Differences between Ramsey and Solow model

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1. Types of Growth model
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GROWTH MODELS

Exogenous growth models

- Economic growth arises by the influences outside the economy or agent.
- Physical capital per worker grows over time, however capital to output is nearly constant
- Economic welfare is determined by external factors (rate of return to capital is nearly constant)

❖ By the way, Growth in output and growth in the volume of international trade are closely related (according to statistics)

Examples from the neoclassical model:

1. The Solow model
2. The Ramsey model

GROWTH MODELS

Endogenous growth models

- Economic growth arises due to influences inside the economy or agent
- Investment in human capital, innovation, and knowledge are significant contributors to economic growth
- Positive externalities and spillover effects lead to an economic development

Models with endogenous growth :

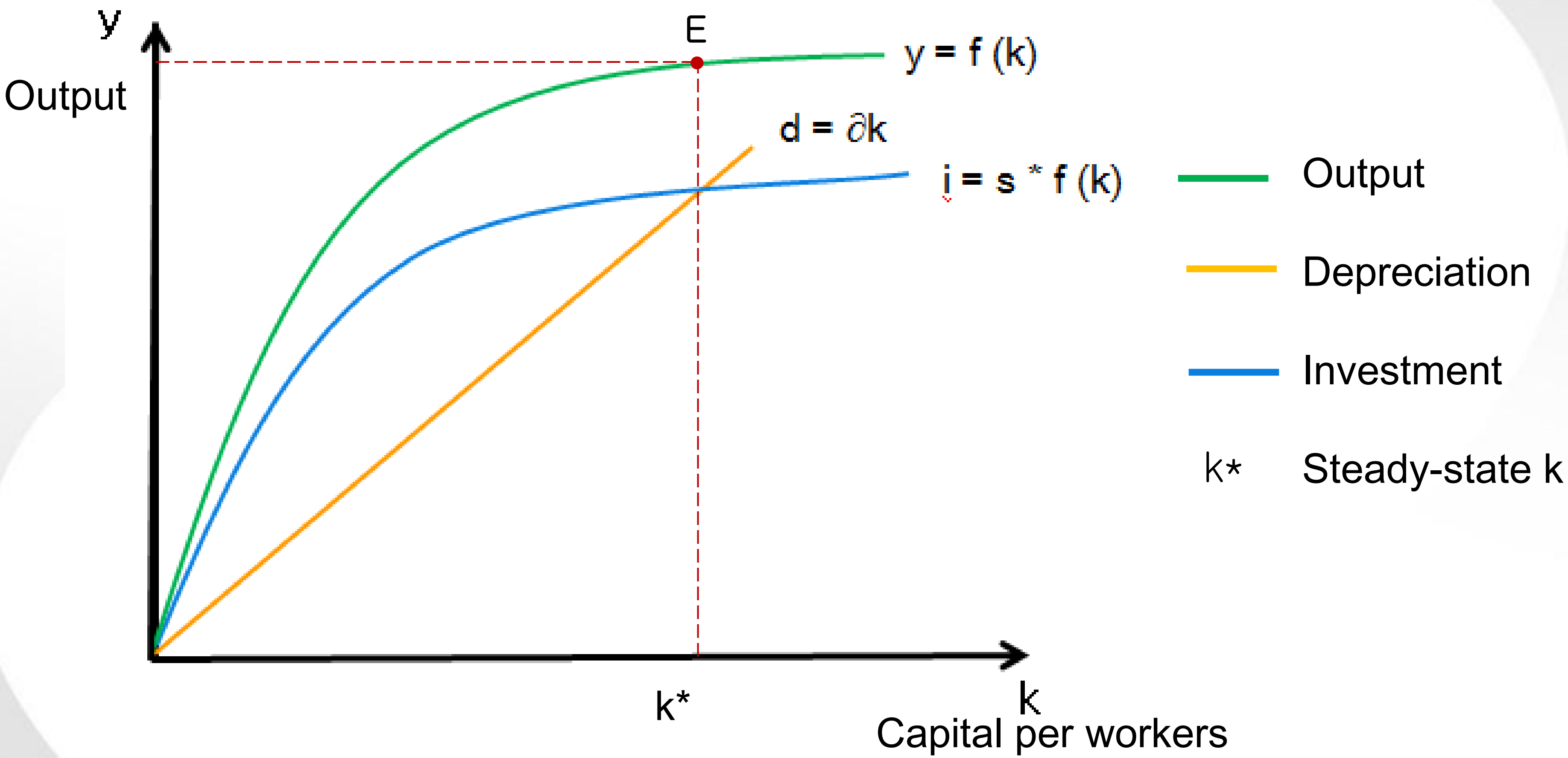
1. The Arrow Model
2. The Levhari-Sheshinski Model
3. The King-Robson Model
4. The Romer Model

SOLOW MODEL

The Solow Growth Model is the first general equilibrium model of production side to study long-run economic growth (invented by **Robert Solow).**

- No consumption
- No prices (one single good)
- Savings propotional to output
- Exogenous technological progress explains all
- Constant returns to scale produciton function
- Technology is free (publicly available as non-excludable, non-rival good)
- Optimal production decision
- Empirically testable
- Closed economy

SOLOW MODEL


y
Output
E
y = f (k)
d = ∂k
i = s * f (k)
Output
Depreciation
Investment
k* Steady-state k
k*
k
Capital per workers

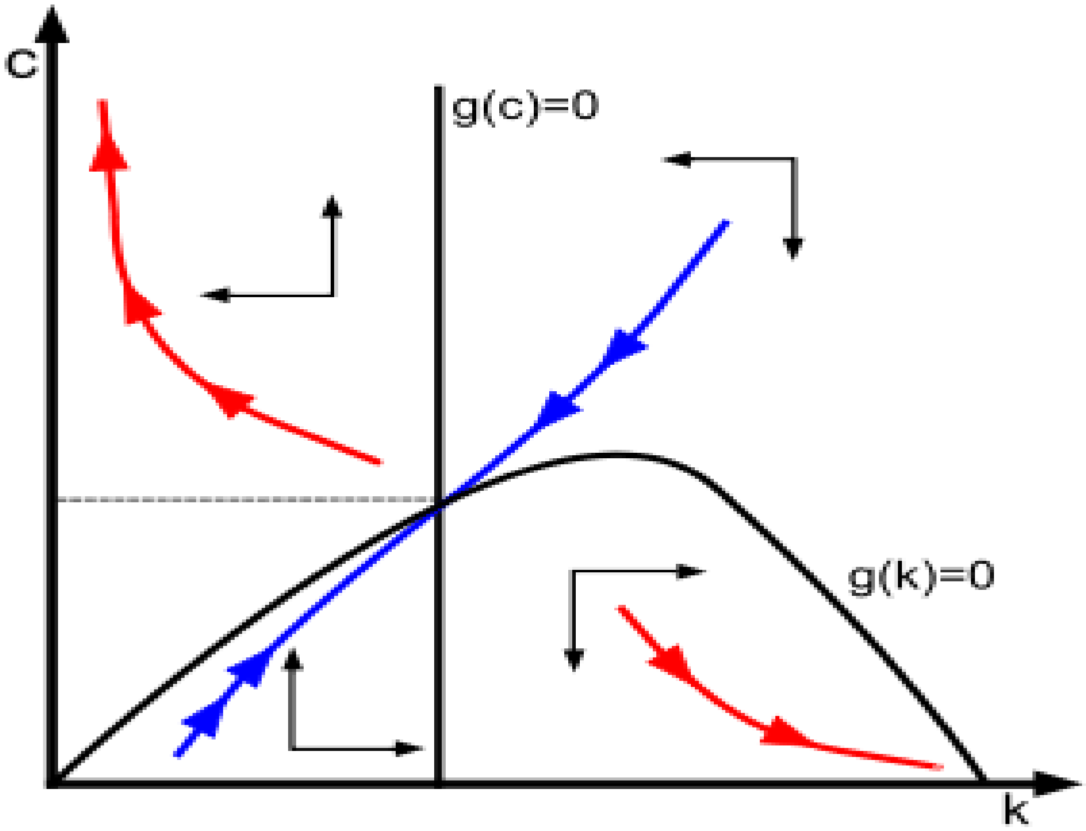
The change in the capital investment come from the change in the savings rate.

RAMSEY MODEL

The Ramsey growth model is a neoclassical model of optimal growth in continuous time for an economy based primarily on the work of **Ramsey**, later extensions by **Cass** and **Koopmans**

- Endogenous saving-consumption decision
- Infinitely-lived household maximizing the intertemporal utility
- Producers maximize profit per period
- Decentralized equilibrium is Pareto efficient
- Explains long-run economic growth
- Constant population growth rate

RAMSEY MODEL



🟦 The dynamic adjustment path of the economy
in which all the constraints present in the model are satisfied.

🟥 The dynamic paths which are ruled out by the transversely condition.

DIFFERENCES BETWEEN BOTH MODELS

1. The choice of consumption is explicitly **micro founded** in Ramsey model, but not in Solow model

2. The **endogenous savings** decision in Ramsey model, but not in Solow model. In the Ramsey model households save less sinc e there is discounting of future utility.

3. The outcome is **Pareto efficient** in Ramsey model, but not in Solow model

4. In the Ramsey model, the long-run equilibrium level of capital per worker is lower that in the Solow model.