Intermediate Macroeconomics
Economics 4353/7353
Summer 2011
Homework #2
Total Points: 50
Due date: July 13

Show your work. Make your explanations, (i.e. including your reasoning), explicit.

(12) Q1. Consider a closed economy with full-employment output $Y = 2100$. Government purchases are given by $G = 200$, and lump-sum taxes by $T = 200$. $TR = 0$. Desired consumption and desired investment are given by:

$$C^d = 350 + 0.7(Y - T + TR) - 70r$$
$$I^d = 300 - 120r$$

(a) Find the equilibrium real interest rate $r$. Find the equilibrium levels of consumption, investment, national saving, private saving, and government saving.

(b) Suppose transfers increase to $TR = 30$. Find the new equilibrium real interest rate and the corresponding levels of consumption, investment, national saving, private saving, and government saving.

(9) Q2. An economy has the per-worker production function $f(k) = 8k^{0.4}$. The depreciation rate is $d = 0.05$ and the labor force growth rate is $n = 0.01$. The saving function, in aggregate form, is $S_t = 0.3Y_t$. Find the steady-state capital-labor ratio, the steady-state value of output per worker, and the steady-state value of consumption per worker.


(9) Q4. Analytical Problem 1.(d), p.234. In answering this question, assume that the economy begins in steady state, and assume that the initial capital-labor ratio is less than the Golden Rule capital-labor ratio. Also, rather than answering the question as posed by the authors, do the following. Suppose there is a temporary rise in the saving rate. Making careful use of our usual graph together with accompanying careful discussion, analyze the time path of consumption per worker beginning from the point in time when the saving rate increases, and onward into the future.

(10) Q5. Consider how unemployment would affect outcomes in the Solow growth model. Suppose that output is produced by the aggregate production function $Y = K^{0.5}[(1-u)L]^{0.5}$, where $K$ is (aggregate) capital, $L$ is the (aggregate) labor force, and
$u$ is the natural rate of unemployment. The aggregate saving function is, as usual, $S = sY$, the labor force grows at rate $n$, and the depreciation rate is $d$.

(7) (a) Express output per worker $(y = Y/L)$ as a function of capital per worker $(k = K/L)$ and the natural rate of unemployment. Derive expressions for the steady-state values of output per worker and capital per worker as functions of the parameters $u$, $s$, $n$, and $d$ only; there should not be any endogenous variables on the righthand side of the equality signs in your functional expressions. Do not substitute numerical values for the parameters.

(3) (b) Suppose that some change in government policy reduces the natural rate of unemployment. How does this change the steady-state values for output per worker and capital per worker? Provide some economic intuition for your results.