

Notes on Excel Simulations of Solow Model

Basic Equations:

$$(1) \quad Y = K^\alpha (AL)^{1-\alpha}$$

$$(2) \quad \hat{L} = n, \quad \hat{A} = g$$

$$(3) \quad S = s Y$$

$$(4) \quad \hat{K}_t = s (Y_t/K_t) - \delta$$

$$(5) \quad K_{t+1} = (1+K_t) K_t$$

$$(6) \quad L_{t+1} = (1+L_t) L_t = (1+n) L_t$$

$$(7) \quad A_{t+1} = (1+A_t) A_t$$

$$(8) \quad \hat{y}_t = (y_{t+1} - y_t) / y_t$$

$$(9) \quad y = Y/L, \quad k = K/L$$

We assume that population (N) is equal to the labor force (L)

There are 3 countries (USA, Foreign 1, Foreign 2)

The program shows the following variables for each country for 100 periods:

\hat{y}	y	Y/AL	K/AL	Y	K	AL	L	A	\hat{K}
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SIMULATIONS

For all countries and in all cases:

$$\alpha = 0.35 \quad \delta = 0.02$$

$$K_0 = 1 \quad L_0 = 10$$

(1) Solow Model with population growth and without technological change: countries differ in their **rate of population growth** .

$$\text{All countries} \quad \hat{A}=0 \quad \hat{A}_0 = 1, \quad s=0.10$$

$$\text{USA: } \hat{L} = 0.10$$

$$\text{Foreign 1: } \hat{L} = 0.05$$

$$\text{Foreign 2: } \hat{L} = 0.15$$

(2) Solow Model with population growth and without technological change :countries differ in their **savings rates**.

$$\text{All countries:} \quad \hat{A}=0, \quad \hat{L}=n=0.10, \quad \hat{A}_0 = 1$$

$$\text{USA: } s = 0.10$$

$$\text{Foreign 1: } s = 0.15$$

$$\text{Foreign 1: } s = 0.05$$

(3) Solow Model with population growth and technological change :countries differ in their **initial technology level** .

$$\text{All countries:} \quad \hat{A}=0.02, \quad \hat{L}=n=0.10, \quad s=0.10$$

$$\text{USA: } \hat{A}_0 = 8$$

$$\text{Foreign 1: } \hat{A}_0 = 4$$

$$\text{Foreign 1: } \hat{A}_0 = 2$$

(4) Solow Model with population growth and technological change :countries differ in their **savings rates**.

$$\text{All countries:} \quad \hat{A}=0.02, \quad \hat{L}=n=0.10, \quad \hat{A}_0 = 8$$

$$\text{USA: } s = 0.10$$

$$\text{Foreign 1: } s = 0.15$$

$$\text{Foreign 1: } s = 0.05$$