学术报告

报告主题：Optimizing systematic technology adoption with uncertain technological learning and heterogeneous agents

报告人：马铁驹

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Abstract: The adoption of new technologies has long been believed and shown to be one of the most important sources of economic growth, long-run productivity and sustainable development. Studies on technology adoption can be grouped into one of two streams. The first stream addresses the psychology-based acceptance of new technologies by individual users or organizations. Well-known models in this stream include the technology adoption lifecycle model, the Bass diffusion model, and the technology acceptance model. The second stream analyzes technology adoption from the perspective of social planning instead of from the perspective of individuals. The systematic technology adoption in this study refers to the second stream, and such technology adoption is planned by social planners on a system level to meet a certain system objective, for example, to satisfy a country's demand for electricity at a minimum total cost and with acceptable environmental effects.

Significant effort has been devoted to developing operational optimization models of systematic technology adoption. Well-known examples of such models include MESSAGE and MARKAL. The purpose of these models is usually to determine the optimal systematic technology adoption to minimize the total cost of the entire system, subject to various constraints. Most of these models treat technological change exogenously and ignore the existence of heterogeneous decision makers who interact with each other in the system. In this study, we conduct exploratory analysis on how uncertain technological change and heterogeneous agents influence the systematic technology adoption with a stylized optimization model.

个人简介：马铁驹,男，国家杰出青年基金获得者(2011)，华东理工大学 商学院 管理科学与工程系教授/博导。主要从系统优化和演化的角度分析新技术的采纳和扩散，代表性论文发表在《European Journal of Operational Research》、《Management Science》、《Energy Economics》、《Energy》、《Decision Sciences》等知名国际期刊。