



Session 15:

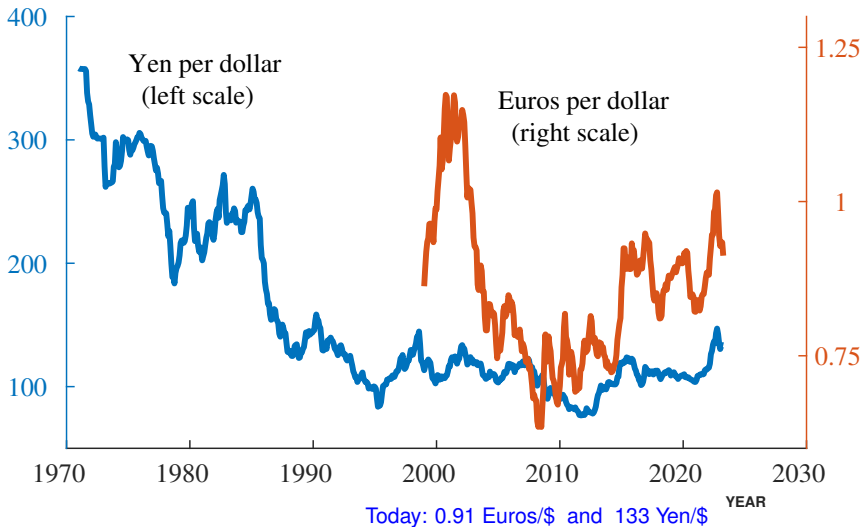
Exchange Rates and the International Financial System

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Outline: Exchange Rates and International Finance

- Exchange Rates and the Law of One Price
- The Short-Run Model including Exchange Rates
- The International Financial System
 - The Policy Trilemma
 - Pro's and con's of different exchange rate systems

The U.S. Exchange Rate vs. the Yen and Euro





Exchange Rates in the Long Run

The Law of One Price

The Law of One Price

- In the long run, goods must sell for the same price in each country
 - Apart from taxes, subsidies, and transportation costs

$$E P = P^w$$

- What determines the nominal exchange rate in the long run?

The Law of One Price

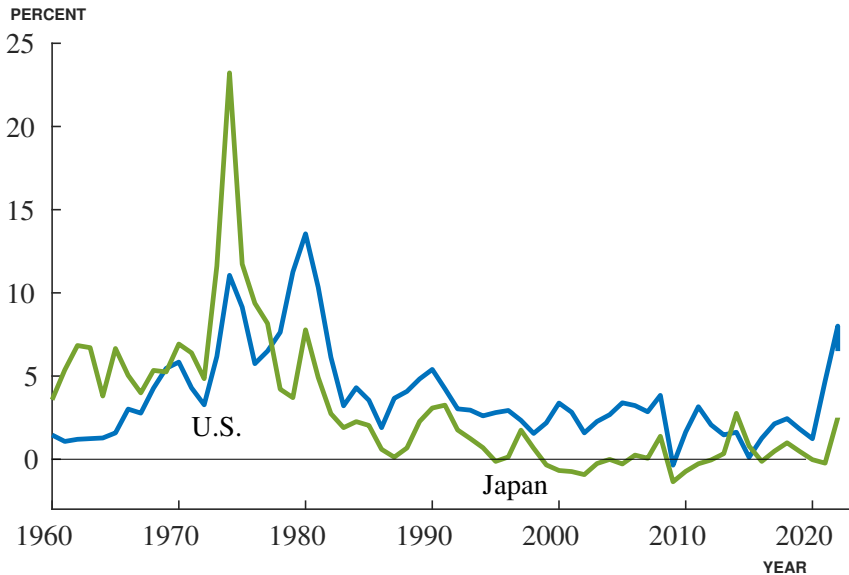
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- What determines the **nominal exchange rate** in the long run?

$$E = P^w / P$$

Inflation in the U.S. and Japan



The Role of Non-Traded Goods

- Does the [Law of One Price](#) apply to goods that cannot be traded?
Examples?
- What happens to the price of non-traded goods as a poor country develops, such as Japan in the 1970s or China today?
- Through retail and distribution, non-traded goods are part of the price of traded goods...

The Real Exchange Rate

- Closely related to the Law of One Price:

$$\text{Real Exchange Rate} \equiv \frac{EP}{P^w}$$

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- Units?

$$\frac{EP}{P^w} = E \frac{\text{euros}}{\text{dollar}} \times P \frac{\text{dollars}}{\text{U.S. good}} \times \frac{1}{P^w \frac{\text{euros}}{\text{Foreign good}}} = \frac{\text{Foreign goods}}{\text{U.S. good}}.$$

- Must equal “one” in the long run (law of one price)

Summary

- Nominal exchange rate:

Price of U.S. currency (in units of foreign currency)

- Real exchange rate:

Price of U.S. goods (in units of foreign goods)

(Can replace “U.S.” with “China,” e.g. if we are talking about China’s RMB.)



Exchange Rates in the Short Run

The Nominal Exchange Rate in the Short Run

- What determines its value in the short run?
- It's all about interest rates...
 - What happens to the dollar if the Fed raises interest rates?
(How attractive are U.S. bonds to international investors?)
 - Basic supply and demand for currency: E is market-clearing price

The Nominal Exchange Rate in the Short Run

- What determines its value in the short run?
 - Buy currencies for international trade
 - Buy currencies for international finance
 - More than 100 times daily U.S. GDP trades hands in forex every day.
- It's all about interest rates...
 - What happens to the dollar if the Fed raises interest rates?
(How attractive are U.S. bonds to international investors?)
 - Basic supply and demand for currency: E is market-clearing price

Nominal and Real Exchange Rates

- Exchange rates and interest rates move in the **same** direction

$$\uparrow i \Rightarrow \uparrow E \quad \text{and} \quad \downarrow i \Rightarrow \downarrow E$$

- What happens to the Real Exchange Rate?

Nominal and Real Exchange Rates

- Exchange rates and interest rates move in the **same** direction

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- What happens to the Real Exchange Rate?

Sticky prices / inflation means the real exchange rate moves just like the nominal exchange rate in the short run.

$$\text{Real Exchange Rate} = \frac{\uparrow E P}{P^W}$$

Summary

How the Exchange Rate Is Determined

		Long run	Short run
Nominal exchange rate	E	Pinned down by relative prices in the two economies; quantity theory of money.	Supply and demand in currency markets; moves in the same direction as i .
Real exchange rate	$\frac{EP}{P^w}$	Law of one price: $EP = P^w \Rightarrow \frac{EP}{P^w} = 1$	Sticky inflation means it moves with unanticipated changes in E .



The Open Economy and the Short Run Model

Including Exchange Rates in our Model

- Recall: Net exports are similar to investment (how?)

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$$S = I + NX$$

- High interest rate reduces investment
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-
- Qualitatively the Short-Run Model is unchanged by this addition
 - The IS curve is now flatter
... and the story behind it is richer

Including Exchange Rates in our Model

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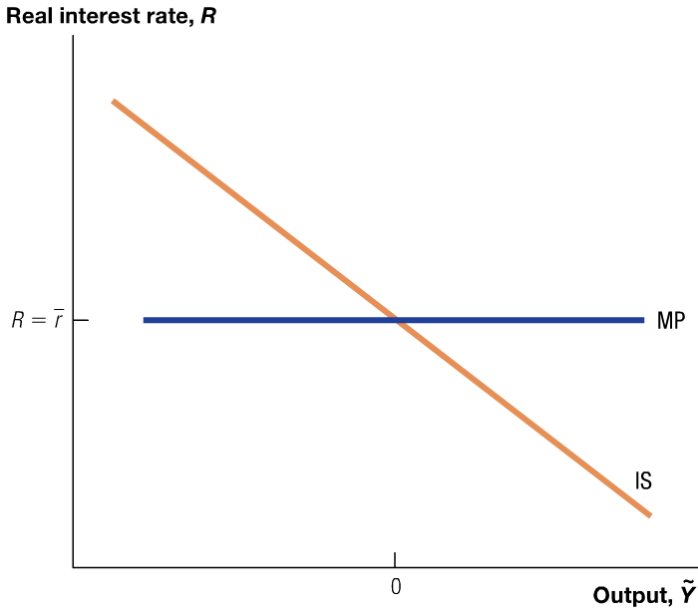
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 - ... and the story behind it is richer

International transmission of monetary policy: foreign rate hike $\uparrow i^{euro}$



International transmission of monetary policy in words

- If the ECB raises their interest rate $\uparrow i^{euro}$
- then the euro...
- and the dollar...
- ... so American exports go...
- and then in the U.S. we have a...
- The Fed then decides to...

International transmission of monetary policy in words

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- and the dollar... **depreciates**
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- If the ECB raises their interest rate $\uparrow i^{euro}$
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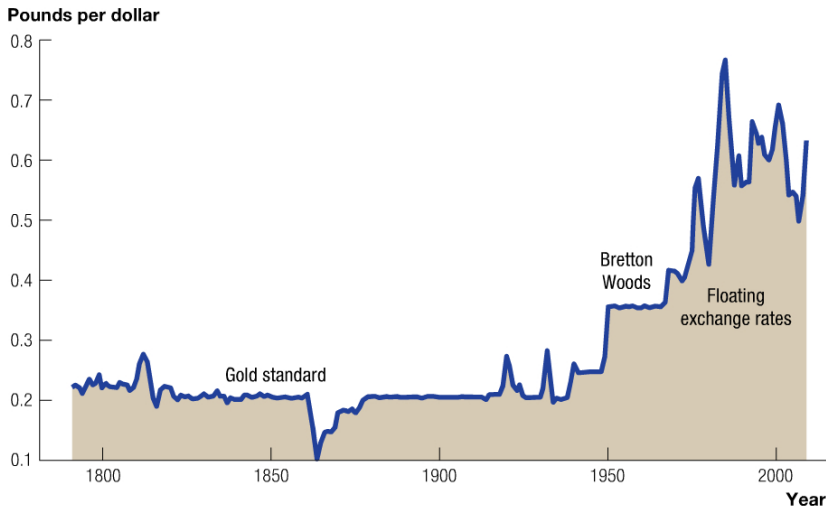
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- and then in the U.S. we have a... boom with somewhat higher inflation
- The Fed then decides to... raise interest rates in the U.S.
- to dampen the shock and fight inflation

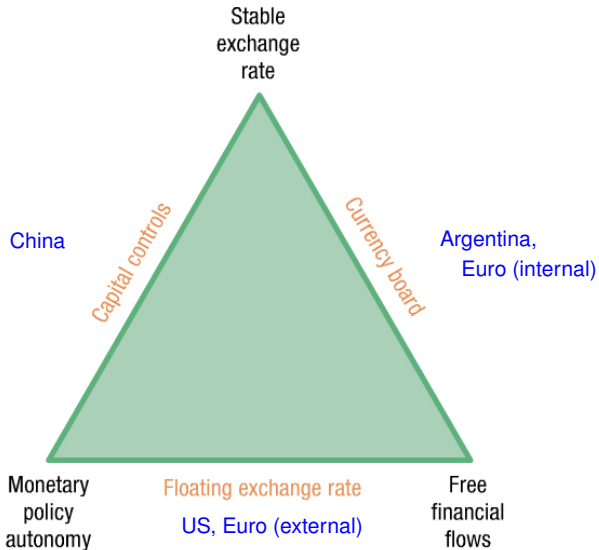


The International Financial System

The U.K. - U.S. Exchange Rate, 1791 – present



The Policy Trilemma



Explaining the Policy Trilemma

- Choose **one** side of the triangle
 - You **get** the two near corners
 - You **give up** the opposite corner
- Examples
 - Floating exchange rate: U.S., Europe (as a whole), Japan
 - Currency board: Argentina (1991–2001), Euro countries (with respect to each other)
 - Capital controls: China (undervalued currency \implies trade surplus $\implies S > I$, accumulating dollars/financial claims/Treasury bonds)

How does a country maintain a fixed exchange rate?

- Examples:
 - China 1998–2005 (8.28 yuan = 1 dollar)
 - Argentina 1991–2001 (1 peso = 1 dollar)
 - Gold Standard (until 1930's), Bretton Woods (postwar)
 - Euro countries (with respect to each other)
- What happens if the Fed raises the U.S. interest rate?

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- What happens if the Fed raises the U.S. interest rate?

*The central bank in Argentina must also raise local interest rates
⇒ Import U.S. monetary policy*

$$i^{Arg} = i^{US}$$

(But now return to China side of triangle...)



Which choice is best?

- Emerging economies
- Europe and the euro

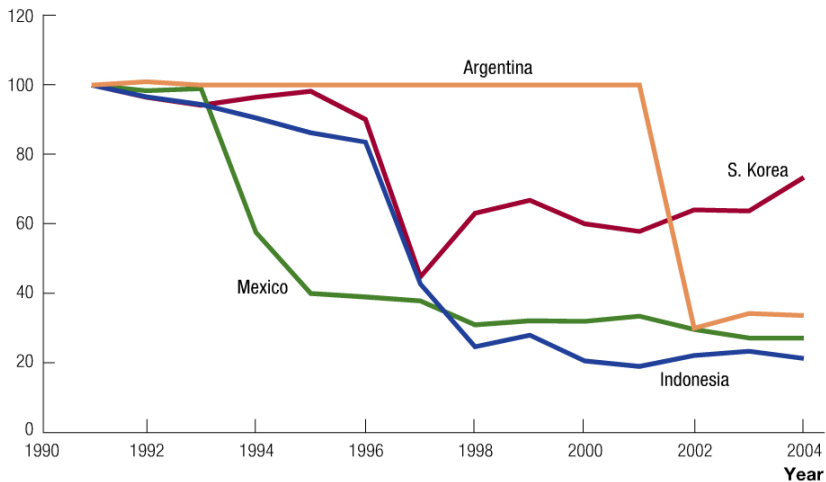
Choosing from the Trilemma: Emerging Economies

$$NX = S - I$$

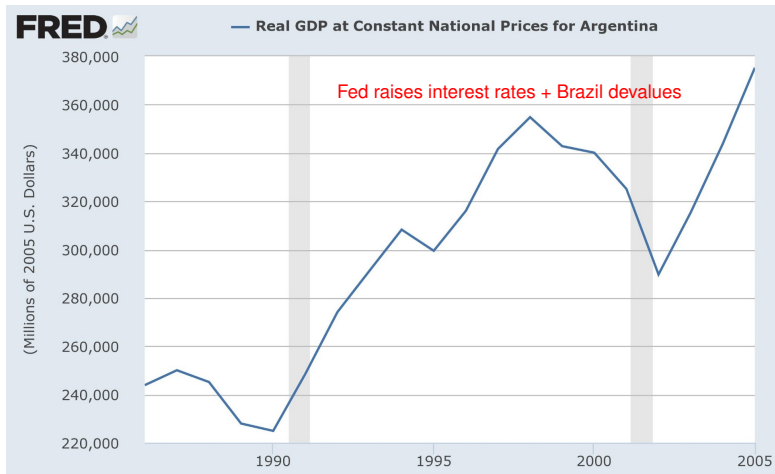
- “Washington Consensus”: Free capital flows permits $S < I$
 - Maintain high C and I through borrowing
 - Good if you need to borrow abroad to invest
 - But: subject to “sudden stops” and financial crises
- China (pre-2008): Undervalued exchange rate $S > I$
 - Must save more than you invest, restrains consumption
 - Cheap domestic goods (EP/P^w is low) encourages NX
 - Produce with global competition. Cheap destination for multinationals. Idea flows.
 - Insulated from “sudden stops” and financial crises.

Depreciations during Several Currency Crises

Exchange rate (1991 = 100)



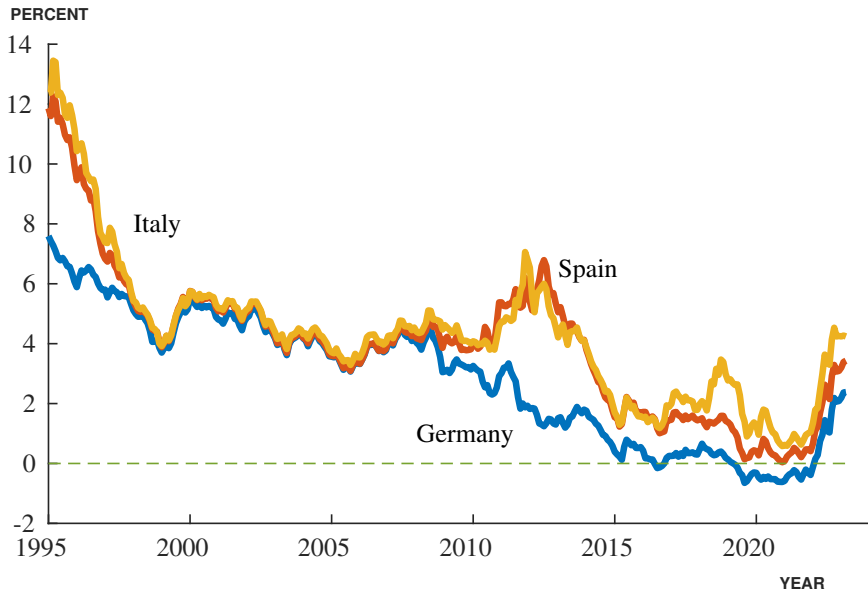
Argentina in the 90's



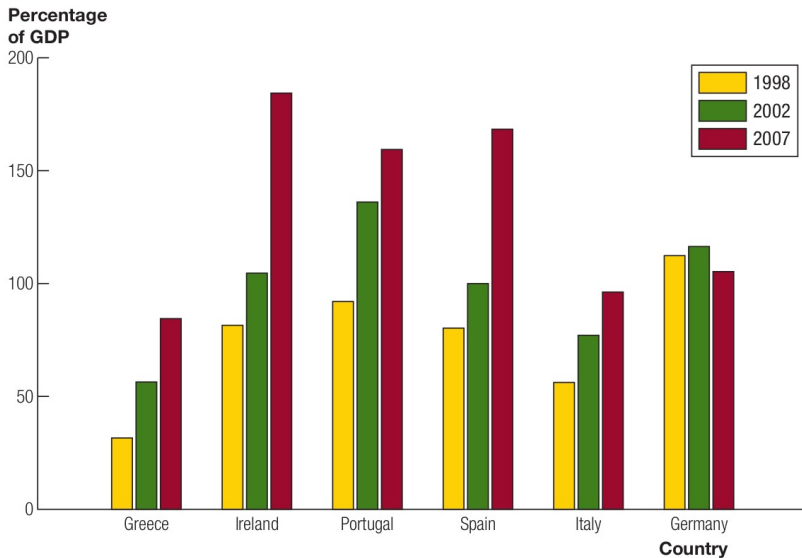


Choosing from the Trilemma: The Euro

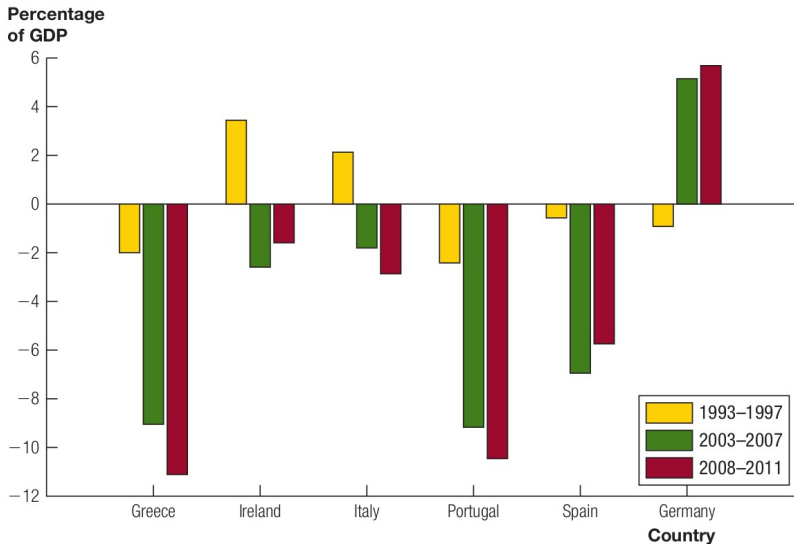
Government Bond Yields in Europe



Domestic Bank Lending in Europe

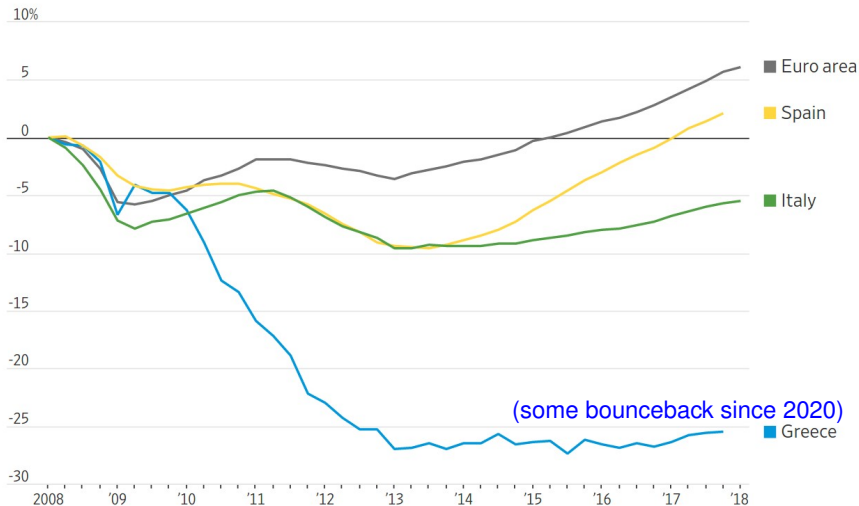


Current Account Balances in Europe (\approx Trade Balance)



Real GDP in Europe

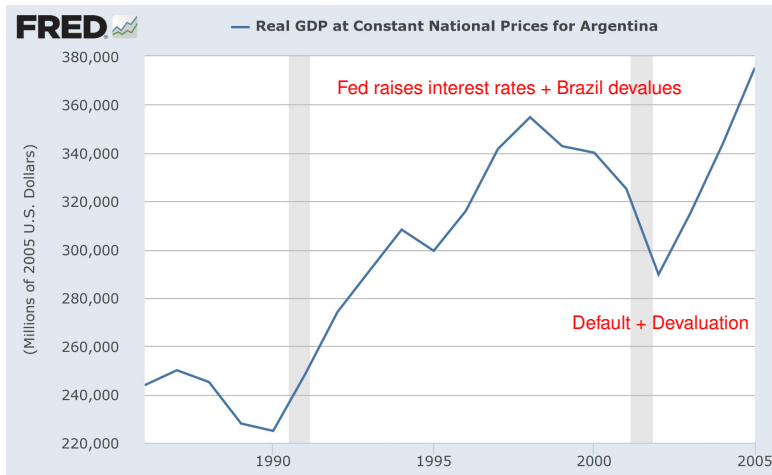
Change in GDP since first-quarter 2008



Choosing from the Trilemma: The Euro

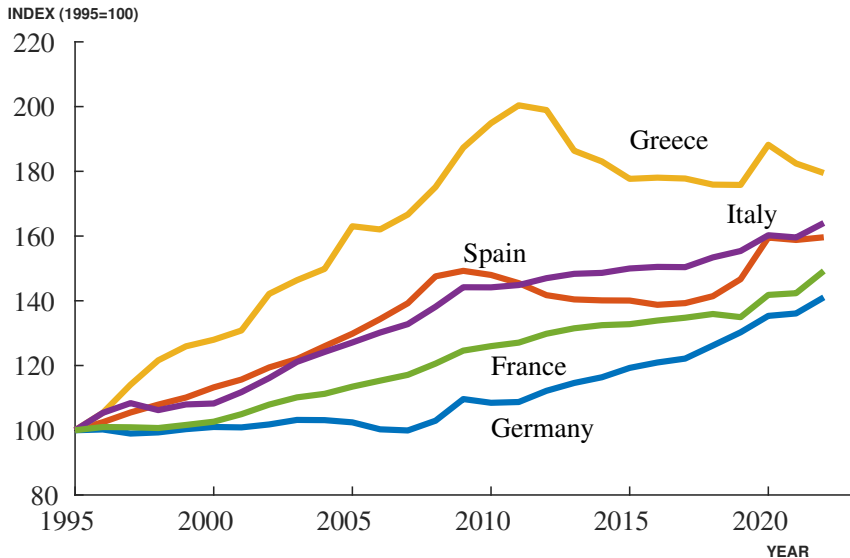
- Countries **within** the euro
 - Lose control of monetary policy
 - Lose the ability to depreciate their exchange rate to gain competitiveness
- Sovereign debt crisis implies that fiscal policy is **contracting** rather than stimulating the economies
- Long-run problems after crisis
 - The lack of “competitiveness” in southern Europe
 - Unemployment must drive down wages since cannot leave the euro
 - Long-term growth
 - **Reading:** What can the German model teach Macron?

Argentine 2001 default



(But Argentina went back to being Argentina!
Recent default on debts, inflation now 100%)

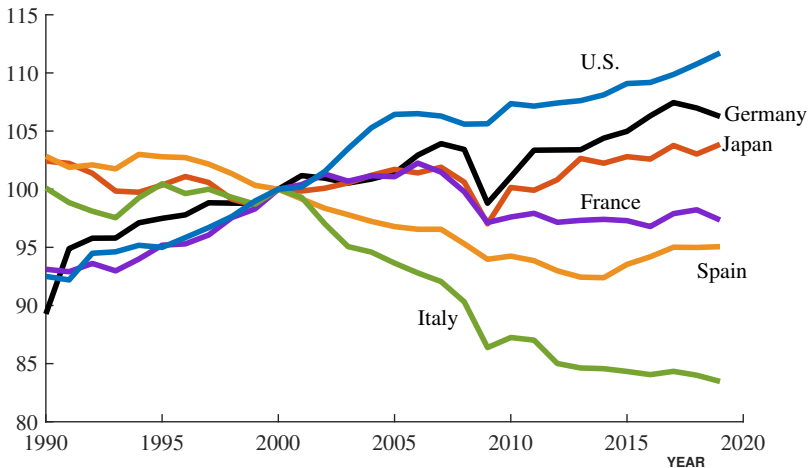
Unit Labor Costs in Europe



Note: ULC = Nominal wage divided by real labor productivity.

Total Factor Productivity in Europe

TOTAL FACTOR PRODUCTIVITY (2000=100)



What are the costs of leaving the euro?

- Debt is in Euros: would have to also default?
- European integration and political economy
 - Diffusion of best practice rules and institutions
- Lose benefits from Euro
- Distributional issues

Questions for Review

- What do the nominal and real exchange rates measure?
- Why should the law of one price hold? What can cause departures from the law of one price?
- Why do interest rates and exchange rates move in the same direction in the short run?
- How and why are net exports similar to investment? What does this imply about the slope of the IS curve?
- What is the policy trilemma, and what tradeoffs does it imply?