

Solow's Model

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Solow's Model

- Helps us understand the long-run growth of an economy.
- The model is based on the idea that the economy's output is produced by capital and labor.
- The model makes the following assumptions:
 - ① The only two factors of production are capital and labor.
 - ② Production takes place according to a Cobb-Douglas production function.
 - ③ Population grows at a constant rate $g_n > 0$.
 - ④ The capital stock depreciates at a constant rate $\delta > 0$.
 - ⑤ The saving rate is constant and equal to s .
 - ⑥ There is no productivity growth.
 - ⑦ The economy is closed.

Solow's Model

- Production takes place according to:

$$Y = AK^\alpha N^{1-\alpha},$$

where $0 < \alpha < 1$ represents the share of capital in output, and $A > 0$ is aggregate productivity.

- Per capita output is given by:

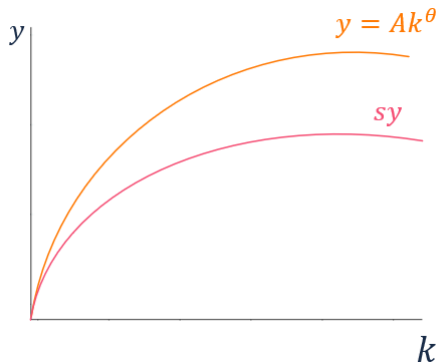
$$y = \frac{Y}{N} = \frac{AK^\alpha N^{1-\alpha}}{N}$$

$$= AK^\alpha N^{-\alpha}$$

$$= A \left[\frac{K}{N} \right]^\alpha$$

$$= Ak^\alpha.$$

Per Capita Output and Investment



Minimum Required Investment

- The minimum required investment (IMN) is a theoretical number, which captures the amount of capital investment necessary for the economy to maintain its current level of capital per worker.
- The IMN takes into account:
 - ① The depreciated capital δk .
 - ② The capital needed to cover the population growth $g_n k$.
- The IMN is given by:

$$IMN = \delta k + g_n k = (\delta + g_n)k.$$

Equilibrium and Steady State

