Lecture 9: Exchange Rate Speculation and Monetary Unions

Jacob Adenbaum

University of Edinburgh

Spring 2024

Readings: Gottfries, Chapter 15

Adapted in part from slides from Jakub Mistak

Where we've been and where we're going

- So far, we've focused our attention on understanding the macroeconomic implications of trade and capital flows
  - We've seen the difference between floating and fixed exchange rate regimes in both the short and the long run
  - Last week, we saw that floating exchange rates have the potential to substantially speed adjustment times following a negative real shock
- This week, we're going to be focusing on the question: when is it sensible for countries to pursue a monetary union? (Fixed exchange rate regime)
  - Need to think about ways that fixed exchange rates can go wrong
  - Sharp implications for the Eurozone

Where we've been and where we're going

- So far, we've focused our attention on understanding the macroeconomic implications of trade and capital flows
  - We've seen the difference between floating and fixed exchange rate regimes in both the short and the long run
  - Last week, we saw that floating exchange rates have the potential to substantially speed adjustment times following a negative real shock
- This week, we're going to be focusing on the question: when is it sensible for countries to pursue a monetary union? (Fixed exchange rate regime)
  - Need to think about ways that fixed exchange rates can go wrong
  - Sharp implications for the Eurozone

Section 1

Currency Runs

What happens with an uncertain exchange rate?

- When discussing fixed exchange rates, we've mostly focused on credibly fixed exchange rates:

$$e^{\otimes} = e^{e}_{t+1} = e_t$$

- **Problem:** Policy makers can choose to change $e^{\otimes}$
  - Sensible investors will price that risk in to e^{e}_{t+1}.
  - This is called a devaluation/revaluation
- When people perceive a risk of changes to the exchange rate, then

$$e^{e}_{t+1} \neq e_t$$

- This can tend to cause serious problems for a country

Interest Parity

- Recall the interest parity condition:

$$i_t - i_t^\star = -\frac{\Delta e_{t+1}^e}{e_t}$$

- Borrowers must compensate investors for expected changes in the exchange rate
- Suppose you come to believe that there is a 10% chance of a 20% devaluation
  - IP implies that

$$i_t - i_t^\star = -0.1(-0.2) = 0.02$$

  - Investors will demand a 2% interest spread to compensate them for the risk of devaluation
- For any given exchange rate today, demanding a higher interest rate means **the IP curve shifts up**

Interest Parity

- Recall the interest parity condition:

$$i_t - i_t^\star = -\frac{\Delta e_{t+1}^e}{e_t}$$

- Borrowers must compensate investors for expected changes in the exchange rate
- Suppose you come to believe that there is a 10% chance of a 20% devaluation
  - IP implies that

$$i_t - i_t^\star = -0.1(-0.2) = 0.02$$

  - Investors will demand a 2% interest spread to compensate them for the risk of devaluation
- For any given exchange rate today, demanding a higher interest rate means **the IP curve shifts up**

Interest Parity

- Recall the interest parity condition:

$$i_t - i_t^\star = -\frac{\Delta e_{t+1}^e}{e_t}$$

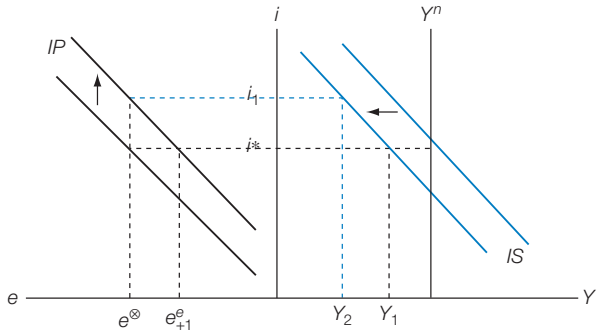
- Borrowers must compensate investors for expected changes in the exchange rate
- Suppose you come to believe that there is a 10% chance of a 20% devaluation
  - IP implies that

$$i_t - i_t^\star = -0.1(-0.2) = 0.02$$

  - Investors will demand a 2% interest spread to compensate them for the risk of devaluation
- For any given exchange rate today, demanding a higher interest rate means **the IP curve shifts up**

Fears of a devaluation cause/exacerbate a recession

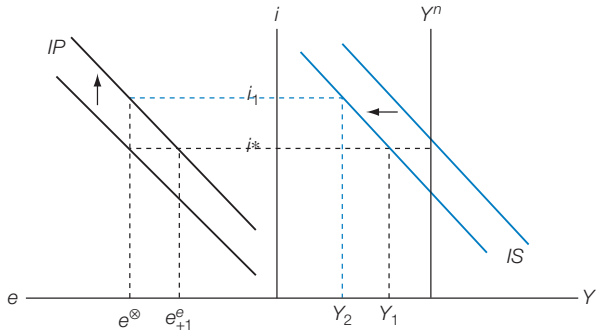
- Suppose we have a negative demand shock (IS curve shifts in)
- If people perceive a threat of a currency devaluation, then IP curve shifts up
- If the CB attempts to hold $e = e^{\otimes}$
  - Money supply must contract
  - Output shifts to an even lower level (Y_2) than would have arisen from the demand shock alone
- Monetary policy becomes **procyclical**



In general, one wants countercyclical monetary policy

Fears of a devaluation cause/exacerbate a recession

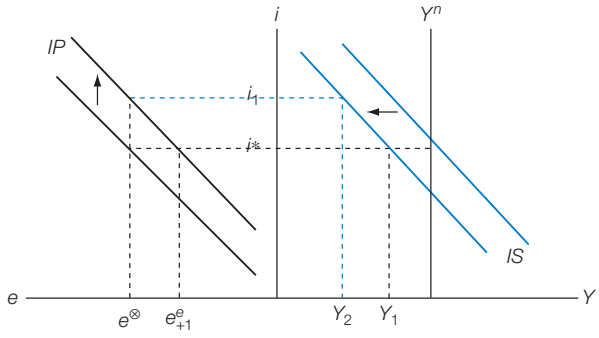
- Suppose we have a negative demand shock (IS curve shifts in)
- If people perceive a threat of a currency devaluation, then IP curve shifts up
- If the CB attempts to hold $e = e^{\otimes}$
  - Money supply must contract
  - Output shifts to an even lower level (Y_2) than would have arisen from the demand shock alone
- Monetary policy becomes **procyclical**



In general, one wants countercyclical monetary policy

Fears of a devaluation cause/exacerbate a recession

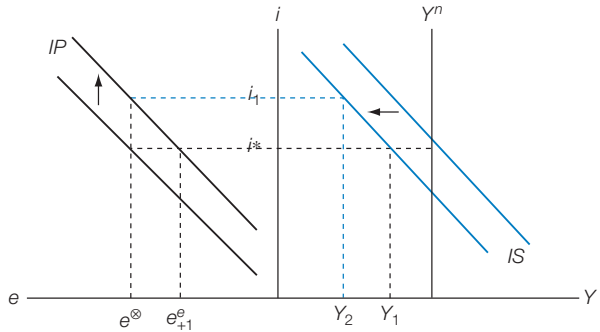
- Suppose we have a negative demand shock (IS curve shifts in)
- If people perceive a threat of a currency devaluation, then IP curve shifts up
- If the CB attempts to hold $e = e^{\otimes}$
  - Money supply must contract
  - Output shifts to an even lower level (Y_2) than would have arisen from the demand shock alone
- Monetary policy becomes **procyclical**



In general, one wants countercyclical monetary policy

Fears of a devaluation cause/exacerbate a recession

- Suppose we have a negative demand shock (IS curve shifts in)
- If people perceive a threat of a currency devaluation, then IP curve shifts up
- If the CB attempts to hold $e = e^{\otimes}$
  - Money supply must contract
  - Output shifts to an even lower level (Y_2) than would have arisen from the demand shock alone
- Monetary policy becomes **procyclical**



In general, one wants countercyclical monetary policy

Defense of exchange rate makes the problem worse

- Once you have committed to a procyclical monetary policy, every negative demand shock is even worse
- When you get hit with a recession, that creates the threat of a currency devaluation
- But the threat of the currency devaluation makes the recession worse...
- Which makes a devaluation **even more likely**
- You can see how this can quickly get out of hand.

Defense of exchange rate makes the problem worse

- Once you have committed to a procyclical monetary policy, every negative demand shock is even worse
- When you get hit with a recession, that creates the threat of a currency devaluation
- But the threat of the currency devaluation makes the recession worse...
- Which makes a devaluation **even more likely**
- You can see how this can quickly get out of hand.

Defense of exchange rate makes the problem worse

- Once you have committed to a procyclical monetary policy, every negative demand shock is even worse
- When you get hit with a recession, that creates the threat of a currency devaluation
- But the threat of the currency devaluation makes the recession worse...
- Which makes a devaluation **even more likely**
- You can see how this can quickly get out of hand.

Defense of exchange rate makes the problem worse

- Once you have committed to a procyclical monetary policy, every negative demand shock is even worse
- When you get hit with a recession, that creates the threat of a currency devaluation
- But the threat of the currency devaluation makes the recession worse...
- Which makes a devaluation **even more likely**
- You can see how this can quickly get out of hand.

Currency Runs: Diamond-Dybvig comes for central banks

- Fears of a devaluation often have this self-fulfilling nature
- This should remind you of bank runs (for good reason)
- Key Insight: promise to purchase £ for $ is a liability of the CB.
- Only backing are the foreign currency reserves
- If all the CB's "creditors" become convinced that it cannot pay (i.e, will devalue the currency) then they will try to pull their money out at the same time, causing a default

Bank of England Balance Sheet

Assets	Liabilities
Foreign Currency ($)	Promise to purchase £ for $ at $e^{\otimes}$
Domestic Assets	Bank deposits

- CB can raise rates to get them to stay, but this has macroeconomic feedback effects
- Higher interest rates make the likelihood of "default" higher, which increases the pressure for a bank run
- Even if the CB did not intend a devaluation, they can run out of reserves, which forces one

Currency Runs: Diamond-Dybvig comes for central banks

- Fears of a devaluation often have this self-fulfilling nature
- This should remind you of bank runs (for good reason)
- Key Insight: promise to purchase £ for $ is a liability of the CB.
- Only backing are the foreign currency reserves
- If all the CB's "creditors" become convinced that it cannot pay (i.e, will devalue the currency) then they will try to pull their money out at the same time, causing a default

Bank of England Balance Sheet

Assets	Liabilities
Foreign Currency ($)	Promise to purchase £ for $ at $e^{\otimes}$
Domestic Assets	Bank deposits

- CB can raise rates to get them to stay, but this has macroeconomic feedback effects
- Higher interest rates make the likelihood of "default" higher, which increases the pressure for a bank run
- Even if the CB did not intend a devaluation, they can run out of reserves, which forces one

Currency Runs: Diamond-Dybvig comes for central banks

- Fears of a devaluation often have this self-fulfilling nature
- This should remind you of bank runs (for good reason)
- Key Insight: promise to purchase £ for $ is a liability of the CB.
- Only backing are the foreign currency reserves
- If all the CB's "creditors" become convinced that it cannot pay (i.e, will devalue the currency) then they will try to pull their money out at the same time, causing a default

Bank of England Balance Sheet

Assets	Liabilities
Foreign Currency ($)	Promise to purchase £ for $ at $e^{\otimes}$
Domestic Assets	Bank deposits

- CB can raise rates to get them to stay, but this has macroeconomic feedback effects
- Higher interest rates make the likelihood of "default" higher, which increases the pressure for a bank run
- Even if the CB did not intend a devaluation, they can run out of reserves, which forces one

Currency Runs: Diamond-Dybvig comes for central banks

- Fears of a devaluation often have this self-fulfilling nature
- This should remind you of bank runs (for good reason)
- Key Insight: promise to purchase £ for $ is a liability of the CB.
- Only backing are the foreign currency reserves
- If all the CB's "creditors" become convinced that it cannot pay (i.e, will devalue the currency) then they will try to pull their money out at the same time, causing a default

Bank of England Balance Sheet

Assets	Liabilities
Foreign Currency ($)	Promise to purchase £ for $ at $e^{\otimes}$
Domestic Assets	Bank deposits

- CB can raise rates to get them to stay, but this has macroeconomic feedback effects
- Higher interest rates make the likelihood of "default" higher, which increases the pressure for a bank run
- Even if the CB did not intend a devaluation, they can run out of reserves, which forces one

Currency Runs: Diamond-Dybvig comes for central banks

- Fears of a devaluation often have this self-fulfilling nature
- This should remind you of bank runs (for good reason)
- Key Insight: promise to purchase £ for $ is a liability of the CB.
- Only backing are the foreign currency reserves
- If all the CB's "creditors" become convinced that it cannot pay (i.e, will devalue the currency) then they will try to pull their money out at the same time, causing a default

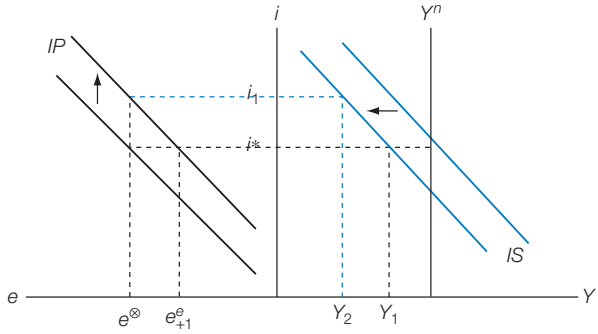
Bank of England Balance Sheet

Assets	Liabilities
Foreign Currency ($)	Promise to purchase £ for $ at $e^{\otimes}$
Domestic Assets	Bank deposits

- CB can raise rates to get them to stay, but this has macroeconomic feedback effects
- Higher interest rates make the likelihood of "default" higher, which increases the pressure for a bank run
- Even if the CB did not intend a devaluation, they can run out of reserves, which forces one

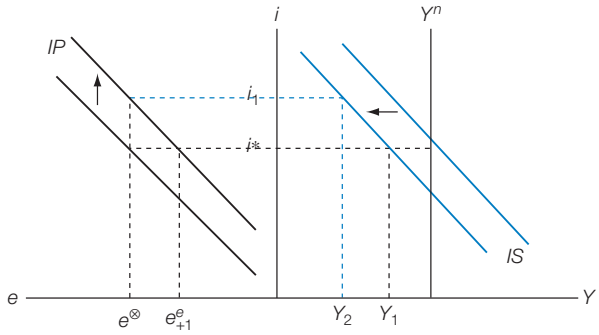
Policy Dilemma: Central bank has no good options

- Return to negative demand shock
- Central bank has only two options:
- Raise i and defend $e^{\otimes}$
  - Worsens recession but restores credibility
  - Still might fail (in the event of a severe currency run)
- Devalue the currency
  - Exchange rate immediately falls and output returns to Y^n
  - Reduces credibility, increasing chances of a currency run
  - Usually central banks allow currency to float after devaluation



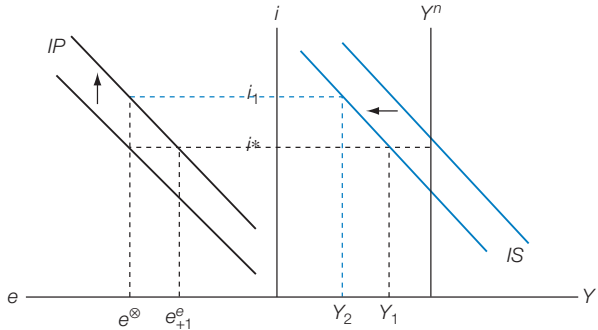
Policy Dilemma: Central bank has no good options

- Return to negative demand shock
- Central bank has only two options:
  - Raise i and defend $e^{\otimes}$
    - Worsens recession but restores credibility
    - Still might fail (in the event of a severe currency run)
  - Devalue the currency
    - Exchange rate immediately falls and output returns to Y^n
    - Reduces credibility, increasing chances of a currency run
    - Usually central banks allow currency to float after devaluation



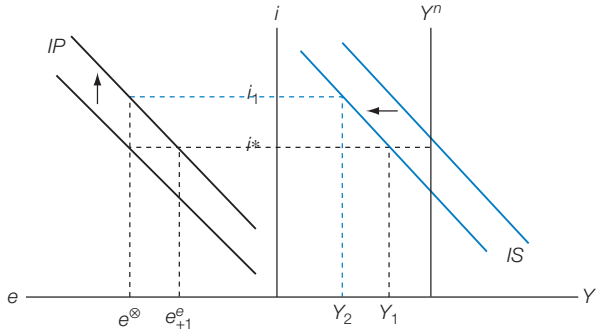
Policy Dilemma: Central bank has no good options

- Return to negative demand shock
- Central bank has only two options:
- Raise i and defend $e^{\otimes}$
  - Worsens recession but restores credibility
  - Still might fail (in the event of a severe currency run)
- Devalue the currency
  - Exchange rate immediately falls and output returns to Y^n
  - Reduces credibility, increasing chances of a currency run
  - Usually central banks allow currency to float after devaluation



Policy Dilemma: Central bank has no good options

- Return to negative demand shock
- Central bank has only two options:
- Raise i and defend $e^{\otimes}$
  - Worsens recession but restores credibility
  - Still might fail (in the event of a severe currency run)
- Devalue the currency
  - Exchange rate immediately falls and output returns to Y^n
  - Reduces credibility, increasing chances of a currency run
  - Usually central banks allow currency to float after devaluation



Devaluation Cycles

- Central bank announces $e^{\otimes}$, but for some reason, $\pi > \pi^{\star}$
  - Mismatched inflation causes **real appreciation** in the currency

$$\varepsilon = \frac{P}{P^{\star}} e$$

  - Exports become less competitive over time (negative demand shock)
  - Procyclical monetary policy in face of demand shock eventually causes a currency run and forces a devaluation
  - Cycle repeats with a lower $e^{\otimes}$
- **Devaulation cycles** are common in countries that with fixed exchange rates
  - Remember: central bank cannot set monetary policy with fixed exchange rate
  - Controlling inflation is up to the fiscal authority
  - If government does not restrain spending to manage inflation, then you're in for trouble

Devaluation Cycles

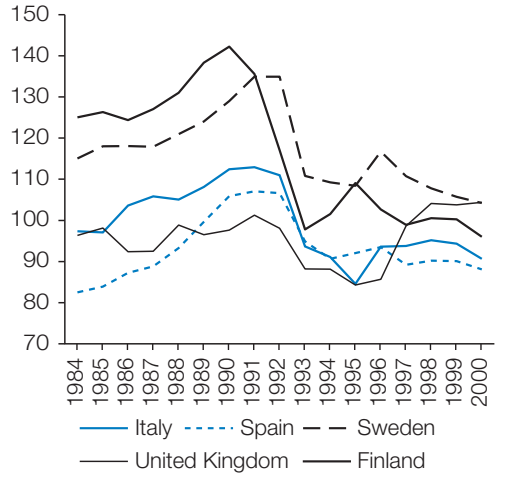
- Central bank announces $e^{\otimes}$, but for some reason, $\pi > \pi^{\star}$
  - Mismatched inflation causes **real appreciation** in the currency

$$\varepsilon = \frac{P}{P^{\star}} e$$

  - Exports become less competitive over time (negative demand shock)
  - Procyclical monetary policy in face of demand shock eventually causes a currency run and forces a devaluation
  - Cycle repeats with a lower $e^{\otimes}$
- **Devaulation cycles** are common in countries that with fixed exchange rates
  - Remember: central bank cannot set monetary policy with fixed exchange rate
  - Controlling inflation is up to the fiscal authority
  - If government does not restrain spending to manage inflation, then you're in for trouble

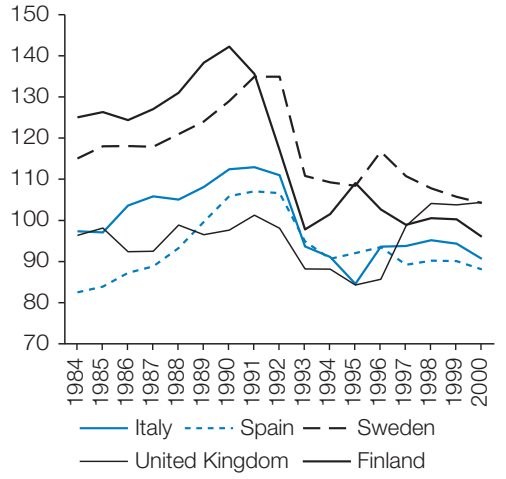
ERM Crisis of 1992

- Starting from 1979, many countries joined the **European Exchange Rate Mechanism**
- System of fixed exchange rates across members (precursor to Euro)
- After German reunification, Bundesbank raised interest rates in response to high government spending
- With a credible $e^{\otimes}$, higher i^* would require higher i in other ERM countries
- Many of the other countries were in recessions at the time: caused massive, simultaneous currency runs
- Real exchange rates fell by 15-30% almost overnight



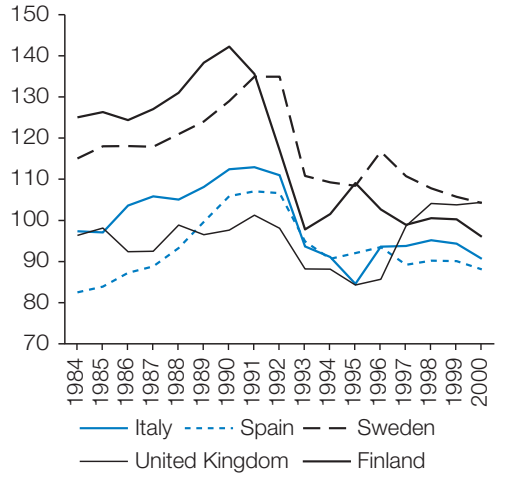
ERM Crisis of 1992

- Starting from 1979, many countries joined the **European Exchange Rate Mechanism**
- System of fixed exchange rates across members (precursor to Euro)
- After German reunification, Bundesbank raised interest rates in response to high government spending
- With a credible $e^{\otimes}$, higher $i^{\star}$ would require higher i in other ERM countries
- Many of the other countries were in recessions at the time: caused massive, simultaneous currency runs
- Real exchange rates fell by 15-30% almost overnight



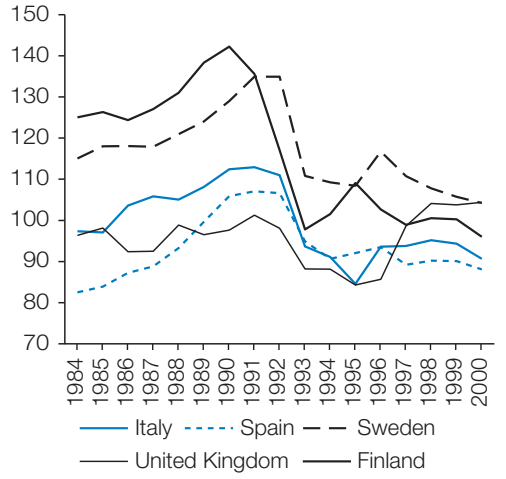
ERM Crisis of 1992

- Starting from 1979, many countries joined the **European Exchange Rate Mechanism**
- System of fixed exchange rates across members (precursor to Euro)
- After German reunification, Bundesbank raised interest rates in response to high government spending
- With a credible $e^{\otimes}$, higher $i^{\star}$ would require higher i in other ERM countries
- Many of the other countries were in recessions at the time: caused massive, simultaneous currency runs
- Real exchange rates fell by 15-30% almost overnight



ERM Crisis of 1992

- Starting from 1979, many countries joined the **European Exchange Rate Mechanism**
- System of fixed exchange rates across members (precursor to Euro)
- After German reunification, Bundesbank raised interest rates in response to high government spending
- With a credible $e^{\otimes}$, higher i^* would require higher i in other ERM countries
- Many of the other countries were in recessions at the time: caused massive, simultaneous currency runs
- Real exchange rates fell by 15-30% almost overnight



Why did the UK never join the Eurozone?

- Even pre-Brexit, the UK never adopted the Euro
- Experience in 1992 on "Black Wednesday" is a big part of the reason why
- They *did* join the ERM (in 1990), but had the same problems as many other countries when Bundesbank raised rates
- Run on sterling happened in a single day: Wednesday, 16th September, 1992
  - Large hedge funds became convinced that the pound would fall
  - Took large short positions (kind of like selling pounds)
  - Bank of England was purchasing as many as £2 billion worth of sterling per hour
- When eventually they ran out of foreign reserves, the pound fell by 15%
  - Bank of England took enormous losses (close to £3.3 billion)
  - All the currency they had spent the whole day purchasing suddenly dropped in value...
- UK left the ERM (allowed currency to float) and never rejoined

Why did the UK never join the Eurozone?

- Even pre-Brexit, the UK never adopted the Euro
- Experience in 1992 on "Black Wednesday" is a big part of the reason why
- They *did* join the ERM (in 1990), but had the same problems as many other countries when Bundesbank raised rates
- Run on sterling happened in a single day: Wednesday, 16th September, 1992
  - Large hedge funds became convinced that the pound would fall
  - Took large short positions (kind of like selling pounds)
  - Bank of England was purchasing as many as £2 billion worth of sterling per hour
- When eventually they ran out of foreign reserves, the pound fell by 15%
  - Bank of England took enormous losses (close to £3.3 billion)
  - All the currency they had spent the whole day purchasing suddenly dropped in value...
- UK left the ERM (allowed currency to float) and never rejoined

Why did the UK never join the Eurozone?

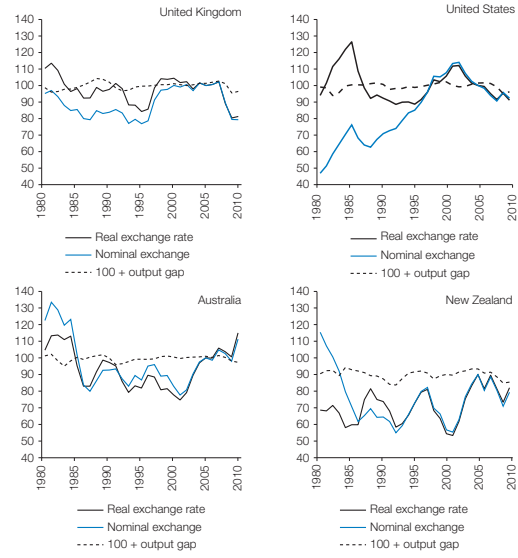
- Even pre-Brexit, the UK never adopted the Euro
- Experience in 1992 on "Black Wednesday" is a big part of the reason why
- They *did* join the ERM (in 1990), but had the same problems as many other countries when Bundesbank raised rates
- Run on sterling happened in a single day: Wednesday, 16th September, 1992
  - Large hedge funds became convinced that the pound would fall
  - Took large short positions (kind of like selling pounds)
  - Bank of England was purchasing as many as £2 billion worth of sterling per hour
- When eventually they ran out of foreign reserves, the pound fell by 15%
  - Bank of England took enormous losses (close to £3.3 billion)
  - All the currency they had spent the whole day purchasing suddenly dropped in value...
- UK left the ERM (allowed currency to float) and never rejoined

Why did the UK never join the Eurozone?

- Even pre-Brexit, the UK never adopted the Euro
- Experience in 1992 on "Black Wednesday" is a big part of the reason why
- They *did* join the ERM (in 1990), but had the same problems as many other countries when Bundesbank raised rates
- Run on sterling happened in a single day: Wednesday, 16th September, 1992
  - Large hedge funds became convinced that the pound would fall
  - Took large short positions (kind of like selling pounds)
  - Bank of England was purchasing as many as £2 billion worth of sterling per hour
- When eventually they ran out of foreign reserves, the pound fell by 15%
  - Bank of England took enormous losses (close to £3.3 billion)
  - All the currency they had spent the whole day purchasing suddenly dropped in value...
- UK left the ERM (allowed currency to float) and never rejoined

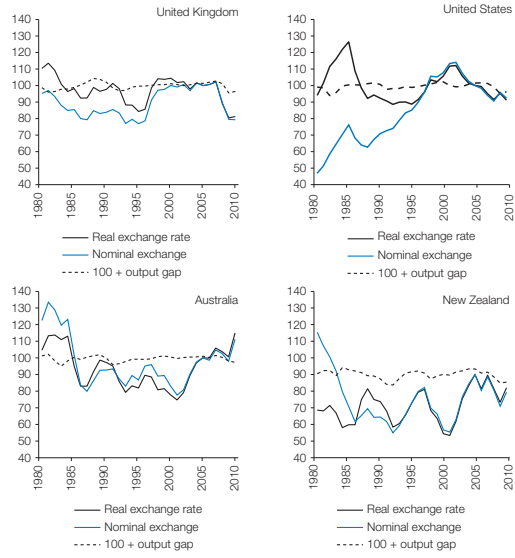
Why would you go through all this hassle?

- It seems like there are serious challenges with fixed exchange rates
  - They're difficult to maintain
  - Bad implications for macroeconomic stabilization
- Why not just let them float?
  - For many countries, this is the right choice
  - Main reasons for wanting fixed exchange rates come down to reducing uncertainty
  - Floating exchange rates are very volatile, and this might be bad for long term financial integration and trade
- We need to think in more detail about the question: under what circumstances does it make sense to have fixed exchange rates?



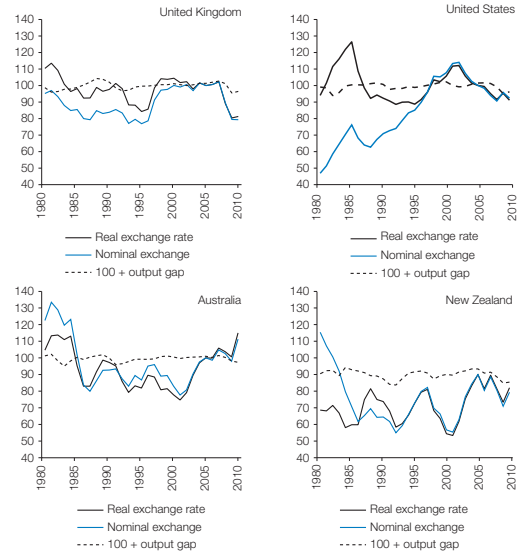
Why would you go through all this hassle?

- It seems like there are serious challenges with fixed exchange rates
  - They're difficult to maintain
  - Bad implications for macroeconomic stabilization
- Why not just let them float?
  - For many countries, this is the right choice
  - Main reasons for wanting fixed exchange rates come down to reducing uncertainty
  - Floating exchange rates are very volatile, and this might be bad for long term financial integration and trade
- We need to think in more detail about the question: under what circumstances does it make sense to have fixed exchange rates?



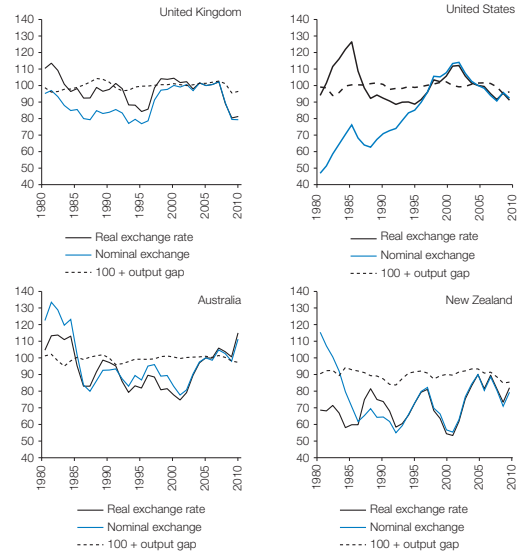
Why would you go through all this hassle?

- It seems like there are serious challenges with fixed exchange rates
  - They're difficult to maintain
  - Bad implications for macroeconomic stabilization
- Why not just let them float?
  - For many countries, this is the right choice
  - Main reasons for wanting fixed exchange rates come down to reducing uncertainty
  - Floating exchange rates are very volatile, and this might be bad for long term financial integration and trade
- We need to think in more detail about the question: under what circumstances does it make sense to have fixed exchange rates?



Why would you go through all this hassle?

- It seems like there are serious challenges with fixed exchange rates
  - They're difficult to maintain
  - Bad implications for macroeconomic stabilization
- Why not just let them float?
  - For many countries, this is the right choice
  - Main reasons for wanting fixed exchange rates come down to reducing uncertainty
  - Floating exchange rates are very volatile, and this might be bad for long term financial integration and trade
- We need to think in more detail about the question: under what circumstances does it make sense to have fixed exchange rates?



Section 2

Currency Unions

Solution to Currency Runs

- We've seen that the key problem with currency runs is that it's hard to commit to a fixed exchange rate
- In a currency union, governments tie their hands:
  - If you literally give up your own currency (and the right to print your own money) you can commit to a fixed exchange rate
  - In this case $e^{\otimes} = 1$
  - Eurozone is most prominent example: A Euro is a Euro, no matter what country you're in
- Other examples:
  - Scotland and England are in a currency (and political) union
  - US states are in a currency union with each other (a dollar in West Virginia is the same as a dollar in New York)
- Clearly a currency union is sensible sometimes
  - Imagine if Edinburgh and Glasgow had different currencies...
  - Under what circumstances is it sensible?

Efficiency Gains: Reduced Transaction Costs

- **Remove transaction costs** for exchanging currencies:
  - Especially before ubiquitous internet access, it was hard to trade in currency markets
  - Difficulty in obtaining information meant that currency brokers/intermediaries could extract large rents

    Also consider opportunity cost of time spent extracting those rents – could be spent on more productive uses
  - Introduction of Euro is estimated to reduce transaction costs by $\approx 0.3\%$ of GDP.
  - May be less important now – internet likely makes currency markets more competitive

    Think of Wise, Monzo, etc...
- **Easier to compare prices**: lowers trade barriers
- All of these are more important when you trade more with your neighbors

Efficiency Gains: Reduced Transaction Costs

- **Remove transaction costs** for exchanging currencies:
  - Especially before ubiquitous internet access, it was hard to trade in currency markets
  - Difficulty in obtaining information meant that currency brokers/intermediaries could extract large rents

    Also consider opportunity cost of time spent extracting those rents – could be spent on more productive uses
  - Introduction of Euro is estimated to reduce transaction costs by $\approx 0.3\%$ of GDP.
  - May be less important now – internet likely makes currency markets more competitive

    Think of Wise, Monzo, etc...
- **Easier to compare prices**: lowers trade barriers
- All of these are more important when you trade more with your neighbors

Efficiency Gains: Reduced Transaction Costs

- **Remove transaction costs** for exchanging currencies:
  - Especially before ubiquitous internet access, it was hard to trade in currency markets
  - Difficulty in obtaining information meant that currency brokers/intermediaries could extract large rents

    Also consider opportunity cost of time spent extracting those rents – could be spent on more productive uses
  - Introduction of Euro is estimated to reduce transaction costs by $\approx 0.3\%$ of GDP.
  - May be less important now – internet likely makes currency markets more competitive

    Think of Wise, Monzo, etc...
- **Easier to compare prices**: lowers trade barriers
- All of these are more important when you trade more with your neighbors

Efficiency Gains: Reduced Transaction Costs

- **Remove transaction costs** for exchanging currencies:
  - Especially before ubiquitous internet access, it was hard to trade in currency markets
  - Difficulty in obtaining information meant that currency brokers/intermediaries could extract large rents

    Also consider opportunity cost of time spent extracting those rents – could be spent on more productive uses
  - Introduction of Euro is estimated to reduce transaction costs by $\approx 0.3\%$ of GDP.
  - May be less important now – internet likely makes currency markets more competitive

    Think of Wise, Monzo, etc...
- **Easier to compare prices**: lowers trade barriers
- All of these are more important when you trade more with your neighbors

Efficiency Gains: Reduced Short Term Price Uncertainty?

- Another claim is that fixed exchange rates can reduce the uncertainty about what prices you will pay for good over short horizons
- Or consider a UK firm that orders an expensive machine for its factory from a German firm? (Payment on delivery, in 3 months, in Euros)
  - What happens if the Euro appreciates in those three months?
  - It might have looked like a good deal when you placed the order, but not so much when it comes time to pay
  - Note: you can't solve this by just paying in pounds. Then the German firm shoulders the risk
- In practice this is not a huge problem for medium to large sized firms with access to good financial markets
  - You can purchase financial products (**Forward contracts**) to hedge against these risks
  - You agree to purchase euros for pounds at a fixed exchange rate at a specified date in the future
  - Fees are generally low – this market functions well

Efficiency Gains: Reduced Short Term Price Uncertainty?

- Another claim is that fixed exchange rates can reduce the uncertainty about what prices you will pay for good over short horizons
- Or consider a UK firm that orders an expensive machine for its factory from a German firm? (Payment on delivery, in 3 months, in Euros)
  - What happens if the Euro appreciates in those three months?
  - It might have looked like a good deal when you placed the order, but not so much when it comes time to pay
  - Note: you can't solve this by just paying in pounds. Then the German firm shoulders the risk
- In practice this is not a huge problem for medium to large sized firms with access to good financial markets
  - You can purchase financial products (**Forward contracts**) to hedge against these risks
  - You agree to purchase euros for pounds at a fixed exchange rate at a specified date in the future
  - Fees are generally low – this market functions well

Efficiency Gains: Reduced Short Term Price Uncertainty?

- Another claim is that fixed exchange rates can reduce the uncertainty about what prices you will pay for good over short horizons
- Or consider a UK firm that orders an expensive machine for its factory from a German firm? (Payment on delivery, in 3 months, in Euros)
  - What happens if the Euro appreciates in those three months?
  - It might have looked like a good deal when you placed the order, but not so much when it comes time to pay
  - Note: you can't solve this by just paying in pounds. Then the German firm shoulders the risk
- In practice this is not a huge problem for medium to large sized firms with access to good financial markets
  - You can purchase financial products (**Forward contracts**) to hedge against these risks
  - You agree to purchase euros for pounds at a fixed exchange rate at a specified date in the future
  - Fees are generally low – this market functions well

Efficiency Gains: Reduced Short Term Price Uncertainty?

- Another claim is that fixed exchange rates can reduce the uncertainty about what prices you will pay for good over short horizons
- Or consider a UK firm that orders an expensive machine for its factory from a German firm? (Payment on delivery, in 3 months, in Euros)
  - What happens if the Euro appreciates in those three months?
  - It might have looked like a good deal when you placed the order, but not so much when it comes time to pay
  - Note: you can't solve this by just paying in pounds. Then the German firm shoulders the risk
- In practice this is not a huge problem for medium to large sized firms with access to good financial markets
  - You can purchase financial products (**Forward contracts**) to hedge against these risks
  - You agree to purchase euros for pounds at a fixed exchange rate at a specified date in the future
  - Fees are generally low – this market functions well

Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

- Consider the problem of a firm thinking of making an investment in a foreign country.
  - Assume that they have a downward sloping inverse demand curve $p(q) = Pq^{\sigma-1}$ where P is the overall price level in the market, and $\sigma < 1$
  - Suppose they have a fixed marginal cost c
- If they internalize their effect on the price (i.e, have market power) then they maximize profits $\pi = p(q)q - qc$:

$$\max_q Pq^{\sigma} - qc$$

- First order conditions imply

$$\sigma P q^{\sigma-1} = c \implies q = \left(\frac{\sigma P}{c}\right)^{\frac{1}{1-\sigma}} \implies p(q) = c/\sigma$$

- We can figure out profits now:

$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

- Consider the problem of a firm thinking of making an investment in a foreign country.
  - Assume that they have a downward sloping inverse demand curve $p(q) = Pq^{\sigma-1}$ where P is the overall price level in the market, and $\sigma < 1$
  - Suppose they have a fixed marginal cost c
- If they internalize their effect on the price (i.e, have market power) then they maximize profits $\pi = p(q)q - qc$:

$$\max_q Pq^{\sigma} - qc$$

- First order conditions imply

$$\sigma P q^{\sigma-1} = c \implies q = \left(\frac{\sigma P}{c}\right)^{\frac{1}{1-\sigma}} \implies p(q) = c/\sigma$$

- We can figure out profits now:

$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

- Consider the problem of a firm thinking of making an investment in a foreign country.
  - Assume that they have a downward sloping inverse demand curve $p(q) = Pq^{\sigma-1}$ where P is the overall price level in the market, and $\sigma < 1$
  - Suppose they have a fixed marginal cost c
- If they internalize their effect on the price (i.e, have market power) then they maximize profits $\pi = p(q)q - qc$:

$$\max_q Pq^{\sigma} - qc$$

- First order conditions imply

$$\sigma P q^{\sigma-1} = c \implies q = \left(\frac{\sigma P}{c}\right)^{\frac{1}{1-\sigma}} \implies p(q) = c/\sigma$$

- We can figure out profits now:

$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

- Consider the problem of a firm thinking of making an investment in a foreign country.
  - Assume that they have a downward sloping inverse demand curve $p(q) = Pq^{\sigma-1}$ where P is the overall price level in the market, and $\sigma < 1$
  - Suppose they have a fixed marginal cost c
- If they internalize their effect on the price (i.e, have market power) then they maximize profits $\pi = p(q)q - qc$:

$$\max_q Pq^{\sigma} - qc$$

- First order conditions imply

$$\sigma P q^{\sigma-1} = c \implies q = \left(\frac{\sigma P}{c}\right)^{\frac{1}{1-\sigma}} \implies p(q) = c/\sigma$$

- We can figure out profits now:

$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

- What does long term price uncertainty do to firm profits?
- Since $0 < \sigma < 1$, we know that $\frac{1}{1-\sigma} > 1$
- This means that π is **convex** in the price level P
- Risk neutral, profit maximizing firms, look as though they are **risk loving** with respect to price (i.e, exchange rate) uncertainty
- Firms can "lean against the wind"
  They produce high output if prices turn out to be high, and low output if prices turn out to be low, hedging against the risk with their optimal behavior

Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

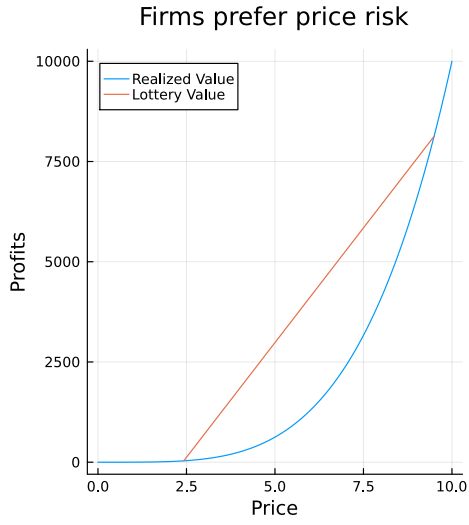
$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

- What does long term price uncertainty do to firm profits?
- Since $0 < \sigma < 1$, we know that $\frac{1}{1-\sigma} > 1$
- This means that π is **convex** in the price level P
- Risk neutral, profit maximizing firms, look as though they are **risk loving** with respect to price (i.e, exchange rate) uncertainty
- Firms can "lean against the wind"
  They produce high output if prices turn out to be high, and low output if prices turn out to be low, hedging against the risk with their optimal behavior

Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

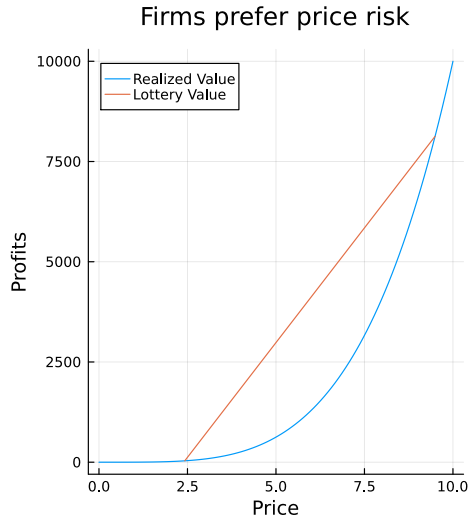
- What does long term price uncertainty do to firm profits?
- Since $0 < \sigma < 1$, we know that $\frac{1}{1-\sigma} > 1$
- This means that π is **convex** in the price level P
- Risk neutral, profit maximizing firms, look as though they are **risk loving** with respect to price (i.e, exchange rate) uncertainty
- Firms can "lean against the wind"
  They produce high output if prices turn out to be high, and low output if prices turn out to be low, hedging against the risk with their optimal behavior



Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

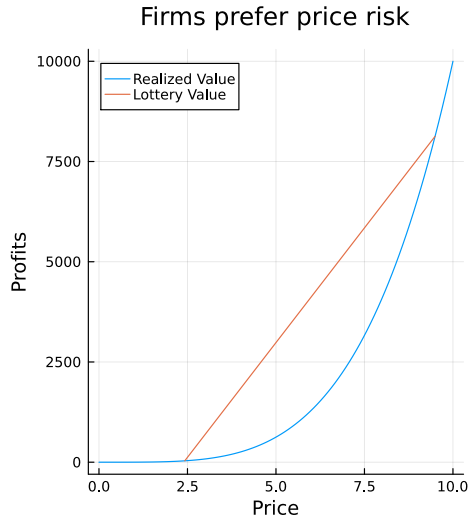
- What does long term price uncertainty do to firm profits?
- Since $0 < \sigma < 1$, we know that $\frac{1}{1-\sigma} > 1$
- This means that π is **convex** in the price level P
- Risk neutral, profit maximizing firms, look as though they are **risk loving** with respect to price (i.e, exchange rate) uncertainty
- Firms can "lean against the wind" They produce high output if prices turn out to be high, and low output if prices turn out to be low, hedging against the risk with their optimal behavior



Efficiency Gains: Reduced Medium/Long Term Price Uncertainty?

$$\pi = c\left(\frac{1-\sigma}{\sigma}\right)\left(\frac{P\sigma}{c}\right)^{\frac{1}{1-\sigma}}$$

- What does long term price uncertainty do to firm profits?
- Since $0 < \sigma < 1$, we know that $\frac{1}{1-\sigma} > 1$
- This means that π is **convex** in the price level P
- Risk neutral, profit maximizing firms, look as though they are **risk loving** with respect to price (i.e, exchange rate) uncertainty
- Firms can "lean against the wind"
  They produce high output if prices turn out to be high, and low output if prices turn out to be low, hedging against the risk with their optimal behavior



Efficiency Gains: Reduced Medium/Long Term Price Uncertainty

- Medium/long term exchange rate risk does not reduce profits (and therefore investment)
- It's possible that if firms aren't risk neutral (e.g., closely held small firms), then their risk aversion could cancel this effect out
- If exchange rates actually help stabilize demand, then floating exchange rates could lead to *lower risk overall*
  - Increased risk in foreign markets outweighed by lower risk in domestic markets
- Overall, it's not theoretically obvious which way this effect should go

Fixed Exchange Rates: Benefits

- It looks like the only clear benefits to fixed exchange rates come from lower transaction costs
- This functions to reduce barriers to trade
- Clearly this is more important for your close trading partners
  - Much more important for New York and New Jersey to have a fixed exchange rate than for New York and Japan
- The more **tightly integrated** your markets are (higher trade volumes) the more important a fixed exchange rate regime will be
- **Political concerns**: it's possible that you want to increase trade for political reasons. By making integration easier, a common currency may encourage more tightly integrated economies

Fixed Exchange Rates: Benefits

- It looks like the only clear benefits to fixed exchange rates come from lower transaction costs
- This functions to reduce barriers to trade
- Clearly this is more important for your close trading partners
  - Much more important for New York and New Jersey to have a fixed exchange rate than for New York and Japan
- The more **tightly integrated** your markets are (higher trade volumes) the more important a fixed exchange rate regime will be
- **Political concerns**: it's possible that you want to increase trade for political reasons. By making integration easier, a common currency may encourage more tightly integrated economies

Fixed Exchange Rates: Benefits

- It looks like the only clear benefits to fixed exchange rates come from lower transaction costs
- This functions to reduce barriers to trade
- Clearly this is more important for your close trading partners
  - Much more important for New York and New Jersey to have a fixed exchange rate than for New York and Japan
- The more **tightly integrated** your markets are (higher trade volumes) the more important a fixed exchange rate regime will be
- **Political concerns**: it's possible that you want to increase trade for political reasons. By making integration easier, a common currency may encourage more tightly integrated economies

Fixed Exchange Rates: Macroeconomic Stability Concerns

- Adopting a fixed exchange rate means giving up independent control of your monetary policy
  - New York has the same monetary policy as West Virginia: set by the Fed
  - Spain has the same monetary policy as Germany: set by the ECB
- The key challenge comes from **asymmetric shocks**
  - If West Virginia gets hit by a local negative demand shock, then monetary policy cannot adjust to fix it
  - The Fed sets only one interest rate
  - It can handle common shocks, but is relatively powerless to stabilize regional shocks
- Key concern for fixed exchange rates: to what extent are your shocks asymmetric across the currency union?

Fixed Exchange Rates: Macroeconomic Stability Concerns

- Adopting a fixed exchange rate means giving up independent control of your monetary policy
  - New York has the same monetary policy as West Virginia: set by the Fed
  - Spain has the same monetary policy as Germany: set by the ECB
- The key challenge comes from **asymmetric shocks**
  - If West Virginia gets hit by a local negative demand shock, then monetary policy cannot adjust to fix it
  - The Fed sets only one interest rate
  - It can handle common shocks, but is relatively powerless to stabilize regional shocks
- Key concern for fixed exchange rates: to what extent are your shocks asymmetric across the currency union?

Fixed Exchange Rates: Macroeconomic Stability Concerns

- Adopting a fixed exchange rate means giving up independent control of your monetary policy
  - New York has the same monetary policy as West Virginia: set by the Fed
  - Spain has the same monetary policy as Germany: set by the ECB
- The key challenge comes from **asymmetric shocks**
  - If West Virginia gets hit by a local negative demand shock, then monetary policy cannot adjust to fix it
  - The Fed sets only one interest rate
  - It can handle common shocks, but is relatively powerless to stabilize regional shocks
- Key concern for fixed exchange rates: to what extent are your shocks asymmetric across the currency union?

Fixed Exchange Rates: Macroeconomic Stability Concerns

- Adopting a fixed exchange rate means giving up independent control of your monetary policy
  - New York has the same monetary policy as West Virginia: set by the Fed
  - Spain has the same monetary policy as Germany: set by the ECB
- The key challenge comes from **asymmetric shocks**
  - If West Virginia gets hit by a local negative demand shock, then monetary policy cannot adjust to fix it
  - The Fed sets only one interest rate
  - It can handle common shocks, but is relatively powerless to stabilize regional shocks
- Key concern for fixed exchange rates: to what extent are your shocks asymmetric across the currency union?

Response to asymmetric demand shock

IS Curve shifts down

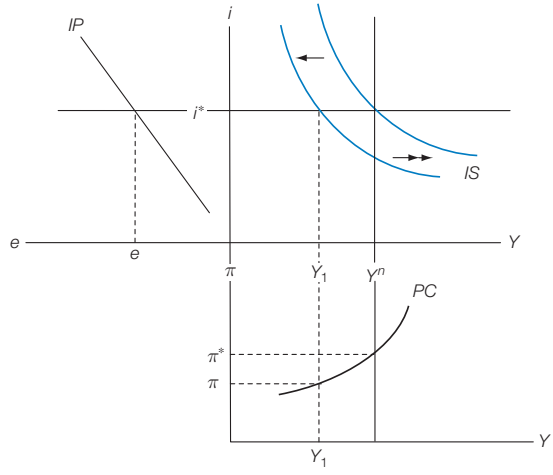
- Return to Y^n comes in 3 possible ways:
  1. Slow price adjustment:

     $$\pi < \pi^\star \implies \frac{d \log \varepsilon}{dt} < 0$$

     Eventually net exports increase so *IS* curve returns to normal
  2. Fiscal Policy: $G \uparrow$ so *IS* curve shifts back

     Nontrivial budget constraints make this difficult
  3. With labor mobility, over a long enough time horizon, people leave and Y^n shifts down
- Price adjustment is **slow and painful**

  You want to use fiscal policy/labor mobility if you can



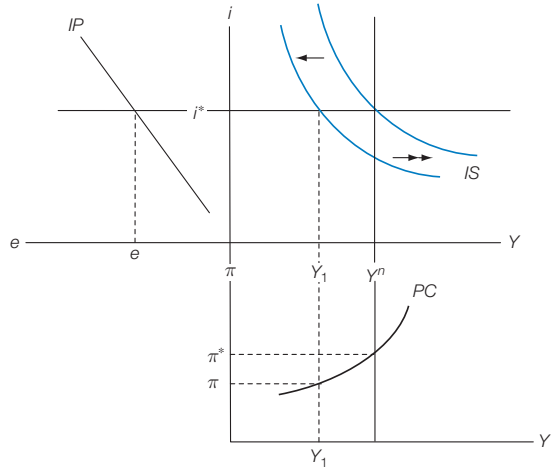
Response to asymmetric demand shock

IS Curve shifts down

- Return to Y^n comes in 3 possible ways:
  1. Slow price adjustment:

$$\pi < \pi^\star \implies \frac{d \log \varepsilon}{dt} < 0$$

     Eventually net exports increase so *IS* curve returns to normal
  2. Fiscal Policy: $G \uparrow$ so *IS* curve shifts back
     Nontrivial budget constraints make this difficult
  3. With labor mobility, over a long enough time horizon, people leave and Y^n shifts down
- Price adjustment is **slow and painful**
  You want to use fiscal policy/labor mobility if you can



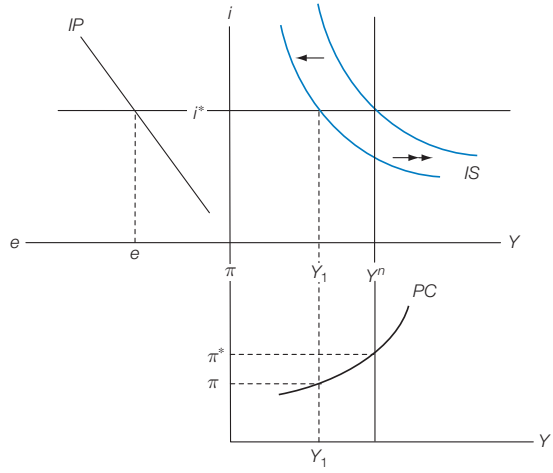
Response to asymmetric demand shock

IS Curve shifts down

- Return to Y^n comes in 3 possible ways:
  1. Slow price adjustment:

$$\pi < \pi^\star \implies \frac{d \log \varepsilon}{dt} < 0$$

     Eventually net exports increase so *IS* curve returns to normal
  2. Fiscal Policy: $G \uparrow$ so *IS* curve shifts back
     Nontrivial budget constraints make this difficult
  3. With labor mobility, over a long enough time horizon, people leave and Y^n shifts down
- Price adjustment is **slow and painful**
  You want to use fiscal policy/labor mobility if you can



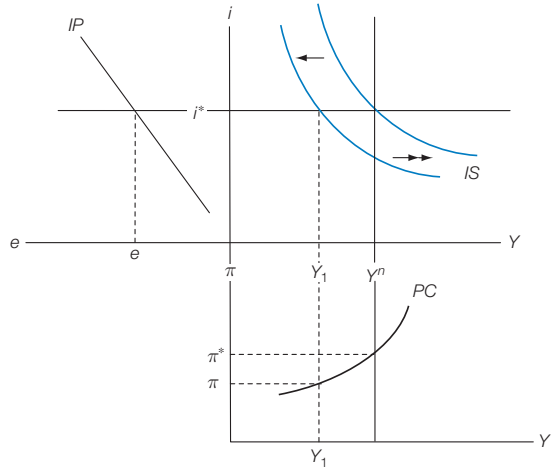
Response to asymmetric demand shock

IS Curve shifts down

- Return to Y^n comes in 3 possible ways:
  1. Slow price adjustment:

$$\pi < \pi^\star \implies \frac{d \log \varepsilon}{dt} < 0$$

     Eventually net exports increase so *IS* curve returns to normal
  2. Fiscal Policy: $G \uparrow$ so *IS* curve shifts back
     Nontrivial budget constraints make this difficult
  3. With labor mobility, over a long enough time horizon, people leave and Y^n shifts down
- Price adjustment is **slow and painful**
  You want to use fiscal policy/labor mobility if you can



Optimal Currency Areas

- When should countries form a currency union?
- We have two competing forces:
  1. How tightly integrated are your economies?
  2. How asymmetric are the shocks you face?
- More integrated economies derive higher benefits from a currency union
- If the shocks you face are fairly symmetric, then stabilization policy can be handled by the common central bank
- However, if you face **asymmetric shocks** then you are at a much higher risk of long, slow, and painful adjustments following regional shocks.

Role of Fiscal Policy

- We said that there were several ways to recover after asymmetric shocks
  1. Slow, painful adjustment through ε and NX
  2. Labor mobility: people leave, so $Y^n \downarrow$

     There is some evidence that this happened in large parts of the upper midwest in the US
  3. **Fiscal policy**: shift IS curve back out
- How well a currency union functions is largely a product of how well it avoids (1) and (2)
  - US: federal government coordinates interregional transfers to help smooth local demand

    UI, social security, other benefits are paid for by the federal government
  - EU: not so much...

    EU budget is less than 1% of overall GDP

Limits of Fiscal Policy

- **Key Challenge:** A country without its own currency (or that borrows in a foreign currency) can be quite constrained in how it conducts fiscal policy
  - When you are hit with a negative demand shock, deficits tend to go up (since tax revenues go down, and expenditures go up)
  - If your creditors become convinced that you might default on your debt, they will charge you a premium on your interest rates
  - Increased interest payments on your debt cause a further **deterioration of public finances**
- Countries are forced into **fiscal austerity** in response to negative demand shocks
- This happens right when you want to use fiscal policy to counteract the negative shock
- Exactly the opposite of what you want to do from the perspective of macroeconomic stabilization

Limits of Fiscal Policy

- **Key Challenge:** A country without its own currency (or that borrows in a foreign currency) can be quite constrained in how it conducts fiscal policy
  - When you are hit with a negative demand shock, deficits tend to go up (since tax revenues go down, and expenditures go up)
  - If your creditors become convinced that you might default on your debt, they will charge you a premium on your interest rates
  - Increased interest payments on your debt cause a further **deterioration of public finances**
- Countries are forced into **fiscal austerity** in response to negative demand shocks
- This happens right when you want to use fiscal policy to counteract the negative shock
- Exactly the opposite of what you want to do from the perspective of macroeconomic stabilization

Limits of Fiscal Policy

- **Key Challenge:** A country without its own currency (or that borrows in a foreign currency) can be quite constrained in how it conducts fiscal policy
  - When you are hit with a negative demand shock, deficits tend to go up (since tax revenues go down, and expenditures go up)
  - If your creditors become convinced that you might default on your debt, they will charge you a premium on your interest rates
  - Increased interest payments on your debt cause a further **deterioration of public finances**
- Countries are forced into **fiscal austerity** in response to negative demand shocks
- This happens right when you want to use fiscal policy to counteract the negative shock
- Exactly the opposite of what you want to do from the perspective of macroeconomic stabilization

Limits of Fiscal Policy

- **Key Challenge:** A country without its own currency (or that borrows in a foreign currency) can be quite constrained in how it conducts fiscal policy
  - When you are hit with a negative demand shock, deficits tend to go up (since tax revenues go down, and expenditures go up)
  - If your creditors become convinced that you might default on your debt, they will charge you a premium on your interest rates
  - Increased interest payments on your debt cause a further **deterioration of public finances**
- Countries are forced into **fiscal austerity** in response to negative demand shocks
- This happens right when you want to use fiscal policy to counteract the negative shock
- Exactly the opposite of what you want to do from the perspective of macroeconomic stabilization

Aside: Fiscal Policy Outside a Currency Union

- All of the analysis on the previous slide is about countries that borrow in a foreign currency (or who are part of a currency union)
- It's pretty hard to imagine how this could happen in the US or the UK

  Or any other country with sovereign control of its currency

  - **Key mechanism**: investors in the government debt decide it's too risky, and sell their bonds
  - Bond prices falling means interest rates rise
  - But if the central bank controls interest rates, they'll just print money to buy the bonds, keeping borrowing costs constant
- If this leads to inflation, then that would be a bit like a partial default on the debt
  - Remember, the economy was hit with a negative demand shock (deflationary)
  - Central bank will need to decrease money supply at some point in the future to avoid overheating the economy
  - By this point, the economy will be out of a recession and government finances will have recovered

Aside: Fiscal Policy Outside a Currency Union

- All of the analysis on the previous slide is about countries that borrow in a foreign currency (or who are part of a currency union)
- It's pretty hard to imagine how this could happen in the US or the UK

  Or any other country with sovereign control of its currency

  - **Key mechanism**: investors in the government debt decide it's too risky, and sell their bonds
  - Bond prices falling means interest rates rise
  - But if the central bank controls interest rates, they'll just print money to buy the bonds, keeping borrowing costs constant
- If this leads to inflation, then that would be a bit like a partial default on the debt
  - Remember, the economy was hit with a negative demand shock (deflationary)
  - Central bank will need to decrease money supply at some point in the future to avoid overheating the economy
  - By this point, the economy will be out of a recession and government finances will have recovered

Aside: Fiscal Policy Outside a Currency Union

- All of the analysis on the previous slide is about countries that borrow in a foreign currency (or who are part of a currency union)
- It's pretty hard to imagine how this could happen in the US or the UK

  Or any other country with sovereign control of its currency

  - **Key mechanism**: investors in the government debt decide it's too risky, and sell their bonds
  - Bond prices falling means interest rates rise
  - But if the central bank controls interest rates, they'll just print money to buy the bonds, keeping borrowing costs constant
- If this leads to inflation, then that would be a bit like a partial default on the debt
  - Remember, the economy was hit with a negative demand shock (deflationary)
  - Central bank will need to decrease money supply at some point in the future to avoid overheating the economy
  - By this point, the economy will be out of a recession and government finances will have recovered

Aside: Fiscal Policy Outside a Currency Union

- All of the analysis on the previous slide is about countries that borrow in a foreign currency (or who are part of a currency union)
- It's pretty hard to imagine how this could happen in the US or the UK

  Or any other country with sovereign control of its currency

  - **Key mechanism**: investors in the government debt decide it's too risky, and sell their bonds
  - Bond prices falling means interest rates rise
  - But if the central bank controls interest rates, they'll just print money to buy the bonds, keeping borrowing costs constant
- If this leads to inflation, then that would be a bit like a partial default on the debt
  - Remember, the economy was hit with a **negative demand shock** (deflationary)
  - Central bank will need to decrease money supply at some point in the future to avoid overheating the economy
  - By this point, the economy will be out of a recession and government finances will have recovered

Aside: Fiscal Policy Outside a Currency Union

- All of the analysis on the previous slide is about countries that borrow in a foreign currency (or who are part of a currency union)
- It's pretty hard to imagine how this could happen in the US or the UK

  Or any other country with sovereign control of its currency

  - **Key mechanism**: investors in the government debt decide it's too risky, and sell their bonds
  - Bond prices falling means interest rates rise
  - But if the central bank controls interest rates, they'll just print money to buy the bonds, keeping borrowing costs constant
- If this leads to inflation, then that would be a bit like a partial default on the debt
  - Remember, the economy was hit with a **negative demand shock** (deflationary)
  - Central bank will need to decrease money supply at some point in the future to avoid overheating the economy
  - By this point, the economy will be out of a recession and government finances will have recovered

Fiscal Policy is Key in a Currency Union

- However, limits of fiscal policy for regional governments require **fiscal coordination**
  - Can take the role of a central government, coordinating transfers
  - If a regional government faces a fiscal crisis, there is a strong pressure for the central bank to buy their debt

    This means that other countries in the currency union assume the default risk
  - In the US, the federal government routinely "bails out" state governments who have accumulated too much debt
    - First time was in 1790 (public assumption of state debt)
    - More recently: large debt financed transfers to the states due to Great Recession, COVID-19
- European Union attempts to avoid this:
  - Maastricht Treaty (established Euro) envisions very little fiscal coordination
  - Puts limits on government deficits as a % of GDP
  - Strict fiscal discipline rules for entering the Euro
  - In general, these rules are not followed after being admitted
  - No bailout clause – ECB is not supposed to be able to monetize member governments' debt

Fiscal Policy is Key in a Currency Union

- However, limits of fiscal policy for regional governments require **fiscal coordination**
  - Can take the role of a central government, coordinating transfers
  - If a regional government faces a fiscal crisis, there is a strong pressure for the central bank to buy their debt

    This means that other countries in the currency union assume the default risk
  - In the US, the federal government routinely "bails out" state governments who have accumulated too much debt
    - First time was in 1790 (public assumption of state debt)
    - More recently: large debt financed transfers to the states due to Great Recession, COVID-19
- European Union attempts to avoid this:
  - Maastricht Treaty (established Euro) envisions very little fiscal coordination
  - Puts limits on government deficits as a % of GDP
  - Strict fiscal discipline rules for entering the Euro
  - In general, these rules are not followed after being admitted
  - No bailout clause – ECB is not supposed to be able to monetize member governments' debt

Fiscal Policy is Key in a Currency Union

- However, limits of fiscal policy for regional governments require **fiscal coordination**
  - Can take the role of a central government, coordinating transfers
  - If a regional government faces a fiscal crisis, there is a strong pressure for the central bank to buy their debt

    This means that other countries in the currency union assume the default risk
  - In the US, the federal government routinely "bails out" state governments who have accumulated too much debt
    - First time was in 1790 (public assumption of state debt)
    - More recently: large debt financed transfers to the states due to Great Recession, COVID-19
- European Union attempts to avoid this:
  - Maastricht Treaty (established Euro) envisions very little fiscal coordination
  - Puts limits on government deficits as a % of GDP
  - Strict fiscal discipline rules for entering the Euro
  - In general, these rules are not followed after being admitted
  - No bailout clause – ECB is not supposed to be able to monetize member governments' debt

Fiscal Policy is Key in a Currency Union

- However, limits of fiscal policy for regional governments require **fiscal coordination**
  - Can take the role of a central government, coordinating transfers
  - If a regional government faces a fiscal crisis, there is a strong pressure for the central bank to buy their debt

    This means that other countries in the currency union assume the default risk
  - In the US, the federal government routinely "bails out" state governments who have accumulated too much debt
    - First time was in 1790 (public assumption of state debt)
    - More recently: large debt financed transfers to the states due to Great Recession, COVID-19
- European Union attempts to avoid this:
  - Maastricht Treaty (established Euro) envisions very little fiscal coordination
  - Puts limits on government deficits as a % of GDP
  - Strict fiscal discipline rules for entering the Euro
  - In general, these rules are not followed after being admitted
  - No bailout clause – ECB is not supposed to be able to monetize member governments' debt

Evaluating the Euro

- Trade Policy: Generally pretty successful
  - Trade value has increased more than 35% since adoption
    Unclear if this is the effect of the Euro, or of preexisting trends
  - More highly integrated capital markets
- Macroeconomic Policy: Pretty disastrous
  - Even pre-2010, average growth in Eurozone was 1% lower than in countries that targeted inflation (floating exchange rate)
    1% lower growth is a staggeringly large effect, since the growth effects compound over time
  - Similar levels of inflation
  - We haven't even talked about the eurozone crisis...

Table 15.2 *Comparison of the Eurozone with five inflation-targeting countries*

Inflation	**1999–2004**	**2005–2010**	**1999–2010**
Australia	3.1	2.9	3.0
Canada	2.3	1.8	2.0
New Zealand	2.0	2.9	2.4
Sweden	1.4	1.4	1.4
United Kingdom	1.2	2.6	1.9
Inflation-targeting countries	2.0	2.3	2.2
Eurozone	2.1	2.0	2.0
Difference	0.1	−0.4	−0.1
Real GDP growth	**1999–2004**	**2005–2010**	**1999–2010**
Australia	3.5	2.8	3.2
Canada	3.4	1.5	2.5
New Zealand	4.0	1.7	2.9
Sweden	3.2	1.7	2.5
United Kingdom	3.0	0.7	1.8
Inflation-targeting countries	3.4	1.7	2.6
Eurozone	2.1	1.0	1.5
Difference	−1.3	−0.7	−1.0
Short-term interest	**1999–2004**	**2005–2010**	**1999–2010**
Australia	5.2	5.6	5.4
Canada	3.8	2.8	3.3
New Zealand	5.7	6.2	5.9
Sweden	3.4	2.1	2.7
United Kingdom	4.8	3.8	4.3
Inflation-targeting countries	4.6	4.1	4.3
Eurozone	3.3	2.7	3.0
Difference	−1.3	−1.4	−1.3

Note: The average for the inflation targeting countries is not weighted by country size.
Source: *OECD Economic Outlook*, statistical appendix, http://www.oecd-ilibrary.org/books.

Evaluating the Euro

- Trade Policy: Generally pretty successful
  - Trade value has increased more than 35% since adoption

    Unclear if this is the effect of the Euro, or of preexisting trends
  - More highly integrated capital markets
- Macroeconomic Policy: Pretty disastrous
  - Even pre-2010, average growth in Eurozone was 1% lower than in countries that targeted inflation (floating exchange rate)

    1% lower growth is a staggeringly large effect, since the growth effects compound over time
  - Similar levels of inflation
  - We haven't even talked about the eurozone crisis...

Table 15.2 *Comparison of the Eurozone with five inflation-targeting countries*

Inflation	**1999–2004**	**2005–2010**	**1999–2010**
Australia	3.1	2.9	3.0
Canada	2.3	1.8	2.0
New Zealand	2.0	2.9	2.4
Sweden	1.4	1.4	1.4
United Kingdom	1.2	2.6	1.9
Inflation-targeting countries	2.0	2.3	2.2
Eurozone	2.1	2.0	2.0
Difference	0.1	−0.4	−0.1
Real GDP growth	**1999–2004**	**2005–2010**	**1999–2010**
Australia	3.5	2.8	3.2
Canada	3.4	1.5	2.5
New Zealand	4.0	1.7	2.9
Sweden	3.2	1.7	2.5
United Kingdom	3.0	0.7	1.8
Inflation-targeting countries	3.4	1.7	2.6
Eurozone	2.1	1.0	1.5
Difference	−1.3	−0.7	−1.0
Short-term interest	**1999–2004**	**2005–2010**	**1999–2010**
Australia	5.2	5.6	5.4
Canada	3.8	2.8	3.3
New Zealand	5.7	6.2	5.9
Sweden	3.4	2.1	2.7
United Kingdom	4.8	3.8	4.3
Inflation-targeting countries	4.6	4.1	4.3
Eurozone	3.3	2.7	3.0
Difference	−1.3	−1.4	−1.3

Note: The average for the inflation targeting countries is not weighted by country size.
Source: *OECD Economic Outlook*, statistical appendix, http://www.oecd-ilibrary.org/books.

Eurozone Debt Crisis: Background

- Large global business cycles at the end of the 2000s (housing bubbles, financial crisis, global recession)
- Many countries like Portugal, Italy, Ireland, Greece, and Spain had large debt and uncompetitive export industries
  - High debt burden in these countries
  - All had relatively high inflation in previous decade: less competitive exports
- At the same time, Germany had low inflation over the previous decade, and had competitive export industries
- When demand shocks hit, many countries had big fiscal crises

Table 15.3 *Inflation differences in the Eurozone*

	Inflation 1999–2010	Difference
Germany	1.6	−0.5
Finland	1.8	−0.3
Austria	1.9	−0.2
France	1.9	−0.2
Belgium	2.1	0.0
Eurozone (14 countries)	2.1	0.0
Netherlands	2.2	0.1
Italy	2.3	0.2
Ireland	2.5	0.4
Portugal	2.5	0.4
Luxembourg	2.7	0.6
Spain	2.9	0.8
Greece	3.4	1.3

Note: Inflation is measured by the percentage change of harmonized consumer price indexes.
Source: *OECD Economic Outlook*, OECD, 10 October 2011, http://www.oecd-ilibrary.org/statistics.

Part of the competitiveness of German exports was that they had spent 10 years as a low-inflation member of a currency union. Without the Euro, the mark would have appreciated, and their exports become less competitive

Eurozone Debt Crisis: Background

- Large global business cycles at the end of the 2000s (housing bubbles, financial crisis, global recession)
- Many countries like Portugal, Italy, Ireland, Greece, and Spain had large debt and uncompetitive export industries
  - High debt burden in these countries
  - All had relatively high inflation in previous decade: less competitive exports
- At the same time, Germany had low inflation over the previous decade, and had competitive export industries
- When demand shocks hit, many countries had big fiscal crises

Table 15.3 *Inflation differences in the Eurozone*

	Inflation 1999–2010	Difference
Germany	1.6	−0.5
Finland	1.8	−0.3
Austria	1.9	−0.2
France	1.9	−0.2
Belgium	2.1	0.0
Eurozone (14 countries)	2.1	0.0
Netherlands	2.2	0.1
Italy	2.3	0.2
Ireland	2.5	0.4
Portugal	2.5	0.4
Luxembourg	2.7	0.6
Spain	2.9	0.8
Greece	3.4	1.3

Note: Inflation is measured by the percentage change of harmonized consumer price indexes.
Source: *OECD Economic Outlook*, OECD, 10 October 2011, http://www.oecd-ilibrary.org/statistics.

Part of the competitiveness of German exports was that they had spent 10 years as a low-inflation member of a currency union. Without the Euro, the mark would have appreciated, and their exports become less competitive

Eurozone Debt Crisis: Background

- Large global business cycles at the end of the 2000s (housing bubbles, financial crisis, global recession)
- Many countries like Portugal, Italy, Ireland, Greece, and Spain had large debt and uncompetitive export industries
  - High debt burden in these countries
  - All had relatively high inflation in previous decade: less competitive exports
- At the same time, Germany had low inflation over the previous decade, and had competitive export industries
- When demand shocks hit, many countries had big fiscal crises

Table 15.3 *Inflation differences in the Eurozone*

	Inflation 1999–2010	Difference
Germany	1.6	−0.5
Finland	1.8	−0.3
Austria	1.9	−0.2
France	1.9	−0.2
Belgium	2.1	0.0
Eurozone (14 countries)	2.1	0.0
Netherlands	2.2	0.1
Italy	2.3	0.2
Ireland	2.5	0.4
Portugal	2.5	0.4
Luxembourg	2.7	0.6
Spain	2.9	0.8
Greece	3.4	1.3

Note: Inflation is measured by the percentage change of harmonized consumer price indexes.
Source: *OECD Economic Outlook*, OECD, 10 October 2011, http://www.oecd-ilibrary.org/statistics.

Part of the competitiveness of German exports was that they had spent 10 years as a low-inflation member of a currency union. Without the Euro, the mark would have appreciated, and their exports become less competitive

Eurozone Debt Crisis: Background

- Large global business cycles at the end of the 2000s (housing bubbles, financial crisis, global recession)
- Many countries like Portugal, Italy, Ireland, Greece, and Spain had large debt and uncompetitive export industries
  - High debt burden in these countries
  - All had relatively high inflation in previous decade: less competitive exports
- At the same time, Germany had low inflation over the previous decade, and had competitive export industries
- When demand shocks hit, many countries had big fiscal crises

Table 15.3 *Inflation differences in the Eurozone*

	Inflation 1999–2010	Difference
Germany	1.6	−0.5
Finland	1.8	−0.3
Austria	1.9	−0.2
France	1.9	−0.2
Belgium	2.1	0.0
Eurozone (14 countries)	2.1	0.0
Netherlands	2.2	0.1
Italy	2.3	0.2
Ireland	2.5	0.4
Portugal	2.5	0.4
Luxembourg	2.7	0.6
Spain	2.9	0.8
Greece	3.4	1.3

Note: Inflation is measured by the percentage change of harmonized consumer price indexes.
Source: *OECD Economic Outlook*, OECD, 10 October 2011, http://www.oecd-ilibrary.org/statistics.

Part of the competitiveness of German exports was that they had spent 10 years as a low-inflation member of a currency union. Without the Euro, the mark would have appreciated, and their exports become less competitive

Eurozone Debt Crisis: 2007 - 2010

- Interest rates on Greek debt increased steadily in 2007 to 2008 (2% spread against German debt)
  - This makes debt burden increase (need to borrow more to pay interest on existing debt)
- In 2010, it was revealed that Greece had lied about details of its fiscal position – it was even worse than reported
  - Private lending to Greek government collapsed (interest rate goes to ∞)
  - Would have had to immediately balance budget, or fail to make legally mandated payments
  - Austerity and budget cuts made the problem even worse
- Crisis spread to other countries with weak fiscal positions (Ireland, Portugal, Spain, and Italy)
  - Their spreads also went up
  - Fiscal positions started to deteriorate

Eurozone Debt Crisis: Bailout

- In response to the crisis, ECB and the Eurozone bailed Greece/Portugal out
  - Partly a response to threats that Greece might unilaterally leave the Euro and default
- Set up funds to loan the Greek/Portuguese governments money at below market rates (assuming default risk)
  - 175 billion EUR to Greece
  - 146 billion EUR to Portugal
- ECB purchased a large quantity of distressed debt
- Very controversial: exploited loopholes in Maastricht Treaty
- In exchange, other Eurozone countries demanded extremely harsh, immediate austerity measures to decrease the Greek debt burden
  - In the midst of a demand induced recession, Greece had to pursue procyclical fiscal policy
- Greece eventually did a **partial default** on the debt purchased by the ECB (in 2012)
- In spite of efforts to avoid it, the Eurozone turned into a fiscal union

Eurozone Debt Crisis: Bailout

- In response to the crisis, ECB and the Eurozone bailed Greece/Portugal out
  - Partly a response to threats that Greece might unilaterally leave the Euro and default
- Set up funds to loan the Greek/Portuguese governments money at below market rates (assuming default risk)
  - 175 billion EUR to Greece
  - 146 billion EUR to Portugal
- ECB purchased a large quantity of distressed debt
- Very controversial: exploited loopholes in Maastricht Treaty
- In exchange, other Eurozone countries demanded extremely harsh, immediate austerity measures to decrease the Greek debt burden
  - In the midst of a demand induced recession, Greece had to pursue procyclical fiscal policy
- Greece eventually did a **partial default** on the debt purchased by the ECB (in 2012)
- In spite of efforts to avoid it, the Eurozone turned into a fiscal union

Eurozone Debt Crisis: Bailout

- In response to the crisis, ECB and the Eurozone bailed Greece/Portugal out
  - Partly a response to threats that Greece might unilaterally leave the Euro and default
- Set up funds to loan the Greek/Portuguese governments money at below market rates (assuming default risk)
  - 175 billion EUR to Greece
  - 146 billion EUR to Portugal
- ECB purchased a large quantity of distressed debt
- Very controversial: exploited loopholes in Maastricht Treaty
- In exchange, other Eurozone countries demanded extremely harsh, immediate austerity measures to decrease the Greek debt burden
  - In the midst of a demand induced recession, Greece had to pursue procyclical fiscal policy
- Greece eventually did a **partial default** on the debt purchased by the ECB (in 2012)
- In spite of efforts to avoid it, the Eurozone turned into a fiscal union

Eurozone Debt Crisis: Bailout

- In response to the crisis, ECB and the Eurozone bailed Greece/Portugal out
  - Partly a response to threats that Greece might unilaterally leave the Euro and default
- Set up funds to loan the Greek/Portuguese governments money at below market rates (assuming default risk)
  - 175 billion EUR to Greece
  - 146 billion EUR to Portugal
- ECB purchased a large quantity of distressed debt
- Very controversial: exploited loopholes in Maastricht Treaty
- In exchange, other Eurozone countries demanded extremely harsh, immediate austerity measures to decrease the Greek debt burden
  - In the midst of a demand induced recession, Greece had to pursue procyclical fiscal policy
- Greece eventually did a **partial default** on the debt purchased by the ECB (in 2012)
- In spite of efforts to avoid it, the Eurozone turned into a fiscal union

Eurozone Debt Crisis: Aftermath of Austerity