

ECON 300

Advanced Macroeconomics

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Midterm Exam

1. (15 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	\$35
Corn Sold to Singapore	\$25
Corn Sold to FoodCo, Inc	\$20
Paid workers	\$40
Tax on profit	\$15

FoodCo, Inc

Sold Corn Flakes to Consumers	\$100
Sold Corn Flakes to Japan	\$10
Sold Corn Flakes to Government	\$15
Bought corn from Farmer Jones	\$20
<u>Corn Inventory</u>	
Beginning of Year	\$10
End of Year	\$5
Bought salt from Egypt	\$10
Paid workers	\$20
Tax on Profit	\$25

Farmland Govt

Taxes	\$50
Purchase of Corn	\$35
Purchase of Corn Flakes	\$15
Unemployment benefits Paid	\$15

Households

Taxes on wage income	\$10
Unemployment benefits	\$15

2. (10 Points) Suppose that utility function u of a representative agent is $u = c^{(1/4)}l^{(3/4)}$, where c is consumption of physical goods and l is consumption of leisure. Suppose further that $w = 3$, $\pi = 8$, and $h = 24$. Find how do optimal values of c and l changes after wage income taxation: $\tau = 0.1$. Try to decompose the substitution and income effects.

3. (15 Points) Suppose that the government decides to reduce taxes. Using the general equilibrium model developed in chapter 5, determine the effects this has 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.

4. (20 Points) Suppose that utility function u of a representative agent is $u = c^{(1/4)}l^{(3/4)}$, where c is consumption of physical goods and l is consumption of leisure. Suppose that production technology is represented by $y = (0.5)\bar{K}^{0.25} \cdot N^{0.75}$ where $\bar{K} = 16$ 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 (use w and π to denote the real wage and profits, respectively). Find the optimal values of c , l , N , y , w , π , and u under the competitive equilibrium assumption.

5. (15 Points) Suppose that Robinson Crusoe has a two-period life in a partial equilibrium framework. Furthermore, we assume that Mr. Crusoe show “borrower” behavior. Analyze the impact of a **decrease** in the interest rate on current and future consumption and saving.

6. (15 Points) Suppose that Daniel has income of $Y_1 = 100$ when he is young and $Y_2 = 110$ when he is old. The real interest rate is $r = 0.1$. The overall utility function of Daniel is $U = c_1^{0.5} + \left(\frac{1}{1.1}\right)c_2^{0.5}$. Find the optimal values of c_1 , c_2 and s .

7. (20 Points) Suppose now that future income has increased to 121. Show its impact on current and future consumption and saving. Do your results fit to theory? Discuss.