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Lecture #6: Exchange Rates in the Short Run and the Long Run (chapter 14 in KG)

1. Exchange Rates in the Short Run. The Zero Bound on Interest Rates.

   (a) Why Can't Market Interest Rates be Negative?

      i. No one would want to lend. Imagine a lender with $i = -0.10$ (i.e., the interest rate is minus 10 percent). In this situation, if you lend \$1.00, you get \$0.90 back later. Note that you could make more money simply by sitting on your money. If you just sit on your dollar, you still have the dollar at the end of the period. Clearly, you 'make' more money sitting on money than lending it out when the interest rate is negative.

      ii. Borrowers would like to borrow and infinite amount with $i = -0.10$. A person who borrows \$1.00 at $i = -0.10$ has to pay back only 90 cents, and gets to keep 10 cents for themselves. So, borrowing is free money. Might as well try to borrow an infinite amount!

      iii. So, with a negative rate of interest, supply would be zero and demand infinite, in the loan market. Markets for foreign exchange cannot clear under these circumstances!

   (b) Suppose the interest rate is zero. In this range the money demand equation must be flat. Open market purchases of government debt (i.e., increases in the money supply) when the interest rate is zero will induce no change in the interest rate. That's because people will be indifferent between government debt and money when the interest rate is zero (how would the analysis be affected if we took into account the liquidity advantages of money).

   (c) Later we will learn that a central bank, by temporarily increasing the money supply (i.e., not changing E^e) can depreciate its own currency, and this may help stimulate its economy. Can the central bank, by temporarily reducing its money supply, engineer a depreciation of the currency if the domestic rate of interest is zero? No, if UIP holds. In this case, the only way it can hope to obtain a depreciation of its currency is to get the rest of the world to reduce its money supply. Let's see why.

      i. Let the 'domestic' government be Japan, so that $R_Y = 0$. Then, from the point of view of Americans, UIP implies:

$$R_\$ = 0 + \frac{E^e - E}{E},$$

where E is the number of dollars per Japanese yen. Under UIP, if Japanese assets generate zero interest, then there must be an anticipated appreciation of the Japanese yen (i.e., $E^e > E$).

ii. Under UIP, to the American all assets (abstracting from risk and liquidity issues) are equivalent: they generate the same expected return. What does it mean when it comes to the assets of some country (say, Japan), where the interest rate is essentially *zero*? It means that the anticipated appreciation of that country's currency (i.e., the anticipated *depreciation* of the value of the dollar versus that currency) must be equal to the dollar rate of return on American assets, $R_\$$.

iii. Suppose the Japanese central bank buys 1 US dollar from an American, in exchange for Japanese Yen. To the American, it's the same as if he has just acquired a US government security and given up a US dollar. It has the same effect as if the Federal Reserve had done an open market purchase of 1 US dollar. If that were to happen, then $R_\$$ would rise and E would fall...the dollar would appreciate and the Yen would depreciate. But, notice that this happened because the Federal Reserve allowed the US money supply to decrease.

iv. Suppose that the US Federal Reserve does *not* wish to see the US money supply decrease. Then, it would do an open market purchase of US government debt. What would the effect of the Japanese and US central bank actions be? The net effect would be to increase Americans' holdings of Yen and decrease their holdings of US government debt. Since, by UIP, these are the same assets when $R_Y = 0$, there is no need for any market price or exchange rate to change.

v. Conclusion: when $R_Y = 0$, if the Japanese central bank wants to depreciate the Japanese Yen, it must convince the US Fed to reduce the US money supply. Just increasing the amount of Yen in the world, while keeping US money stock unchanged will have no effect on anything when $R_Y = 0$, according to UIP.

vi. Looking at Japanese data (see attached), we see how the Japanese central bank has driven the interest rate (this is the central bank's discount rate, the interest rate it charges for loans to Japanese banks) down to zero. It has been at zero this year, a time when the Japanese Yen has appreciated.

2. The Long Run (we didn't get to this last time).

(a) A permanent increase in M results, in long run, in a proportional increase in P and no change in R, Y.

(b) Rationale:

   i. Permanent increase in M is much like a currency reform, and don't expect this to impact on R or Y.

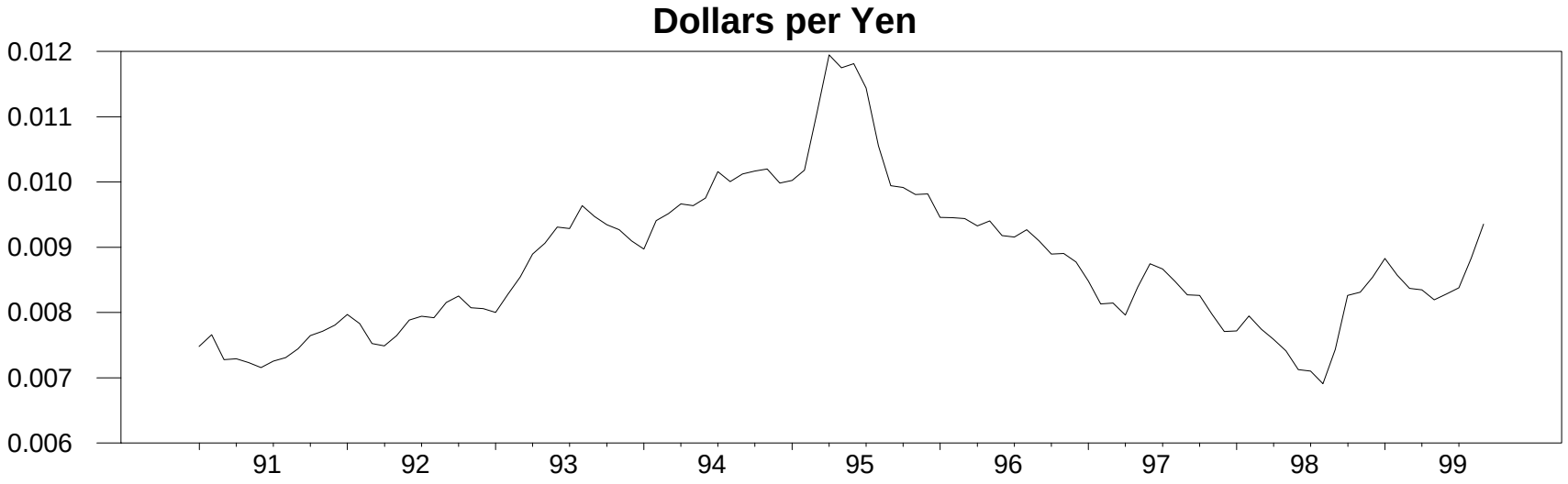
   ii. Countries with big increases in M have big increases in P (see Italy in Figure 14-10, and the Latin American countries in the case study on page 386, and attached data on Bolivia, taken from page 391 of KG).

(c) A permanent increase in M results, in the long run, in a proportional increase in E.
Rationale:

   i. countries with big rise in M also have big depreciations. Example: Bolivia data on attached figure, taken from page 391 of KG.

   ii. E is a price (it's the number of dollars it takes to buy one unit of foreign currency), so the notion that, in long run, E rises in proportion to rise in M seems consistent with notion that all the prices summarized in P rise in proportion to M in the long run.

(d) Experiment: Permanent increase in US money supply. Important result: exchange rate overshooting.


Dollars per Yen
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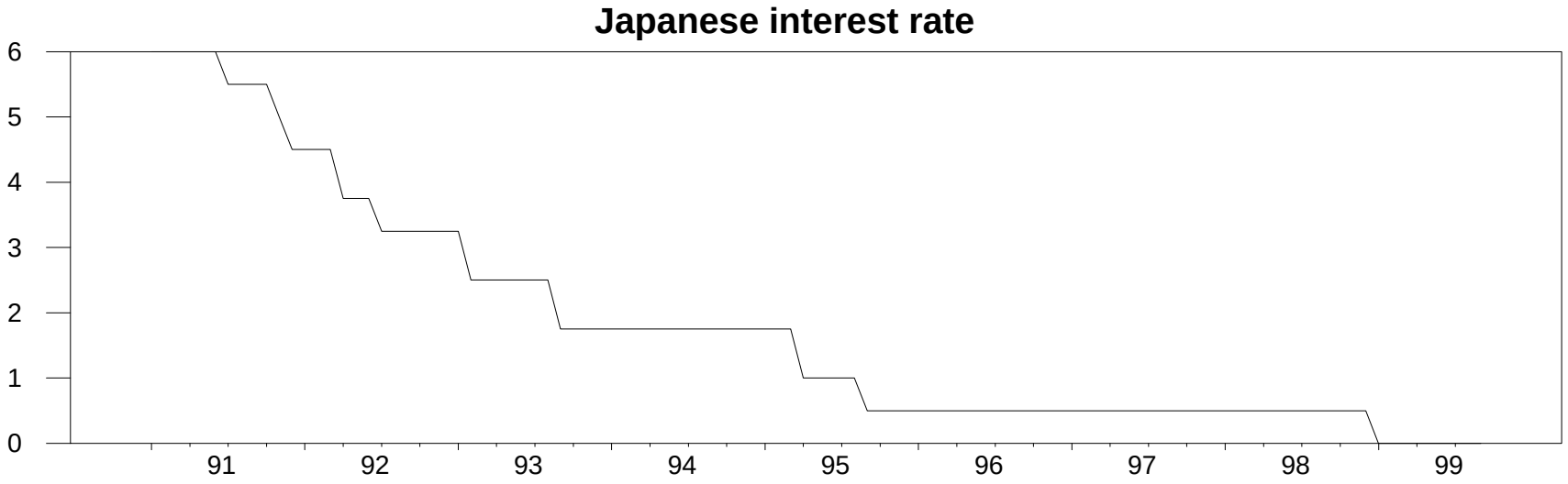
Japanese interest rate
6
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4
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99