

ECON 202
INTERMEDIATE MACROECONOMICS
Dr. Yetkiner

12 March 2007

Exercise IV
The Static General Equilibrium Model of Consumption-Leisure Tradeoff

1. (Linear Production Technology) Suppose that utility function u of a representative agent is $u = c^\alpha l^{1-\alpha}$, where c is consumption of physical goods and l is consumption of leisure. Suppose that production technology is represented by $y = zN$ where y is output, z is productivity parameter and N is labor demand. We assume that $h = l + N$ and w is the real wage. There is no government in the economy.

- Find the optimal values of c , l , N , y , w , and u under the competitive equilibrium assumption.
- Find the optimal values of c , l , N , y , and u under the social planner's solution assumption. Are the results different? Why or why not?
- Find the impact of one-time permanent changes in exogenous variables on endogenous variables in the model.

2. (Short-run Cobb-Douglas production technology) Suppose that utility function u of a representative agent is $u = c^\alpha l^{1-\alpha}$, where c is consumption of physical goods and l is consumption of leisure. Suppose that production technology is represented by $y = zK^\beta N^{1-\beta}$ where z is productivity parameter, K is a given amount of physical capital stock, and N is labor demand. We assume that $h = l + N$, w is the real wage, and π is profits. There is no government in the economy.

- Find the optimal values of c , l , N , y , w , π , and u under the competitive equilibrium assumption.
- Find the optimal values of c , l , N , y , and u under the social planner's solution assumption. Are the results different? Why or why not?
- Find the impact of one-time permanent changes in exogenous variables on endogenous variables in the model.

3. (With Government sector) Suppose that utility function u of a representative agent is $u = c^\alpha l^{1-\alpha}$, where c is consumption of physical goods and l is consumption of leisure. Suppose that production technology is represented by $y = zK^\alpha N^{1-\alpha}$ where z is productivity parameter, K is a given amount of physical capital stock, and N is labor demand. We assume that $h = l + N$ and w is the real wage. We also assume that there is a government in the economy that charges lump-sum taxes on profits, which are spent on exogenously determined government expenditures, G .

- Try to find the optimal values of c , l , N , y , w , and u under the competitive equilibrium assumption.
- Try to find the optimal values of c , l , N , y , and u under the social planner's solution assumption. Are the results different? Why or why not?
- Find the impact of one-time permanent changes in exogenous variables on endogenous variables in the model.

4. (With externality) Suppose that utility function u of a representative agent is $u = c^\alpha l^{1-\alpha}$, where c is consumption of physical goods and l is consumption of leisure. Suppose that production technology is represented by $y = zK^\beta N^{1-\beta} N^\gamma$ where z is productivity parameter, K is a given amount of physical capital stock, N is labor demand, and γ is a parameter that determines the extent of externality in the economy. We assume that $\gamma > 0$, that is, the stock of labor has a positive externality effect on production. We also assume that $h = l + N$ and w is the real wage. There is no government in the model.

- Find the optimal values of c , l , N , y , w , and u under the competitive equilibrium assumption.
- Find the optimal values of c , l , N , y , and u under the social planner's solution assumption. Are the results different? Why or why not?
- Compare this model with the previous model (i.e., question #3) and state the qualitative difference between the two models?