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The Role of Crossbreed Cow Adoption on Farm Productivity and Technical Efficiency in Ethiopia

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Abstract

Ethiopia has an enormous potential for milk production given its estimated 59.5 million cattle heads and 11.8 million cows. Over 98 % of the cattle are indigenous East African breeds characterised by low milk yield. Crossing of indigenous breeds with European breeds and promoting adoptions became the foci of Ethiopia's livestock development initiatives in the last fifty years. The initiatives were aimed at raising milk production and hence farmers' incomes. However, the effect of crossbreed cow adoption on the farmers' milk production performance remained unclear. This study examined the effect of crossbred cow ownership on productivity and technical efficiency in milk production. The study is based on a cross-sectional data collected from a stratified random sample of 250 farmers in three districts in central Ethiopia. Advances in productivity analysis uncovered the inadequacy of single-technology frontier methods in comparing the relative performances of decision makers which use heterogeneous technology. Such heterogeneity calls for a differentiated picture of potentials. In this study, we implemented two variants of meta-frontier production function framework: semi-parametric and fully-parametric methods. The results showed that the production frontier pertaining to farmers using only crossbreed cows is superior to those using only indigenous cows and those keeping both types. Farmers keeping only indigenous cows have the lowest production frontier. Mean technical efficiencies from a common meta-technology frontier are 0.76, 0.61 and 0.65 for only crossbreed cows group, only indigenous cows group and both types of cows group, respectively, under the semi-parametric method. We obtained rather lower mean technical efficiency levels of 0.72, 0.46 and 0.54 for the respective groups when the fully-parametric method is used. The results from the fully-parametric method are preferred for policy purposes since the method helps to address some obvious measurement issues in developing country data. The technical efficiency variations of the three groups signify enhanced effort and motivation for maximization in high stake investments such as crossbreed cows compared to subsistence. The results suggest that the adoption of crossbreed cows helps to raise productivity, technical efficiency and market orientation. Nonetheless, further study is needed to identify constraints and drivers of the adoption.

Keywords: Crossbred cow, Ethiopia, meta-frontier, milk, productivity, technical efficiency

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