Global Dependence and Productivity Catching-up: A Conditional Nonparametric Frontier Analysis

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Abstract:

Increasing globalization and interconnection among countries generates spatial and temporal dependence which will affect the production process of each country. Many studies have analyzed the effect of cross-sectional dependence by using restrictive parametric models.

We use a flexible nonparametric two-step approach on conditional efficiencies to eliminate the dependence of production inputs/outputs on these common factors. By using a dataset of 44 countries over 1970-2007, we estimate the global frontier and explore the channels under which Foreign Direct Investment (FDI) and time affect the production process and its components: impact on the attainable production set (input-output space), and the impact on the distribution of efficiencies. We extend existing methodological tools - flexible non parametric location-scale frontier model - to examine these interrelationships. We emphasize the usefulness of ″pre-whitened″ inputs/outputs to obtain more reliable measure of productivity and efficiency to better investigate the driven forces behind the catching-up productivity process. Furthermore, since the influence of external factors has been eliminated, our proposed approach mitigates the problem of endogeneity bias caused by reverse causality between the external factors as FDI and productivity.