Economic Growth

Notes on Excel Simulations of Solow Model

Basic Equations:

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

(2) $A = n$, $A = g$
(3) $S = s Y$
(4) $A = s (Y_t/K_t) - \delta$
(5) $K_{t+1} = (1+K_t) K_t$
(6) $L_{t+1} = (1+L_t) L_t = (1+n) L_t$

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

(8)
$$\bigwedge_{t=(y_{t+1} - y_t) / y_t}^{(8)}$$

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

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:

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у	у	Y/AL	K/AL	Y	Κ	AL	L	А	K

SIMULATIONS

For all countries and in all cases:

 $\begin{array}{ll} \alpha \,=\, 0.35 & \delta \,=\, 0.02 \\ K_0 \,=\, 1 & L_0 \,=\, 10 \end{array}$

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

All countries $\bigwedge^{\wedge} A=0 A_0 = 1, s= 0.10$ $\bigwedge^{\wedge} L=0.10$ Foreign 1: L = 0.05 Foreign 2: L = 0.15

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

All countries:	$A=0$, $L=n=0.10$, $A_0=$	- 1
USA: $s = 0.10$	Foreign 1: $s = 0.15$	Foreign 2: $s = 0.05$

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

All countries: $\bigwedge^{\wedge} A=0.02$, L=n=0.10, s=0.10USA: $A_0 = 8$ Foreign 1: $A_0 = 4$ Foreign 2: $A_0 = 2$

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

All countries: $\bigwedge^{\wedge} A=0.02$, L=n=0.10, $A_0=8$ USA: s = 0.10 Foreign 1: s = 0.15 Foreign 2: s = 0.05