

Economics 613: Macroeconomics I

Fall 2006

Cornell University

Problem Set #6

Due: Wednesday, September 27, 2006

One-Sector Technology

$$7C + 3Z = 22K^{1/4}L^{3/4}$$

1. Draw the PPF in (C, Z) space. Let p be the price of machines. For which p is production completely specialized to consumption? Completely specialized to investment? Draw the supply curve of investment.

2.

$$\begin{aligned}\dot{K} &= Z - \frac{K}{5} \\ L &= L_0 e^{0.02t}\end{aligned}$$

Calculate: (a) the maximum sustainable capital-labor ratio \tilde{k} , and the corresponding output per worker \tilde{y} , and (b) the Golden-Rule capital-labor ratio \hat{k} , and the corresponding consumption per worker \hat{c} and output per worker, \hat{y} .

3. Do parts (1) and (2) for the one-sector technology:

$$\begin{aligned}Y &= C + Z = \min[K, L] \\ \dot{K} &= Z - \frac{K}{10} \\ \frac{\dot{L}}{L} &= 0.01\end{aligned}$$

4. Some people call \hat{k} the optimal capital-labor ratio. Criticize these people. Be succinct and precise.