::Solutions::

Practice Exam 1

- You have 75 minutes to complete this exam.

- You may use a calculator; you may **not** use any other device (cell phone, etc.)

- You may consult one page of notes (both sides); you may not use books, notebooks, etc.

- Show your work.

I understand that the honor code applies: I will not lie, cheat, or steal to gain an academic advantage, nor tolerate those who do.

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Signature

_____

Printed Name

1. [5 pts] Assume that prices are perfectly flexible. The money supply in England (£) is expected to grow at 3% percent per year and the money supply in Canada (CAD) is expected to grow at 7% per year. Each country's real output growth rate is expected to be 2%. What is $d^e_{CAD/£}$, the expected CAD-pound depreciation rate?

Use relative PPP:

$$d^e_{CAD/£} = (\mu_{ca} - \mu_{uk}) - (g_{ca} - g_{uk})$$
$$d^e_{CAD/£} = (7 - 3) - (2 - 2)$$
$$d^e_{CAD/£} = 4\%$$

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2. [5 pts] If the Japanese interest rate is 0.5%, the U.S. interest rate is 2.5% and the expected dollar-yen exchange rate is $E^e_{\$/¥} = 0.01$, what theory could you use to find the spot dollar-yen exchange rate? What is the value of the spot exchange rate according to the theory?

Use uncovered interest parity:

$$d^e_{\$/¥} + i_¥ = i_\$$$
$$\left(\frac{E^e_{\$/¥}}{E_{\$/¥}} - 1\right) + i_¥ = i_\$$$
$$\left(\frac{0.01}{E_{\$/¥}} - 1\right) + 0.005 = 0.025$$
$$E_{\$/¥} = 0.0098$$

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3. [5 pts] Why do we not use purchasing power parity theory in the short-run? Explain your reasoning.

> For purchasing power parity to hold, we require prices to be flexible. In the short run, prices are sticky (not flexible) so PPP is not a good theory for explaining exchange rates in the short run.

4. [5 pts] The quantity theory of money can be written as $M/P = L(i)Y$. What is the function $L(i)$? Why is $L(i)$ decreasing in i?

> $L(i)$ is liquidity demand. It is the share of nominal income (PY) that people want to hold as money.
>
> Liquidity demand is decreasing in i because money does not earn interest (i is the opportunity cost of money). When i rises, people want to hold less money and more interest bearing assets.

Consider a world with two countries, home and foreign. **Assume that prices are sticky in the short run but perfectly flexible in the long run.**

At time T, there is a **temporary decrease in the home money supply**. Assume that nothing in the foreign economy changes and nothing else in the home economy changes.

5. [15 pts] What happens to $E_{H/F}$, the home-foreign spot exchange rate, in both the short- and long-run? Explain your answer using whatever figures and equations you find suitable.

> The temporary change in the money supply leaves the **long-run expected exchange rate unchanged.** Money in the long-run is expected to be unchanged.
>
> Let the money supply shrink from M_H^1 to M_H^2. Because prices are sticky, the decrease in the money supply leads to a decrease in real money demand to M_H^2/P_H^1. This raises the home interest rate to i_H^2. (See the graphs in the extra space at the end.)
>
> The higher home interest rate **appreciates the home currency in the short run**. This is due to UIP and the fact that a temporary change in the money supply does not change the expected future exchange rate. The associated figure is in the extra space at the end.

6. [15 pts] Is the short-run exchange rate, $E_{H/F}$, above or below the expected long-run exchange rate? Will it stay this way forever? Explain your answer.

> The new spot rate is below the expected long-run exchange rate. (That is, the spot rate has appreciated relative to the long-run rate.)
>
> No, the spot rate will not stay this way forever. As the temporary decrease in the money supply goes away, interest rates will return to their old level and the exchange rate will return to the long-run value.

Consider a world with two countries, home and foreign. **Assume that prices are sticky in the short run but perfectly flexible in the long run.**

At time T, there is a **permanent decrease in the home money supply**. Assume that nothing in the foreign economy changes and nothing else in the home economy changes.

7. [15 pts] What happens to $E_{H/F}$, the home-foreign spot exchange rate, in both the short- and long- run? Explain your answer using whatever figures and equations you find suitable.

> Begin with the long-run outcome. When the money supply falls (but Y_H and L_H don't change) the price level adjusts to exactly offset it: M/P is unchanged and so is the interest rate. Since P_H has decreased, PPP says that the expected exchange rate appreciates shifting the FR curve down. The new long-run exchange rate is $E^4_{H/F}$ falls, **appreciating the home currency in the short-run**. (See the figures in the extra space at the end.)
>
> In the short run, two things happen: 1) the FR curve shifts as it did in the long-run figures and 2) M_H/P_H falls increasing the home interest rate. The short-run exchange rate is at the intersection of the new FR curve and the DR curve, $E^2_{H/F}$. **The home currency appreciates in the short-run**. (See the figures in the extra space at the end.)

8. [15 pts] Is the short-run exchange rate $E_{H/F}$ above or below the expected long-run exchange rate? Will it stay this way forever? Explain your answer.

> The short-run exchange rate is below the long-run rate. This is because, in addition to the shift in FR, in the short-run, the interest rate increases.
>
> Things will not stay this way. As the price level adjusts, the interest rate will return to its initial level and the exchange rate will converge to its long-run level.

Assume prices are perfectly flexible. Goods and assets are freely traded between Mexico and Spain. The Mexican expected inflation rate is 10% per year and the Spanish expected inflation rate is 5% per year.

9. [10 pts] Which country has the higher expected real interest rate? Explain your answer.

> When prices are flexible and goods and assets are freely traded, real interest parity holds. This means that both countries have the same expected real interest rate.
>
> UIP (free asset trade) states
>
> $$d^e_{Peso/€} = i_{mx} - i_{sp}$$
>
> RPPP (free goods trade) in expectation states
>
> $$d^e_{Peso/€} = \pi^e_{mx} - \pi^e_{sp}$$
>
> Equating the two gets us
>
> $$i_{mx} - i_{sp} = \pi^e_{mx} - \pi^e_{sp}$$
> $$i_{mx} - \pi^e_{mx} = \pi_{sp} - i^e_{sp}$$
> $$r^e_{mx} = r^e_{sp}$$

10. [5 pts] Which country do you expect to have the higher nominal interest rate? Explain your answer

> Mexico has the higher nominal interest rate. Real rates are expected to be the same, so the only difference is inflation. Mexican inflation is higher.
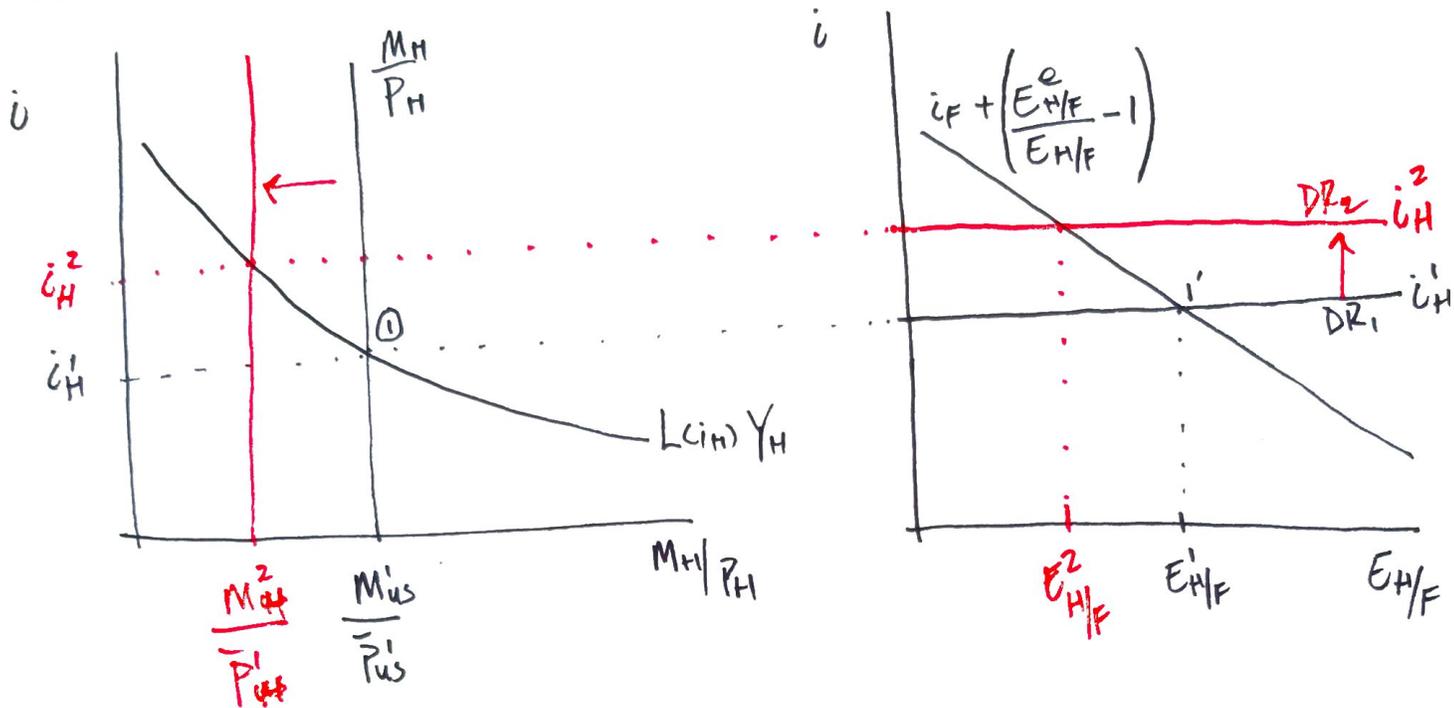
11. [5 pts] *Challenging.* Assume the U.S. and Europe are the only countries in the world. Suppose we observe the nominal interest rate in the United States fall and the dollar appreciate. Does the long-run approach (monetary approach) or the short-run approach (asset approach) better explain this phenomenon? Explain your reasoning.

> The long-run approach explains this. Suppose the US decreased it expected inflation rate (e.g., by decreasing the growth rate of money). By RPPP, we expect the dollar to **appreciate**. In the long run, the real interest rate is pinned down by the world interest rate, so $i = \pi^e + r^*$ says that the **nominal interest rate should fall.**
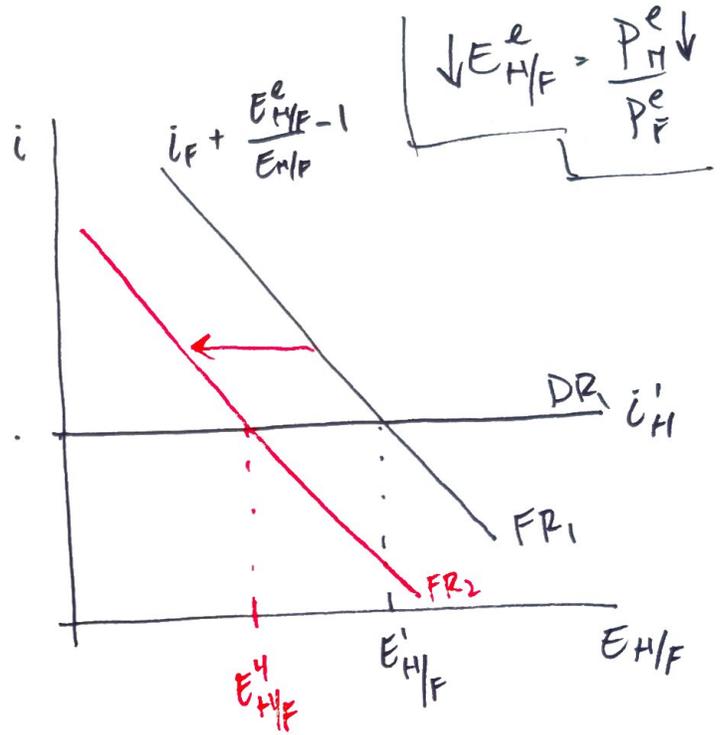
Extra Space

Clearly label the question number, and leave a reference to this page near the question.

QUESTION #5

Left graph (vertical axis i, horizontal axis M_H/P_H):

$\frac{M_H}{P_H}$

i_H^2

i_H^1

①

$L(i_H) Y_H$

$\frac{M_H^2}{\bar{P}_{US}^1}$

$\frac{M_{US}^1}{\bar{P}_{US}^1}$

Right graph (vertical axis i, horizontal axis $E_{H/F}$):

$i_F + \left(\frac{E_{H/F}^e}{E_{H/F}} - 1 \right)$

DR_2 i_H^2

DR_1 i_H^1

$1'$

$E_{H/F}^2$

$E_{H/F}^1$

QUESTION # 7

Long-run

$i_F + \dfrac{E^e_{H/F} - 1}{E_{H/F}}$

$\downarrow E^e_{H/F} > \dfrac{P^e_H}{P^e_F} \downarrow$

i

i_H

$DR_1 \; i'_H$

FR_1

FR_2

$E^4_{H/F}$

$E'_{H/F}$

$E_{H/F}$

$L(i_H) Y_H$

$\dfrac{M'_H}{P'_H}$

M/P

Short-run

i

i^2_H

i'_H

$L(i_H) Y_H$

$\dfrac{M^2_H}{P'_H}$

$\dfrac{M'_H}{P'_H}$

M/P

i

$DR_2 \; i^2_H$

$PR_1 \; i'_H$

FR_2

FR_1

$E^2_{H/F}$

$E^4_{H/F}$

$E'_{H/F}$

$E_{H/F}$