UNIVERSITY OF CALIFORNIA
DEPARTMENT OF ECONOMICS

Economics 202B
Spring 2008
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Problem Set 2
Due in lecture Thursday, February 7

1. Consider an economy described by the Solow model that is on its balanced growth path. Assume that the saving rate is s_0. Now suppose that from time t_0 to time t_1, the saving rate rises gradually from s_0 to s_1 (where $s_1 > s_0$), and then remains at s_1.

Sketch the resulting path over time of log output per worker. For comparison, also sketch on the same graph: (i) the path that log output per worker would have followed if the saving rate had remained at s_0; (ii) the path that log output per worker would have followed if the saving rate had jumped discontinuously from s_0 to s_1 at time t_0 (and remained at s_1).

Explain your answer.

2. Saving rates may be higher at higher levels of income. This problem asks you to investigate the consequences of this possibility for economic growth.

Consider the Solow model without technological progress. For simplicity, assume that A is one, so that y and k are income per worker and capital per worker.

Now suppose that, in contrast to our usual assumptions:

-- The saving rate is zero if income per worker is less than some critical level, $f(\tilde{k})$.

-- The saving rate is s (where $s > 0$) if income per worker exceeds $f(\tilde{k})$.

Finally, assume that $sf(\tilde{k})$ is greater than $(n + \delta)\tilde{k}$.

a. Describe how, if at all, this change affects our usual diagram for the Solow model -- that is, the diagram showing actual investment per worker and break-even investment per worker as functions of capital per worker.

b. Describe what the behavior of output per worker over time will be if:

i. The initial level of capital per worker, $k(0)$, is between 0 and $\tilde{k}$.

ii. The initial level of capital per worker, $k(0)$, is slightly greater than $\tilde{k}$.

3. Romer, Problem 2.3.

(OVER)

EXTRA PROBLEMS (NOT TO BE HANDED IN/ONLY SKETCHES OF ANSWERS WILL BE PROVIDED)

4. In the usual Solow model, people consume a constant fraction of their income: $C(t) = (1-s)Y(t)$. Suppose instead, however, that consumption depends on income and on wealth. Specifically, suppose $C(t) = (1-s)Y(t) + aK(t)$, where a is a positive parameter. Assume that, as in the usual Solow model, investment is the difference between output and consumption.

How, if at all, does this change in the model affect the basic diagram for the Solow model -- that is, the diagram showing actual and break-even investment per unit of effective labor as functions of capital per unit of effective labor?

5. Romer, Problem 1.9.

6. Romer, Problem 1.10.

7. Romer, Problem 2.4.

EXTRA EXTRA PROBLEM (NOT TO BE HANDED IN/NO ANSWER WILL BE PROVIDED)

8. Romer, Problem 1.12.