Economics 102: Problem Set 4

Due date: October 30 (Friday). Note: you can either give your homework to Prof. Wang right after class or put it in the box outside my office (Heady Hall 473) before 5:00pm on the due date.

Note: The second midterm exam is next Friday, November 6, 2009. No makeup exams will be given this time.

Problem 1 Suppose an economy is described by $Y = 5,000$, $G = 1,000$, $T = 1,000$. $C = 250 + 0.75(Y - T) - 10r$, $I(r) = 1,000 - 50r$.

(1) Find the equilibrium interest rate and the equilibrium investment.

(2) Compute private saving, public saving, and national saving.

(3) Suppose now the economy's investment function is $I(r) = I_0 - 50r$, where $I_0 > 0$ is an unknown constant. Find the new equilibrium interest rate and the equilibrium investment. How do the equilibrium interest rate and investment change with I_0?

(4) Now treat Y, G, T as unknown constants as well and solve for the equilibrium interest rate and equilibrium investment as a function of Y, G, T, and I_0. What happens to the equilibrium interest rate when T increases?

Problem 2 Suppose an economy is described by the following consumption and investment functions: $C(Y-T) = 25+M(Y-T)$, $I(r) = 100-50r$, where $0 < M < 1$ denotes the constant MPC. Take M, G, T, and r as the model's exogenous variables. The model's only endogenous variable is Y.

(1) Suppose $M = 0.5$, $r = 0.1$, $G = 15$ and $T = 10$. (a) Solve for the equilibrium Y. (b) Compute the equilibrium private saving and public saving.

(2) Solve the equilibrium Y as a function of the exogenous variables M, G, T, and r.

(3) Suppose there are two economies which are identical in all other aspects except that the MPC (which is M in our model) in the first economy is lower than that in the second economy. Which economy's equilibrium Y is higher?

(4) What happens to the equilibrium Y if the Fed lowers the interest rate.

(5) What happens too the equilibrium Y if the government increases G? Compute the government-purchases multiplier.

(6) Suppose $T = tY$, where $t > 0$ is a constant, the tax rate. How does the equilibrium Y depend on t? (You must show mathematically.)