3.5 Demand management (demand side policies) — monetary policy (includes HL only sub-topics)

Learning objectives

3.5 Demand management (demand side policies) – monetary policy (includes HL only sub-topics)	Depth	Diagrams and calculations
Monetary policy • Control of money supply and interest rates by the central bank	AO1	
Goals of monetary policy • Low and stable rate of inflation • Inflation targeting • Low unemployment • Reduce business cycle fluctuations • Promote a stable economic environment for long-term growth • External balance	AO2	

Learning objectives

3.5 Demand management (demand side policies) – monetary policy (includes HL only sub-topics)	Depth	Diagrams and calculations
The process of money creation by commercial banks (HL only)	AO2	
Tools of monetary policy (HL only) • Open market operations • Minimum reserve requirements • Changes in the central bank minimum lending rate (base rate/discount rate/refinancing rate changes) • Quantitative easing	AO2	
Demand and supply of money – determination of equilibrium interest rates (HL only)	AO2 AO4	Diagram (HL only): showing the determination of equilibrium interest rates

Learning objectives

3.5 Demand management (demand side policies) – monetary policy (includes HL only sub-topics)	Depth	Diagrams and calculations
Real versus nominal interest rates	AO2	Calculation: real interest rates from given data
Expansionary and contractionary monetary policies to close deflationary/recessionary and inflationary gaps	AO3 AO4	Diagram: AD/AS curves showing expansionary and contractionary monetary policy

Effectiveness of monetary policy
• Constraints on monetary policy, including:
  • limited scope of reducing interest rates, when close to zero
  • low consumer and business confidence
	AO3	

Learning objectives

3.5 Demand management (demand side policies) – monetary policy (includes HL only sub-topics)	Depth	Diagrams and calculations

• Strengths of monetary policy, including:
  • incremental, flexible and easily reversible
  • short time lags
• Strengths and limitations in promoting growth, low unemployment, and low and stable rate of inflation
	AO3	

Starter – data analysis

Source: The Downward Spiral in Interest Rates

Data Analysis Questions

1. What do you notice from the data?
2. What questions do you wonder about the data?
3. Research information that may help you answer your questions from Q2.
4. What conclusions can you make from Q1, Q2, and Q3?

Monetary policy

Monetary policy is carried out by the central bank and involves the control of money supply and interest rates to influence aggregate demand and subsequently fulfil macroeconomic objectives.

Key terms

Central bank: The monetary authority responsible for an economy's monetary policy and financial system regulation.

Interest rates: The cost of borrowing and reward for saving of money, expressed as a percentage.

Money supply: The amount of money circulating in the economy, which includes notes and coins, loans, credits and deposits.

Demand-side policy: Government policy that aims to influence the level of AD of the economy.

Goals of monetary policy

Using the sources below, compare and contrast the objectives of the three central banks:

Source 1: The Federal Reserve

Source 2: The Bank of England

Source 3: European Central Bank

Goals of monetary policy

Low and stable rate of inflation

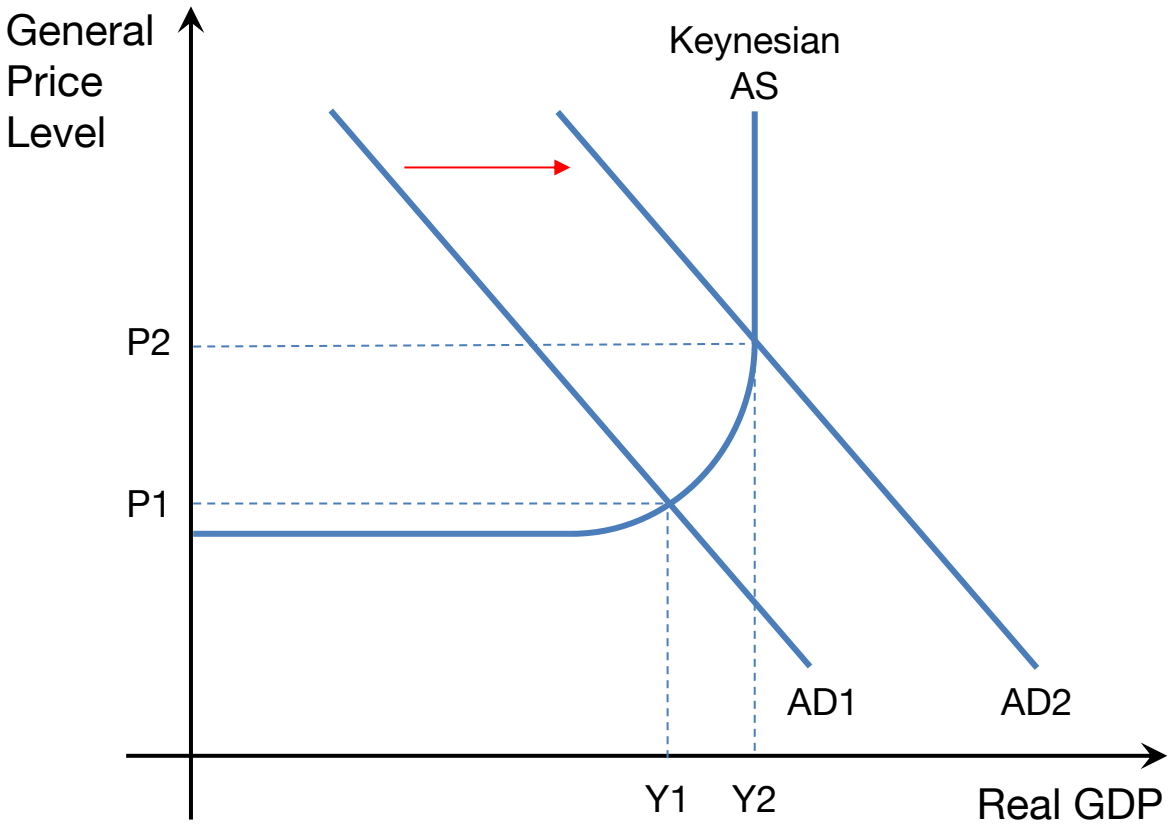
An **inflation target** is the practice of using monetary policy to achieve a predetermined level of inflation. By increasing the transparency of the central bank and controlling inflation, this would create a stable economic environment for consumers and producers.

Real world example

Podcast: Inflation Target Acquired

1. What is the inflation target set by the Federal Reserve?
2. How does the central bank influence inflation rates?

Goals of monetary policy



Low unemployment

The central bank may stimulate the economy by reducing interest rates. This reduces the cost of borrowing for firms and households, encouraging investment and consumption.

- AD increases from AD1 to AD2.
- Real GDP increases from Y1 to Y2.
- Unemployment decreases.

Goals of monetary policy

Reduce business cycle fluctuations

Monetary policy is used to influence the level of economic activity.

At times of an economic downturn, interest rates are lowered to stimulate the economy.

When the economy is booming, interest rates are raised to lower inflationary pressure.

Using an AD/AS diagram, illustrate how the central bank influences the economy by raising interest rates.

Goals of monetary policy

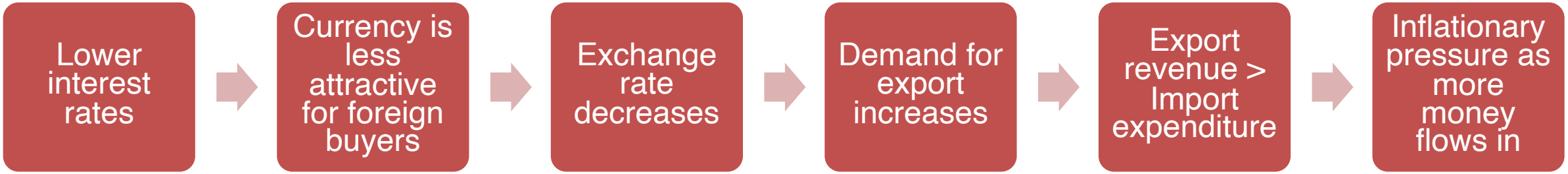
Promote a stable economic environment for a long-term growth

Low and stable inflation creates an environment of economic stability. This generates a higher level of certainty and confidence for households and firms to plan economic activities.

Goals of monetary policy

External balance

The external balance refers to the value of an economy's export revenue being equal to its import expenditure. Interest rates can influence the exchange rate, which in turn affects the value of exports and imports.



The process of money creation by commercial banks (HL only)

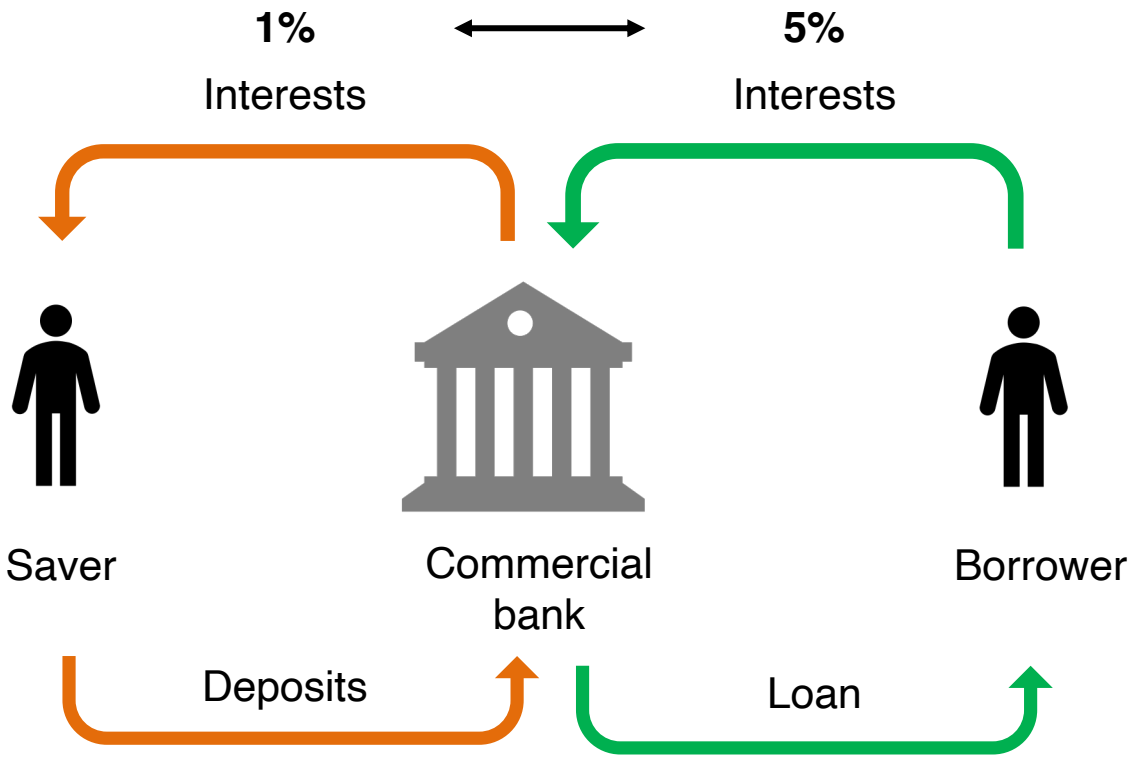
Video: How Banks Create Money

Credit creation (HL only)

Credit creation is the process by which banks create money by providing loans using saving deposits.

The process of money creation by commercial banks (HL only)

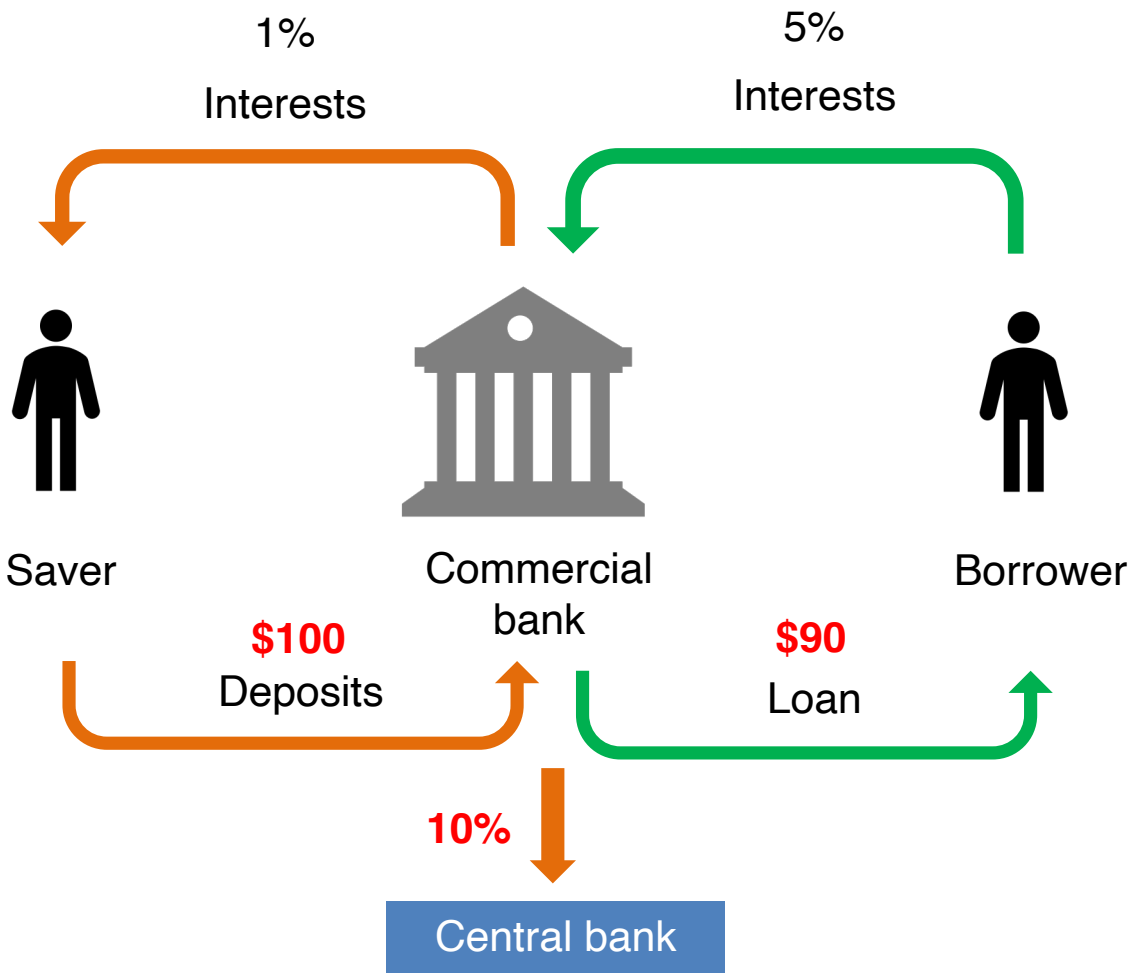
- Savers deposit money in banks and gain a rate of interest.
- Banks will create loans from the deposits and lend some money to the borrowers.
- Banks charge an interest rate to borrowers.
- Interest rate charged to borrowers exceed the Interest rate paid to savers. This is how banks profit from providing loans.



The process of money creation by commercial banks (HL only)

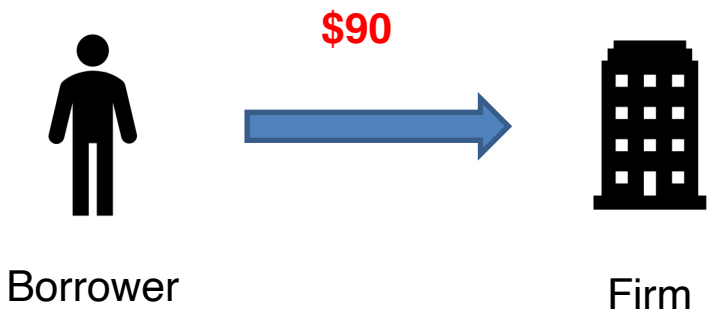
For example,

- A saver deposits $100 into the bank.
- The central bank decides a **minimum reserve ratio**, which is the required percentage of deposits commercial banks must keep in their vaults.
- Minimum reserve ratio = 10%
- The bank keeps $10 of deposits in their vaults and lends the remaining $90 as loans.



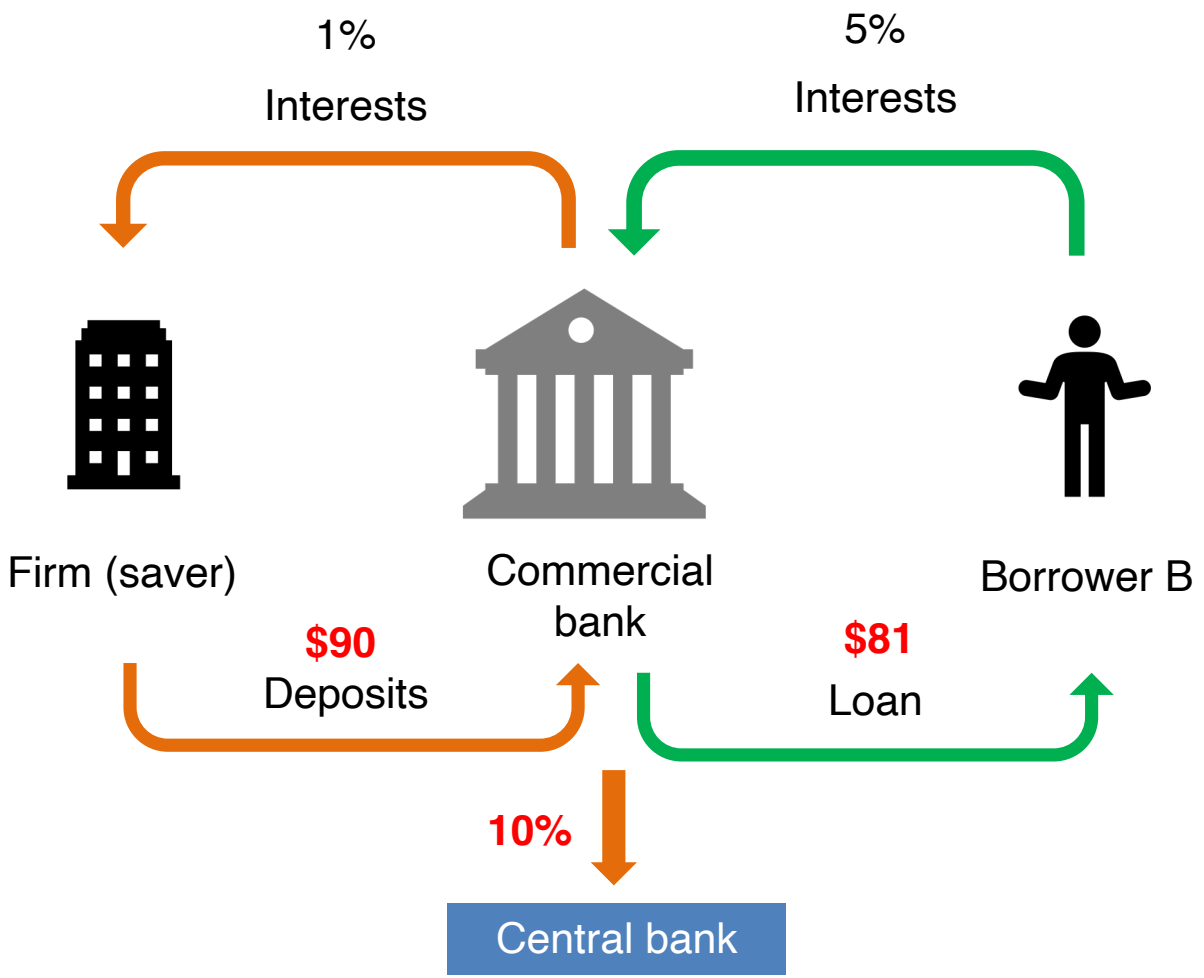
The process of money creation by commercial banks (HL only)

- The borrower uses the $90 for consumption, contributing to the economy and creating income for businesses.



The process of money creation by commercial banks (HL only)

- The firm then deposits the $90 earned into the bank.
- The money supply increases by $90.
- The central bank reserves 10% of the deposits.
- The commercial bank lends the remaining $81 to another borrower. The process continues.
- **Deposits generate loans, which then returns to the bank as deposits, which subsequently increases money supply**.



The process of money creation by commercial banks (HL only)

Money multiplier (supplementary)

A formula used to calculate how much an initial deposit increases the economy's money supply by:

$$\text{Money multiplier} = \frac{1}{\text{Reserve ratio}}$$

In the previous example, the money multiplier = $\frac{1}{0.1}$ = 10.

We can then calculate how much the initial deposit ($100) increases the money supply:

(savings x money multiplier) – savings = impact on money supply

($100 x 10) – $100 = $900

The initial $100 of savings increases the money supply by $900.

The process of money creation by commercial banks (HL only)

Money multiplier (supplementary)

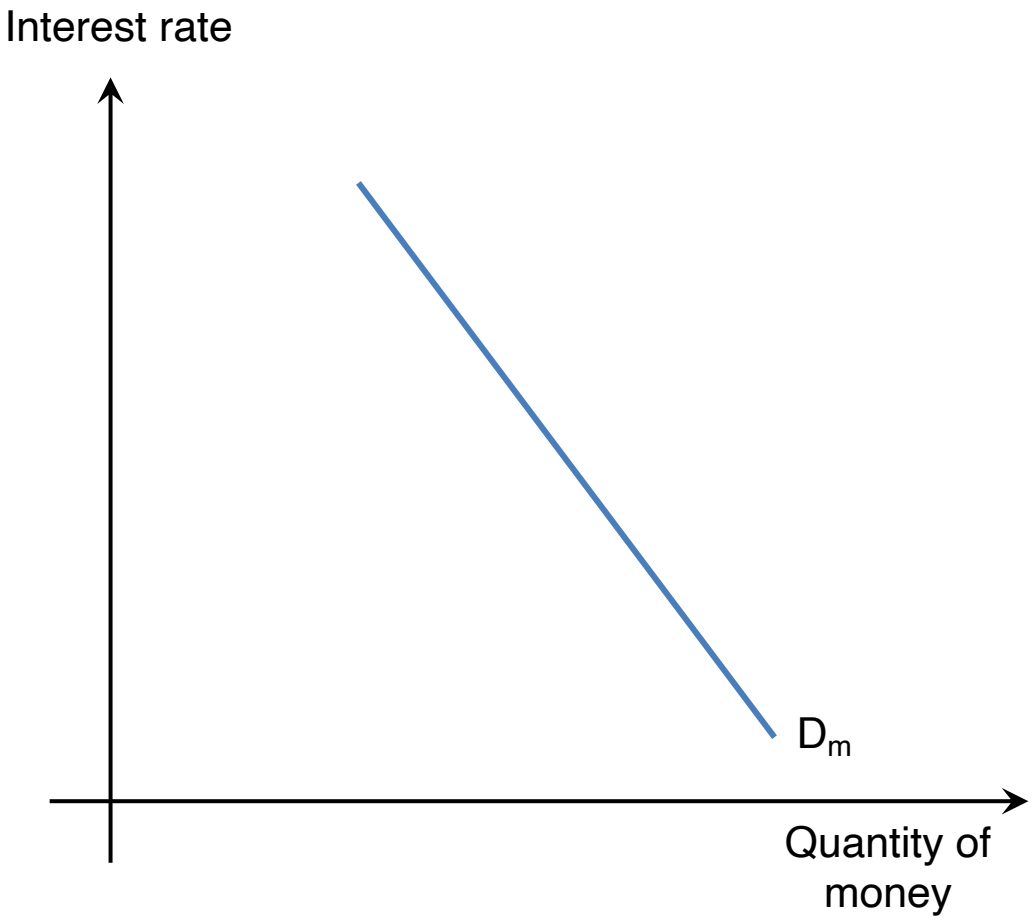
Suppose the central bank wants to limit the economic activity and reduce inflationary pressures. The reserve ratio increases to 20%. Calculate how much an initial saving of $100 would increase money supply by.

Money multiplier = $\frac{1}{0.2}$ = 5

Money supply increased = ($100 × 5) – $100 = $400

How is the reserve ratio and money supply related?

Demand and supply of money (HL only)

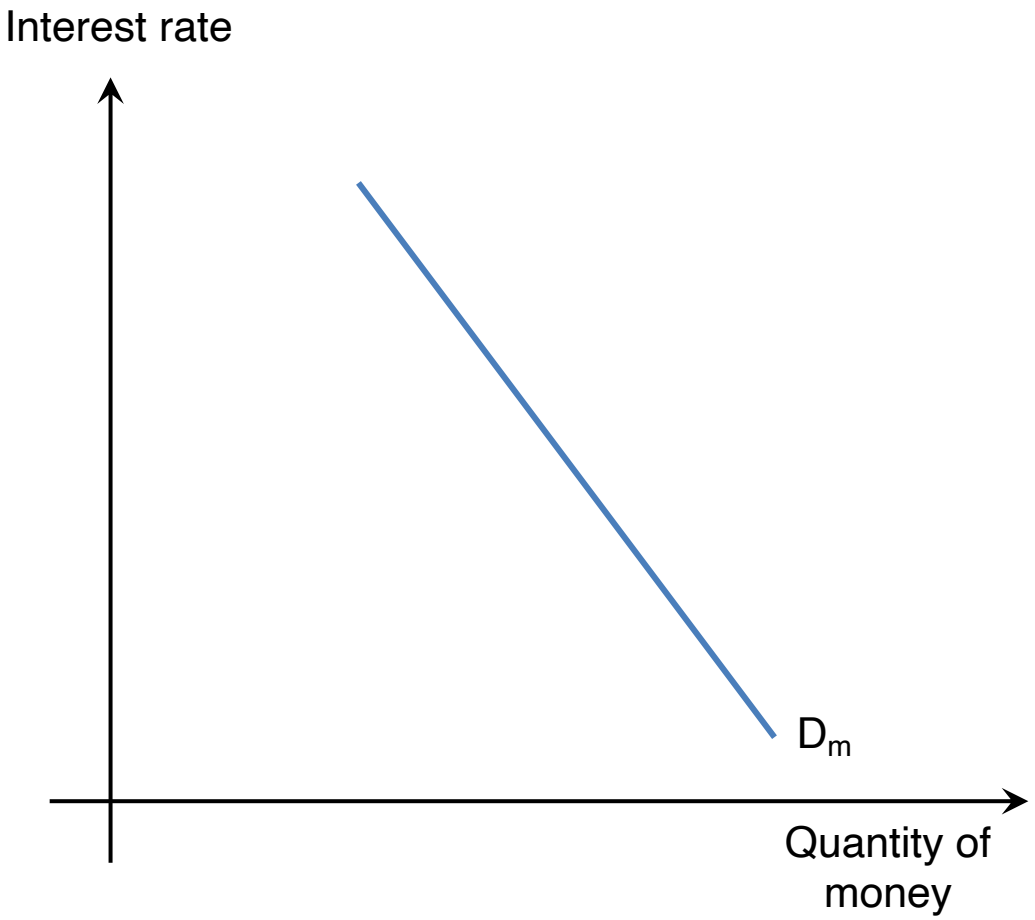


The **demand for money** (D_m) refers to the willingness and ability of borrowers to obtain loans.

Stakeholders who may demand loans includes:

- Households
- Firms
- Government

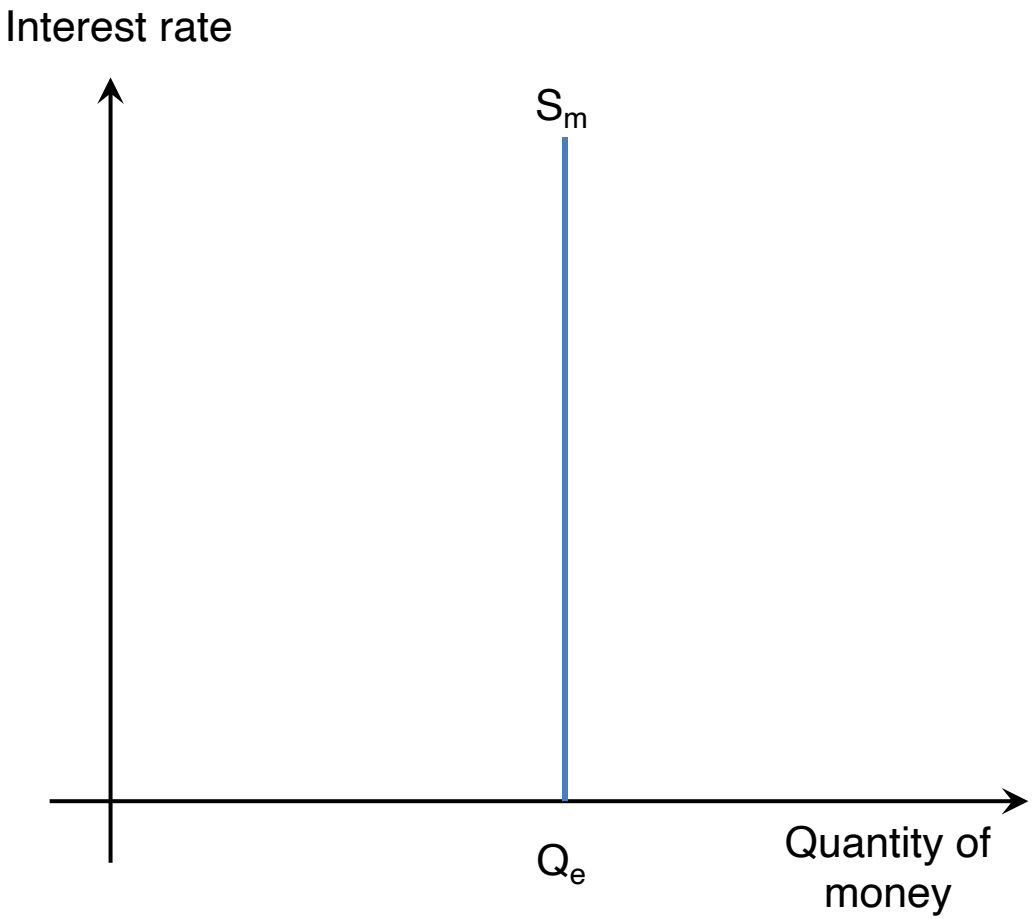
Demand and supply of money (HL only)



The **demand for money** (D_m) shows the inverse relationship between interest rates and the quantity of money/loans demanded.

As interest rates increase, the quantity of loans demanded decrease, because it is more expensive to borrow money. The opposite applies when interest rates decrease.

Demand and supply of money (HL only)

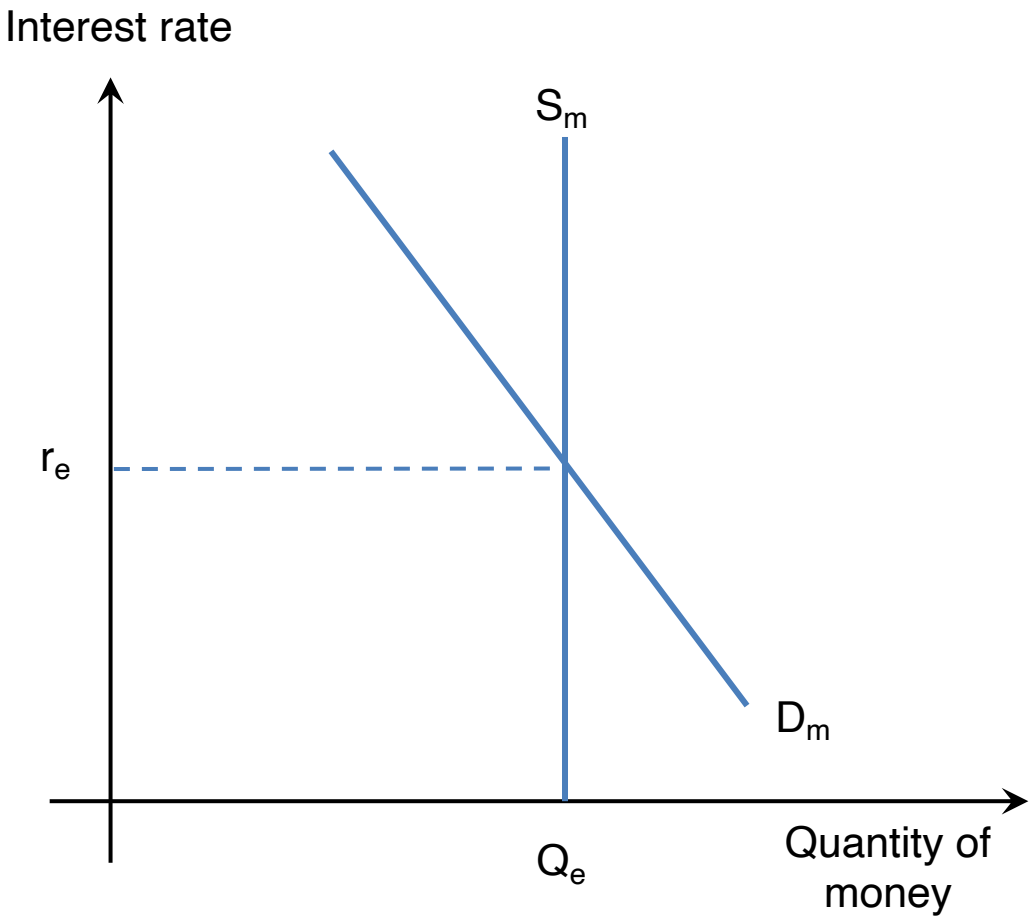


The **supply of money** (S_m) refers to the amount of money circulating in the economy at any time.

Why is the supply curve of money perfectly inelastic?

The supply of money is fixed by the central bank (monetary authority) at any point in time and is not dependent on interest rates.

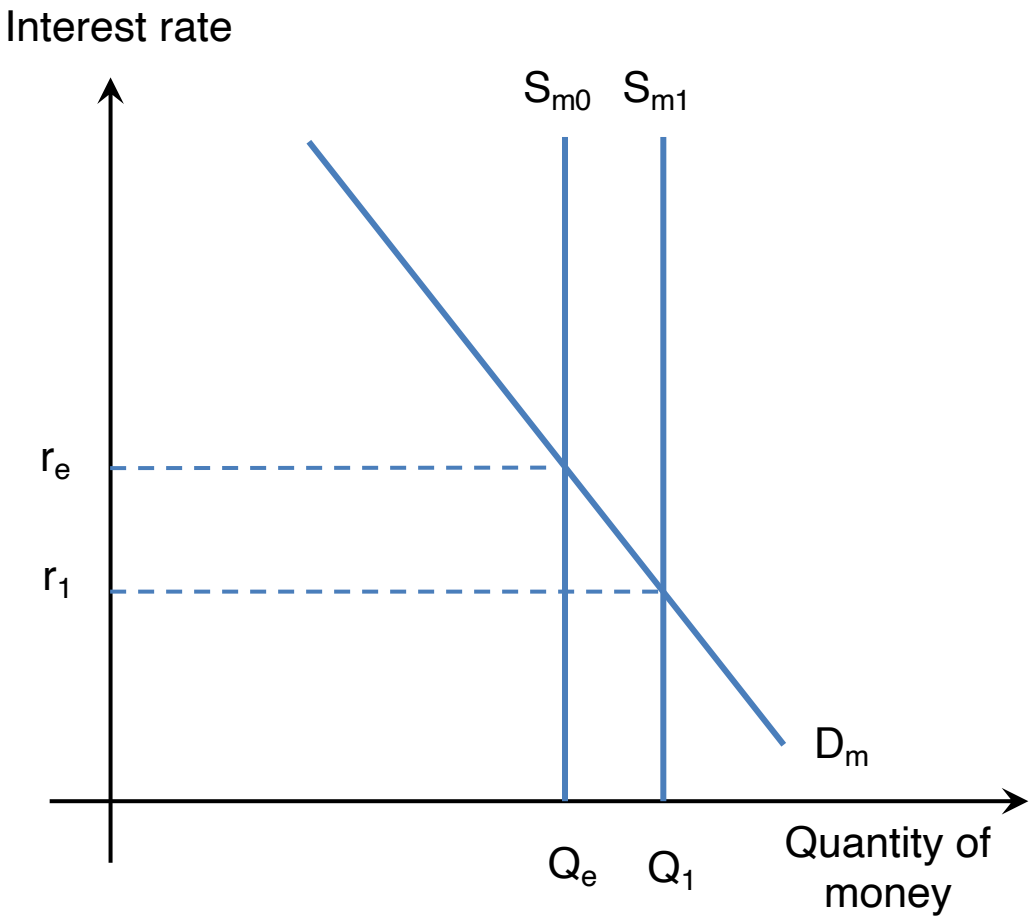
Demand and supply of money (HL only)



The **equilibrium interest rate** (r_e) can be determined by the intersection of the demand (D_m) and supply (S_m) of money.

This is the market interest rate at which borrowers and lenders agree on.

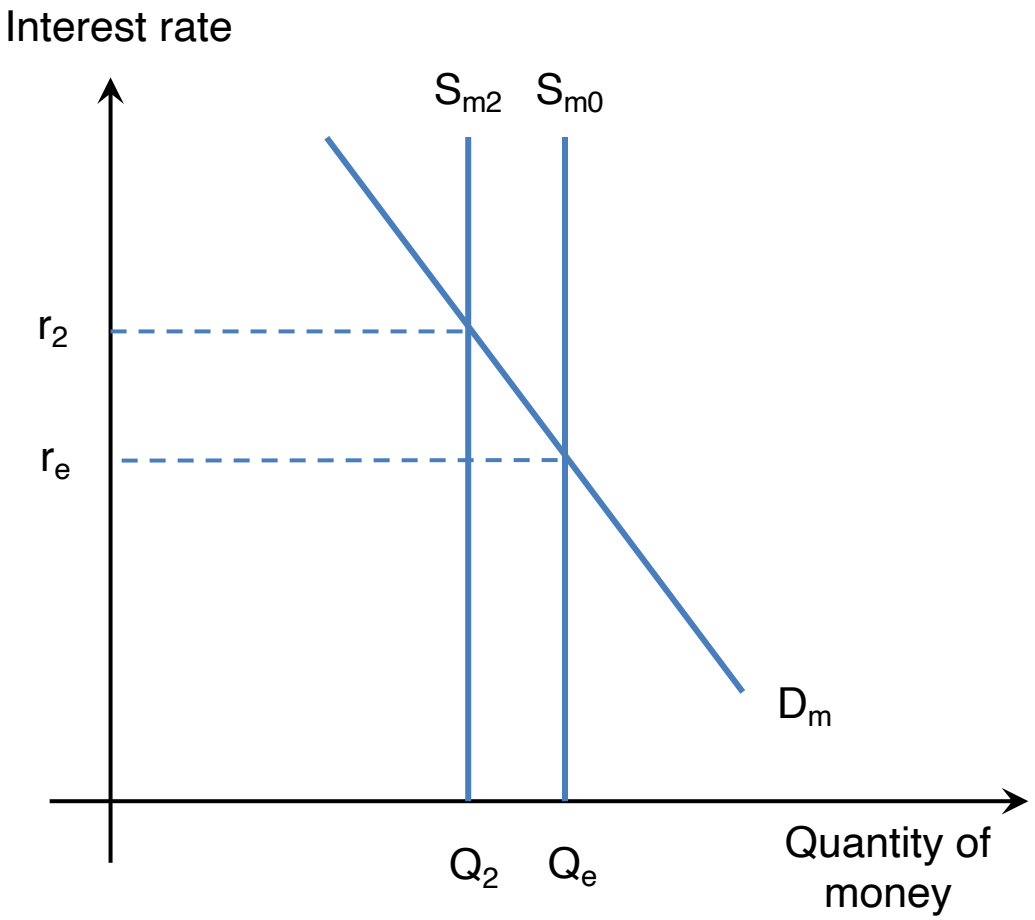
Demand and supply of money (HL only)



Increases in money supply

The central bank may increase money supply using the tools of monetary policy (outlined in slide 32) from S_{m0} to S_{m1}. This decreases the interest rate to r_1.

Demand and supply of money (HL only)



Decreases in money supply

The central bank may decrease money supply using the tools of monetary policy (outlined in slide 32) from S_{m0} to $S_{m2.}$ This decreases the interest rate to r_2.

Demand and supply of money (HL only)

The central bank considers the following factors when setting interest rates:

- **The exchange rate** – Lower interest rates decreases the demand of the domestic currency. The exchange rate will fall, encouraging the sale of exports.
- **Property prices** – Property prices directly impact the level of consumer confidence and the potential economic growth of the economy.
- **The rate of growth and nominal wages** – Higher wage rates imply that firms will increase prices. A rise in interest rate helps to reduce inflationary pressure.
- **The state of the economy** – A reduction in interest rates lifts the economy out of a recession.
- **Business confidence levels** – Lower interest rates encourage firms to invest.

Tools of monetary policy (HL only)

There are four main methods used by the central bank to influence the money supply and interest rates. These include:

- Open market operations
- Minimum reserve requirements
- Changes in the central bank minimum lending rate
- Quantitative easing (QE).

Open market operations (HL only)

Open market operations refers to the buying and selling of government bonds by a central bank to control money supply and interest rates.

Open market operations (HL only)

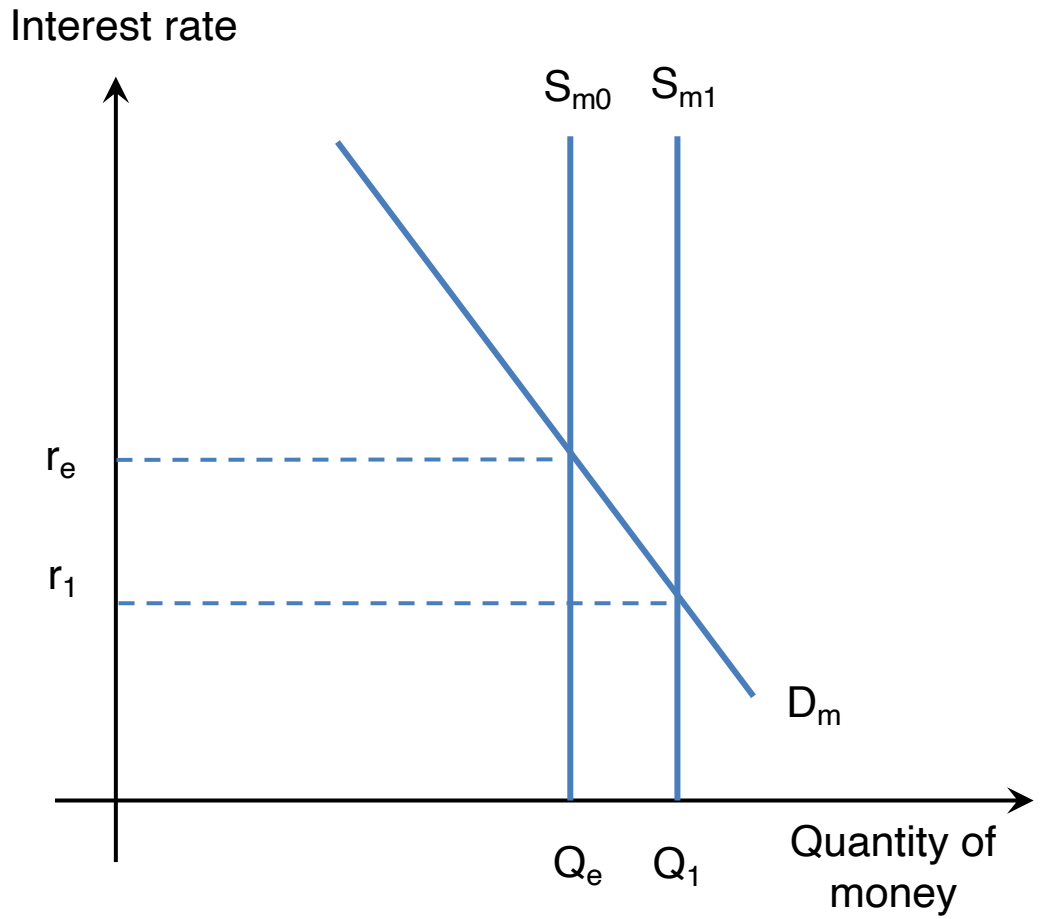
Governments may sell bonds to investors. In exchange for the investor's money, a bond certificate offers interest payments and the promise to repay the initial investment at a certain date. This is used to raise finance for operations and public projects. There are two ways in how open market operations occurs:

- Central bank buys government bonds to increase money supply.
- Central bank sells government bonds to decrease money supply.

Open market operations (HL only)

If a central bank wishes to carry out **expansionary monetary policy** and aims to lower interest rates, they could buy government bonds from commercial banks.

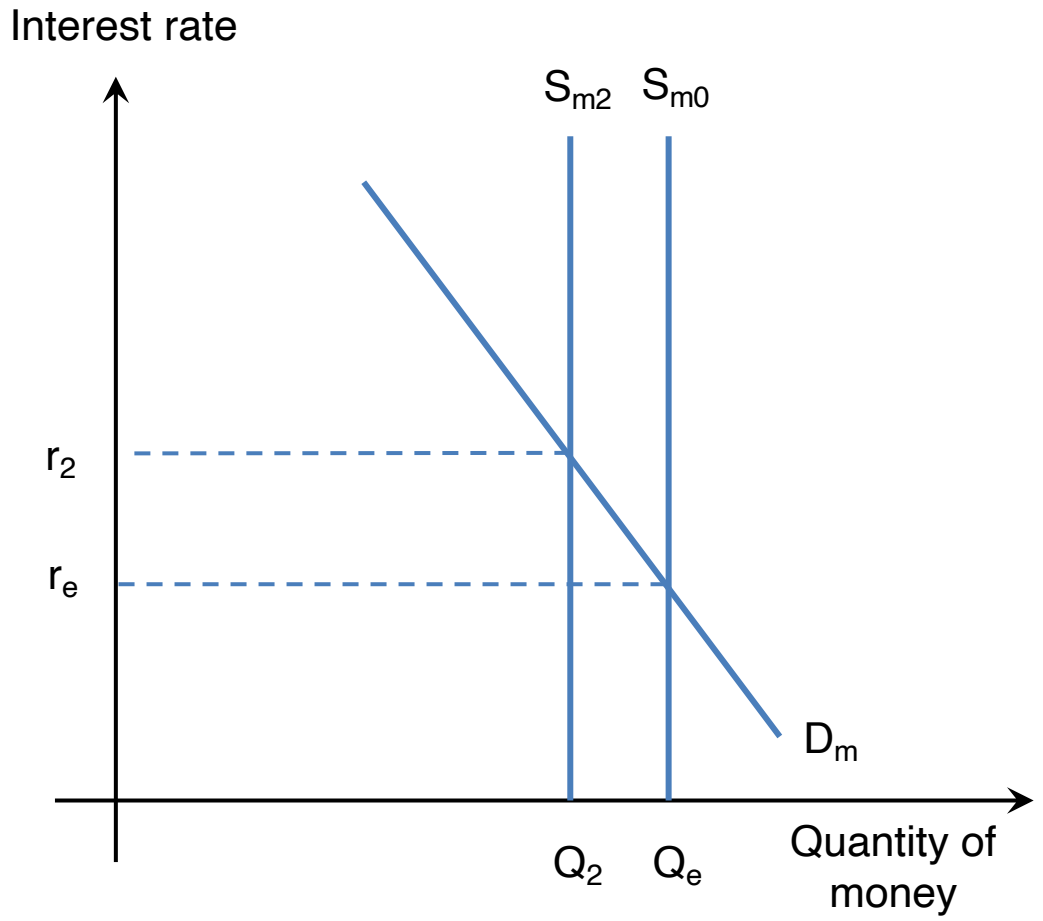
This increases money supply from Sm0 to Sm1 as commercial banks have now have additional money to create more loans. Interest rates decrease from re to r1.



Open market operations (HL only)

If a central bank wishes to carry out **contractionary monetary policy** and aims to increase interest rates, they could sell government bonds from commercial banks.

This decreases money supply from Sm0 to Sm2 as commercial banks have now have less money loan out. Interest rates increase from re to r2.



Minimum reserve requirements (HL only)

The **minimum reserve requirement (MRR)** is the required percentage of deposits that commercial banks keep in their vaults.

Minimum reserve requirements (HL only)

There is an inverse relationship between MRR and the money multiplier. The higher the MRR, the lower the money multiplier, meaning that there is a lower amount of money created.

What is the relationship between money supply and interest rates?

Expansionary monetary policy:

Lower MRR to increase money supply, injecting liquidity to the economy. Interest rate decreases, raising consumption and investment expenditure. This stimulates economic growth.

Contractionary monetary policy:

Raise MRR to limit the money supply, thereby increasing interest rates. Consumption and investment expenditure decrease, lowering inflationary pressure.

Minimum lending rate (HL only)

The minimum lending rate is the interest rate charged by the central bank on loans to commercial banks.

Changes in the central bank minimum lending rate (HL only)

The MLR influences all interest rates on bank loans, credit transactions, and mortgages.

Expansionary monetary policy:

The central bank can lower the MLR. The commercial banks will also lower their interest rates paid to savers, encouraging consumption and investment through borrowing. Hence, AD increases.

Contractionary monetary policy:

The central bank can raise the MLR. The commercial banks will also increase their lending rates, which encourages people to save more. Consumption and investment hence decrease, lowering the level of AD.

Case study (HL only)

Article: Fed keeps rates near zero

1. How does the change in MLR affect the other loan rates and stimulate the economy?
2. How does the change in MLR benefit borrowers?
3. Which stakeholders are worse off as a result of low interest rates?

Quantitative easing (HL only)

In times of recessions, even though interest rates are near zero, banks may be reluctant to lend while consumers are unwilling to consume due to low confidence in the economy. This leads to the liquidity trap, when the MLR cannot be further lowered, and expansionary monetary policy is ineffective.

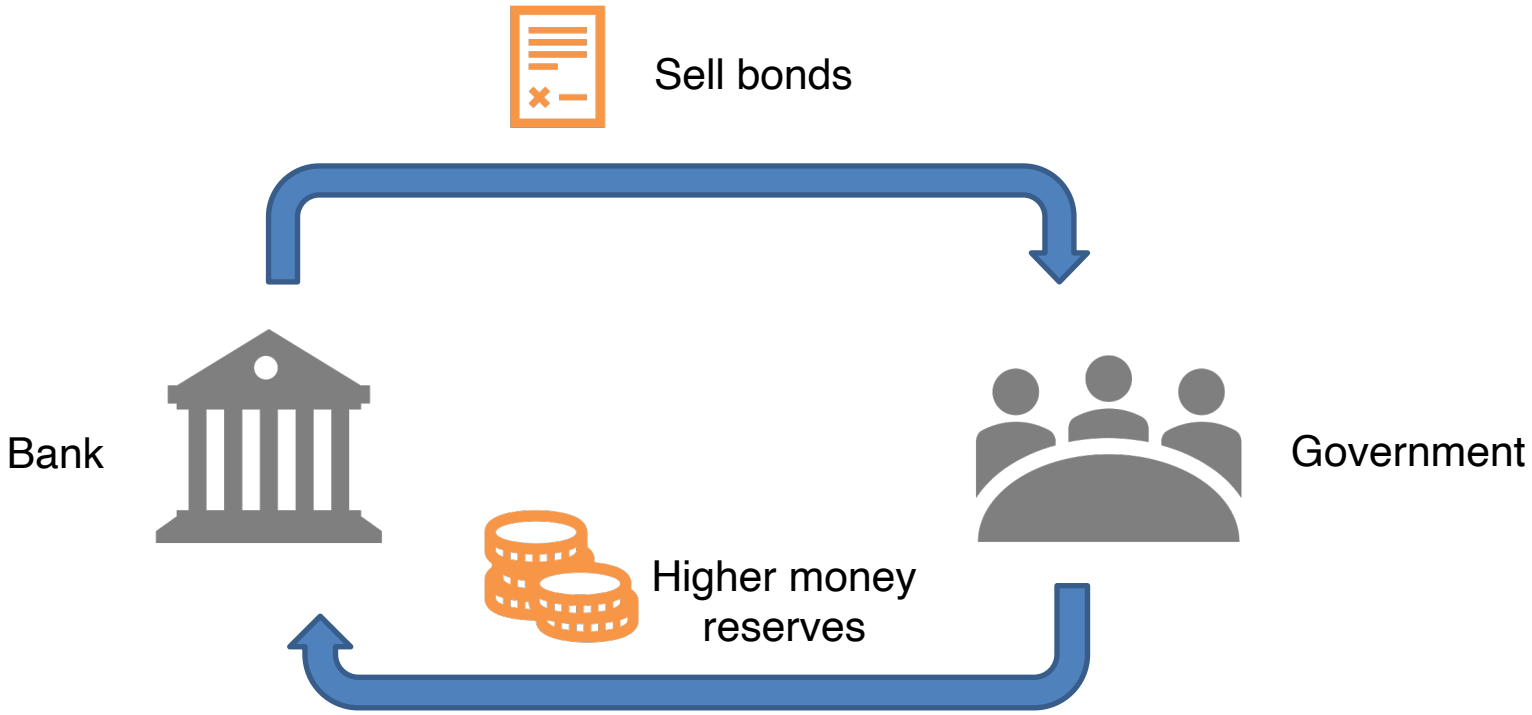
The central bank may then use another method to stimulate the economy: **quantitative easing**.

Quantitative easing (HL only)

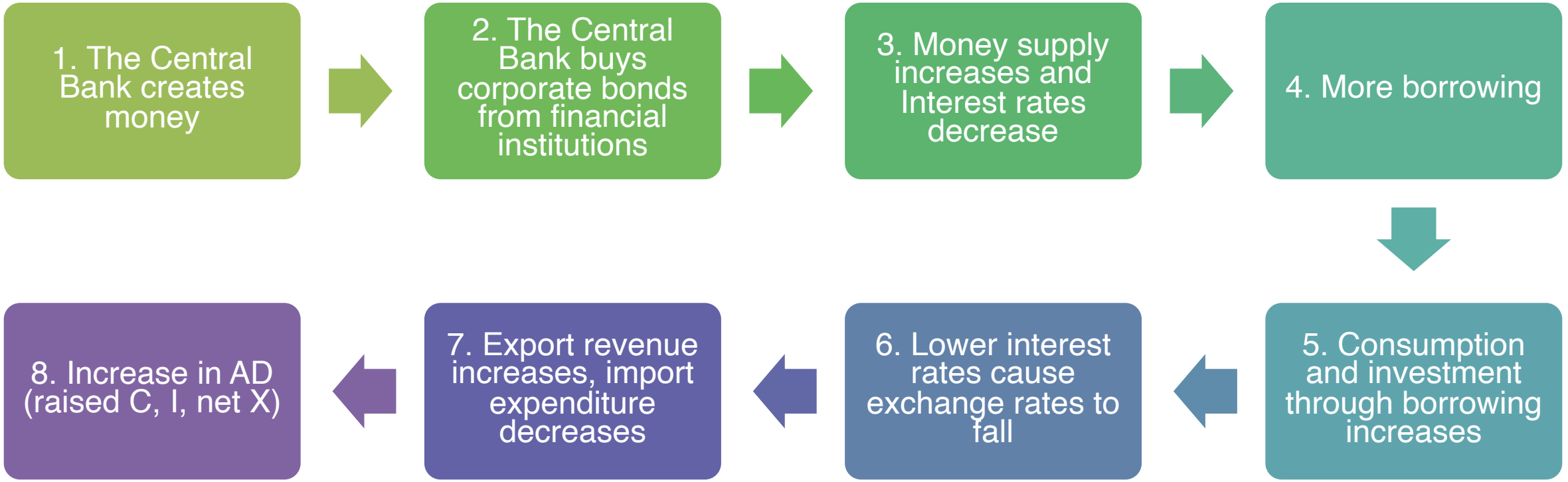
Quantitative easing is a tool of monetary policy in which the central bank injects money directly into the economy through purchasing corporate bonds.

Quantitative easing (HL only)

Bonds are a type of debt. Banks selling corporate bonds to the government will receive additional money which increases liquidity. In other words, money supply increases, encouraging lending and hence economic growth. QE also helps to avoid deflation.



Quantitative easing (HL only)



Summary of the tools of monetary policy (HL only)

The table shows the actions of the central bank in expansionary and contractionary monetary policies.

	Open market operations	Minimum reserve requirements	Minimum lending rates	Quantitative easing
Expansionary	Purchase government bonds	Lower MRR	Lower MRL	Purchase corporate bonds
Contractionary	Sell government bonds	Raise MRR	Raise MRL	-

Real versus nominal interest rates

Interest rate is the cost of borrowing and reward for saving of money, expressed as a percentage.

Nominal interest rate is the actual interest rate that is agreed between the bank and the customer, which is the rate that borrowers pay their loans or savers receive from their deposits.

Real interest rate considers the impact of inflation on the cost of borrowers and the return for savers.

Real interest rate = Nominal interest rate – Inflation rate

Real versus nominal interest rates

Example and Interpretation

Justin saves $5,000 for a year and receives a nominal interest rate of 2%. The annual inflation rate is 1.5%. Calculate the nominal return and real return for Justin's savings after 1 year.

Nominal return = $5,000 × 2% = $100

Real interest rate = 2% – 1.5% = 0.5%

Real return = $5,000 × 0.5% = $25

Although Justin's savings increases by $100, the **real** return on his savings considering inflation is only $25.

Real world example – data analysis

Source: Visualizing the 700-Year Fall of Interest Rates

Data Analysis Questions

1. What do you notice from the data?
2. What questions do you wonder about the data?
3. Research information that may help you answer your questions from Q2.
4. What conclusions can you make from Q1, Q2, and Q3?

Real versus nominal interest rates

Negative interest rates can occur when the nominal interest rate is less than the inflation rate as

Real interest rate = Nominal interest rate – Inflation rate

For example, if the nominal interest rate is 1% and the inflation rate is 2%, then the real interest rate is -1%. This means the purchasing power of any savings would **fall** by 1% by year end.

Real world example (supplementary)

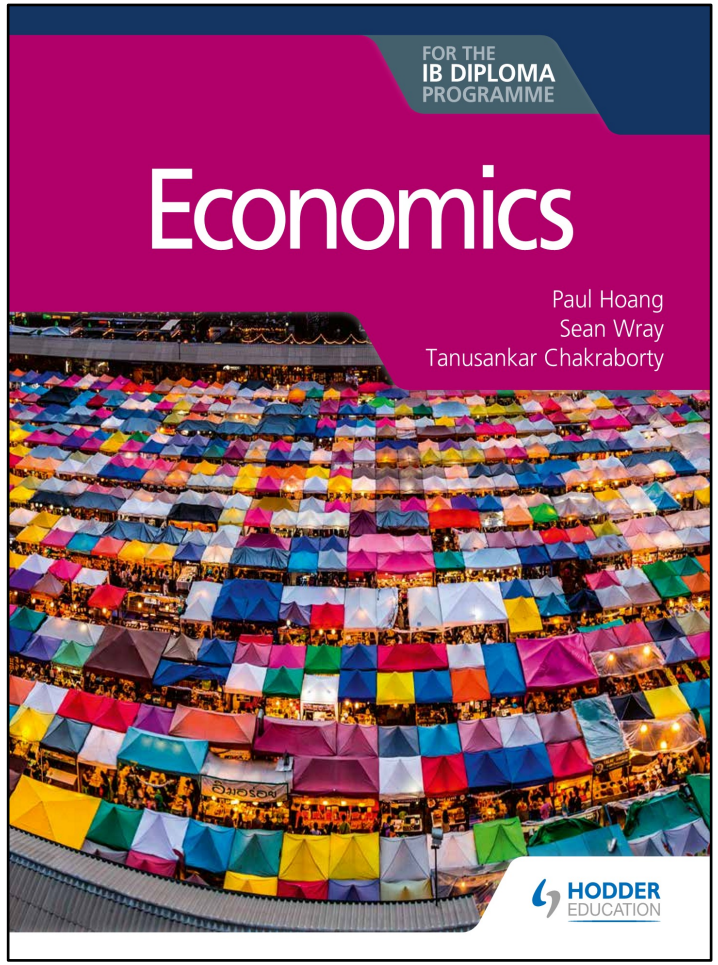
Video: Negative Interest Rates: Explained

Over to you…

Hoang, Wray, & Chakraborty (2020)

Economics for the IB Diploma Programme

- Page 375
- Paper 3 Exam Practice Question 24.2
- [4 marks]

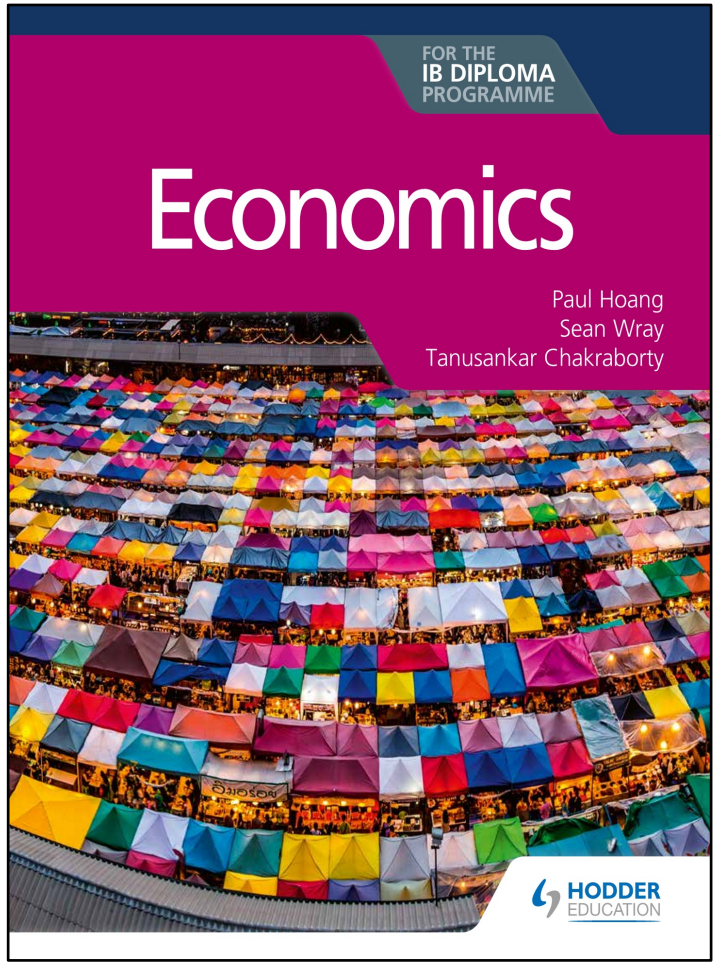


Over to you… (HL only)

Hoang, Wray, & Chakraborty (2020)

Economics for the IB Diploma Programme

- Page 373
- Paper 2 and 3 Exam Practice Question 24.1
- [3 marks]



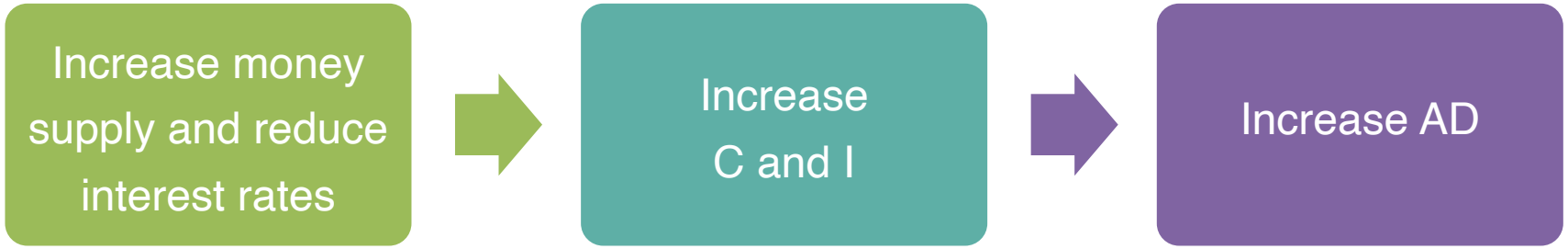
Expansionary monetary policy

Expansionary monetary policy aims to increase the level of aggregate demand by increasing money supply and reducing interest rates.

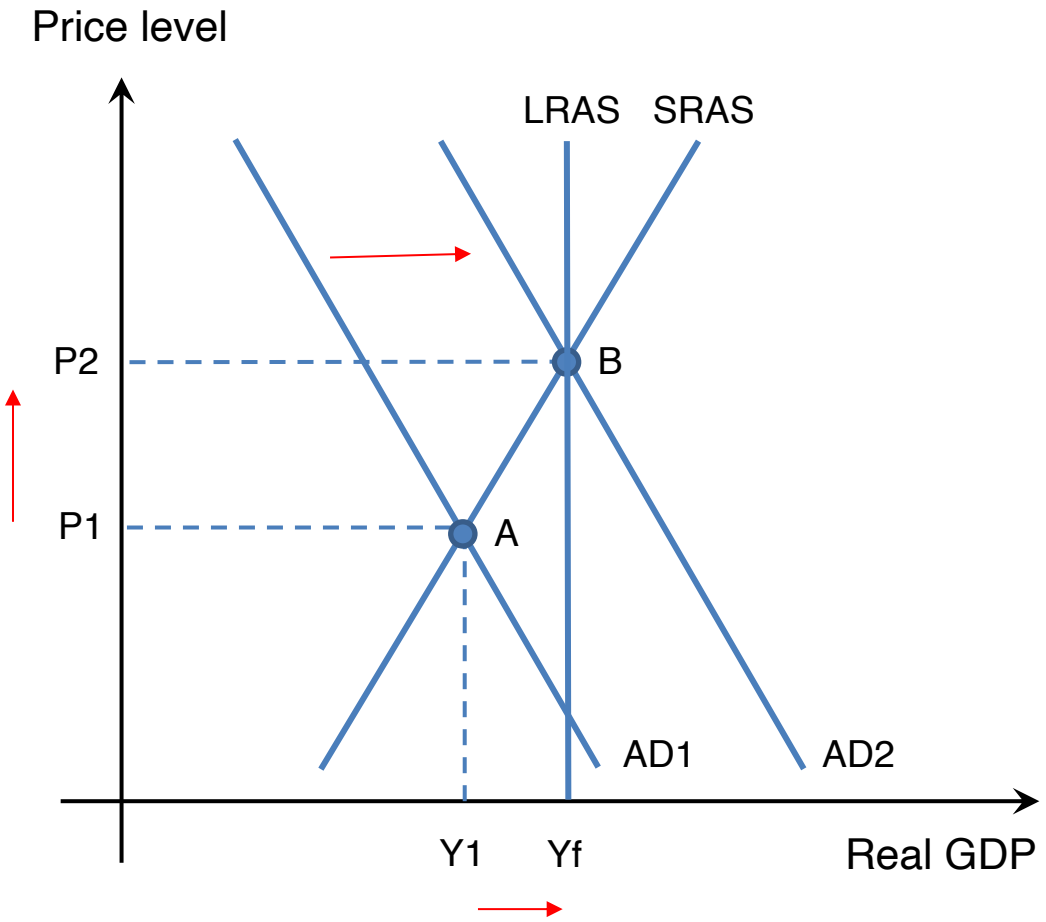
Expansionary and contractionary monetary policies

Expansionary monetary policy

The cost of borrowing and reward for saving reduces, increasing consumption and investment through increased borrowing and reduced savings. An expansionary monetary policy hence stimulates the economy by shifting the AD curve to the right.



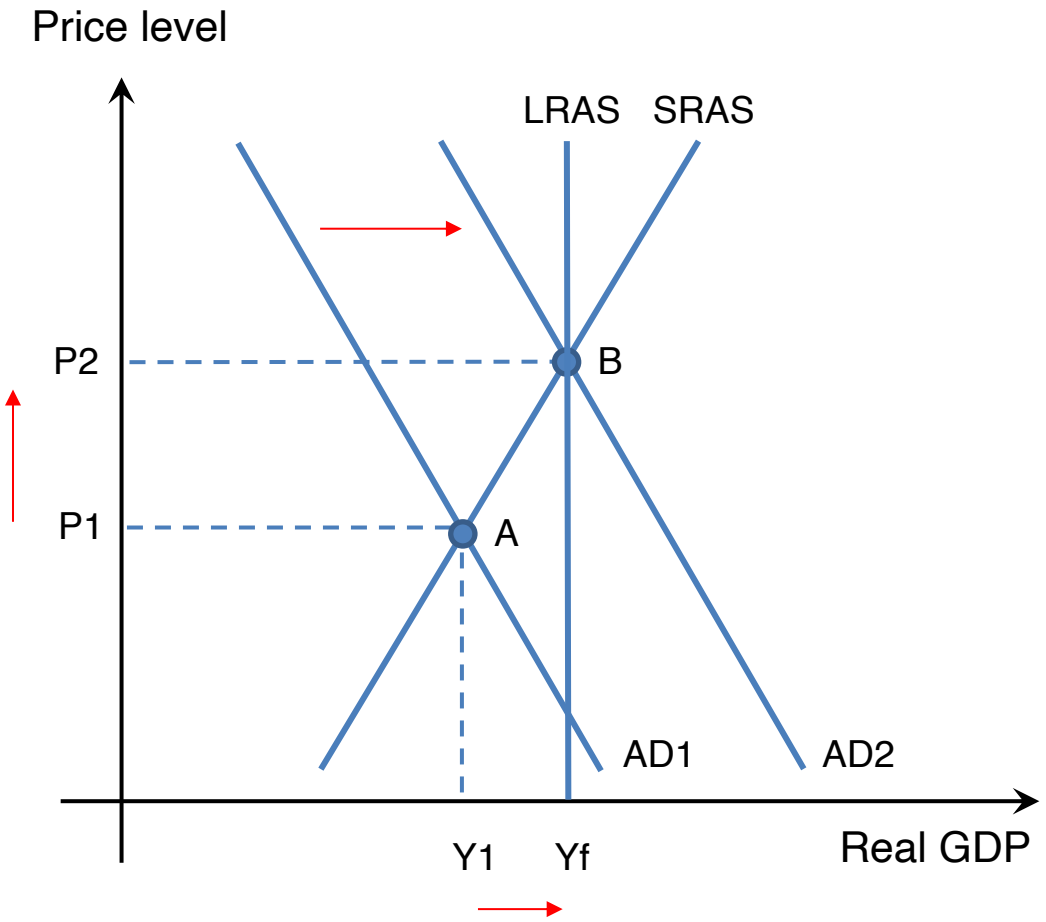
Expansionary and contractionary monetary policies



Expansionary monetary policy

- Consumption and investment increases
- AD curve shifts right from AD1 to AD2
- Equilibrium moves from point A to B
- Real GDP increases from Y1 to Yf, closing the deflationary gap
- Price level rises, leading to inflationary pressures.
- Unemployment reduces.

Expansionary and contractionary monetary policies



When is expansionary monetary policy used?

- When inflation is below the target rate
- When the economy is suffering from a recessionary gap where unemployment is high and economic growth is low or negative.

Contractionary monetary policy

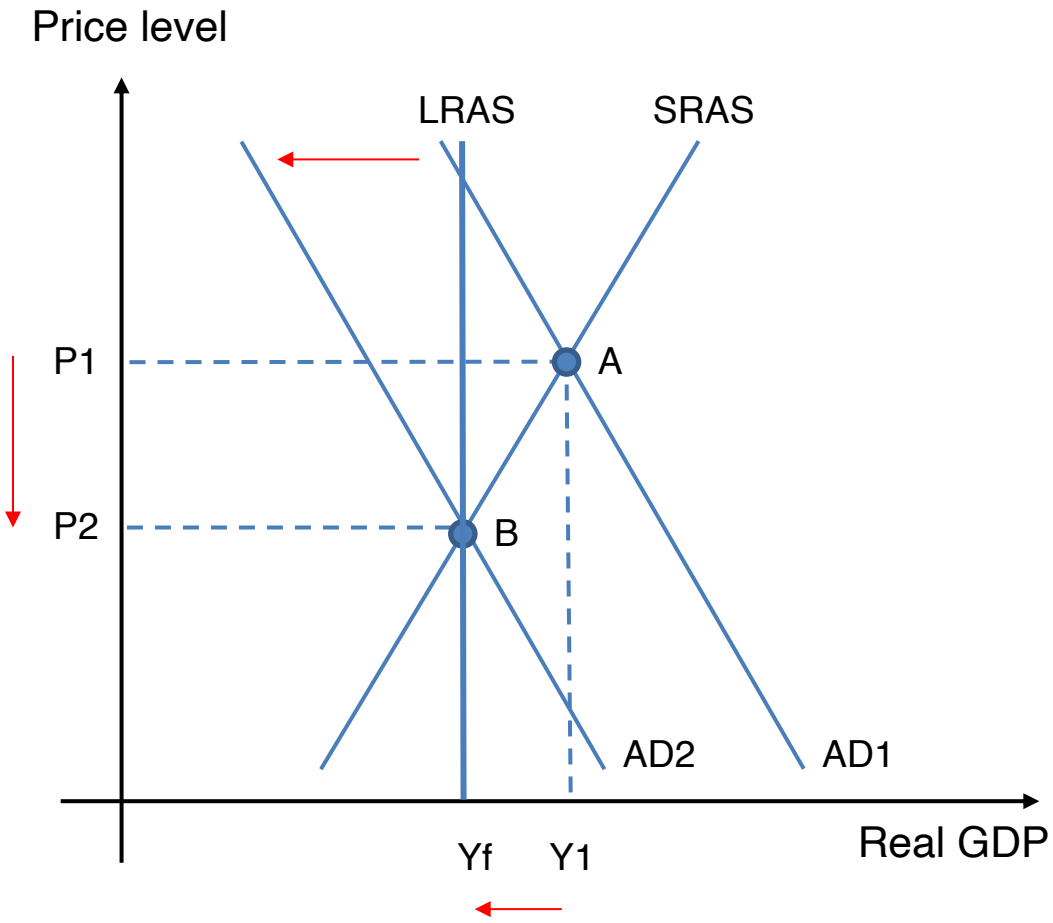
Contractionary monetary policy aims to decrease the level of aggregate demand by decreasing money supply and increasing interest rates.

Expansionary and contractionary monetary policies

Contractionary monetary policy

The cost of borrowing and reward for saving increases, decreasing consumption and investment through decreased borrowing and increased savings. Contractionary monetary policy reduces or dampens AD and economy activity and subsequently reduces inflationary pressures.

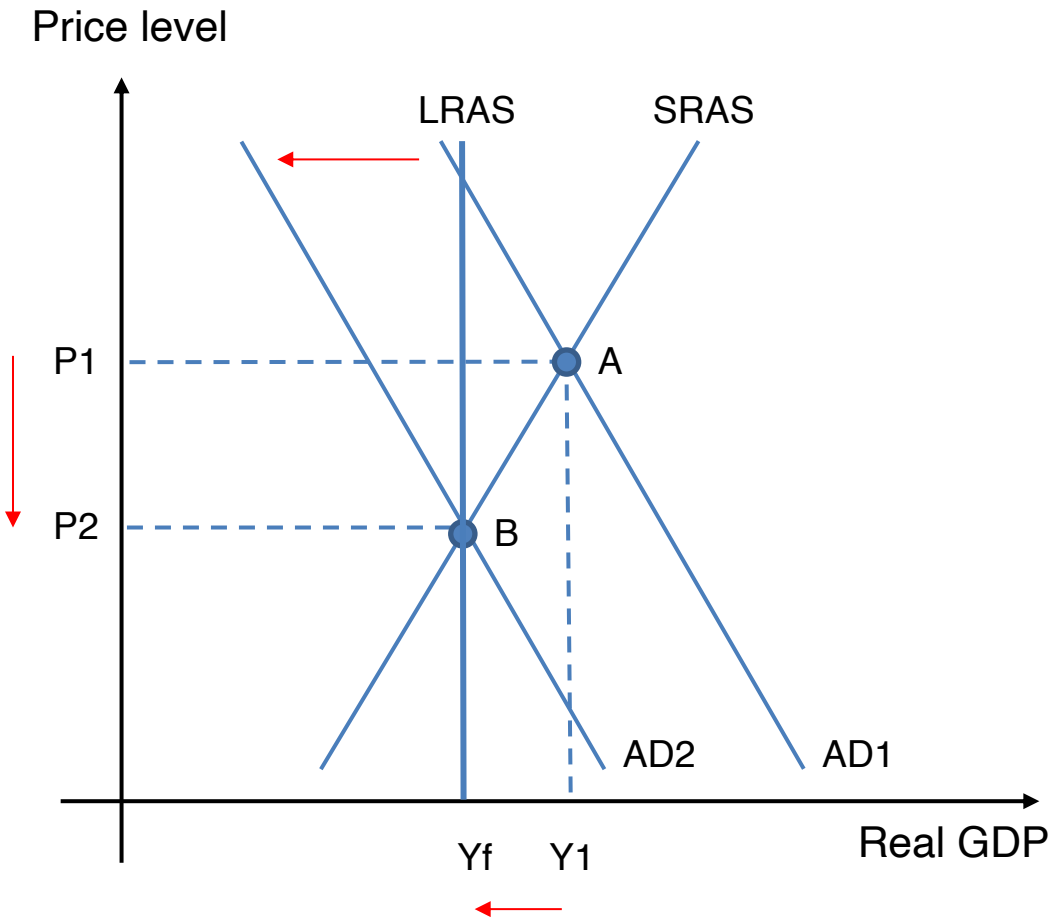
Expansionary and contractionary monetary policies



Contractionary monetary policy

- Consumption and investment decreases
- AD curve shifts left from AD1 to AD2
- Equilibrium moves from point A to B
- Real GDP decreases from Y1 to Yf, closing the inflationary gap
- Price level decreases from P1 to P2
- Unemployment increases

Expansionary and contractionary monetary policies



When is contractionary monetary policy used?

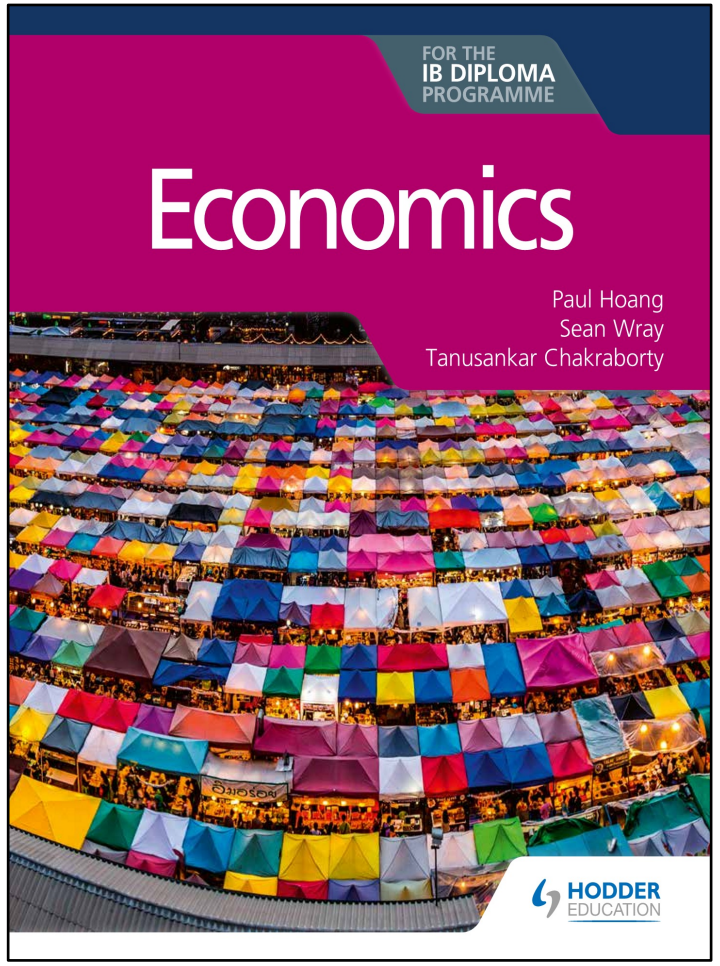
- When inflation is above the target rate
- When the economy is experiencing high levels of economic growth and low levels of unemployment, contractionary monetary policy may be used as a proactive measure to slow AD growth and prevent the economy from overheating.

Over to you… (HL only)

Hoang, Wray, & Chakraborty (2020)

Economics for the IB Diploma Programme

- Page 376
- Paper 2 and 3 Exam Practice Question 24.3
- [4 marks]
- Paper 2 and 3 Exam Practice Question 24.4
- [4 marks]



Constraints of monetary policy

Limited scope of reducing interest rates, when close to zero

Low interest rates do not necessarily pull an economy out of recession. For example, central banks cut interest rates close to 0% during the COVID-19 pandemic. This means that interest rates cannot be lowered further to stimulate the economy. Expansionary monetary policy is not necessarily effective.

Real world example

Video: What 0% Interest Rate Really Means

How do zero interest rates discourage saving?

Constraints of monetary policy

Low consumer and business confidence

During the 2008 financial crisis, even though interest rates were nearly zero, the lack of consumer and business confidence led to a prolonged recession. Changes in interest rates and money supply can be destabilizing to firms and consumers.

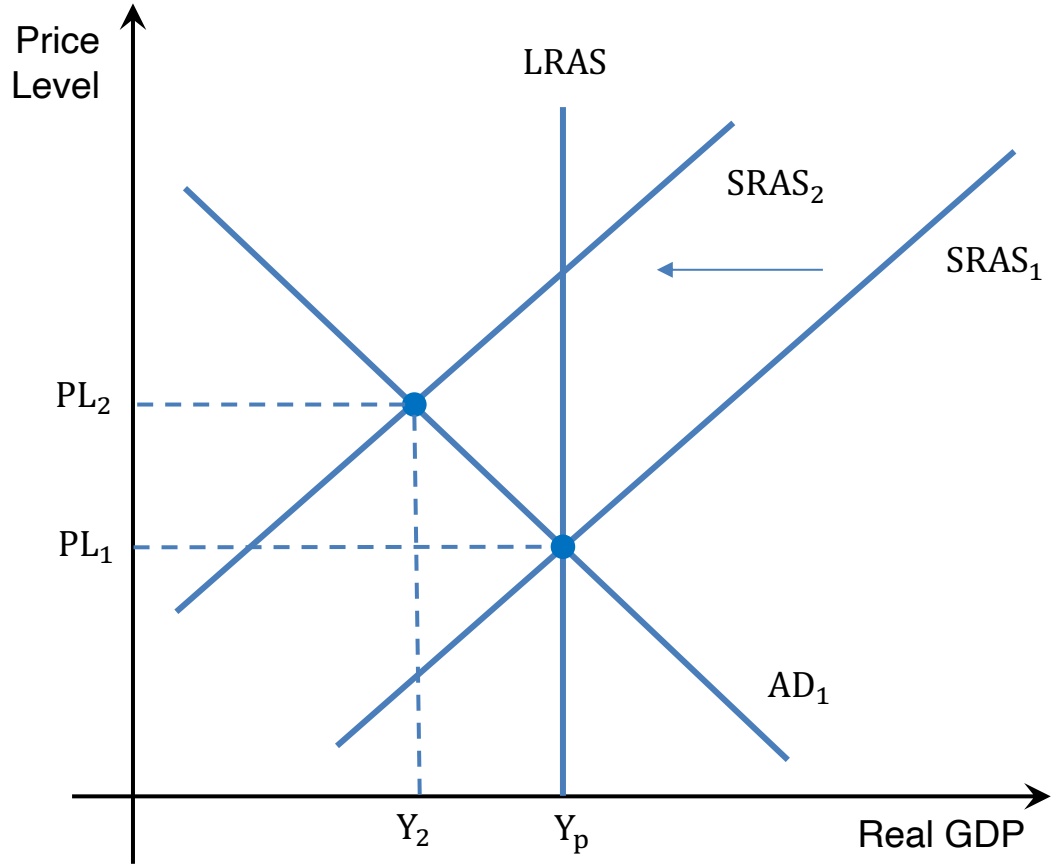
At times of recessions, consumers may be unwilling to purchase goods and services. Firms may not borrow money to invest even though interest rates are low.

Constraints of monetary policy

Trade-offs with other macroeconomic aims

A key limitation of contractionary demand side policy comes with the **trade-offs** when dealing with **cost-push inflation**.

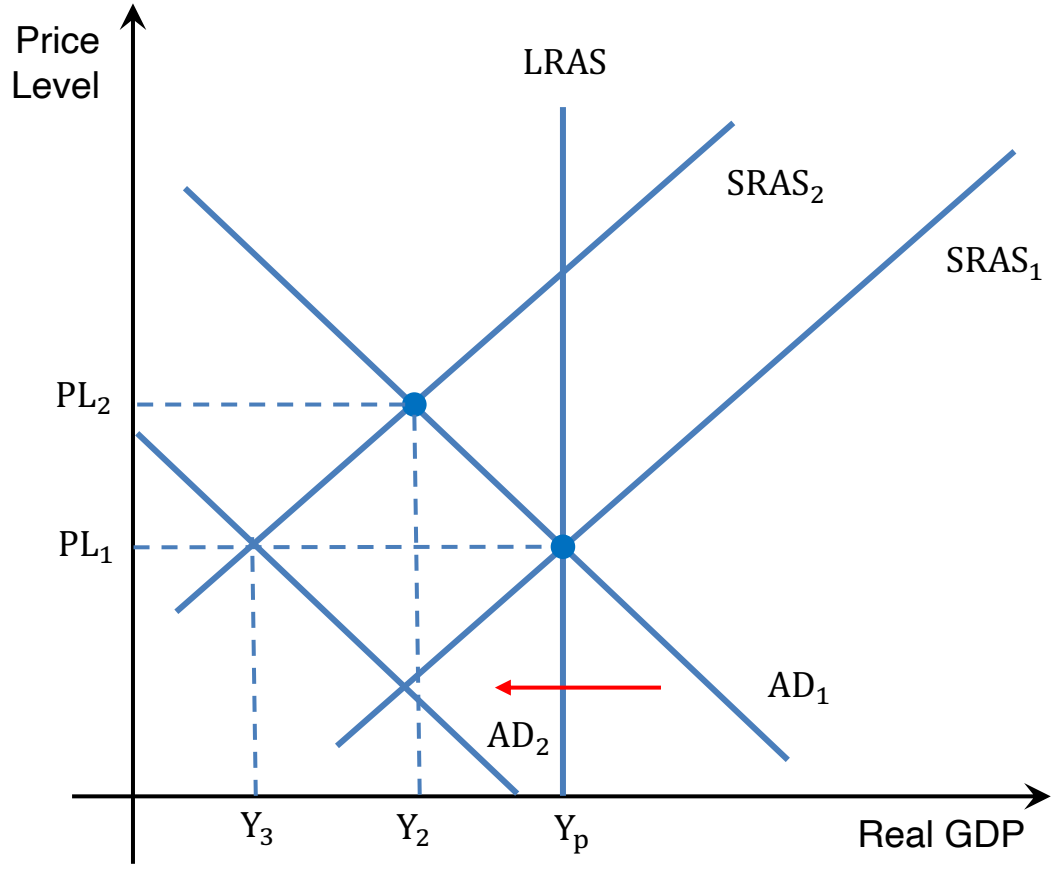
When the economy experiences cost-push inflation, price levels increase from PL1 to PL2 while real GDP decreases to Yp to Y2.



Constraints of monetary policy

Trade-offs with other macroeconomic aims

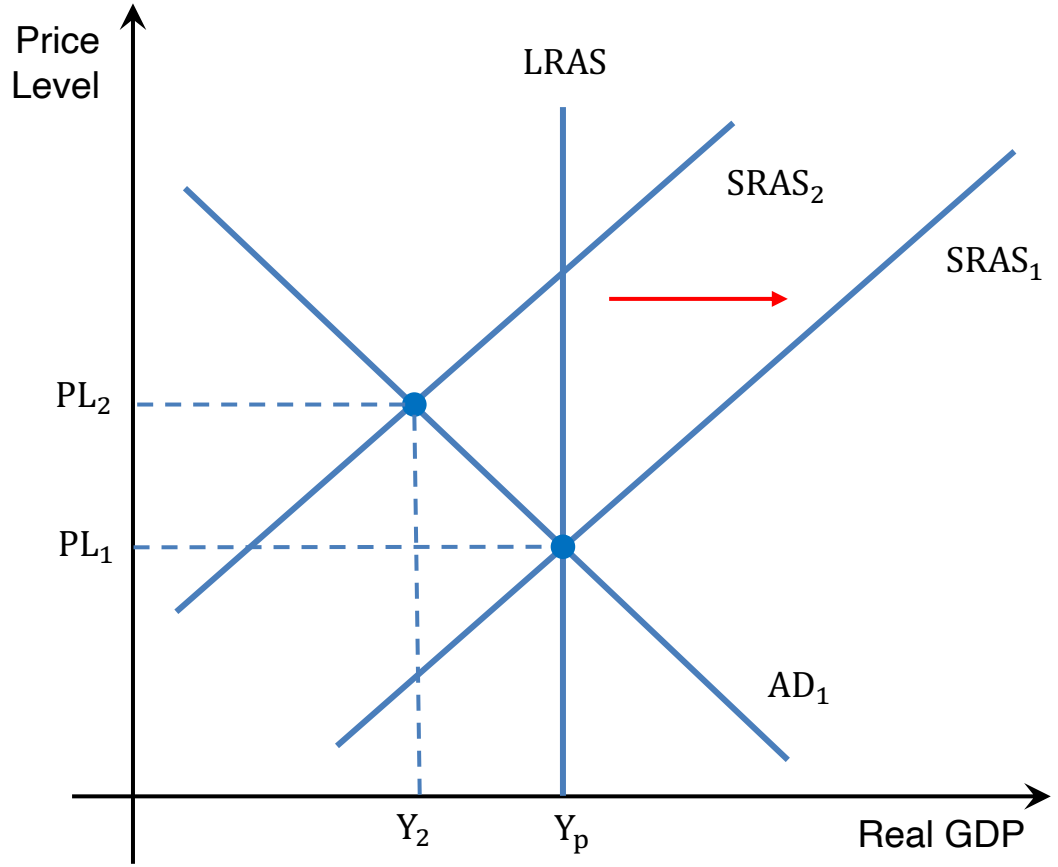
In order to maintain a low and stable rate of inflation, contractionary monetary (or fiscal) policy may be used to reduce AD1 to AD2. While this may reduce the rate of inflation back to a low and stable rate at PL1, there is a trade-off with two other macroeconomic objectives of economic growth and unemployment as real GDP decreases further to Y3 resulting in a greater recessionary gap.



Constraints of monetary policy

Trade-offs with other macroeconomic aims

Therefore, when addressing cost-push inflation in an economy, it is more suitable to implement supply-side policies. This addresses the objectives of low and stable inflation, economic growth, and low unemployment.



Strengths of monetary policy

Incremental, flexible and easily reversible

Incremental – Interest rates can be adjusted incrementally (at 0.25%) to reduce the risks of causing huge disruptions in the economy.

Flexible – Since the central bank is independent from political interferences, it has the flexibility to act at the best interest of the economy.

Reversible – The decision is reversible. For example, if the money multiplier is underestimated and thus causing inflation, the central bank can increase the interest rates immediately.

Strengths of monetary policy

Short time lags

Monetary policy can be implemented more quickly compared to fiscal policy. For example, the Bank of England cut interest rates twice a week in March 2020 to stabilize the economic downturn.

However, a certain degree of time lag is still inevitable as time is needed for households and firms to react to changes in interest rates.

Research activity (groups of 3-4)

1. Select a central bank of your choice
2. Research the central bank's monetary policy conducted over the past 5 years.
3. How effective has the central bank been in achieving their aims?

Over to you… (HL only)

Hoang, Wray, & Chakraborty (2020)

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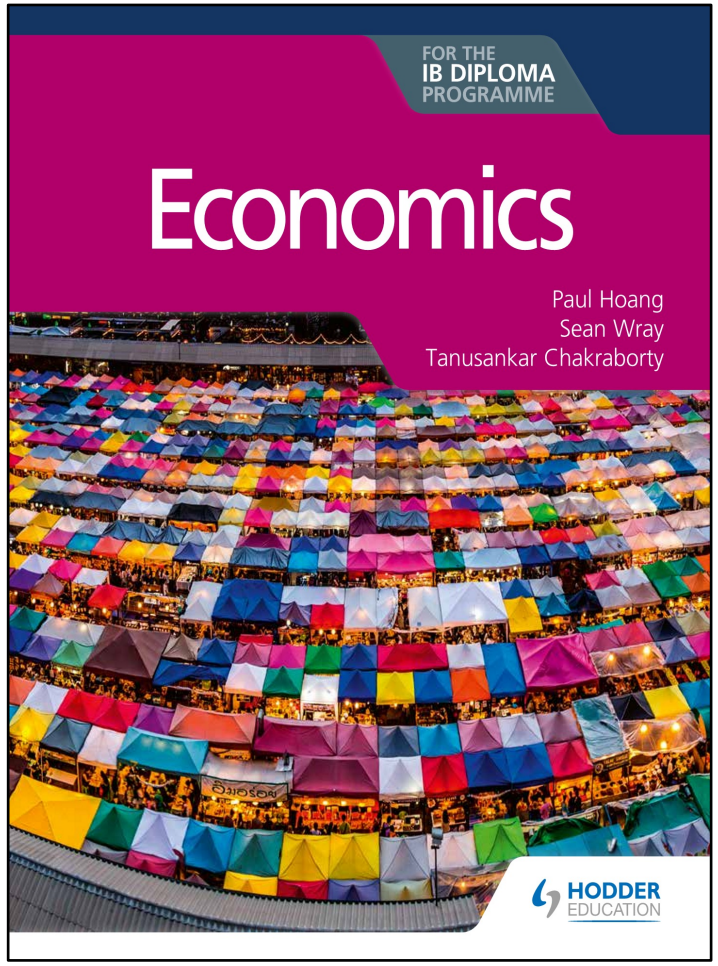
- Page 378-379
- Paper 1 Exam Practice Question 24.5
- [10 marks]
- Paper 1 Exam Practice Question 24.6
- [15 marks]



Test your knowledge on this unit: Kahoot!