Sudden Stops With Downward Nominal Wage Rigidity And Fixed Exchange Rates

Consider a two-period, small, open economy. Households are endowed with 10 units of tradables in period 1 and 13.2 units in period 2 \((Q^T_1 = 10 \text{ and } Q^T_2 = 13.2)\). The country interest rate is 10 percent, or \(r = 0.1\), the nominal exchange rate, defined as the price of foreign currency in terms of domestic currency, is fixed and equal to 1 in both periods \((E_1 = E_2 = 1)\). Suppose that the foreign-currency price of tradable goods is constant and equal to one in both periods, and that the law of one price holds. Nominal wages are downwardly rigid. Specifically, assume that the nominal wage in period 1, measured in terms of domestic currency, can be no lower than 8.25 \((W_1 \geq 8.25)\). Suppose the economy starts period 1 with no assets or debts carried over from the past \((B^*_0 = 0)\). Suppose that the household’s preferences are defined over consumption of tradable and nontradable goods in periods 1 and 2, and are described by the following utility function,

\[
\ln C^T_1 + \ln C^N_1 + \ln C^T_2 + \ln C^N_2,
\]

where \(C^T_i\) and \(C^N_i\) denote, respectively, consumption of tradables and nontradables in period \(i = 1, 2\). Let \(p_1\) and \(p_2\) denote the relative prices of nontradables in terms of tradables in periods 1 and 2, respectively. Households supply inelastically \(\bar{h}_1 = 1\) units of labor to the market each period. Finally, firms produce nontradable goods using labor as the sole input. The production technology is given by

\[
Q^N_1 = h^\alpha_1
\]

and

\[
Q^N_2 = h^\alpha_2
\]

in periods 1 and 2, respectively, where \(Q^N_i\) and \(h_i\) denote, respectively, nontradable output and hours employed in period \(i = 1, 2\). The parameter \(\alpha\) is equal to 0.75.

1. Compute the equilibrium levels of consumption of tradables and the trade balance in periods 1 and 2.
2. Compute the equilibrium levels of employment and nontradable output in period 1.
3. Suppose now that the country interest rate increases to 32 percent. Calculate the equilibrium levels of consumption of tradables, the trade balance, consumption of nontradables, and the level of unemployment, all for period 1. Provide intuition.
4. Given the situation in the previous question, calculate the minimum devaluation rate in period 1 consistent with full employment in that period. To answer this question, assume that the nominal exchange rate in period 0 was also fixed at unity. Explain.