

## The Global Economy

### Fixed Exchange Rates



## Is China's currency "undervalued"?

### The renminbi

- Terminology
  - Currency: renminbi (RMB)
  - Units: yuan
- Is the RMB "undervalued"?
- What do we mean by that?
- How would we decide?

3

### The renminbi

- New York Senator Charles Schumer
  - It's time to put some muscle into our trade relationship with China. For too long, the Chinese government has been playing games with the value of its currency in order to get a competitive edge.
- What is he saying? Do you agree?

4

### The renminbi

- Paul Krugman
  - Here's how it works: Unlike the dollar, the euro or the yen, whose values fluctuate freely, China's currency is pegged to the dollar by official policy. At this exchange rate, Chinese manufacturing has a large cost advantage over its rivals. [As a byproduct], China's government buys up dollars, adding to a \$2 trillion-plus hoard of foreign exchange reserves.
- What is he saying? Do you agree?

5

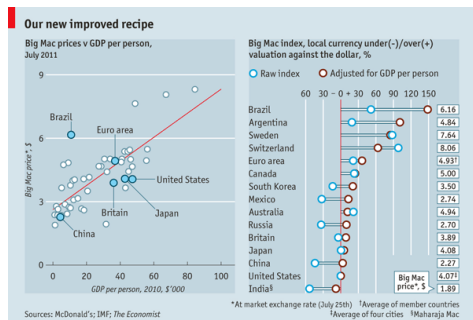
### Yuan per dollar



Source: Fed via FRED.

6

## Big Mac prices



Source: The Economist.

7

## The renminbi

- Is it undervalued? Why or why not?
- My summary
  - Chinese goods cheap, but not especially so [remember: PPP doesn't work that well – for anyone] [also: prices generally lower in poor countries]
  - Not mentioned: Chinese price indexes of poor quality, makes PPP calculations noisy
  - **Fixed exchange rate and massive accumulation of dollar reserves is unusual, attracts attention**
  - Something to think about: latent demand for dollars limited by capital controls [more shortly on what this means]

8

## Fixed Exchange Rates

## The idea

- In a fixed exchange rate system, the central bank buys and sells foreign currency as needed to maintain the exchange rate
- Can fail spectacularly if the central bank runs out of foreign currency

10

## The idea

- Stan Fischer, First Deputy Managing Director, IMF
  - Each of the major crises since 1994 – Mexico in 1994, Thailand, Indonesia and Korea in 1997, Russia and Brazil in 1998, and Argentina and Turkey in 2000 – has involved a fixed or pegged exchange rate. And countries that did not have pegged rates – among them South Africa, Israel in 1998, Mexico in 1998, and Turkey in 1998 – avoided crises of this type.
- What is he saying? Does it make sense to you?

11

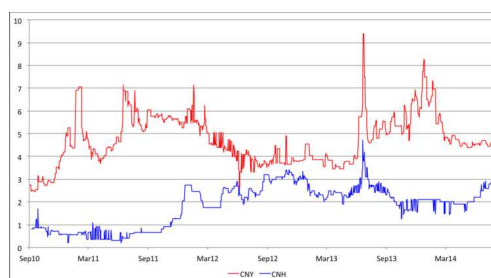
## Roadmap

- Is China's currency "undervalued"?
- Exchange rate systems
- Fixed exchange rates
- The trilemma

12

## Exchange rate systems

## RMB rates in Shanghai and HK



What's going on here?

14

## The renminbi

- EIU, Country Finance Report, China
  - Although the government maintains relatively strict exchange controls, the general trend over the past decade has been towards gradual liberalisation of China's foreign-exchange market. The country reached its most significant milestone in December 1996 when it officially made the renminbi convertible on the current account. Convertibility on the capital account is not expected in the near future.
- What are they saying? Do you agree?

15

## Exchange rate systems

- Convertibility
  - A currency is **convertible** if you can trade it freely for foreign currency -- and vice versa
- Exchange controls
  - Limits on convertibility for some purposes
- Fixed and flexible exchange rate systems
  - An exchange rate is **flexible** [floating] if the market price is determined with little or no direct government participation
  - An exchange rate is **fixed** [pegged] if the central bank supports an official rate by buying and selling foreign currency

16

## Exchange rate systems

- China, EIU, Country Finance Report
  - Although the government maintains relatively strict exchange controls, the trend has been towards gradual liberalisation of the foreign-exchange (forex) market. In December 1996 China officially made the renminbi convertible on the current account. Convertibility on the capital account is not expected in the near future.
  - The State Administration of Foreign Exchange (SAFE) administers the complex set of regulations that China uses to keep its currency open for trade purposes but closed for most types of investment).

17

## Exchange rate systems

- Mexico, EIU, Country Finance Report
  - No restrictions apply to export proceeds and import payments. Export revenues may be held indefinitely in Mexican pesos or in foreign currency.
  - No restrictions apply to Mexican individuals or companies borrowing from abroad, nor are restrictions imposed on nonresident companies and individuals borrowing domestically.

18

## Exchange rate systems

- China, EIU, Country Finance Report
  - In 2010 China announced that the renminbi's fixed peg to the US dollar would be replaced by a more flexible currency regime. China's decision to abandon the renminbi's peg spurred the development of a new range of foreign-exchange-related services, even though the exchange rate is still tightly controlled by Chinese authorities.

19

## The renminbi

- IMF, Article IV Consultation, 2011
  - IMF staff: Reforms should seek to secure a more modern framework for monetary management ... and open the capital account. In all of this, a stronger renminbi will be an important complement.
  - [Chinese] authorities disagreed with the staff. They underlined the progress that has been made in continuing to improve the mechanism for setting the exchange rate.
- What are they saying? Do you agree?

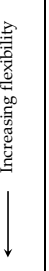
20

## Exchange rate systems

- Mexico, EIU, Country Finance Report
  - The value of the peso is determined by market forces through a floating exchange-rate regime that has been in place since the December 1994 peso devaluation. Under this framework, the Banco de Mexico (the central bank) makes no commitment to the level of the peso exchange rate and does intervene in foreign-exchange markets to ensure currency stability.

21

## Exchange rate systems

Increasing flexibility 	Common currency	(Euro Zone, Panama)
	Currency board	(HK, Argentina < 00)
	Fixed exchange rate	(US < 71)
	Crawling peg	(Mexico < 95, China > 05)
	Managed exchange rate	(Saudi Arabia?)
	Floating exchange rate	(US, Mexico)

22

## *Fixed exchange rates*

## Fixed exchange rates

- How does the central bank "fix" the rate?  
[Ask yourself: how would you set any price?]
- Foreign exchange reserves
  - Foreign-denominated assets on the central bank's balance sheet

24

## Reminder: money supply mechanics

### Central bank

Assets	Liabilities
Bonds 20	Money 20

- How does central bank increase money supply?

### Households and firms

Assets	Liabilities
Money 20	
Bonds 180	

25

## Fixed exchange rate mechanics

### Central bank

Assets	Liabilities
Bonds 10	Money 20
FX reserves 10	

- What are foreign-exchange reserves?
- How does bank maintain fixed exchange rate? ("intervention")
- What happens if people want to sell FX? Buy?

### Households and firms

Assets	Liabilities
Money 20	
FX 50	
Bonds 190	

26

## Fixed exchange rate mechanics

### Central bank

Assets	Liabilities
Bonds 10	Money 20
FX reserves 10	

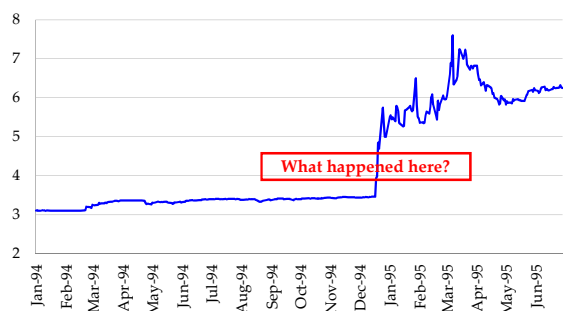
- What happens to money if people want to sell FX?
- How can we offset this? ("sterilization")

### Households and firms

Assets	Liabilities
Money 20	
FX 50	
Bonds 190	

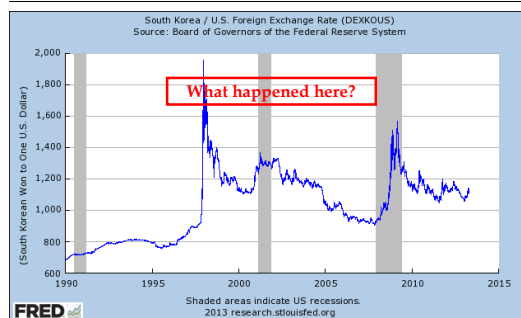
27

## Pesos per dollar



28

## Won per dollar



29

## Fixed exchange rate mechanics

### Central bank

Assets	Liabilities
Bonds 10	Money 20
FX reserves 10	

- What happened in Mexico in Dec 1994?

### Households and firms

Assets	Liabilities
Money 20	
FX 50	
Bonds 190	

30

## Fixed exchange rate mechanics

### Central bank

Assets		Liabilities	
Bonds	10	Money	10
FX reserves	0!		

- What happened in Mexico in Dec 1994?

### Households and firms

Assets		Liabilities	
Money	10		
FX	60		
Bonds	190		

31

## Fixed exchange rate mechanics

### Central bank

Assets		Liabilities	
Bonds	10	Money	20
FX reserves	10		

- How did China get trillions of reserves?
- Could China run out?

### Households and firms

Assets		Liabilities	
Money	20		
FX	50		
Bonds	190		

32

## Fixed exchange rates: currency boards

- The idea
  - If reserves > local currency, you can never run out
  - [think about this...]
- Has worked well in Hong Kong
- Failed in 2001 in Argentina – why?
  - Weak political system
  - Banks had dollar liabilities, not matched with dollar assets

33

## Fixed exchange rates: summary

- Fixed rate maintained through central bank sales and sales/purchases of foreign currency (“intervention”)
  - Sales limited by quantity of reserves
  - Typically changes the money supply, but you can offset that with conventional monetary policy (trade money for bonds): “sterilization”
- Often fail in spectacular fashion
  - A suggestion that large adjustments are called for?

34

## *The trilemma*

## The trilemma

- What’s a trilemma?
  - Three choices, but you only get two
- The politician’s trilemma
  - Honest, smart, electable
- MBA student’s trilemma
  - Job, school, social life

36

## The trilemma

- The trilemma of international finance
  - Fixed exchange rate
  - Free flow of capital (no “controls”)
  - Independent monetary policy

37

## The trilemma

- What are the US's trilemma choices?
  - Fixed exchange rate
  - Free flow of capital
  - Independent monetary policy

38

## The trilemma

- What are China's trilemma choices?
  - Fixed exchange rate
  - Free flow of capital
  - Independent monetary policy

39

## The trilemma: UK, 1992

- Quasi-fixed rate with European currencies (DM)
  - Trading band of 2.25%
- Free flow of capital
- High interest rates in Germany forced UK to follow
  - Why?
- Weak UK economy made lower interest rate attractive
- What are your choices?

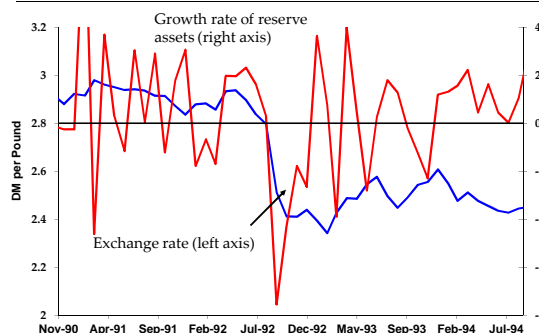
40

## The trilemma: UK, 1992

- George Soros wonders which one will go first
  - Fixed exchange rate?
  - Free flow of capital?
  - Independent monetary policy?
- Bets the farm on the first one, makes ~\$1b
- Bank of England lets pound float

41

## DeutscheMark-Pound exchange rates

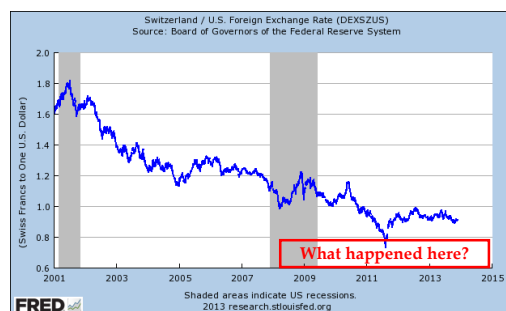


## The trilemma: UK, 1992

- Who lost?
- UK Treasury estimates
  - £800m in trading losses (buying into a down market)
  - £2.4b in capital gains it would have made if it kept reserves
- Search for “Black Wednesday”
  - September 16, 1992

43

## Swiss francs per dollar



44

## The trilemma: Switzerland, 2011-

- Sharp appreciation in 2011
  - Big Mac index suggested 98% overvaluation
  - Exporters suffering, companies threatened to leave
- September 2011
  - Swiss National Bank announced massive intervention
  - Established a floor of 1.2 per euro
- Which did we give up?
  - Fixed exchange rate?
  - Free flow of capital?
  - Independent monetary policy?

45

## What have we learned?

- Fixed exchange rates require government support
  - Buy and sell FX at official rate
  - Or restrict convertibility
- Common transactions
  - Intervention: sales and purchases of foreign currency
  - Sterilization: undo impact on money supply
- Trilemma: you only get two of
  - Fixed exchange rate
  - Free (international) flow of capital
  - Independent monetary policy

46

## The Global Economy

### Macroeconomic Crises

## Final exam

- Material since midterm only
- Bring calculator (logs and exponents not needed)
- Also one page with anything on it you wish
- Practice exams posted
- Also answers to problem sets and practice problems
- Exam lasts 2 hours, followed by Malt House (my treat)
- Special office hours: Sat 4-5, Tue 3-5:30, Fri 3-5
- Or email me

48

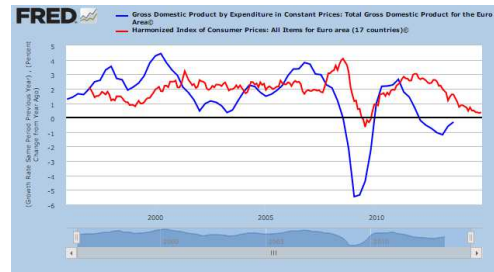


### PS #4 Q1: ECB policy

- How does it compare to the Taylor rule?
- How would you assess it?

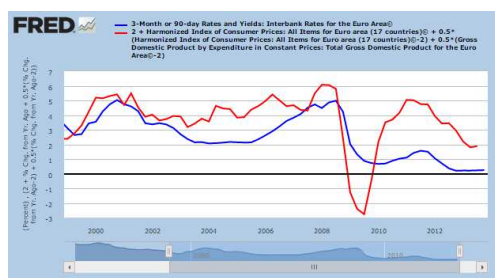
49

### PS #4 Q1: inflation and growth



50

### PS #4 Q1: Taylor rule



51

## PS #4 Q2: Brazil's budget

- How does it look to you?
- What would you add to the numbers?

52

## Brazil

- From a Brazilian student
  - The state owned banks are absurd. Brasil uses its development bank to offer subsidized interest rates to friends of the government. The bank is a major owner of companies as well. And the cost does not go in the budget.
  - Revenues from the deep-water oil are complicated. Right now, the more Petrobras produces, the more money they lose. They are instructed by the government not to raise prices, so there has been a misalignment with market prices. Petrobras has lost half its market value over the last year or so because of that interference.

53

## Problem Set #4

- Answers will be posted Saturday afternoon

54

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## *Macroeconomic Crises*

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## Crises

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- What countries are in trouble now?
- How would you be able to tell?

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56

## The ideas

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- Macroeconomic crises: stuff happens, fact of life
- Sometimes source of opportunities
- Hard to predict, but there are often signs of trouble

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57

## Roadmap

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- What's happening?
- Crises
- **Signs of trouble** [aka "the checklist"]
- Crisis responses
- Examples: Mexico, Korea, Europe

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58

## What's happening?

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- "Meet Putin's neighbors," Bloomberg, via Rafael Roman
  - Just how much has President Vladimir Putin's Ukraine incursion eroded investor confidence in Russia?
  - Consider the names that the country is now surrounded by in CDS market: Lebanon, El Salvador and war-torn Iraq. With investors charging 389 basis points a year to insure against a halt in Russian debt payments, those three countries – all of which either have junk ratings or none at all – are quoted at the closest levels to Putin's government.
- What's going on? Do you agree?

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59

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## *Crises*

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## Crises

- Crises =
  - Unusually large recessions
  - Typically different in type as well as magnitude
- A regular feature of the world throughout history
- Significant business risk, also opportunity

61

## Crises

- Australia, 1891-1893 (“Barings crisis”)
  - GDP fell 18%
- United States, 1907-1908
  - GDP fell 10%
- Mexico, 1994-1995
  - GDP fell 9%, peso fell almost 50%
- Korea, 1997-98
  - GDP fell 9%, won fell 30%
- Argentina, 1999-2002
  - GDP fell 20%, peso fell 65%

62

## Crisis triggers

- The classic crisis triggers
  - Sovereign debt (“debt crisis”)
  - Financial system weakness (“financial crisis”)
  - Fixed exchange rates (“exchange rate crisis”)

63

## *Signs of trouble*

## Signs of trouble

- Can we see them coming?
- What would we look at?

65

## Signs of trouble

- Crisis checklist
  - Government debt and deficits
  - Financial system
  - Exchange rate and reserves
  - Politics and institutions

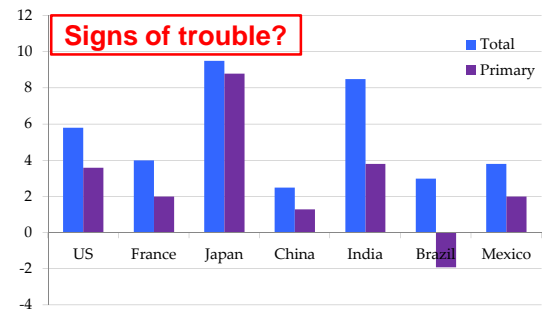
66

## Signs of trouble

- Sovereign debt indicators
  - Lots of debt (ratio of public debt to GDP)
  - Large and continuing deficits
  - Underlying long-term problems: pensions, banks, guarantees...
- Secondary indicators
  - Signs of investor concern (CDS spreads)
  - Political instability, hints that default might be attractive
  - Debt short term
  - Debt denominated in foreign currency

67

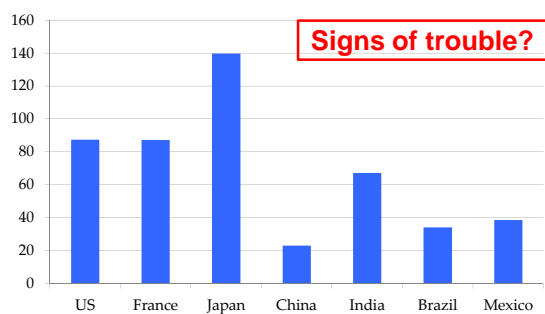
## Government deficits (% of GDP, 2013)



Source: IMF, WEO.

68

## Government debt (net, % of GDP)



Source: IMF, WEO.

69

## Signs of trouble

- Financial system indicators
  - [for completeness, not part of this course]
  - Low capital ratios at banks and related institutions
  - Increasing loan losses, nonperforming loans
- Secondary indicators
  - Rapid growth in real estate prices
  - Currency mismatches, borrowing in foreign currency
  - Rapid growth of “near banks”

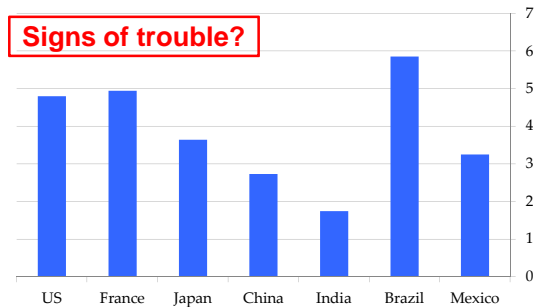
70

## Signs of trouble

- Exchange rate indicators
  - Fixed or “managed” exchange rate system
  - Overvaluation either by PPP or relative to last five years
  - Low foreign exchange reserves
- Secondary indicators
  - Nature of any “fix,” esp convertibility
  - Governance of monetary authority

71

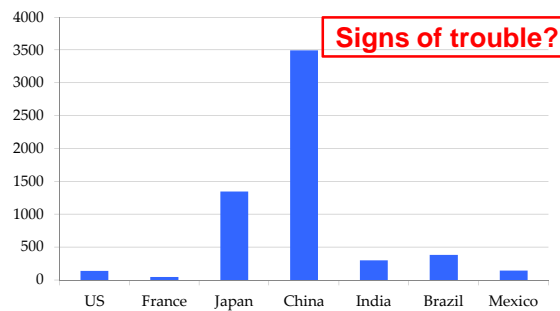
## Big Mac prices (USD)



Source: The Economist.

72

## Foreign exchange reserves (USD billions)



Source: The Economist.

73

## Signs of trouble

- Walter Wriston, CEO of Citibank, 1980 or so
  - Countries don't go out of business. The infrastructure doesn't go away, the productivity of the people doesn't go away, the natural resources don't go away. Generally their assets exceed their liabilities, which is the technical reason for private bankruptcy. Which makes this very different from a company.
- What is he saying? Do you agree?

74

## Signs of trouble

- Indicators of politics and institutions
  - Weak institutions overall
  - Political uncertainty – elections, for example
- Remember Wriston
  - Governments choose to default

75

## Crisis responses

## Crisis responses

- Response to government budget problems
  - Reduce spending, raise taxes (duh!)
  - IMF loans can smooth transition, come with "conditionality"
  - If default happens, resolve it quickly

77

## Crisis responses

- Response to financial sector problems
  - If system is sound but illiquid, lend aggressively against normally good collateral  
[classic role of central bank: lender of last resort]
  - If system is insolvent, get through bankruptcy and recapitalize as quickly as possible  
[this is fiscal policy: costs money, at least up front]

78

## Crisis responses

- Response to exchange rate problems
  - Let the currency float
  - More controversial: impose capital controls

79

## Crisis responses

- Response to political problems
  - Hmmm....

80

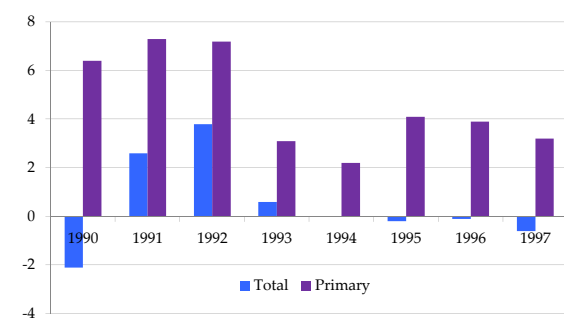
## Mexico

## Mexico, 1994-1995

- High growth in early 1990s
- Economic liberalization, NAFTA
- Modest government debt [27%] and deficit [1%]
- Exchange rate “managed”
- Higher inflation than US led to “real appreciation”
- Political turmoil during 1994 presidential election [Chiapas, Colosio, ...]
- What went wrong? What was the trigger?

82

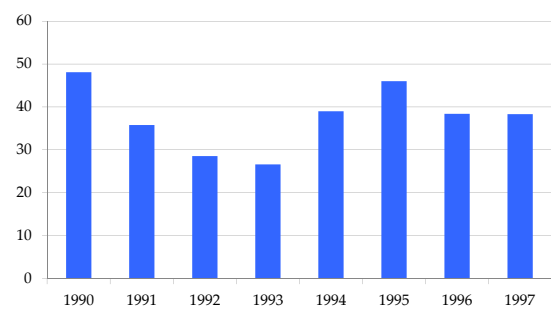
## Mexico: government surpluses (% of GDP)



Source: EIU, CountryData

83

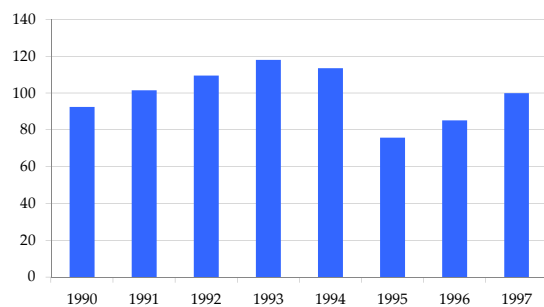
## Mexico: government debt (% of GDP)



Source: EIU, CountryData

84

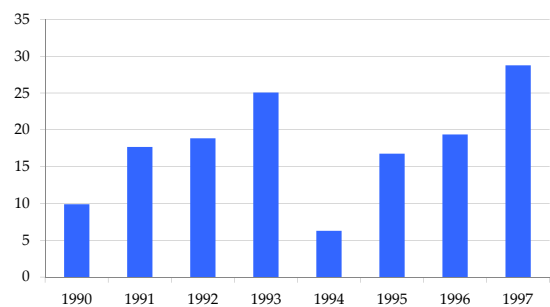
### Mexico: real exchange rate



Source: EIU, CountryData

85

### Mexico: foreign exchange reserves



Source: EIU, CountryData

86

### Mexico: what went wrong?

- Debt modest, budget surpluses
- But ...
  - High degree of political uncertainty
  - Borrowing both short-term and (partly) in dollars
  - Low reserves, managed exchange rate not defensible
- Mid-December 1994: investors refused to roll over government debt – boom!

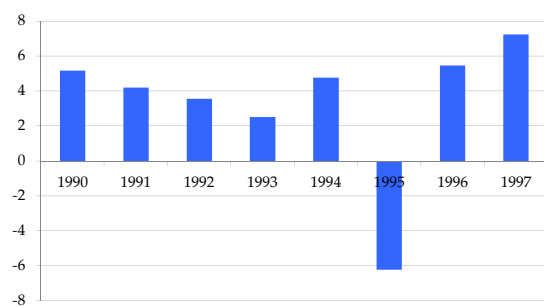
87

### Mexico: what was the response?

- January 31, 1995:
  - Mexico borrows \$20b from US collateralized by oil
  - Other governments and agencies arrange \$30b lines of credit
- Mexico cuts spending, raises taxes in 1995, budget balanced throughout crisis
- The result
  - GDP falls sharply in 1995, rebounds in 1996
  - Loans repaid in full in 1997

88

### Mexico: GDP growth



Source: EIU, CountryData

89

### Mexico: crisis checklist

- Where did we go wrong?
  - Government debt and deficits
  - Financial system
  - Exchange rate and reserves
  - Politics and institutions

90

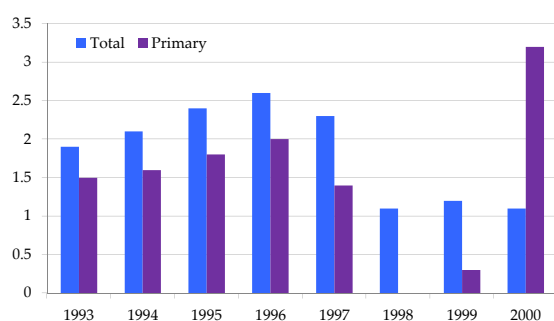
## Korea

## Korea

- Great success story from mid-1950s on
- Continued rapid growth 1990-96
- Currency pegged
- What went wrong? What was the trigger?

92

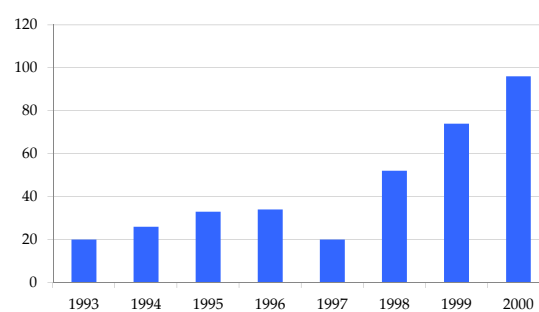
### Korea: government surpluses (% of GDP)



Source: EIU, CountryData

93

### Korea: foreign exchange reserves



Source: EIU, CountryData

94

### Korea: what went wrong?

- Strong growth
- Government ran surpluses, but ...
  - Banks lent aggressively to corporates (Chaebols)
  - Much of it financed by short-term foreign borrowing
  - Kia Motors collapsed in July
  - US interest rates rose, dollar appreciated
  - Reserves fell
- December 1997: currency collapsed – boom!

95

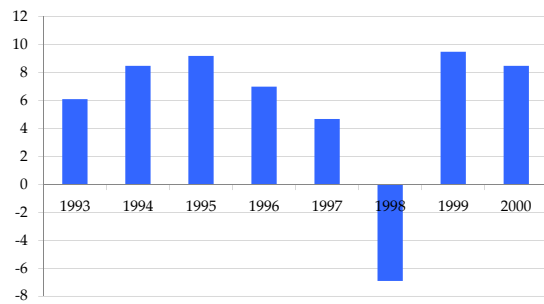
### Korea: what was the response?

- The response
  - IMF contributes 21b to 58.4b bailout (USD)
  - Government shuts down insolvent banks
  - Bankrupt firms sold or merged
  - FX reserves increased
  - Crisis rebranded locally as “IMF crisis”
- The result
  - Wages fell sharply
  - GDP rebounded in 1999

96



## Korea: GDP growth



Source: EIU, CountryData

97

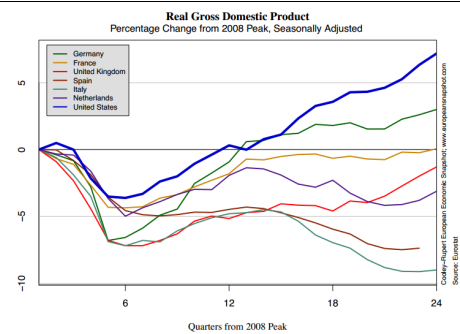
## Korea: crisis checklist

- Where did we go wrong?
  - Government debt and deficits
  - Financial system
  - Exchange rate and reserves
  - Politics and institutions

98

## Europe

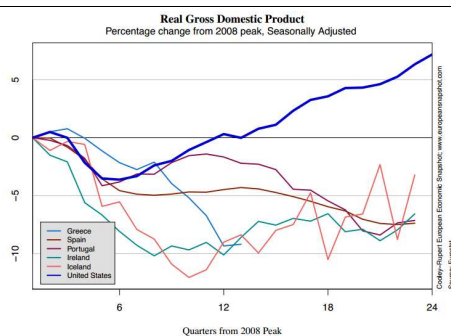
## Europe



Source: Cooley and Rupert, European Economic Snapshot.

100

## Europe



Source: Cooley and Rupert, European Economic Snapshot.

101

## Europe

- What's going on over there?
- Our goal: make this as simple as possible
- What's the trigger?
- My take
  - Sovereign debt problems
  - "Enabled" by Euro Zone
  - Exacerbated by common currency [how?]

102

## Europe

- The plan is to stop here
- The rest of these slides are just in case there are questions
- But Europe is way too complicated to put on an exam

103

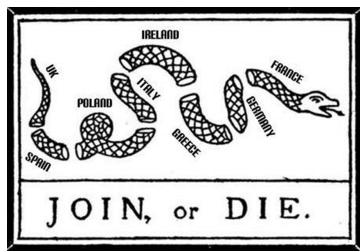
## Europe

- Edward Hugh, Fistful of Euros blog, May 2013:
  - The euro bares an uncanny resemblance to Dr Strangelove's doomsday machine, designed so that one day it would almost inevitably blow up the global financial system, but constructed so that any attempt to dismantle it would produce the same outcome.

104

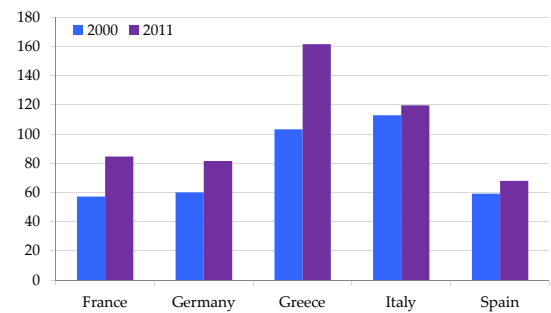
## Europe

- From former student Aaron Martin



105

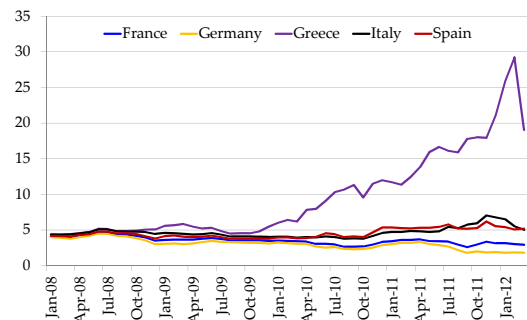
## Government debt (% of GDP)



Source: EIU, CountryData.

106

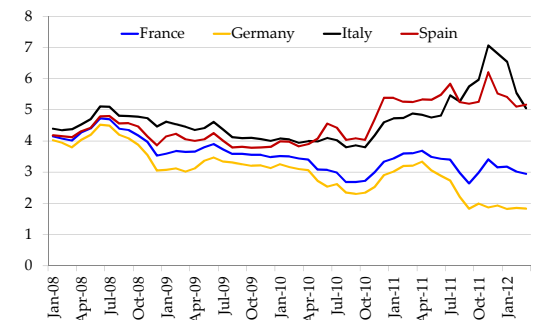
## Long-term government interest rates



Source: ECB, statistical data warehouse.

107

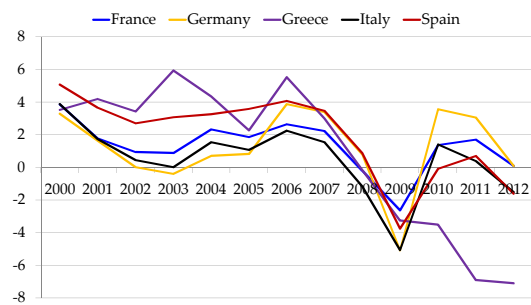
## Long-term government interest rates



Source: ECB, statistical data warehouse.

108

## GDP growth



Source: ECB, statistical data warehouse.

109

## The Articles of Confederation

- From Wikipedia
  - Under the Articles of Confederation, the central government's power was limited. The Congress — the only federal institution — was denied powers of taxation: it could only request money from the states. Most decisions, including modifications to the Articles, required unanimous approval of all thirteen state legislatures.
- Good structure or bad? Why?

110

## Europe

- European Union emerged from wreckage of WW II
  - Closer economic ties to connect countries, maintain peace
- Short history
  - Paris Treaty (1951): coal and steel community
  - Treaty of Rome (1957): more extensive free trade zone
  - Continued integration and expansion
  - Maastricht Treaty (1993) set up single currency and ECB

111

## Two currency unions

Common?	US	EU
Currency	Yes	Yes
Deposit insurance	Yes	No
Bank regulation	Yes	No
Fiscal policy	Yes	No
Political authority	Yes	No
Language	Yes	No
Olympic team	Yes	No
Army	Yes	No

112

## Europe

- Monetary Union came with conditions
  - Limits on debt and deficits
  - A “no-bailout” clause
- Why?
  - Attempt to reconcile centralized monetary policy and decentralized fiscal policy
- No exit plan

113

## Euro Zone as enabler

- Why could countries borrow at German rates?
- Euro Zone as “enabler”
  - Treaty limits on debt and deficits not enforced
  - National bank regulators accepted all sovereign debt as riskless
  - Payments system (TARGET2) leaves central banks of strong countries with claims on those of weak countries [implicit loans from Bundesbank to Greece, etc]
  - Free capital mobility plus national deposit insurance is an invitation to a bank run
  - No exit plan

114

## Euro Zone leadership vacuum

- Federal structure unworkable
  - Political power lies with the countries – also fiscal authority
  - Unanimous consent needed for everything
  - That's what killed the "Articles of Confederation"

115

## Euro Zone future

- Where from here?
  - More centralized "federal" system?
  - Or the reverse?
  - Slow response makes years of low growth more likely
  - Also rigid labor markets and other market restrictions

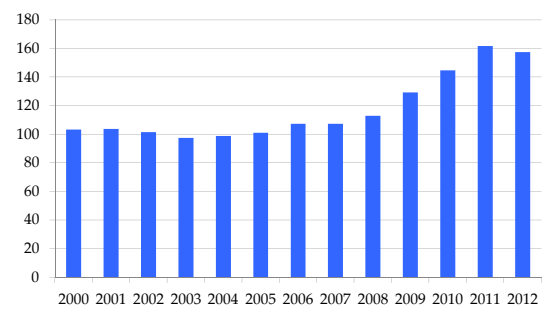
116

## Greece

- What's happening in Greece?

117

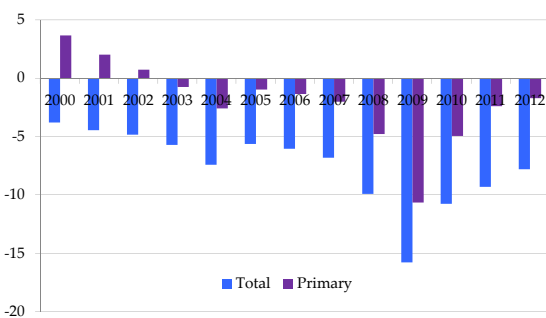
## Greece: government debt (% of GDP)



Source: EIU, CountryData

118

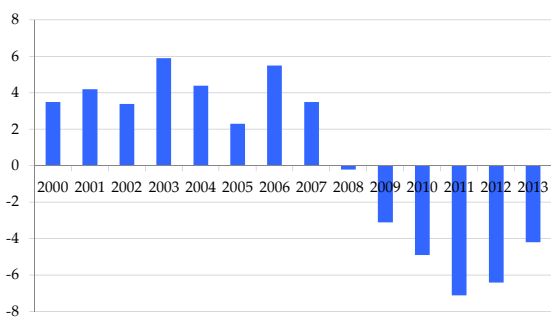
## Greece: government surpluses (% of GDP)



Source: EIU, CountryData

119

## Greece: GDP growth



Source: IMF, WEO.

120

## Greece

- What's happening in Greece?
  - Large government debt, suspect financial statements
  - Continuing deficits (high spending, poor tax collection)
  - Current debt likely insupportable without help
- Questions
  - Why were they able to sell debt at such low rates?
  - Why is this taking so long?
  - Would devaluation have helped?
  - Should they leave the Euro Area?

121

## Greece: crisis checklist

- Where did we go wrong?
  - Government debt and deficits
  - Financial system
  - Exchange rate and reserves
  - Politics and institutions

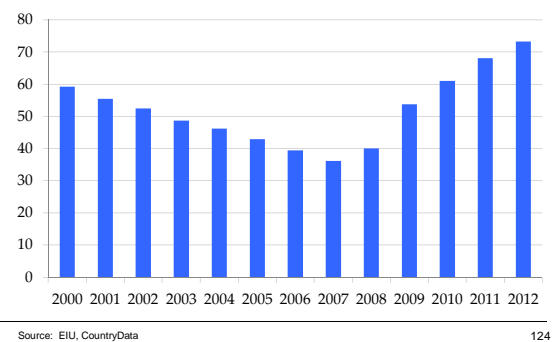
122

## Spain

- What's happening in Spain?

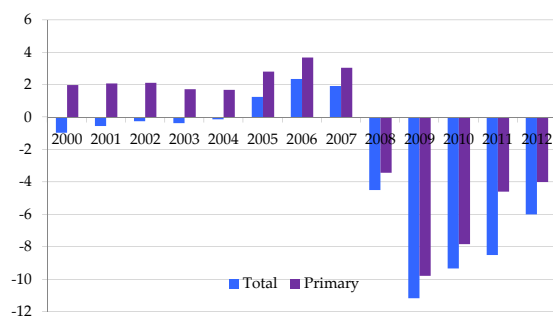
123

## Spain: government debt (% of GDP)



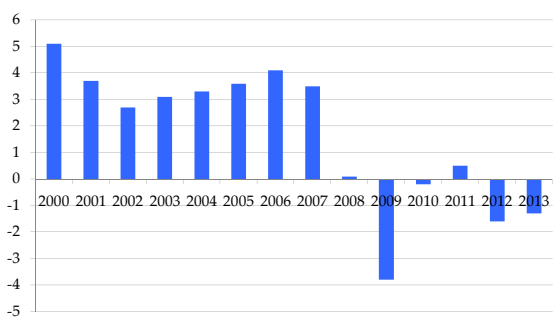
124

## Spain: government surpluses (% of GDP)



125

## Spain: GDP growth



126

## Spain

- What's happening in Spain?
  - Modest debt and deficits prior to crisis
  - Larger housing boom and bust than most
  - Downturn hit revenue hard, led to large deficits
  - Rigid labor markets likely slowing recovery
- Questions
  - How big are hidden liabilities of regional governments and "cajas"? [like Korea?]

127

## Spain: crisis checklist

- Where did we go wrong?
  - Government debt and deficits
  - Financial system
  - Exchange rate and reserves
  - Politics and institutions

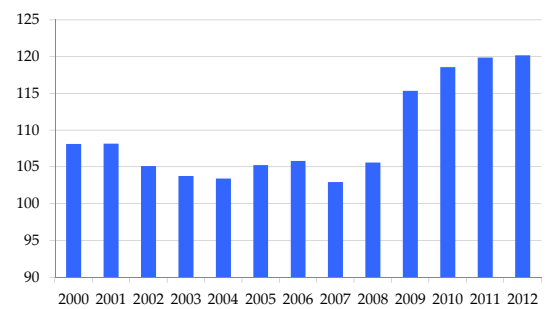
128

## Italy

- What's happening in Italy?

129

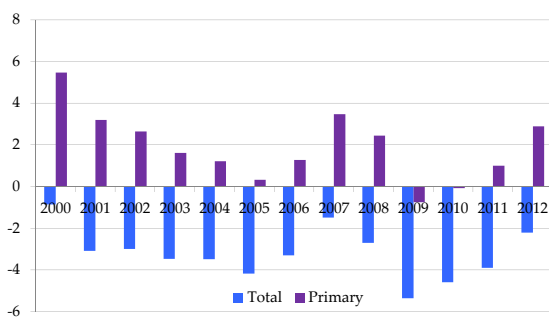
## Italy: government debt (% of GDP)



Source: EIU, CountryData

130

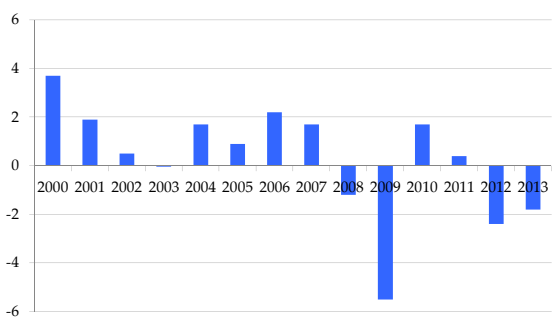
## Italy: government surpluses (% of GDP)



Source: EIU, CountryData

131

## Italy: GDP growth



Source: IMF, WEO.

132

## Italy

- What's happening in Italy?
  - Large debt prior to crisis, but deficits modest and primary balance is in surplus
  - Sharp increase in interest rate raised burden of debt
  - Problem is productivity and growth – there isn't any
  - Political system gridlocked?
- Questions
  - What will it take to restart economic growth?

133

## Italy: crisis checklist

- Where did we go wrong?
  - Government debt and deficits
  - Financial system
  - Exchange rate and reserves
  - Politics and institutions

134

## What have we learned?

- Crises happen
- Hard to predict, but signs of trouble include
  - Government debt and deficits
  - Financial sector weakness
  - Fixed, overvalued exchange rate
  - Weak political leadership, unstable politics
  - [aka "the checklist"]
- Europe's a complicated mess

135