

EUROPE AND THE EURO

Harvard Economics 1011B
Professor Gabriel Chodorow-Reich
Spring 2020

OUTLINE

- 1 EUROPEAN INTEGRATION PROJECT
- 2 CONVERGENCE
- 3 BUST

OUTLINE

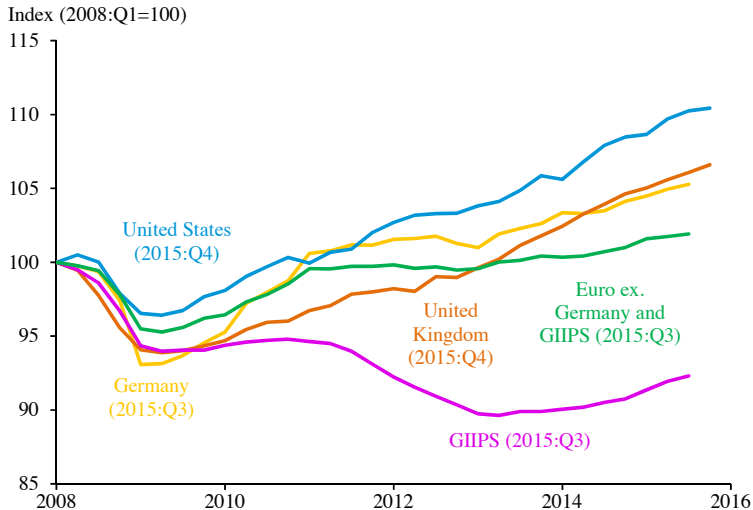
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DISASTER

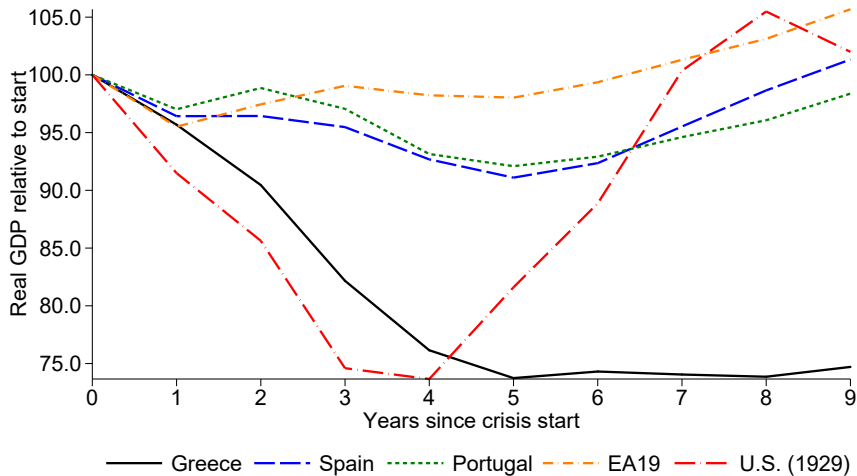
Real GDP, 2008–2015



Note: GIIPS includes Greece, Ireland, Italy, Portugal, and Spain.

Source: National Sources via Haver Analytics.

DISASTER



POLITICAL MOTIVATION FOR INTEGRATION

- World Wars I and II.
- Cold war.
- Hegemonic U.S.

EUROPEAN UNION VERSUS EURO

- European Union:

- ▶ Political compact.
- ▶ Free trade and immigration compact.
- ▶ 27 member countries.

- Euro area:

- ▶ Countries which use the euro.
- ▶ 19 member countries: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Portugal, Slovakia, Slovenia, Spain.
- ▶ 8 EU countries which do not use euro: Bulgaria, Croatia, Czech Republic, Denmark, Hungary, Poland, Romania, Sweden, United Kingdom.

REMINDER: THE TRILEMMA

- Fixed exchange rate: $\% \Delta_{t,t+1} e = 0$.
- Perfect capital mobility: investor can arbitrage interest parity.
- Result: With fixed exchange rate and perfect capital mobility,
 $i_{t,t+1} = i_{t,t+1}^*$.
- Monetary trilemma: a country cannot simultaneously peg a fixed exchange rate, allow free capital mobility, and conduct independent monetary policy.

OPTIMAL CURRENCY AREA

- OCA if:
 - 1 Benefits high (lots of trade).
 - 2 Vulnerabilities low (similar shocks, flexible prices).
 - 3 Adjustment easy (labor mobility, fiscal adjustment, banking union).

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- Comparison of EU and U.S. before euro crisis:

Criteria	U.S. states	EU countries
Open to trade	High	Medium
Similar economies/similar shocks	Medium	Medium
Flexible prices	Low	Low
High labor mobility across borders	High	Low
Fiscal union	High	Low
Banking union	High	Low

MAASTRICHT TREATY

- Signed February 1992, in force November 1993.
- Culmination of post-war project to unify Europe, including single market.
- Created euro, single currency to enter into circulation in 1999.
- Convergence criteria:
 - ① Price stability: CPI not more than 1.5 p.p. above average of three lowest inflation Member States.
 - ② Sound public finances: government deficit less than 3%.
 - ③ Sustainable public finances: government debt/GDP less than 60%.
 - ④ Durability: long-term interest rate less than 2 p.p. average of three lowest Member States.
 - ⑤ Exchange rate stability: participation in fixed exchange rate system for at least two years.

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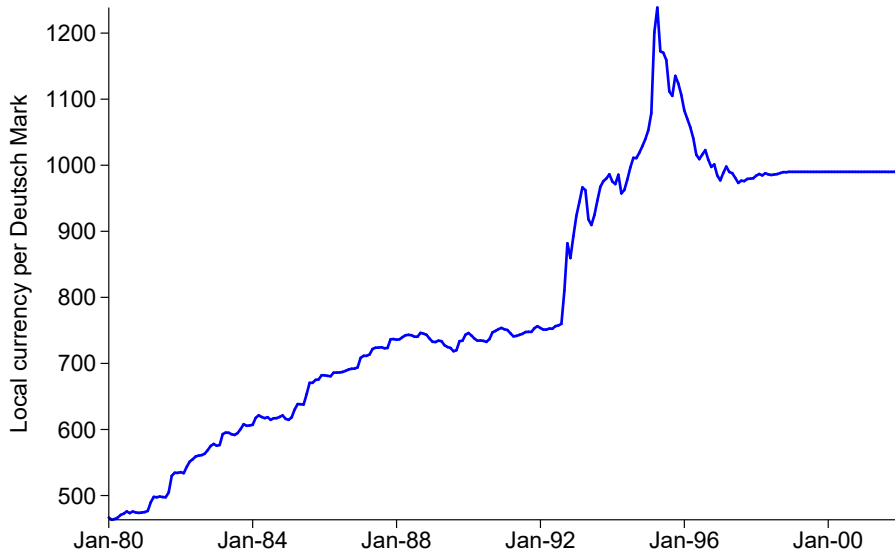
CONVERGENCE PERIOD SUMMARY

- Price levels converge.
- Interest rates fall in periphery.
- Most countries keep deficits in range of Maastricht criteria.
 - ▶ Portugal, especially Greece outliers.
- Capital flows from core (Germany, France) to periphery (Spain, Italy, Portugal, Ireland, Greece).
- Capital in periphery not allocated efficiently.

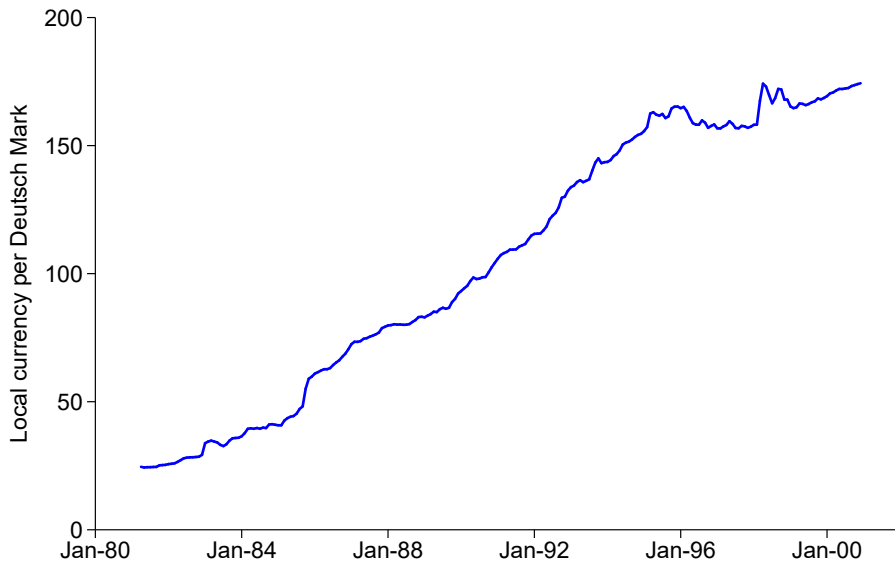
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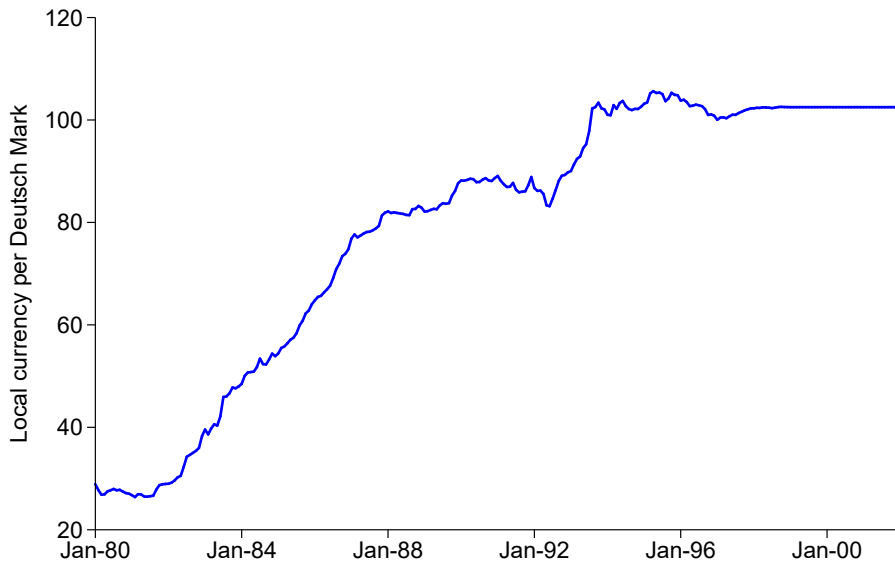
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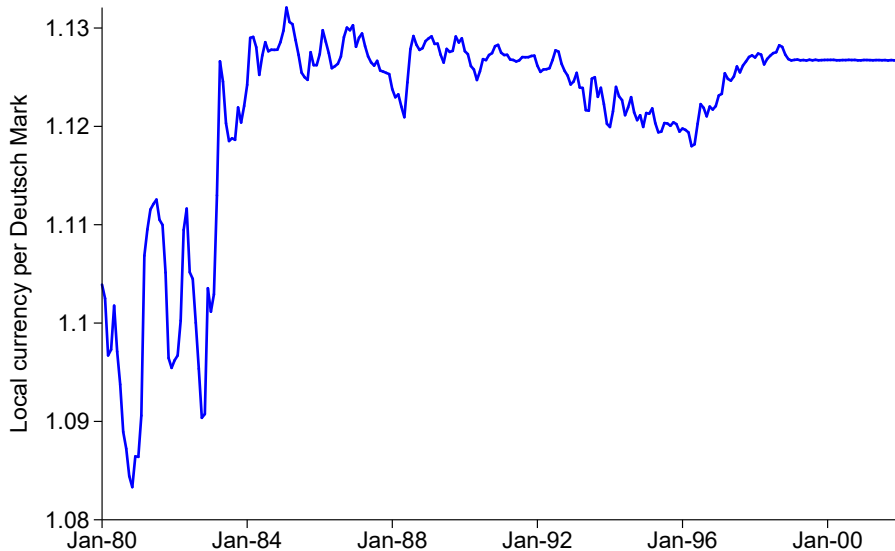
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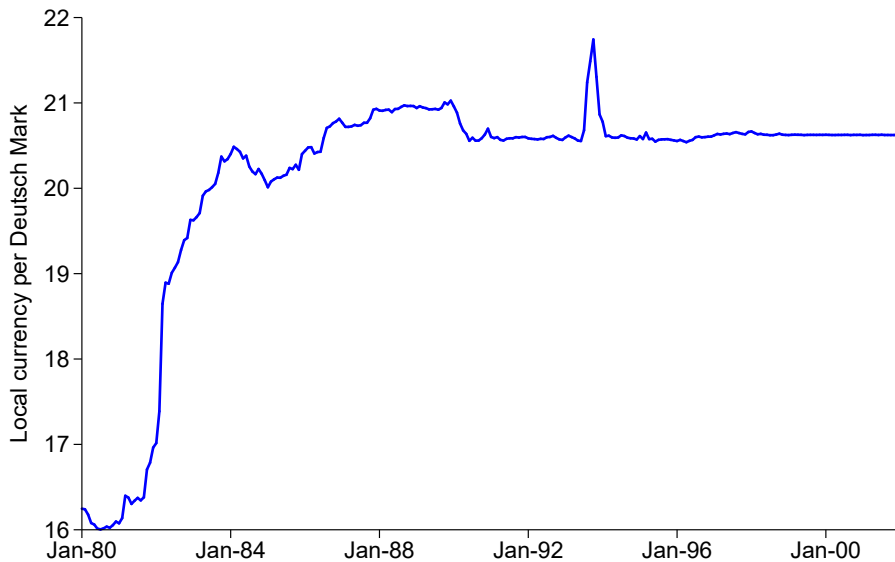
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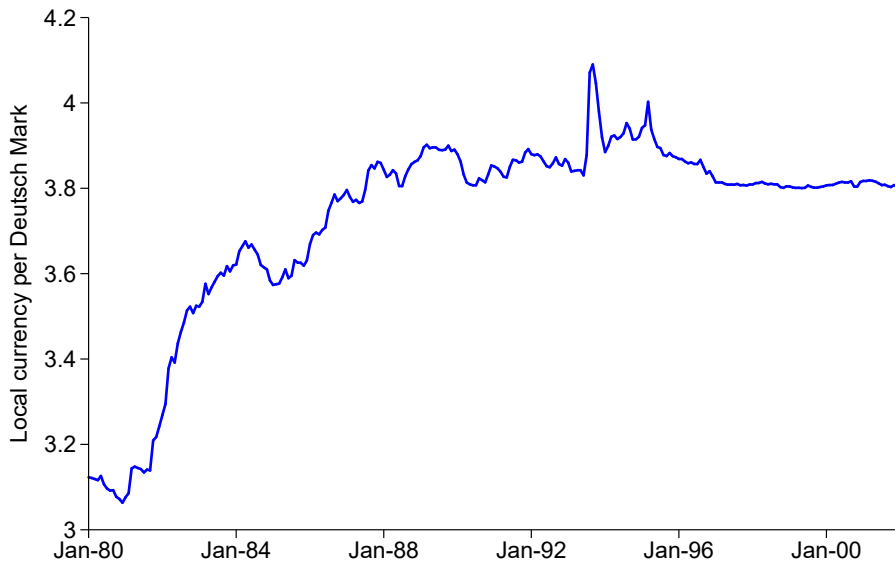
NETHERLANDS



BELGIUM



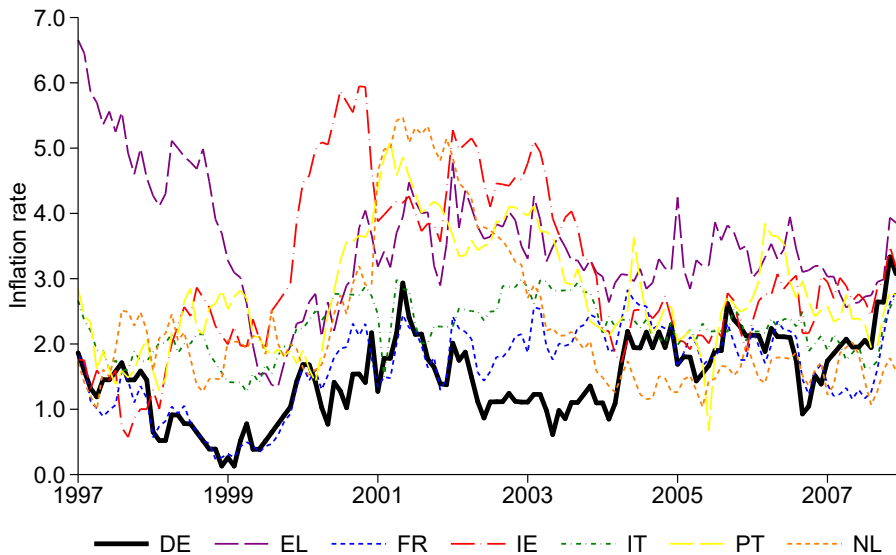
DENMARK



U.K.



INFLATION CONVERGENCE



PRICE CONVERGENCE IN EURO AREA

- Define log real exchange rate for good z at time t between countries i and j :

$$q_{i,j}(z, t) = p_i(z, t) - p_j(z, t) - e_{i,j}(t).$$

- Evidence from online prices: Cavallo, Neiman, Rigobon (QJE 2014).

RER BY GOOD VERSUS U.S.

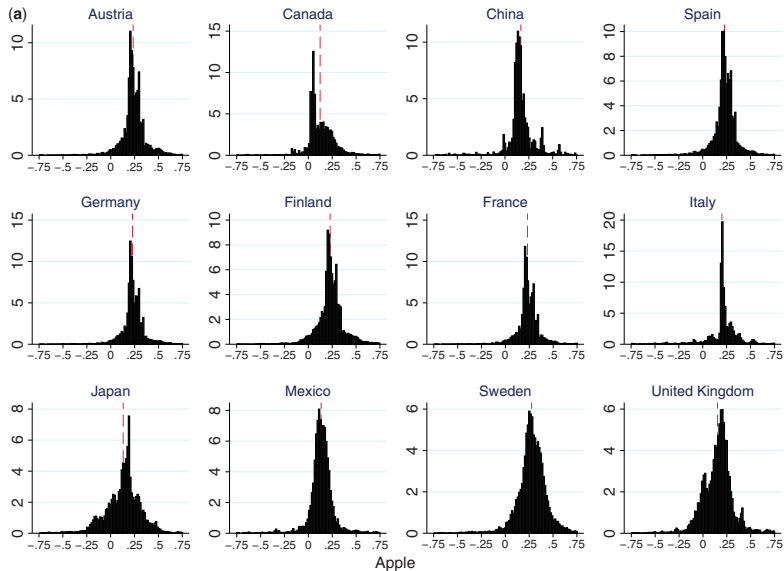
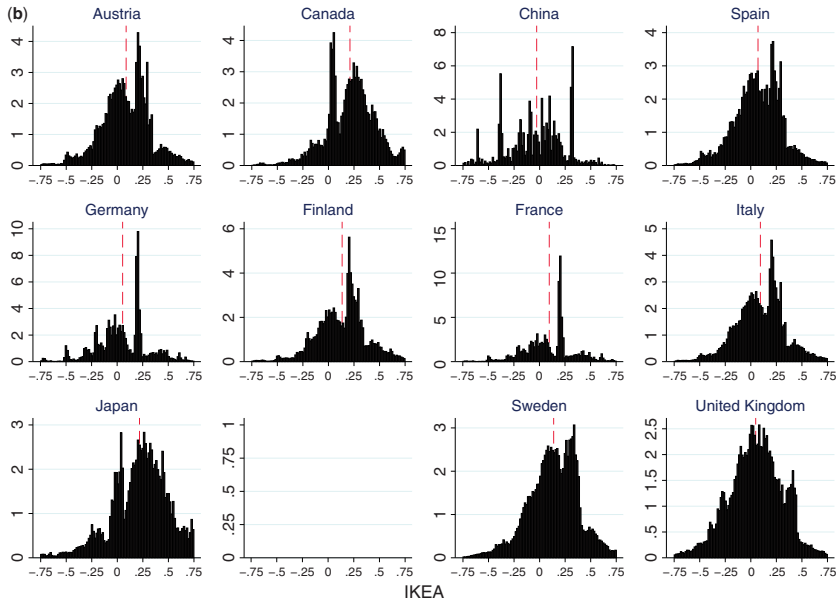
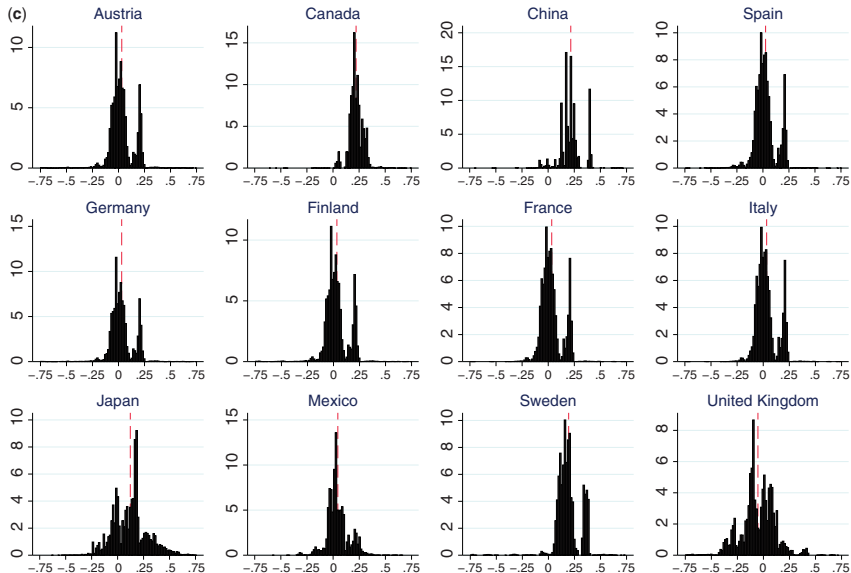


FIGURE III

RER BY GOOD VERSUS U.S.

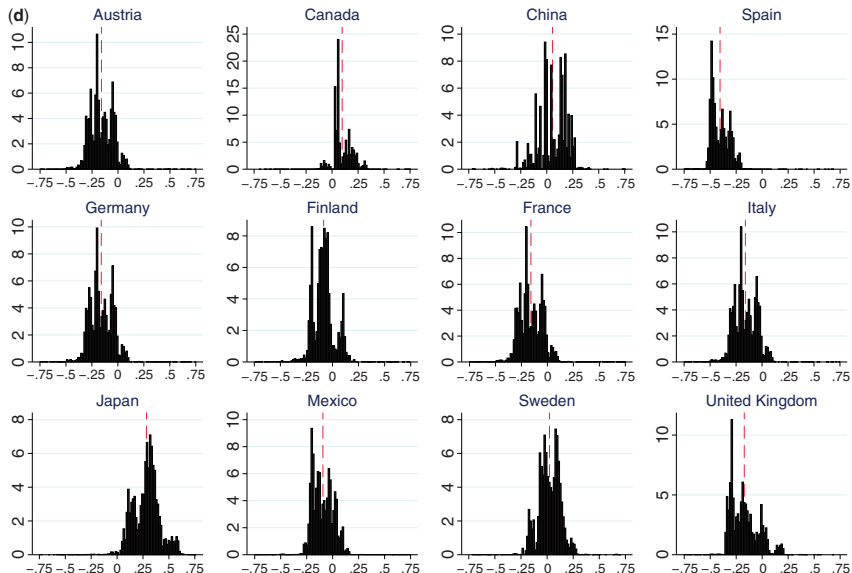


RER BY GOOD VERSUS U.S.



H&M

RER BY GOOD VERSUS U.S.



Zara

RER BY GOOD VERSUS SPAIN

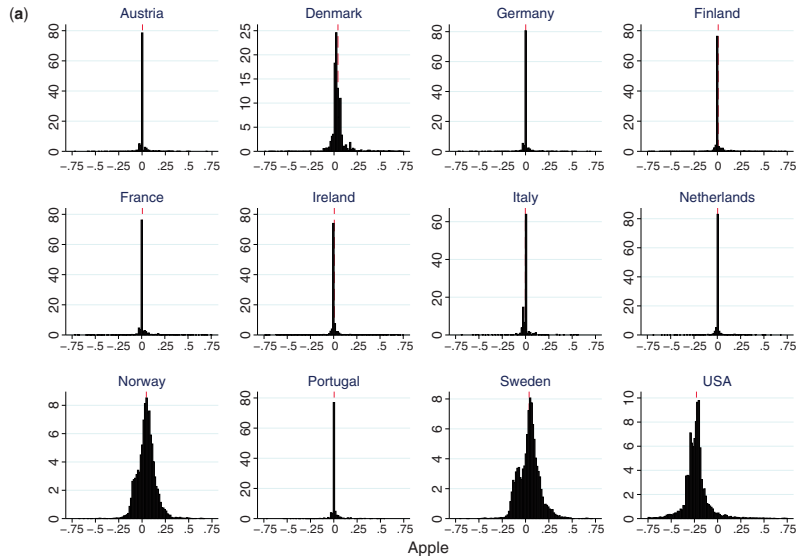
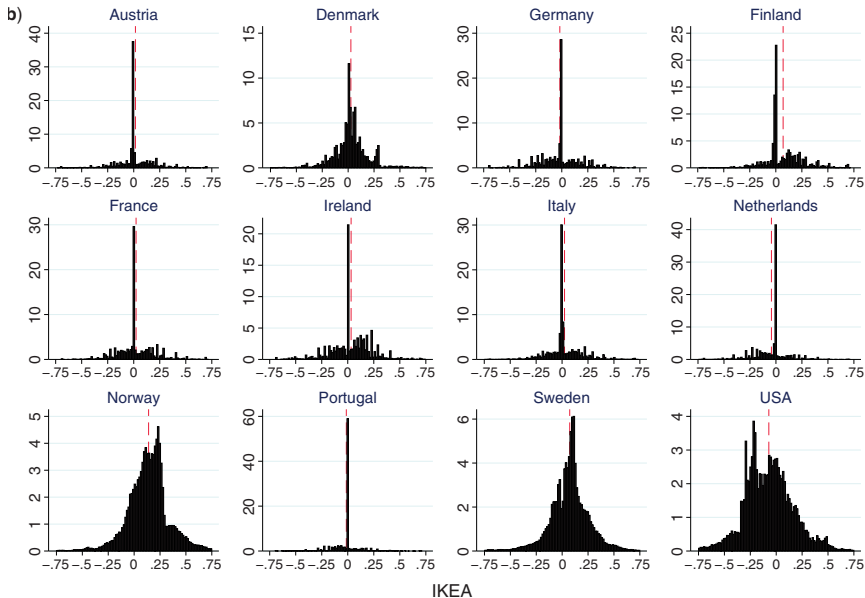
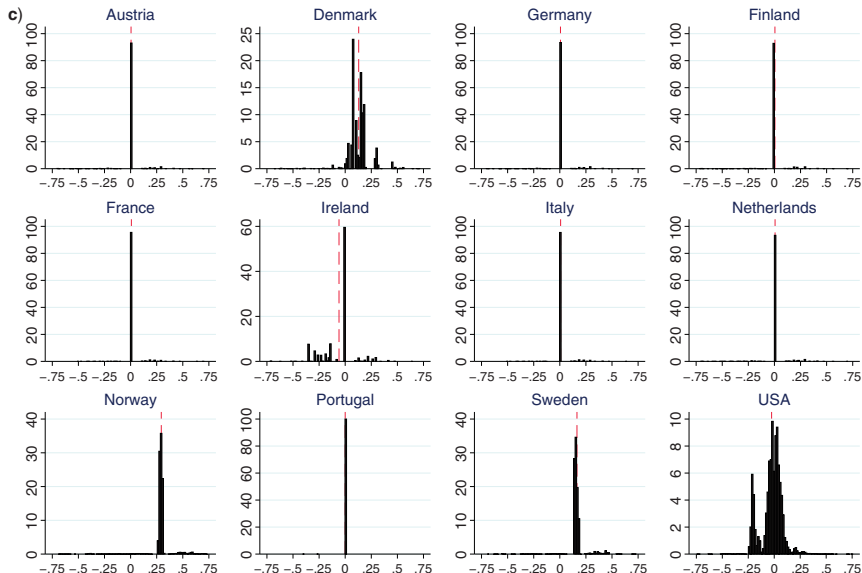


FIGURE V

RER BY GOOD VERSUS SPAIN

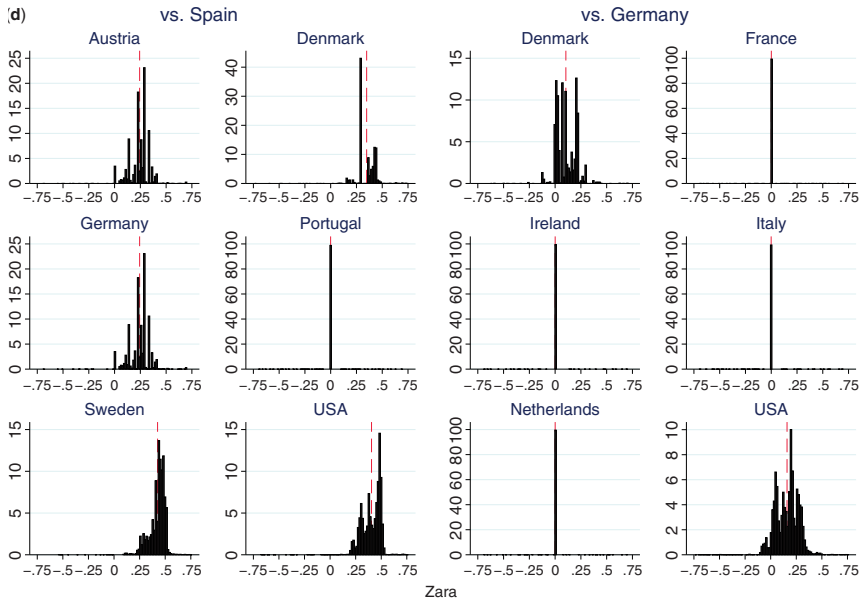


RER BY GOOD VERSUS SPAIN



H&M

RER BY GOOD VERSUS SPAIN AND GERMANY

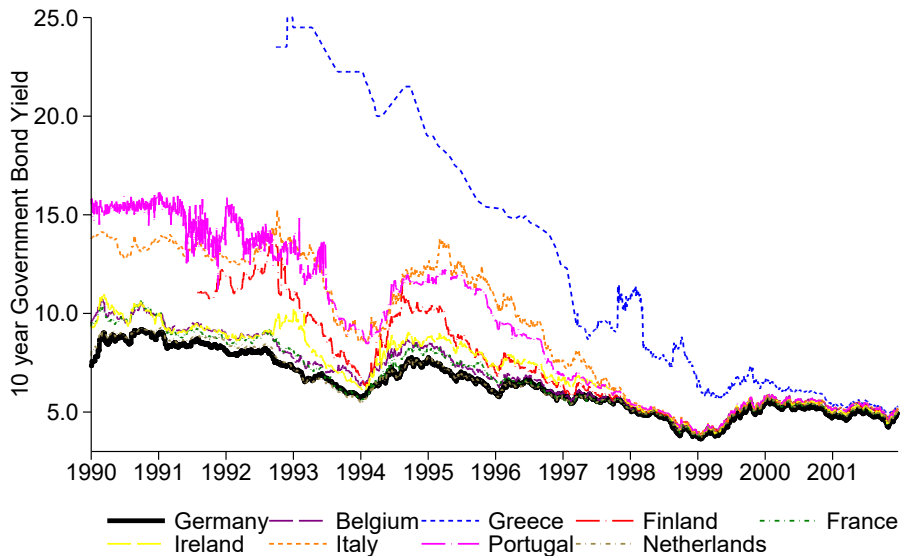


INTEREST RATE CONVERGENCE

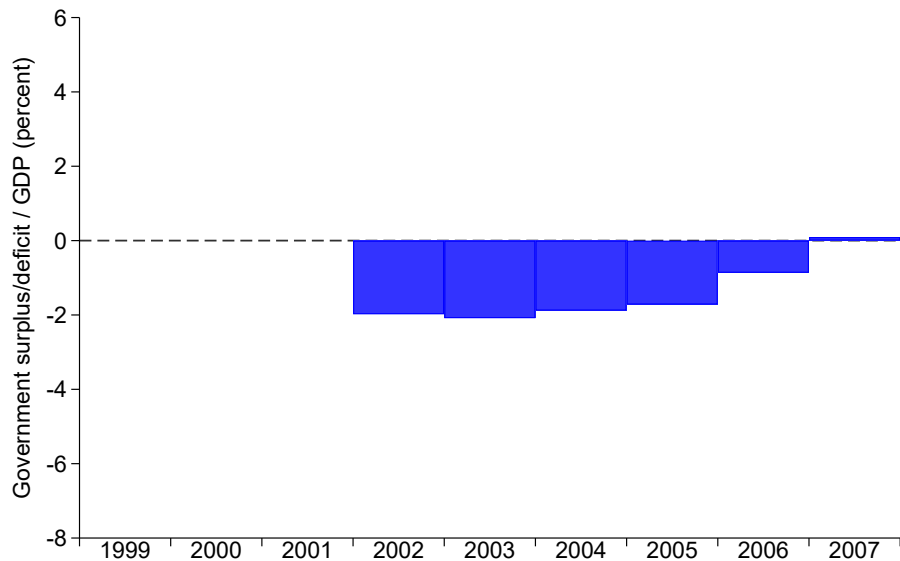
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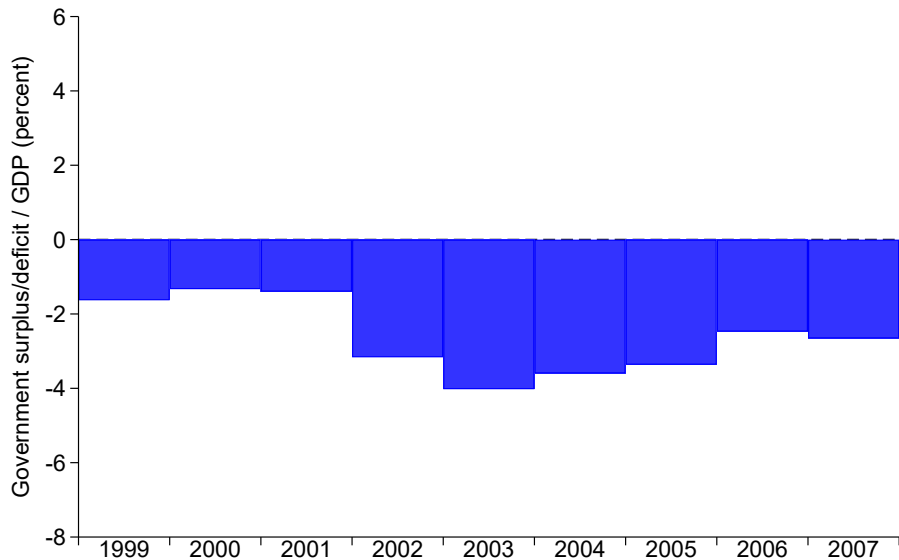
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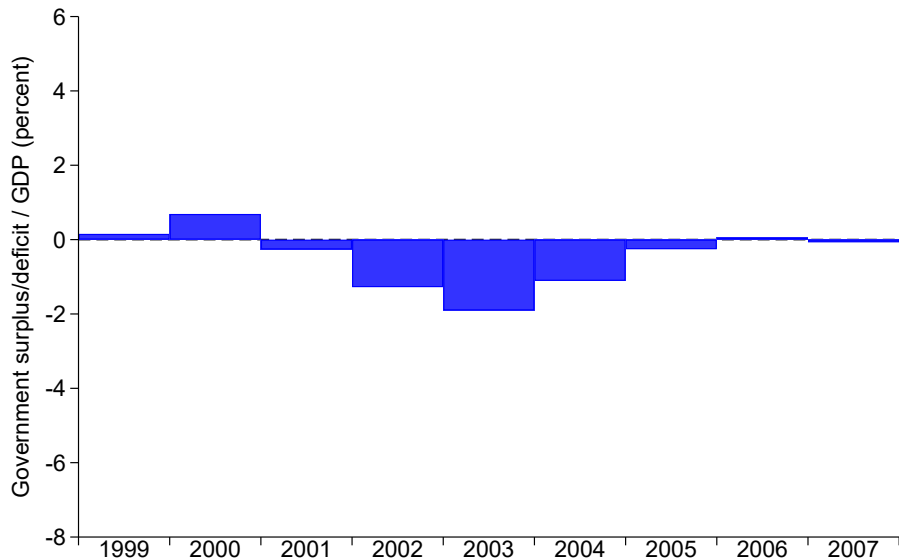
GERMANY



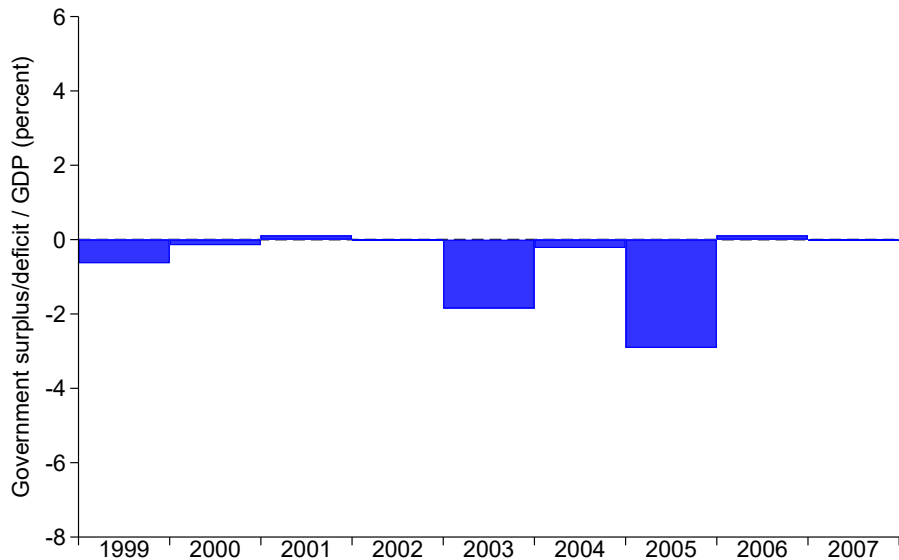
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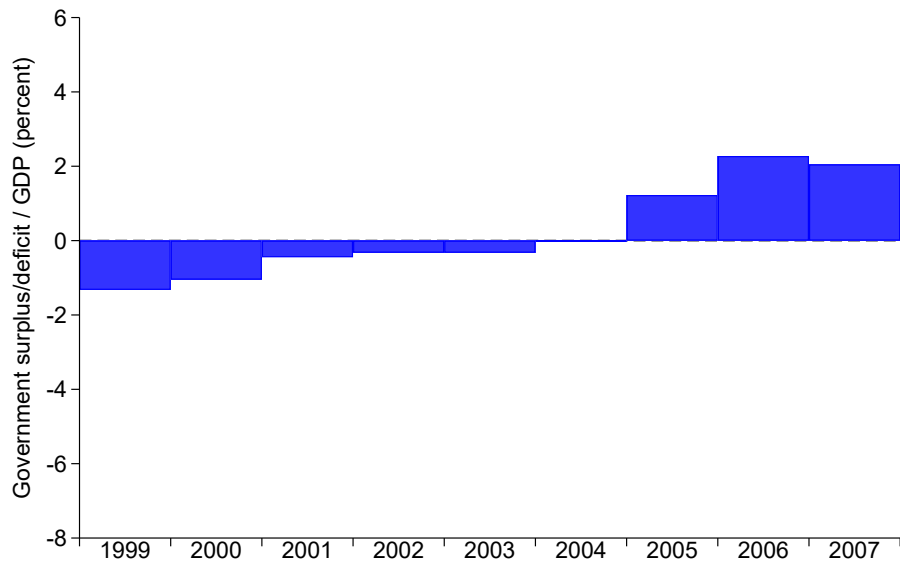
NETHERLANDS



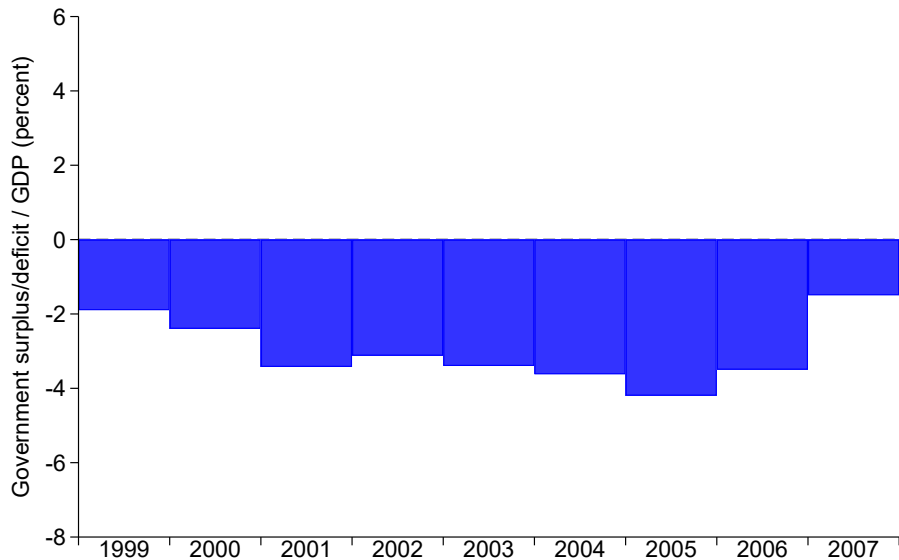
BELGIUM



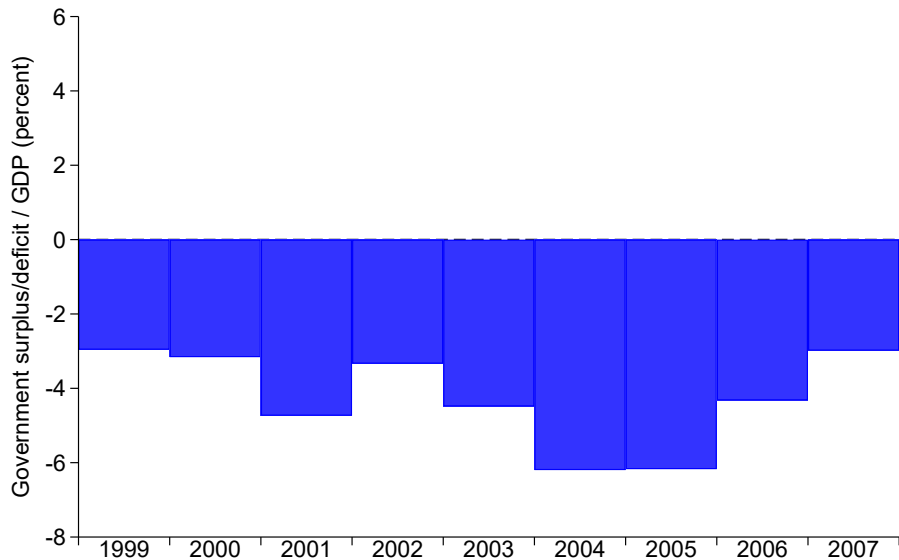
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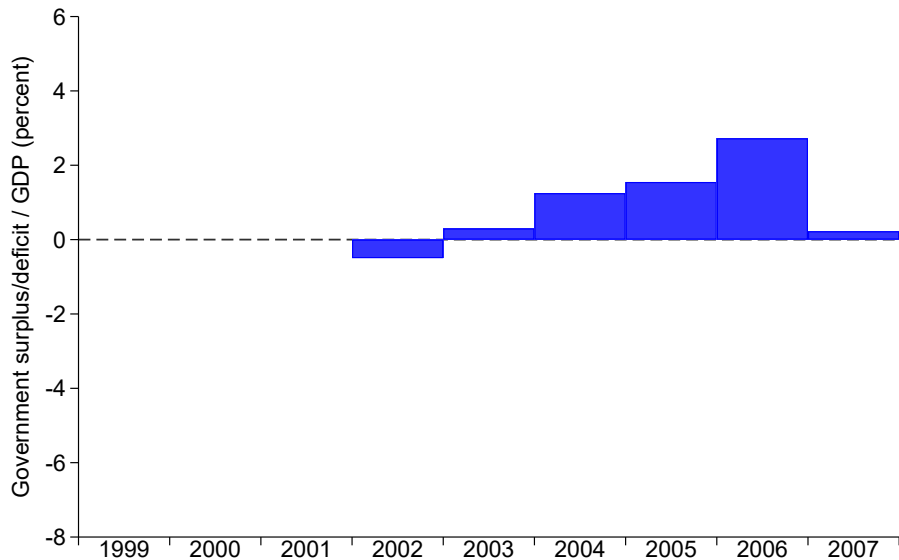
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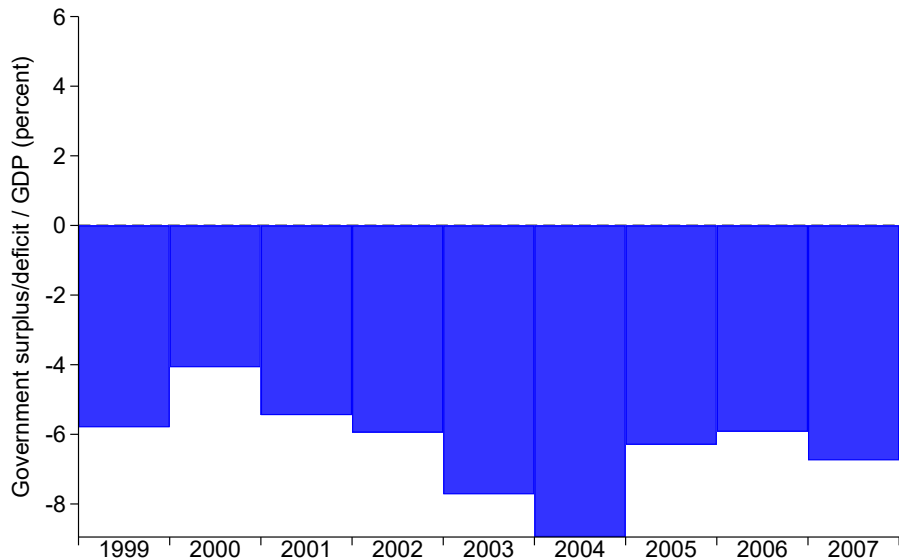
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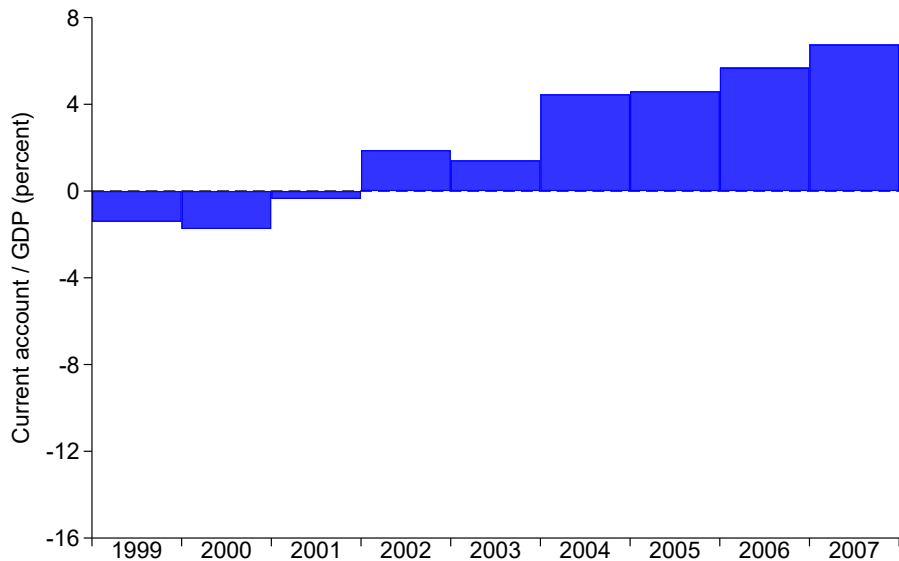
IRELAND



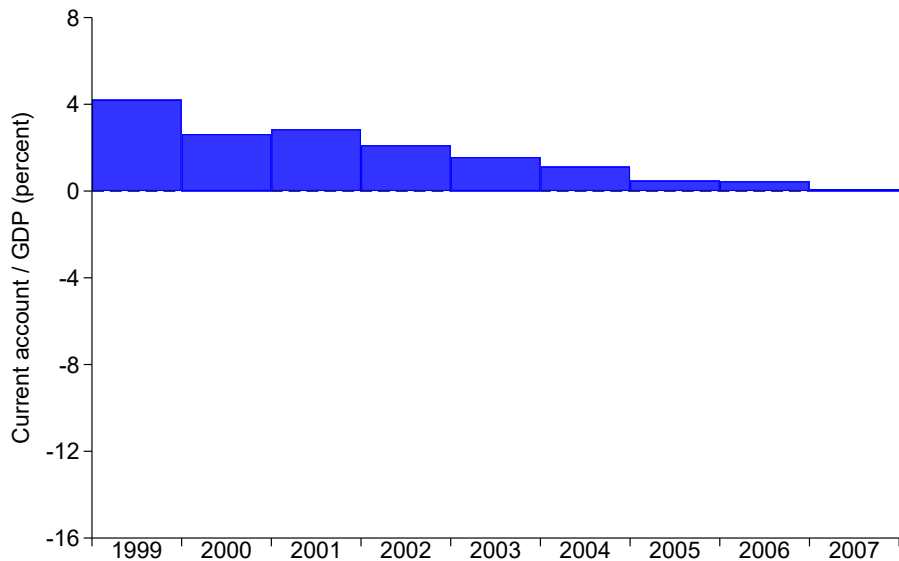
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GERMANY



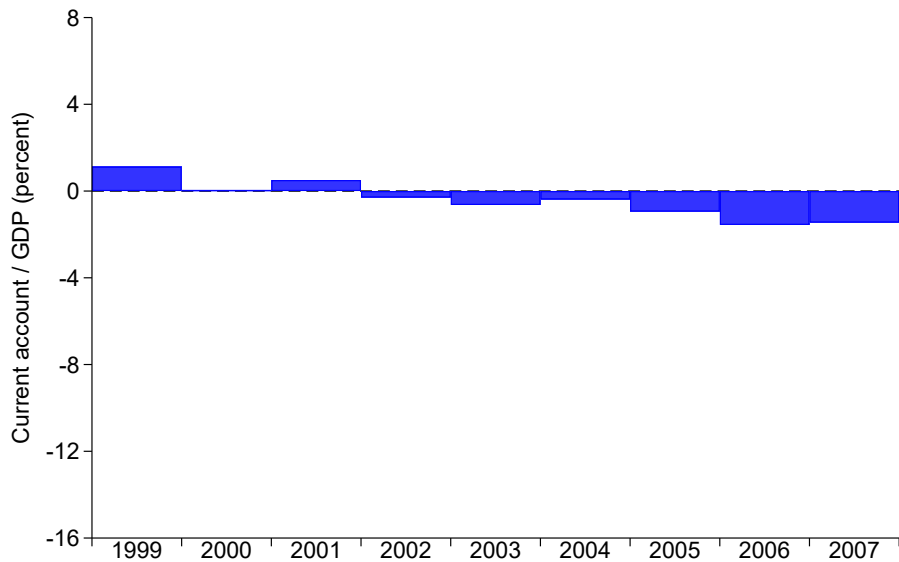
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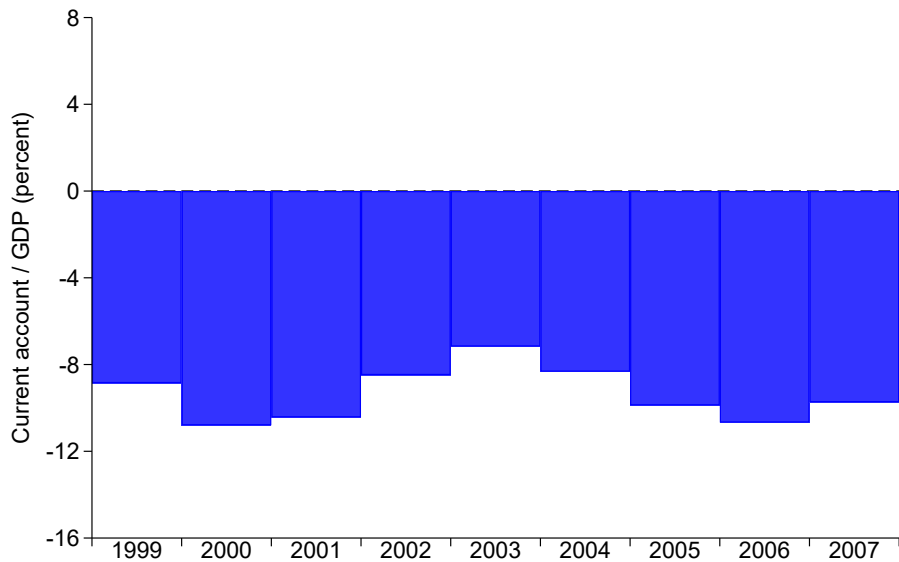
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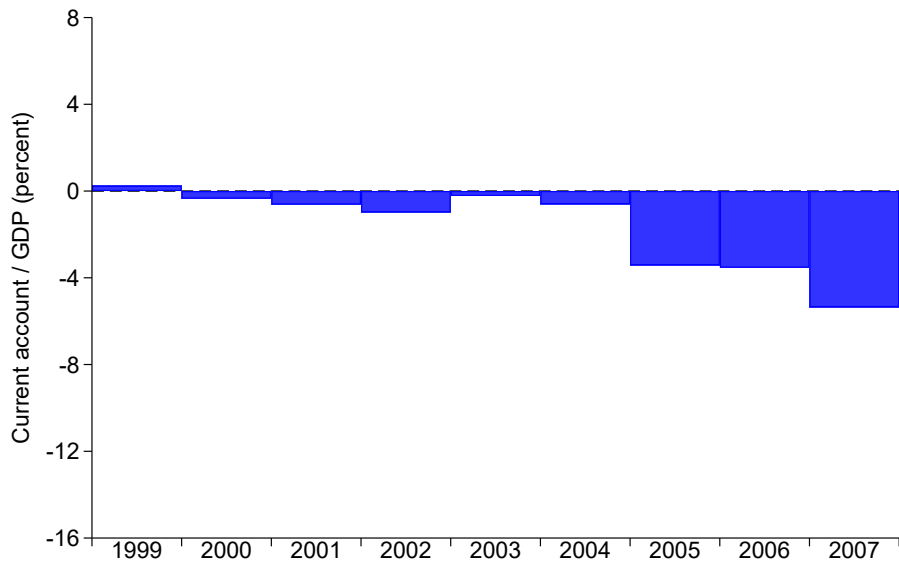
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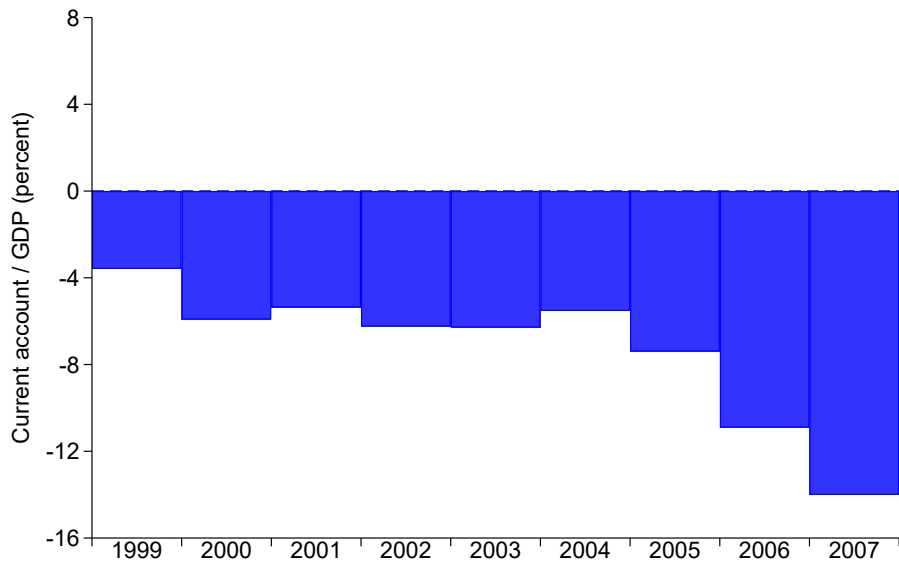
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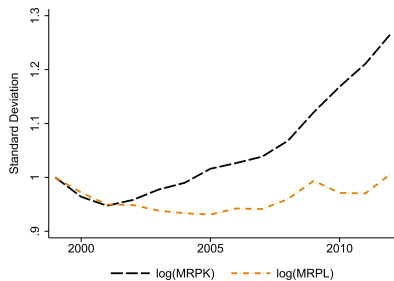
MISALLOCATION

- Financial system should allocate capital to best use.
- Let R_t denote user cost of capital and $F_i(K_{i,t}, L_{i,t})$ the production function for firm i . Optimization requires:

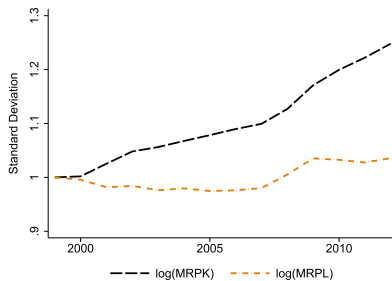
$$R_t = \frac{\partial F_i(K_{i,t}, L_{i,t})}{\partial K_{i,t}} \quad \forall i.$$

- Frictions distort equilibrium from first best. For example, financing constraints or political favoritism.
- Low quality firms may be beneficiaries of cheap credit.

MISALLOCATION IN SPAIN



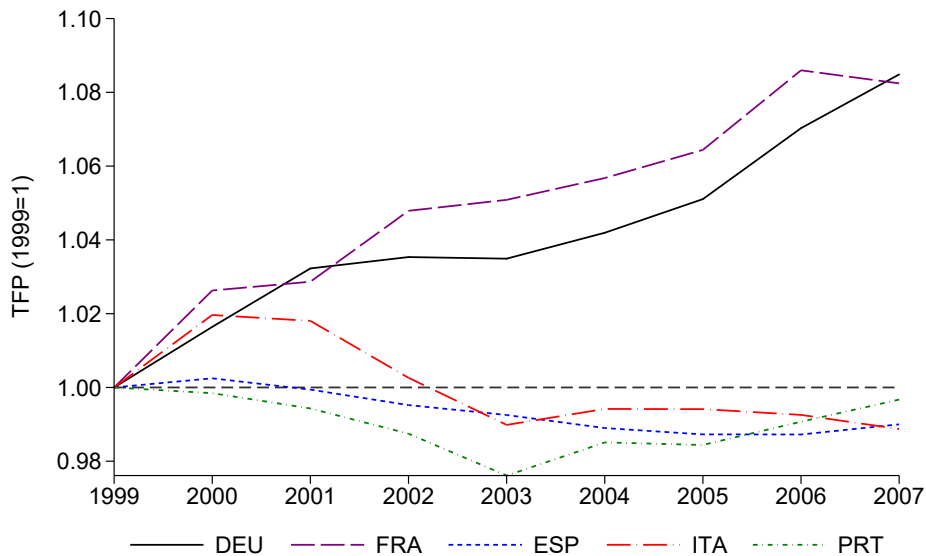
(a) Permanent Sample



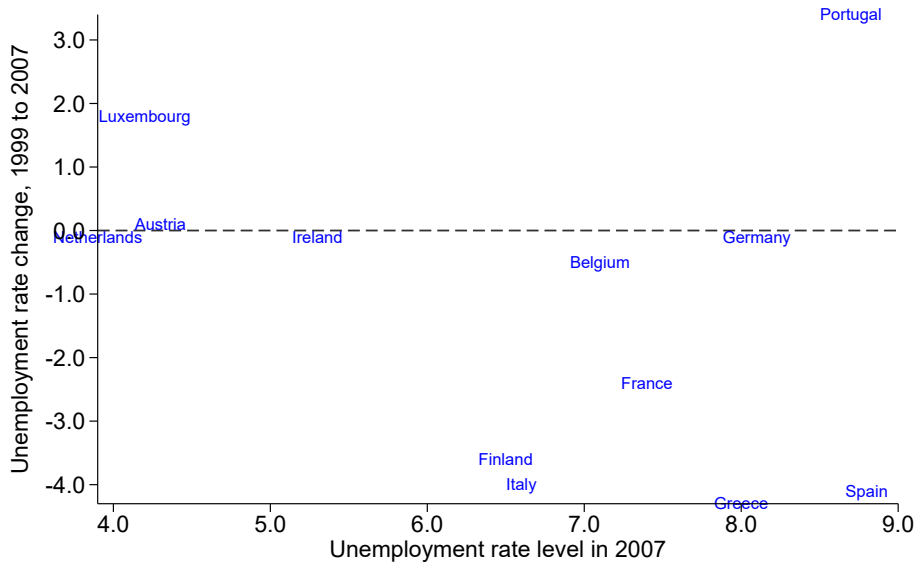
(b) Full Sample

Source: Gopinath et al., "Capital Allocation and Productivity in South Europe."

CAPITAL INFLOWS NOT PRODUCTIVITY ENHANCING



UNEMPLOYMENT



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- Price levels converge.
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- Most countries keep deficits in range of Maastricht criteria.
 - ▶ Portugal, especially Greece outliers.
- Capital flows from core (Germany, France) to periphery (Spain, Italy, Portugal, Ireland, Greece).
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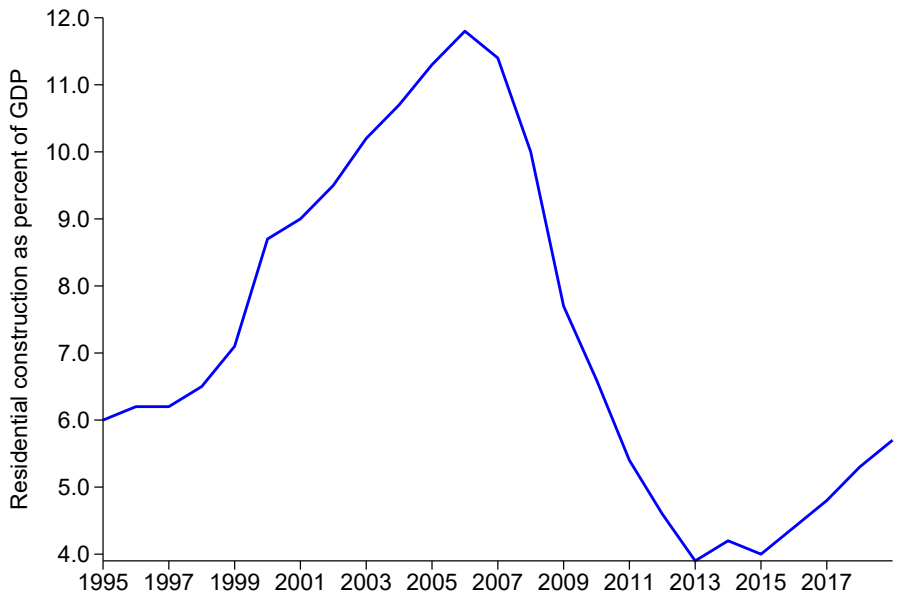
WHAT HAPPENED?

- Asymmetric shocks.
- Low inflation: difficult internal adjustment.
- Financial system meltdowns.
- No fiscal transfers \Rightarrow euro breakup risk \Rightarrow Diamond-Dybvig runs.

ASYMMETRIC SHOCKS

- Spain: residential real estate bubble burst.
- Ireland: banking sector collapse and expensive state guarantee.
- Greece: restatement of prior deficit and solvency concerns.
- Contagion.
- Fiscal austerity in periphery.

SPAIN: RESIDENTIAL CONSTRUCTION BUST



Greeks aim to cut deficit

**By Tony Barber
in Luxembourg**

Greece has promised to cut its budget deficit and improve the quality of its official statistics after European allies voiced strong criticism of the nation's management of its finances.

George Papaconstantinou, finance minister in the new Socialist government, said the deficit would rise to almost 12.5 per cent of gross domestic product this year, far higher than estimates provided by the former conservative government. The news, delivered at a meeting of European Union finance ministers, was unpleasant but not unexpected for Greece's 15 euro-

zone partners. They had suspected that the financial crisis would have a more serious impact on Greece's deficit and debt than had been admitted in Athens.

Germany and other countries that emphasise fiscal rigour are determined that the eurozone's stability, watched more closely than ever by markets since the crisis began, should not be jeopardised by the inability or reluctance of Greece and other less disciplined states to keep finances in order.

Jean-Claude Juncker, chairman of the so-called Eurogroup of countries, said: "The game is over. We need serious statistics."

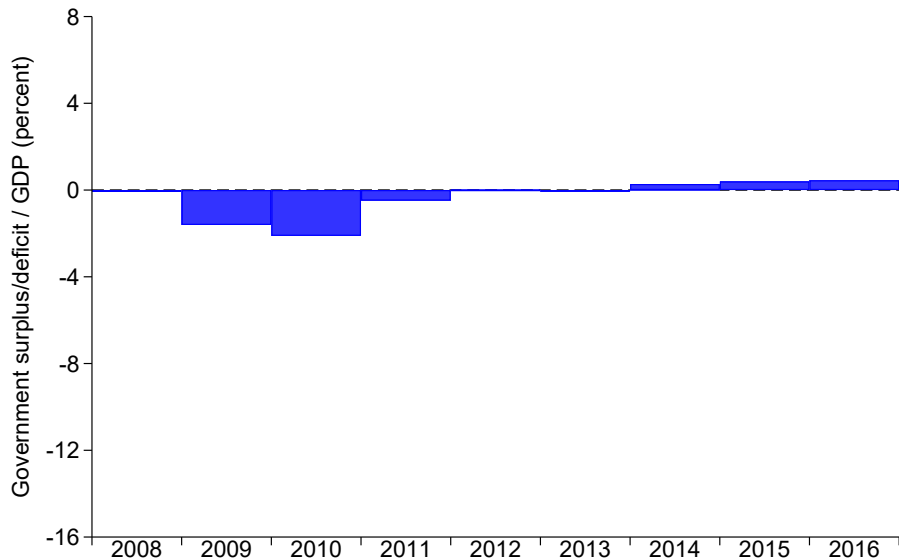
The extent of Greece's troubles was underlined

yesterday by the central bank, which said public debt rose to 111.5 per cent of GDP in June from 99.2 per cent at the end of last year. Some private sector economists predict that Greece's debt will climb as high as 150 per cent by 2016, a figure unmatched in any European country since the euro's launch in 1999 and above the 60 per cent level set for eurozone entrants.

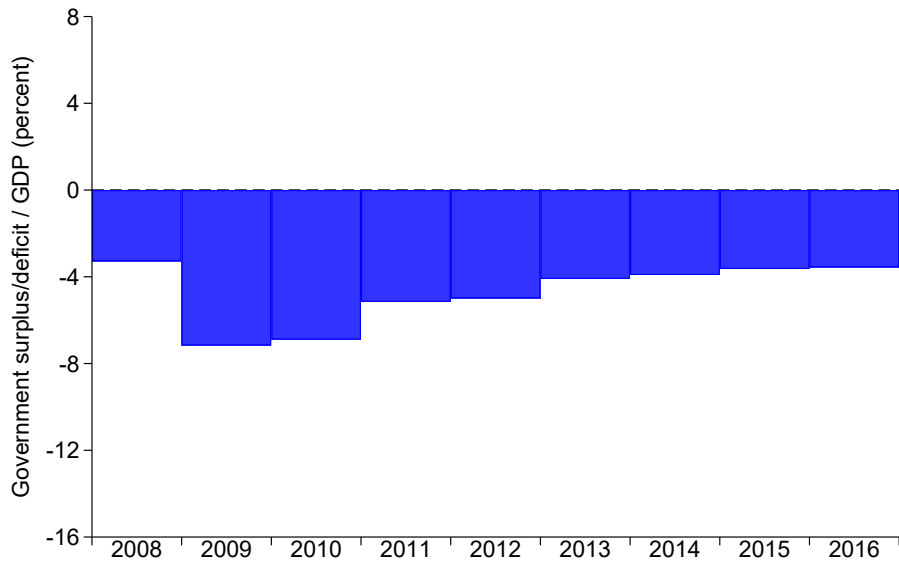
The uproar over the size of the deficit recalled an incident at the start of the decade, when Greece under-reported its deficit in order to qualify as the 12th member of the eurozone in 2001.

Reports and analysis,
www.ft.com/brussels

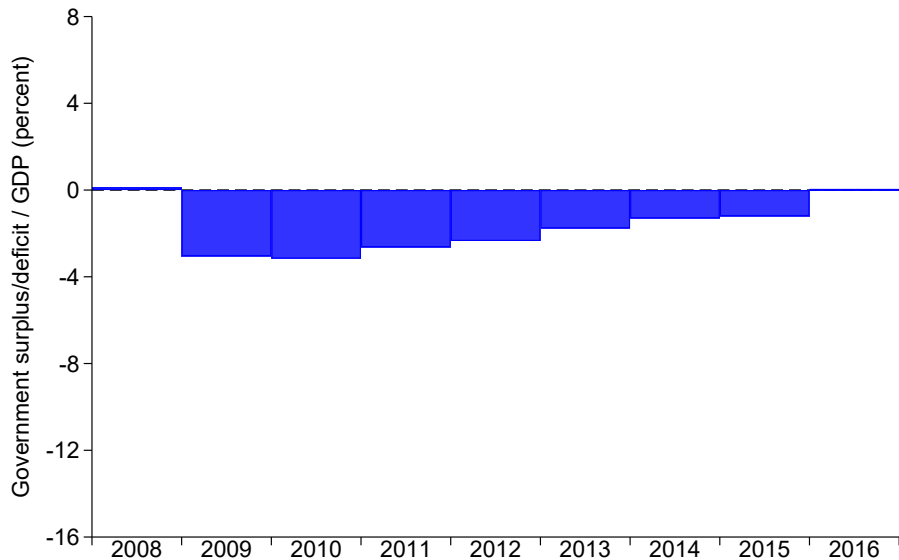
GERMANY



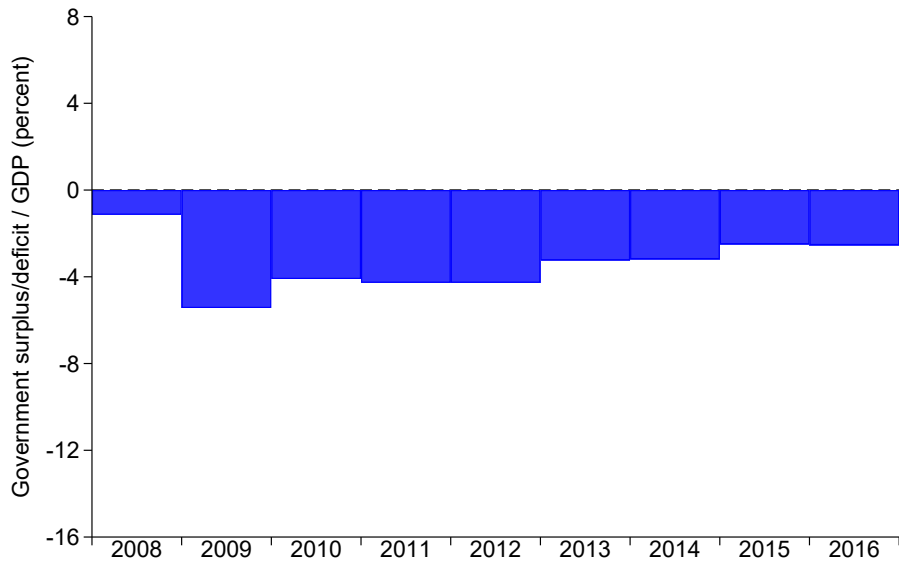
FRANCE



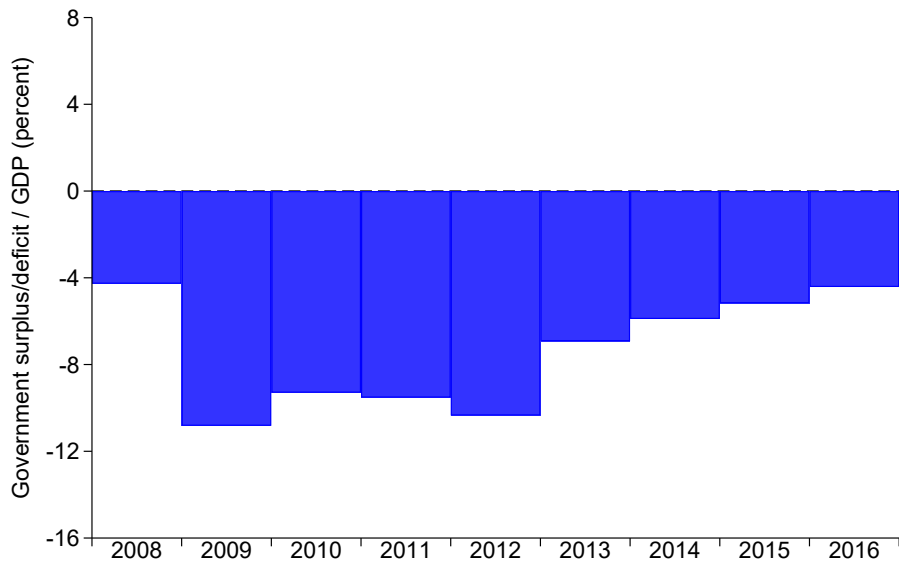
NETHERLANDS



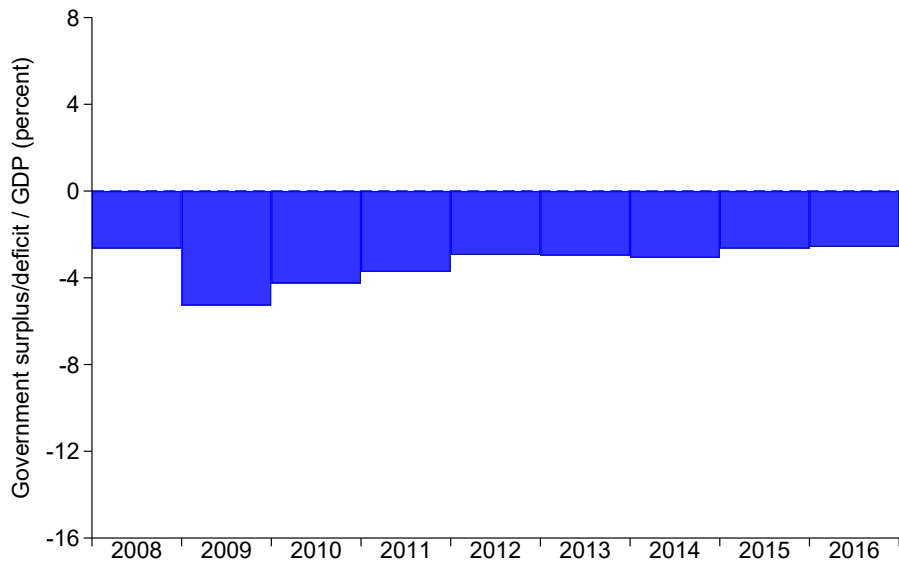
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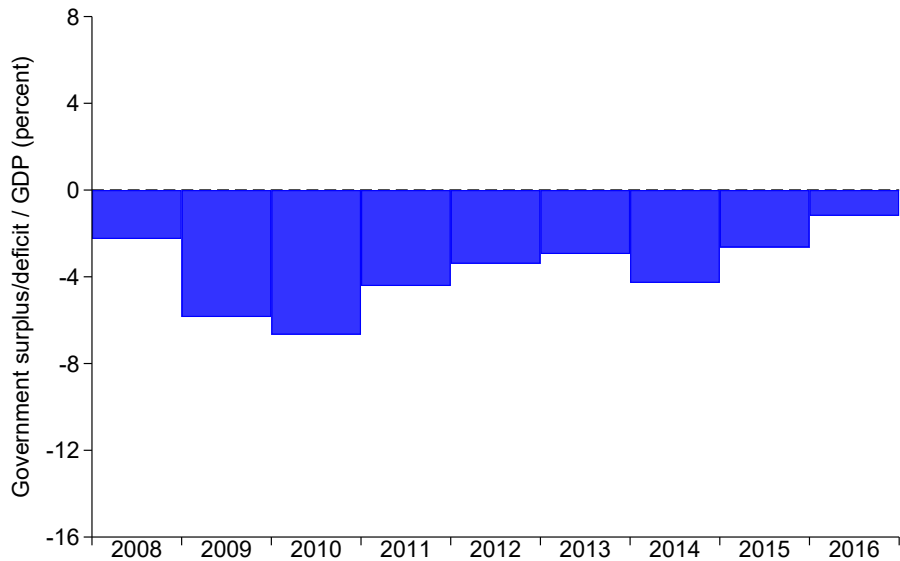
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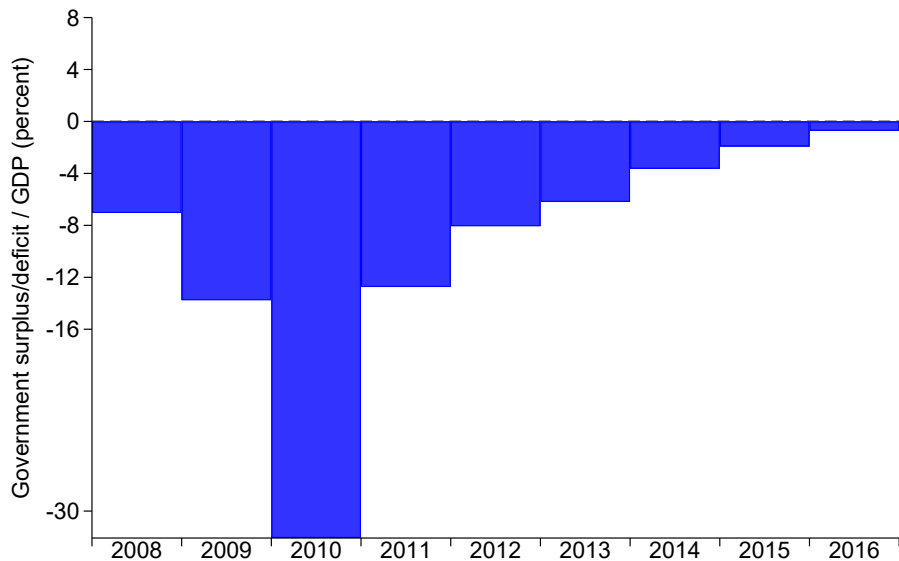
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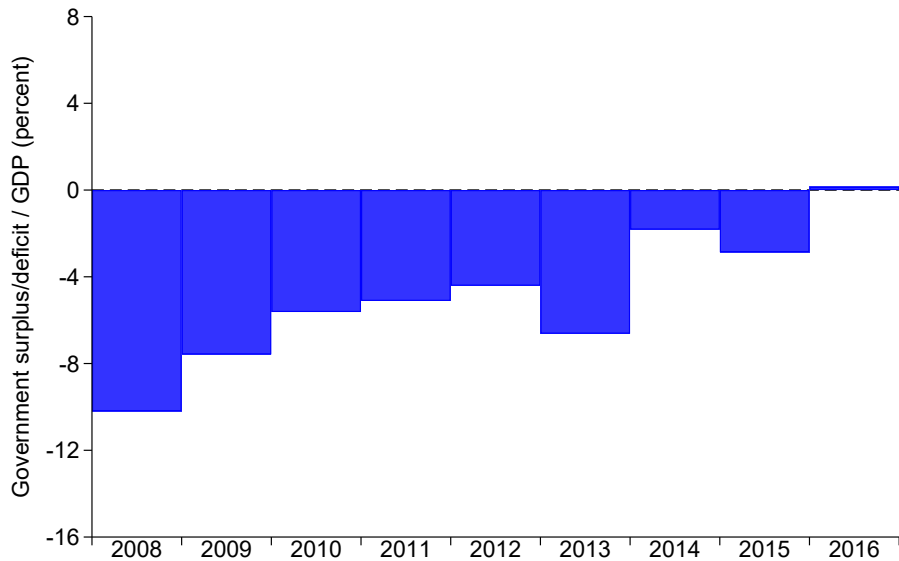
PORTUGAL



IRELAND



GREECE



FISCAL POLICY REMINDER

- IS curve and MP curve with fixed exchange rate and sticky inflation:

$$Y = \frac{C_0 + I_0 + G - (C_1 + I_1) T}{1 - C_1 - I_1} + \frac{(I_2(r) + NX(r))}{1 - C_1 - I_1}, \quad I_2'(r), NX'(r) < 0, \\ r = r^*.$$

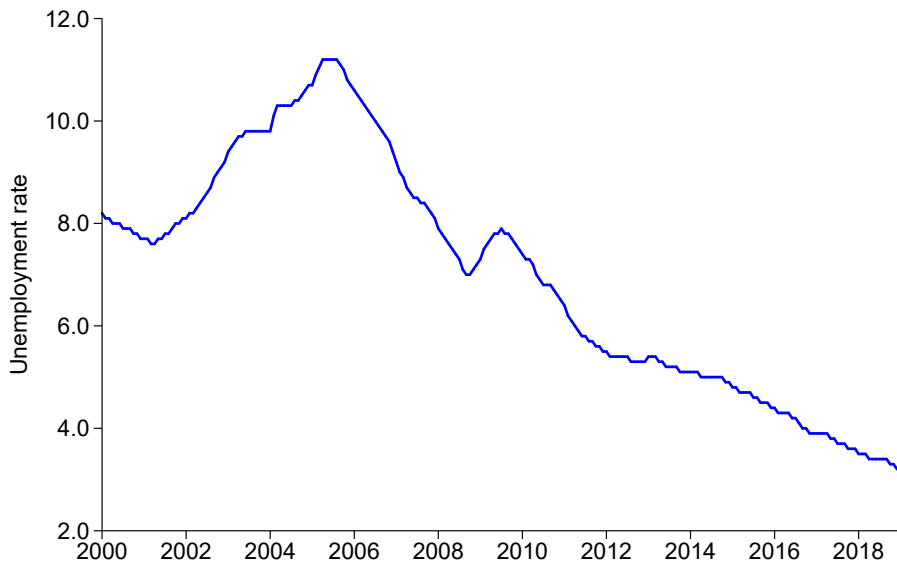
- Implicitly differentiate first equation with respect to G :

$$\frac{\partial Y}{\partial G} = \frac{1}{1 - C_1 - I_1}.$$

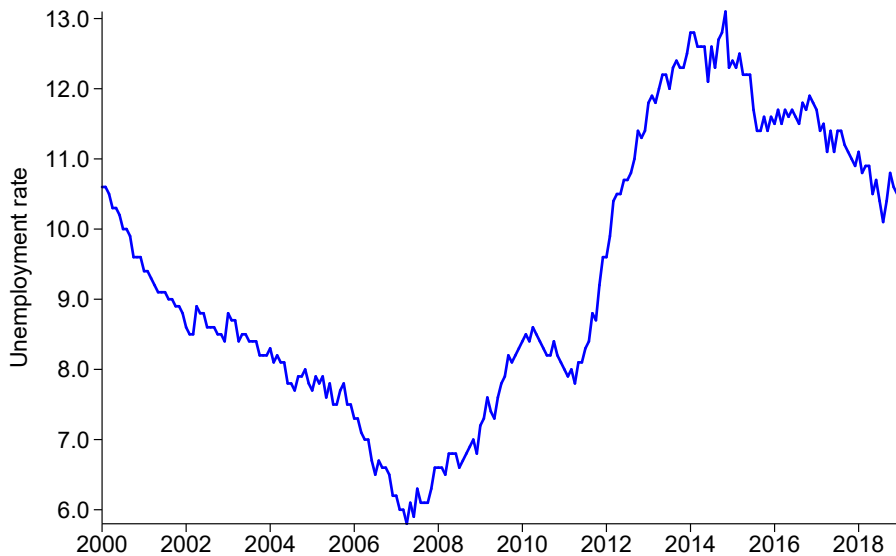
- Implicitly differentiate first equation with respect to T :

$$\frac{\partial Y}{\partial T} = -\frac{(C_1 + I_1)}{1 - C_1 - I_1}.$$

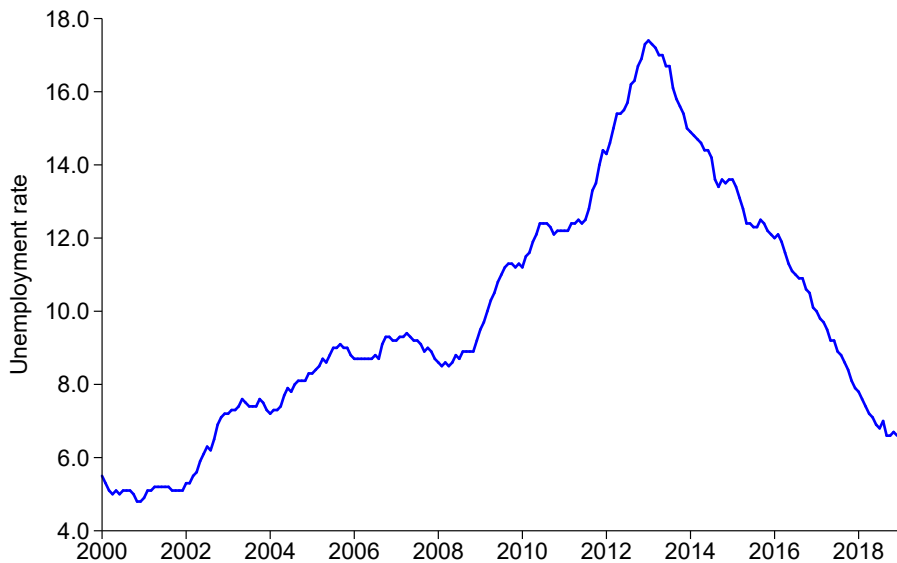
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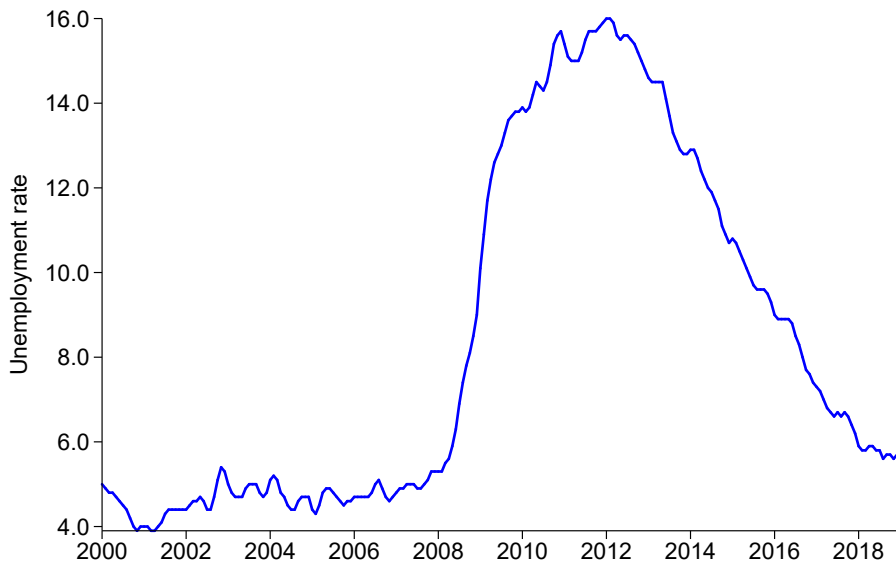
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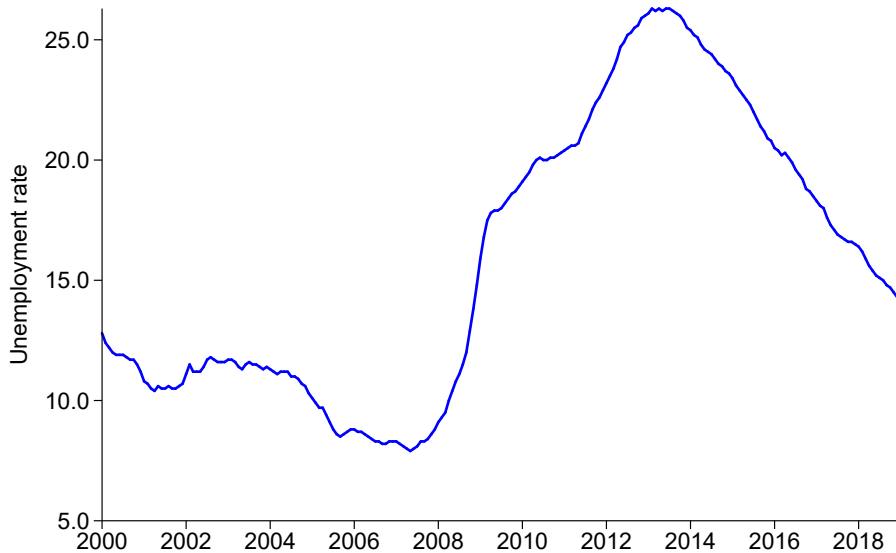
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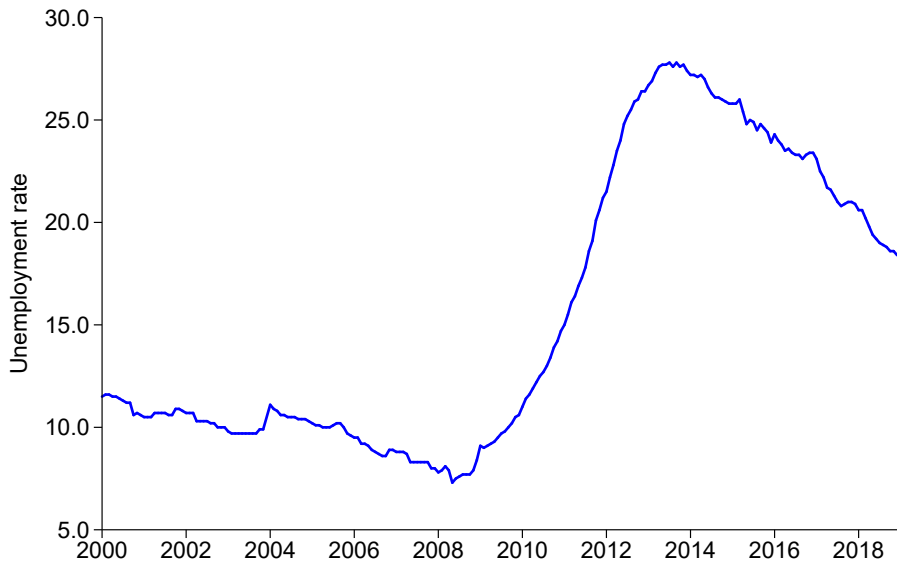
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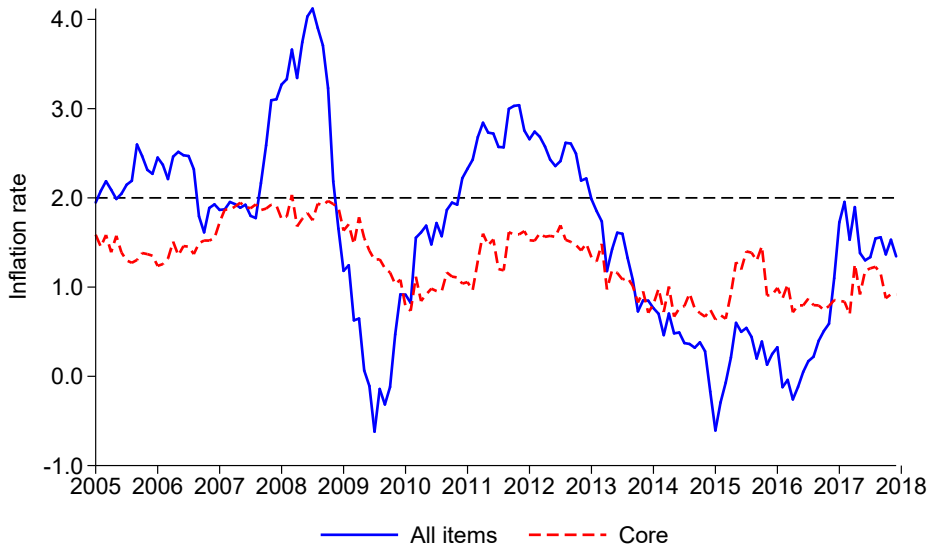
SPAIN



GREECE



EURO AREA INFLATION RATE



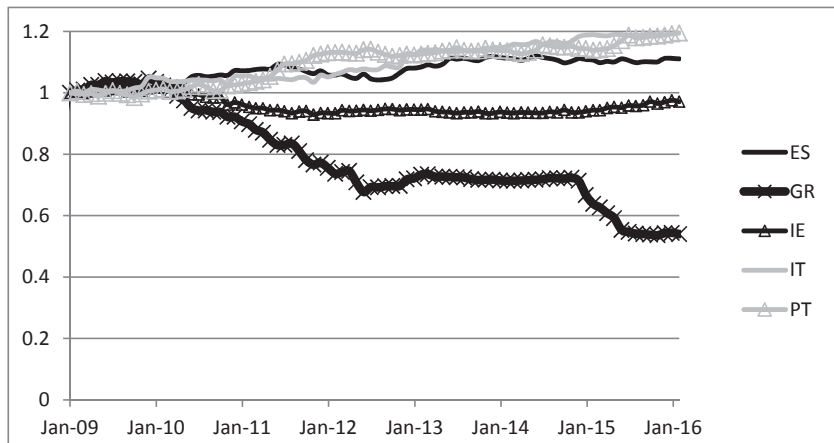
RUNS

- Greek citizen has banking account denominated in euro.
- Greek banking system collapses (runs out of euro) if everyone withdraws their deposits.
- If Greek banking system collapses, Greece exits euro and prints drachma (Grexit).
- If Grexit, then Greece defaults, but sovereign bonds held by banking system.
- If Grexit, everyone with a bank account will suddenly have X drachma instead of X euro.
- Then better to have euro notes stuffed under mattress than drachma in bank.
- Conclusion: if you expect everyone else to withdraw, you should withdraw.
- Diamond-Dybvig applied to national banking system.

RUNS AND POLICY

- ECB can arrest run by lending to Greek banking system.
- Same lender of last resort function as in domestic economy.
- ECB president Mario Draghi, July 26, 2012: “Within our mandate, the ECB is ready *to do whatever it takes* to preserve the euro.”
- If announcement credible, ECB doesn't have to do anything.
- ECB policies: QE, negative interest rates, banking union.

BANK DEPOSITS



INTEREST RATES AND CREDIT SPREADS

- Interest parity, no uncertainty or default risk:

$$1 + i_{t,t+1} \approx 1 + i_{t,t+1}^* - \% \Delta_{t,t+1} e.$$

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- Interest parity with uncertainty:

$$1 + i_{t,t+1} \approx 1 + i_{t,t+1}^* - E_t[\% \Delta_{t,t+1} e].$$

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- Interest parity with uncertainty:

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- Interest parity with uncertainty and default risk:

$$p^D(0) + (1 - p^D)(1 + i_{t,t+1}) \approx 1 + i_{t,t+1}^* - E_t[\% \Delta_{t,t+1} e].$$

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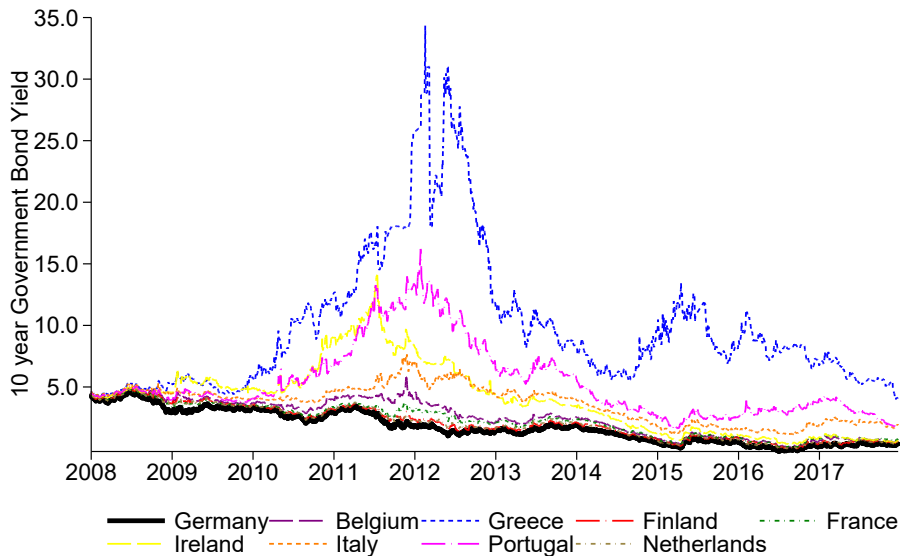
$$p^D(0) + (1 - p^D)(1 + i_{t,t+1}) \approx 1 + i_{t,t+1}^* - E_t[\% \Delta_{t,t+1} e].$$

- In crisis default risk and depreciation risk (euro exit) rise.

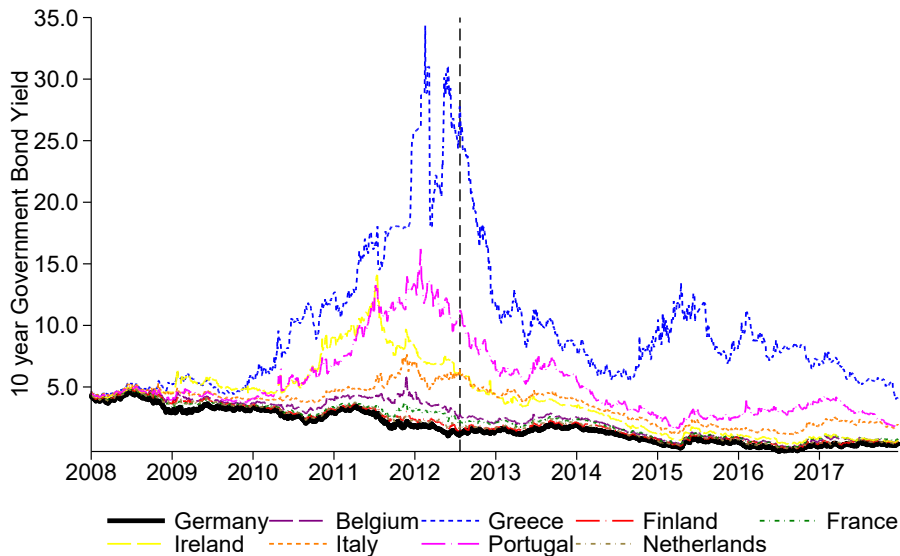
MULTIPLE EQUILIBRIA IN SOVEREIGN DEBT

- Suppose government has debt outstanding of 100% of GDP and can service interest payments of 6% of GDP. If interest payments higher than 6% of GDP, government defaults.
- Suppose safe interest rate is 1%.
- If everyone expects government to repay, then interest rate is safe rate, debt service is 1% of GDP, and government repays.
- If expectation of default exceeds 5%, then interest rate $> 6\%$ and government defaults.
- As individual investor, even if I think government will repay, if I worry *everyone else* thinks government will default, then I will demand risky interest rate and government will default.
- Self-fulfilling prophecy, or Diamond-Dybvig applied to sovereign debt markets.

INTEREST RATE DIVERGENCE



INTEREST RATE DIVERGENCE



LESSONS

- How to restore competitiveness in periphery:
 - ① Raise productivity: structural reforms.
 - ② Devalue real exchange rate $\varepsilon = \bar{e} \times P/P^*$.
 - ★ But internal devaluation difficult – requires large recession to get wages and prices to fall.
 - ★ Similar to countries stuck on gold standard during Great Depression.
 - ★ Easier if higher inflation in the core. (Reluctant) role for ECB.
 - ③ Exit euro? Likely to induce run on banking system, default on external debt.
- Multiple equilibria in sovereign risk. (Reluctant) role for ECB.
- Fiscal austerity matters \Rightarrow fiscal union.
- Bank bailouts costly \Rightarrow banking union.
- Danger in half measures. Will Europe go all the way?

COVID-19: A NEW CHALLENGE

- Direct threat to open borders/migration.
- Strain on country finances.

OUTLINE

- 1 EUROPEAN INTEGRATION PROJECT
- 2 CONVERGENCE
- 3 BUST