

LSMS-ISA
Integrated Surveys on Agriculture

Gender Differentials in Agricultural Production

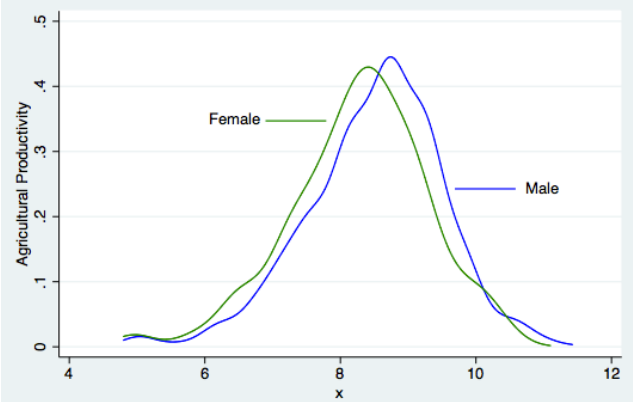
In 2011/2012, Ethiopia's Central Statistical Agency (CSA), in collaboration with the World Bank, conducted the first wave of the Ethiopia Rural Socioeconomic Survey (ERSS), which collects detailed data on household welfare and income-generating activity[1]. The ERSS' sample includes 4,000 households that are representative of small towns and rural areas; wave 2 will be expanded to include urban areas and will run from 2013 to 2014.

Agriculture is an integral part of household income in Ethiopia; nearly 80 percent of employed individuals work in the agriculture sector[2]. However, there is a gender gap in productivity that limits the sector's full potential. This brief decomposes the gender differentials for agricultural production in Ethiopia, looking primarily at the explained variation of the differential. The analysis was carried out at the level of the holder, an individual within a household responsible for a given extension of land. The results that follow reflect the analysis of 1,518 holders, of which 84 percent are male and 16 percent are female[3].

Agricultural Production by Gender

Agricultural production is defined here as the monetary value (in Birr) of self-reported production per hectare during the last agricultural season. There is an overall gender difference in self-reported agricultural productivity of 19 percent. The average productivity for male holders is 7,509 Birr/Hectare, compared to 6,133 Birr/Hectare for female holders. This could be due to differences in the size of land holdings, number of fields managed, and other agriculture-related inputs; or, it could be due to deeper differences reflecting different levels of investment in human capital for men and women. Figure 1 shows the male and female distributions for agricultural production. Note the uniform shift to the right (female → male) by approximately 20 percent at every point on the distribution.

Figure 1: Holders' Productivity Distribution, by Gender



Relevant Characteristics by Gender

Table 1 outlines a few of the characteristics that are significantly statistically different for male and female holders. On average, female holders have 1.27 fewer years of education, are nearly twice as likely to be illiterate, and inhabit households with both fewer people and smaller dependency ratios, than their male counterparts. Additionally, female holders manage smaller areas of land, spend fewer hours per week on agricultural activities, and have less access to non-labor agriculture inputs, such as number of oxen used to work the land.

Table 1: Mean Differences in Characteristics, by Gender of Holder

	Male Holder	Female Holder
Illiteracy	0.53	0.9
Years of schooling	1.77	0.51
Household Size	5.59	3.85
Dependency Ratio	0.67	0.54
Household Food Consumption	233.80	192.5

[1] Full dataset available for download from http://go.worldbank.org/S4640KPFC0

[2] Source: http://data.worldbank.org/country/ethiopia

[3] The entire sample contains 3,558 holders. Holders were excluded from the analysis if they did not report a gender, produced below or above the 1st or 99th percentile, respectively, or were missing information for some covariate included in the analysis.

Total Land Managed (Hectares)	1.44	1.12
Number of Fields Managed	13.22	11.9
Hrs/week on agricultural activities	22.99	14.44
% of Plot Rented by Holder	0.12	0.03
Oxen/Hectare	1.28	0.93

*** p<0.01, ** p<0.05, * p<0.1

Endowment Effect

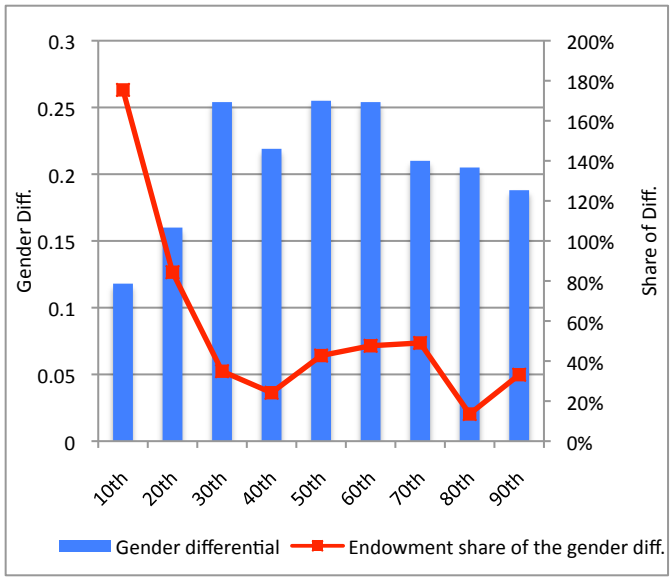
As stated above, the gender differentials in agricultural production can be decomposed into explained and unexplained variation. Explained variation refers to the gender differential for various characteristics, or *endowments*, that could potentially explain the gap between male and female production. Thus, we aim to identify factors from Table 1 such that if the characteristic has a mean difference for males and females, we would expect a mean difference in agricultural production by gender as well.

The Oaxaca-Blinder method, the traditional technique used to quantify explained and unexplained variation in a given differential, was employed here to determine how much of the gender differential in agricultural production can be attributed to the endowments. From the characteristics in Table 1 above, the Oaxaca-Blinder decomposition finds that household size, the dependency ratio, household consumption, number of fields managed, the proportion of farming parcels that are rented, and the number of hours dedicated to agricultural activities comprise the endowment effect.

For the average gender differential in productivity of 19 percent, we find that 6 percentage points (32 percent) correspond to the endowment effect. In other words, 32 percent of the gender differential in agricultural production can be explained by factors such as differences in land size managed, non-labor inputs, and time spent on agricultural activities, etc. The remaining 68 percent of the gender differential is essentially *unexplained*; this proportion of the differential stems from differences in returns to the endowment characteristics.

Figure 2 demonstrates the gender differential for the agriculture productivity distribution at each decile of the distribution, as well as the share of the differential that can be attributed to the endowment effect. The gender differential in production is largest from the 30th to 60th percentile. Note that, while there is not a significant difference in production at the 10th percentile, there is a relatively large and significant endowment effect. Thus, if women had the same endowments as men (at the 10th percentile of production), they would be 175 percent more productive.

Figure 2: Gender Differential at Deciles of Agricultural Productivity Distribution and Share Explained by Endowments



When developing poverty reduction policies and programs it is important to not only reduce the overall poverty rate, but to reduce the variance of productivity as well, ensuring improvements for everyone. Successfully achieving the latter often necessitates identifying certain "pockets" of poverty that may not benefit from standard anti-poverty measures. Poor female landholders represent such a pocket. The findings presented above suggest there are explainable factors driving this group's low productivity, a fact which can be used to help shape policy aimed at helping this subpopulation.

This brief is based on data collected by the Central Statistical Agency as part of the Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA) project. The full dataset is available for download at CSA via http://www.csa.gov.et.

The findings outlined in this brief are drawn from…

Decomposition of Gender Differentials in Agricultural Productivity in Ethiopia, by Arturo Aguilar, Eliana Carranza, Markus Goldstein, Talip Kilic, and Gbemisola Oseni, The World Bank, June 2013

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