International Macroeconomics
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Problem Set 8 – Asset Approach

Questions

8.1 Consider an economy with sticky prices and flexible exchange rates.

(a) What would be the effects in the short run of a reduction in the money supply if:
(a1) economic agents interpret it as temporary.
(a2) economic agents interpret is as permanent.

(b) In the case of a permanent reduction in the money supply, show the time paths of the money supply, the price level, the exchange rate and the interest rate. Discuss what is meant by overshooting.

8.2 Holding output constant, discuss the implications of a rise in the foreign interest rate in a country with: (i) fixed exchange rates; (ii) flexible exchange rates.

8.3 Consider an economy with flexible exchange rates and sticky prices in the short run, where the interest rate parity holds instantaneously, and PPP holds in the long run (one year time). The demand for real money balances is given by $m^D = \frac{Y}{10i}$, where $Y_f = 150$ refers to full employment output (constant). The foreign price level is constant and equal to $P^* = 2$.

(a) Assume initially that $M = 150$ and that $i = i^* = 10\%$. Find the:
(a1) Real Money Demand.
(a2) Price Level.
(a3) Nominal Exchange Rate.
(a4) Represent graphically the equilibrium in the money market and in the foreign exchange market.

(b) Assume that there's a temporary positive output shock, so that: $Y' = 300$. Considering that the central bank keeps the money supply unchanged, find:
(b1) The domestic interest rate.
(b2) Assume that the nominal exchange rate is still the same as in (a3). If you needed money in the foreign country in one year, would you prefer to transfer the money today and invest in the foreign country or to invest in the domestic country today and transfer the money in 12 months?
(b3) If all agents in the economy did the same as you, how would the nominal exchange rate adjust?
(b4) Using the nominal exchange rate found in (b3), is the currency at premium or at discount? (*Tip: you don't need to compute the forward, just compare the spot rate with the expected rate*)
(b5) Explain the adjustment in the money market and in the foreign exchange market.

(c) Assume now that with the same temporary output expansion ($Y' = 300$), the central bank wants instead to keep the exchange rate fixed.
(c1) Compute the implied money supply.
(c2) Explain the adjustment in the money market and in the foreign exchange market.

8.4 Consider a small open economy where the demand for domestic real money (peso) is given by: $m^D = Y/20i$, where $Y = 100$ refers to output and i refers to the domestic interest rate (one year). Further assume that initially the nominal money supply is $M^S = 600$ and that the interest rate is the same as abroad and equal to 5%. Finally, assume that the price level abroad is constant and given by $P^* = 1$. The PPP holds in the long run (one year time), but in the short run prices are sticky.

(a) Assuming that no policy changes are expected:
(a1) Compute the velocity of money in the domestic economy.
(a2) Find the price level and the nominal exchange rate.

(b) Assume now that the central bank decides to contract the money supply to $M^S = 100$ but on a temporary basis, only. Assuming that the price level is constant:
(b1) Find the new domestic interest rate and nominal exchange rate.
(b2) Represent this shock in the money market and in the foreign exchange market.
(b3) What happened to the real exchange rate?

(c) Now assume that the contraction in the money supply to $M^S = 100$ was permanent.
(c1) How will prices evolve over time?
(c2) What will be the nominal exchange rate one year ahead?
(c3) What will happen to the exchange rate at the time of the shock?
(c4) Represent the short and long run equilibria in the money market and in the foreign exchange market.

8.5 Consider a small open economy where the real demand for money (peso) is given by $m^D = Y/(100 \cdot i)$, where $Y = 50$ refers to output and i refers to the domestic interest rate (one year). Further assume that initially the nominal money supply is $M^S = 1000$ and that the interest rate is the same as abroad and equal to 25%. Finally, assume that the price level abroad is constant and given by $P^* = 5$. The PPP holds in the long run (one year time), but in the short run prices are sticky.

(a) Assuming that no central bank action is expected:
(a1) Compute the domestic price level.
(a2) Compute the velocity of money.
(a3) Compute the nominal exchange rate.

(b) Assume that the central bank decided to expand, on a temporary basis, the money supply to $M^S = 5000$. Assuming the exchange rates are flexible:
(b1) Find the new domestic interest rate and nominal exchange rate.
(b2) Find the real exchange rate.
(b3) Represent the adjustment in the money market and in the foreign exchange market, explaining the mechanisms involved.

(c) Departing from a), consider the effects of a <u>temporary</u> increase in output to $Y = 100$.
(c1) Compute the impact on the domestic interest rate and on the nominal exchange rate, assuming that there was no central bank intervention.
(c2) Assuming that the central bank runs a fixed exchange rate regime, how will it intervene following the shock? Describe graphically and numerically the (temporary) equilibrium in that case.

8.6 This question considers the relationship between Swedish kronor (SK) and Danish krone (DK). Let the exchange rate be defined as Swedish kronor per Danish krone, ESK/DK. On all graphs, label the initial equilibrium point A. Suppose that there is an economic boom in Sweden, leading to an increase in real money demand in that country.

(a) Assume this change in real money demand is temporary and analyze it graphically. Label your short-run equilibrium point B and your long-run equilibrium point C.

(b) Assume this change in real money demand is permanent. Using a new diagram, illustrate how this change affects the money and FX markets. Label your short-run equilibrium point B and your long-run equilibrium point C.

(c) Illustrate how each of the following variables changes over time in response to a permanent increase in real money demand: nominal money supply MS, price level PS, real money supply MS/PS, Swedish interest rate iSK, and the exchange rate ESK/DK.

8.7 Consider an economy with sticky prices, where the interest rate parity holds instantaneously, and PPP holds in the long run (one year time). The demand for real money balances is given by $m^D = \frac{Y}{20i}$, where output (Y) is constant at 100. The foreign price level is constant and equal to 1.

(a) Assuming that the money supply is 5000, and that both the domestic and the foreign interest rates are equal to 0,04:
(a1) Find the real money demand, the price level and the nominal exchange rate.
(a2) Represent graphically the equilibrium in the (M/P, i) and (e, i) spaces.

(b) Suppose now that there was a temporary increase in the foreign interest rate to i*=0.05.
(b1) Compute the impact on the domestic interest rate and on the nominal exchange rate, assuming that the central bank kept the nominal supply unchanged.
(b2) If the central bank wanted instead the nominal exchange rate to remain fixed, how should it intervene?
(b3) Describe graphically the equilibrium in both cases (b1 and b2).

(c) Assuming flexible exchange rates, analyse the case in which the shift in the foreign interest rate is permanent. Describe the short term and long-term implications of the shock, and represent graphically, both in the money market and in the foreign exchange market.