

## Productivity and Household Welfare Impact of Technology Adoption: A Microeconometric Analysis

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**Abstract :** Since rural households are basically entitled to food through own production, improving productivity might lead to enhance the welfare of rural population through higher food availability at the household level and lowering the price of agricultural products. Increasing agricultural productivity through the use of improved technology is one of the desired outcomes from sensible food security and agricultural policy. The ultimate objective of this study was to evaluate the potential impact of improved agricultural technology adoption on smallholders' crop productivity and welfare. The study is conducted in Ethiopia covering 1500 rural households drawn from four regions and 15 rural villages based on data collected by Ethiopian Rural Household Survey. Endogenous treatment effect model is employed in order to account for the selection bias on adoption decision that is expected from the self-selection of households in technology adoption. The treatment indicator, technology adoption is a binary variable indicating whether the household used improved seeds and chemical fertilizer or not. The outcome variables were cereal crop productivity, measured in real value of production and welfare of households, measured in real per capita consumption expenditure. Results of the analysis indicate that there is positive and significant effect of improved technology use on rural households' crop productivity and welfare in Ethiopia. Adoption of improved seeds and chemical fertilizer alone will increase the crop productivity by 7.38 and 6.32 percent per year of each. Adoption of such technologies is also found to improve households' welfare by 1.17 and 0.25 percent per month of each. The combined effect of both technologies when adopted jointly is increasing crop productivity by 5.82 percent and improving welfare by 0.42 percent. Besides, educational level of household head, farm size, labor use, participation in extension program, expenditure for input and number of oxen positively affect crop productivity and household welfare, while large household size negatively affect welfare of households. In our estimation, the average treatment effect of technology adoption (average treatment effect on the treated, ATET) is the same as the average treatment effect (ATE). This implies that the average predicted outcome for the treatment group is similar to the average predicted outcome for the whole population.

**Keywords :** Endogenous treatment effect, technologies, productivity, welfare, Ethiopia

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