International finance
Solution to question 2 problem set 6

Please remind students of how the monetary model was derived in lecture 5 under the assumption of perfectly flexible prices, perfect foresight ($e^e_{t+1} = e_{t+1}$) and constant growth rate (possibly zero) for exogenous variables. Please explain the economic intuition (money market eq, no arbitrage between home and foreign assets,etc).

$$\text{LM: } m_t - p_t = \bar{y} - \alpha i_t \tag{1}$$
$$\text{PPP: } e_t + p^*_t - p_t = 0. \tag{2}$$
$$\text{UIP: } i_t = i^*_t + \Delta e_{t+1} \tag{3}$$
$$\text{Constant money growth: } m_{t+1} - m_t = \mu \tag{4}$$
$$\tag{5}$$

Assuming α is the same for home and foreign country this can be reduced to

$$e_t = (m_t - m^*_t) - (\bar{y}_t - \bar{y}^*_t) + \alpha \Delta e_{t+1} \tag{6}$$
$$\Delta e_{t+1} = \pi_{t+1} - \pi^*_{t+1} = \mu - \pi^*_{t+1}. \tag{7}$$

1. Assume Europe is home and US is foreign (irrelevant, but just as well). Please explain economic intuition behind each answer.

   (a) False. $(\bar{y}_t - \bar{y}^*_t)$ falls which implies depreciation of Euro (higher e_t).

   (b) True. $(m_t - m^*_t)$ falls.

   (c) Do (d) first. False. Higher $i_t - i^*_t$, i.e. higher $\Delta e_{t+1} = \mu - \pi^*_{t+1}$ μ from (7) above. e_t would rise.

   (d) True. This implies lower $\Delta e_{t+1} = \pi_{t+1} - \pi^*_{t+1}$ as inflation coincides with rate of money growth in the (constant growth rate) equilibrium considered.

2. We use equations (6) and (7) above with $\alpha = 0.5$.Note that since you are not hold whether the announcement is actually carried out, we can only say what happens at time t or before but not from $t + 1$ onwards, since we do not know what the central bank *actually* does.

   (a) i. The exchange rate is constant before the announcement and it falls by $\alpha(0.05 - 0.1) = -.025$ immediately after the announcement at time t.

   ii. The exchange rate is constant before the announcement and it changes (increases) by $\alpha(0.2 - 0.1) = .05$ immediately after the announcement at time t.

   iii. The exchange rate is constant before the announcement and it increases by $\alpha([0.5 \times 0.05 + 0.5 \times 0.1] - 0.1) = \alpha(0.075 - 0.1) = -0.0125$. immediately after the announcement at time t. The case is intermediate between the central bank doing nothing (i.e. before time t) and case i., because of imperfect credibility.

(b) The money supply is expected not to grow; i.e. $\mu = 0$. Before the shock (i.e. before time t) it is $e = m = 10$. After the shock, agents expect $e_{t+1} = m_{t+1} = 20$, where the last equality comes from agents expecting the money supply to double at time $t+1$. You can then use $e_t = m_t + 0.5(e_{t+1} - e_t) = 5 + 0.5(20 - e_t)$ to solve for $e_t = 10$. The policy change leaves the exchange rate unaffected since agents expect the central bank to increase the money supply in the future (of course whether it fully offsets the current change or not depends about expectations about the future (i.e. $m_{t+1} <> 20, etc.$)