

::Solutions::

Problem Set #2: Due end of class October 2, 2018

You may discuss this problem set with your classmates, but everything you turn in must be your own work.

Questions 1–3 are based on chapter 14, questions 7 and 8 in the textbook.

Questions 7–8 are based on chapter 15, question 1 in the textbook.

1. Consider two countries: Japan and Korea. Japan's real output growth is 1% and in Korea, real output growth is 6%. The Bank of Japan has a money growth rate of 2% and the Bank of Korea has a money growth rate of 12%. [All growth rates are annual.]

- (a) What is the inflation rate in Japan? In Korea?

$$\pi_J = \mu_J - g_J = 2\% - 1\% = 1\%$$

$$\pi_K = \mu_K - g_K = 12\% - 6\% = 6\%$$

- (b) What is the expected rate of depreciation of the Korean Won to the Japanese Yen?

$$d_{W/\text{¥}} = \pi_K - \pi_J = 6\% - 1\% = 5\%$$

- (c) What theory are you using to make the calculation in part (b)? When is the theory valid?

We are use relative PPP. The theory is valid when prices are flexible, which we think of as the long run.

- (d) If the Bank of Korea would like to fix their exchange rate against the Japanese Yen, what money supply growth rate should it choose? [Hint: A fixed exchange rate is constant.]

$$d_{W/\text{¥}} = \pi_K - \pi_J$$

$$0 = \pi_K - 1\%$$

So Korea needs a 1% inflation rate. This means that Korea needs a 7% money growth rate:
 $\pi_K = 7\% - 6\% = 1\%$.

2. Consider two countries: Japan and Korea. Japan's real output growth is 1% and in Korea, real output growth is 6%. The Bank of Japan has a money growth rate of 2% and the Bank of Korea has a money growth rate of 12%. [All growth rates are annual.] For the following questions, assume that prices are perfectly flexible.

Answer the following questions using the quantity theory of money in which L is constant. Treat Korea as the home country and Japan as the foreign country.

- (a) Suppose the money growth rate in Korea increases from 12% to 15%. If nothing changes in Japan, what is the new inflation rate in Korea?

$$\pi_K = 15\% - 6\% = 9\%$$

- (b) Using time series diagrams, illustrate how the change in Korea's money supply growth rate affects Korea's: money supply M_K , interest rate i_K , prices P_K , real money supply M_K/P_K , and exchange rate, $E_{\text{Won}/\text{Yen}}$. [See figure 14-6 in the textbook or our notes from class for examples.]

See the figures at the end.

3. Repeat your analysis from 2(b) using the quantity theory of money with interest-sensitive liquidity preference, $L(i)$.

See the figures at the end.

4. What is real interest parity? Is this a "long-run" or "short-run" result?

Real interest parity is the idea that the expected real interest rate should be the same across countries in the long run.

5. Real interest parity is the result of two other “parity conditions.” Name them and provide a formula for each. To be concrete, use dollars and pounds in your equations.

1. Uncovered interest parity

$$d_{\$/\pounds}^e = i_{\$} - i_{\pounds}$$

2. Relative PPP (in expectation)

$$d_{\$/\pounds}^e = \pi_{us}^e - \pi_{uk}^e$$

6. Derive real interest parity from the two equations you listed in question 5.

Set the two equations equal to each other

$$i_{\$} - i_{\pounds} = \pi_{us}^e - \pi_{uk}^e$$

$$i_{\$} - \pi_{us}^e = i_{\pounds} - \pi_{uk}^e$$

$$r_{us} = r_{uk}$$

7. Use money market and FX diagrams [an example is figure 15-7 in the textbook] to answer the following questions about the relationship between the British pound and the U.S. dollar. Use the dollar-pound exchange rate $E_{\$/\pounds}$. How does a change in the U.S. money supply affect interest rates and exchange rates? On all graphs, label the initial equilibrium point A .

- (a) Illustrate how a **temporary** decrease in the U.S. money supply affects the money and FX markets. Label the short-run equilibrium point B .

See the figures at the end.

- (b) How do the following variables change (increase/decrease/unchanged) in the short run? Use your figure from part (a) as necessary to evaluate the U.S. interest rate, British interest rate, the exchange rate, the expected exchange rate, and the U.S. price level.

- U.S. interest rate increases
- British interest rate unchanged
- The dollar-pound fx rate falls (the dollar appreciated)
- The expected exchange rate is unchanged
- The U.S. price level is unchanged

8. Repeat your analysis in question 7 but consider a **permanent** decrease in the U.S. money supply. Use a new set of graphs. Again, label the initial equilibrium point A .

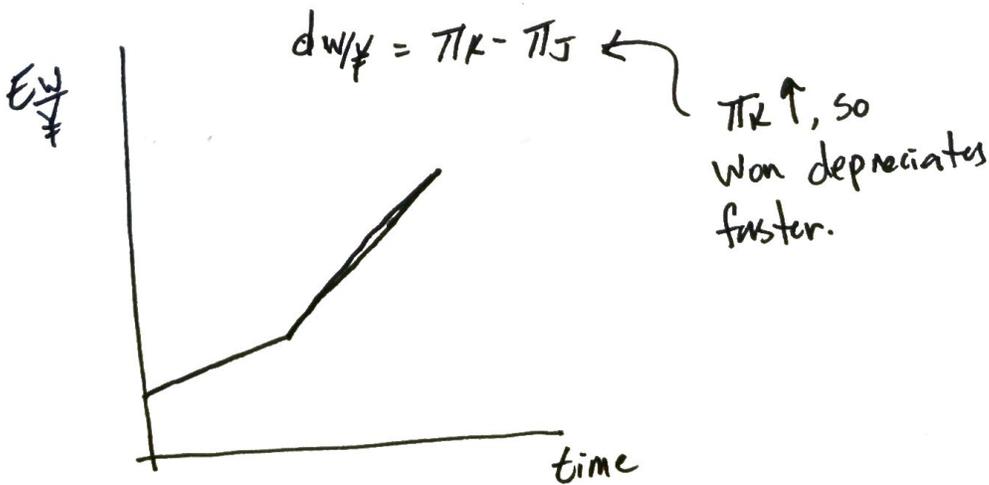
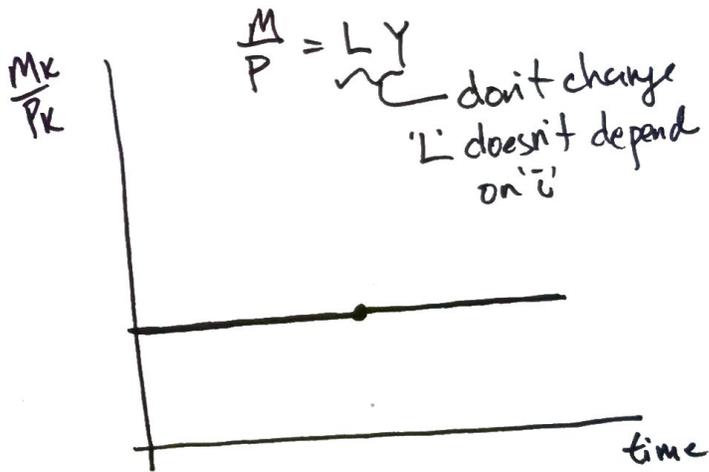
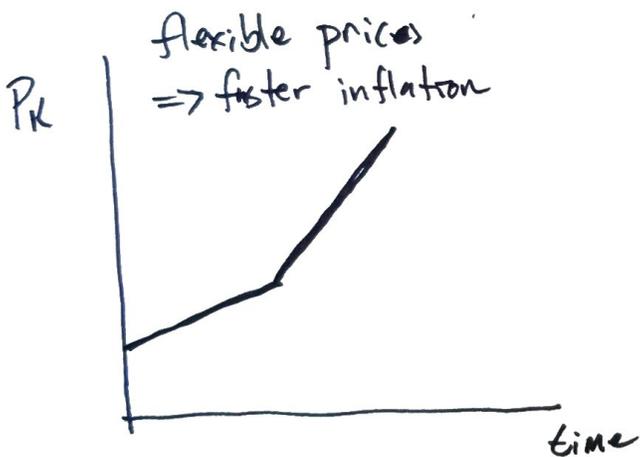
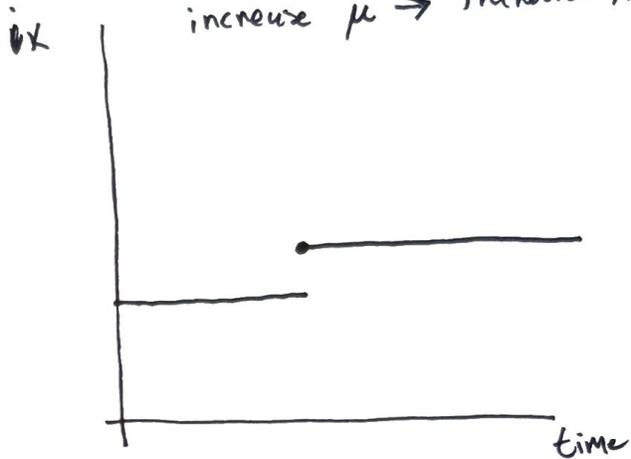
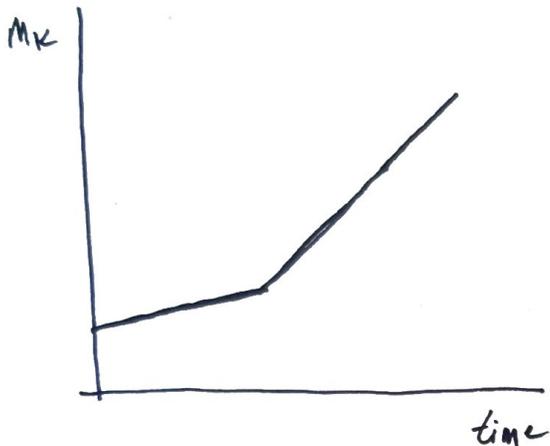
- (a) Illustrate how a **permanent** decrease in the U.S. money supply affects the money and FX markets. Label the **long-run equilibrium** point B . [Reminder: In the long-run prices are perfectly flexible.]
- (b) How do the following variables change (increase/decrease/unchanged) in the long run? Use your figure from part (a) as necessary to evaluate the U.S. interest rate, British interest rate, the exchange rate, the expected exchange rate, and the U.S. price level.

- U.S. interest rate unchanged
- British interest rate unchanged
- The dollar-pound fx rate falls (although less than in the short run)
- The expected dollar-pound fx rate falls (in the long run the fx rate and the expected fx rate are the same)
- The U.S. price level falls

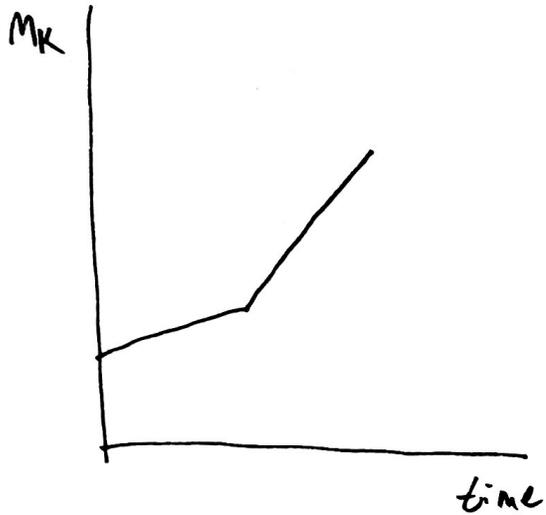
QUESTION 2 (B):

$$\dot{u}_K = \pi^e + r^*$$

increase $\mu \rightarrow$ increase π & π^e



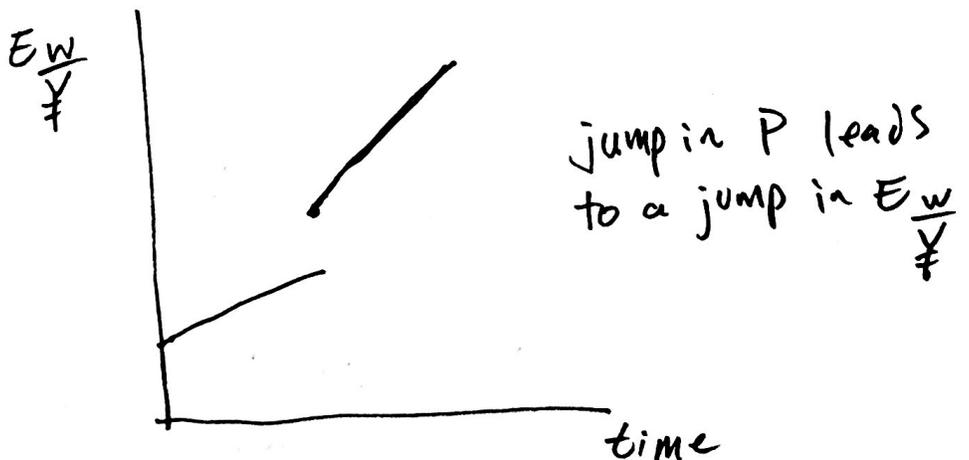
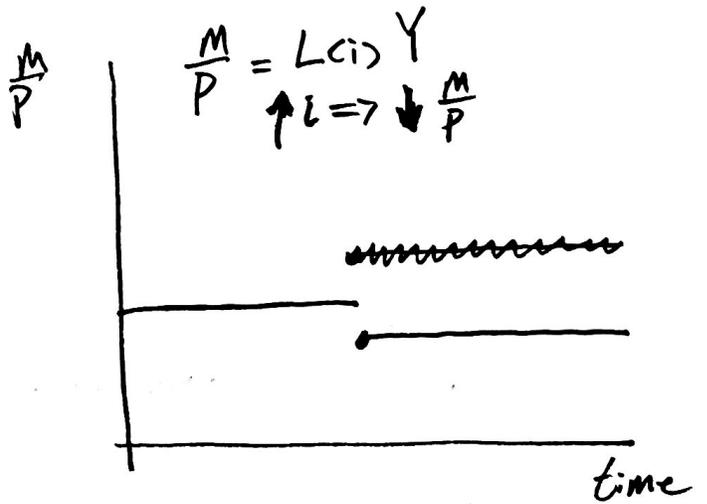
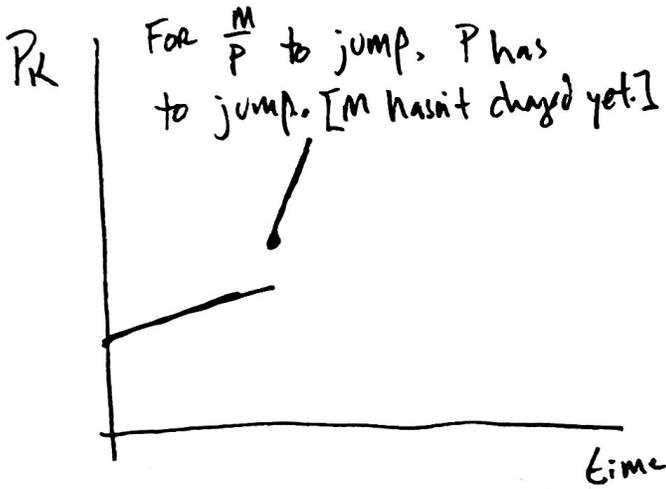
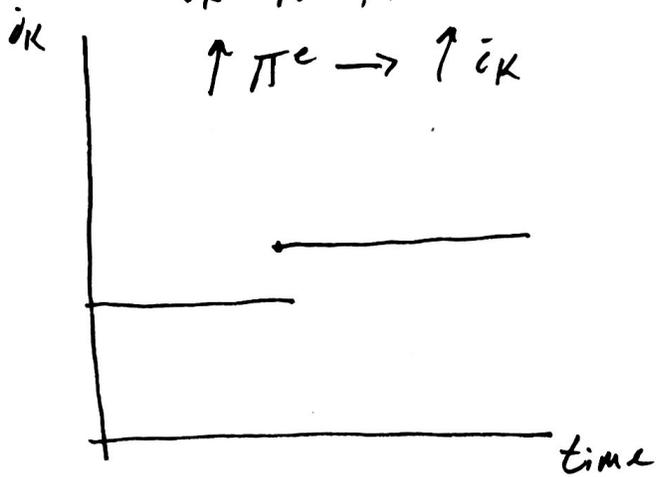
QUESTION #3



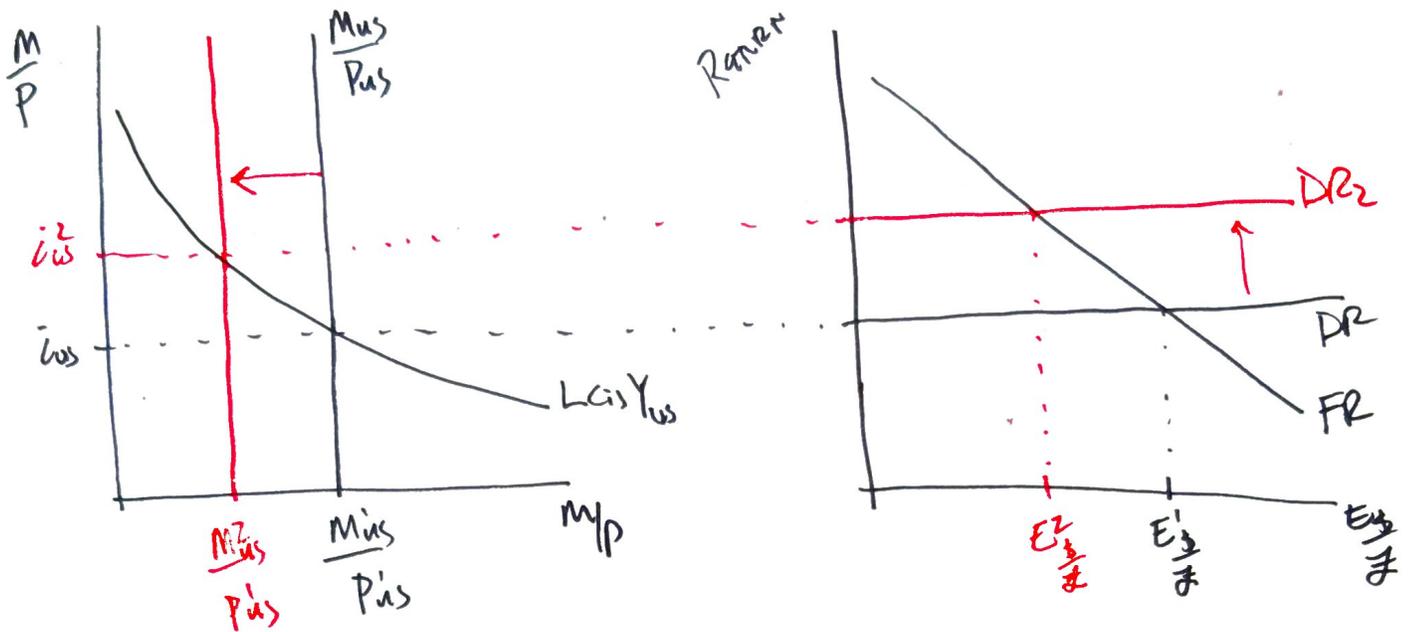
[Note expectations drive this]

$$i_K = \pi^e + r^*$$

$$\uparrow \pi^e \rightarrow \uparrow i_K$$



QUESTION 7 (A)



QUESTION 8(A)

SHORT-RUN

