Homework #8
Economics 411-1
Due Tuesday, November 27.
Christiano

1. Consider a model in which utility is a function not just of market consumption, c, and market labor effort, l, but also of consumption of home produced goods or services, c_n, and home labor effort, l_n. Specifically,
$$\log\left(c+c_n\right)-\gamma\log\left(\frac{l^{1+\psi}}{1+\psi}+l_n\right),$$
where $\gamma,\psi>0$. The home labor effort yields services via the home production function, $c_n=\psi_0 l_n$. Show that this formulation implies a utility function in terms of market goods and labor having the following form:
$$\text{constant}+a\log\left(c-\psi_0\frac{l^{1+\psi}}{1+\psi}\right),$$
where 'constant' and a are parameters. (Hint: recall how we got $F(k,k')$ for the version of the growth model in which utility is a function of labor effort, in addition to consumption.)

2. Consider the two equilibria in the Shleifer model studied in class. In one equilibrium (the immediate implementation equilibrium), an intermediate firm that receives a new idea implements it immediately. In the other equilibrium, firms in the 'South' delay implementation for one period while firms in the 'North' implement immediately (the simultaneous implementation equilibrium). In each case, we limited the range of options of a firm with a new idea: either implement immediately or implement in the next period. Verify that the immediate implementation and simultaneous implementation equilibria remain equilibria if we expand the range of options to allow a firm to wait *two* periods before innovating.

3. Compute a numerical example like the one in the Shleifer handout, except do it for an equilibrium in which innovations in the South are always implemented immediately, and innovations in the North are implemented with a one period delay.