ECON 520
International Macroeconomics **8 May 2017**
Dr. Yetkiner

Midterm

1. (35 Points) 2x2 Closed Economy under General Equilibrium
Suppose that there is a 2-factor 2-good economy, in which the consumer's maximization problem is defined as follows:

$$Max\ X^b \cdot Y^{1-b}$$
$$s.t. \quad X + P \cdot Y = \omega \cdot \bar{N} + r \cdot \bar{B}$$

The production functions of the model economy are defined as $X = A_X \cdot K_X^{\alpha} \cdot N_X^{1-\alpha}$ and $Y = A_Y \cdot K_Y^{\beta} \cdot N_Y^{1-\beta}$, where A_X and A_Y are productivity parameters in the respective sector. Both industries are perfectly competitive and all factors of production are fully employed, that is, $K_X + K_Y = \bar{K}$ and $N_X + N_Y = \bar{N}$. Find the equilibrium values of all endogenous variables by using the market solution approach.

2. (20 Points) A Two-Period Small Open Economy
Suppose that there is a two-period small open economy in which there is no production. Utility function U of the representative agent is $U = \frac{C_1^{1-\theta}-1}{1-\theta} + \frac{1}{1+\rho} \cdot \frac{C_2^{1-\theta}-1}{1-\theta}$. In the model economy, endowments are $\bar{Y}_1 = 100$ and $\bar{Y}_2 = 300$, and the (international) real rate of interest is $\bar{r} = 0.5$. Suppose that $1 + \rho = 1 + \bar{r}$ and that current account is defined as $CA_t \equiv B_{t+1} - B_t = \bar{Y}_t + \bar{r}B_t - C_t$, in which B_t is the value of net claims on the rest of the world. Find the equilibrium values of C_1, C_2, CA_1, and CA_2.

3. (20 Points) A Two-Period Small Open Economy with Investment

Suppose that there is a two-period small open economy. Utility function U of the representative agent is $U = \frac{C_1^{1-\theta}-1}{1-\theta} + \frac{1}{1+\rho} \cdot \frac{C_2^{1-\theta}-1}{1-\theta}$. In the model economy, production function (for both periods) is defined as $Y_t = K_t^{0.5} L_t^{0.5}$, $L_t = 1$, and the (international) real rate of interest is $\bar{r} = 0.1$. Suppose that $1 + \rho = 1 + \bar{r}$ and that current account is defined as $CA_t \equiv B_{t+1} - B_t = \bar{Y}_t + \bar{r}B_t - C_t - I_t$, in which B_t is the value of net claims on the rest of the world and $I_t = K_{t+1} - K_t$. Find the equilibrium values of C_1, C_2, CA_1, CA_2, Y_2, K_2, I_1, and I_2, given $K_1 = 9$.

4. (20 Points) A Two-Period Open Economy with Endogenous Interest Rate

Suppose that there are two periods in a two-economy world. Utility functions of the representative agents are $U = Ln[C_1] + \frac{1}{1+\rho} \cdot Ln[C_2]$ and $U^* = Ln[C_1^*] + \frac{1}{1+\rho^*} \cdot Ln[C_2^*]$. Endowments are $\bar{Y}_1 = \bar{Y}_1^* = 100$ and $\bar{Y}_2 = \bar{Y}_2^* = 200$ and $\rho = 0.1$ and $\rho^* = 0.05$. The (international) real rate of interest is endogenous. Find the equilibrium values of r, C_1, C_2, C_1^*, C_2^*, S_1, and S_1^*. **Hint**: At equilibrium $\bar{Y}_1 + \bar{Y}_1^* = C_1 + C_1^*$.