Solow growth model

Exercises

Economics II – Lecture 9

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EXERCISE 1

Consider an economy without technological progress described by the following equations:

$$Y = K^{\frac{1}{2}}$$

$$s = 0.375$$

$$\delta = 0.025$$

a) Calculate the steady state values of capital and per capita income and graphically represent the balance.

b) Find the respective golden rule values and calculate the new marginal propensity to save, providing a graphic representation of the new golden rule balance (in a new chart).

EXERCISE 2

Consider an economy described by the following data:

$$Y = K^{\frac{1}{2}}$$

$$s = 0.2$$

$$\delta = 0.01$$

a) Calculate the steady state values $k_0^*; y_0^*; c_0^*$ per worker. Find the respective golden rule values. Graph the values found.

b) Suppose that depreciation value grows to 0.03. Calculate the new steady state values per worker:. Also find the respective golden rule values. Graph the new values.

EXERCISE 3

Consider an economy described by the following data:

$$Y = K^{\frac{1}{2}}$$

$$\delta = 0.02$$

a) Calculate the saving propensity "s" which guarantees that the capital per worker of steady state (k *) is equal to the capital per worker of golden rule (kg):. Give a graphical representation of the values found.

b) Consider that amortization varies (δ=0.05) while s remains as computed. Calculate the new steady state values of capital and product per worker:. Graph the new values found.

c) Explain economically and describe graphically how y, i and c evolve as the system passes from steady state equilibrium to that of golden rule.

d) Now suppose that the government takes measures that bring technological progress from zero to a positive growth rate of g. Graph the new steady state balance graphically.

e) Explain if and why there is permanent growth in this new steady state.