Session 16:
Exchange Rates and the International Financial System

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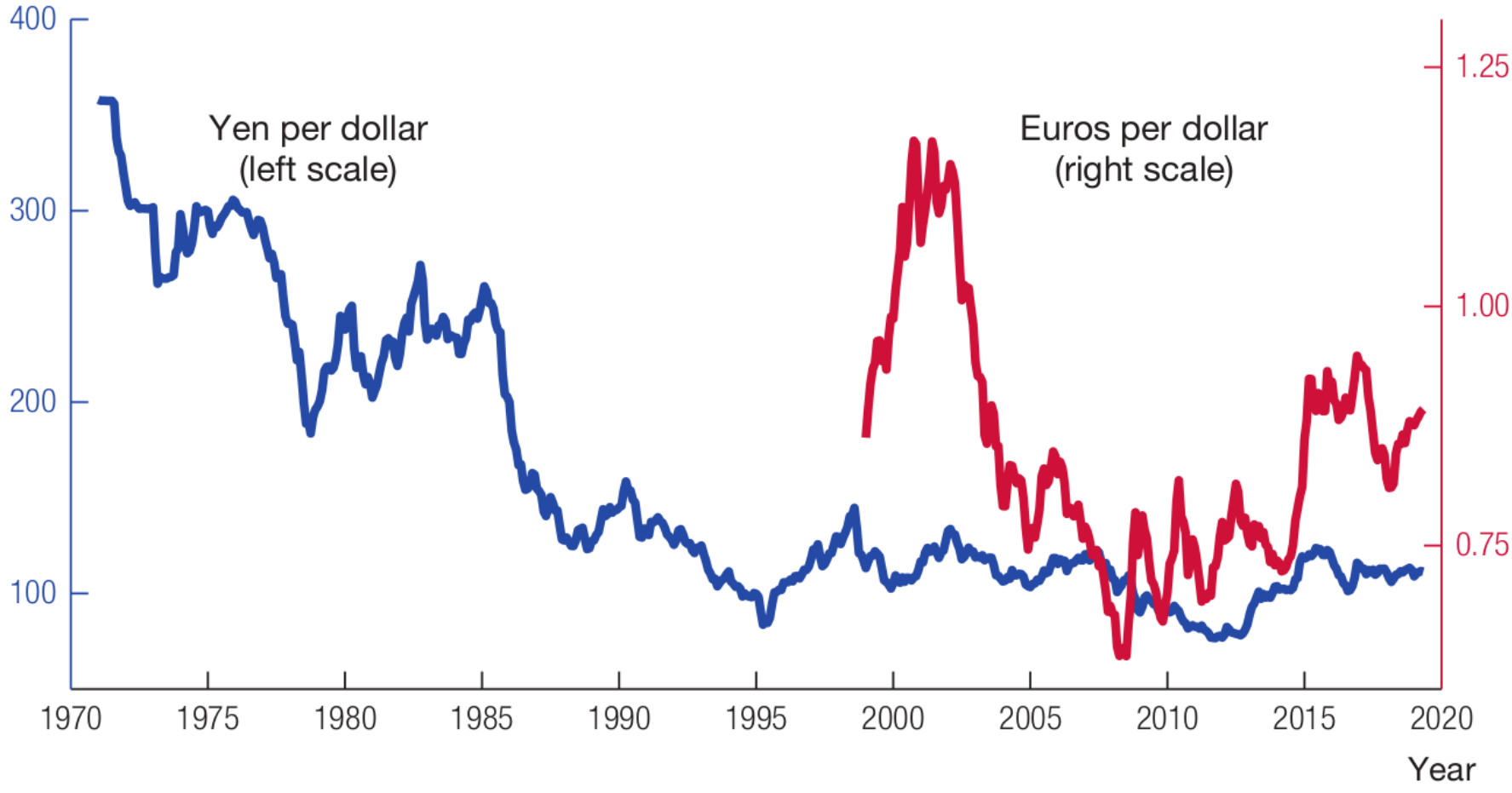
Outline: Exchange Rates and International Finance

- 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



Today: 0.82 Euros/$ and 109 Yen/$

Exchange Rates in the Long Run

The Law of One Price

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

$$E \quad P \quad = \quad P^w$$

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

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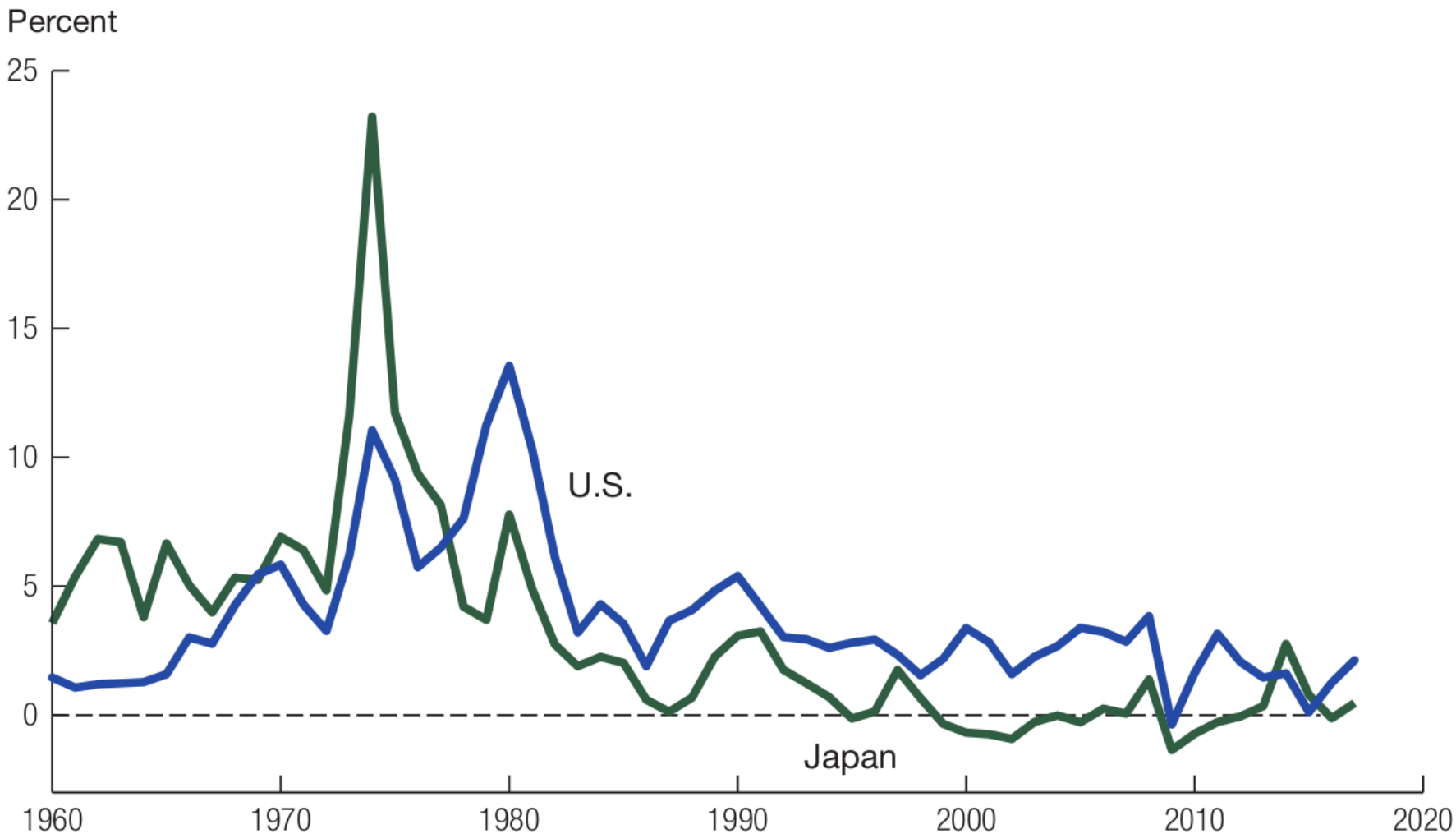
$$E \quad = \quad P^w \; / \; P$$

Inflation in the U.S. and Japan



The Big Mac Index (From The Economist)

- Focus on a common, specific good as an indication of whether or not currencies are over- or under-valued.
- Measure price of a Big Mac in each country, and convert to the dollar price using the exchange rate. Where are Big Macs expensive?
- More currencies and discussion at
  `http://www.economist.com/content/big-mac-index`

Country		2000 —— 2020	Under/over valued, %
Switzerland	Franc		28.8
Sweden	Krona		12.6
Norway	Krone		7.5
United States	US$		BASE CURRENCY
Israel	Shekel		-5.5
Canada	C$		-6.6
Euro area	Euro		-8.8
Australia	A$		-11.9
Denmark	Krone		-13.4
New Zealand	NZ$		-13.9
Uruguay	Peso		-15.2
Britain	Pound		-21.6
Singapore	S$		-21.7
Thailand	Baht		-24.9

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:

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- Units?

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

- 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

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  - Buy currencies for international finance
  - More than 100 times daily U.S. GDP trades hands in forex every day.

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- What determines its value in the short run?
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  - 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?

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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

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$$S = I + NX$$

  - High interest rate reduces investment
  - High interest rate reduces net exports (via the XR)

- Qualitatively the Short-Run Model is unchanged by this addition
  - The IS curve is now flatter

    ... and the story behind it is richer

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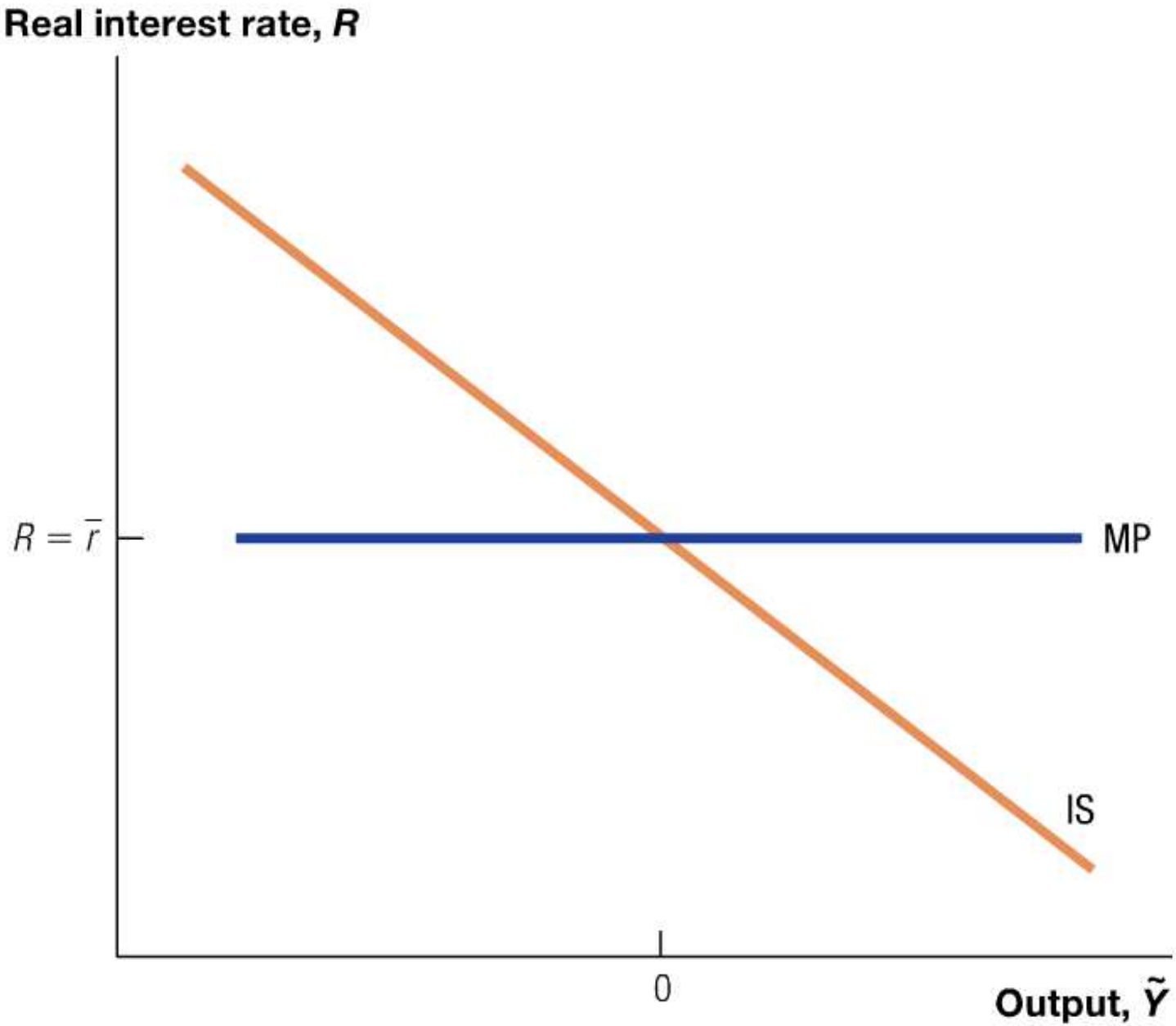
International transmission of monetary policy: foreign rate hike $\uparrow i^{euro}$



International transmission of monetary policy in words

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

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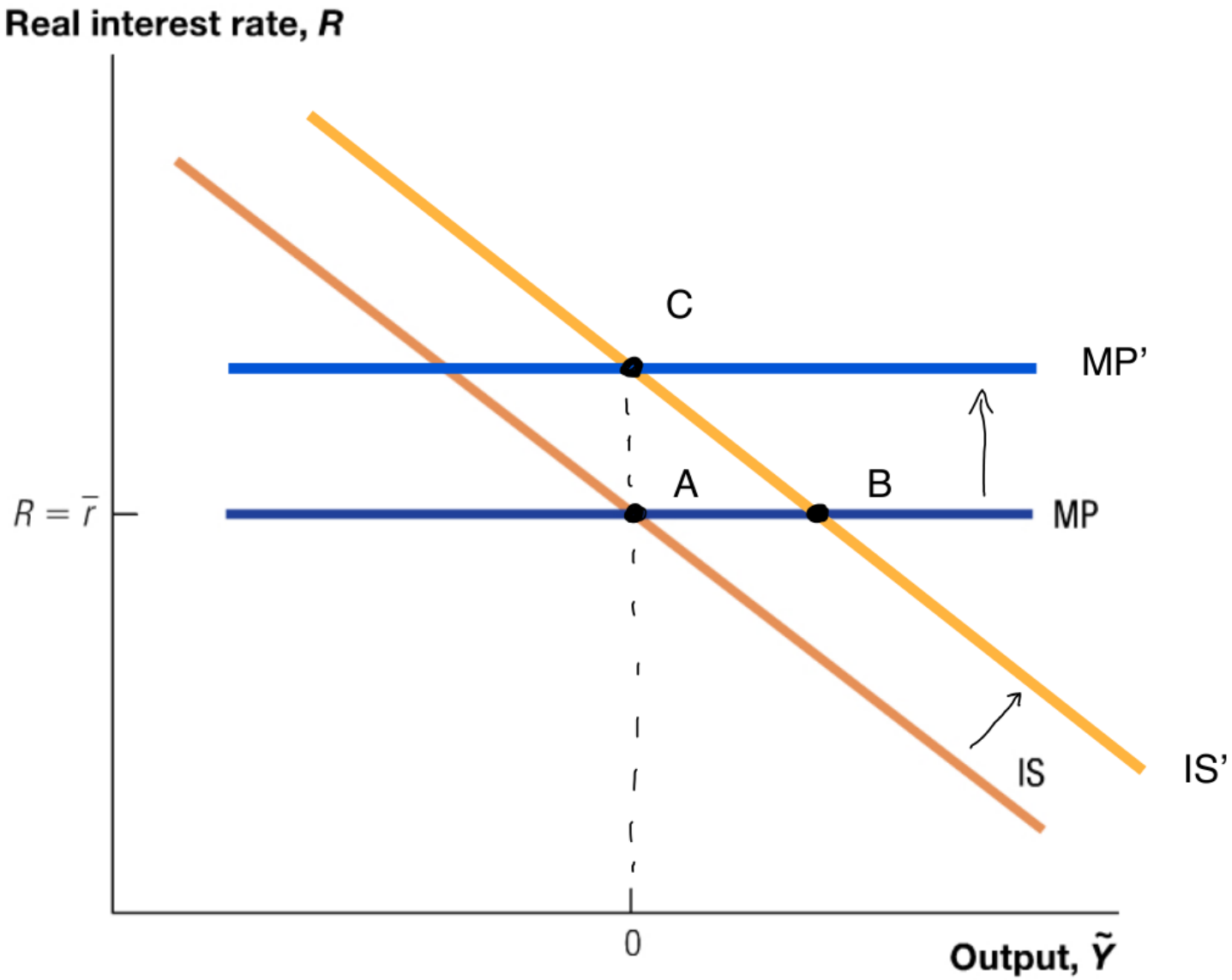
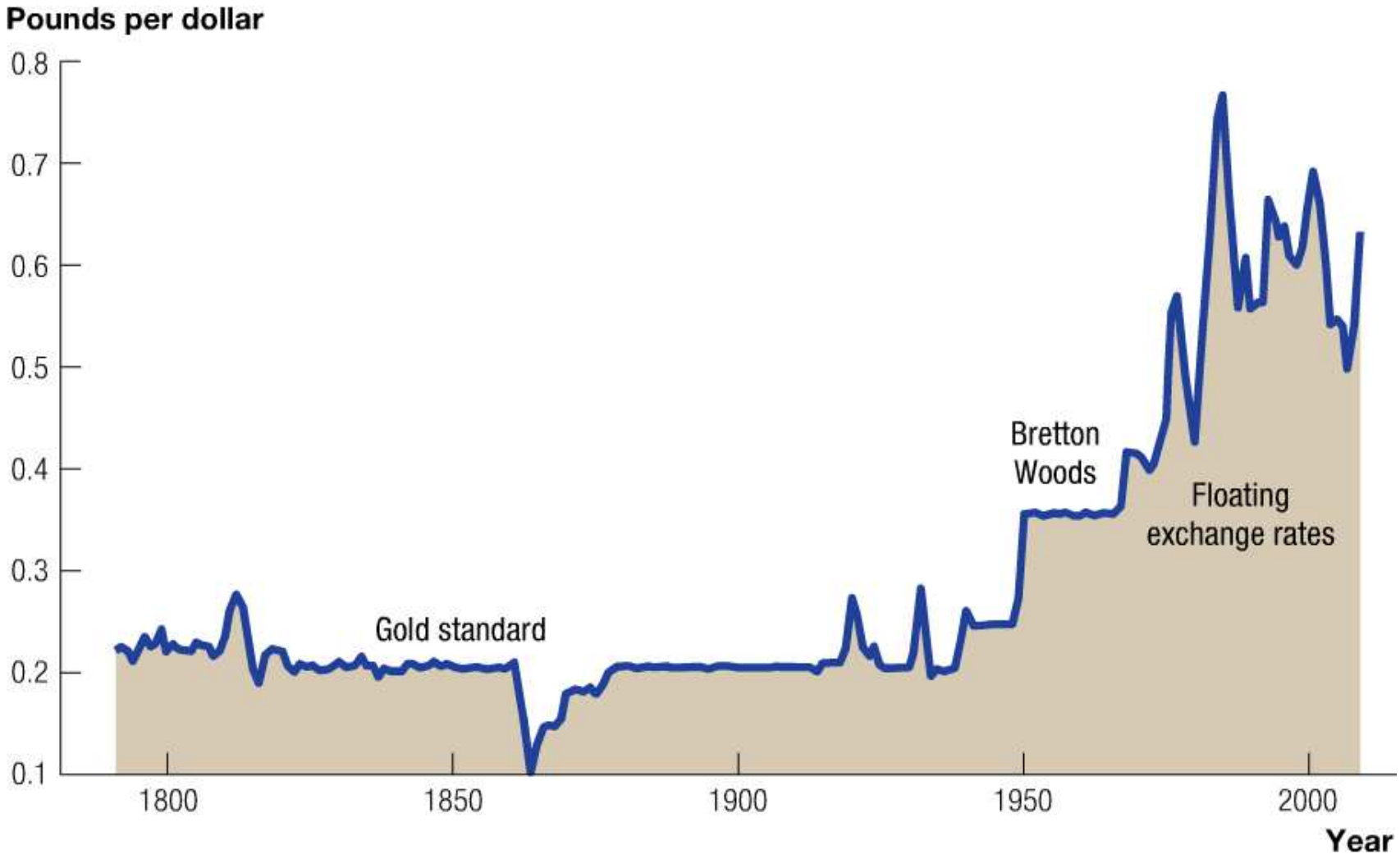
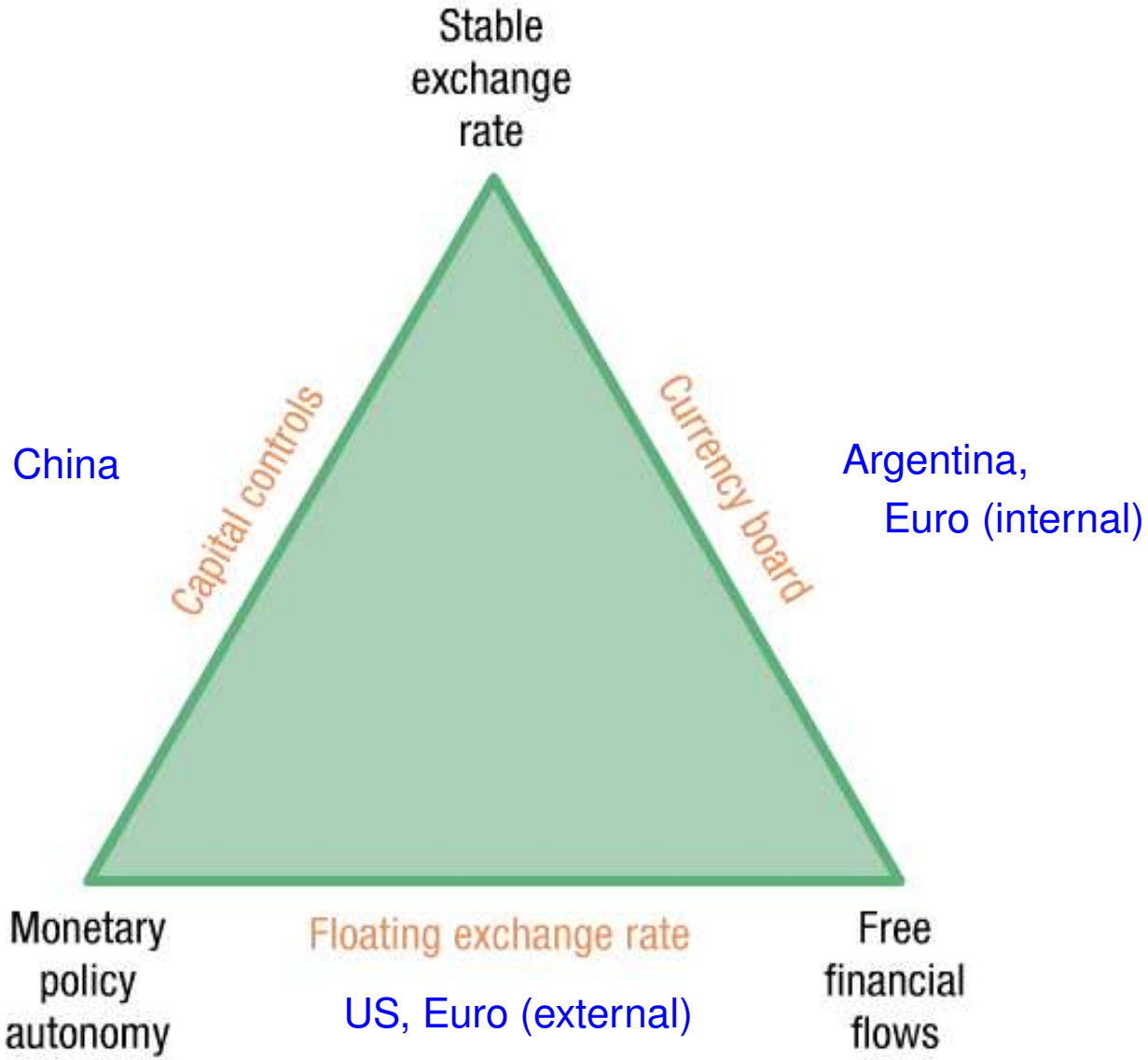


The International Financial System

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 $\Longrightarrow$ trade surplus $\Longrightarrow$, 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)

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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

$\Rightarrow$ *Import U.S. monetary policy*

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

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

Which choice is best?

– Emerging economies

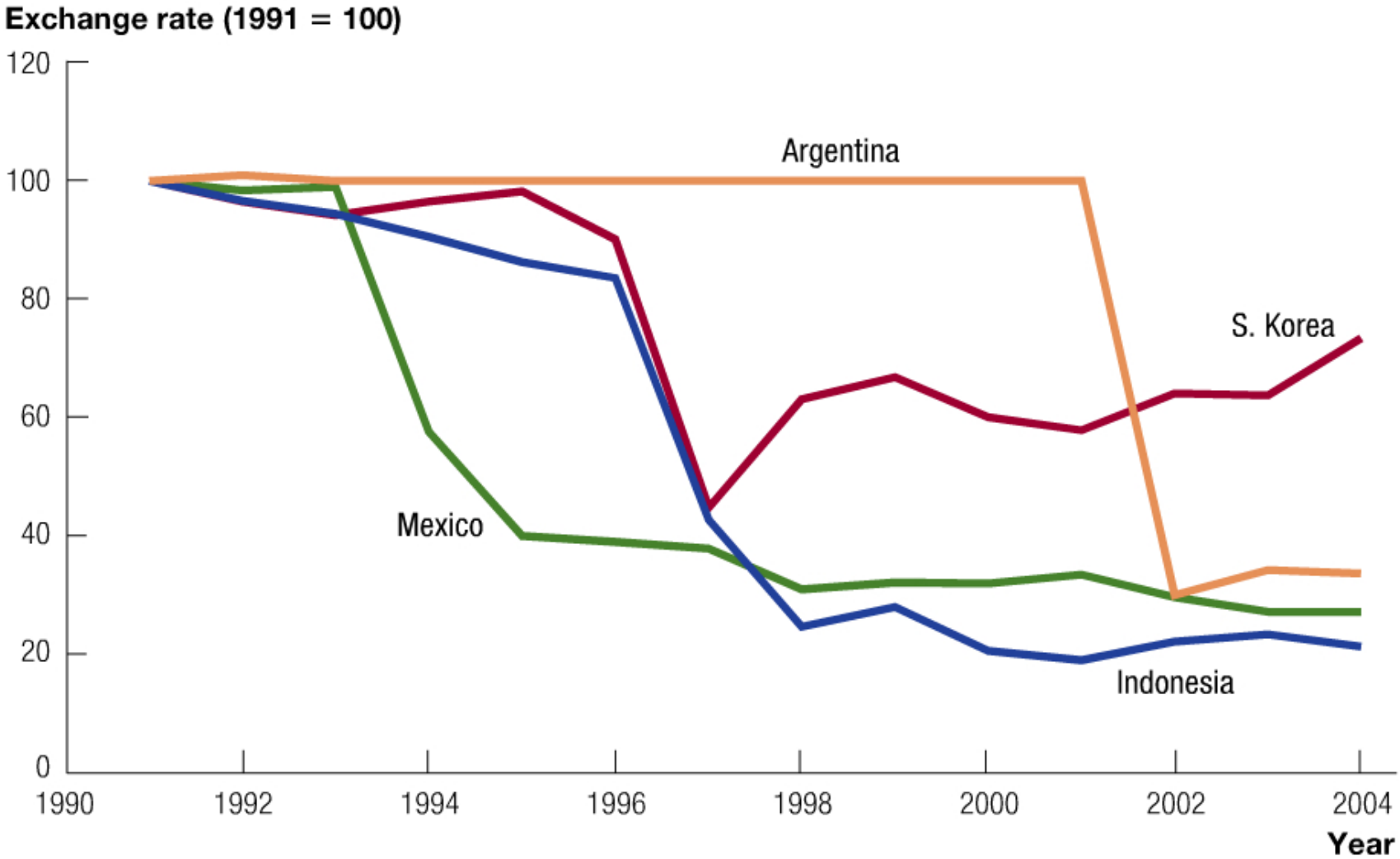
– Europe and the euro

Choosing from the Trilemma: Emerging Economies

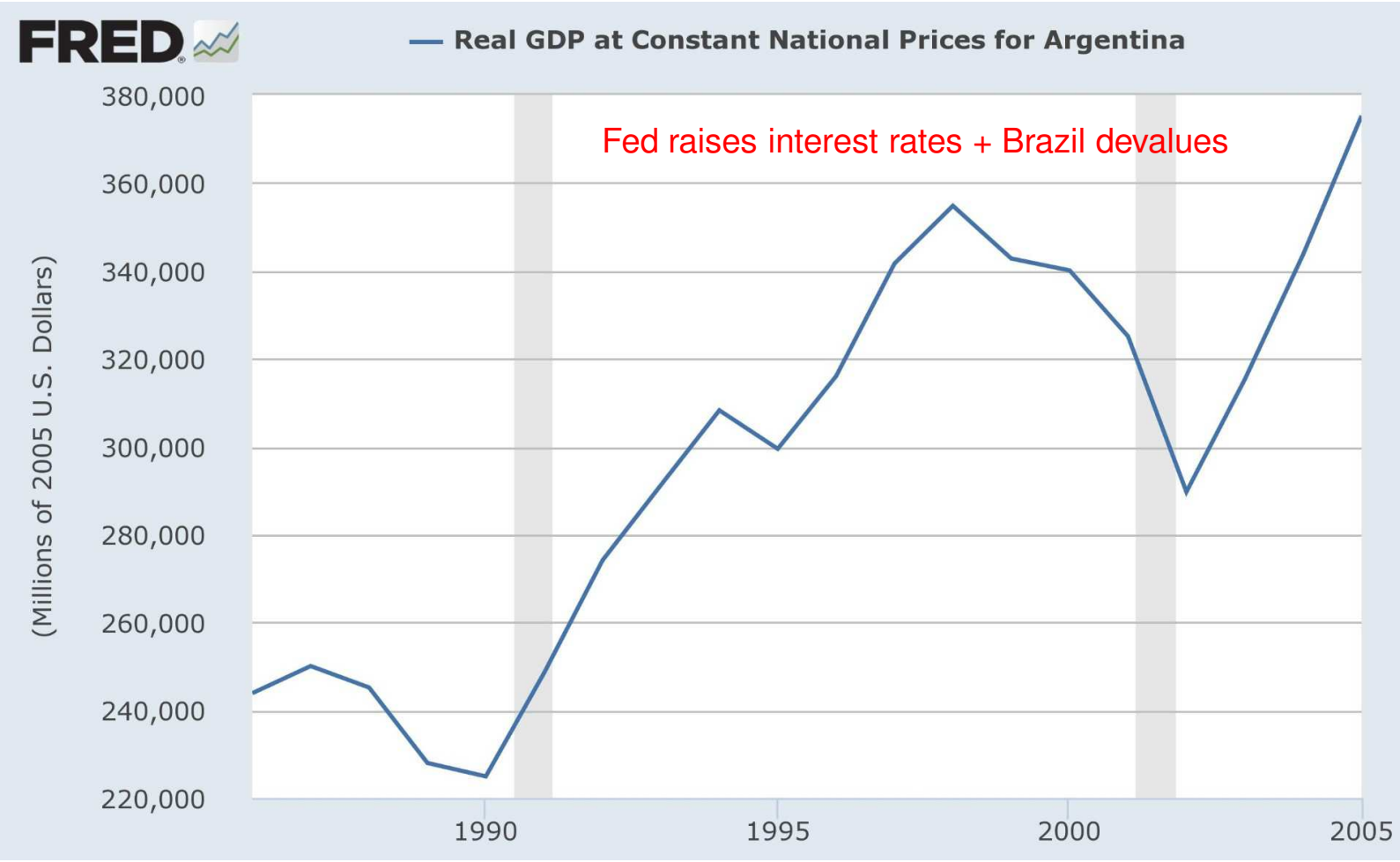
$$NX = S - I$$

- "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

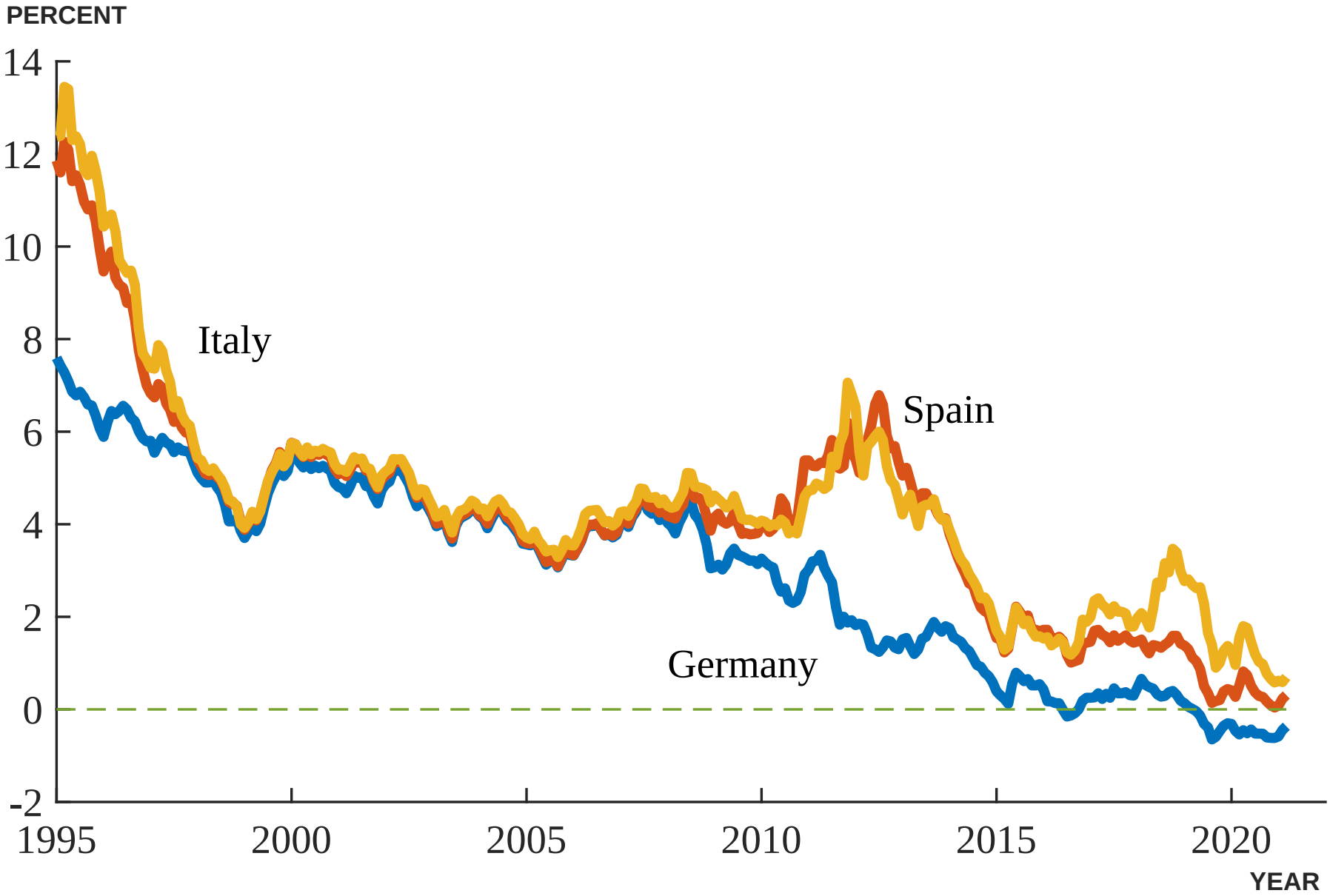


Argentina in the 90's

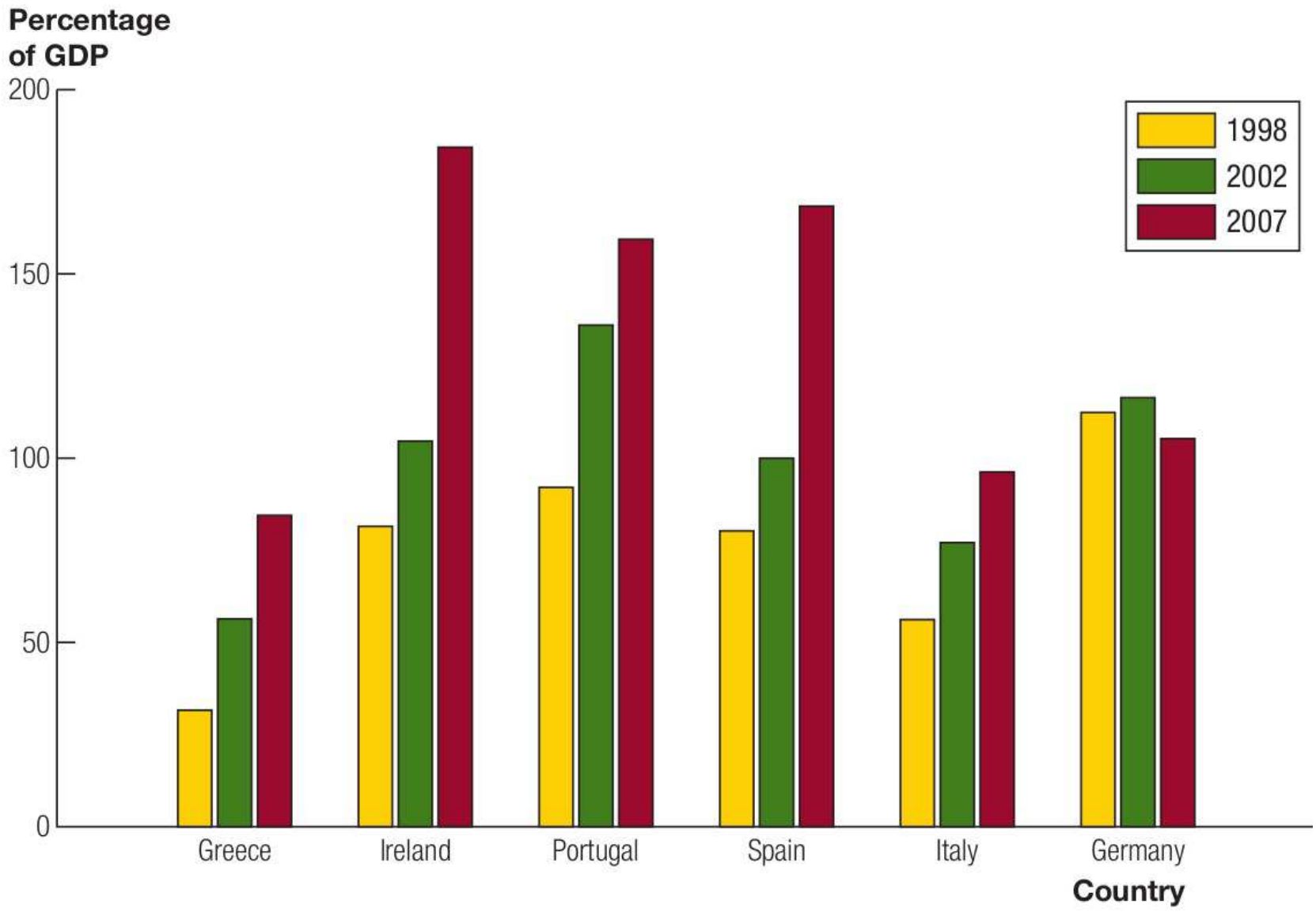


Choosing from the Trilemma: The Euro

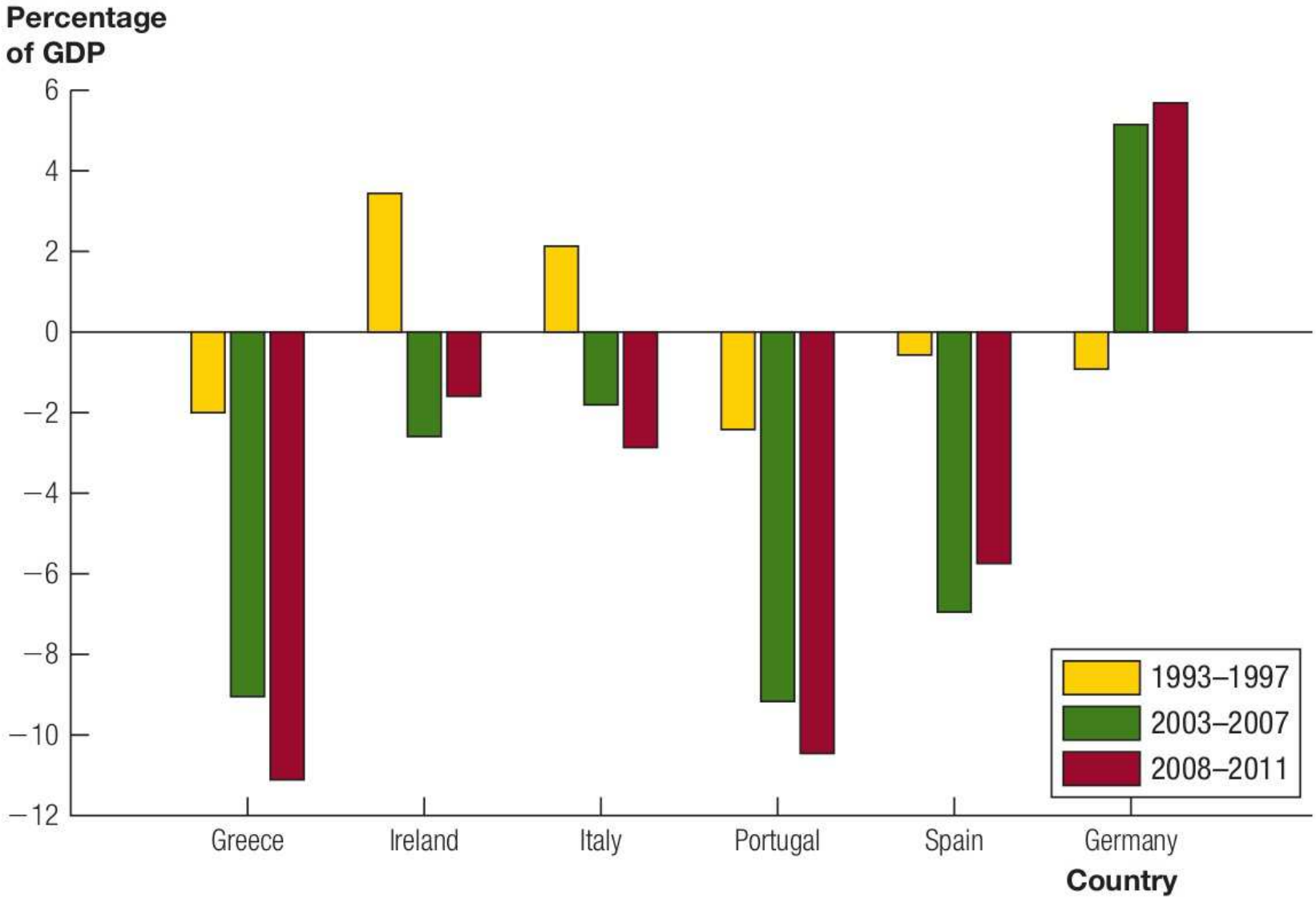
Government Bond Yields in Europe



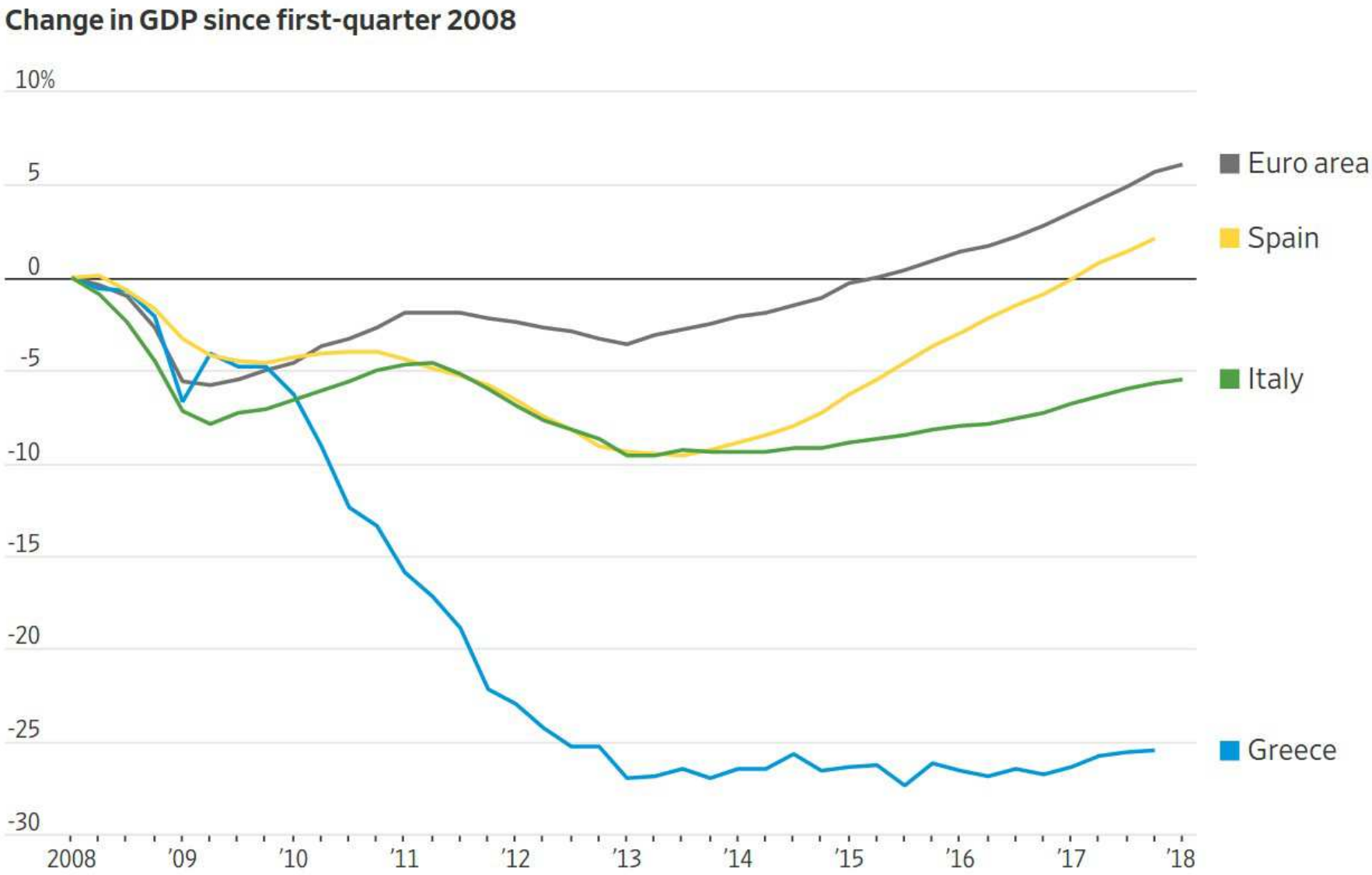
Domestic Bank Lending in Europe



Current Account Balances in Europe ($\approx$ Trade Balance)



Real GDP in Europe



Choosing from the Trilemma: The Euro

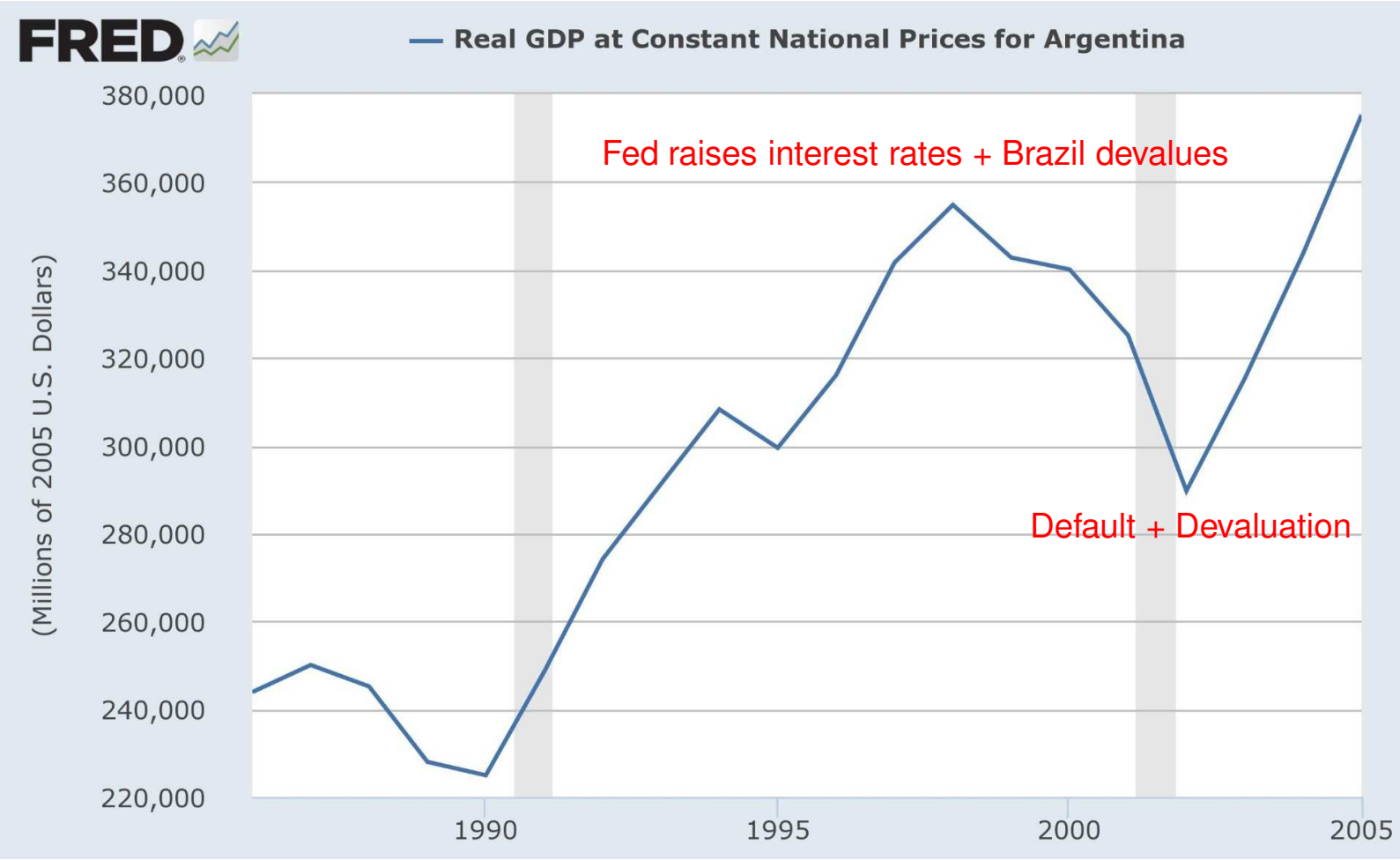
- Countries within the euro
  - Lose control of monetary policy
  - Lose the ability to depreciate their exchange rate to gain competitiveness
- Sovereign debt crisis implies that fiscal policy is contracting rather than stimulating the economies
- Long-run problems after crisis
  - The lack of "competitiveness"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

The Dollar vs. Yen, more recently

- **1 USD = 108.939 JPY** May 22, 2021, 21:30 UTC

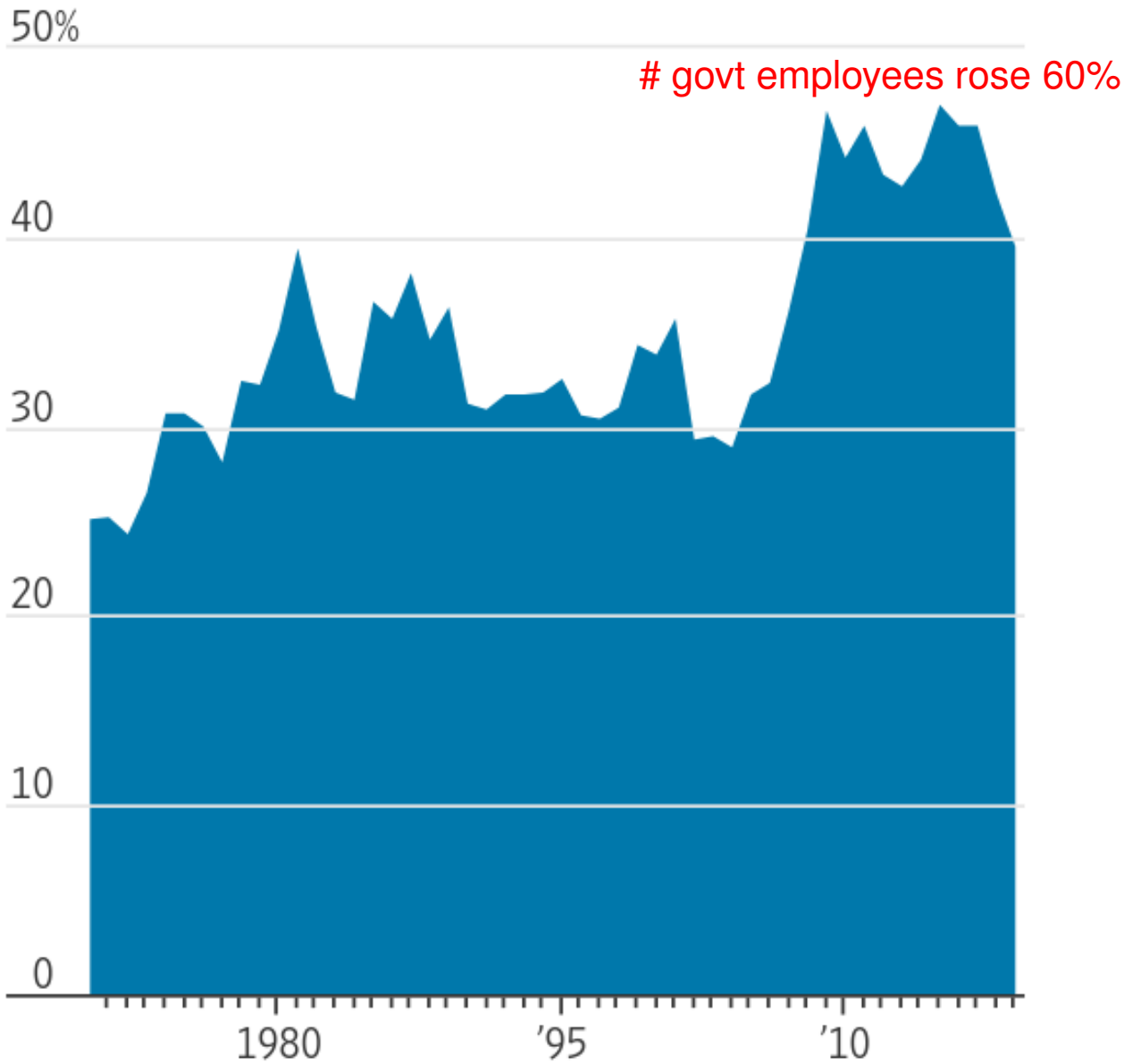
Abenomics: 50% depreciation of the Yen!

Argentine 2001 default



(But Argentina went back to being Argentina!)

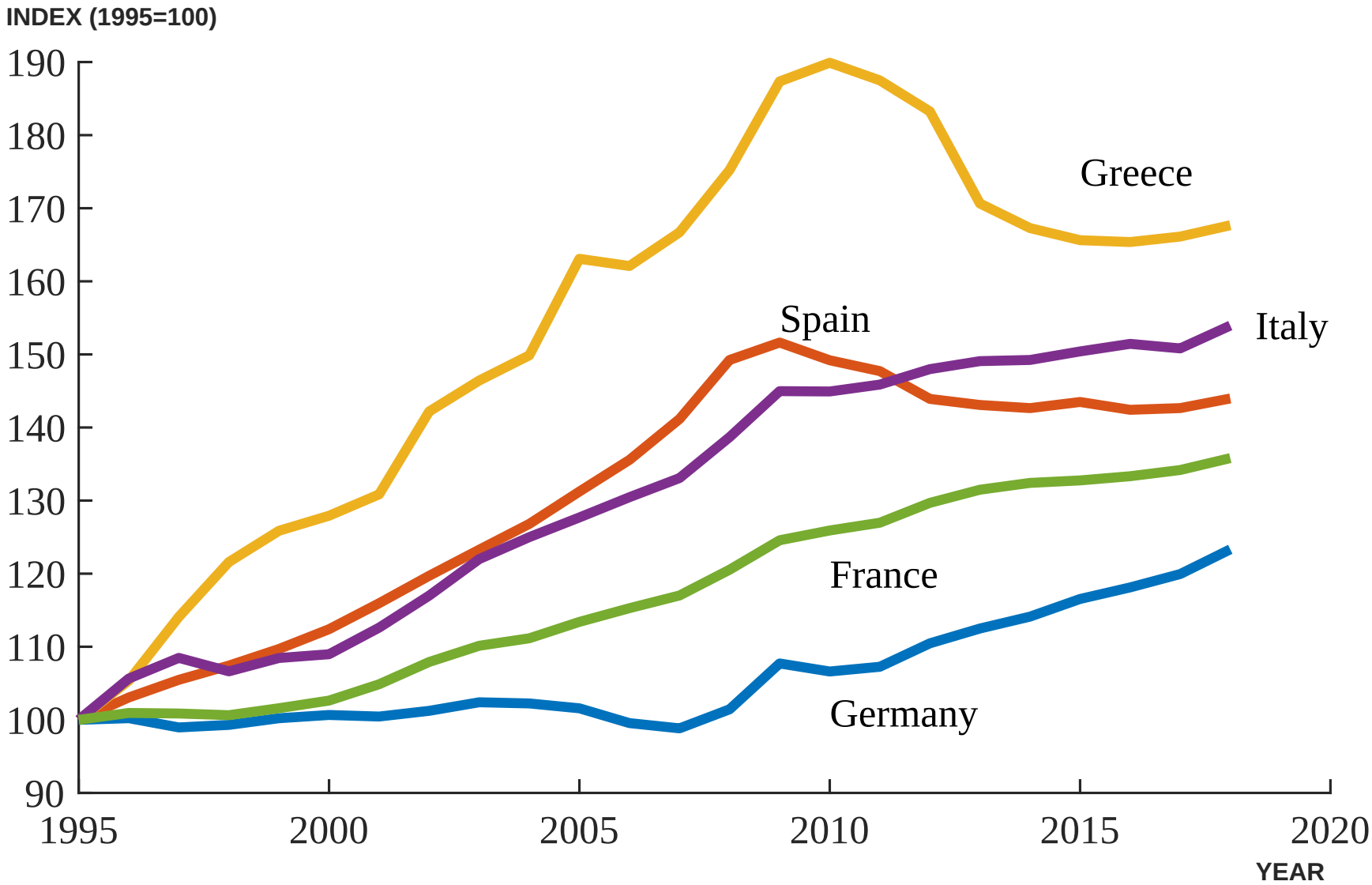
Reading: Argentina – Govt spending share of GDP



govt employees rose 60%

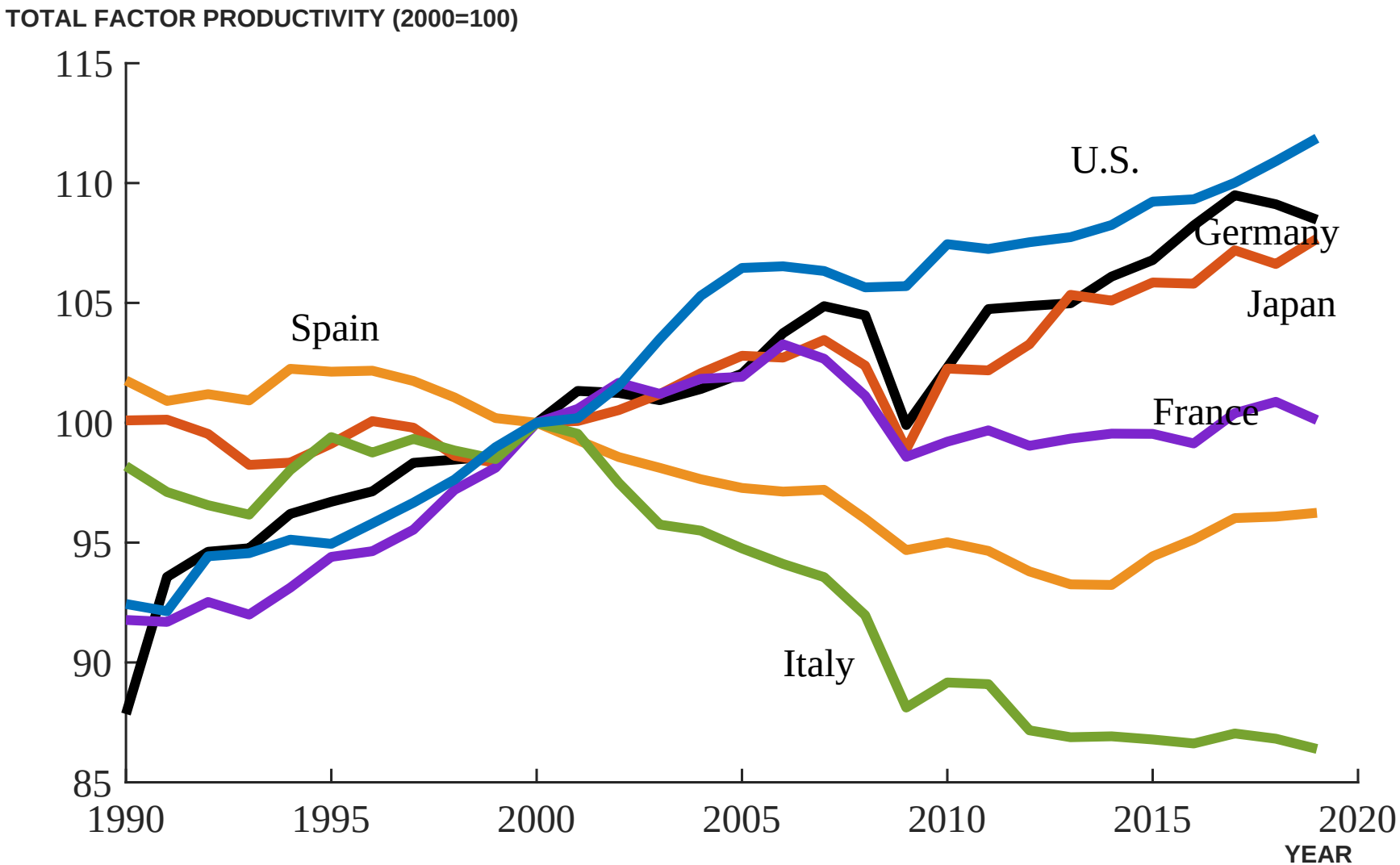
Inflation up to 50% per year recently

Unit Labor Costs in Europe



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

Total Factor Productivity in Europe



What are the costs of leaving the euro?

- Debt is in Euros: would have to also default?
- European integration and political economy
- 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?