

報告要旨

題名 : Knowledge Spillover and Endogenous Fluctuations

報告者 : 品川俊介

This paper studies a R&D-based growth model, and presents a theoretical analysis on business cycles, knowledge spillover, and the scale effect of long-run growth, by using the framework of the variety expansion model without capital accumulation. In particular, we investigate the relation between dynamic properties of equilibrium paths and linearity of knowledge spillover.

We consider a discrete-time dynamic model with endogenous technological change. We assume that a new variety of goods is invented by allocating labor for R&D activities, and inventors enjoy a temporary monopoly by limited patent protection. Following the formalism adopted in much of the literature, we assume that there exists knowledge spillover in R&D, that is, the stock of existing knowledge has an effect on the productivity of present R&D. Further, we investigate following two cases:

- First, we adopt the knife-edge assumption of knowledge spillover, based on the first-generation R&D-based endogenous growth models, in which increase in knowledge is linearly proportional to stock of knowledge.
- Second, instead of assuming the knife-edge condition, we impose diminishing returns to knowledge in R&D, as in the semi-endogenous growth models.

Under the former assumption, the equilibrium paths converges to the unique steady state, and no bifurcation occurs. In contrast, after relaxing the knife-edge condition, and following the formalism proposed in the semi-endogenous growth models, the economy has a fluctuating equilibrium path by a bifurcation theorem. In other words, we can show that the loss of the linearity of knowledge spillover is the important factor in causing fluctuations.