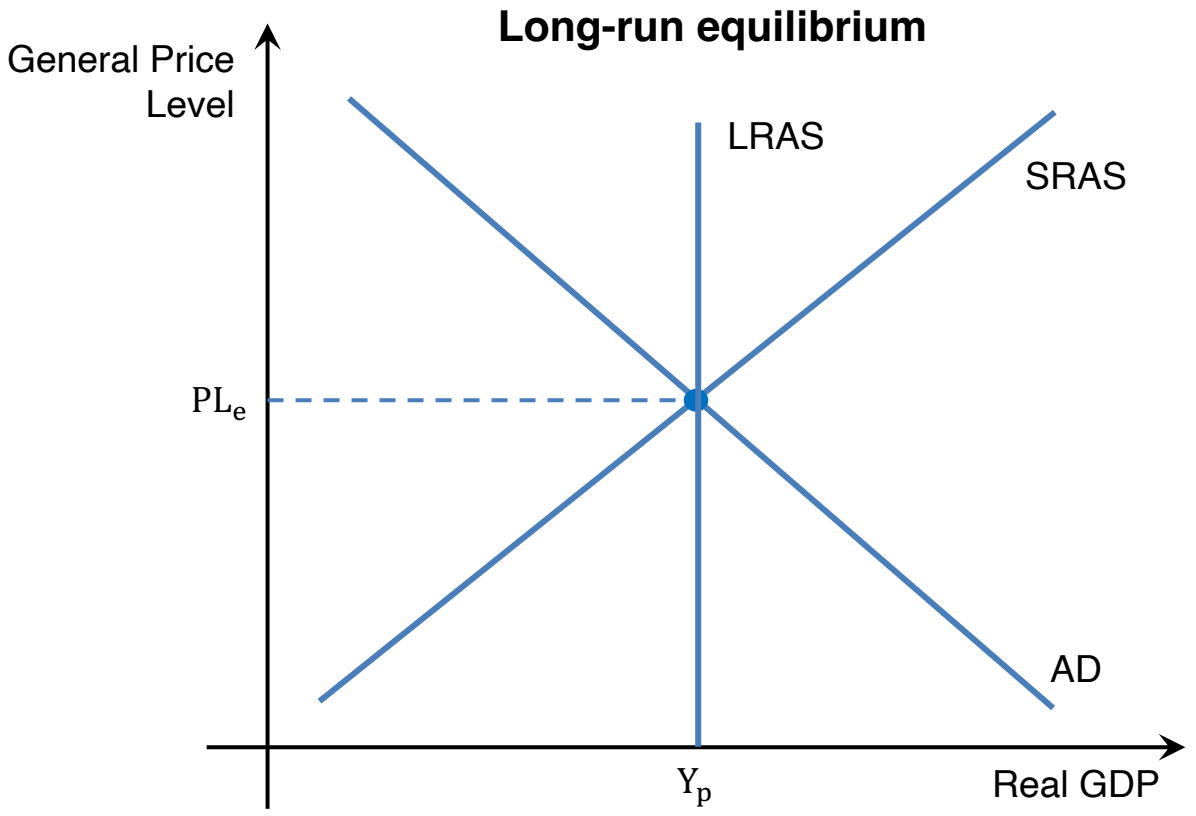




Monetarist Model – long run equilibrium

Long run equilibrium occurs where

AD = SRAS = LRAS at the **full employment level of output (potential output)** Y_p at price level PL_e.



Full Employment and the Natural Rate of Unemployment

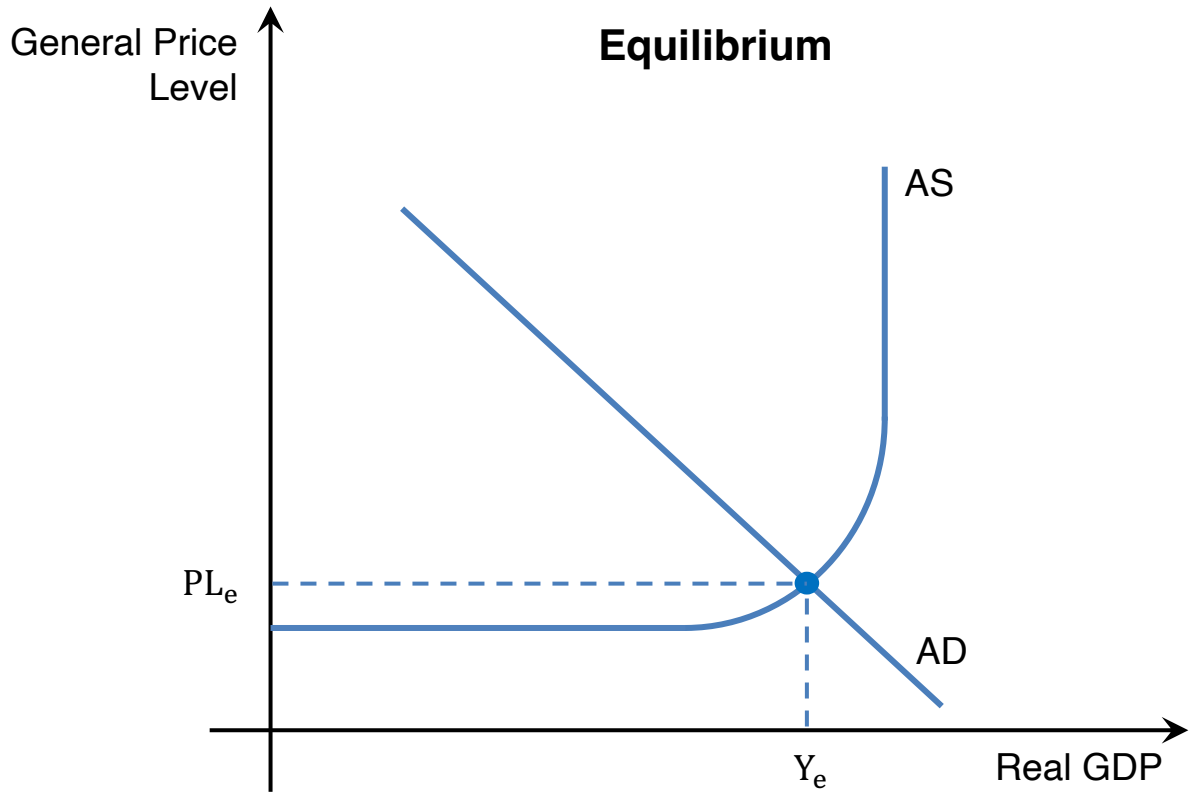
Full employment does not mean a complete absence of unemployment. Every economy will experience a **natural rate of unemployment (NRU)** which comprises of:

- Frictional unemployment where people in between jobs.
- Seasonal unemployment where demand for a specific kind of work changes with the seasons.
- Structural unemployment where there is mismatch between skills available and required.

At full employment, there is an absence of cyclical unemployment which occurs due to downturns in the business cycle i.e., unemployment due to insufficient levels of AD.

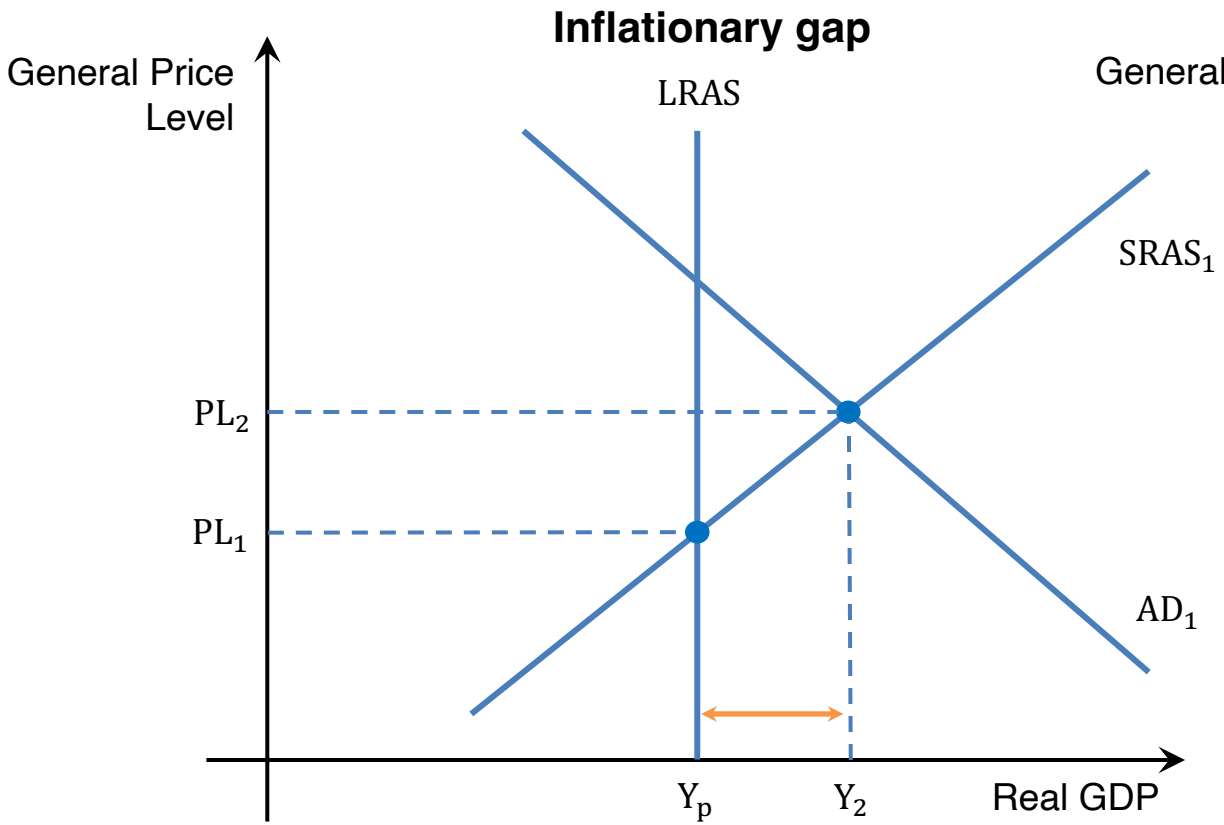
Keynesian Model – equilibrium

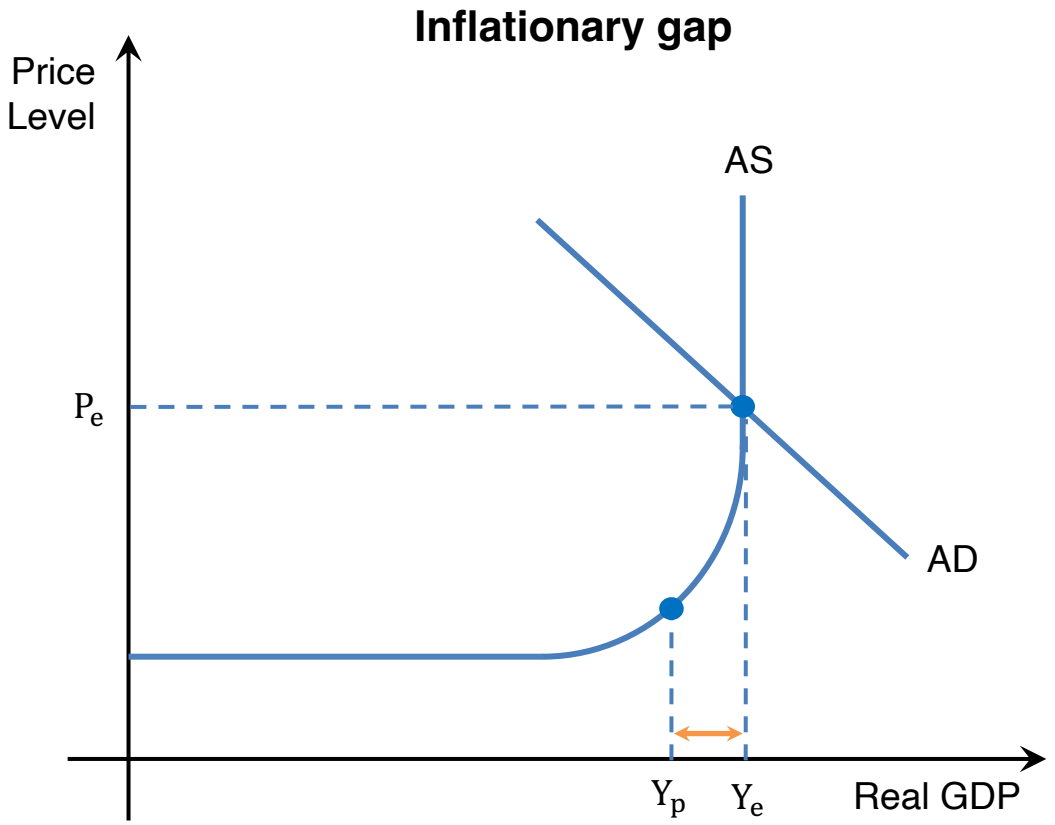
In the Keynesian model, the **macroeconomic equilibrium** occurs when AS is equal to AD, resulting in the equilibrium price level PL_e and real GDP Y_e.



Inflationary and deflationary gaps

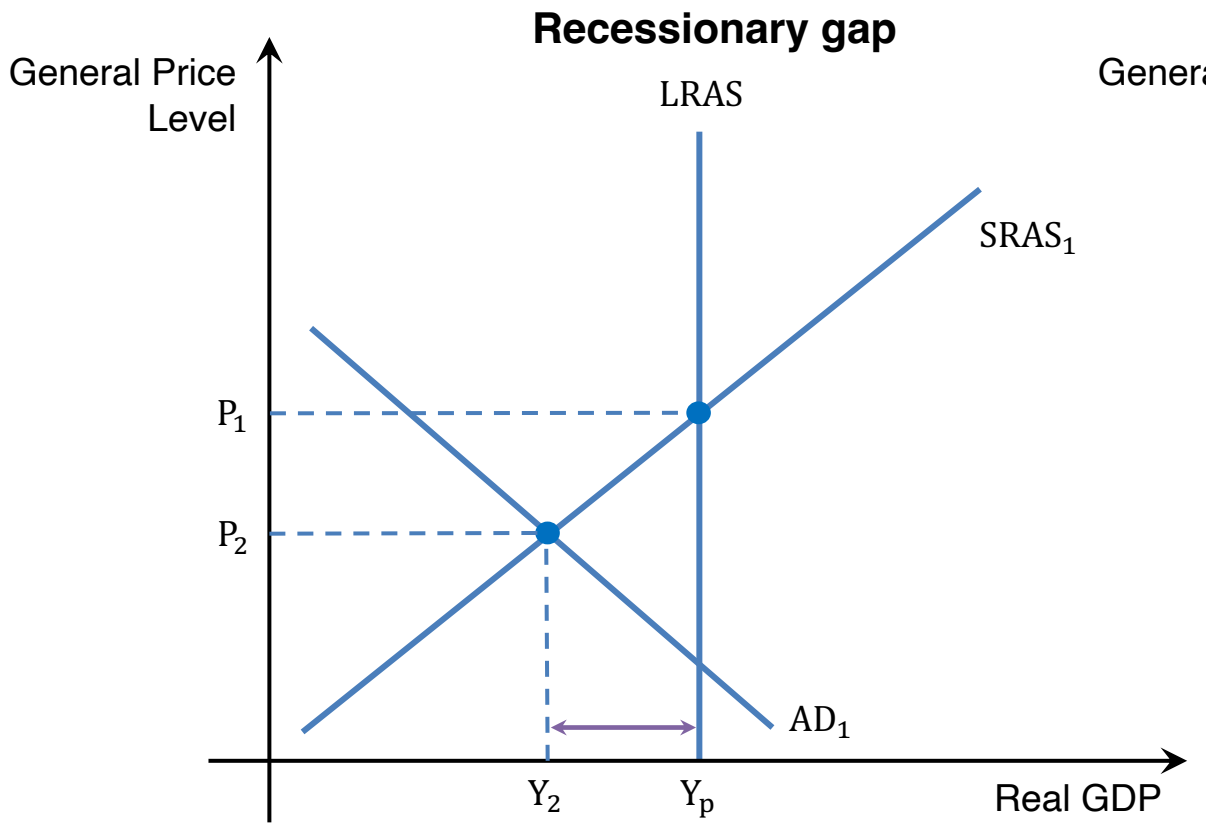
An **inflationary gap** occurs when actual real GDP is greater than the potential level of GDP at full employment level of output. Inflationary gaps are usually caused by excess levels of AD

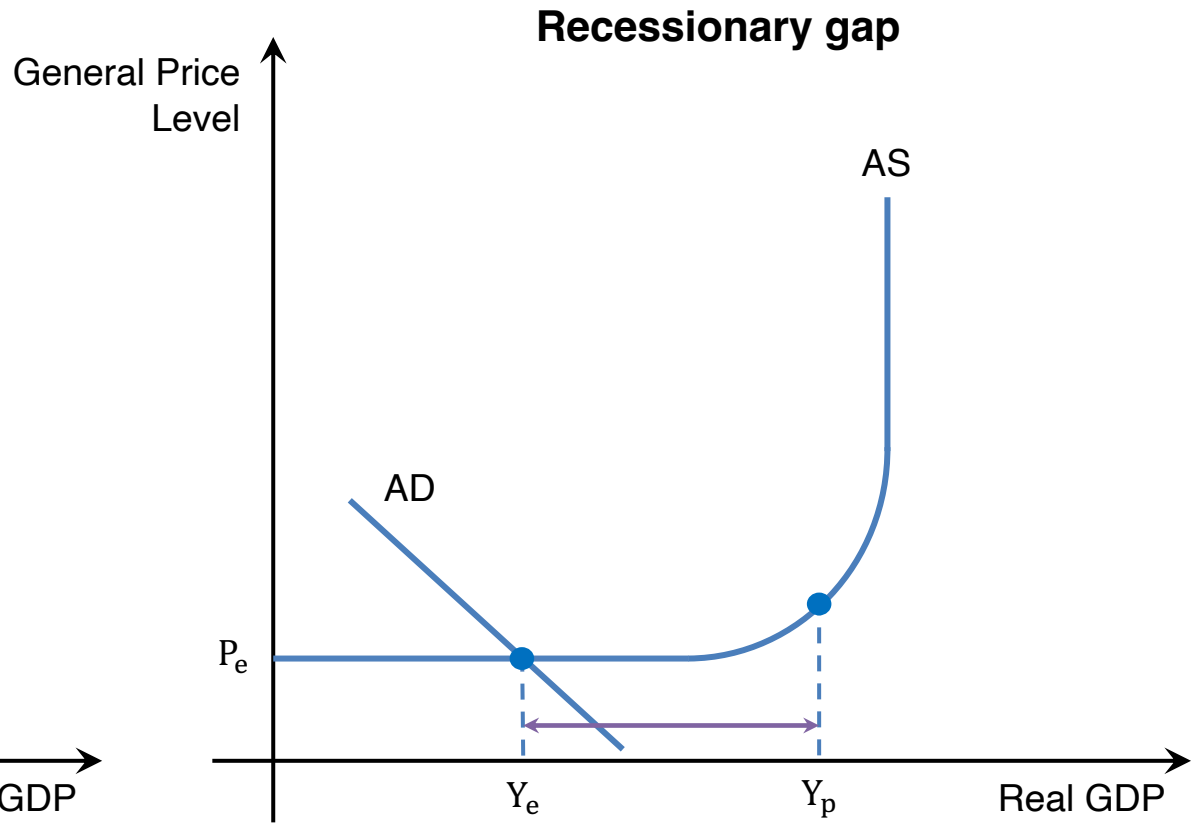




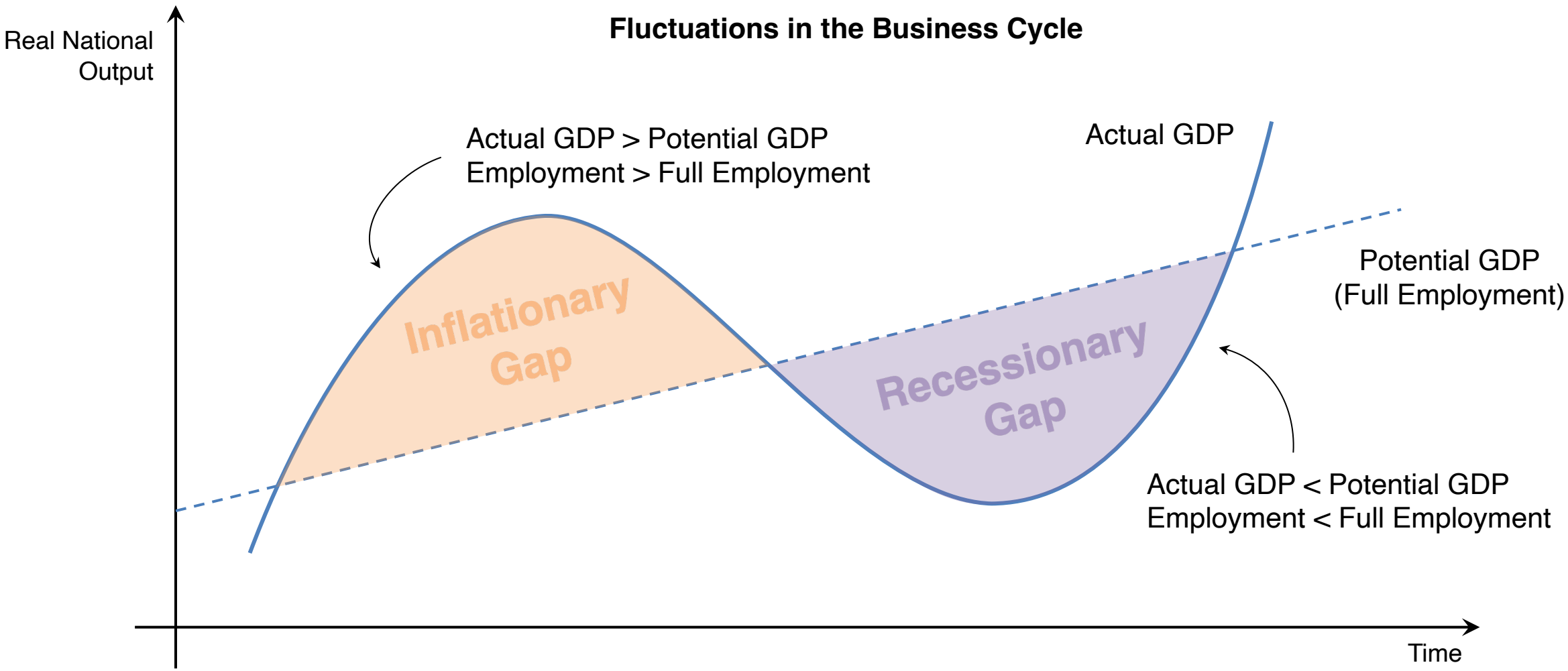
Inflationary and deflationary gaps

A **deflationary/recessionary gap** occurs when actual real GDP is less than the potential level of GDP at full employment level of output. Deflationary gaps are usually caused by insufficient AD.





Inflationary and deflationary gaps in the business cycle

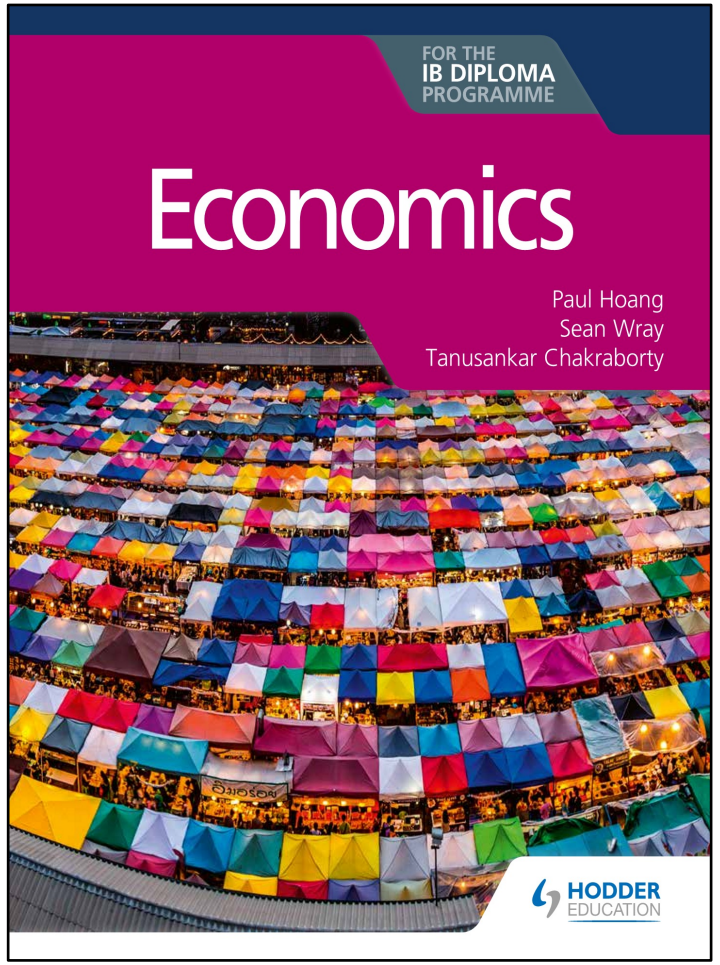


Over to you…

Hoang, Wray, & Chakraborty (2020)

Economics for the IB Diploma Programme

- Page 257
- Paper 3 Exam Practice Question 17.4
- [1 + 2 + 2 + 1 marks]



Real world example – Artificial Intelligence

The White House proposed government spending on artificial intelligence (AI) and quantum information sciences research and development in its 2021 budget proposal.

Read the article and answer the following questions.

Real world example – Artificial Intelligence

Article: Trump administration to propose big jump in funding for AI, Quantum R&D

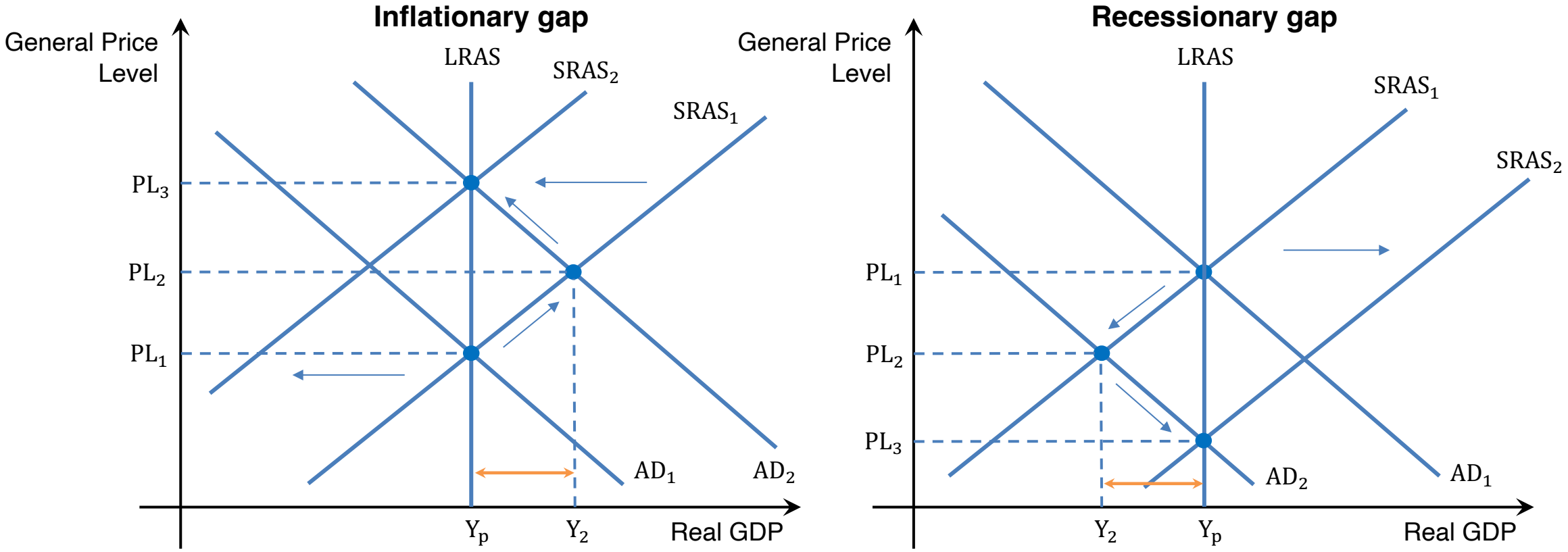
1. What is meant by the term budget proposal (line 3)?

2. Explain the impact that the increased spending on AI and Quantum Computing is likely to have on economic growth.

3. With the use of a diagram, illustrate the effect that this spending would have on the long-run equilibrium level of real output and prices in the US economy.

Automatic adjustment to full employment equilibrium

In the short run, there may be inflationary or deflationary gaps in the New Classical Model, but these are always temporary. Automatic adjustments of market forces will eventually restore the economy back to the long run equilibrium at the level of potential output.

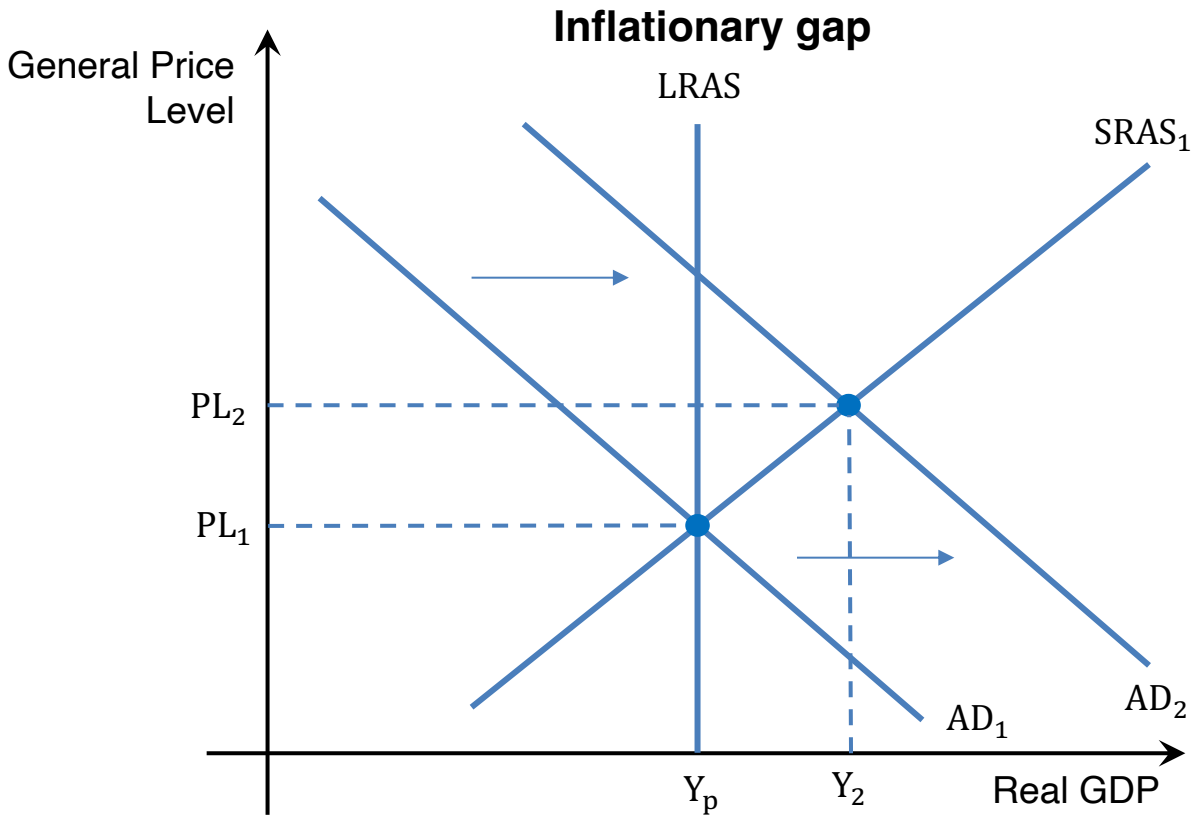


Automatic adjustment to full employment equilibrium

Restoring an inflationary gap

1. Assume an economy is in long run equilibrium where AD=SRAS=LRAS resulting in PL1 and Yp.

2. Suppose there is an increase in AD from AD1 to AD2, resulting in an inflationary gap where Y2 > Yp and price levels increase from PL1 to PL2.

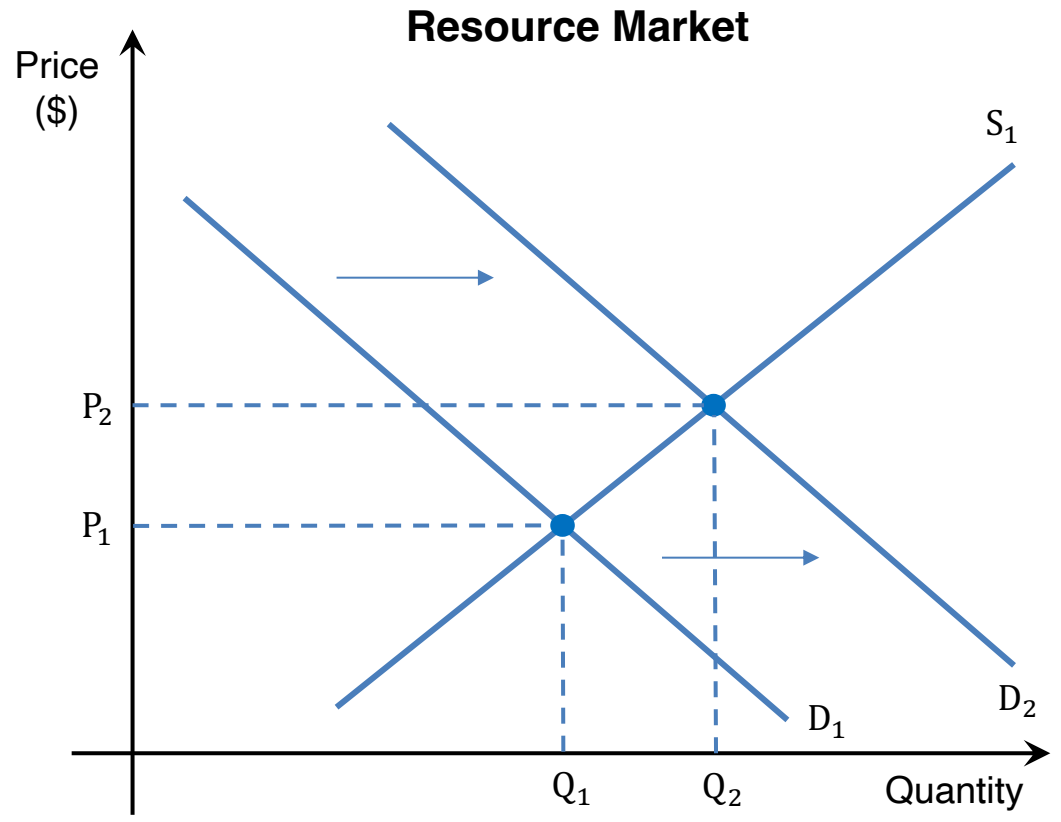


Automatic adjustment to full employment equilibrium

Restoring an inflationary gap

3. At the Y2 level of real GDP, firms are producing more goods and services compared to Yp which requires more resources.

   In the resource market, the demand for resources such as labour is increasing, resulting in a higher price of resources.

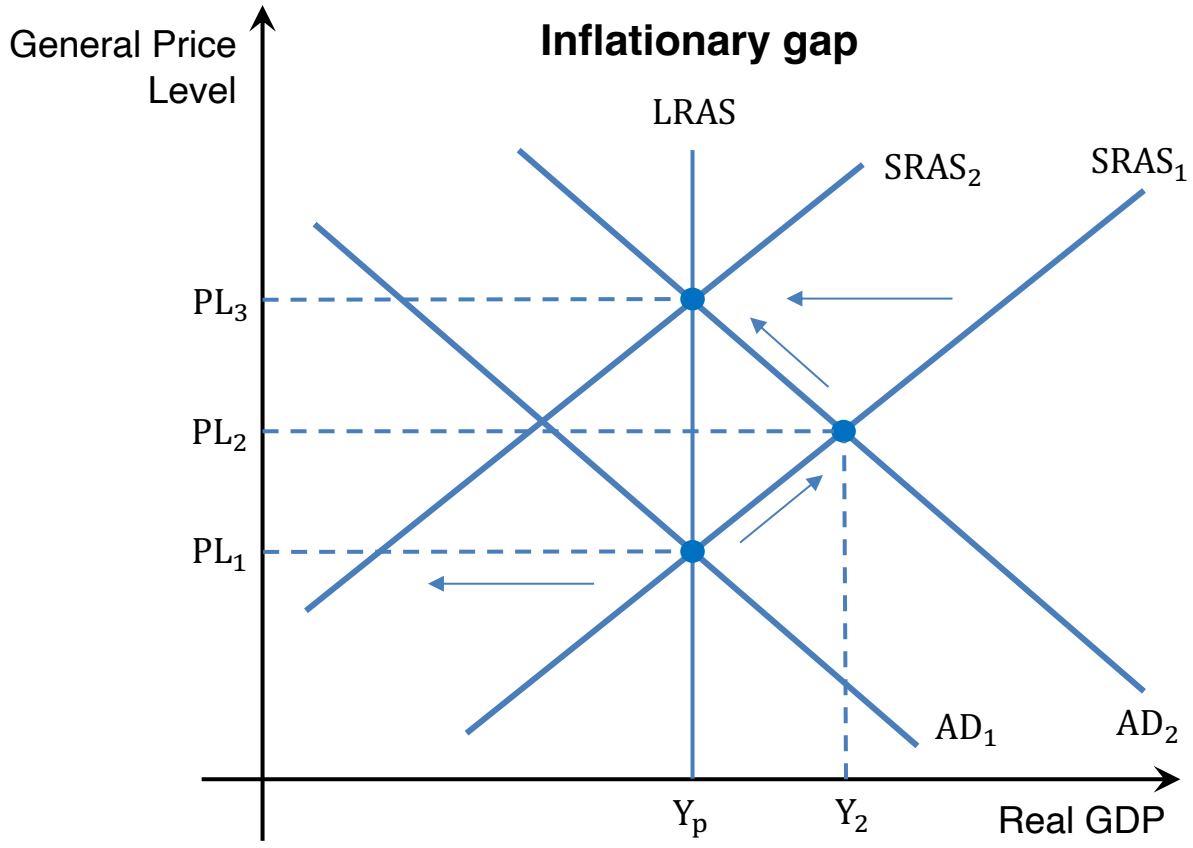


Automatic adjustment to full employment equilibrium

Restoring an inflationary gap

4. When the price of resources increase, this negatively impacts SRAS resulting in a shift to SRAS2. Real GDP returns to Yp and price levels increase further from PL2 to PL3.

5. The full employment level of output is restored at Yp and the economy returns to its long run equilibrium.



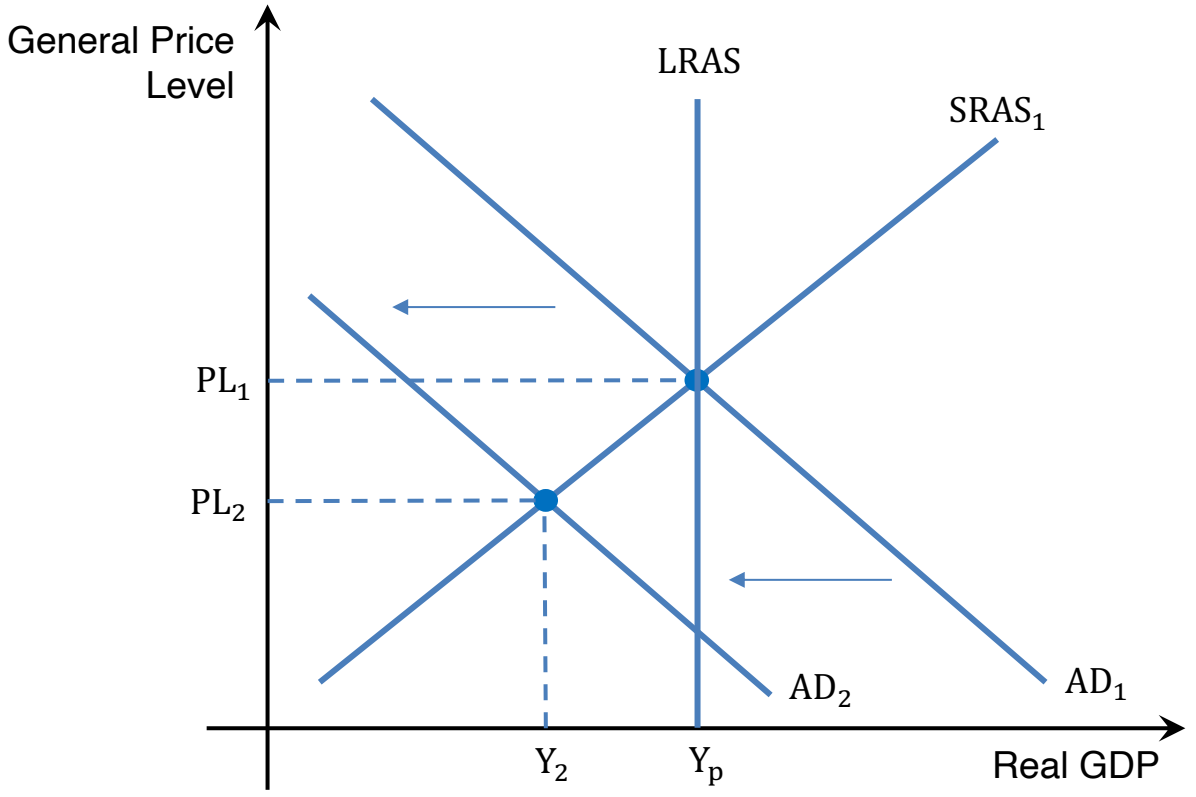
Automatic adjustment to full employment equilibrium

Restoring a recessionary gap

1. Assume an economy is in long run equilibrium where AD=SRAS=LRAS resulting in PL1 and Yp.

2. Suppose there is a decrease in AD from AD1 to AD2, resulting in a recessionary gap where Y2 < Yp and price levels fall from PL1 to PL2.

Recessionary gap

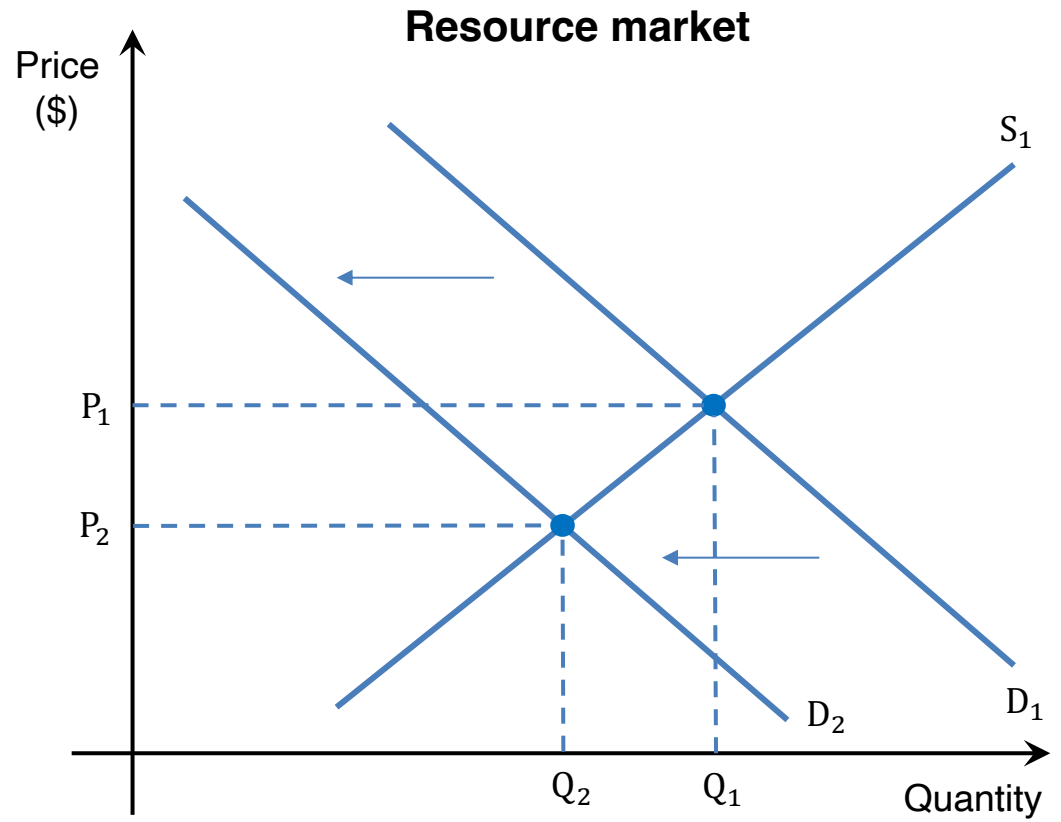


Automatic adjustment to full employment equilibrium

Restoring a recessionary gap

3. At the Y2 level of real GDP, firms are producing less goods and services compared to Yp which leads to unemployment.

   In the resource market, the demand for resources such as labour is falling, resulting in a lower price of resources.

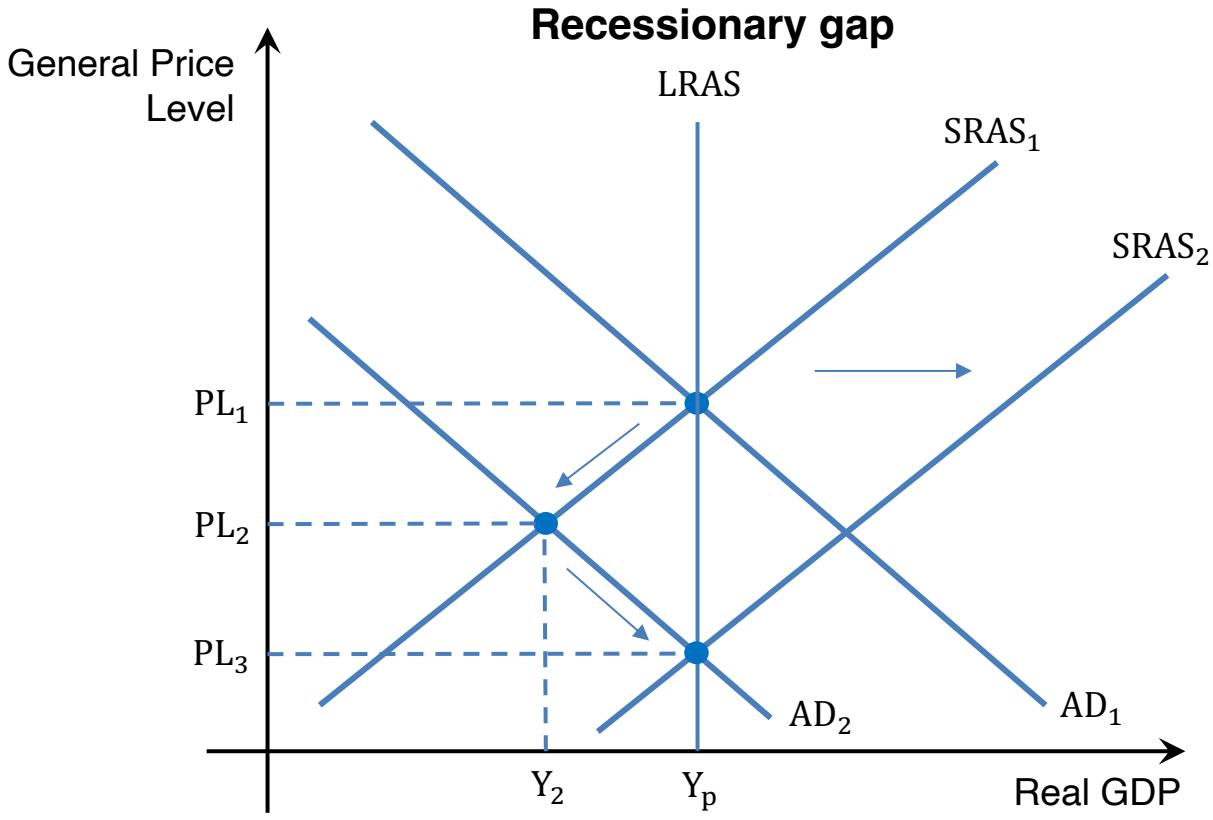


Automatic adjustment to full employment equilibrium

Restoring a recessionary gap

4. When the price of resources fall, this increases SRAS resulting in a shift to SRAS2. Real GDP returns to Yp and price levels fall further from PL2 to PL3.

5. The full employment level of output is restored at Yp and the economy returns to its long run equilibrium.



Over to you…

Hoang, Wray, & Chakraborty (2020)

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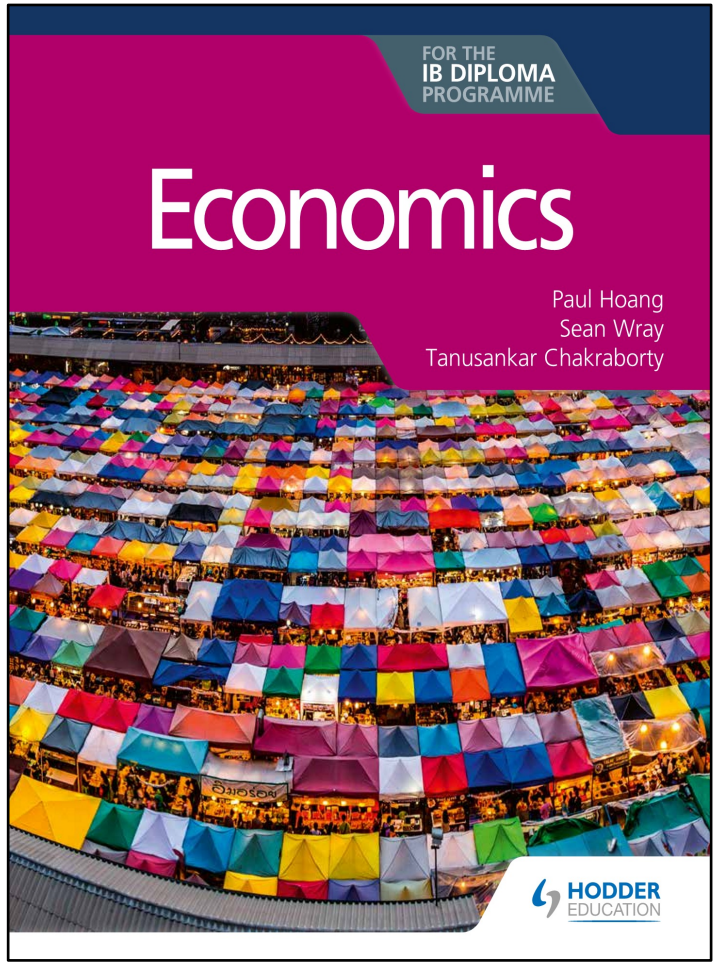
- Page 261
- Paper 2 Exam Practice Question 17.5 + 17.6
- [4 marks] + [4 marks]

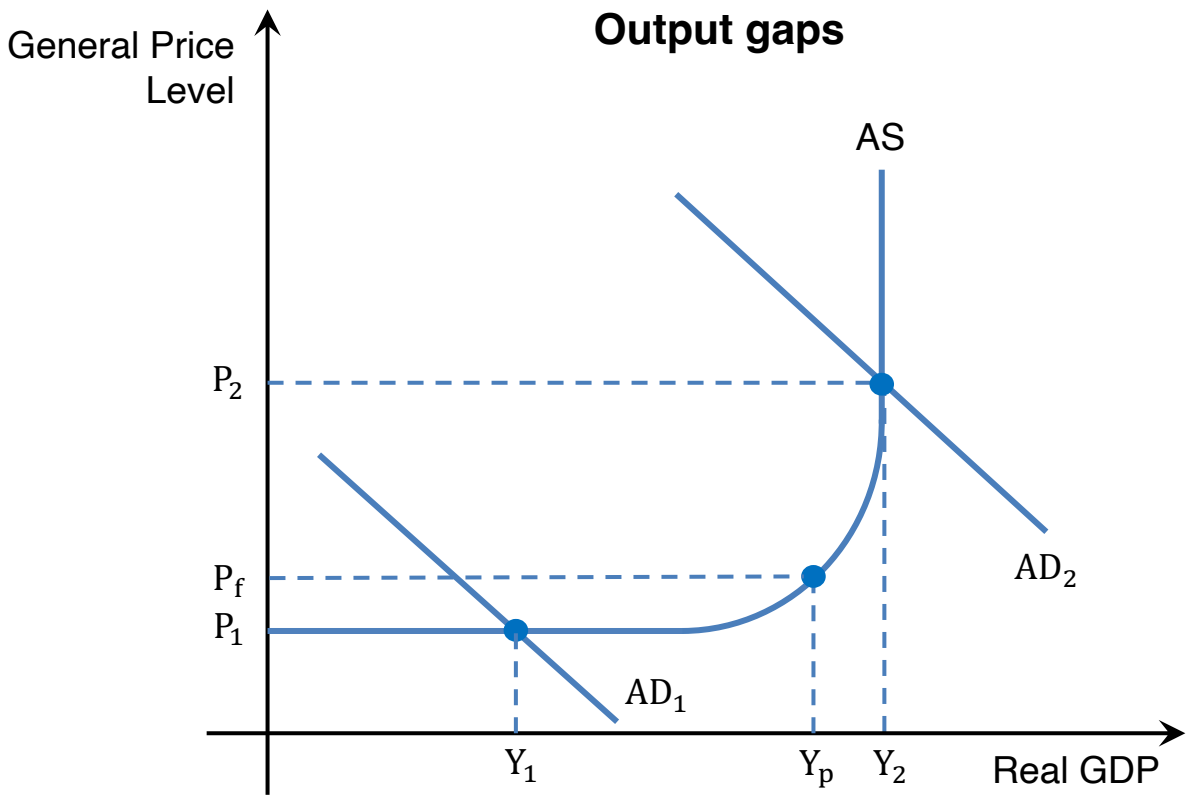


Keynesian Model – long-run output gaps

In the Keynesian model, an economy can remain stuck in a recessionary gap.

This is due to the assumption that **resource prices are inflexible** and therefore market forces cannot automatically adjust AS back to full employment.

Keynesian economists believe that government intervention is necessary to eliminate an output gap with demand-side policies.



Keynesian vs New Classical Model

	Monetarist	Keynesian
Resource prices	Flexible	Sticky downwards
Nature of aggregate supply	SRAS and LRAS	Keynesian AS – 3 sections
Other assumptions	Automatically adjusts to full employment level of output	May be stuck in a recessionary gap
Role of government intervention	Laissez-faire	Demand side policies required to correct recessionary gap

Which types of economies are Monetarist and Keynesian economics more useful for?

Test your knowledge on this unit: Kahoot!