

A Common Factor Approach to Spatial Heterogeneity in Agricultural Productivity Analysis

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Abstract:

In this paper we investigate a 'global' production function for agriculture, using FAO data for 128 countries from 1961-2002. Our review of the empirical literature in this field highlights that existing cross-country studies largely neglect variable time-series properties, parameter heterogeneity and the potential for heterogeneous Total Factor Productivity (TFP) processes across countries. We motivate the case for technology heterogeneity in agricultural production and present statistical tests indicating nonstationarity and cross-section dependence in the data. Our empirical approach deals with these difficulties by adopting the Pesaran (2006) Common Correlated Effects estimators, which we extend by using alternative weight-matrices to model the nature of the cross-section dependence. We furthermore investigate returns to scale of production and production dynamics. Our results support the specification of a common factor model in intercountry production analysis, highlight the rejection of constant returns to scale in pooled models as an artefact of empirical misspecification and suggest that agro-climatic environment, rather than neighbourhood or distance, drives similarity in TFP evolution across countries. The latter finding provides a possible explanation for the observed failure of technology transfer from advanced countries of the temperate 'North' to arid and/or equatorial developing countries of the 'South'.