

ECON 300

Advanced Macroeconomics

Dr. Yetkiner

29 November 2013

Midterm Exam

1. (10 Points) Calculate the GDP of Farmland, a fictitious economy whose numbers are listed below. Do so using all three methods (value added approach, income approach, and expenditure approach).

FarmLand, year 2000

Farmer Jones, (private firm)

Corn sold to Govt	\$25
Corn sold to Singapore	\$25
Corn sold to FoodCo, Inc	\$20
Paid workers	\$40
Tax on profit	\$15
Pesticide bought from Turkey	\$10

Farmland Govt

Taxes	\$50
Purchase of Corn	\$25
Transfers to Poor People	\$10
Purchase of Corn Flakes	\$15

FoodCo, Inc

Corn Flakes Sold to Consumers	\$100
Corn Flakes Sold to Japan	\$10
Corn Flakes Sold to Government	\$15
Corn bought from Farmer Jones	\$20
<u>Corn Inventory</u>	
Beginning of Year	\$20
End of Year	\$10
Paid workers	\$20
Tax on Profit	\$25

Households

Taxes on wage income	\$10
----------------------	------

2. (30 Points- Work-Leisure tradeoff) Suppose that utility function u of a representative agent is $u = c^{0.20}l^{0.80}$, where c is consumption of physical goods and l is consumption of leisure. Suppose also that production technology is represented by $y = (0.5)\bar{K}^{0.5} \cdot N^{0.5}$ where $\bar{K} = 4$ is the physical capital stock and N is labor. We assume that $h = 24$, $h = l + N$ and that there is no government in the economy. Whenever required, use w and π to denote the real wage and real profits, respectively.

- (a) First, suppose that you are under **PARTIAL EQUILIBRIUM**. Find the optimal values of c and l (in terms of exogenous variables) from the representative consumer's utility maximization. (10 points)
- (b) Suppose now that you are under **GENERAL EQUILIBRIUM**. Find the optimal values of c , l , N , y , w , π , and u under the competitive equilibrium assumption. (20 points)

3. (30 Points-Two-Period Partial Equilibrium) Suppose that Ahmet has income of $Y_1 = 800$ when he is young and $Y_2 = 997.5$ when he is old. The real interest rate is $r = 0.05$. The overall utility function of Daniel is $U = \frac{c_1^{1-\theta} - 1}{1-\theta} + \left(\frac{1}{1.4}\right) \frac{c_2^{1-\theta} - 1}{1-\theta}$, where $\theta = 2$.

- (i) Find the optimal values of c_1 , c_2 and s **AND** show them in the corresponding graph. Is this representative agent borrower or a lender? **(15 points)**
- (ii) Suppose now that the interest rate increases to $r = 0.10$. Find the new optimal values of c_1 , c_2 and s **AND** show them in the graph. **Interpret your results** (changes in endogenous variables) **(15 points)**.

4. (20 Points) Using the *general equilibrium* model of **work-leisure** tradeoff developed in chapter 5, determine the effects of an increase in the total factor productivity in AgroLand on *aggregate output*, *consumption*, *employment*, and the *real wage*. Hint: Do not forget to draw a figure and discuss in detail the impact of the exogenous shock.

5. (10 Points) Using the *partial equilibrium* model of **work-leisure** tradeoff developed in chapter 4, determine the effects of an increase in **exogenous income** (e.g., decrease in lump sum taxes) on *consumption*, *employment*, and *leisure*. Hint: Do not forget to draw a figure and discuss in detail the impact of the exogenous shock.