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Expanding Chinese Farms: A Spatial Panel Data Analysis to Explore the Large-Scale Production Units

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Abstract

As a result of industrialisation and urbanisation, large numbers of rural workers in China shifted to non-agricultural industries seeking to increase household income, leading to a weak agriculture run by part-time workers. In response, the government has launched a series of policies to encourage farmland transfer from smallholders to various types of large-scale production units. The Chinese agricultural sector therefore gradually evolved from single entities of small-scale farms to the co-existence of small-scale farms and various types of large-scale production units. Yet, it seems that the emergence and expansion rate of large-scale farm operation vary widely across regions. There are also signs of spatial agglomeration effects driven by local socio-economic factors and policies.

To date, very few studies have quantified the drivers of expansion of the large-scale farm sector in China; there is only scarce evidence referring to potential spatial correlations across regions. This paper contributes to the literature by applying spatial panel data models to explain the changes in the share of land cultivated under large-scale farm operation. The model is developed at county-level for the Jiangsu Province in China. The model is calibrated by using county-level statistical data from 2002 to 2015 across 44 counties of the Jiangsu Province. Several preliminary and robustness checks were done. The Moran's I test is first estimated to back the choice of considering spatial interactive relationships; and the results of the spatial panel data models are compared with those of non-spatial panel models. Moreover, both direct and indirect effects are estimated.

Three results stand out: (1) the spatial model is appropriate: the Moran's I values are positive and significant from 2002 to 2015, confirming the rationality of considering spatial interactive relationships; tests to non-spatial panel models further indicate the presence of spatial dependence and the Spatial Durbin Model is proven to be the most appropriate model specification; (2) estimation results suggest that the development level of large-scale farm operation is positively associated with agricultural mechanisation levels and has a U-shaped relationship with cultivated land area per household; (3) estimates of direct and indirect effects show that the economic development level and non-farm employment situation in the county has positive spatial spillover effects on the development of large-scale farm operation while institutional factors like registration of land certificates show negative spatial spillover effects.

Keywords: Large-scale production units, spatial autocorrelation, spatial panel data model, spillover effects

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