NYU STERN

The Global Economy
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Practice Problems D: Exchange Rates & Crises

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This will not be collected or graded, but it's a good way to make sure you're up to speed. We recommend you do it before the next class.

1. *Purchasing power parity for Big Macs.* The Economist reports the following data for local prices of Big Macs and US dollars in July 2014:

	Big Mac Price (Local Currency) (A)	Exchange Rate (LCUs per Dollar) (B)
Argentina	21	8.17
Brazil	13	2.22
China	16.9	6.20
Euro Area	3.68	0.74
Japan	370	101
United States	4.80	1.00

LCU = Local Currency Units, USD = US dollars

(a) What is the dollar price of a Big Mac in each of these locations?

(b) Which country has the cheapest Big Macs?

(c) What exchange rates for the first three currencies would equate the dollar prices of Big Macs to the US price?

(d) Based on Big Mac prices, which currencies would you say are undervalued relative to the US dollar?

Solution: The calculations are summarized in the embedded spreadsheet: download this pdf file, open it with the Adobe Reader or the equivalent, and click on the pushpin:

(a) Dollar prices of Big Macs are reported in the spreadsheet as column (C), computed as (A)/(B). USD prices range from 2.57 (Argentina) to 5.86 (Brazil).

(b) Argentina.

(c) Column (D) in the spreadsheet has the "Big Mac parity" rates: 4.38 LCUs per dollar in Argentina, 2.71 in Brazil, and 3.52 in China.

(d) Here we're comparing the market price [column (B)] to the Big Mac parity [column (D)]. In column (E) we compute the under/overvaluation as a percentage: 100*[(D)/(B)-1]. We see that the Argentina peso is 46% undervalued by this measure, and the Chinese RMB is 43% undervalued.

2. *Foreign exchange reserves.* Countries often buy and sell foreign currency as part of their day-to-day central bank operations.

   (a) Describe the central bank's balance sheet. Where do foreign exchange reserves appear?

   (b) If private citizens choose to buy foreign currency from the central bank, what happens to the central bank's balance sheet? What limits how much of this the central bank can do?

Solution:

(a) The balance sheets look something like this:

Central Bank

Assets		Liabilities	
Bonds	10	Money	20
FX reserves	10		

Households & firms (everyone else)

Assets		Liabilities	
Money	10		
FX	50		
Bonds	180		

Foreign exchange reserves are an asset of the central bank.

(b) Suppose private citizens buy 5 worth of "FX" (foreign currency) from the central bank, paying in local currency (money). Balance sheets change like this:

Central Bank

Assets		Liabilities	
Bonds	10	Money	15
FX reserves	5		

Households & firms (everyone else)

Assets		Liabilities	
Money	5		
FX	55		
Bonds	180		

The central bank's ability to do this trade is limited by the quantity of reserves it holds. Once it runs out, it either finds a way to get more or stops trading currencies.

3. *The trilemma in action.* In 1992, the Bank of England found that its commitment to maintain a quasi-fixed parity of the pound against the Deutschemark forced it to raise short-term interest rates during a recession. What were its choices? How does this illustrate the trilemma?

Solution: The trilemma says you can have at most two of these three things: (i) independent monetary policy, (ii) fixed exchange rate, and (iii) free capital mobility.

In the UK in 1992, they took (iii) as given, but tried to get both (i) and (ii) as well. The economy was in a recession, so the central bank wanted to lower interest rates. But that conflicted with their agreement to maintain a quasi-fixed exchange rate with European currencies, including the Deutschemark. In the end, they kept (i) and abandoned (ii).

4. *Crisis triggers.* Economic crises have been with us throughout recorded history. Although they often come as a surprise, their forms are familiar from past experience.
   (a) What are the classic crisis triggers?
   (b) What indicators would you use to assess each source of crisis risk?
   (c) What are the standard responses to each one?

(d) What would you do now if you were the benevolent dictator of the European Union?

Solution:

(a) Classic triggers: government debt, finance/banking, and fixed exchange rates.

(b) Common indicators:

- Government debt: lots of debt, continuing deficits, and (most important) the political situation.
- Banking: not part of this course, but analysts would look at capital ratios, nonperforming loans, and asset problems in the economy (real estate is a standard source of problems dating back to Roman times).
- Fixed exchange rate: overvaluation either from PPP or compared to the recent past, reserves.

(c) Common responses:

- Government debt: fiscal discipline, perhaps an IMF program to indicate commitment and finance a transition period.
- Banking: if the issue is illiquidity, the central bank supplies liquidity to the financial system; if the issue is insolvency, it's important to recapitalize the system and get it working again.
- Fixed exchange rate: give it up, let the currency float.

(d) Where do we start?