

Problem set # 3 - 2024

1. (*national accounting*). Using national accounting identity show that the current account is equal to the difference between national saving and national investment.
 - a. What happen to the current account if, other things being equal, the private saving of a country declines?
 - b. What happen to the current account if, other things being equal, public investment increases?
 - c. In an open economy how can a country build up the stock of capital without rising its saving?
 - d. Why is it likely that we observe a twin deficit when a country runs a policy of high expenditure and/or large tax cut?
2. (*interest parity condition*). Interest rate for 1 year euro deposit is 2% and the interest rate for 1 year dollar deposit is 4%.
 - a. If one euro is quoted 1.2 dollar in today's market (spot rate) what would be the expected exchange rate in one year ahead?
 - b. Let's suppose that the Fed lowers the interest rate from 4% to 2%. If market participants do not change their view on expected exchange rate as determined above, what would be the spot rate?
 - c. Suppose that with dollar interest rate at 2% and euro interest rate at 2%, market participants change their expectations on exchange rate from 1.2 to 1.4. What is the effect on the spot rate?
3. (*Money market and interest rates in the short term*) The Chairman of ECB decides through open market operations to sell a large amount of Italian government bonds.
 - a. What would you expect to happen to the short-term interest rate? (use the graph to show the effect)
 - b. An unexpected recession causes a drastic drop of the income. What is the effect on the short-term interest rate via money market other thing being equal? (use the graph to show the effect)
4. (*overshooting*) The Fed announces that will increase permanently the money stock. Market participants revise their one year ahead expectation of the exchange rate of dollar against the euro: they expect a devaluation of the dollar of 20% with respect of the original expected exchange rate before of

the announcement. The 1-year dollar deposit is 6%, the 1 year euro deposit 2% and is 1.20 is the exchange rate today or the spot rate.

- a. Calculate the expected exchange rate before the announcement.
- b. Calculate the immediate effect on the spot rate after the announcement considering that the increase in money supply will lower the dollar interest to 4% from 6%.
- c. Calculate where the spot exchange rate will set when the dollar interest rate goes back to its initial level as result of the decrease of real supply of money as the level of price adjusts at the new level.

5. (*PPP theory*) A representative basket of goods costs in the US \$1357 dollar and in Europe €1108 euro. If the PPP theory of exchange rate holds what is the exchange rate of the dollar against the euro?
- a. Calculate the exchange rate if the Fed increases permanently the stock of money supply causing an increase in prices of 5%.
 - b. What is the effect on the interest rate of the increase of the money stock assuming that prices adjust immediately?
 - c. In the US the money supply growth constantly at 5% and in Europe at 2%. If the real interest rate is 1% both in the US and in Europe, what are the inflation rate and the nominal interest rate in the US and in Europe?
6. (short-term and long-term effects of changes in money stock and money growth on interest rate, prices, inflation and exchange rate) (Use a graph in which the x-axis measures time (t) and the y-axis the variable under examination. Remember in this exercise you are asked to show the short-term and the long-term effects of changing money).

The Fed decides to increase the money stock (M_1) of 10% at time t_1

- a. Show the immediate effect on the interest rate and states what will be the interest, after all adjustments have worked out, assuming that takes 2 period for restoring the new equilibrium. The interest rate is at t_1 4%.
- b. Show the effect on the price index dynamic. Assume that the consumer price index is equal to 100 at t_1
- c. Show the effect on the exchange rate (dollar against the euro) assuming that at t_1 the exchange rate is $E_{\$/\text{€}}$ is equal to 1. Assume that PPP holds after the two periods transition.

The Fed decides to increase the growth of money from 4% to 6%.

- a. Show the immediate effect on the interest rate and states what will be the interest rate after all adjustments have worked out assuming that takes 2 period for restoring the new equilibrium. The interest rate is at t_1 , 4%. (Hint: Fisher effect)

7. (*Real Exchange Rate*) Define the real exchange rate.
- If PPP holds what are the effects on the real exchange rate and nominal exchange rates of a permanent increase of the money stock by the Fed? Explain
 - What are the effects on real exchange rate and nominal interest rate of an increase in total productivity in the US with respect to Europe? Explain.
 - What are the effects on real exchange rate and nominal interest rate of an increase for the demand for US goods relative to European goods? Explain.
8. (*DD-AA model*) Show how derive the DD schedule and the AA schedule. Put the two schedules in the same graph. Show how the schedules shifts if:
- The money stock increases.
 - The foreign country decreases the money supply.
 - The money demand decreases due to an innovation in the payment technology.
 - The government increases military spending.
 - People increase the propensity to consume.
 - Foreign prices increase.
9. (*fixed exchange rate*) Show and explain using the DD-AA schedules:
- The CB under a fixed exchange regime is powerless to affect the money supply.
 - The fiscal policy is more effective under a fixed exchange regime than under a floating exchange rate regime.
10. (*open economy trilemma*) Explain the open economy trilemma and discuss how the Gold Standard and the Bretton Woods systems were dealing with the trilemma.