

SPATIAL DEPENDENCE IN THE ADOPTION OF ORGANIC DRYSTOCK FARMING IN IRELAND

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ABSTRACT

This article analyses spatial dependence in the form of neighbourhood effects and unobserved regional effects in the adoption of organic farming. Bayesian spatial probit models are applied to survey data of almost 600 Irish drystock farmers. The results confirm that farmers located in close proximity exhibit similar choice behaviour. In addition, we identify the importance of farmer interactions in adoption decision in the sense that local social norms and attitude have important spillover effects. Overall, the study underlines the importance of accounting for interdependence in farmers' decisions which emerges as important in the formulation of agricultural policy.

INTRODUCTION

Spatial dependence implies that farmers located in close proximity exhibit similar choice behaviour. This may arise due to communication between farmers, which can, for example, raise awareness, reduce information costs or change preferences. Alternatively, spatial dependence may arise due favourable conditions for organic farming that can prevail in certain geographic areas.

Despite the fact that spatial dependence is widely thought to be an important factor affecting technology adoption, few studies have previously attempted to empirically study this effect. Hence, this study applies Bayesian spatial probit models to control for spatial dependence in the adoption of organic farming of Irish drystock farmers.

METHODOLOGY

In order to test for spatial dependencies several spatial probit models are applied. Specifically, a spatial autoregressive probit model (SAR) that controls for neighbourhood influences and a spatial error probit model (SEM) that controls for unobserved spatial effects are employed. A number of models that differ in the spatial weight matrix specifications are estimated and compared to reveal the size of the neighbourhood and spatial effect. In order to estimate the spatial probit models, a Bayesian estimation framework using a MCMC sampler is used.

RESULTS AND DISCUSSION

Our estimates show that the adoption of organic farming in Ireland exhibits spatial dependence which is observed in two ways: first, the Bayesian SAR probit models confirm that farmers' adoption choices are dependent on their neighbors' decisions, suggesting that communication or interaction between farmers in close proximity affect uptake decisions. Second, the Bayesian SEM probit models indicate that unobserved effects that are correlated over space impact on adoption decisions, suggesting that regional specific natural or economic characteristics impact on the uptake of organic farming.

Moreover, the use of spatial econometric models allowed more precise estimation in contrast to a non-spatial model. Hence, when spatial dependence is present it is important to control for it. Moreover, the spatial dependence parameter contains important policy information and spatial models can thus improve policy inferences drawn from empirical evidence.