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The Yield Effects of Organic Farming: A Case Study of Black Pepper in India

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Abstract

Global debates on sustainable agriculture have brought certified alternative farming systems like organic agriculture to the forefront. In the recent decades, organic certification schemes have captured the willingness to buy of the environmentally conscious and ecologically motivated consumer; threatening to break out of its current niche markets.

Yet, the principal objection towards certified systems like organic agriculture is low yields. Such conclusions are often drawn by simply comparing organic and conventional crop yields. But this is subject to severe methodological limitations due to issues of selection bias, endogeneity and absence of a valid counterfactual. A justifiable counterfactual group is needed to ascertain the yield of organic farmers if they were conventional and *vice-versa*.

In this context, we study Indian agriculture which has the leading number of organic producers in the world. The domestic black pepper scarcity and soil fertility problems pushed many smallholder farmers to shift to alternative agricultural systems like certified organic farming to increase production. Some of these organic farmers were also fair trade certified. But, previous studies were only restricted to organic and not extended to fair trade systems. Hence, we explore this choice in the framework of the ability of certification schemes to increase pepper production. We use data collected from 277 smallholder black pepper farm households in Idukki district, Kerala, India. We estimate a multinomial endogenous switching regression equation along with a counterfactual analysis to ascertain the effects of organic and fair trade certification on production. We also methodologically expand the multinomial counterfactual model to include heterogeneity effects.

Results show that organic farmers are the most productive and that conventional farmers will increase yield by 113% if they adopt certified organic black pepper farming. Base heterogeneity effects reveal that organic farmers have unobservable characteristics that make them better farmer even under a counterfactual setting. Transitional heterogeneity effects are negative implying that conventional farmers will benefit the most if the venture into certified organic black pepper farming. We also find that a joint organic and fair trade certification is vital for those farmers who were less high-yielding before they ventured into certified systems.

Keywords: Fair trade, heterogeneity effects, impact evaluation, India, multinomial endogenous switching regression, organic farming