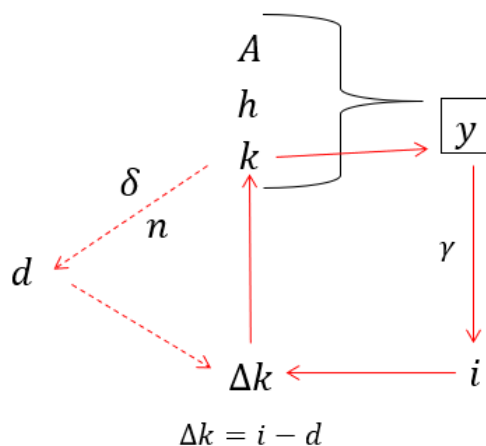


Solow Model

Operating Mode



N.B.:
 "γ-arrow" complete:
 $s = \gamma$ (in autarky)
 $s < \gamma$ (net capital inflow)
 $s > \gamma$ (net capital outflow)

Core Functions

Production function:

$$y = f(k) = Ak^\alpha h^{1-\alpha}$$

Driver:

$$\Delta k = i - d = \gamma y - (\delta + n)k$$

Variables and Symbols

y	Output p.C.	h	Human capital parameter
A	Productivity	γ	Investment rate
k	Capital stock p.C.	δ	Depreciation rate
i	Investment p.C.	n	Population growth rate
d	Depreciation p.C.		

Relevance

The significance of this model can hardly be overestimated. In the model, the variables tend to equilibrium values with zero growth. Can explain why catching-up economies have diminishing growth rates over time and why economies may remain at one level of development (be it LDCs, middle-income trap countries or Japan).

The "Solow Shock": Dispelling the idea that the most important variable for long-term growth is capital. This hope – irritatingly – still enjoys great popularity (e.g. EU and NGOs).

Although it allows for "only" exogenous growth in the long-run, i.e. technological progress must be introduced from outside the model, its main implication is that productivity is in the driver seat. Without productivity improvements, there is a "threat" of zero growth.

Limitations

Having recognised that productivity is central, the next open question is how this in turn arises, i.e. how it can be "endogenized" (explained within the model). A part of the labour force could e.g. produce productivity through research while the other part produces output.

This is particularly relevant to explain the permanent (though lower) growth in advanced economies at the knowledge frontier.

However, one can also show provisionally in the Solow model that there is no "threat" of equilibrium, i.e. that economies can also grow over very long periods of time, once continued productivity progress is assumed. For the question of "infinite growth", however, other areas, such as an ecologically motivated maximum resource throughput per period, must be taken into consideration.