

Economics 614: Macroeconomics II

Spring 2004

Cornell University

Problem Set #10

Due: May 5, 2004

Inventive Activity and Capital Accumulation

$$Y = Y_C + Y_I + Y_R = AK^{1/3}L^{2/3}$$

$$Y_R = (1/5)Y$$

$$Y_C = (9/10)(4/5)Y$$

$$Y_I = (1/10)(4/5)Y$$

$$L = 1$$

$$\dot{K} = Y_I - (1/5)K$$

$$\dot{A} = Y_R - (1/20)A$$

1

Fully describe the dynamical system including:

- (a) the phase diagram
- (b) the associated linear system
- (c) the economic implications
- (d) stability of the system
- (e) robustness of the assumptions.

2

Change the production function to $Y = A^{1/5}K^{1/3}L^{2/3}$. Redo the analyses above. (In part 1, the production function exhibits increasing returns in the reproducible factors [$1 + 1/3 > 1$], while in part 2, the production function exhibits decreasing returns to the reproducible factors [$1/5 + 1/3 < 1$].)