

## Tenants Use Less Input on Rented Plots: Evidence from Northern Ethiopia

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**Abstract :** The study aims to investigate the impact of land tenure arrangements on fertilizer use per hectare in Northern Ethiopia. Household and Plot level data are used for analysis. Land tenure contracts such as sharecropping and fixed rent arrangements have endogeneity. Different unobservable characteristics may affect renting-out decisions. Thus, the appropriate method of analysis was the instrumental variable estimation technic. Therefore, the family of instrumental variable estimation methods two-stage least-squares regression (2SLS), the generalized method of moments (GMM), Limited information maximum likelihood (LIML), and instrumental variable Tobit (IV-Tobit) was used. Besides, a method to handle a binary endogenous variable is applied, which uses a two-step estimation. In the first step probit model includes instruments, and in the second step, maximum likelihood estimation (MLE) (“etregress” command in Stata 14) was used. There was lower fertilizer use per hectare on sharecropped and fixed rented plots relative to owner-operated. The result supports the Marshallian inefficiency principle in sharecropping. The difference in fertilizer use per hectare could be explained by a lack of incentivized detailed contract forms, such as giving more proportion of the output to the tenant under sharecropping contracts, which motivates to use of more fertilizer in rented plots to maximize the production because most sharecropping arrangements share output equally between tenants and landlords.

**Keywords :** tenure-contracts, endogeneity, plot-level data, Ethiopia, fertilizer

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