CHETAN GHATE MACROECONOMICS II INDIAN STATISTICAL INSTITUTE FALL 2003 SEPTEMBER 2, 2003

Problem Set 5: Please turn all solutions in pencil.

This problem set is based on your readings of Lucas (1988), Xie (1994), and Benhabib and Perli (1994).

Problem 1 (Xie, 1994). Show that the solution of the differential equation

$$\frac{\dot{C}}{C} - \frac{\dot{K}}{K} = \lambda - \frac{\rho}{\beta} + \frac{C}{K},\tag{1}$$

is $C(t) = (\frac{\rho}{\beta} - \lambda)K(t)$. Also show that this solution satisfies the transversality condition.

Problem 2 (Xie, 1994). Based on Theorem 1, show, by inspection, that $u^* \in (0, 1)$.

Problem 3 (Xie, 1994). Prove Lemma 4 rigorously (do not simply replicate the steps in the article - show me all the derivations).

Problem 4 (Xie, 1994). Prove Theorem 3 and 5 rigorously (do not simply replicate the steps in the article - show me all the derivations).

Problem 5 (Lucas, 1988, Xie, 1994, Behabib and Perli, 1994). Just in words, state the main ideas conveyed in all three articles. Examine how each of the two JET articles extends Lucas (1988). In your own words, state one interesting/new research problem that could emerge out of these articles.