The Role of Crossbreed Cow Adoption on Farm Productivity and Technical Efficiency in Ethiopia. Tropentag 2018, Ghent, Belgium

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Introduction

- Crossbreeding and promoting adoptions became the foci of Ethiopia's livestock development initiatives since the 1970s
  - ✓ Aim: raising milk production and hence farmers' incomes
- However, the effect of crossbreed cow adoption on the farmers' milk production performance remained unclear
  - ✓ 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

Figures 1,2,3: Pictures taken during fieldwork in central Ethiopia (2016)

Methods and Materials

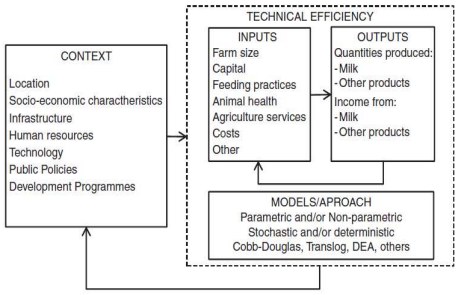

Figure 4: Milk Production Efficiency Synthesis framework (*Mareth et al., 2017)*

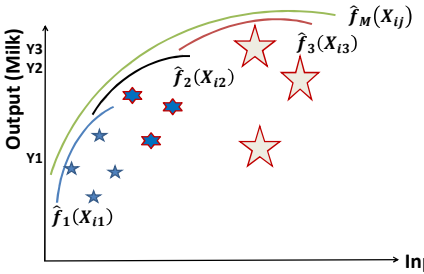

Figure 5: Parametric Meta-frontier production function framework (sketch based on Huang et al. , 2014)

Figure 6: Study area

- ❖ Data: cross-sectional data (2016)
- ❖ Sampling: stratified random sample
- ❖ Sample size: 250 farmers

Method of Analysis

- ❖ Meta-frontier production function method applied: Semi-parametric and Fully-parametric

Results and Discussion

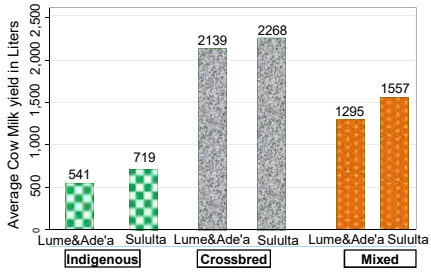

Figure 7 Descriptive: Milk per cow in each district by cow type

Table 1: Summary of mean group *technical efficiencies*, *meta-technology ratios* and *meta-technology efficiencies*

Farmer class	Group TE (SFA)	Meta Technology Ratio		Meta-technology Efficiency	
		DEA	SFA	Semi-Parametric (O'Donnell et al., 2008)	Fully Parametric (Huang et al., 2014)
Indigenous only	0.81	0.74	0.56	**0.61**	**0.46**
Crossbred only	0.91	0.84	0.79	**0.76**	**0.72**
Mixed case	0.78	0.84	0.70	**0.65**	**0.54**

- ➢ Farmers keeping only crossbreed cows have superior milk production frontier followed by those keeping both cow types
- ➢ Farmers keeping only crossbred cows exhibit consistently highest mean Meta-technology TE
- ➢ Lower mean meta-technology TE results under the fully-parametric method
- ➢ Result from fully-parametric method is preferred for policy as it reduces the obvious measurement issues in LDC's data

Conclusions

- ➢ Farmers' actual per cow milk yield in relation to potential yield varies according to differences in the genetics of the cows kept by the farmers
  - ✓ The use of crossbred cows enhances milk productivity as well as technical efficiency levels
  - ✓ Enhanced motivation for maximization when the stakes are higher as compared to the case of low value investments for mere subsistence
  - ✓ The evidence supports the arguments favoring promotion of the adoption of crossbred cows in order to improve milk productivity and technical efficiency

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