統計科學研究所
INSTITUTE OF STATISTICAL SCIENCE

Seminar

Title：Testing specification of distribution in stochastic frontier analysis

Speaker：Prof. Ming-Yen Cheng (鄭明燕 教授)
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Time：10:30 ~ 12:00, Monday, April 1, 2024

Place：Auditorium, B1F, Institute of Statistical Science

Abstract

Stochastic frontier analysis is regularly used in empirical studies to evaluate the productivity and efficiency of companies. A typical stochastic frontier model involves a parametric frontier subject to a composite error term consisting of an inefficiency and a random error. We develop new tests for specification of distribution of the inefficiency. We focus on simultaneous relaxation of two common assumptions: 1) parametric frontier which may lead to false conclusions when misspecified, and 2) homoscedasticity which can be easily violated when working with real data. While these two issues have been extensively studied in prior research exploring the estimation of a stochastic frontier and inefficiencies, they have not been properly addressed in the considered testing problem. We propose novel bootstrap and asymptotic distribution-free tests with neither parametric frontier nor homoscedasticity assumptions, in both cross-sectional and panel settings. Our tests are asymptotically consistent, simple to implement and widely applicable. Their powers against general fixed alternatives tend to one as sample size increases, and they can detect root-n order local alternatives. We demonstrate their efficacies through extensive simulation studies. When applied to a banking panel dataset, our tests provide sound justification for the commonly used exponential specification for banking data. The findings also show that a new parametric frontier model is more plausible than the conventional translog frontier.

※ Tea reception starts at 10：10.

※ Online live streaming through Cisco Webex will be available.