ECON 4350: Growth and Investment
Excercises for seminar 2

Spring 2007

1   Short questions

This is a type of exercises you can expect to figure as part of an exam. They call for rather short and to the point answers. You should draw on models where relevant, but not go through the entire model.

Do you agree with statements A-C? Explain why or why not?

A. "Diminishing marginal product is essential for convergence to a steady-state in the Solow model"

B. Consider Table 1 in **?** (at an exam the table would have been included in the problem set). When focusing on the results from the intermediate sample: "The estimated parameters are well in accordance with what we should expect from theory as to their signs and numerical size."

C. "It is always desirable to increase investments in order to increase productivity"

2   Technical questions

2.1   Existence of steady-state in the augmented Solow model

Consider the augmented Solow model as presented in Mankiw, Romer and Weil. Prove that a steady state exists and is unique.

2.2   The formal formulation of the Solow-model

Set up a complete mathematical formulation of the closed economy Solow-model (only one accumulated and reproducible input) in the following three situations. Take care to get the details right!

1. Population growth but no technological progress.

2. As above, but in discrete time (i.e. all entities are only measured at given points in time $t = 0, 1, 2, \ldots$).

3. As in 1, but adding technological progress.

3 Variable savings rate

Consider the simplest Solow-model framework, but assume that the savings rate depends on the level of y in the following manner

$$s(y) = \begin{cases} s_1, & y < \underline{y} \\ s_2 & y \geq \underline{y} \end{cases}$$

where s_1, s_2 and $\underline{y}$ are given parameters.

i. Can you configure these and the other parameters of the model in such a way that you end up with more than one stady-state?

ii. Do you see any new role for policy in this situation?

iii. Do you find this assumption about savings behavior realistic?

iv. Assume instead that the savings rate is a continuous function of y that is either always increasing in y or always decreasing in y. Can we now get more than one equilibrium?