

Econ 340

Lecture 14 Pegging the Exchange Rate

Lecture 14 Outline: Pegging the Exchange Rate

- How It's Done
 - Market Intervention
 - Bands of Fluctuation
 - Hybrids of Pegged and Floating
 - The Gold Standard
- Who Pegs?
- Mechanics of Intervention
 - Reserves
 - Money Supply
 - Sterilization
- Effects of Pegging
- Chinese Currency Manipulation

Econ 340, Deardorff, Lecture 14:
Pegging

2

How It's Done

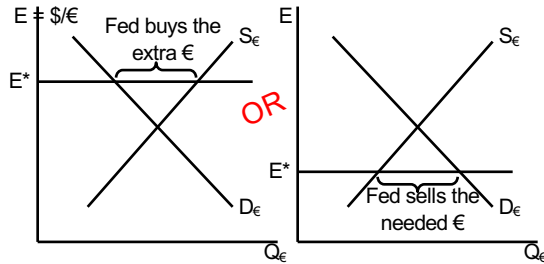
- What "Pegging" Means
 - To "fix" the exchange rate by intervening in the market
 - It does not mean just fixing it by law – making it illegal to exchange the currency at other than the official rate
 - Countries do that too, but that is not pegging, and it does not entirely work: gives rise to "black market"
 - "Intervention" means
 - Buying or selling foreign currency, so as to
 - Make up the difference between the market's supply and demand
 - Normally done by the central bank of the pegging country

Econ 340, Deardorff, Lecture 14:
Pegging

3

How It's Done

- Example: If the Fed were to peg the \$ to the € at rate E^* (Note: it does not do this!)



Econ 340, Deardorff, Lecture 14:
Pegging

4

How It's Done

- What "Pegging" Means
 - In practice, pegs are never exact
 - Central banks
 - Set a "par value" (= "central value")
 - Intervene only if rate moves some distance (e.g., 1%) above or below this par value
 - This range of movement is called an "exchange rate band"
 - We will ignore this complication in drawing the market, and pretend that they peg the rate exactly

Econ 340, Deardorff, Lecture 14:
Pegging

5

How It's Done

- Hybrids of Pegged and Freely Floating Exchange Rates
 - Managed Float
 - Intervene to influence the rate
 - But do not announce a target rate or par value
 - And do not necessarily keep the rate constant
 - "Dirty Float" = same as Managed Float

Econ 340, Deardorff, Lecture 14:
Pegging

6

How It's Done

- Hybrids of Pegged and Freely Floating Exchange Rates
 - “Leaning Against the Wind”
 - Particular form of managed float that
 - Does not try to alter the level of the exchange rate, but
 - Does try to slow its rate of change
 - Purpose: to dampen fluctuations

Econ 340, Deardorff, Lecture 14:
Pegging

7

How It's Done

- Hybrids of Pegged and Freely Floating Exchange Rates
 - Crawling Peg
 - A pegged rate with a par value that moves
 - Slowly
 - and
 - Predictably
 - Example: Country might announce that the par value will appreciate by 0.01% each week as long as central bank is buying foreign exchange, and vice versa

Note: All of these hybrids still do require intervention in the exchange market

Econ 340, Deardorff, Lecture 14:
Pegging

8

How It's Done

- The Gold Standard
 - Common in 19th century, but ended 1914.
 - Countries
 - Defined their currencies in terms of gold
 - Stood ready to buy and sell gold at their official rate
 - Result was like pegged exchange rates, except that the pegging was to gold.
 - “Rules” of the Gold Standard
 - Fix price of gold in terms of your own currency
 - Keep money supply equal gold supply (or proportional to it)
 - Be ready to redeem currency in terms of gold and allow gold (and thus money) to flow internationally
 - Implication of the gold standard: Changes in money supply (gold) equilibrate the markets

Econ 340, Deardorff, Lecture 14:
Pegging

9

Lecture 14 Outline: Pegging the Exchange Rate

- How It's Done
 - Market Intervention
 - Bands of Fluctuation
 - Hybrids of Pegged and Floating
 - The Gold Standard
- Who Pegs?
- Mechanics of Intervention
 - Reserves
 - Money Supply
 - Sterilization
- Effects of Pegging
- Chinese Currency Manipulation

Econ 340, Deardorff, Lecture 14:
Pegging

10

Who Pegs?

- US?
 - No
 - But we did have a pegged exchange rate until 1973
 - (Strictly speaking, it was other countries that pegged to us, not us to them)
 - In fact, from the late 1940s until 1973, virtually all countries pegged to the US dollar (exceptions were Canada, which sometimes floated, and several former colonies that pegged to the British pound or French franc)

Econ 340, Deardorff, Lecture 14:
Pegging

11

Who Pegs?

- Europe?
 - No: the euro floats freely
 - Before the euro, but after 1973,
 - Countries did not peg to currencies outside Europe
 - But they often did try to peg to each other
 - Denmark now pegs to the euro
 - Other EU countries outside the euro (UK, Sweden) and countries outside the EU (Switzerland, Norway) all have floating exchange rates

Econ 340, Deardorff, Lecture 14:
Pegging

12

Who Pegs?

- Other Developed Countries?
 - No: Canada, Japan, Australia, New Zealand, S. Korea all have floating rates

Econ 340, Deardorff, Lecture 14:
Pegging

13

Who Pegs?

- Developing Countries?
 - They are mixed
 - A sample (from IMF, 2008):
 - Argentina: pegged (to US dollar)
 - Brazil: float
 - Bulgaria: currency board (pegged to euro)
 - China pegged to dollar until summer 05, and July 08 to July 2010; now sometimes says it pegs to basket of currencies
 - Costa Rica: crawling peg
 - India: managed float
 - Egypt: managed float
 - Nepal: pegged (to India's rupee)

Econ 340, Deardorff, Lecture 14:
Pegging

14

Lecture 14 Outline: Pegging the Exchange Rate

- How It's Done
 - Market Intervention
 - Bands of Fluctuation
 - Hybrids of Pegged and Floating
 - The Gold Standard
- Who Pegs?
- Mechanics of Intervention
 - Reserves
 - Money Supply
 - Sterilization
- Effects of Pegging
- Chinese Currency Manipulation

Econ 340, Deardorff, Lecture 14:
Pegging

15

Mechanics of Intervention

- Always: Buy or sell foreign currency in exchange for domestic currency
- This has two effects, if nothing else is done:
 1. Changes the level of reserves of foreign currency
 2. Changes the level of the country's own domestic money supply in circulation

Econ 340, Deardorff, Lecture 14:
Pegging

16

Mechanics of Intervention

- Change in Central Bank's Reserves of Foreign Currency
 - What they buy is added to reserves
 - What they sell is subtracted from reserves

Econ 340, Deardorff, Lecture 14:
Pegging

17

Mechanics of Intervention

- Change in Country's Domestic Money Supply
 - When US Central Bank (CB) buys € with \$, those \$ go into circulation
 - This adds to the US money supply
 - (Actually, it adds even more, due to "money multiplier" you learned about in Econ 102)
 - When CB sells € for \$, those \$ come out of circulation
 - Reducing the money supply
 - Similar to Gold Standard

Econ 340, Deardorff, Lecture 14:
Pegging

18

Mechanics of Intervention

- Sterilization
 - However, Central Bank has the option of preventing this change in the money supply by “sterilization”
 - Sterilization = Use of offsetting open market operations to keep the money supply unchanged
 - Example: To sterilize a \$1 m. purchase of foreign currency, CB would sell \$1 m.-worth of bonds
 - This takes the \$1 m. back out of circulation
 - Sterilization is a policy choice
 - Central Bank can do it, or not, as it sees fit
 - Some central banks have said they lack the tools to sterilize
 - Most, if they intervene in the exchange market, do sterilize, thus preventing gold-standard-like adjustment

Econ 340, Deardorff, Lecture 14:

Pegging

19

Lecture 14 Outline: Pegging the Exchange Rate

- How It's Done
 - Market Intervention
 - Bands of Fluctuation
 - Hybrids of Pegged and Floating
 - The Gold Standard
- Who Pegs?
- Mechanics of Intervention
 - Reserves
 - Money Supply
 - Sterilization
- Effects of Pegging
- Chinese Currency Manipulation

Econ 340, Deardorff, Lecture 14:

Pegging

20

Effects of Pegging

- Case I: Dollar Over-valued
 - In this case (unlike PPP), “overvalued” means the dollar is being pegged at a rate that is above (i.e., appreciated relative to) the market-clearing rate
 - Which means that the actual exchange rate, E , the price of foreign currency, is below the market-clearing rate, E_0
 - At the overvalued exchange rate, there is excess demand for foreign currency, which CB must provide by selling out of reserves. Thus reserves fall.
 - If it does not sterilize, then the money supply also shrinks
 - If it does sterilize, then it buys bonds

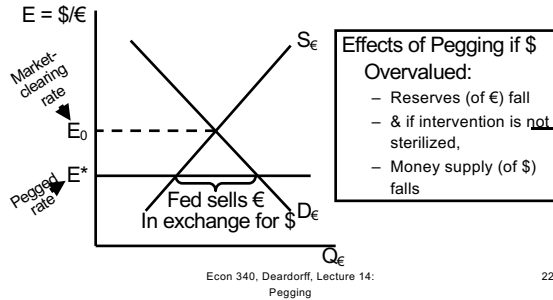
Econ 340, Deardorff, Lecture 14:

Pegging

21

Effects of Pegging

- Peg if \$ Overvalued



Effects of Pegging

- Further implication of an overvalued peg
 - If it continues, central bank must eventually run out of reserves
 - This, as we'll see, causes a Crisis
 - Exchange-rate crisis, or
 - Financial crisis

Econ 340, Deardorff, Lecture 14: Pegging

23

Effects of Pegging

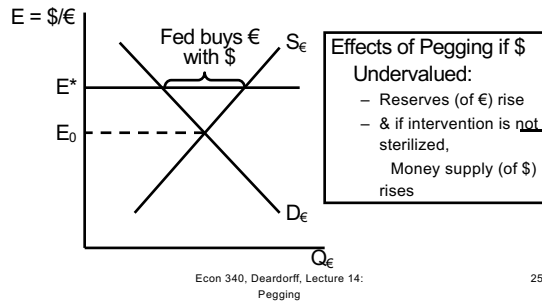
- Case II: Dollar Under-valued
 - In this case, "undervalued" means the dollar is being pegged at a rate that is below (i.e., depreciated relative to) the market-clearing rate
 - Which means that E , the price of foreign currency, is above the market-clearing rate, E_0
 - At undervalued rate, there is excess supply of foreign currency, which CB must take out of the market by buying and adding to reserves
 - If it does not sterilize, then the money supply grows
 - If it does sterilize, then it sells bonds

Econ 340, Deardorff, Lecture 14: Pegging

24

Effects of Pegging

- Peg if \$ Undervalued



Effects of Pegging

- Further implication of an undervalued peg
 - Nothing critically important
 - If it continues, Central Bank piles up more and more reserves, but there is no limit on its ability to do that
 - Result: No crisis
 - However, if it does not sterilize, then money supply grows too, and this may cause inflation

Econ 340, Deardorff, Lecture 14:
Pegging

26

Effects of Pegging

- Note the asymmetry:
 - Overvalued peg leads to crisis
 - Undervalued peg does not

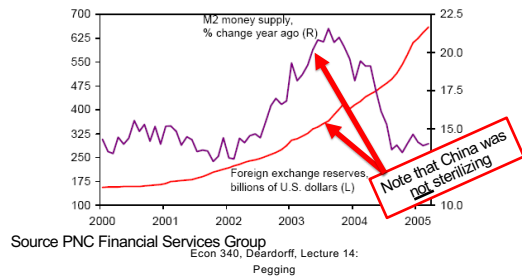
Econ 340, Deardorff, Lecture 14:
Pegging

27

Effects of Pegging

- Example of Undervalued Peg: China

Global Imbalances Reflected In Growth Of Reserves



Effects of Pegging

- A Special Case: The US Dollar
 - Most countries that peg their currencies, peg them to the US dollar
 - That means that their reserves are dollar-denominated assets, mostly US gov't bonds
 - If they keep their currencies undervalued, then that means the dollar is overvalued
 - But the overvalued dollar need not lead to crisis
 - Others want, need, or at least choose, to hold our dollars

Econ 340, Deardorff, Lecture 14:
Pegging

29

Effects of Pegging

- A Special Case: The US Dollar (see Ferguson)
 - Most of US foreign borrowing is being met by foreign central banks
 - That means they are holding reserves, a result of buying dollars to
 - Keep their currency down
 - Keep the US dollar up
 - Or just to have dollars available in case of crisis
 - We benefit from the high dollar: we can buy cheap goods and services
 - But we borrow in dollars in order to do it
 - If others were to stop lending, then the dollar would fall and so would the value of our debt, which they hold!
 - Thus it is "their problem," not ours!

Econ 340, Deardorff, Lecture 14:
Pegging

30

Effects of Pegging

- A Special Case: The US Dollar vs Chinese Renminbi (see Levy)
 - Many US policymakers disagree: Thus US has pressured China to appreciate the yuan
 - Why? To make it easier to sell US goods
 - Congress threatens trade barriers against China
 - Might have once been legal under Section 421, special "China safeguard" negotiated with China's WTO accession, but that has now expired.
 - Instead Trump is using tariffs on China for other reasons

Econ 340, Deardorff, Lecture 14:
Pegging

31

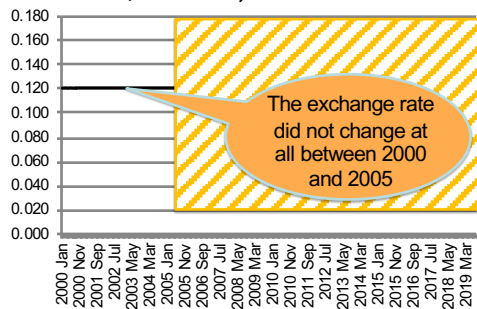
Effects of Pegging

- A Special Case: The US Dollar vs Chinese Renminbi (see Levy)
 - Levy argues
 - Tariffs against China won't work
 - We'll just switch to importing from other low-cost countries
 - US trade deficit (due to our low saving) will be unchanged
 - To really have an effect and send a message, we should: Reduce government spending!

Econ 340, Deardorff, Lecture 14:
Pegging

32

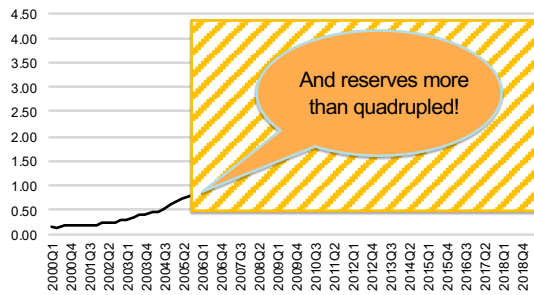
China's Exchange Rate, US\$/Yuan, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

33

China's Reserves, \$ trillions, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

34

Effects of Pegging

- A Special Case: The US Dollar vs Chinese Renminbi
 - It is clear from the two graphs that
 - China was pegging their currency to the US dollar in 2000-2005
 - To do so they were buying dollars and thus accumulating almost \$1 trillion of reserves

Econ 340, Deardorff, Lecture 14:
Pegging

35

Effects of Pegging

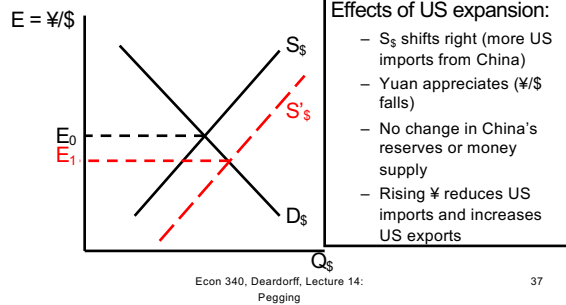
- Example: To see the effects on US of China pegging versus floating,
 - Consider the Chinese foreign exchange market (for \$)
 - Suppose the US economy expands, increasing US imports from China.
 - What will happen if
 - The renminbi floats?
 - Or, instead, if
 - The renminbi is pegged to the US dollar?
 - We'll look at China's market for foreign exchange, where their foreign currency is the dollar

Econ 340, Deardorff, Lecture 14:
Pegging

36

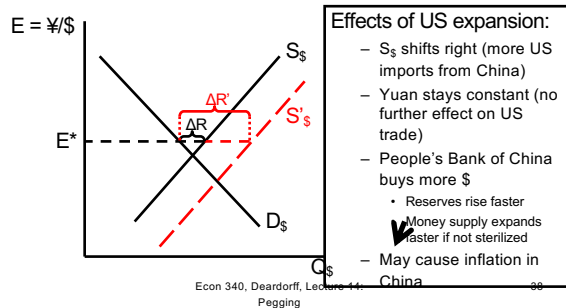
Effects of US Expansion on China if Renminbi is Floating

- US expansion if renminbi is floating



Effects of US Expansion on China if Renminbi is Pegged

- US expansion if renminbi is pegged



Effects of Pegging

- Implication of Example:
 - Something always changes in the exchange market when changes occur for trade, capital flows, or other transactions
 - Exchange rate changes if floating
 - Reserves (and maybe money supply) change if pegged

Lecture 14 Outline: Pegging the Exchange Rate

- How It's Done
 - Market Intervention
 - Bands of Fluctuation
 - Hybrids of Pegged and Floating
 - The Gold Standard
- Who Pegs?
- Mechanics of Intervention
 - Reserves
 - Money Supply
 - Sterilization
- Effects of Pegging
- Chinese Currency Manipulation

Econ 340, Deardorff, Lecture 14:
Pegging

40

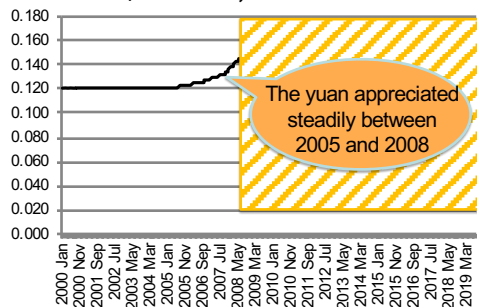
Chinese Currency Manipulation

- We saw in the graphs above that China was intervening in 2000-2005 to keep the value of its currency down
- This led policy makers in the US to complain, and in 2005 China let its currency rise

Econ 340, Deardorff, Lecture 14:
Pegging

41

China's Exchange Rate, US\$/Yuan, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

42

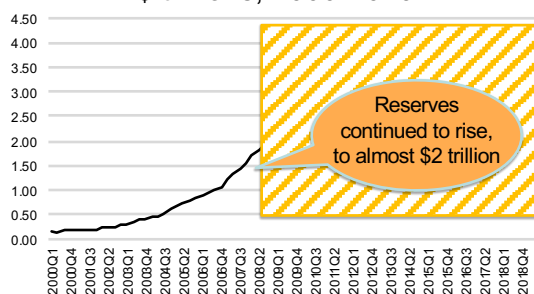
Chinese Currency Manipulation

- But China's reserves continued to rise, indicating that it was still buying dollars.

Econ 340, Deardorff, Lecture 14:
Pegging

43

China's Reserves, \$ trillions, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

44

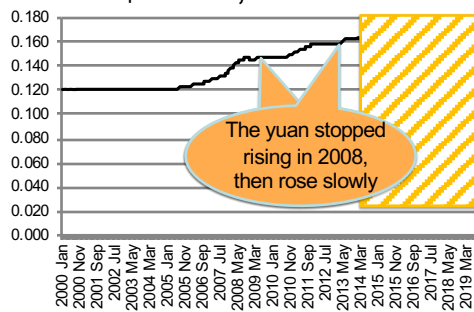
Chinese Currency Manipulation

- The financial crisis of 2008 slowed down both
 - The appreciation of the renminbi, and
 - The growth of reserves

Econ 340, Deardorff, Lecture 14:
Pegging

45

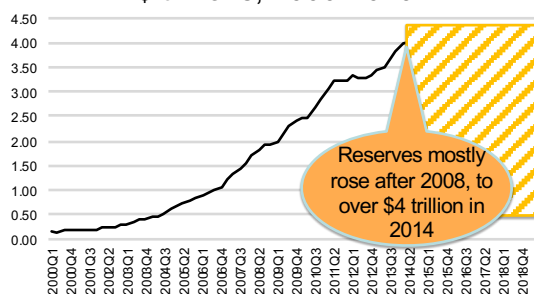
China's Exchange Rate, US\$/Yuan, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

46

China's Reserves, \$ trillions, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

47

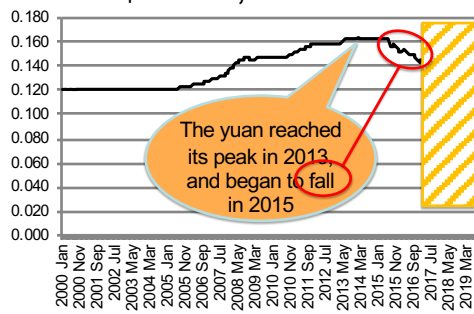
Chinese Currency Manipulation

- The financial crisis of 2008
 - Slowed down the appreciation of the renminbi, off and on
 - But reserves continued to grow rapidly in most periods until 2014
 - China's purchases of US dollars were still holding down the yuan's value, or slowing its rise
- But all that changed in 2014

Econ 340, Deardorff, Lecture 14:
Pegging

48

China's Exchange Rate, US\$/Yuan, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

49

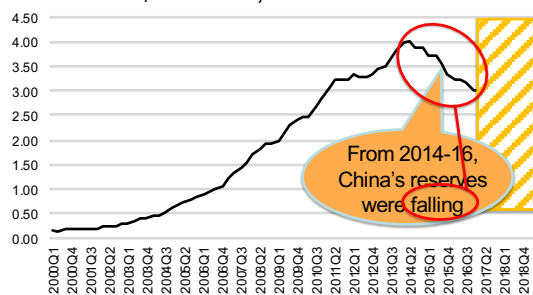
US\$/Yuan 2016-17



Econ 340, Deardorff, Lecture 14:
Pegging

50

China's Reserves, \$ trillions, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

51

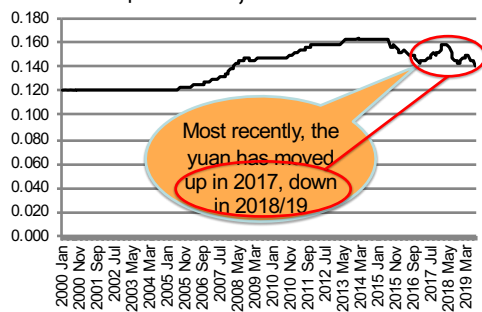
Chinese Currency Manipulation

- Conclusion:
 - China did intervene extensively 2000-2014,
 - Sometimes to keep the yuan from moving,
 - Other times to slow its rise
 - But since then, until 2017,
 - Although the yuan was falling in value until 2017,
 - This was in spite of Chinese intervention, not because of it
 - They sold close to \$1 trillion of reserves, slowing its fall (over \$1 trillion as of March 2017)

Econ 340, Deardorff, Lecture 14:
Pegging

52

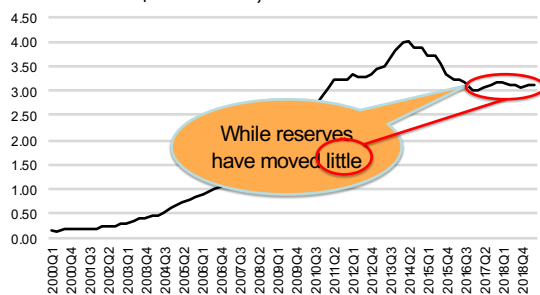
China's Exchange Rate, US\$/Yuan, 2000-2018



Econ 340, Deardorff, Lecture 14:
Pegging

53

China's Reserves, \$ trillions, 2000-2019



Econ 340, Deardorff, Lecture 14:
Pegging

54

US\$/Yuan 2017-18



Econ 340, Deardorff, Lecture 14:
Pegging

55

US\$/Yuan 2018-19



Econ 340, Deardorff, Lecture 14:
Pegging

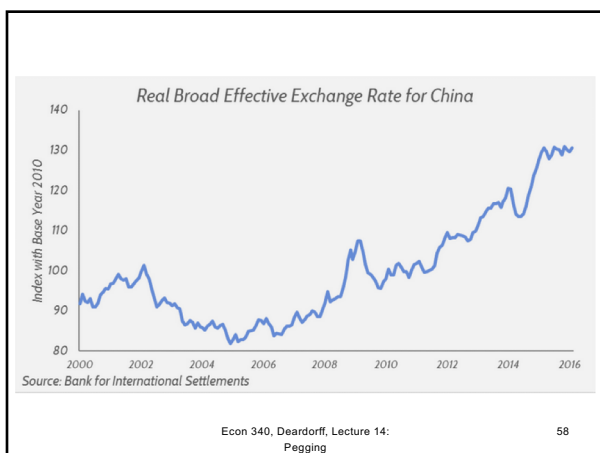
56

Chinese Currency Manipulation

- See Varas
 - Varas notes that China fixed its exchange rate from 1995 to 2005, consistent with the graph above
 - But she also shows the following graph, which shows the value of the yuan
 - Moving first up, then down, in 2000-2005
 - Then rising steadily ever since, except for
 - A big drop after the 2008 crisis
 - And a smaller drop in 2015

Econ 340, Deardorff, Lecture 14:
Pegging

57

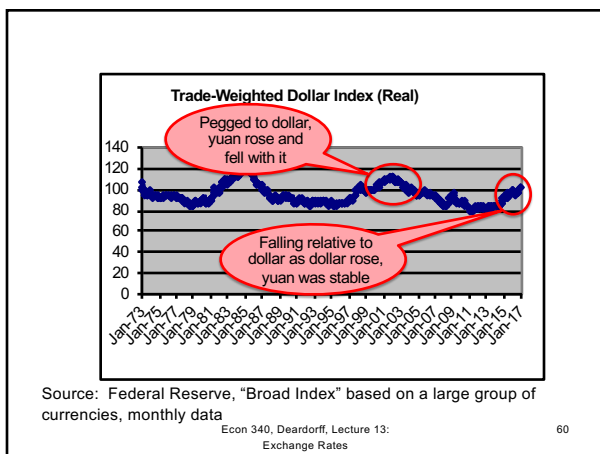


Chinese Currency Manipulation

- Why does Varas disagree with my graphs?
 - Hers is the “Real Broad Effective Exchange Rate”
 - Since the renminbi was pegged to the US dollar 2000-2005, it rose and fell with the dollar relative to other currencies
 - See the Graph of the Trade-Weighted Dollar from the last lecture

Econ 340, Deardorff, Lecture 14: Pegging

59



Chinese Currency Manipulation

- Conclusion from both Varas and these graphs:
 - China did manage its exchange rate and limited its appreciation until fairly recently
 - During 2014-16, however, China acted to raise its currency's value, not to lower it
 - And since 2016, it has hardly intervened at all
 - It has not, throughout this time span, ever acted deliberately to depreciate the yuan
 - Therefore China has not been a currency manipulator

Econ 340, Deardorff, Lecture 14:
Pegging

61

Next Time

- International Macroeconomics
 - Macro Effects ON the Exchange Market
 - Macro Effects OF the Exchange Market
 - Macro Effects THROUGH the Exchange Market

Econ 340, Deardorff, Lecture 14:
Pegging

62
