4.5 Exchange rates

Learning objectives

4.5 Exchange rates	Depth	Diagrams and calculations
Floating exchange rates • Determination • Depreciation and appreciation of a currency	AO2 AO4	Diagram: showing the exchange rate determination and changes in equilibrium in a floating exchange rate system Calculation: using exchange rates, the price of a good in different currencies

Learning objectives

4.5 Exchange rates	Depth	Diagrams and calculations
Changes in demand and supply for a currency – factors including: • foreign demand for exports • domestic demand for imports • inward/outward foreign direct investment • inward/outward portfolio investment • remittances • speculation • relative inflation rates • relative interest rates • relative growth rates • central bank intervention	AO2 AO4	Calculation: changes in the value of a currency from a set of data

Learning objectives

4.5 Exchange rates	Depth	Diagrams and calculations
Consequences of changes in the exchange rate on economic indicators, such as: • the inflation rate • economic growth • unemployment • the current account balance • living standards	AO3 AO4	Diagram: AD/AS curves to show potential consequences of changes in the exchange rate on the economy
Fixed exchange rate • Devaluation and revaluation of a currency • How fixed exchange rates are maintained	AO2 AO4	Diagram: showing how a fixed exchange rate is maintained

Learning objectives

4.5 Exchange rates	Depth	Diagram and calculations
Managed exchange rates • Overvalued currencies • Undervalued currencies	AO2 AO4	Diagram: showing the exchange rate determination and changes in equilibrium in a managed exchange rate system
Fixed versus floating exchange rate systems (HL only)	AO3	

Real world example – data analysis

Open the following foreign exchange charts and select the time period under the chart as “All”

Source 1: USD/EUR Chart

Source 2: USD/HKD Chart

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?

Introduction

International trade involves the use of different national currencies. National currencies are traded for each other on the foreign exchange market and the value of one currency in terms of another is known as the **exchange rate**.

Introduction

Every foreign exchange market involves a **currency pair**.

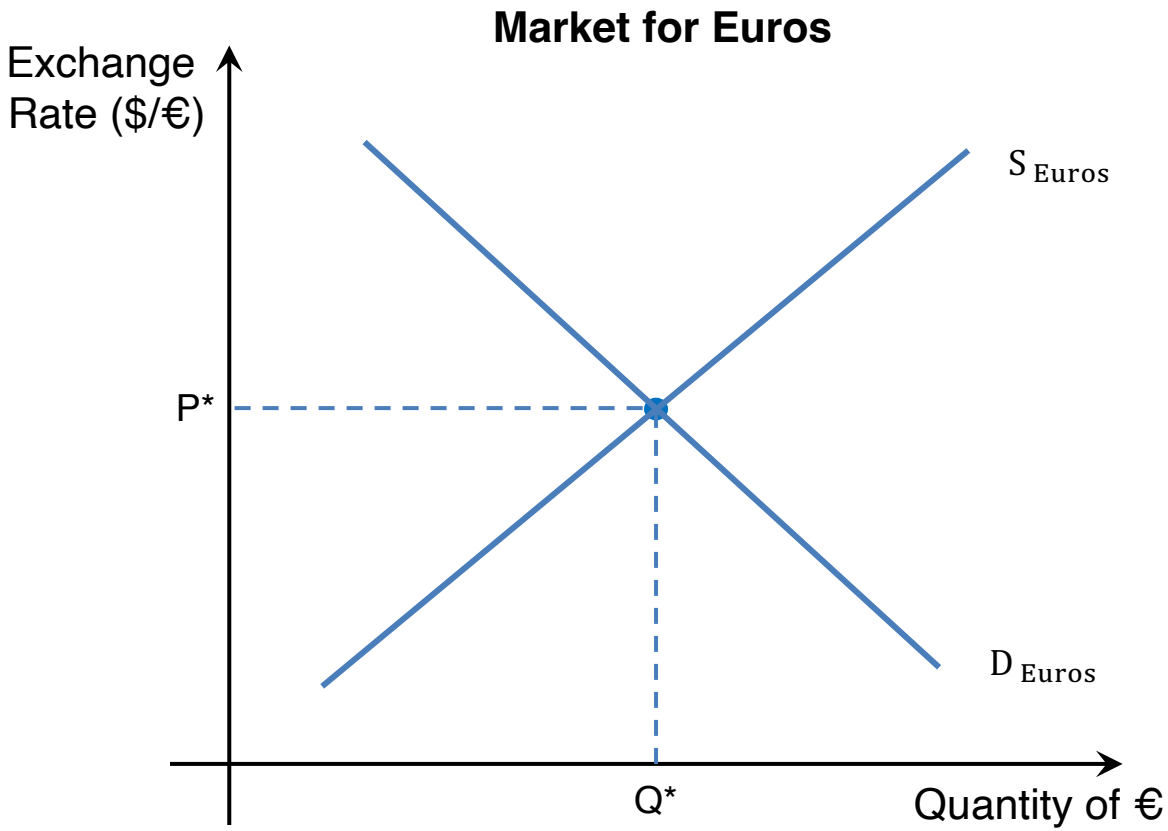
Examples: World's most traded currency pairs.

Foreign exchange market

A **foreign exchange market** can be modelled using a demand and supply diagram.

The y-axis represents the “price” or exchange rate of one currency in terms of another. For example, the exchange rate of Euros can be expressed in US dollars i.e., the number of US dollars required to purchase one Euro.

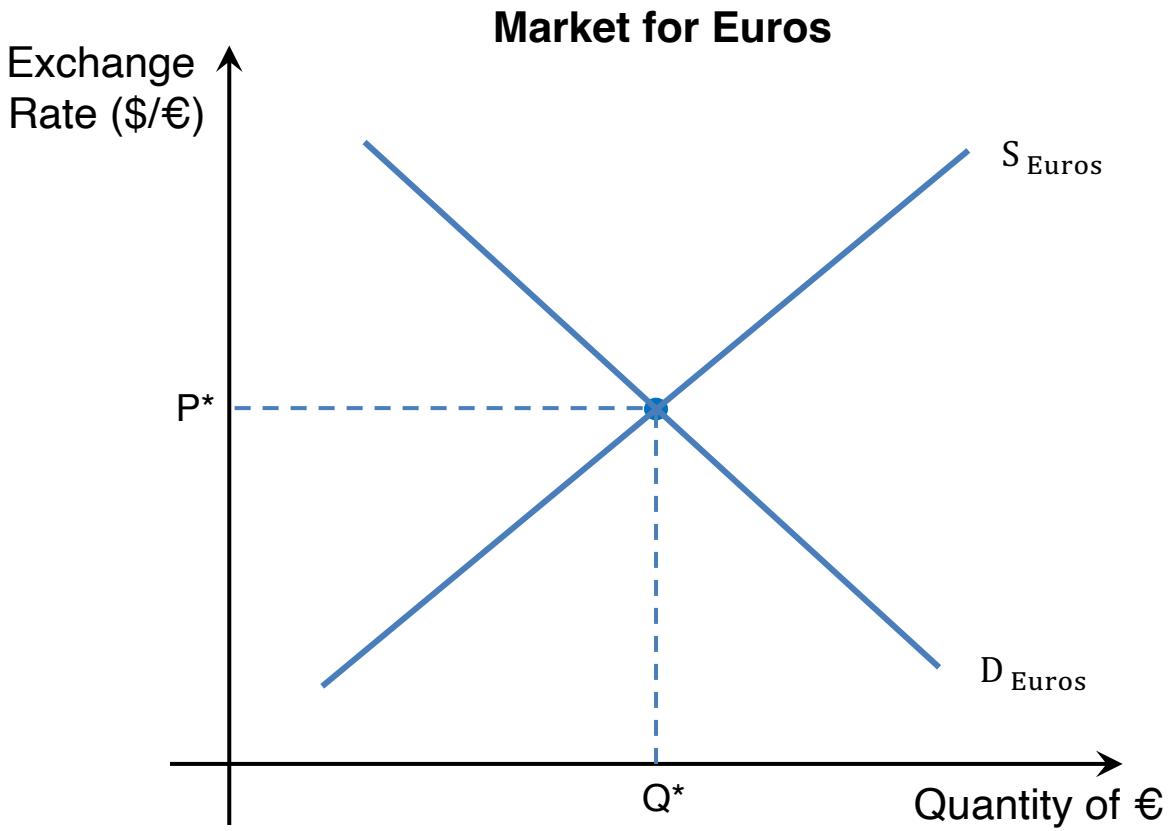
The x-axis shows the quantity of Euros traded for US dollars in this foreign exchange market.



Foreign exchange market - Stakeholders

Demand for Euros include USD holders e.g., consumers, firms, government, who are willing and able to exchange their USD to Euros.

Supply for Euros include Euro holders e.g., consumers, firms, government, who are willing and able to exchange their Euros to USD.

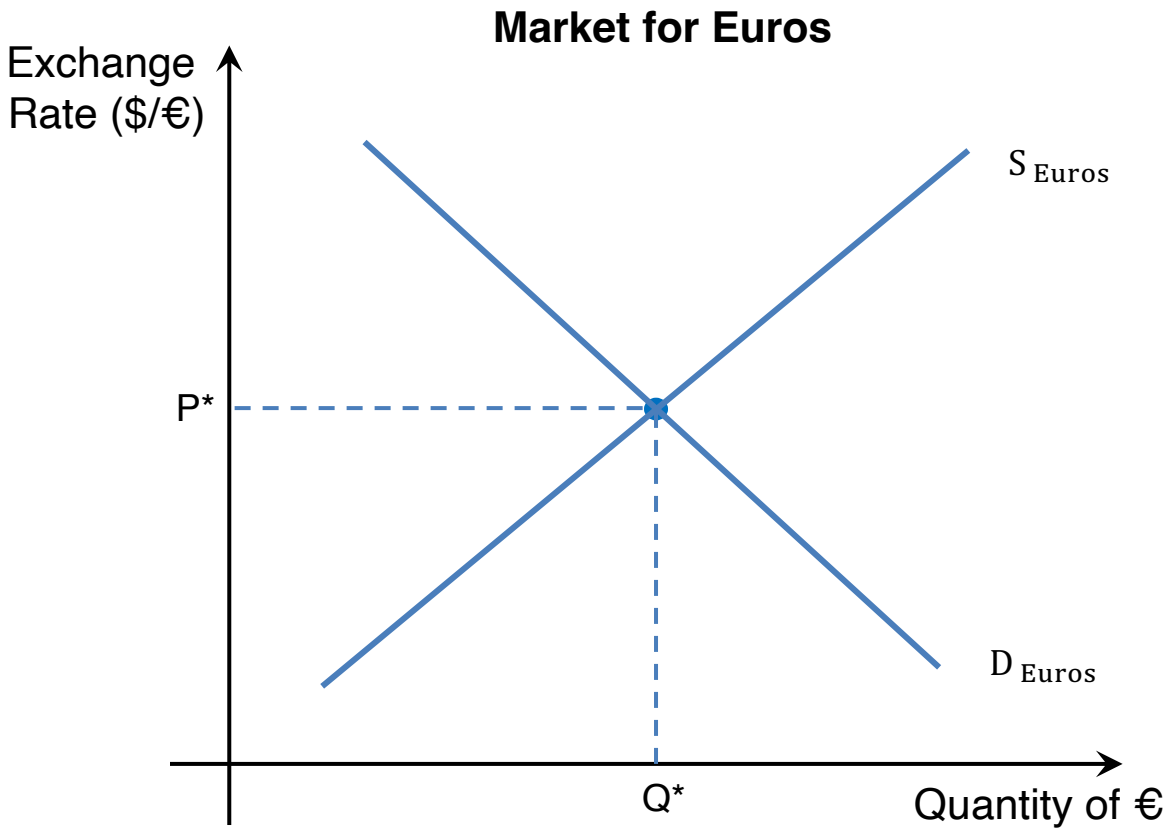


Foreign exchange market

The exchange rate **P*** is determined by the equilibrium between demand and supply.

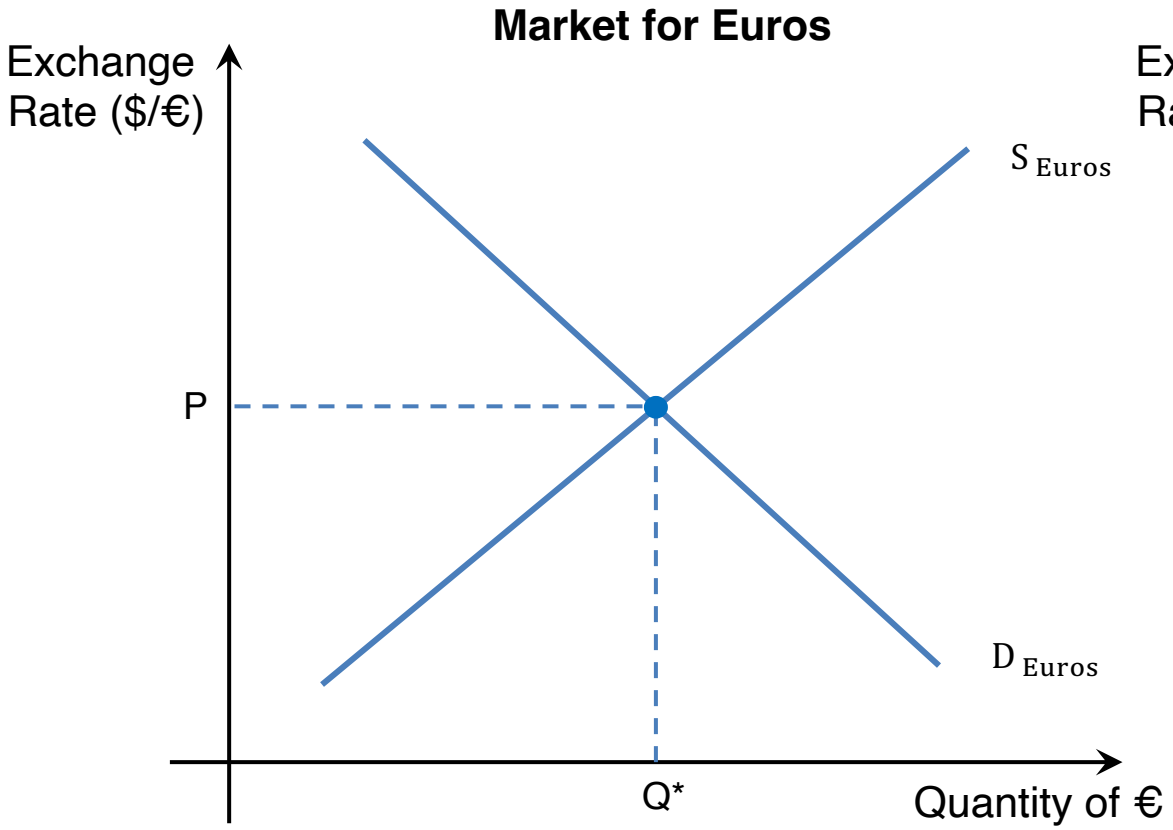
The exchange rate for Euros is denoted by:

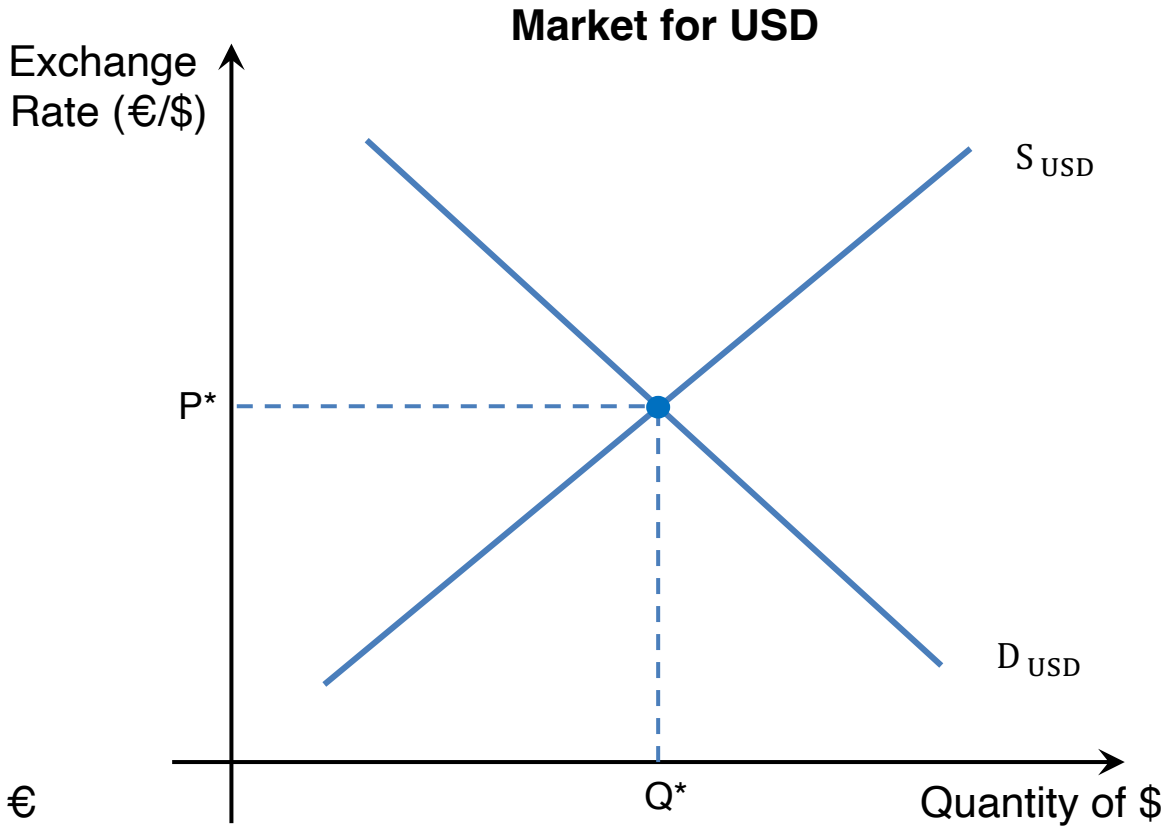
$$1 \text{ EUR} = (P*) \text{ USD}$$



Foreign exchange market - Interdependence

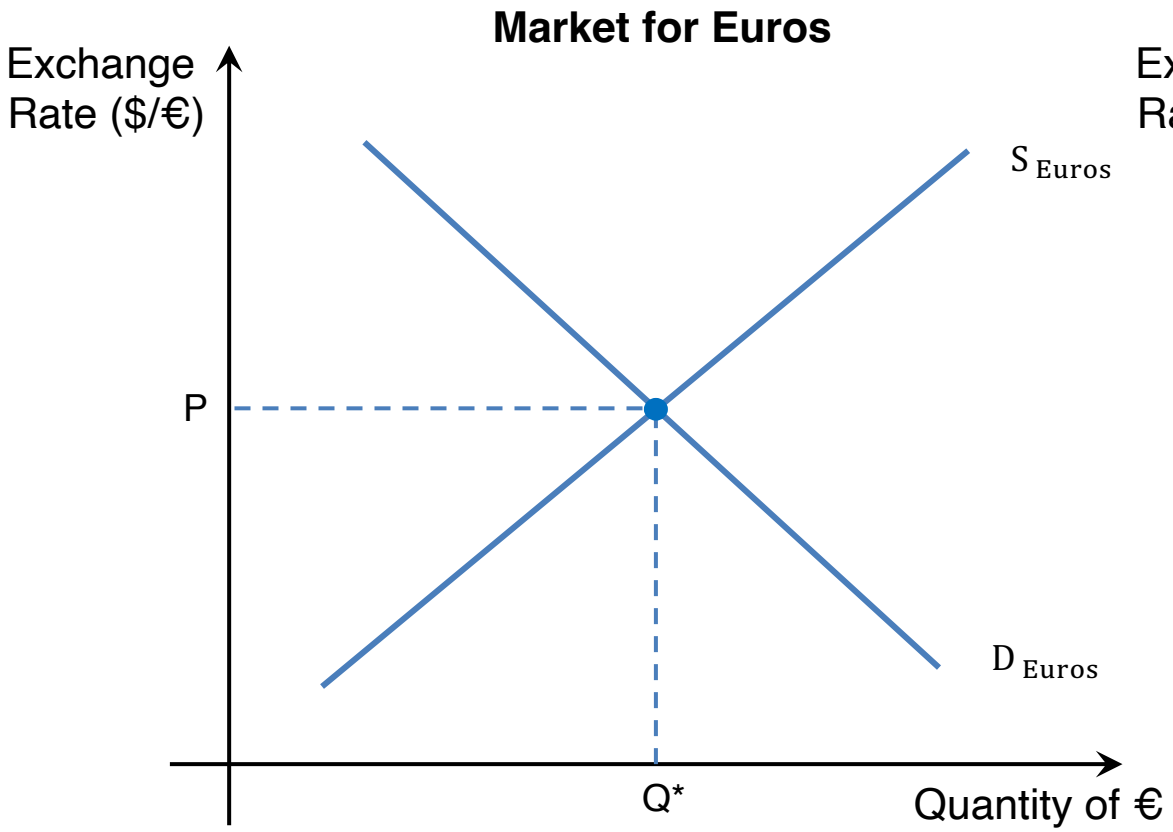
Every foreign exchange market involves two currencies and subsequently two **interdependent** markets. For example, the USD/EUR pair involves the market for Euros and the market for USD.

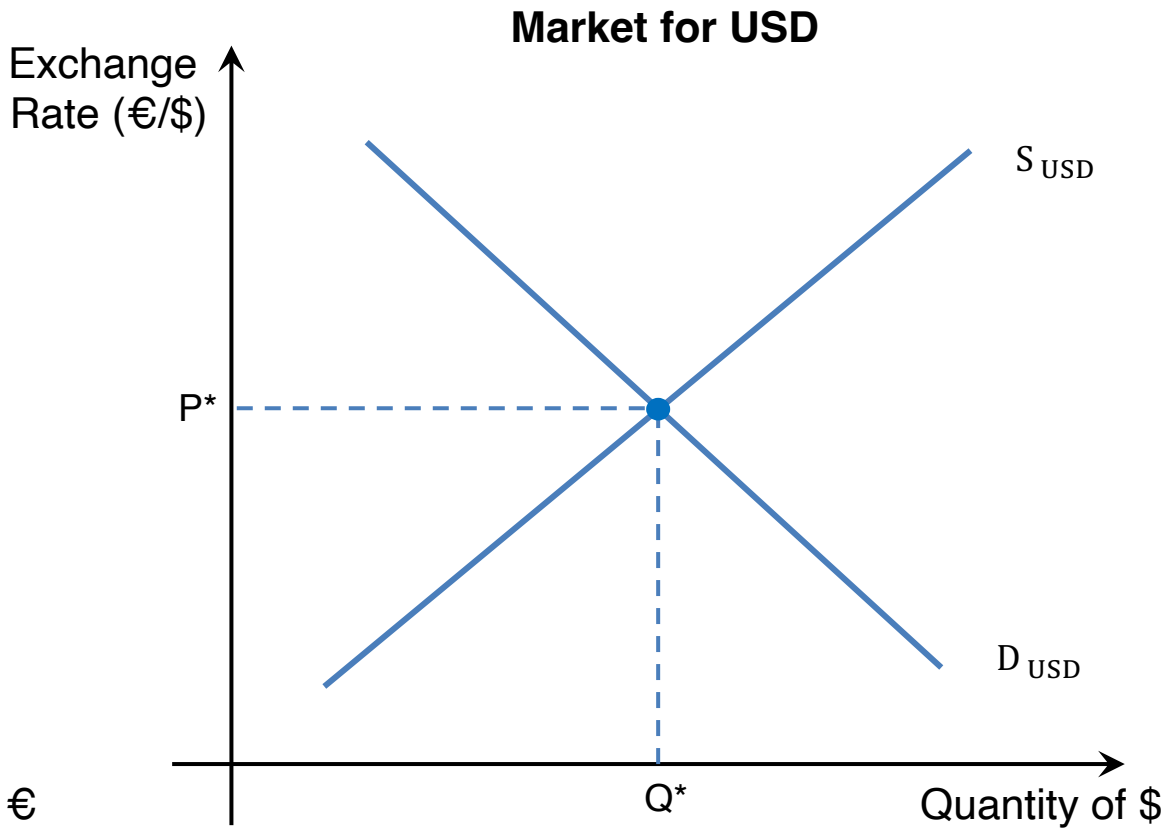




Foreign exchange market - Interdependence

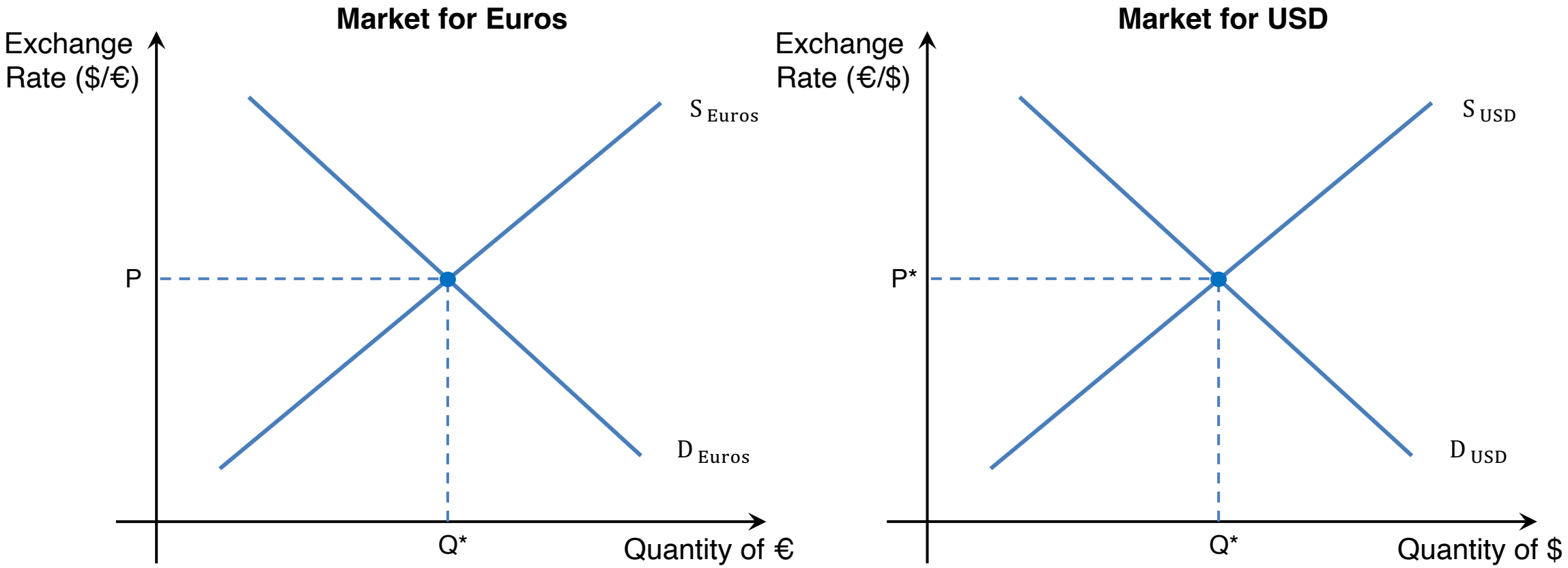
The two markets consists of the same group of stakeholders which make up the buyers and sellers of both currencies.





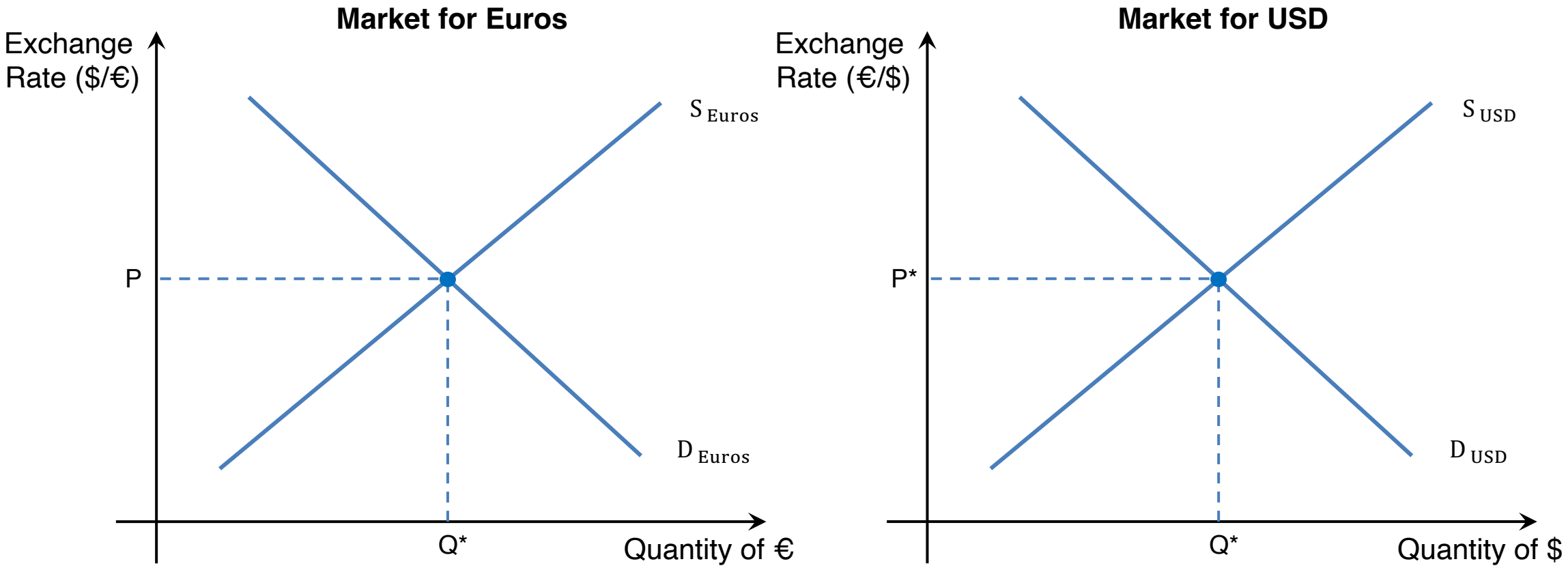
Foreign exchange market - Interdependence

The demand for Euros consisting of USD holders are also the suppliers of USD who are willing and able to exchange their USD for Euros.



Foreign exchange market - Interdependence

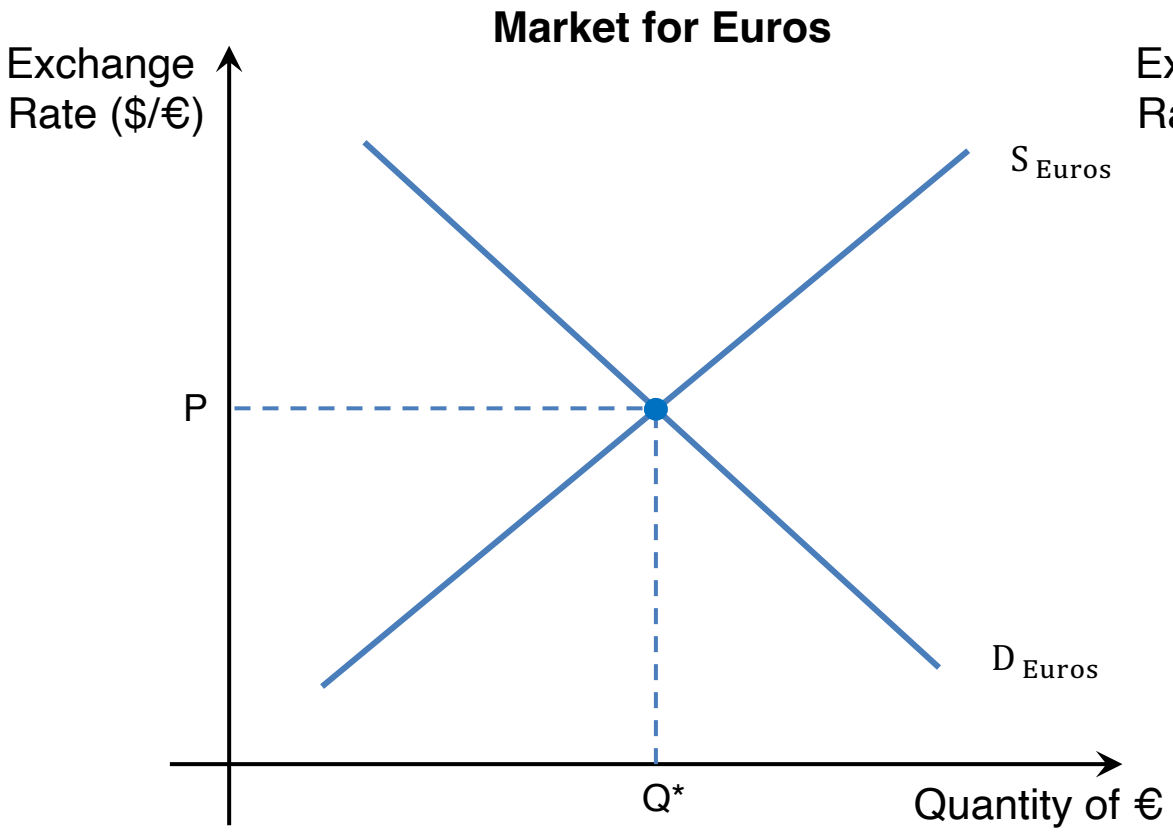
The supply for Euros consisting of Euro holders also make up the demand for USD who are willing and able to exchange their Euros for USD.

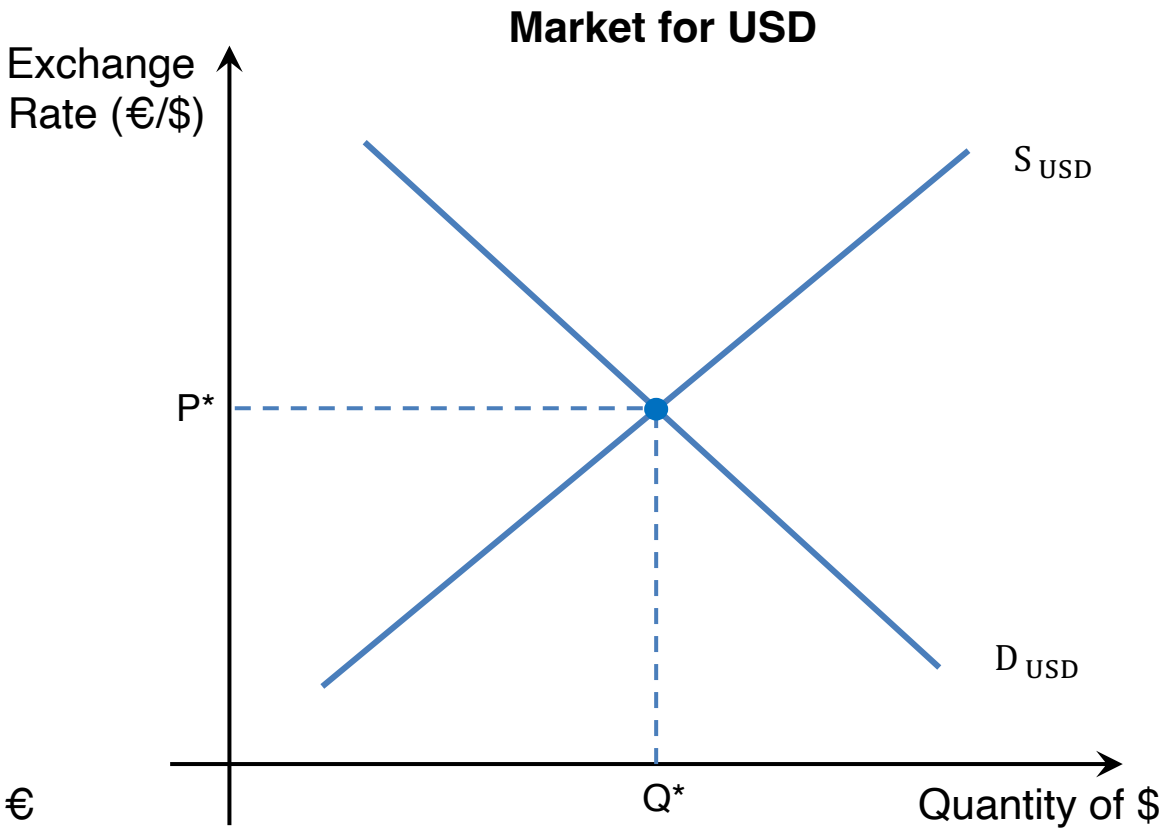


Foreign exchange market - Interdependence

If there is a change in demand or supply in one market, it is reflected in the other market.

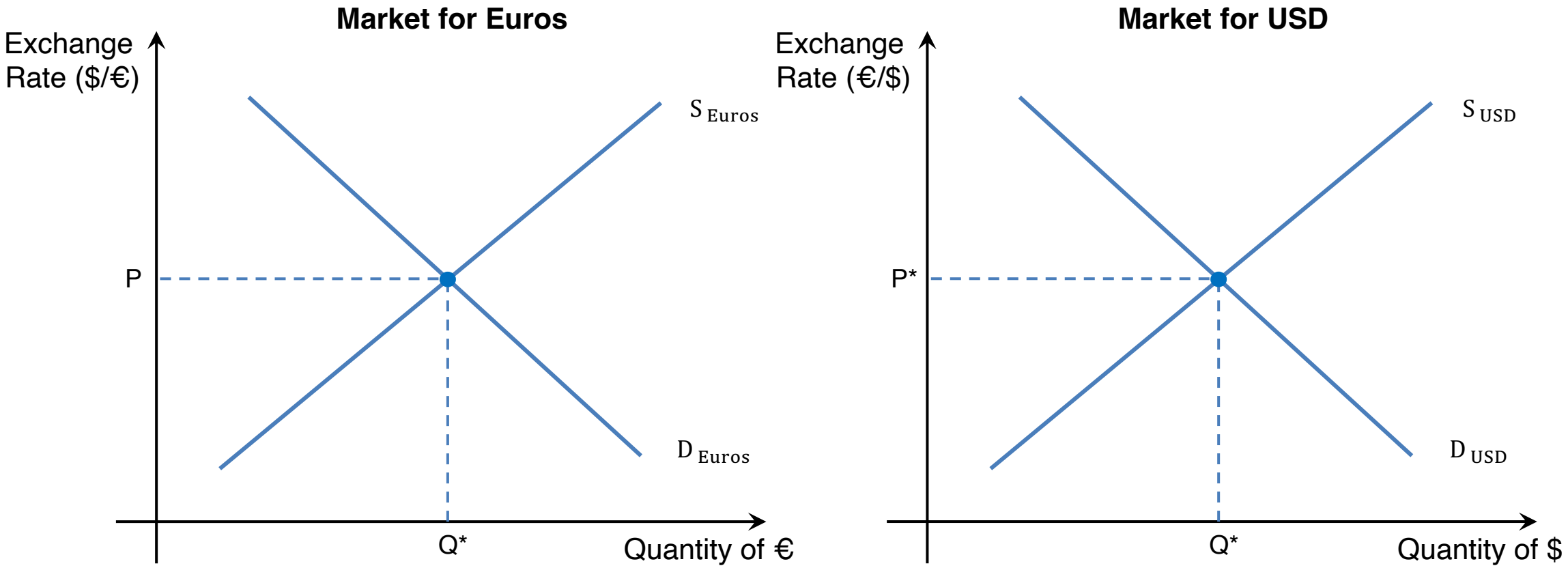
Subsequently, if there is a change in the exchange rate in one market, it is reflected in the other.





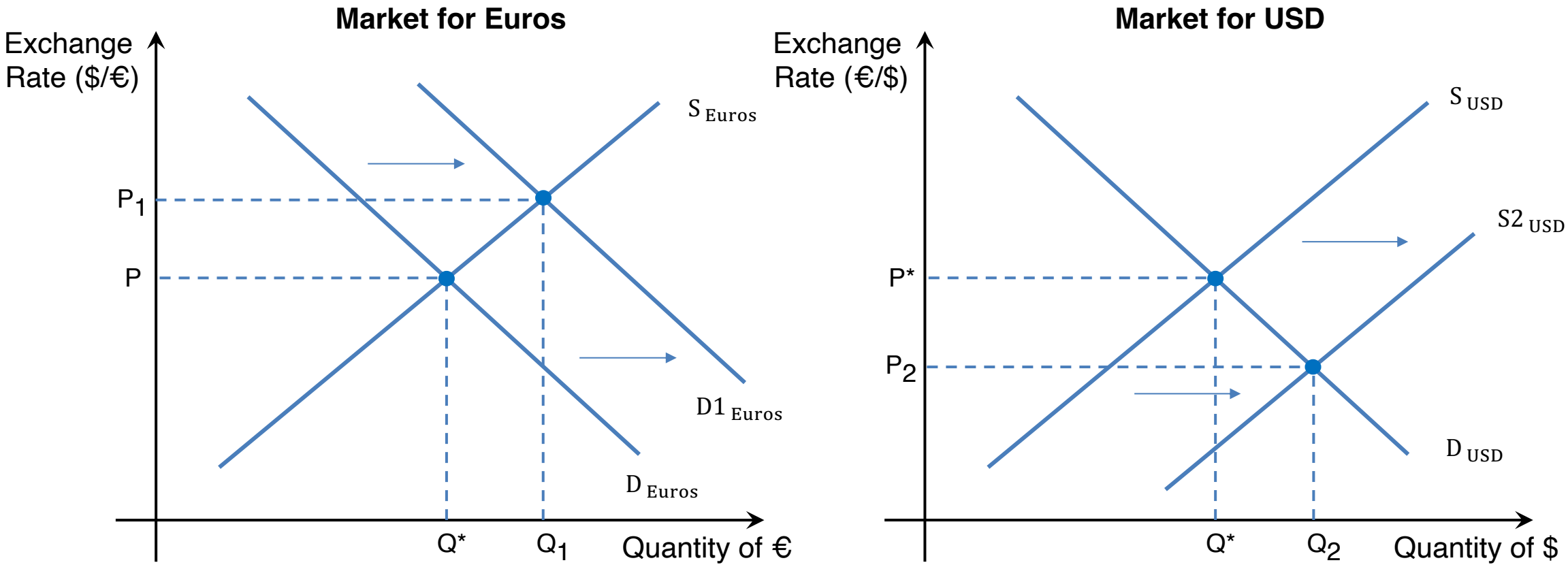
Foreign exchange market - Interdependence

Suppose there is an increase in interest rates in the EU. How would this affect the market for Euros and the market for USD?



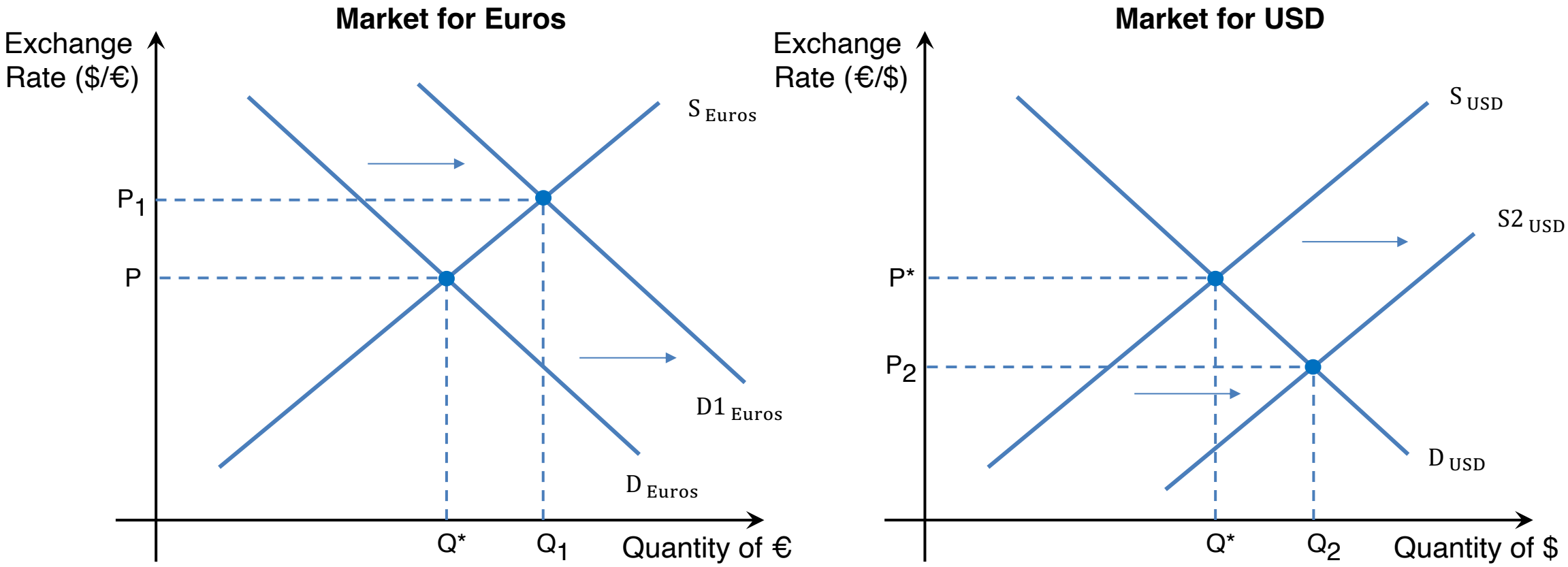
Foreign exchange market - Interdependence

Demand for Euros increase as USD holders convert more USD to Euros to benefit from increased returns to saving. This is reflected by an increase in supply for USD in the market for USD.



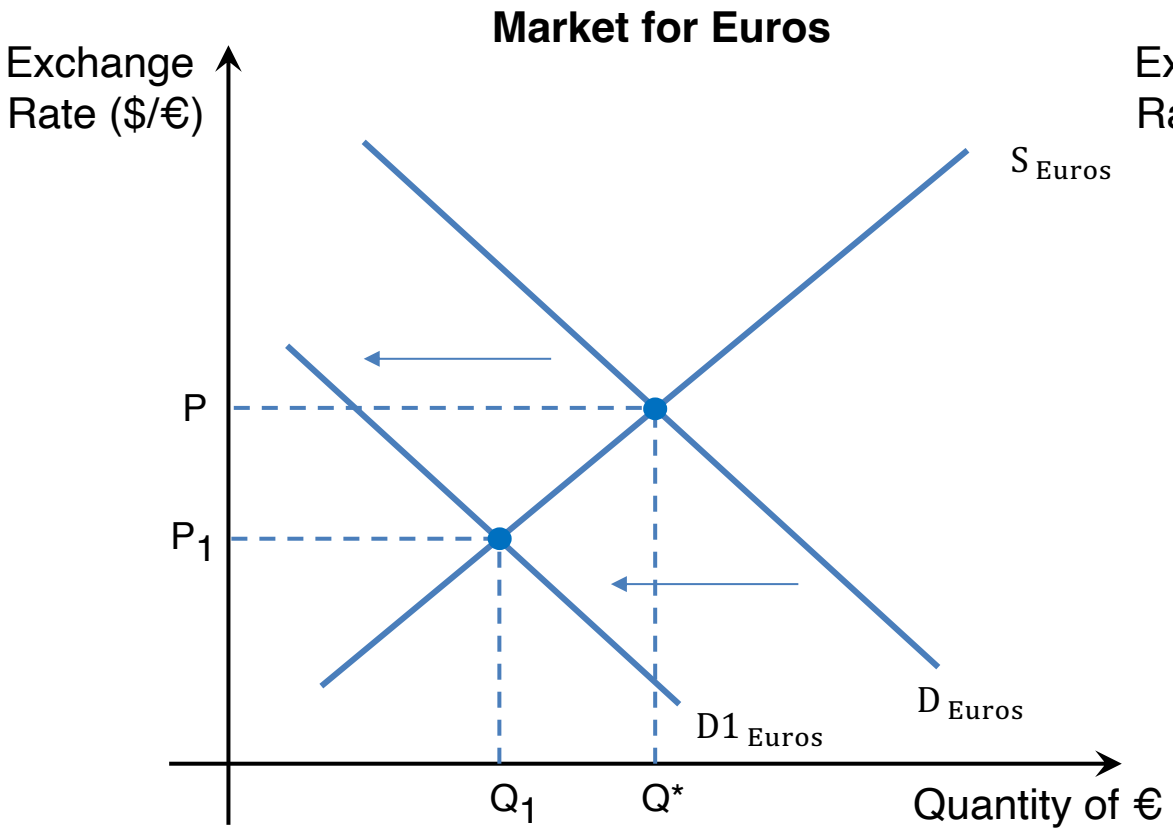
Foreign exchange market - Interdependence

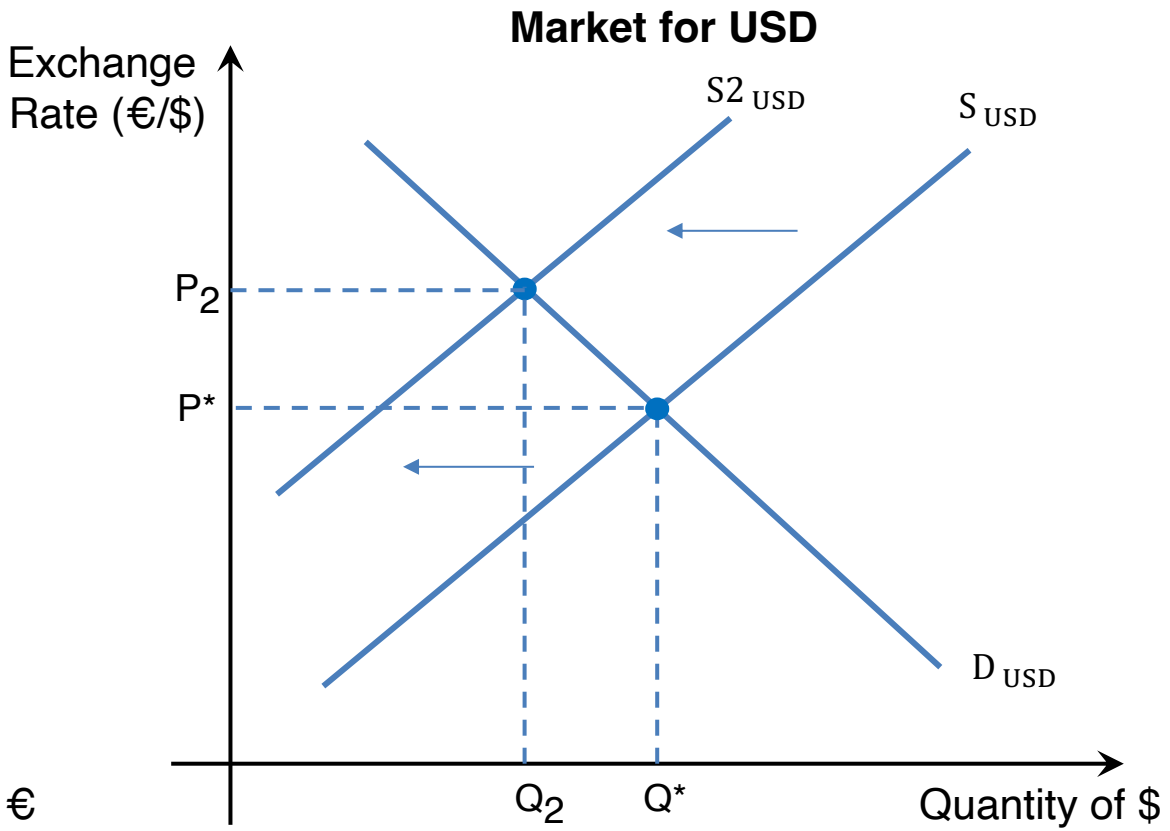
The value of the Euro increases from P to P1 while the value of USD falls from P* to P2.



Foreign exchange market - Interdependence

Similarly, a fall in demand for Euros is equivalent to a fall in supply for the US dollar, vice versa.





Over to you…

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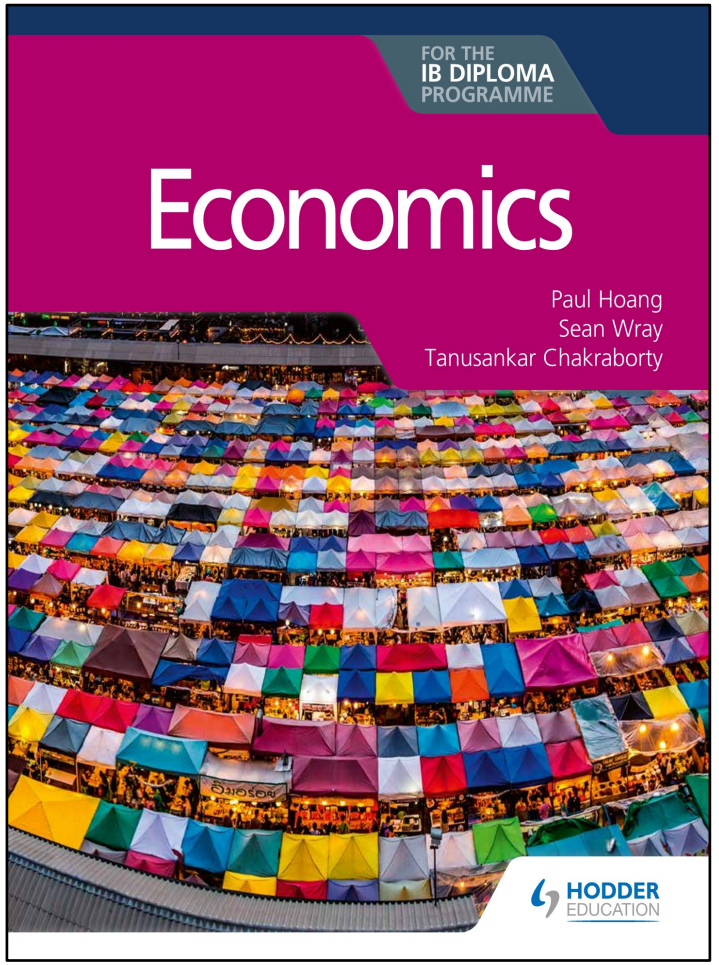
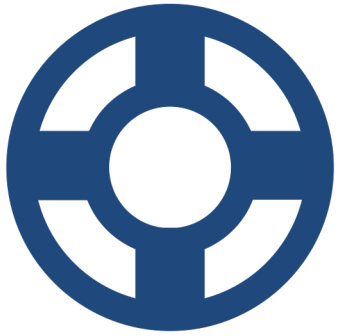
Economics for the IB Diploma Programme

- Page 488-489
- Paper 2 and 3 Exam Practice Question 31.1, 31.2, 31.3, and 31.4
- [2 marks] + [2+2 marks] + [2+2 marks] + [2 marks]



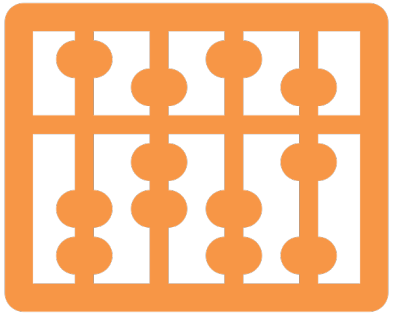
Exchange rate systems

There are three types of **exchange rates systems.**



Floating

Fixed



Managed

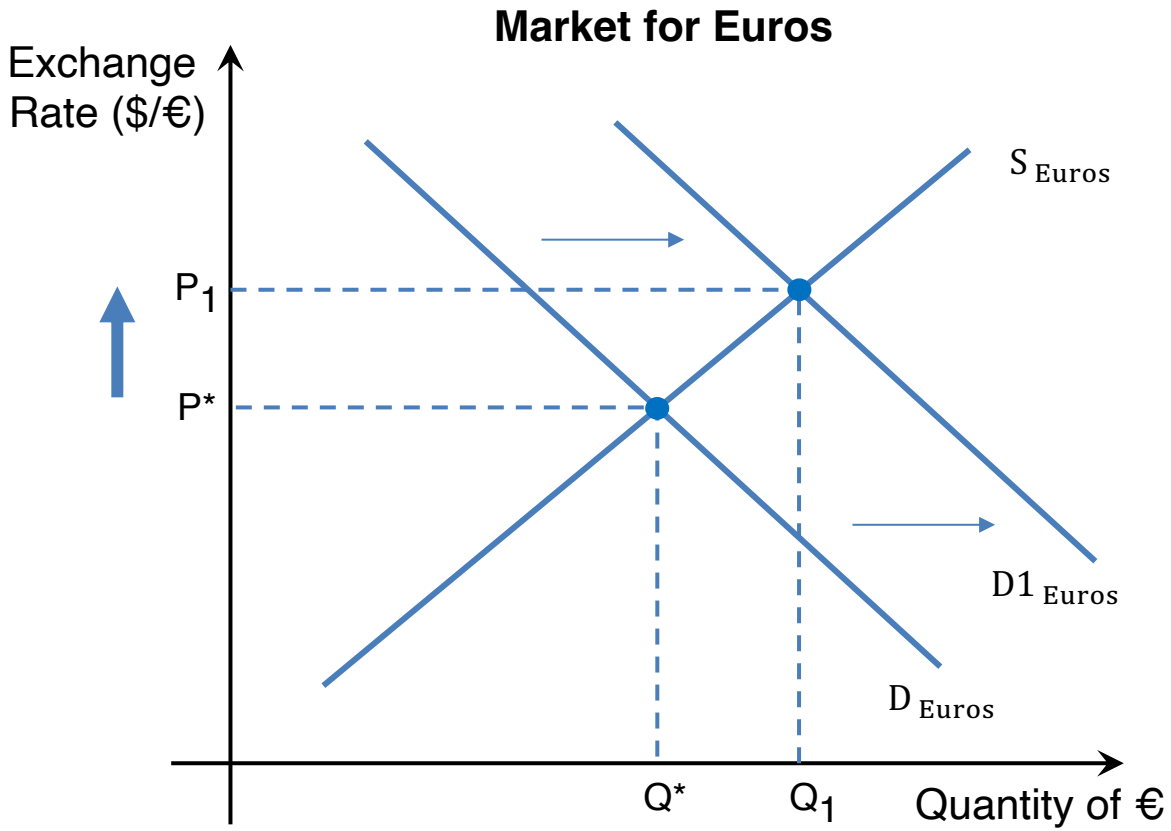
Floating Exchange Rates

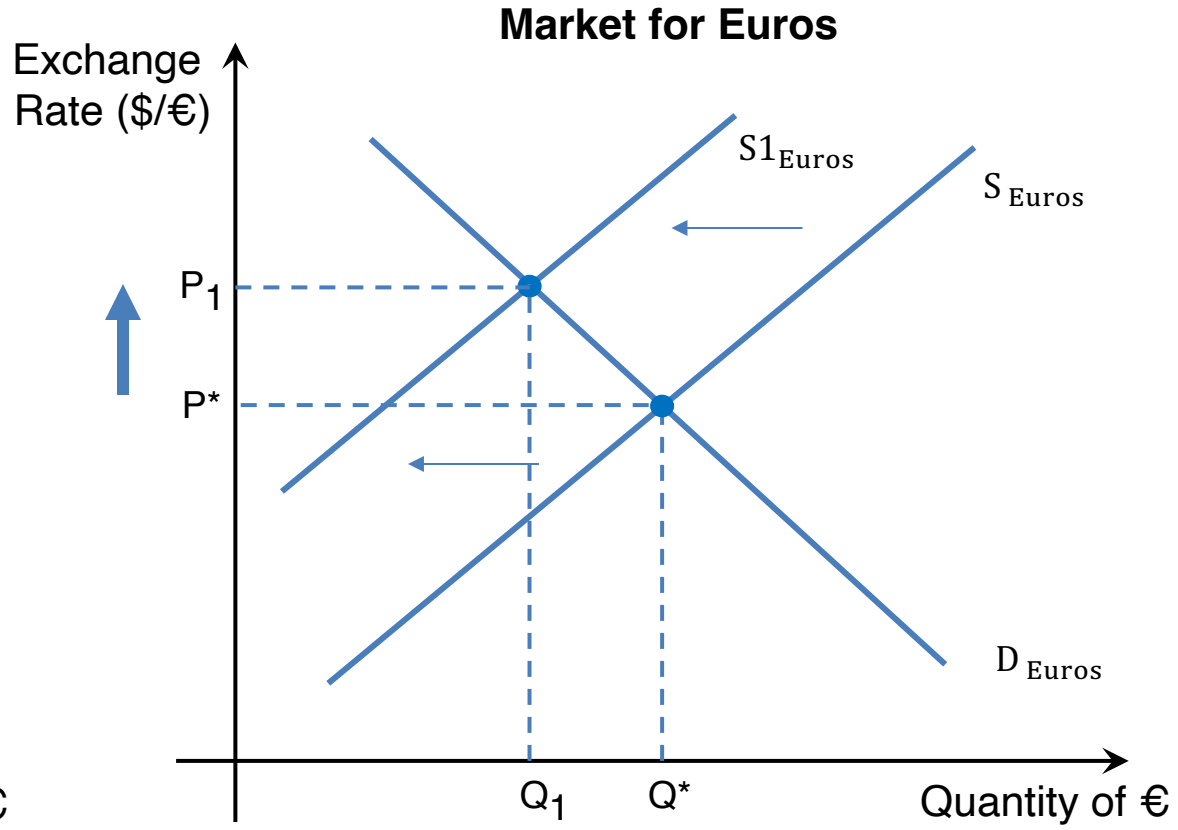
In a **floating exchange rate** regime, the value of a currency is determined by market forces of demand and supply without government intervention.

Floating Exchange Rates

Changes in demand and supply affects the equilibrium exchange rate.

Appreciation refers to the rise in the value of a currency in a floating exchange rate system.

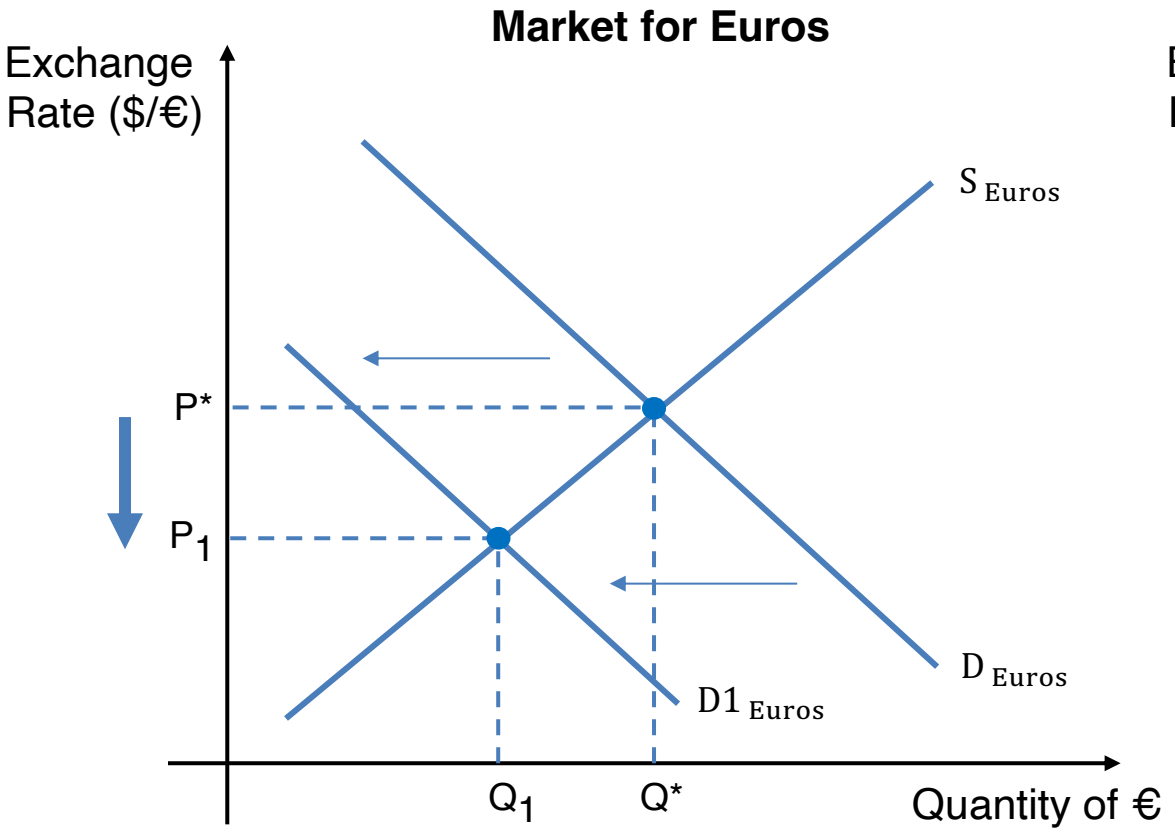


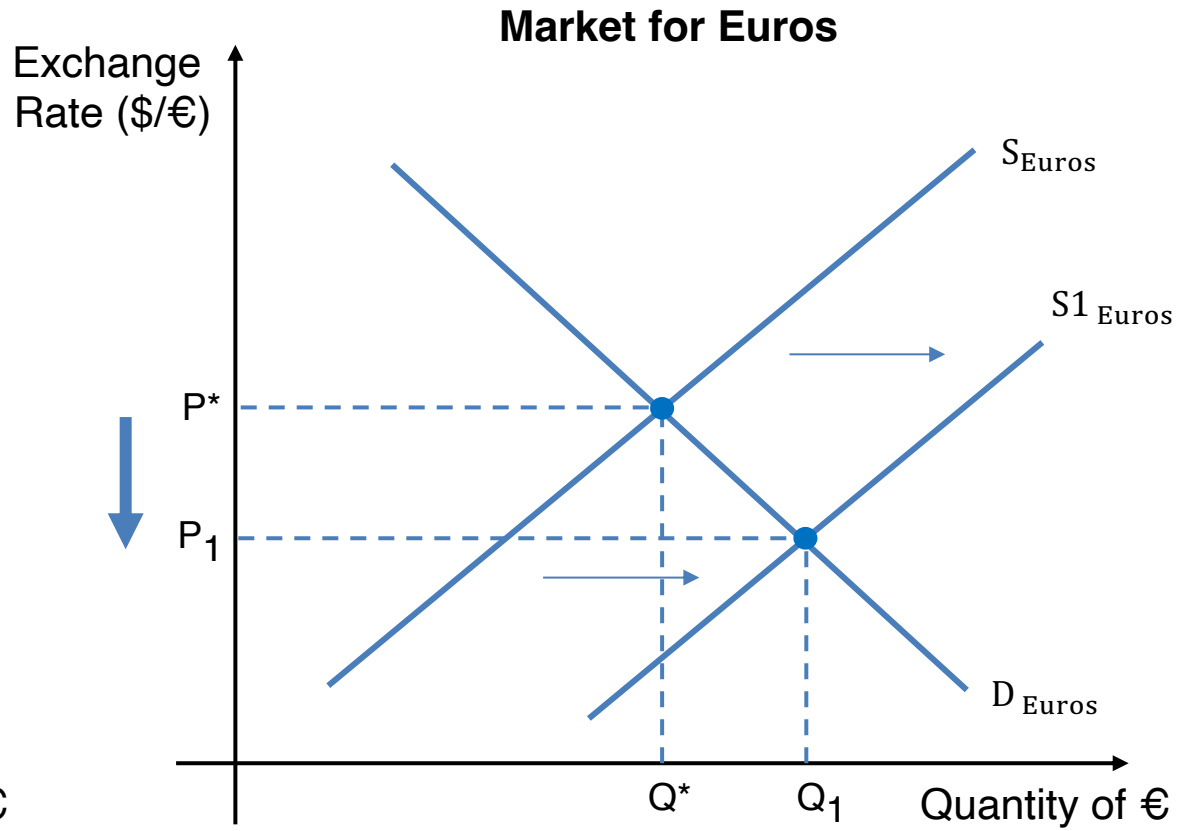


Floating Exchange Rates

Changes in demand and supply affects the equilibrium exchange rate.

Depreciation refers to the fall in the value of a currency in a floating exchange rate system.



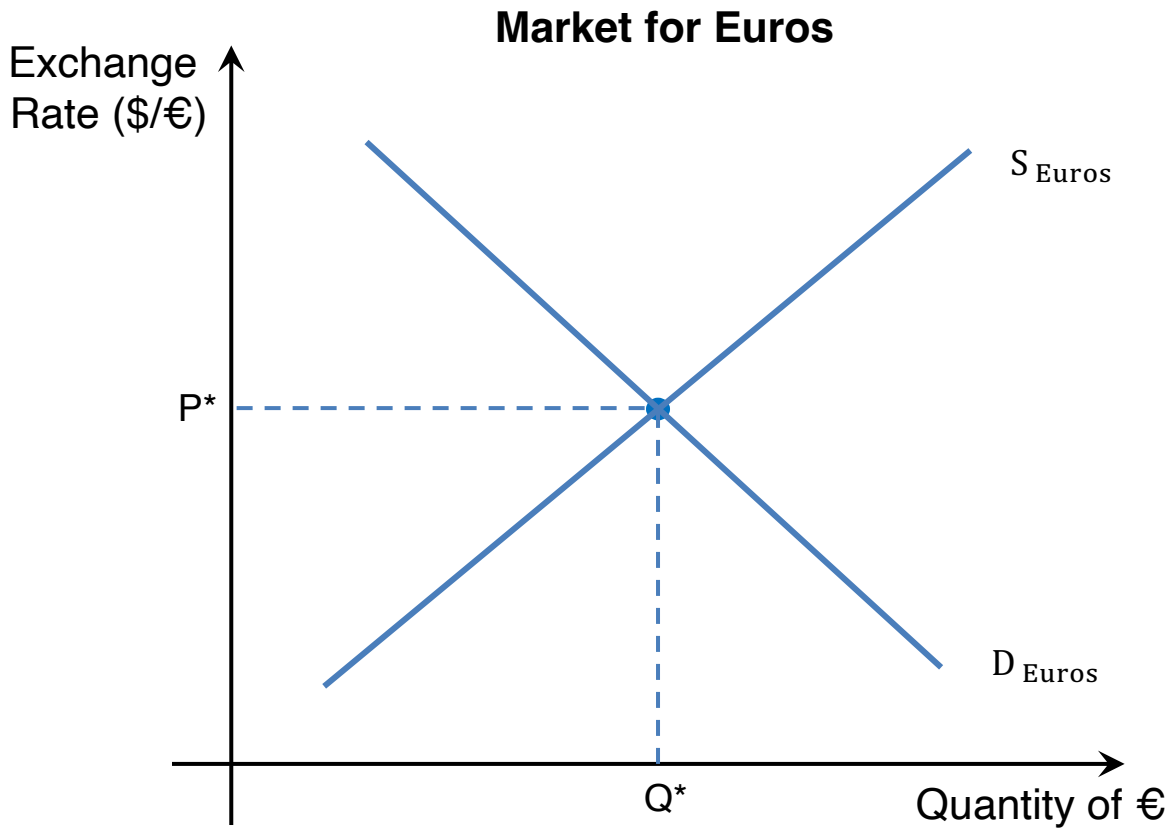


Floating Exchange Rates – appreciation

When the value of the Euro increases, it is known to **appreciate** and its exchange rate **increases** i.e. *it takes more USD to purchase one Euro.*

As with resource and product markets, the price – or exchange rate – of a Euro will increase either by:

- A **rise in demand** for the Euro
- A **fall in supply** for the Euro

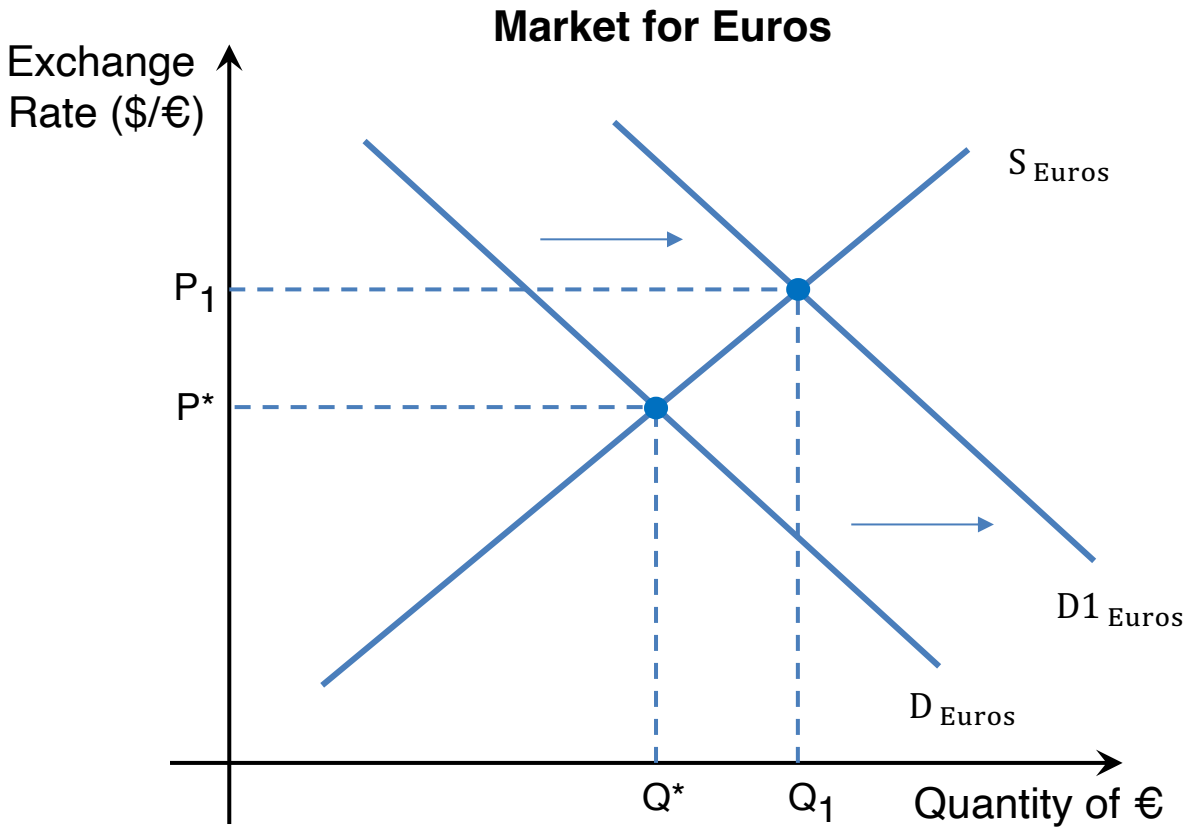


Floating Exchange Rates – appreciation

An increase in demand for Euros will increase its exchange rate from P* to P_1.

Why might the demand curve increase?

- Increased demand for EU exports
  - Firms in the Eurozone expect to be paid in Euros.
  - Hence, non-EU consumers demanding EU exports must purchase Euros which increases demand.

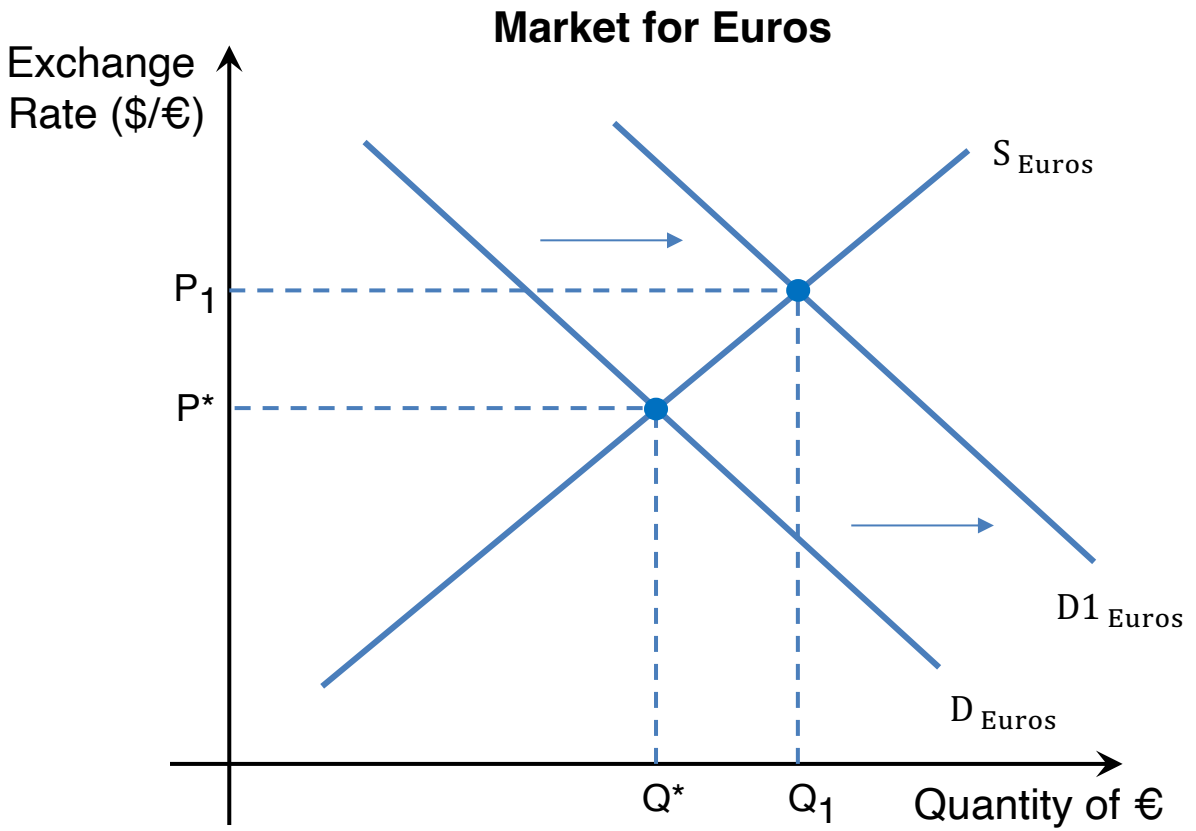


Floating Exchange Rates – appreciation

An increase in demand for Euros will increase its exchange rate from P* to P_1.

Why might the demand curve increase?

- Increased investment towards the Eurozone
  - Foreign firms fund FDI by purchasing the Euro
  - Foreign investors fund portfolio investment by purchasing the Euro

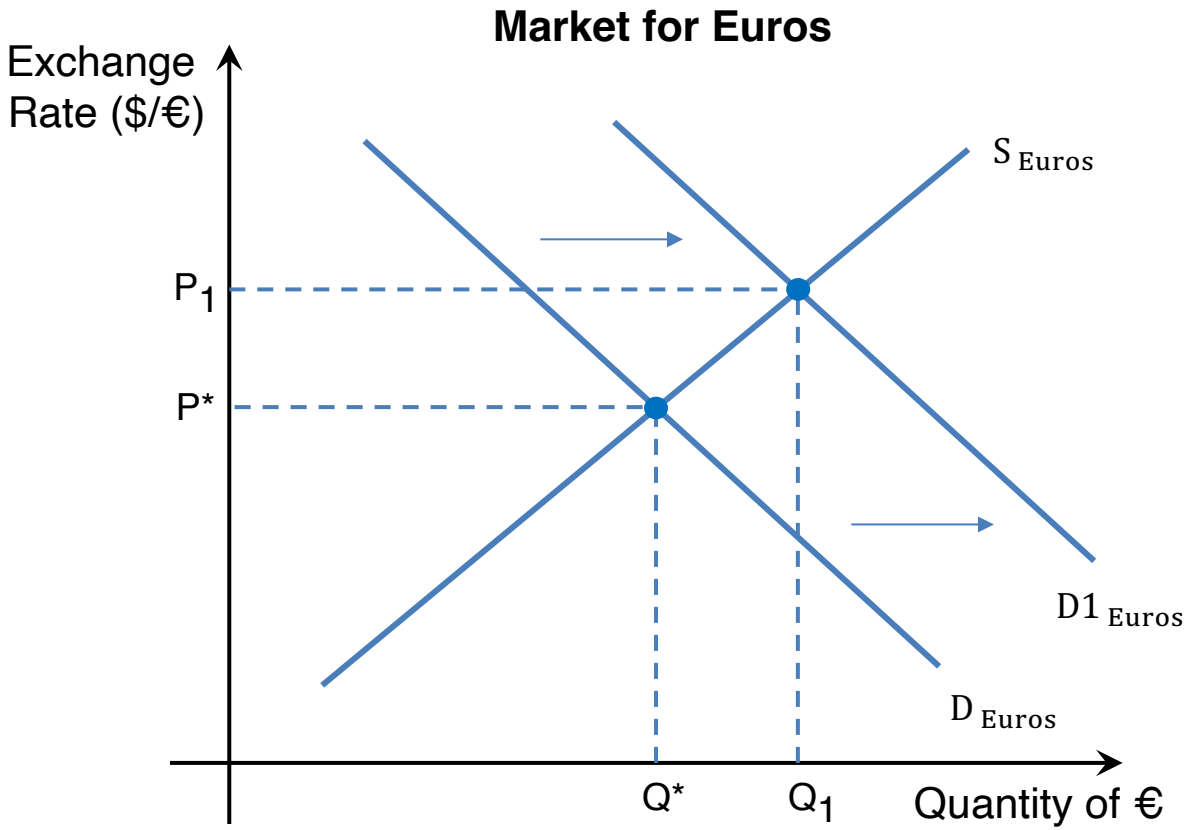


Floating Exchange Rates – appreciation

An increase in demand for Euros will increase its exchange rate from P* to P_1.

Why might the demand curve increase?

- Remittances from expatriates
  - Expatriates may remit their foreign income back to the Eurozone
  - For remittances to be spent within the Eurozone, foreign currencies must be converted into Euro

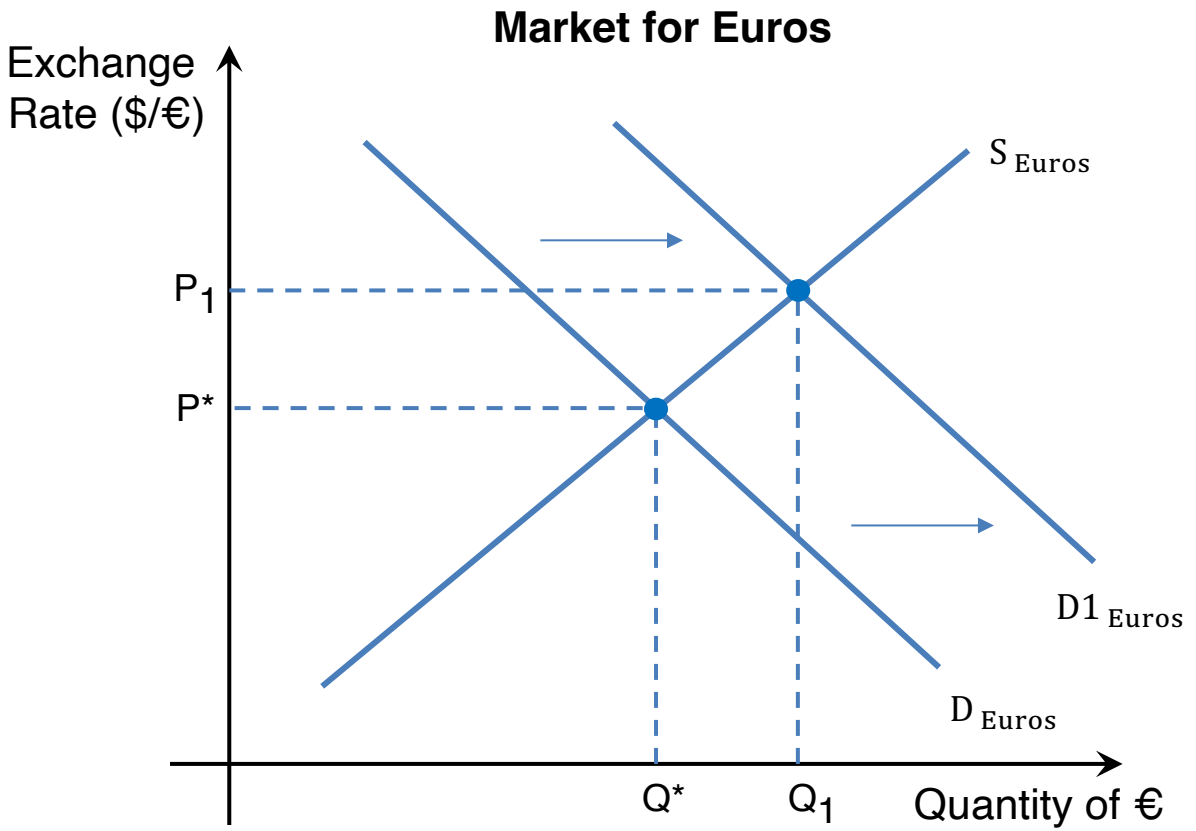


Floating Exchange Rates – appreciation

An increase in demand for Euros will increase its exchange rate from P* to P_1.

Why might the demand curve increase?

- Speculation (hot money)
  - Currency speculators may purchase the Euro, expecting its value to rise, allowing them to sell their Euro for a profit.
  - This leads to a self-fulfilling prophecy, as it increases demand for the Euro, leading it to appreciate, *ceteris paribus*.

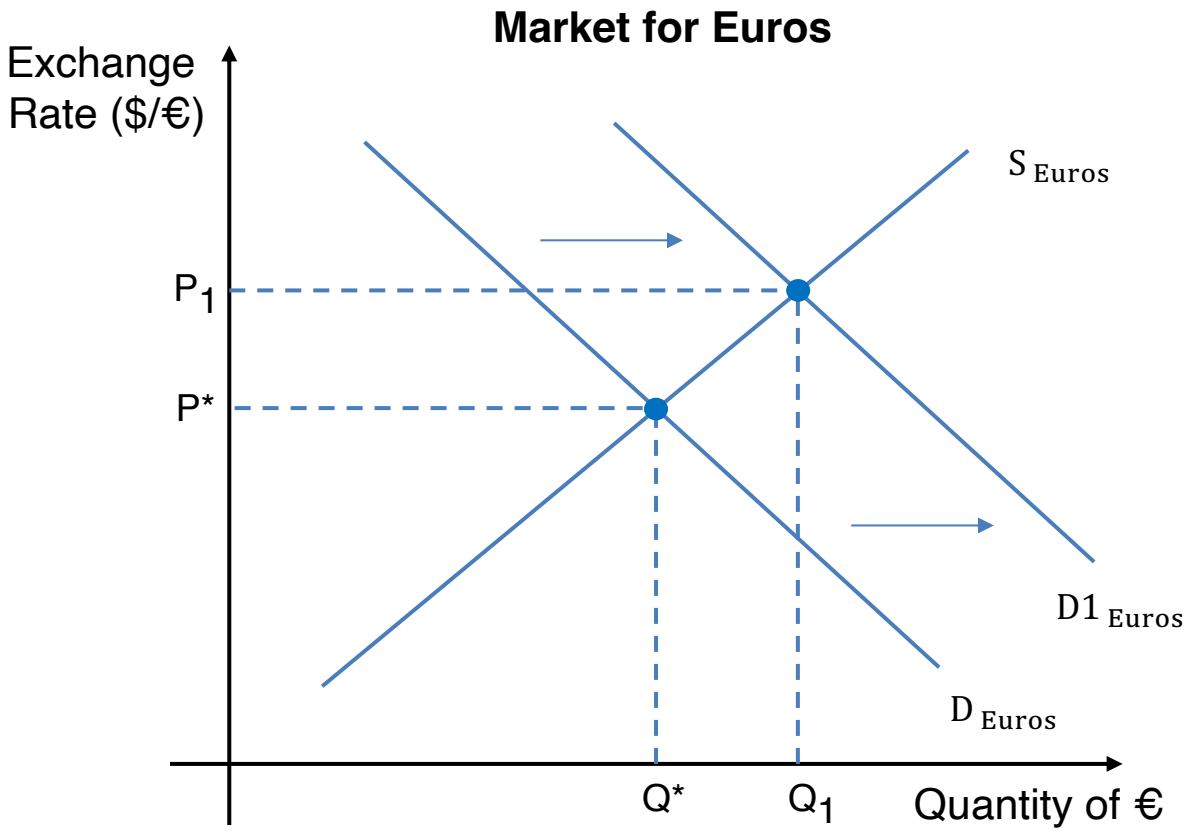


Floating Exchange Rates – appreciation

An increase in demand for Euros will increase its exchange rate from P* to P_1.

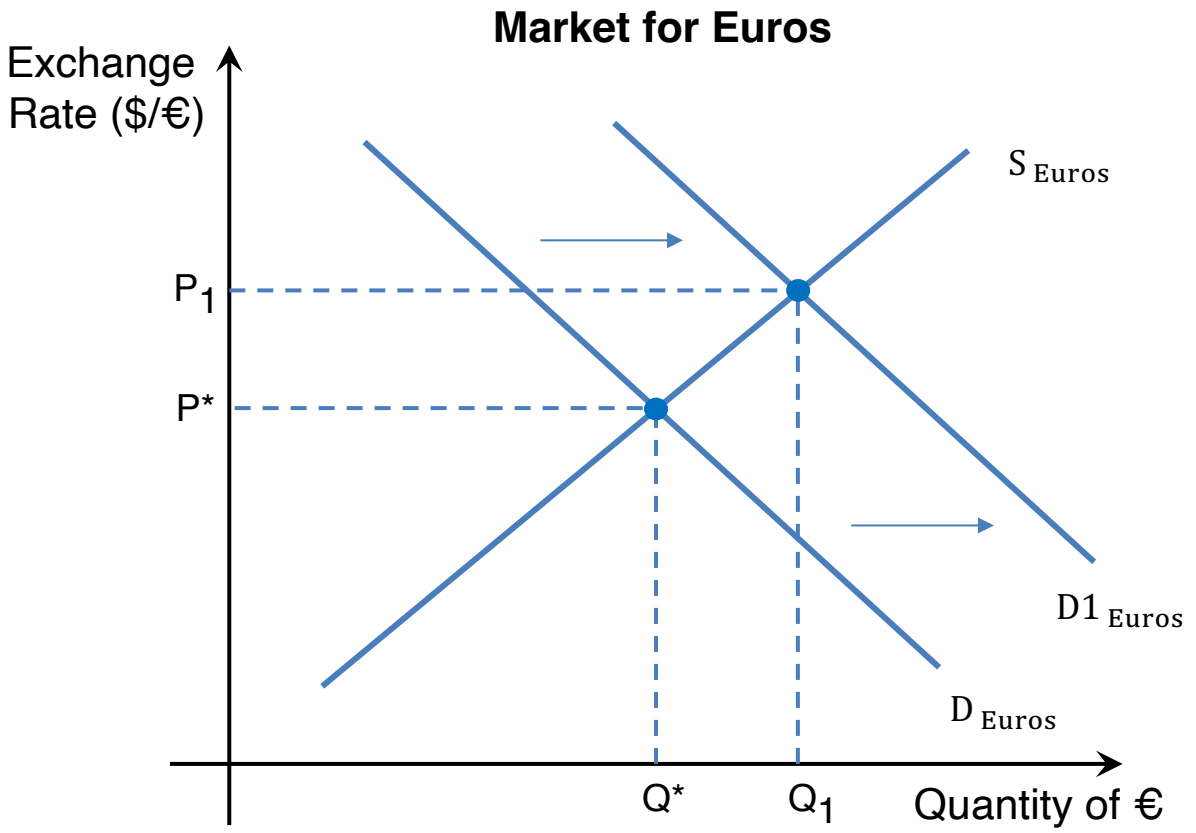
Why might the demand curve increase?

- A fall in relative inflation rates
  - When the inflation rate within the Eurozone is lower than the global average, its exports will be relatively cheaper than the rest of the world
  - As a result, increased demand of the Eurozone's exports appreciates the Euro



Floating Exchange Rates – appreciation

An increase in demand for Euros will increase its exchange rate from P* to P_1.



Why might the demand curve increase?

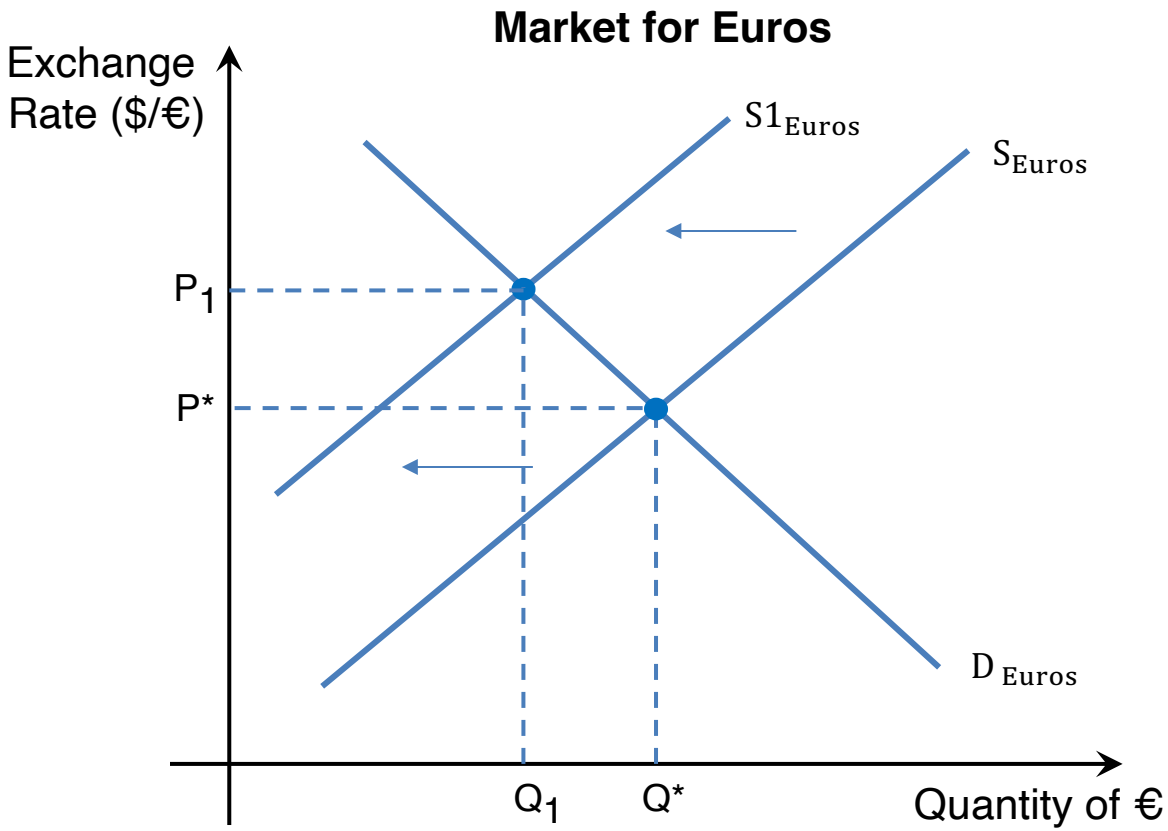
- A rise in relative interest or growth rates
  - Contractionary monetary policy increases the incentive to save and earn interest payments
  - As a result, investors with accounts within the Eurozone may exchange their foreign currency to Euros, increasing demand

Floating Exchange Rates – appreciation

A fall in supply for Euros will also increase its exchange rate from P* to P_1.

Why might the supply curve decrease?

- A fall in domestic demand for imports
  - When residents of the Eurozone import less goods and services, they exchange less of their Euro for foreign currencies
  - As a result, the supply curve decreases.

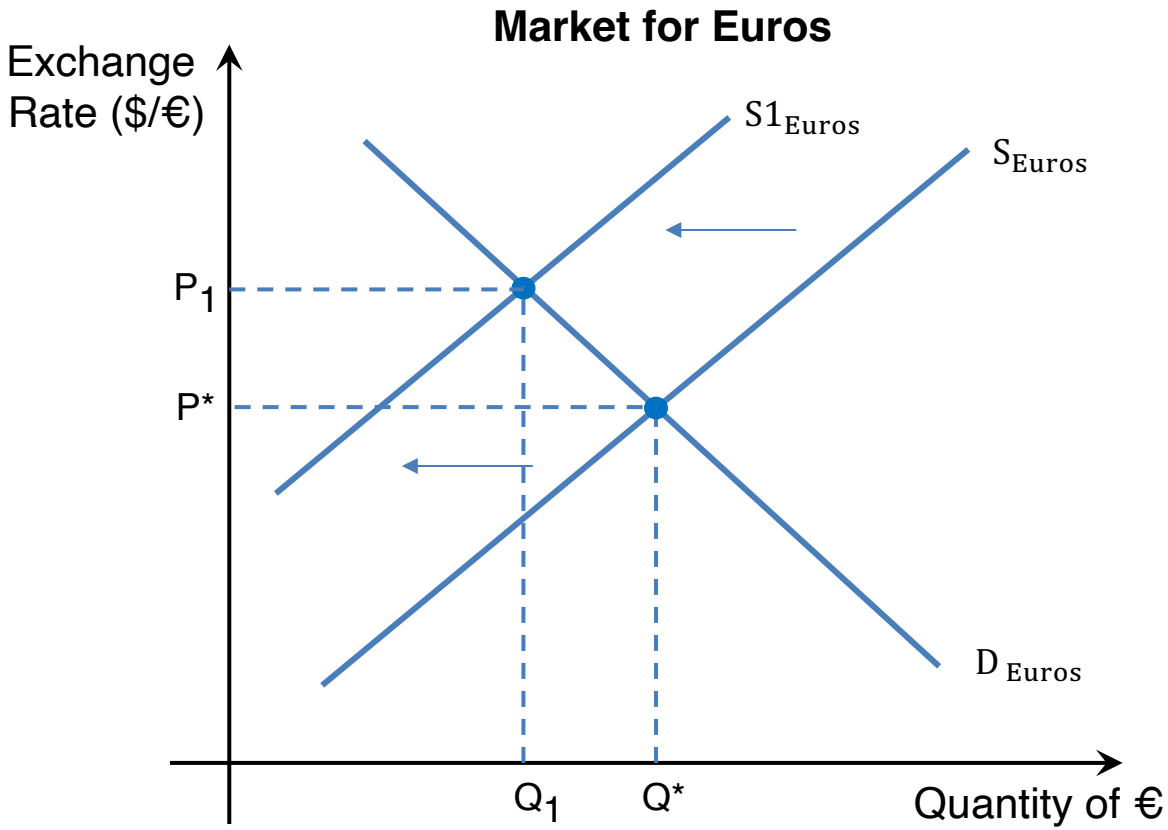


Floating Exchange Rates – appreciation

A fall in supply for Euros will also increase its exchange rate from P* to P_1.

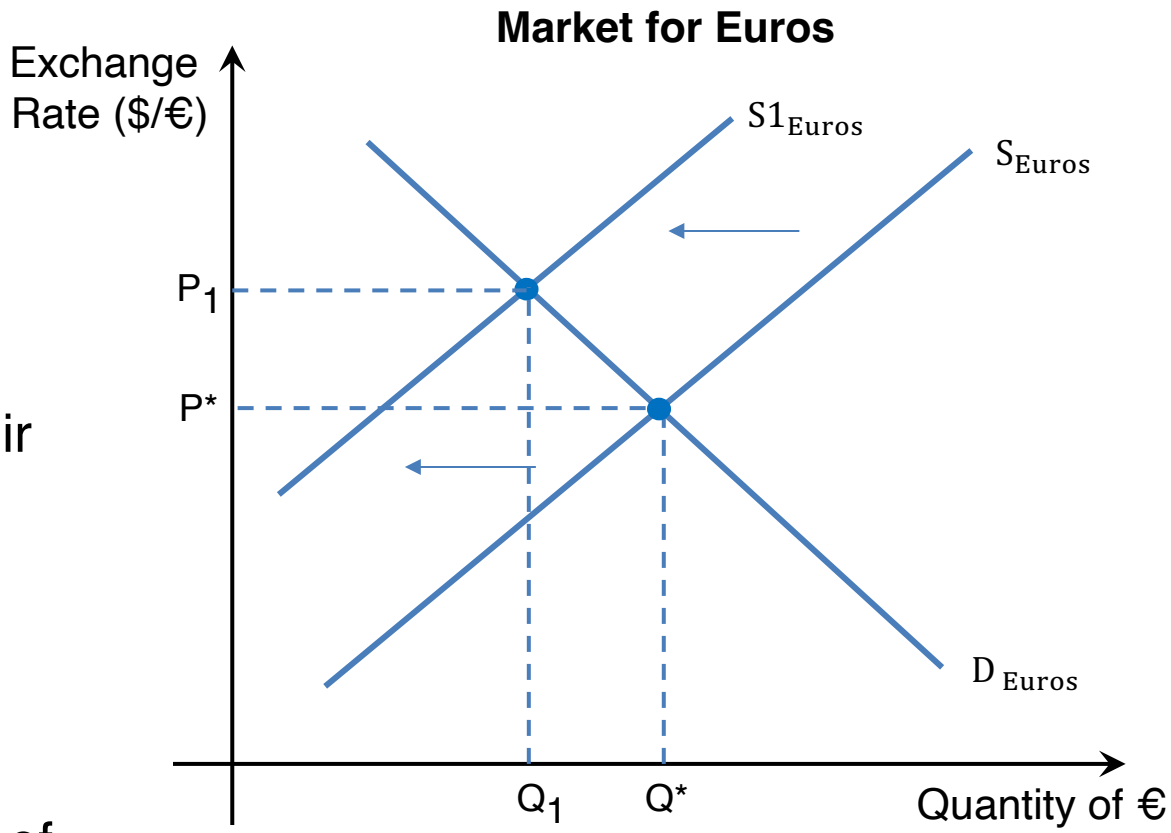
Why might the supply curve decrease?

- A fall in outward investment from the Eurozone
  - Eurozone firms fund outward FDI by selling their Euro for foreign currencies
  - Eurozone investors fund outward portfolio investment also by selling their Euro
  - Hence, a fall in outward investment will reduce supply of the Euro.



Floating Exchange Rates – appreciation

A fall in supply for Euros will also increase its exchange rate from P* to P_1.



Why might the supply curve decrease?

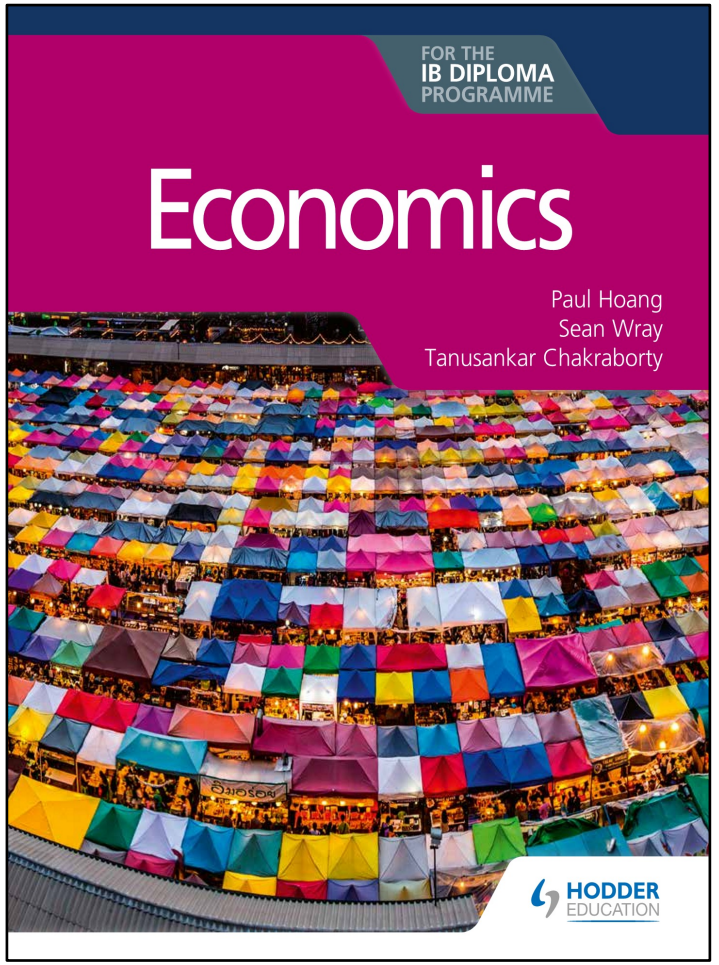
- Central bank intervention
  - Central banks may restrict the supply of their currency through administrative barriers
  - Some currencies can only be legally traded from approved outlets
  - This prevents governments or large groups of investors from manipulating a given currency.

Over to you…

Hoang, Wray, & Chakraborty (2020)

Economics for the IB Diploma Programme

- Page 494
- Paper 2 and 3 Exam Practice Question 31.5
- [4 marks]

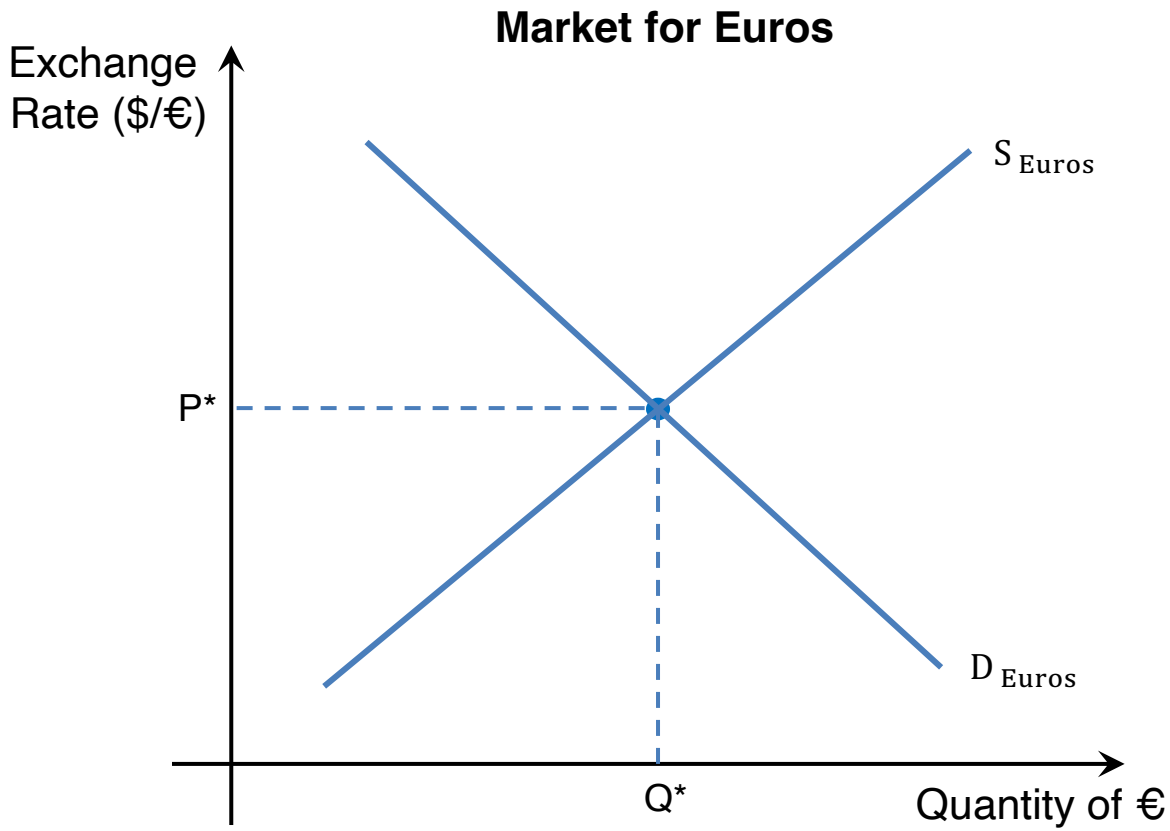


Floating Exchange Rates – depreciation

When the value of the Euro falls, it is known to **depreciate** and its exchange rate **falls** i.e. *it takes less USD to purchase one Euro.*

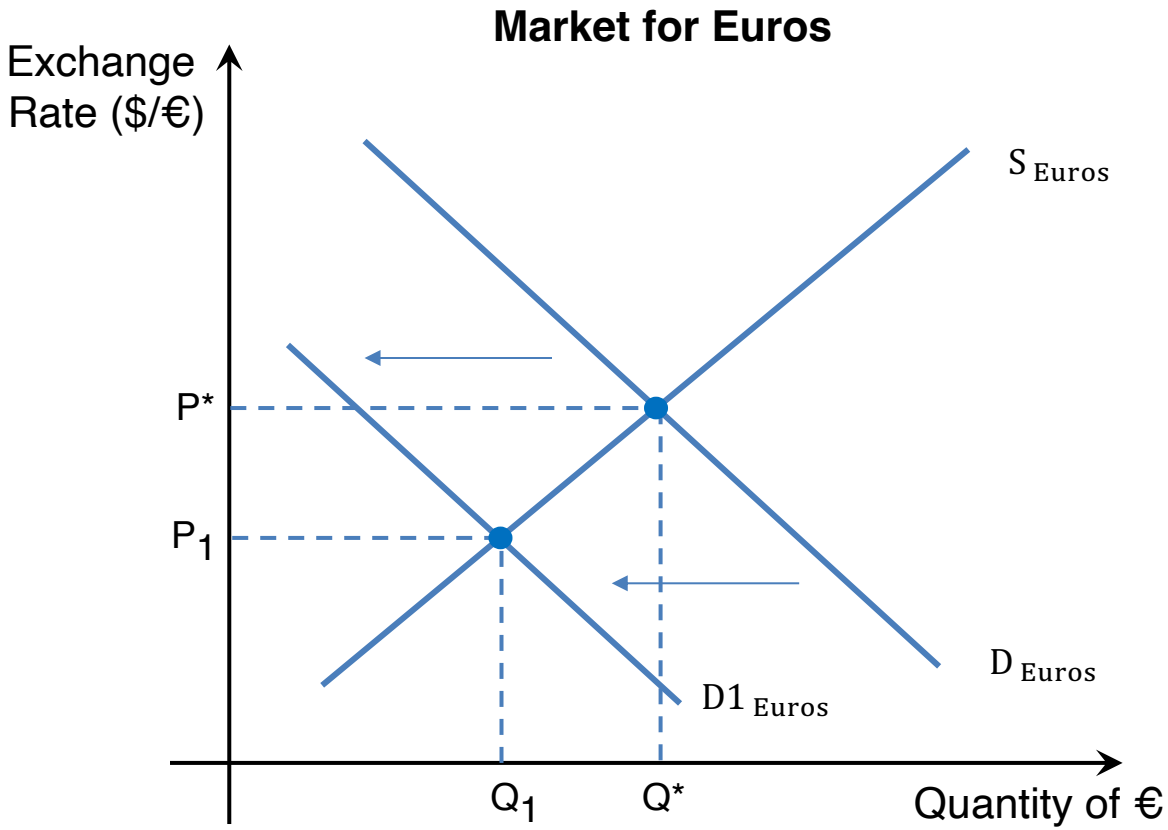
As with resource and product markets, the price – or exchange rate – of the Euro falls either by:

- A **fall in demand** for the Euro
- A **rise in supply** for the Euro



Floating Exchange Rates – depreciation

A fall in demand for Euros decreases its exchange rate from P* to P_1.



Why might the demand curve fall?

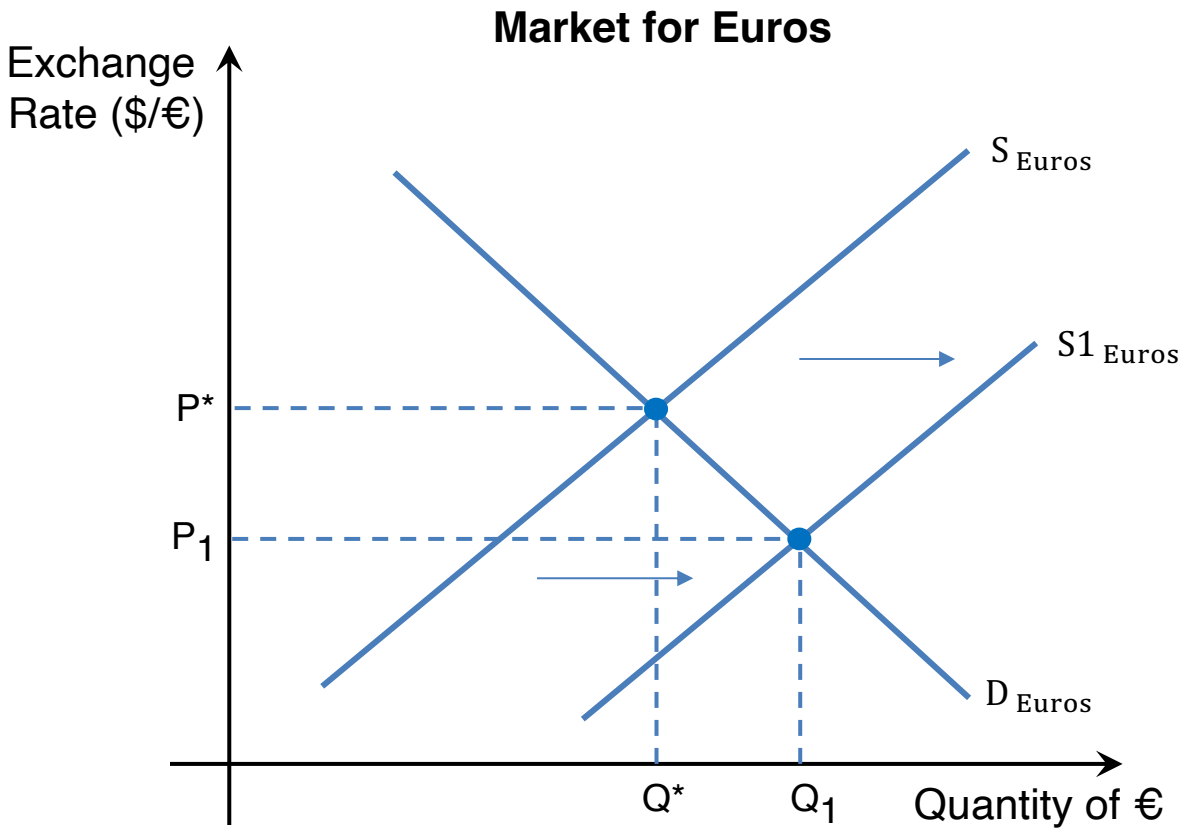
- A fall in demand for exports from the Eurozone
- A fall in inward direct and portfolio investment
- A fall in remittances
- Speculation that the exchange rate will fall
- A rise in relative inflation rates
- A fall in relative interest and growth rates

Floating Exchange Rates – depreciation

A rise in supply for Euros will also decrease its exchange rate from P* to P_1.

Why might the supply curve rise?

- An increase in domestic demand for imports
- An increase in outward investment from the Eurozone
- A fall in central bank intervention



Real world example – factors affecting exchange rates

Article: [US dollar-yuan exchange rate: what is it and why is it important?]

With reference to the article, explain factors which has affected the supply and demand of USD/CNY.

Consequences of Changes in Floating Exchange Rates

The consequences of changes in exchange rates can be remembered through the following mnemonic:

E - Economic Growth

L - Living Standards

I - Inflation

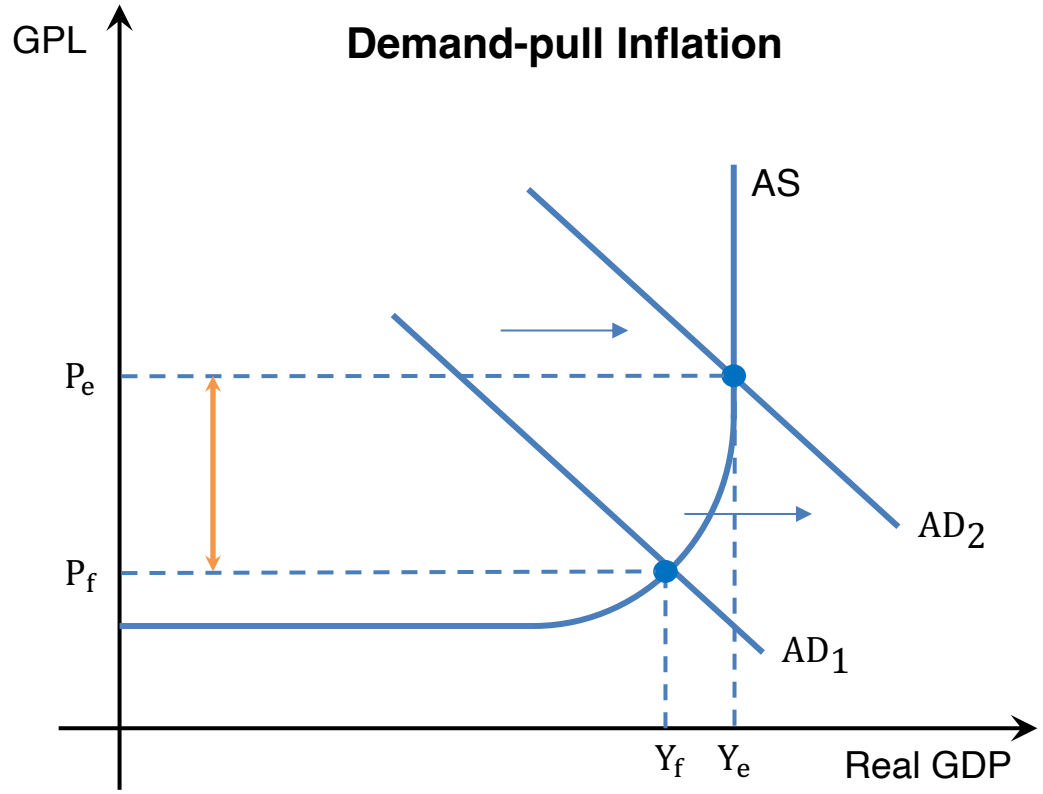
T - Trade Balance (Net Exports)

E - Employment

Consequences of Depreciation

Depreciation in the exchange rate will:

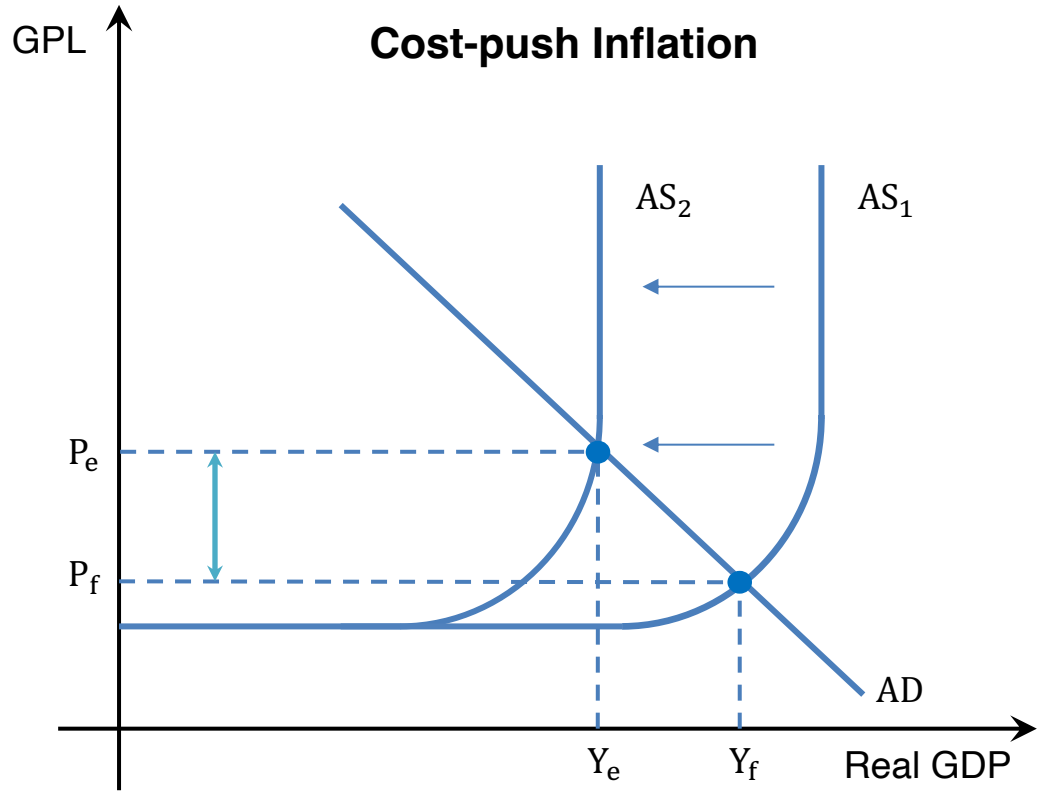
- Make a country's exports cheaper to foreign consumers
- Make imports more expensive to domestic consumers
- Overall, this improves a country's trade balance (X – M) and subsequently AD, increasing economic growth ($Y_f \rightarrow Y_e$).
- However, a rise in AD may lead to **demand-pull inflation.**



Consequences of Depreciation

Furthermore, imported factors of production will be more expensive, reducing producers' willingness to produce.

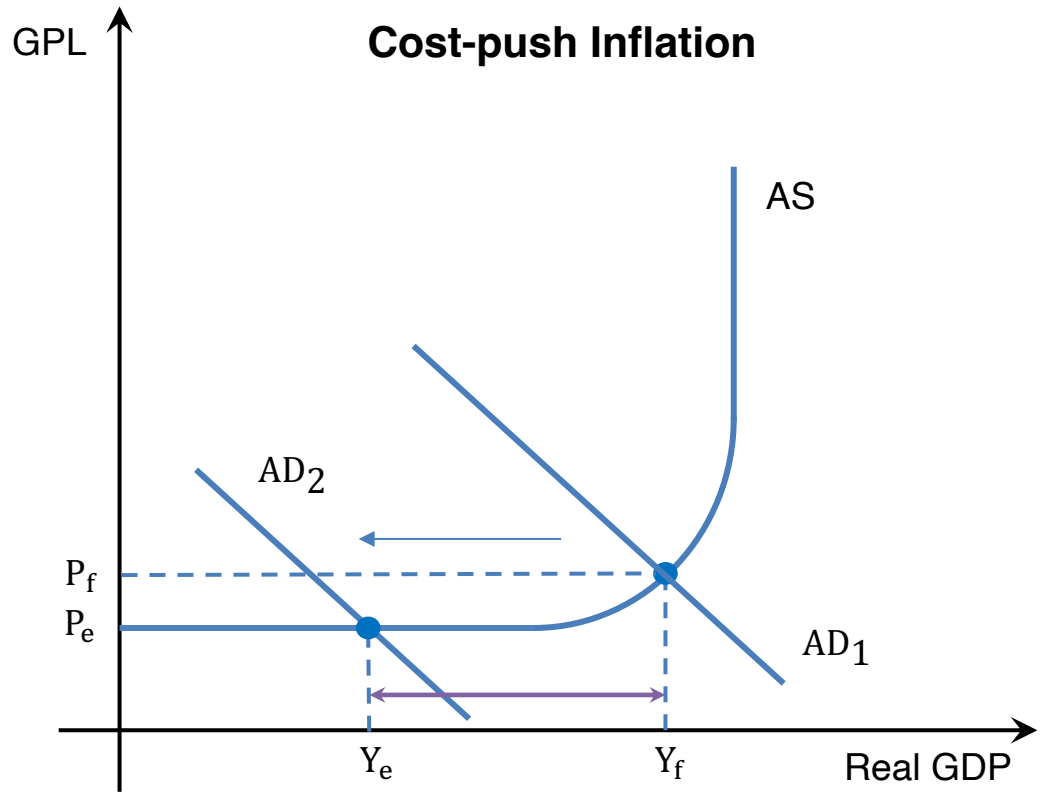
This leads to **cost-push inflation** as aggregate supply shifts inwards.



Consequences of Appreciation

An appreciation in the exchange rate will:

- Make a country's exports more expensive to foreign consumers
- Make imports cheaper to domestic consumers
- Overall, this worsens a country's trade balance, decreasing economic growth and hence standards of living.
- Due to lower AD, producers will produce at a lower level of output $(Y_f \rightarrow Y_e)$
- As the economy is below full capacity, this leads to **unemployment**.



Over to you…

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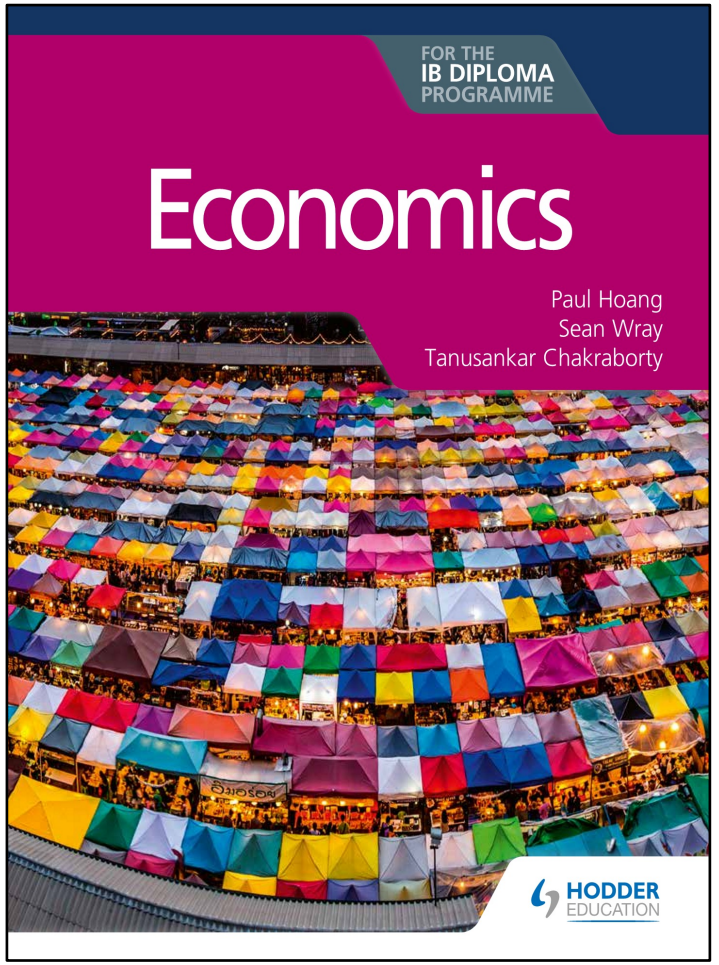
- Page 497
- Paper 1 Exam Practice Question 31.6
- [10 + 15 marks]



Fixed Exchange Rates

A **fixed exchange rate** system is one where the central bank and/or government of an economy fixes the value of the national currency to the value of another currency at a particular level.

Examples: Top Exchange Rates Pegged to the U.S. Dollar

Fixed Exchange Rates

The central bank and/or the government must actively intervene in the foreign exchange market in order to influence demand and supply of the currency to maintain the exchange rate at the predetermined level. Intervention may take several forms:

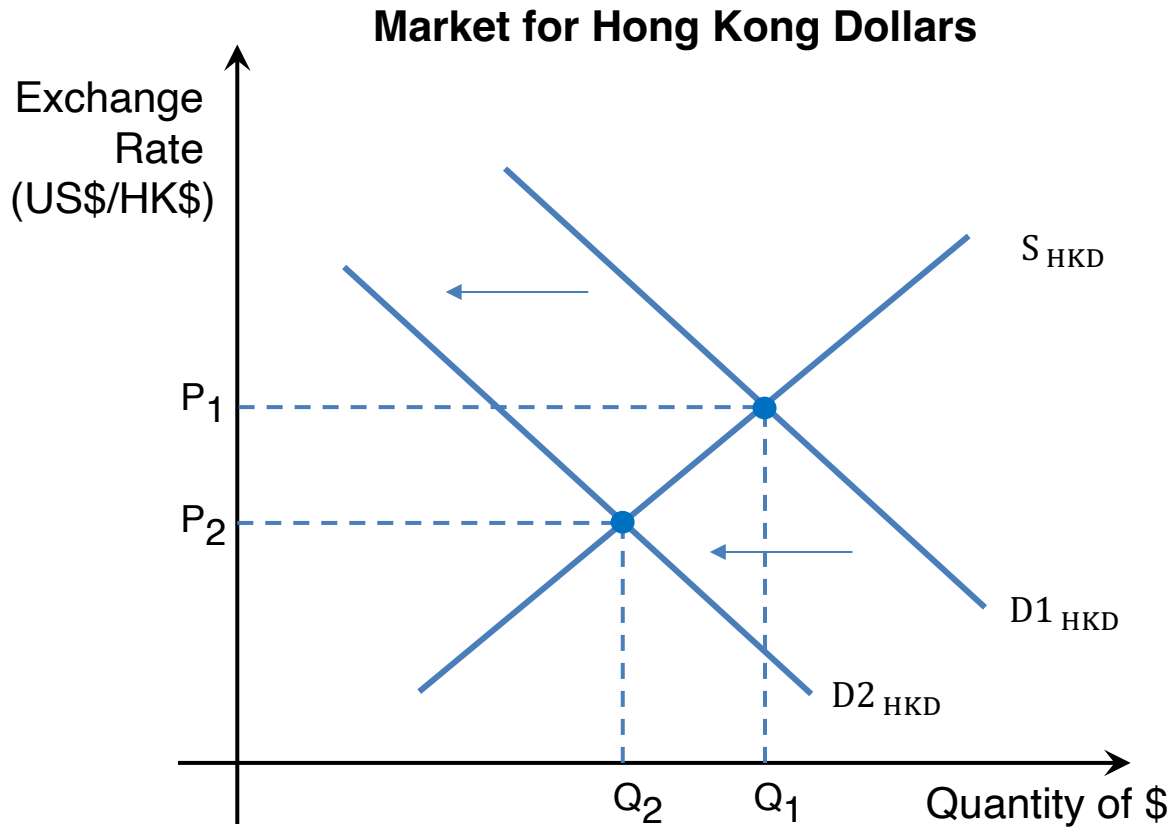
- Buying and selling official reserves
- Changing interest rates
- Import controls

Fixed Exchange Rates

An example of a fixed or pegged exchange rate is the Hong Kong Dollar against the US Dollar.

Suppose there is a fall in demand for the HKD ($D_1 \rightarrow D_2$), resulting in downward pressure on the exchange rate. In a floating exchange rate system, the exchange rate would depreciate from $P_1 \rightarrow P_2$.

In order to maintain the fixed exchange rate value at P1, Hong Kong's de facto central bank (HKMA) must **intervene** in the market.

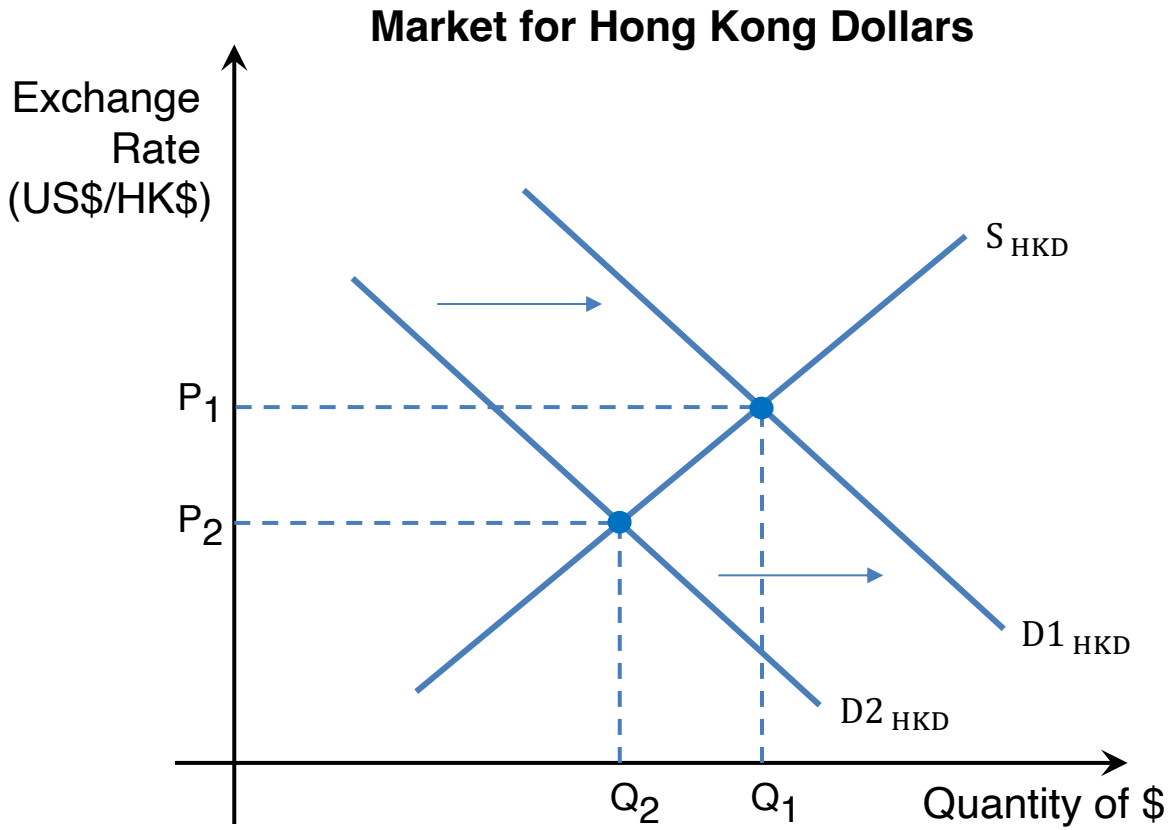


Fixed Exchange Rates

Official reserves

Following a fall in demand in HK dollars from $D_1 \rightarrow D_2$, the HKMA can sell some of its foreign currency reserves (USD) and purchase HK dollars to increase demand back to D1 from D2.

This allows the value of the HK dollar to be maintained at the predetermined level of P1.

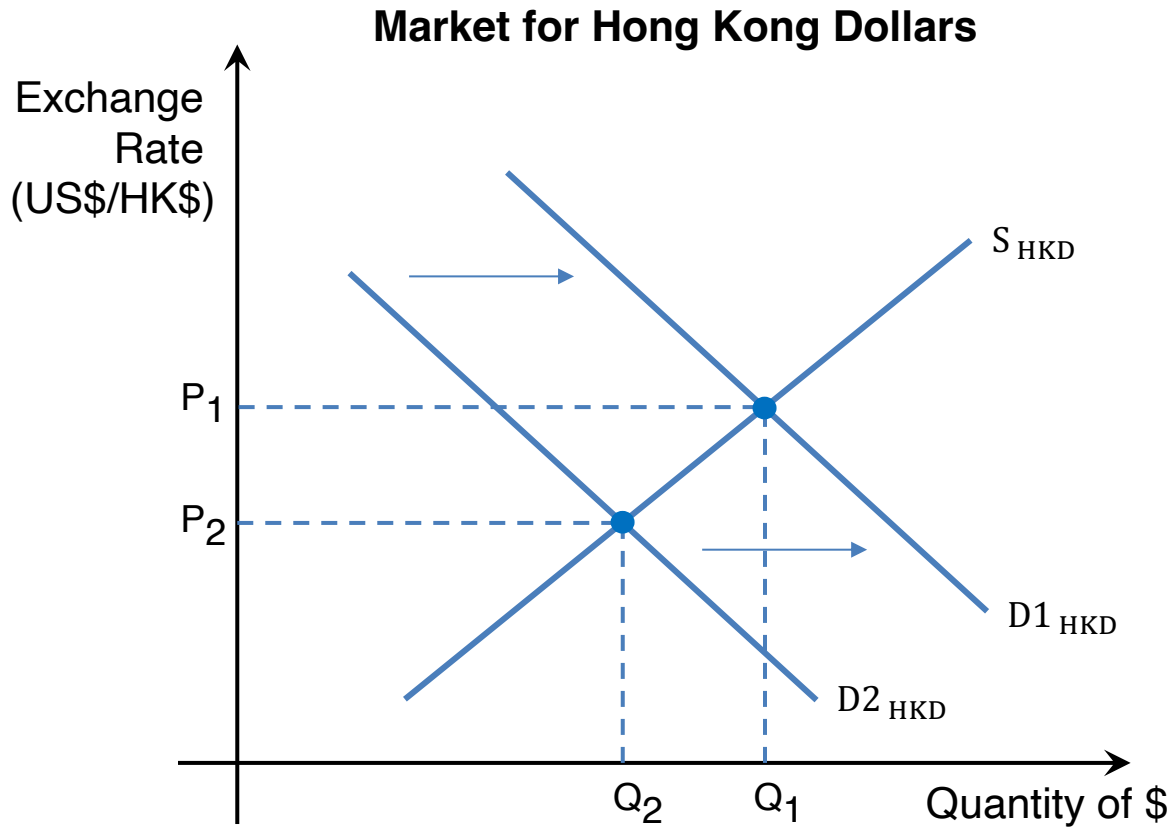


Fixed Exchange Rates

Changing interest rates

Following a fall in demand in HK dollars from $D_1 \rightarrow D_2$, the HKMA can increase domestic interest rates to raise the demand for HK dollars, as the return of saving in HK dollars increase.

This allows the value of the HK dollar to be maintained at the predetermined level of P1.

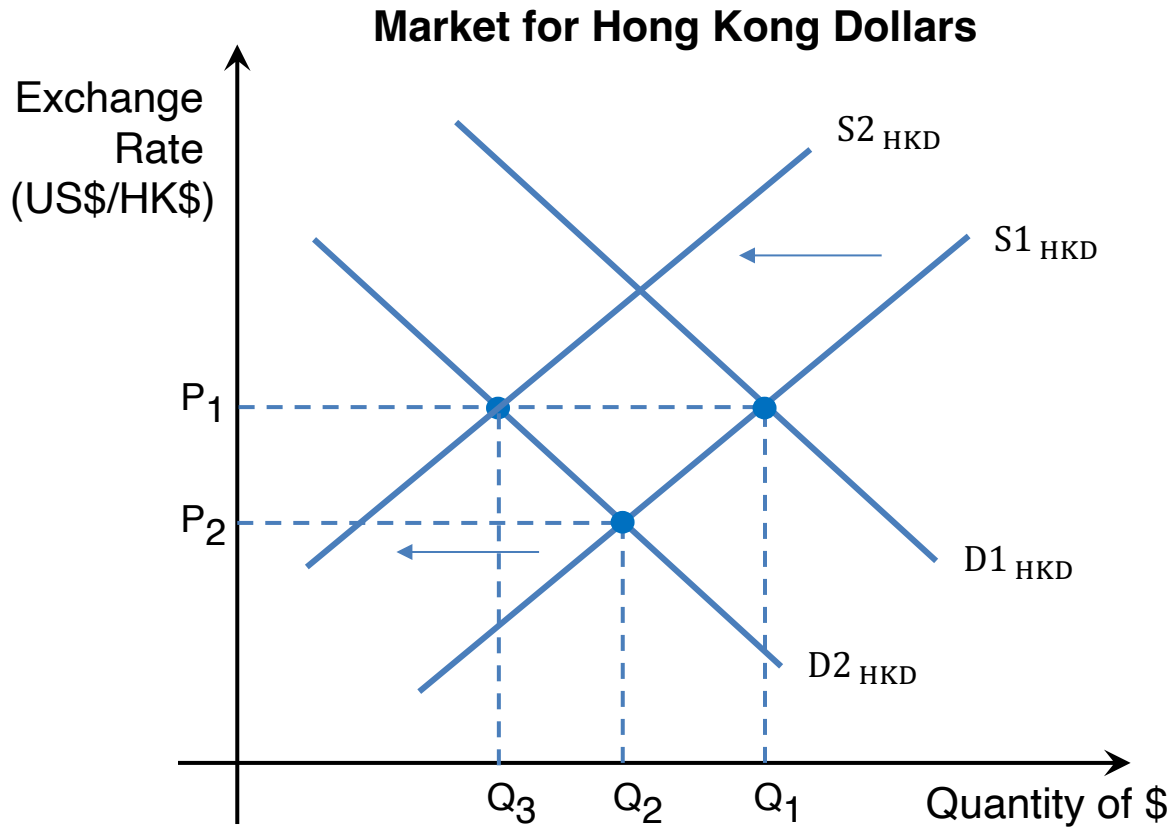


Fixed Exchange Rates

Import controls

Following a fall in demand in HK dollars from $D_1 \rightarrow D_2$, the Hong Kong government can impose protectionist policies to limit imports. This reduces the supply of HK dollars from S1 to S2.

This allows the value of the HK dollar to be maintained at the predetermined level of P1.



Fixed Exchange Rates

Devaluation occurs when the central bank or the government reduces the predetermined value of a currency in a fixed exchange rate system.

Revaluation occurs when the central bank or the government increases the predetermined value of a currency in a fixed exchange rate system.

The economic consequences of devaluation and revaluation are similar to depreciation and appreciation, respectively.

Evaluation of Floating and Fixed Exchange Rates (HL only)

The arguments for and against fixed and floating exchange rate systems include:

- Certainty
- Opportunity costs
- Currency liquidity
- Speculation
- Monetary policy

Certainty (HL only)

Fixed exchange rates offer **stability**, reducing concerns with fluctuations which may lead to a losses for consumers and producers.

As a result, fixed exchange rates often encourages foreign direct investment as it reduces the exchange rate risk for firms.

Opportunity Costs (HL only)

Fixed exchange rates often encourage the improvement of a country's long-term international competitiveness, as a fixed exchange rate system reduces market volatility.

In a freely floating exchange rate system, long term improvements to international competitiveness would appreciate the currency, partially negating the effects of any reform.

Opportunity Costs (HL only)

As fixed exchange rates are constant, there is more incentive to improve a country's intrinsic international competitiveness.

However, central banks will need to hold foreign reserves, incurring an opportunity cost. Furthermore, a significant amount of time is needed to monitor the market and engage revaluations and devaluations.

Currency Liquidity (HL only)

Currency liquidity refers to the availability of currency in a market.

The holding of foreign reserves by central banks reduces the availability of currencies on global markets for private investors.

Overall, this crowds out private investors that may have invested in global economies.

Speculation (HL only)

Floating exchange rates are subject to speculation where investors may buy or sell a currency depending on their beliefs on the future value of the currency.

This often leads to fluctuations in the exchange rate and increases volatility and uncertainty.

Monetary Policy (HL only)

Under a fixed exchange rate system, central banks adjust interest rates to influence their exchange rate.

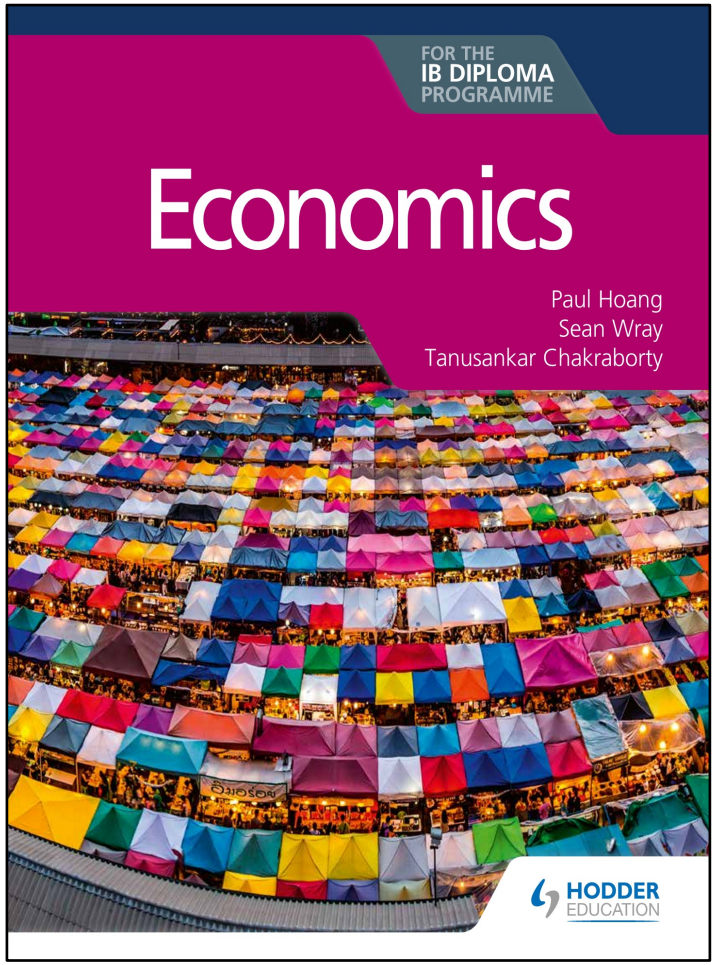
As a result, there is less to no freedom to use monetary policy to achieve macroeconomic aims.

Over to you…

Hoang, Wray, & Chakraborty (2020)

Economics for the IB Diploma Programme

- Page 504
- Paper 3 Exam Practice Question 31.7
- [1 + 2 marks]



Managed Exchange Rate

A **managed exchange** rate system incorporates elements of both a floating and fixed exchange rate, where the currency is primarily subject to free market forces, with occasional central bank or government intervention to prevent large fluctuations.

Managed Exchange Rates

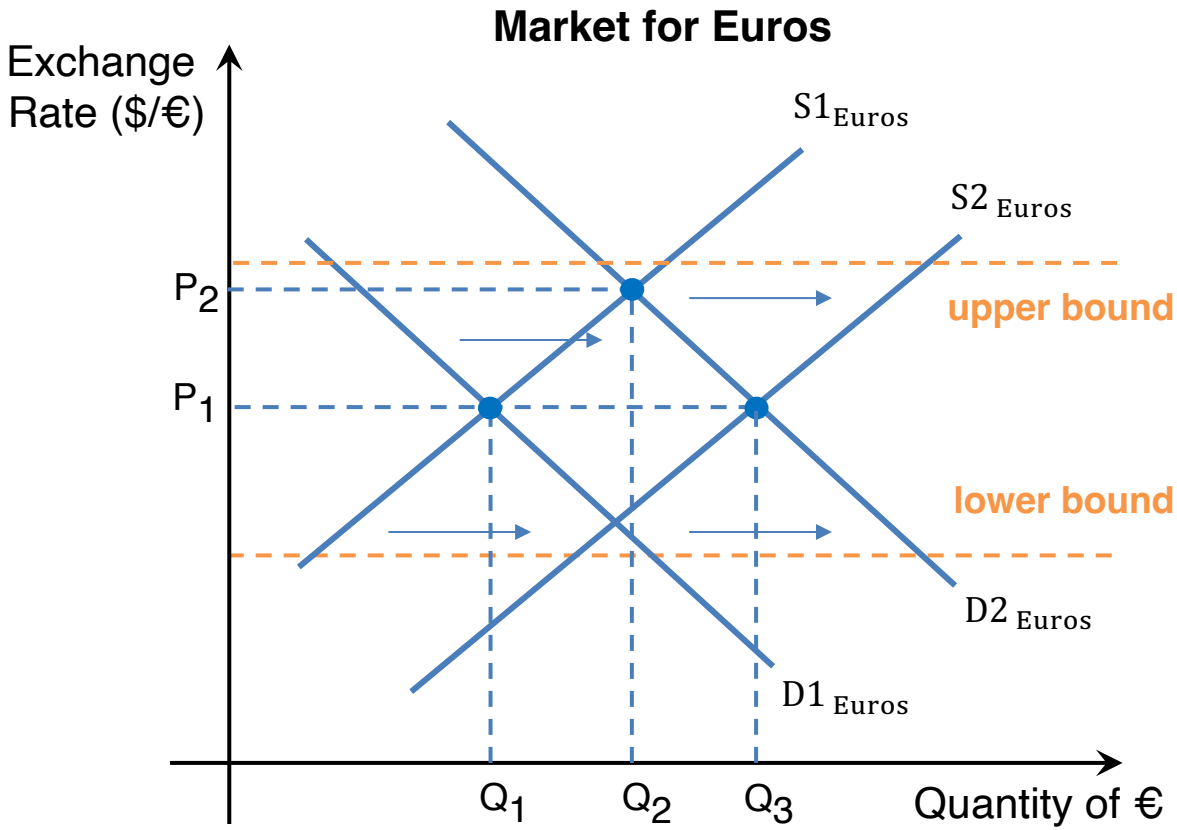
A **managed exchange rate** is similar to a floating exchange rate system. However, the central bank intervenes to keep the exchange rate within a range known as a **crawling peg**.

It is sometimes known as a **dirty float** as exchange rates are primarily floating with some government intervention.

Most major currencies follow a managed exchange rate system such as the US Dollar, Euro, British Pound, and Japanese Yen.

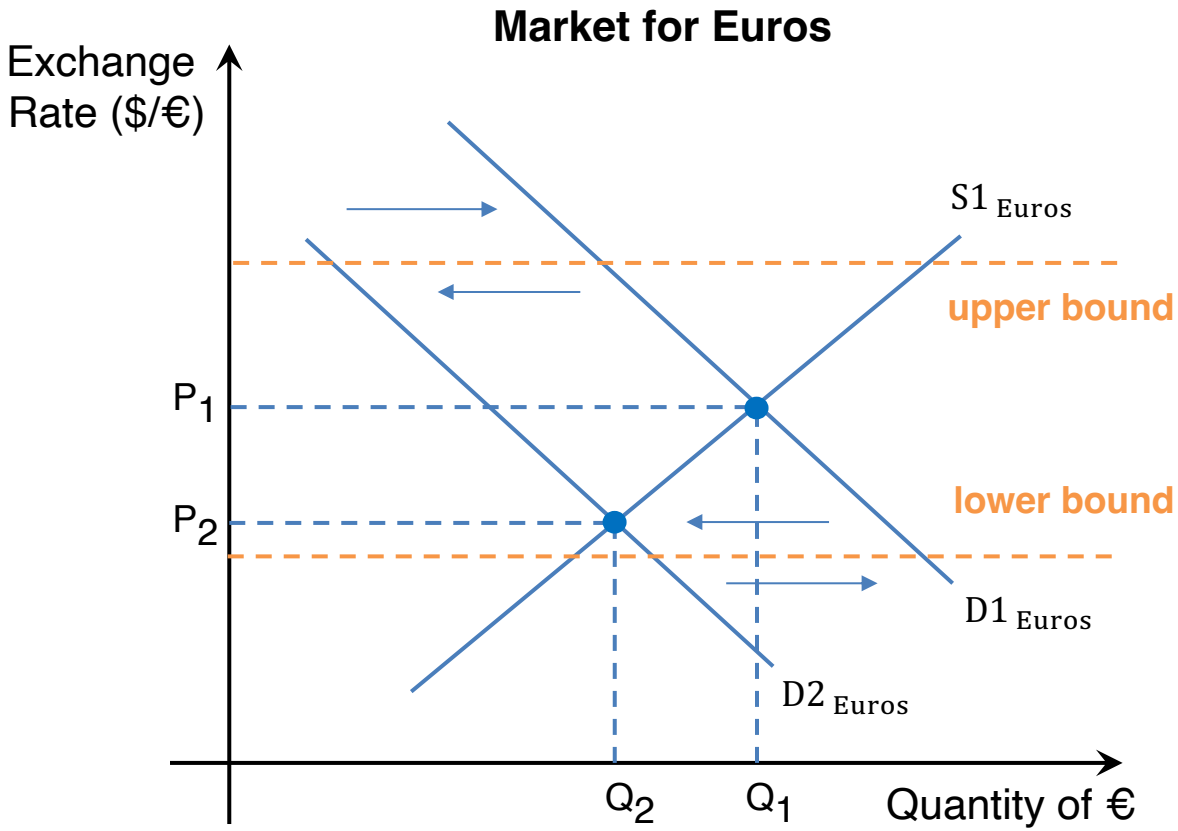
Managed Exchange Rates

When the exchange rate is close to its upper bound, the ECB may occasionally buy foreign currencies, increasing the supply of Euros to keep their exchange rate within the bounds.



Managed Exchange Rates

When the exchange rate is close to its lower bound, the ECB may occasionally sell its foreign reserves to buy back its Euro, increasing the demand of Euros to keep their exchange rate within the bounds.



Managed Exchange Rates

An **overvalued** currency is one that has been managed at a value higher than its true floating exchange rate value.

An **undervalued** currency is one that has been managed at a value lower than its true floating exchange rate value.

The economic consequences of an **overvalued** and **undervalued** are similar to depreciation/devaluation and appreciation/revaluation, respectively.

Real world example – the Chinese Yuan

Watch the video from 9:22 and answer the following questions

1. Explain how and why China manipulates its currency.
2. Discuss whether currency manipulation is fair to society at large?

Test your knowledge on this unit: Kahoot!