



Problem sets 6: One-period general equilibrium model

EE312: Intermediate macroeconomics

Semester 2/2018

Instructor: Dr. Kittichai Saelee

Due on April 23rd, at the BE office before 3 pm.

Optional question (Does not require you to turn in)

Calculus of the General equilibrium

In class, we discussed about the graphical approach to the general equilibrium analysis. This exercise guides you step-by-step towards understanding the same topic using mathematical analysis. Consider a simple mathematical version of the general equilibrium model. Assume that the preference of a represent household can be given by,

$$u(C, L) = \alpha \ln(C) + (1 - \alpha) \ln(L)$$

The budget constraint is: $C = w(1 - L) - T$, where T is lump-sum tax, and w is wage, both of which are measured in terms of units of output. Assume that total time endowment is normalized to 1, and hence L is expressed in term of the fractions of total time endowment. Capital is fixed at 1, and the representative firm technology is: $Y = z\sqrt{N}$

- 1) Use the optimization and find the household labor supply function. Is the quantity of labor supply always fixed?
- 2) Find the labor demand function. Is the labor demand function downward-sloping in wage?
- 3) Find expressions for the equilibrium values of the labor input and the wage. (Hint: labor market is cleared when labor demand is equal to labor supply.)

4) Given “T”, how much does the representative worker (household) consume in the equilibrium?

5) Use the comparative static and show the impact of “T” on equilibrium variables, i.e. real wage, output, private consumption, working hour.

6) Redo the analysis in (2.1) – (2.5), with a new utility function given by,

$$u(C, L) = 2\sqrt{C} - a \frac{(1 - L)^{1.5}}{1.5}$$

What is the impact of an increase in “a” on the equilibrium variables? What does “a” capture?