International finance
Homework 2 (aka problem set 9)

This problem set is to be posted in the coursework box (opposite the third-year notice board in the Economics Department) by 7 o'clock p.m. Monday 17 March. Your answers to it will be marked and will count for half of your total coursework mark. You are encouraged to work on the problem set in groups, but the final writing up has to be carried out individually. In the case of identical answers the mark will be split equally among the individuals involved (e.g. if two people provide an identical solution and it is worth 70 points each of them receives a mark of 35!)

1. Consider the perfect-foresight version of Dornbusch model described by the following equations

$$\begin{array}{ll} \text{IS:} & y_t = z_t + (e_t + p^* - p_t), \\ \text{LM:} & m_t - p_t = \bar{y} - i^* - \Delta e_{t+1}, \\ \text{Period t=1 AS:} & p_t = \bar{p}, \\ \text{Period } t > 1 \text{ AS:} & y_t = \bar{y}. \end{array}$$

   All variables are in logs, with $m_t, y_t, e_t, p_t, p^*, i^*$ denoting respectively the current nominal money supply, output, the nominal exchange rate, the home price level, its foreign counterpart and the foreign nominal interest rate. The variable $\bar{z}$ captures exogenous changes to aggregate, desired expenditure, while $\Delta e_{t+1} = e_{t+1} - e_t$ denotes the expected change in the nominal exchange rate. The home price level is fixed at $\bar{p}$ in period 1, while it is fully flexible and output is at its full employment level $\bar{y}$ from period 2 onwards. The nominal exchange rate is flexible. Assume for simplicity, that the variables $p^*, i^*, \bar{p}, \bar{y}$ all equal zero.

   (a) Assume $\bar{z}$ and m_t equal zero and are expected to stay constant. Determine the equilibrium values of y_t, p_t, e_t at any time from $t = 1$ (included) onwards.

   (b) Suppose that at time $t = 1$, the foreign price level increases permanently to $p^* = 1$. Determine the equilibrium values of y_t, p_t, e_t at any time from $t = 1$ (included) onwards. Does e_t overshoot its long-run value? Explain.

   (c) Suppose that $p^* = 0$, as in (a), but that at time $t = 1$ the foreign interest rate increases permanently to $i^* = 1$. Determine the equilibrium values of y_t, p_t, e_t at any time from $t = 1$ (included) onwards. Does e_t overshoot its long-run value? Explain.

2. Consider the modern version of the monetary model described by the following equations

$$\begin{aligned} &\text{LM: } m_t - p_t = \bar{y} - 0.5(i^* + \Delta e_{t+1}), \\ &\text{PPP: } e_t = p_t - p^*. \end{aligned}$$

   For simplicity, assume $i^*, \bar{y}, p^*, m_t$ all equal zero.

(a) Suppose that at time $t = 1$, the government sets the rate of money growth to 0.2 and agents expect the policy to be permanent. Derive the equilibrium values of e_t and p_t for all $t \geq 1$.

(b) Suppose that at time $t = 1$ the government announces that it will irrevocably peg the exchange rate at $\bar{e} = 2$ from time $t = 2$ onwards and that it will set the money supply from $t = 2$ onwards so as to maintain the peg. The public fully believes the announcement and the government does indeed implement it. Derive the equilibrium values of e_t and p_t from $t = 1$ onwards and of the nominal money supply from time $t = 2$ onwards.