International Macroeconomics

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Problem Set 5 – The Monetary Approach Questions

- **5.1** Consider a world with two economies, Pesolia and Poundolia, where the respective currencies are Peso and Pound. In Poundolia, there are N=1000 workers and the production level is Y=1000 units. In Pesolia, there are N=100 workers and Y=50 units. The Central Bank of Poundolia issues M=1000. Assume along the whole exercise that the velocity of circulation is unitary.
 - (a) How much should one unit of product cost in Poundolia (in Pounds)?
 - (b) How much should be the average wage of one worker in Poundolia in pounds?
 - (c) If in Pesolia M was equal to 50000 pesos, how much would be prices and wages (in pesos)?
 - (d) Assuming that both countries produce exactly the same good and that this good can be both exported and imported, how much should be the price of a peso in pounds (in the long run)?
 - (e) Keeping the previous assumptions, where is purchasing power higher? Why?
 - (f) Now imagine that the central bank of Pesolia decided to duplicate the quantity of money in their economy. What would happen to prices, wages and the exchange rate?
 - (g) Explain what would happen to prices, wages and the exchange rate if in Pesolia each worker started to produce half of what they produced before. If the objective of the central bank was to keep inflation at zero, what should they do?
- **5.2** Consider an economy where both prices and the exchange rate are fully flexible, and where the Fisher principle and the purchasing power parity hold instantaneously. Moreover, it is known that the domestic real interest rate is constant and equal to r = 0.04 and that the demand for real money balances is given by $m^D = Y/(20i)$, where Y = 100 refers to output (constant) and i is the nominal interest rate. The foreign price level is constant and equal to 2.
 - (a) Assuming that the money supply is constant and equal to 250:
 - (a1) Quantify the inflation rate and the nominal interest rate.
 - (a2) Find the real money demand and the price level.
 - (a3) Compute the money velocity.
 - (a4) Find the nominal exchange rate.
 - (b) Unexpectedly, the central bank decided to expand the money supply by 16% every year. (b1) What should happen to the inflation rate, the interest rate, real money demand and money velocity?
 - (b2) Describe graphically the new money market equilibrium in the (M/P, i) space.
 - (b3) Draw the time path for the price level, quantifying.

- **5.3** Consider an economy with flexible prices, where money supply is initially expanding at 20% per year. Assume that the: PPP and the Fisher effect hold instantaneously; the foreign price level is constant at $P^* = 1$; the real interest rate is 5%; the money demand is given by $m^D = Y/4i$, full employment output is $Y_f = 200$.
 - (a) Assuming that no policy change is expected:(a1) Describe in a graph the money market equilibrium of this economy.(a2) Draw the time paths of the price level, the nominal exchange rate and the nominal interest rate.
 - (b) Assume now that, at the time the domestic money supply reached the level M=10000, the central bank <u>unexpectedly</u> decided to anchor the money supply at that level, so as to stop the ongoing inflation.
 - (b1) Find the new interest rate and money demand.
 - (b2) Describe the new money market equilibrium in a graph.

(b3) Assuming that prices were fully flexible, find out what would happen to the price level and the nominal exchange rate.

- (c) In alternative, suppose that, when domestic money reached the level M=10000, the central bank decided to fix the exchange rate at e=50. In that case, what would be the required policy change?
- (d) In the real world, it happens that prices are pretty flexible upwards especially during hyperinflation episodes – but sticky downwards. Given this, what are the pros and cons of the two policy avenues to stop high inflation? Which other measures are often implemented?
- **5.4** Consider a small open economy producing a tradable good (*T*) and a non-tradable (*N*) good. The corresponding production functions are $Y_T = aL_T$ and $Y_N = bL_N$, where $L_T = 60$ and $L_N = 60$ are immobile across sectors. In this economy, the demand functions are $C_T = M/2P_T$, $C_N = M/2P_N$, where M=120 denotes for nominal money balances, and the weight of each good in the consumer price index is 50%. Finally, assume that the TB is always zero, and foreign prices are $P_T^* = P_N^* = 1$.
 - (a) Assuming that a = b = 1, determine:
 - (a1) The nominal exchange rate.
 - (a2) The domestic price level.
 - (a3) The real exchange rate.
 - (b) Now consider the case of a productivity increase in the tradable good sector, from a=1 to a=2. Assuming that the money supply was kept constant:
 - (b1) Find the nominal exchange rate.
 - (b2) Find the price level.
 - (b3) Find the real exchange rate.
 - (c) Considering the same productivity shock, analyse what should happen if the central bank wanted to keep the inflation rate at zero, computing:(c1) The nominal exchange rate.
 - (c2) The money supply.
 - (c3) The real exchange rate.

- (d) Finally, consider the case in which the central bank wanted the exchange rate to remain fixed after the productivity shock, computing the implied levels of:(d1) The nominal exchange rate.
 - (d2) The money supply.
 - (d3) The real exchange rate.
- (e) Based on this exercise, explain why the EMU entry criteria, of a stable exchange rate with the euro and low inflation could not suit the enlargement countries in the East.
- **5.5** Consider an economy with flexible prices where the purchasing power parity and the fisher principle hold instantaneously. Assume that $P^* = 1$, the real interest rate is 20% and the money demand is given by $m^D = \frac{Y}{5i}$. Full employment output is given by $Y_f = 200$. Initially, the money supply is growing $\mu = 20\%$ and the exchange rate is floating.
 - (a) Quantify:
 - (a1) the inflation rate
 - (a2) the nominal interest rate
 - (a3) real money demand
 - (a4) Describe the money market equilibrium in a graph.
 - (b) Now assume that at the time the domestic money supply reached M = 600, the central bank unexpectedly decided to anchor the money supply at that level. (b1) Find the new interest rate and money demand
 - (b2) Describe the adjustment and the new money market equilibrium in a graph.

(b3) Assuming that prices were fully **flexible**, what would happen to the price level and the exchange rate? Quantify and draw the corresponding time paths.(b4) Discuss the pros and cons associated with this measure.

- (c) Assume instead that the central bank unexpectedly decided to fix the exchange rate when it reached e = 1.5.
 - (c1) Find the new interest rate and money demand.
 - (c2) Compute and explain the adjustment mechanism in the money market.
 - (c3) Draw the corresponding time paths [M, P and e].

(c4) Assume that initially the money supply was backed by the following amount of domestic assets: $B_c = 75$. What will happen to the central bank's foreign reserves? Explain using the central bank's balance sheet.

(c5) Discuss the pros and cons associated with this measure.