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Gender Differences in Agricultural Productivity in Côte d'Ivoire

Changes in Determinants and Distributional Composition over the Past Decade

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Abstract

This paper analyzes changes in agricultural productivity gender gaps in Côte d'Ivoire between 2008 and 2016 using decomposition methods. The analysis finds that the unconditional gender gap between male- and female-headed households has decreased by 14 percent over the past decade. The conditional gender gap has decreased by 32 percent and becomes statistically insignificant once accounting for whether households farm export crops. This transition is driven by improvements across crop types, but it is particularly remarkable for export crop productivity, likely due to increased adoption of fertilizer and pesticide by female-headed households. Despite these substantial improvements, female-headed households in the bottom half of the distribution remain disadvantaged. Moreover, over the past decade, female-headed households did not transition into commercial agriculture and have witnessed greater reductions in land area compared with their male counterparts. The results show that helping these female-headed households access agricultural labor, strengthen their land rights, and adopt export crops are the three most promising policy options to reach gender parity in agriculture in Côte d'Ivoire.

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Gender Differences in Agricultural Productivity in Côte d'Ivoire: Changes in Determinants and Distributional Composition over the Past Decade

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1 Introduction

Farming is the primary source of food and income in Sub-Saharan Africa and provides up to 65 percent of all jobs on the continent. Agricultural development – and in particular improving productivity in the sector – has the potential to spur growth and substantially reduce poverty in the region (Carletto et al. 2013). In Sub-Saharan Africa, women account for half of the agricultural workforce, and a gap between male and female farmers in agricultural production, both in terms of output and productivity, has been largely documented across the region. Closing the gender gap in agricultural productivity is thus a key entry point to improving productivity overall on the continent. Past studies have shown that the potential gross gains to GDP from closing the agricultural productivity gender gap would be $100 million in Malawi, $105 million in Tanzania and $67 million in Uganda (UN Women 2015).

To close the gender gap, it is not only essential to shed light on the main determinants of the productivity gap, but also to see what factors have contributed to closing it over time. Doing so will contribute to closing the existing "knowledge gap" on this topic, as well as the "policy gap" that goes with it, by explaining the steps that African governments and their development partners can take to equalize opportunities for female and male farmers (O'Sullivan et al. 2014).

This paper contributes to the literature by providing new evidence on how agricultural productivity gaps in Côte d'Ivoire have changed over time and why, while addressing some of the limitations of previous studies. Several existing Sub-Saharan African studies show that estimates of the gender productivity gap become insignificant once differences in access to productive resources and individual characteristics are considered (Alene et al. 2008; Gilbert et al. 2002; Kinkingninhoun-Mêdagbé et al. 2010; Moock 1976; Oladeebo and Fajuyigbe 2007; Saito et al. 1994; Vargas Hill and Vigneri 2009). This implies that the difference in productivity arises mainly from differential access to resources and differential farmers' characteristics by gender. Yet, conclusions based on prevailing evidence are often limited by methodological and data constraints, as well as by neglect of distributional statistics besides the mean.

To our knowledge, ours is the first paper to estimate the gender gap in agricultural productivity in Côte d'Ivoire. Côte d'Ivoire offers an interesting setting for such an analysis. As most Sub-Saharan African countries, the country's economy relies greatly on agriculture. According to the Enquête Nationale sur la Situation de l'Emploi et du Travail des Enfants (ENSETE), in 2013, 50.4% of the workforce worked in agriculture. The agricultural sector also accounted for 21.6% of the GDP in 2017 (WDI, World Bank). Women are heavily involved in agricultural production, with 46.2% of the female workforce working in agriculture. One specificity of Ivoirian agriculture is that it relies heavily on non-staple food production. Of the 19 Sub-Saharan African countries studied in Chauvin et al. (2012), Côte d'Ivoire has the second-highest agriculture income share coming from non-staple food other than cereals or fruits and vegetables, both for urban households (57.64%) and rural households (62.12%). The high prevalence of export crop production allows us to differentiate the extent of the gap between food crops and export crops, and document to what extent the aggregate gender gaps observed are due to occupational segregation between crop types versus lower access to inputs and returns from these inputs, within food and export crops.

The second main contribution of our paper is that while most existing studies rely on one cross-sectional estimate due to data limitations, our paper uses two cross-sections, allowing for an analysis of trends in productivity gaps over time as well as changes in its determinants. We use two nationally representative surveys from Côte d'Ivoire: the 2008 household survey Enquête Niveau de Vie des Ménages (ENV 2008), which is a traditional household living standards survey that was collected between June and September 2008, and the latest employment survey Enquête Nationale sur la Situation de l'Emploi et le Secteur

Informel, which was collected between May and August 2016 (ENSESI 2016). Both surveys include detailed agricultural modules, with production and input data at the plot-crop level, allowing for comparability across the two years.

The third contribution of our paper is the decomposition of gender gaps along the productivity distribution, offering insights into the drivers of the gender gap for both poorer and richer farmers. We first use the traditional Oaxaca-Blinder technique employed in the gender wage gap literature, based on the gender of the household head, to estimate: (i) the proportion of the gender productivity gap that results from differential characteristics of household heads, land, and unequal access to productive inputs (endowment effect); and (ii) the proportion that results from unequal returns to the previous components (structure effect) (Oaxaca 1973; Blinder 1973). This method allows us to identify the main drivers that explain the gender differences in productivity, and changes in these drivers between 2008 and 2016. We then use Recentered Influence Function (RIF) regressions proposed by Firpo et al. (2009) to identify how the previous results change along the productivity distribution.

A large and significant unconditional gender difference in productivity of 21 percent favoring male-headed households is found in 2008. The gap increases to 31 percent once introducing region fixed effects and controlling for household and farm characteristics. It is attenuated – dropping by 4 percentage points – when we control for whether any export crops are farmed by the household. When the analysis is conducted separately for food and export crops, the productivity gap within food crops is over twice as large as that within export crops (40 vs. 17 percent) suggesting that the gender gap in agricultural productivity is closely related to occupational segregation between crop types.

Between 2008 and 2016, we note a large reduction in the gender gap between female- and male-headed households. The unconditional gender gap drops to 18 percent in 2016, while the conditional gender gap drops to 21 percent: a 32 percent reduction over 8 years. Further, when we control for whether the household farms any export crops, the gender gap becomes statistically insignificant in 2016. Thus, farming of export crops remains a very strong determinant of agricultural productivity: in 2016 the gender gap within food crops is significant at 19 percent, while that within export crops is no longer significant. These gaps must be interpreted as lower bounds of agricultural productivity gender gaps: the 2008 data provides information on the plot manager's gender as well on the plot owner's gender, and we are able to show that estimated gender gaps are even larger when using either of these variables – rather than household headship – to differentiate between male and female productivity.[1]

The Oaxaca-Blinder decomposition shows that in 2008, the single largest driver of female-headed households' lower agricultural productivity was the low number of household male laborers, closely followed by their lower adoption of export crops, and then lower use of non-labor inputs (pesticides and chemical fertilizer). The low number of household male laborers disadvantaged poorer female-headed households most, while for chemical fertilizer it is the converse. The poorest female-headed households also faced the lowest returns on factors of production. Overall, gender gaps are observed all along the productivity distribution in 2008; apart from being slightly larger in the bottom half of the productivity redistribution, they are remarkably stable. A second key finding is that while the lower use of non-labor inputs matters more for export crop productivity (chemical fertilizer does not matter at all for food crops, while pesticide use matters less), the lower use of household male labor matters more for food crops. Moreover, while higher female labor use helped to close the gap in food crops between 2008 and 2016, it did not matter for export crop productivity.

[1] See Table A.1a - A1b for plot manager and A.2a – A.2b for plot owner in the Appendix.

In 2016, lower adoption of export crops is the key driver of the gender gap in agricultural productivity. Other key drivers are lower use of pesticide and of chemical fertilizer. A new factor that emerges as a driver of the gender gap in 2016 is the lower number of fields managed by female-headed households, which matters in particular for food crop productivity. Overall, a gender difference in productivity favoring men is still found for the lower half of the productivity distribution, among poorer households. The lower number of fields managed by the household, lower adoption of export crops and lower use of pesticide work to increase the gap in all deciles, but more strongly so in the lower deciles. However, the endowment component driven by labor inputs peaks at the bottom of the distribution, with the lowest-productivity households being most impacted by low access to household male labor.

The key takeaway from our paper is that Côte d'Ivoire has witnessed a remarkable shrinking of its gender gap over the past decade, driven by a closing of the gender gap in both export crop and food crop productivity. During the same period, there has been a significant government push to increase the inclusion of women in agriculture programs, which is evident in the large increase in input use—especially pesticide—in female-headed household (in absolute terms, as well as relative to male-headed households). Together with our second key finding that while labor inputs matter more for food crop productivity, non-labor inputs are key for export crop productivity, this gain in non-labor inputs by female-headed households helps to explain the disappearance of the export crop productivity gap. Nonetheless, our results also indicate that part of the increase in agricultural productivity observed during the past decade is due to lower landholdings by female-headed households. Strengthening women's land rights – along with increasing their access to labor and facilitating their adoption of export crops – should be the key policy priorities in Côte d'Ivoire for improving female farmers' livelihoods.

Section 2 of this paper provides a descriptive analysis of the 2008 and 2016 survey sample in terms of socio-demographic and agricultural variables, and explores differences related to the gender of the household head. Section 3 presents our results. It is split in two subsections that estimate and decompose the agricultural productivity gender gap for 2008 and 2016 using Oaxaca and RIF decompositions, as well as a third subsection that presents trends in gender gaps' explanatory factors between 2008 and 2016 and provides a discussion of the drivers of the observed changes in gender gaps between both years. The last section concludes with policy recommendations and suggestions for future research.

2 Data

Our 2008 analysis uses household data from the Enquête Niveau de Vie des Ménages (ENV). The data are representative at the national, regional and urban/rural levels. The data overall contain 12,600 households, of which 6,159 were agricultural households, and 5,760 households report some production. Observations with productivity above the 99th percentile or below the 1st percentile are excluded, leaving 5,647 observations. Finally, 217 observations are excluded for not having information available for covariates included in the analysis.

This yields the final 5,428 household data set, of which 752 are headed by women (13.9 percent), while 4,676 (86.1 percent) are headed by men. The sample restriction imposed on covariate availability does not yield a significant difference in productivity between households excluded and those that remain in the sample. However, the households remaining in our final sample do have some differences from the original sample: they cultivate more land, the household head is married and has primary and tertiary education at a higher frequency. The households also have a higher dependency ratio, more male labor use, a higher

total number of crops produced and a higher likelihood of using purchased seed and farming export crops.[2] All descriptive statistics and regressions are weighted by the sample weight, which is the inverse probability of a household being included in the sample. The sample design exploited a two-stage clustered sampling method. At the first stage, a certain number of enumeration areas (EAs) were randomly selected with equal probability, and with implicit stratification by urban/rural and region, while in the second stage 20 households were randomly selected within each EA.

Table 1: Descriptive statistics for the pooled sample and by gender of the household head (2008)

	Pooled sample	Female-headed households	Male-headed households
Self-reported productivity (XOF/ha)**	213,993	177,852	219,486
Productivity (XOF/ha)- Export crops	234,350	165,920	239,725
Productivity (XOF/ha)- Food crops**	207,123	161,433	214,661
Total land area cultivated (ha)***	8.19	4.86	8.69
Number of Fields Managed by the household***	4.59	4.47	4.61
Household head age (years)***	44.89	49.54	44.18
Married***	0.81	0.33	0.88
Divorced/Separated***	0.05	0.18	0.03
Widowed***	0.08	0.45	0.02
Single/Never married**	0.06	0.05	0.06
Household head has Primary education***	0.24	0.13	0.26
Household head has Secondary education***	0.13	0.05	0.15
Household head has Tertiary education***	0.01	0.00	0.01
Household head disability**	0.04	0.05	0.03
Dependency ratio***	0.96	1.21	0.92
Household Male Labor Use (Number)***	1.20	0.32	1.33
Household Female Labor Use (Number)***	0.88	1.33	0.81
Household Child Labor Use (Number)	0.11	0.09	0.11
Hired Labor Use (Number)	1.58	1.42	1.60
Total number of crops produced	4.30	4.15	4.32
Household used any purchased seed	0.13	0.12	0.14
Plots that use Chemical Fertilizer (% of total) ***	0.09	0.04	0.10
Plots that use Pesticide (% of total) ***	0.17	0.05	0.19
Export crops dummy (1 if Household produced any export crop) ***	0.74	0.43	0.79
Observations	**5428**	**752**	**4676**

Dependency ratio: number of individuals in the household under 15 and over 65 over the total number of household members.
***/**/* indicate statistical significance of the difference between male-headed and female-headed households at the 1/5/10 percent level respectively.

Table 1 shows simple averages for the overall sample, and then separately by gender of the household head. We also display significance levels in the table, obtained from t-tests.

[2] These same patterns are observed in 2016, reassuring us as to the national representativeness of our longitudinal analysis. Results are available upon request.

Overall, we see that male-headed households have higher agricultural productivity (measured as the value of harvested crops over the last 12 months per hectare), this advantage being significant for food crops only. In terms of explanatory variables, we see a large difference between female- and male-headed households for total land area cultivated, with male-headed households cultivating nearly twice as much. Though the total land area cultivated is substantially lower for women, the number of fields managed are only slightly lower. This indicates that the average size of plots managed by female-headed households is lower than that for male-headed households.

Female household heads also tend to be older than their male counterparts, be less educated, and have a higher incidence of disability. The dependency ratio is 32 percent higher in female-headed households. Female-headed households also have a lower number of household laborers – mostly deriving from lower household male labor. All labor variables are defined as the number of workers employed on household land during the last 12 months. Moreover, the prevalence of chemical fertilizer use and pesticide use is less than half that of male-headed households. Male-headed households are also 36 percentage points likelier to cultivate an export crop (cashew, cacao, coffee, cotton, rubber or palm oil).

Next, we investigate these same differences between male- and female-headed households in 2016, using data from the Enquête Nationale sur la Situation de l'Emploi et le Secteur Informel (ENSESI). Identically to the 2008 ENV, the sample is representative at the national, regional and urban/rural levels. The sample contains 10,392 households overall, of which 5,910 were agricultural households, and 4,529 households report some production and have information available for covariates included in the analysis. We implement the same procedure of excluding observations with productivity above the 99th percentile or below the 1st percentile, leading to a 3,936 households data set of which 517 are headed by women (13.1 percent), while 3,419 (86.9 percent) are headed by men. The share of female-headed households is thus held constant between 2008 and 2016 in our data.

As in 2008, some differences in education, household male labor, input use and export crop adoption are observed between households excluded and those remaining in the sample. All descriptive statistics and regressions are weighted by the sample weight which is the inverse probability of a household to be included in the sample. The sample design exploited two-stage clustered sampling methods. At the first stage, a certain number of EAs were randomly selected with equal probability, and with implicit stratification by urban/rural and region while in the second stage 12 households were randomly selected within each EA.

In Table 2, we present the 2016 results for the overall sample average and for female-headed and male-headed households separately. Similarly, to 2008, we report in the table the significance levels of all differences, using a t-test. The simple difference shows no significant difference in overall agricultural productivity between female-headed households and male-headed households. Note that the summary statistics presented in Table 2 are fairly sensitive to winsorization, while our gender gap results are not, remaining substantially unchanged regardless of how the data is trimmed. Female-headed households cultivated far less land than male-headed households. As in 2008, female household heads in 2016 tend to be older, less educated and have a higher incidence of disability. Households headed by women use less hired labor and substantially less male household labor, though they use more female and child household laborers. The dependency ratio in female-headed households is approximately 39 percent higher; they also use less fertilizer and pesticide and are 38 percentage points less likely to be engaged in export crop cultivation.

Table 2: Descriptive statistics for the pooled sample and by gender of the household head (2016)

	Pooled sample	Female-headed households	Male-headed households
Self-reported productivity (XOF/ha)	200,438	196,096	201,015
Self-reported productivity (XOF/ha)- Export crops	192,969	176,564	194,143
Self-reported productivity (XOF/ha)- Food crops	217,913	214,056	218,550
Total land area cultivated in ha***	5.48	2.79	5.84
Number of Fields Managed by the household***	2.60	2.19	2.65
Household head age (years)***	43.72	50.16	42.87
Married***	0.84	0.38	0.90
Divorced/Separated***	0.03	0.09	0.02
Widowed***	0.06	0.44	0.01
Single/Never married*	0.07	0.09	0.06
Household head has Primary education***	0.28	0.21	0.28
Household head has Secondary education***	0.13	0.03	0.14
Household head has Tertiary education	0.01	0.00	0.01
Household head disability***	0.15	0.23	0.14
Dependency ratio***	1.05	1.39	1.00
Household Male Labor Use (Number)***	2.26	0.62	2.47
Household Female Labor Use (Number)***	1.24	2.16	1.12
Household Child Labor Use (Number)***	0.08	0.14	0.07
Hired labor use (Number)**	3.03	2.86	3.05
Total number of crops produced***	2.77	2.48	2.80
Household used any purchased seed	0.30	0.32	0.29
Plots that Use Chemical Fertilizer (% of total)***	0.17	0.08	0.18
Plots that Use Pesticide (% of total)***	0.51	0.35	0.53
Export crops dummy (1 if Household produced any export crop)***	0.83	0.50	0.88
Observations	3936	517	3419

Dependency ratio: number of individuals in the household under 15 and over 65 over the total number of household members.
***/**/* indicate statistical significance of the difference between male-headed and female-headed households at the 1/5/10 percent level respectively.

3 Results

3.1 Determinants of the gender gap in 2008

Using the 2008 data, we first run a simple Ordinary Least Squares (OLS) regression of logged values of agricultural productivity in XOF/ha on female household headship. In Table 3, we find a 21 percent agricultural productivity gap to the detriment of female household heads (column 1), which is slightly attenuated to 17 percent once introducing region fixed effects (column 4).[3] Although we find a negative and significant gap of 23 percent for export crops, which are defined as cashews, cacao, coffee, cotton, rubber and palm oil, this gap disappears when adjusting for cross-regional differences through the introduction of fixed effects (column 5). The gender gap in food crop productivity remains unchanged at 24 percent (column 6).

Table 3. OLS regressions of agricultural productivity without control variables (2008)

	Log [Self-reported Productivity (XOF/ha)]					
	(1)	(2)	(3)	(4)	(5)	(6)
	All crops	Export crops	Food crops	All crops	Export crops	Food crops
Female-headed households	-0.234***	-0.264***	-0.279***	-0.182***	-0.079	-0.270***
	(0.054)	(0.094)	(0.056)	(0.053)	(0.088)	(0.055)
Constant	11.356***	11.221***	11.399***	11.584***	11.606***	11.566***
	(0.020)	(0.027)	(0.022)	(0.102)	(0.151)	(0.108)
Region fixed effects	No	No	No	Yes	Yes	Yes
Adjusted R-squared	0.004	0.002	0.006	0.074	0.094	0.088
% gap	**21%**	**23%**	**24%**	**17%**	**8%**	**24%**
Observations	5428	3588	4601	5428	3588	4601

*Note: ***/**/* indicate statistical significance at the 1/5/10 percent level respectively. % gap values are obtained with the exp(b)-1 transformation (Halvorsen and Palmquist (1980))*

In Table 4, we introduce the descriptive variables shown in Table 1 into our regression as controls, keeping region fixed effects. Here, we see that indeed selection into export crops is driving some of the gap, which decreases from 31 percent to 27 percent when introducing a dummy capturing whether the household farms export crops (column 2).

Conditional on controlling for female headship, we see that farming a smaller land area, having an older household head, having a household head who does not suffer from a disability, using more female household or hired labor, or especially male household labor, managing a higher number of fields, producing more crops, and applying inputs such as chemical fertilizer and pesticide are all positively related to productivity. However, conditional on using these other inputs, use of purchased seed is negatively related to productivity. Household child labor use, the dependency ratio, education and marital status are not significantly related to productivity when simultaneously controlling for all the other variables mentioned above.

[3] We follow Halvorsen and Palmquist (1980) in calculating the percentage effect of a dummy variable on a logged dependent variable as exp(b)-1.

In columns (3) and (4), we run the analysis separately for export crops and food crops. The gap remains larger for food crops, at 40 percent. It is notable that overall, the gap in food crop productivity increases by 16 percentage points when comparing households that have similar characteristics, compared to the unconditional gender gap in food crops. Similarly, after introducing our covariates in the model, the gap for female farmers who farm export crops becomes significant, even though it is less than half of that found in food crops (17 percent).

Overall, we see that the same inputs that matter for overall productivity also matter for export and food crop productivity separately. Some differences that emerge between the two are that the total number of crops produced only matters for export crops and that the number of fields is more correlated with food crop productivity than with export crop productivity. The use of inputs such as pesticide and especially chemical fertilizer matter more for export crop productivity, while the negative effect of purchased seed comes from food crops only. Interestingly, household labor use is more important for food crops, with female labor and having a household head that suffers from a disability are not significantly correlated with export-crop productivity.

Table 4. OLS regressions of agricultural productivity with control variables (2008)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Female-headed households	-0.377***	-0.309***	-0.190*	-0.505***
	(0.057)	(0.058)	(0.100)	(0.065)
Log [Total land area cultivated in ha]	-0.647***	-0.675***	-0.710***	-0.595***
	(0.016)	(0.016)	(0.024)	(0.019)
Household head age (years)	0.005***	0.005***	0.005***	0.004***
	(0.001)	(0.001)	(0.002)	(0.001)
Married	0.022	0.010	0.075	-0.062
	(0.068)	(0.068)	(0.103)	(0.089)
Divorced/Separated	0.042	0.036	-0.063	-0.042
	(0.091)	(0.091)	(0.142)	(0.108)
Widowed	-0.073	-0.085	-0.053	-0.092
	(0.090)	(0.089)	(0.137)	(0.110)
Household head has Primary education	-0.012	-0.026	-0.050	0.007
	(0.037)	(0.036)	(0.052)	(0.045)
Household head has Secondary education	-0.021	-0.024	0.033	-0.083
	(0.046)	(0.045)	(0.064)	(0.055)
Household head has Tertiary education	0.255	0.242	0.470	-0.075
	(0.211)	(0.206)	(0.289)	(0.222)
Household head disability	-0.156**	-0.160**	0.046	-0.169*
	(0.073)	(0.072)	(0.107)	(0.089)
Dependency ratio	0.012	0.010	-0.015	0.004
	(0.017)	(0.017)	(0.026)	(0.021)
Household Male Labor Use (Number)	0.122***	0.118***	0.069***	0.099***
	(0.017)	(0.017)	(0.026)	(0.021)
Household Female Labor Use (Number)	0.054***	0.054***	0.012	0.059***
	(0.017)	(0.017)	(0.026)	(0.019)
Household Child Labor Use (Number)	-0.001	-0.000	0.007	0.026
	(0.026)	(0.025)	(0.042)	(0.031)
Hired Labor Use (Number)	0.020***	0.020***	0.020***	0.016***
	(0.003)	(0.003)	(0.004)	(0.003)
Number of Fields Managed by the household	0.074***	0.076***	0.043**	0.085***

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
	(0.011)	(0.011)	(0.020)	(0.014)
Total number of crops produced	0.033***	0.023*	0.078***	-0.014
	(0.013)	(0.013)	(0.022)	(0.016)
Household used any purchased seed	-0.166***	-0.152***	-0.099	-0.178***
	(0.043)	(0.043)	(0.070)	(0.051)
Plots that Use Chemical Fertilizer (% of total)	0.304***	0.296***	0.445***	0.123
	(0.074)	(0.073)	(0.103)	(0.091)
Plots that Use Pesticide (% of total)	0.634***	0.598***	0.669***	0.561***
	(0.061)	(0.060)	(0.082)	(0.082)
Export crops dummy (1 if Household produced any export crop)		0.295***		
		(0.039)		
Constant	11.422***	11.343***	11.627***	11.588***
	(0.105)	(0.104)	(0.171)	(0.125)
Region fixed effects	Yes	Yes	Yes	Yes
Adjusted R-squared	0.417	0.424	0.368	0.336
% gap	**31%**	**27%**	**17%**	**40%**
Observations	5428	5428	3588	4601

*Note: ***/**/* indicate statistical significance at the 1/5/10 percent level respectively.*

Next, we run a Oaxaca-Blinder decomposition analysis to identify the drivers of the gender gap: both in terms of different levels of endowments and in terms of differential returns from those endowments. Results are shown in Table 5.

Within endowments (the 'explained' component), we see that cultivating a smaller total land area is the main factor acting to female household head's advantage, due to the documented inverse relationship between land area and productivity.[4] This relationship has been observed in many developing countries and can be considered a stylized fact (Kimhi 2006; Larson et al. 2014). To a lesser extent, we also see that the older age of female household heads compared to male household heads, and their higher use of female household labor, works to their advantage. While having an older – and thus perhaps more experienced – household head is more important for export crops, having more female household labor only benefits women in food crop cultivation.

Given the additive linearity property of the decomposition, it is possible to determine the contribution of each component towards the gender gap. The ratio of the different components to the overall gap describe the importance of each covariate. The most important factors in widening the gender gap are female household heads' lower rates of export crop cultivation (0.44 of overall gap) and use of household male labor (0.51 of gap), followed by their lower use of pesticide (0.33 of gap) and then chemical fertilizer (0.08 of gap). Lower use of non-labor inputs – especially of chemical fertilizer – is a more significant driver of the gender gap in export crop productivity, while lower use of household male labor matters more for the gap in food crop productivity.

In aggregate terms, however, the inverse farm-size productivity relationship (IR) dominates the endowment effect, leading to it reducing the gender gap on average, while the gender gap in agricultural productivity is completely driven by lower returns to inputs. These lower returns appear to be driven by variables outside

[4] As first noted by Chayanov (1926) in Russia and rediscovered by Sen (1962) in India, it states that land productivity decreases with farm size.

standard socio-demographic and farm characteristics, as they are mainly driven by the constant in our regressions. However, we do notice that female-headed households face lower returns to female household labor in export crop cultivation. Conversely, their smaller plot size and lower number of fields managed result in relatively higher returns from these factors for export crop production. When removing land area from the decomposition, we find that both the endowment and the structure effect increase the gender gap, as expected (results available upon request).

Table 5. Oaxaca-Blinder decomposition of the gender differential in agricultural productivity with region fixed effects (2008)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
overall				
Male headed households	11.356***	11.356***	11.221***	11.399***
	(0.036)	(0.036)	(0.048)	(0.040)
Female Headed households	11.122***	11.122***	10.957***	11.120***
	(0.061)	(0.061)	(0.104)	(0.062)
difference	0.234***	0.234***	0.264***	0.279***
	(0.059)	(0.060)	(0.102)	(0.063)
explained	-0.144**	-0.075	0.074	-0.226***
	(0.058)	(0.060)	(0.097)	(0.066)
unexplained	0.377***	0.309***	0.190*	0.505***
	(0.060)	(0.061)	(0.103)	(0.069)
explained				
Log [Total land area cultivated in ha]	-0.437***	-0.456***	-0.267***	-0.413***
	(0.046)	(0.047)	(0.067)	(0.047)
Household head age (years)	-0.028***	-0.025***	-0.035***	-0.018**
	(0.008)	(0.008)	(0.014)	(0.008)
Married	0.012	0.006	0.044	-0.035
	(0.039)	(0.039)	(0.062)	(0.049)
Divorced/Separated	-0.006	-0.005	0.006	0.006
	(0.013)	(0.012)	(0.014)	(0.014)
Widowed	0.031	0.036	0.026	0.039
	(0.037)	(0.037)	(0.067)	(0.047)
Household head has Primary education	-0.002	-0.003	-0.008	0.001
	(0.005)	(0.005)	(0.008)	(0.006)
Household head has Secondary education	-0.002	-0.002	0.003	-0.008
	(0.005)	(0.005)	(0.006)	(0.006)
Household head has Tertiary education	0.002	0.001	0.003	-0.000
	(0.001)	(0.001)	(0.002)	(0.001)
Household head disability	0.003	0.004	-0.001	0.003
	(0.002)	(0.002)	(0.002)	(0.002)
Dependency ratio	-0.003	-0.003	0.003	-0.001
	(0.005)	(0.005)	(0.006)	(0.006)
Household Male Labor Use (Number)	0.123***	0.119***	0.069**	0.102***
	(0.019)	(0.019)	(0.029)	(0.026)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Household Female Labor Use (Number)	-0.028***	-0.028***	-0.007	-0.026***
	(0.010)	(0.010)	(0.016)	(0.010)
Household Child Labor Use (Number)	-0.000	-0.000	0.000	0.001
	(0.000)	(0.000)	(0.001)	(0.001)
Hired Labor Use (Number)	0.004	0.004	0.006	0.003
	(0.003)	(0.003)	(0.004)	(0.003)
Number of Fields Managed by the household	0.010	0.010	-0.023	0.033*
	(0.015)	(0.015)	(0.017)	(0.018)
Total number of crops produced	0.006	0.004	-0.038*	-0.006
	(0.006)	(0.004)	(0.023)	(0.008)
Household used any purchased seed	-0.004	-0.003	-0.005	-0.005
	(0.002)	(0.002)	(0.004)	(0.003)
Plots that Use Chemical Fertilizer (% of total)	0.019***	0.018***	0.030***	0.006
	(0.006)	(0.006)	(0.009)	(0.005)
Plots that Use Pesticide (% of total)	0.083***	0.078***	0.082***	0.061***
	(0.012)	(0.012)	(0.016)	(0.012)
Export crops dummy (1 if Household produced any export crop)		0.104***		
		(0.019)		
unexplained				
Log [Total land area cultivated in ha]	-0.050	-0.055	-0.254**	-0.033
	(0.040)	(0.041)	(0.103)	(0.050)
Household head age (years)	-0.057	0.015	-0.548	-0.259
	(0.188)	(0.188)	(0.337)	(0.209)
Married	0.040	0.033	0.025	0.003
	(0.066)	(0.064)	(0.089)	(0.079)
Divorced/Separated	0.015	0.011	0.013	-0.003
	(0.030)	(0.029)	(0.041)	(0.033)
Widowed	-0.007	-0.023	-0.066	0.010
	(0.073)	(0.071)	(0.143)	(0.076)
Household head has Primary education	-0.026	-0.026	-0.050*	-0.017
	(0.019)	(0.018)	(0.028)	(0.020)
Household head has Secondary education	-0.020*	-0.019*	-0.036*	-0.004
	(0.011)	(0.011)	(0.019)	(0.010)
Household head has Tertiary education	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household head disability	0.002	0.003	-0.015	-0.001
	(0.011)	(0.011)	(0.022)	(0.011)
Dependency ratio	0.014	0.004	0.002	0.016
	(0.046)	(0.045)	(0.065)	(0.055)
Household Male Labor Use (Number)	-0.024	-0.026	0.003	-0.004
	(0.025)	(0.025)	(0.036)	(0.027)
Household Female Labor Use (Number)	-0.053	-0.065	0.315***	-0.062
	(0.063)	(0.063)	(0.117)	(0.070)
Household Child Labor Use (Number)	0.012	0.013	0.008	0.007

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
	(0.009)	(0.009)	(0.012)	(0.011)
Hired Labor Use (Number)	-0.009	-0.008	-0.029	-0.003
	(0.015)	(0.015)	(0.022)	(0.017)
Number of Fields Managed by the household	-0.079	-0.072	-0.688**	0.043
	(0.138)	(0.138)	(0.277)	(0.168)
Total number of crops produced	0.103	0.111	0.461	-0.065
	(0.150)	(0.151)	(0.294)	(0.176)
Household used any purchased seed	0.021	0.020	0.023	0.005
	(0.015)	(0.015)	(0.024)	(0.017)
Plots that Use Chemical Fertilizer (% of total)	0.013	0.012	0.008	0.002
	(0.010)	(0.010)	(0.018)	(0.010)
Plots that Use Pesticide (% of total)	-0.016	-0.012	-0.015	-0.005
	(0.014)	(0.014)	(0.030)	(0.015)
Export crops dummy (1 if Household produced any export crop)		0.019		
		(0.058)		
Constant	0.215	0.126	1.014*	0.969***
	(0.402)	(0.382)	(0.561)	(0.359)
Observations	5428	5428	3588	4601

*Note: ***/**/* indicate statistical significance at the 1/5/10 percent level respectively.*

Next, we conduct the decomposition for each decile of the productivity distribution, using the Recentered Influence Function (RIF) method. Note that agricultural productivity has a positive relationship, significant at the 1 percent level, to both total consumption and per capita consumption in our data. It is thus a proxy for wealth, meaning that households with higher agricultural productivity are also richer.

Results of the decomposition are shown in Table 6. First, we see that the unconditional gender gap is fairly stable across productivity deciles, ranging from 18 percent in the 60th and 70th deciles to 25 percent in the 30th decile. A closer examination of the endowment effect shows that the inverse farm-size productivity relationship primarily works to the advantage of the lowest- and highest-productivity female-headed households. Female household head's older age does not reduce the gap for the lowest-productivity households, while higher household female labor use does not work to close the gap for the highest-productivity households.

The negative effect of lower household male labor use and pesticide use is most pronounced for the lowest-productivity female heads, while lower application of chemical fertilizer does not emerge as a determinant for them. Interestingly, lower planting of export crops appears to exhibit a U-shaped relationship and is a driver of the gender gap both for the lowest-productivity and highest-productivity households.

Table 6. RIF decomposition of the gender differential in agricultural productivity with region fixed effects (2008)

	Log [Self-reported Productivity (XOF/ha)]								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
overall									
Male headed households	9.842***	10.466***	10.856***	11.156***	11.396***	11.631***	11.901***	12.198***	12.643***
	(0.068)	(0.050)	(0.044)	(0.038)	(0.035)	(0.036)	(0.035)	(0.036)	(0.048)
Female Headed households	9.642***	10.185***	10.568***	10.893***	11.190***	11.438***	11.708***	11.999***	12.398***
	(0.095)	(0.083)	(0.076)	(0.073)	(0.072)	(0.066)	(0.065)	(0.065)	(0.074)
difference	0.200*	0.281***	0.288***	0.262***	0.205***	0.193***	0.193***	0.199***	0.245***
	(0.105)	(0.084)	(0.074)	(0.069)	(0.067)	(0.062)	(0.066)	(0.068)	(0.084)
% gap	**18%**	**24%**	**25%**	**23%**	**19%**	**18%**	**18%**	**18%**	**22%**
explained	-0.233*	-0.088	-0.129	-0.034	0.001	0.022	-0.003	0.065	-0.054
	(0.124)	(0.090)	(0.080)	(0.066)	(0.064)	(0.065)	(0.065)	(0.066)	(0.092)
unexplained	0.433***	0.369***	0.417***	0.297***	0.204***	0.171**	0.196***	0.134	0.299***
	(0.141)	(0.107)	(0.088)	(0.073)	(0.073)	(0.070)	(0.071)	(0.083)	(0.116)
explained									
Log [Total land area cultivated in ha]	-0.576***	-0.409***	-0.347***	-0.294***	-0.276***	-0.272***	-0.277***	-0.311***	-0.493***
	(0.077)	(0.048)	(0.039)	(0.032)	(0.029)	(0.029)	(0.030)	(0.034)	(0.059)
Household head age (years)	-0.019	-0.017	-0.017*	-0.021***	-0.015*	-0.015**	-0.022***	-0.020**	-0.025**
	(0.015)	(0.011)	(0.010)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.012)
Married	0.011	0.031	0.007	0.011	-0.015	0.012	-0.010	-0.038	-0.021
	(0.089)	(0.062)	(0.051)	(0.042)	(0.043)	(0.044)	(0.045)	(0.052)	(0.078)
Divorced/Separated	-0.007	0.001	-0.011	-0.001	-0.003	-0.020	-0.007	0.018	0.022
	(0.031)	(0.021)	(0.016)	(0.014)	(0.014)	(0.015)	(0.015)	(0.017)	(0.024)
Widowed	0.009	0.019	-0.016	0.010	0.024	0.037	0.064	0.116**	0.070
	(0.089)	(0.064)	(0.054)	(0.046)	(0.045)	(0.046)	(0.047)	(0.047)	(0.063)
Household head has Primary education	-0.006	-0.007	-0.006	-0.000	-0.001	0.005	0.004	-0.000	-0.009
	(0.012)	(0.009)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.009)
Household head has Secondary education	-0.011	-0.007	-0.005	0.004	-0.005	-0.000	-0.000	0.005	-0.008
	(0.013)	(0.008)	(0.007)	(0.006)	(0.005)	(0.005)	(0.005)	(0.007)	(0.009)
Household head has Tertiary education	0.000	0.000	0.001	0.002	0.003*	0.003	0.003*	0.005**	-0.001
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Household head disability	-0.000	-0.000	0.000	0.000	0.001	0.002	0.003	0.003	0.011**
	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
Dependency ratio	-0.015	-0.009	-0.009	-0.001	-0.004	-0.010	-0.006	-0.001	0.012

	Log [Self-reported Productivity (XOF/ha)]								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
	(0.012)	(0.009)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.008)
Household Male Labor Use (Number)	0.170***	0.141***	0.093***	0.086***	0.117***	0.112***	0.080***	0.080***	0.099**
	(0.044)	(0.035)	(0.028)	(0.024)	(0.022)	(0.023)	(0.023)	(0.027)	(0.042)
Household Female Labor Use (Number)	-0.065**	-0.051**	-0.029**	-0.028**	-0.023**	-0.024**	-0.026**	-0.006	-0.028
	(0.031)	(0.021)	(0.015)	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)	(0.019)
Household Child Labor Use (Number)	-0.000	-0.001	-0.000	0.000	-0.000	0.000	-0.001	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Hired Labor Use (Number)	0.004	0.005	0.004	0.004	0.004	0.003	0.002	0.002	0.002
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Number of Fields Managed by the household	0.019	0.014	0.012	0.009	0.010	0.006	0.003	0.003	0.003
	(0.028)	(0.020)	(0.017)	(0.014)	(0.014)	(0.009)	(0.005)	(0.005)	(0.005)
Total number of crops produced	0.004	0.005	0.004	0.004	-0.002	0.000	0.002	0.003	0.007
	(0.010)	(0.007)	(0.005)	(0.005)	(0.003)	(0.003)	(0.004)	(0.004)	(0.008)
Household used any purchased seed	-0.004	-0.002	-0.004	-0.005	-0.003	-0.002	-0.002	-0.002	-0.003
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Plots that Use Chemical Fertilizer (% of total)	0.007	0.008	0.017***	0.016***	0.019***	0.019***	0.022***	0.015**	0.027**
	(0.009)	(0.007)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.011)
Plots that Use Pesticide (% of total)	0.115***	0.086***	0.062***	0.065***	0.053***	0.055***	0.063***	0.069***	0.085***
	(0.023)	(0.017)	(0.014)	(0.012)	(0.012)	(0.011)	(0.012)	(0.014)	(0.019)
Export crops dummy (1 if Household produced any export crop)	0.103***	0.048*	0.029	0.015	0.023	0.024	0.023	0.065***	0.145***
	(0.040)	(0.026)	(0.023)	(0.019)	(0.019)	(0.019)	(0.019)	(0.021)	(0.034)
unexplained									
Log [Total land area cultivated in ha]	-0.193*	-0.129*	0.015	0.056	0.069	0.017	-0.009	-0.053	-0.170**
	(0.103)	(0.066)	(0.057)	(0.050)	(0.043)	(0.037)	(0.035)	(0.045)	(0.079)
Household head age (years)	0.009	0.196	-0.292	-0.170	0.188	-0.024	-0.110	-0.074	-0.173
	(0.322)	(0.280)	(0.268)	(0.229)	(0.243)	(0.229)	(0.229)	(0.220)	(0.279)
Married	0.160	0.187*	0.031	0.058	0.111	0.088	0.091	0.125	-0.172*
	(0.130)	(0.099)	(0.107)	(0.102)	(0.096)	(0.093)	(0.085)	(0.103)	(0.097)
Divorced/Separated	0.058	0.061	0.021	0.049	0.086**	0.050	0.020	0.025	-0.095**
	(0.055)	(0.045)	(0.044)	(0.043)	(0.040)	(0.039)	(0.037)	(0.045)	(0.045)
Widowed	0.179	0.147	0.052	0.021	0.068	0.038	0.044	0.089	-0.228**
	(0.123)	(0.100)	(0.105)	(0.106)	(0.099)	(0.098)	(0.090)	(0.104)	(0.099)
Household head has Primary education	-0.019	-0.017	-0.024	-0.024	-0.002	-0.019	-0.052**	-0.047*	-0.065*
	(0.034)	(0.029)	(0.029)	(0.028)	(0.025)	(0.020)	(0.021)	(0.025)	(0.035)

	Log [Self-reported Productivity (XOF/ha)]								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
Household head has Secondary education	0.048*	0.001	-0.001	0.006	0.007	-0.004	-0.021**	-0.021*	-0.040**
	(0.028)	(0.017)	(0.015)	(0.013)	(0.011)	(0.010)	(0.011)	(0.011)	(0.016)
Household head has Tertiary education	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000*	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household head disability	0.018	-0.010	-0.010	-0.006	-0.001	-0.010	-0.002	-0.003	-0.006
	(0.021)	(0.014)	(0.015)	(0.012)	(0.013)	(0.012)	(0.011)	(0.012)	(0.014)
Dependency ratio	0.145	0.087	0.029	-0.049	-0.064	-0.079	-0.047	-0.004	-0.080
	(0.095)	(0.077)	(0.060)	(0.059)	(0.055)	(0.052)	(0.056)	(0.060)	(0.066)
Household Male Labor Use (Number)	0.083	0.028	-0.022	-0.041	-0.086***	-0.053	-0.033	-0.037	-0.050
	(0.052)	(0.041)	(0.033)	(0.034)	(0.030)	(0.034)	(0.030)	(0.035)	(0.048)
Household Female Labor Use (Number)	-0.076	-0.081	-0.128	-0.043	-0.013	0.067	0.049	-0.118	-0.017
	(0.131)	(0.110)	(0.108)	(0.107)	(0.090)	(0.090)	(0.093)	(0.099)	(0.114)
Household Child Labor Use (Number)	0.013	0.011	0.003	0.016	0.015	0.007	-0.005	0.004	0.015
	(0.017)	(0.017)	(0.014)	(0.013)	(0.014)	(0.015)	(0.011)	(0.014)	(0.013)
Hired Labor Use (Number)	-0.003	0.013	-0.003	-0.036	-0.026	-0.028	-0.010	0.042**	0.020
	(0.022)	(0.021)	(0.023)	(0.023)	(0.019)	(0.021)	(0.022)	(0.017)	(0.020)
Number of Fields Managed by the household	0.008	-0.132	0.083	-0.009	-0.210	-0.232	0.025	0.070	-0.054
	(0.367)	(0.245)	(0.226)	(0.197)	(0.208)	(0.225)	(0.196)	(0.217)	(0.230)
Total number of crops produced	0.174	0.255	-0.094	-0.202	0.192	0.312	0.059	0.075	0.075
	(0.403)	(0.284)	(0.226)	(0.206)	(0.199)	(0.222)	(0.193)	(0.224)	(0.254)
Household used any purchased seed	-0.025	-0.002	0.050**	0.035*	0.028	0.014	0.008	0.010	-0.027
	(0.032)	(0.029)	(0.024)	(0.021)	(0.017)	(0.016)	(0.014)	(0.016)	(0.024)
Plots that Use Chemical Fertilizer (% of total)	-0.022	-0.016	-0.010	-0.001	-0.008	0.023	0.032**	0.027*	0.025
	(0.015)	(0.012)	(0.011)	(0.012)	(0.011)	(0.015)	(0.014)	(0.016)	(0.021)
Plots that Use Pesticide (% of total)	0.006	0.010	-0.014	-0.011	0.013	-0.006	-0.019	-0.017	-0.017
	(0.020)	(0.023)	(0.019)	(0.018)	(0.017)	(0.017)	(0.017)	(0.022)	(0.027)
Export crops dummy (1 if Household produced any export crop)	0.068	-0.056	-0.038	-0.036	-0.027	-0.053	-0.044	-0.010	0.128
	(0.122)	(0.096)	(0.083)	(0.071)	(0.058)	(0.058)	(0.055)	(0.061)	(0.087)
Constant	-0.497	-0.183	0.995**	0.588	-0.325	0.078	0.348	0.178	1.661***
	(0.613)	(0.502)	(0.463)	(0.424)	(0.414)	(0.401)	(0.428)	(0.489)	(0.605)
Observations	5428	5428	5428	5428	5428	5428	5428	5428	5428

*Note: ***/**/* indicate statistical significance at the 1/5/10 percent level respectively.*

Regarding returns to endowments (the structure effect), we see that the female-headed households' advantage related to their higher returns from education is mainly driven by higher-productivity households. Higher returns from lower land area cultivated only help close the gap for the highest- and lowest-productivity deciles. Lower returns to hired labor use and to chemical fertilizer contribute to the productivity disadvantage of female-headed households in top productivity deciles.

A key result of interest is that export crops drive more than half of the productivity gap for the highest- and lowest-productivity households.

In the Appendix, we provide Tables of the RIF results separately for export (Table A.3) and food crops (Table A.4). A notable result specific to export crop productivity is that gender gaps are most strongly driven by the middle of the distribution, with no significant gender gap in productivity at the bottom. Also, lower tertiary education increases the gender gap for the upper half of the distribution but is not significantly correlated at all with food crop productivity. While labor use almost entirely disappears as a driver of the gap (except for the lower returns to female household labor prevalent in the middle of the distribution), lower use of fertilizer and especially pesticide among female-headed households remains a key driver across the distribution.

For food crop productivity, on the other hand, household labor use has a strong and significant association: lack of male labor increases the gap in every productivity decile, while a higher number of female workers helps shrink the gap for the lower half of the productivity distribution. Moreover, the lower number of fields managed by female-headed households increases the gender gap for the lower end of the distribution. Lower use of chemical fertilizer only significantly increases the gap for mid-range productivity households.

3.2 Determinants of the gender gap in 2016

In this section, we analyze results for agricultural productivity eight years later, in 2016, in order to determine how the gender gap and its drivers have evolved. The results from the simple OLS regression displayed in Table 7 below show that the gender gap is statistically significant with and without region fixed effects (columns 1 and 4). Similar to 2008, the export crop productivity gap is not significant in the fixed effect specification. The food crop productivity gap is only significant in the fixed effect specification, and drops by 10 percentage points over the period.

Table 7. OLS regressions of agricultural productivity without control variables (2016)

	Log [Self-reported Productivity (XOF/ha)]					
	(1)	(2)	(3)	(4)	(5)	(6)
	All crops	Export crops	Food crops	All crops	Export crops	Food crops
Female-headed households	-0.197***	-0.119	-0.129	-0.163**	-0.016	-0.155*
	(0.077)	(0.091)	(0.087)	(0.077)	(0.093)	(0.080)
Constant	11.697***	11.772***	11.633***	11.510***	11.884***	10.879***
	(0.025)	(0.024)	(0.033)	(0.418)	(0.398)	(0.442)
Region fixed effects	No	No	No	Yes	Yes	Yes
Adjusted R-squared	0.003	0.001	0.001	0.063	0.068	0.116
% gap	**18%**	**11%**	**12%**	**15%**	**2%**	**14%**
Observations	3936	2823	2749	3936	2823	2749

*Note: ***/**/* indicate statistical significance at the 1/5/10 percent level respectively.*

The inclusion of all the key factors of production described in Tables 1 and 2, while keeping region fixed effects, show a statistically significant gender gap of 21 percent with female-headed households having lower productivity (Table 8), compared with 31 percent in 2008.

The gender gap in agricultural productivity is entirely driven by lower food crop productivity among female-headed households in 2016. The coefficient of the dummy variable capturing whether the household farms export crops is positive and statistically significant (Table 8, column 2). Indeed, the gender gap decreases by 9 percentage points, from 21 to 12 percent, and becomes non-significant when introducing the export crops adoption variable.

As in 2008, the logarithm of land area cultivated is negatively correlated with agricultural productivity. The number of hired laborers and household male labor, the use of fertilizer and use of pesticide are all associated with higher productivity. The household head having tertiary education is associated with lower productivity.

Moreover, certain explanatory variables are only related to either food- or export-crop productivity, while controlling for female headship. The positive relationships between number of fields managed and household male labor use with productivity are driven by food crop productivity. The total number of crops produced is positively related to export crop productivity, and negatively correlated to food crop productivity. The household head having secondary education is significantly negatively related to food crop productivity, while having tertiary education is significantly negatively related to export crop productivity specifically – perhaps because of the opportunity cost of learning on-the-job agricultural skills.

Table 8. OLS regressions of agricultural productivity with control variables (2016)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Female-headed households	-0.235**	-0.132	-0.064	-0.212*
	(0.101)	(0.099)	(0.112)	(0.114)
Log [Total land area cultivated in ha]	-0.294***	-0.378***	-0.308***	-0.295***
	(0.029)	(0.032)	(0.039)	(0.038)
Household head age (years)	0.003	0.003	0.002	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Married	0.166	0.146	0.106	0.135
	(0.101)	(0.099)	(0.099)	(0.128)
Divorced/Separated	0.184	0.160	0.068	0.272
	(0.159)	(0.151)	(0.160)	(0.233)
Widowed	0.098	0.030	-0.004	0.135
	(0.161)	(0.155)	(0.174)	(0.182)
Household head has Primary education	-0.031	-0.044	-0.048	-0.073
	(0.051)	(0.051)	(0.053)	(0.067)
Household head has Secondary education	-0.107	-0.107	-0.095	-0.188*
	(0.087)	(0.086)	(0.075)	(0.104)
Household head has Tertiary education	-0.706***	-0.664**	-0.760***	-0.416
	(0.264)	(0.262)	(0.236)	(0.343)
Household head disability	0.061	0.042	0.014	0.085
	(0.061)	(0.060)	(0.064)	(0.081)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Dependency ratio	0.009	0.007	-0.010	0.034
	(0.025)	(0.024)	(0.027)	(0.030)
Household Male Labor Use (Number)	0.033*	0.032	0.019	0.057***
	(0.020)	(0.020)	(0.017)	(0.022)
Household Female Labor Use (Number)	-0.016	-0.005	0.003	-0.014
	(0.018)	(0.018)	(0.019)	(0.022)
Household Child Labor Use (Number)	-0.048	-0.039	-0.103	-0.052
	(0.069)	(0.069)	(0.071)	(0.078)
Hired labor use (Number)	0.022***	0.022***	0.011**	0.025***
	(0.004)	(0.004)	(0.005)	(0.005)
Number of Fields Managed by the household	0.111***	0.104***	0.032	0.199***
	(0.021)	(0.021)	(0.023)	(0.029)
Total number of crops produced	0.007	0.011	0.070***	-0.064**
	(0.021)	(0.022)	(0.023)	(0.031)
Household used any purchased seed	-0.078	-0.058	-0.044	-0.005
	(0.052)	(0.052)	(0.053)	(0.064)
Plots that Use Chemical Fertilizer (% of total)	0.255***	0.264***	0.333***	0.233**
	(0.081)	(0.080)	(0.081)	(0.116)
Plots that Use Pesticide (% of total)	0.348***	0.357***	0.240***	0.192**
	(0.067)	(0.066)	(0.069)	(0.086)
Export crops dummy (1 if Household produced any export crop)		0.474***		
		(0.072)		
Constant	11.043***	10.874***	11.763***	10.579***
	(0.466)	(0.438)	(0.401)	(0.481)
Adjusted R-squared	0.132	0.148	0.122	0.179
% gap	**21%**	**12%**	**6%**	**19%**
Observations	3936	3936	2823	2749

*Note: ***/**/* indicate statistical significance at the 1/5/10 percent level respectively.*

To isolate the relative importance of the different factors in explaining the gender gap, we run an Oaxaca-Blinder decomposition analysis (Table 9). As already observed in Table 7, the overall unconditional gap is statistically significant, while the unconditional export crop productivity gap and food crop productivity gap taken separately are not. The explained component (endowment effect) of the gender gap is both significant for the overall gap and for food crops, working to close the gap for women.

Within the explained portion, we see that the factor that contributes the most to the endowment effect is the total land area cultivated by the household. This variable contributes negatively to the endowment effect, thus reducing the gender gap; again, female-headed households cultivate smaller plots and there is an inverse relationship between land area and productivity. Interestingly, the lower rates of secondary and tertiary education among female-headed households work to reduce the gap for them, since these lower rates are positively related to productivity.

Again, given the additive linearity property of the decomposition, it is possible to determine the contribution of each component towards the gender gap. The key factors that increase the gap in agricultural productivity between male- and female-headed households are the latter's lower adoption of export crops (91% of overall gap), lower use of pesticide (34% of gap) and lower use of chemical fertilizer (13% of gap). A lower number of fields managed by the household also emerges as a key driver for the gap (24% of overall gap),

driven by food crop productivity, while the lower number of crops produced work to close this same gap. The lower amount of male household labor only contributes to the gap in food-crop productivity but is a substantial driver. The lower incidence of being married among female-headed households is a significant driver only for the overall gap.

Due to the importance of female headed households' smaller land area cultivated in closing the gap, the overall endowment effect is non-significant for women, with the gap being driven entirely by lower returns from their endowments. Among the structure effect components that increase the gap for women, we observe lower returns to household female labor use, to primary education, and to not being single. For food crops, we also see a structural effect of household head disability which widens the food crop productivity gap for women. For export crops, we also see lower returns to fertilizer use and number of crops produced widening the gender gap.

Higher returns to the use of pesticide in female-headed households work to close the gap for all crop types. For export crops, higher returns to child labor work to decrease the gender gap, while higher returns to pesticide use alone render the overall structure effect insignificant. For food crops, higher returns to the total number of crops produced also work to close the gap.

Table 9. Oaxaca-Blinder decomposition of the gender differential in agricultural productivity with region fixed effects (2016)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
overall				
Male headed households	11.697***	11.697***	11.772***	11.633***
	(0.033)	(0.033)	(0.031)	(0.041)
Female Headed households	11.499***	11.499***	11.653***	11.504***
	(0.070)	(0.070)	(0.081)	(0.082)
difference	0.197***	0.197***	0.119	0.129
	(0.074)	(0.074)	(0.084)	(0.087)
explained	-0.037	0.065	0.055	-0.083
	(0.076)	(0.077)	(0.101)	(0.092)
unexplained	0.235**	0.132	0.064	0.212*
	(0.091)	(0.090)	(0.119)	(0.110)
explained				
Log [Total land area cultivated in ha]	-0.274***	-0.352***	-0.183***	-0.317***
	(0.035)	(0.039)	(0.034)	(0.049)
Household head age (years)	-0.021	-0.022	-0.022	0.005
	(0.014)	(0.014)	(0.021)	(0.016)
Married	0.087*	0.076	0.066	0.069
	(0.053)	(0.052)	(0.061)	(0.065)
Divorced/Separated	-0.012	-0.011	-0.003	-0.021
	(0.011)	(0.010)	(0.007)	(0.019)
Widowed	-0.042	-0.013	0.002	-0.055
	(0.066)	(0.064)	(0.099)	(0.074)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Household head has Primary education	-0.002	-0.003	-0.004	-0.006
	(0.004)	(0.004)	(0.005)	(0.005)
Household head has Secondary education	-0.012	-0.012	-0.011	-0.017*
	(0.009)	(0.009)	(0.008)	(0.010)
Household head has Tertiary education	-0.006**	-0.006*	-0.005**	-0.003
	(0.003)	(0.003)	(0.002)	(0.003)
Household head disability	-0.005	-0.004	-0.002	-0.006
	(0.006)	(0.006)	(0.009)	(0.006)
Dependency ratio	-0.003	-0.003	0.001	-0.014
	(0.009)	(0.009)	(0.004)	(0.012)
Household Male Labor Use (Number)	0.062	0.058	0.034	0.110***
	(0.038)	(0.037)	(0.031)	(0.042)
Household Female Labor Use (Number)	0.016	0.005	-0.002	0.015
	(0.018)	(0.018)	(0.011)	(0.023)
Household Child Labor Use (Number)	0.003	0.003	0.001	0.004
	(0.005)	(0.005)	(0.002)	(0.007)
Hired Labor Use (Number)	0.004	0.004	0.006	0.005
	(0.006)	(0.006)	(0.005)	(0.007)
Number of Fields Managed by the household	0.052***	0.048***	0.009	0.175***
	(0.013)	(0.013)	(0.008)	(0.036)
Total number of crops produced	0.002	0.003	0.009	-0.050*
	(0.007)	(0.007)	(0.010)	(0.029)
Household used any purchased seed	0.002	0.001	0.001	0.000
	(0.003)	(0.002)	(0.002)	(0.000)
Plots that Use Chemical Fertilizer (% of total)	0.025***	0.026***	0.031***	0.022*
	(0.009)	(0.009)	(0.011)	(0.011)
Plots that Use Pesticide (% of total)	0.065***	0.067***	0.053***	0.030*
	(0.016)	(0.016)	(0.018)	(0.016)
Export crops dummy (1 if Household produced any export crop)		0.179***		
		(0.035)		
unexplained				
Log [Total land area cultivated in ha]	0.185***	0.201***	0.064	0.163***
	(0.047)	(0.048)	(0.104)	(0.049)
Household head age (years)	-0.051	0.021	-0.037	-0.120
	(0.263)	(0.252)	(0.271)	(0.302)
Married	0.347***	0.348***	0.216***	0.193
	(0.120)	(0.117)	(0.077)	(0.170)
Divorced/Separated	0.056**	0.056**	0.016	0.046
	(0.025)	(0.025)	(0.020)	(0.034)
Widowed	0.322***	0.329***	0.168	0.246**
	(0.092)	(0.092)	(0.148)	(0.113)
Household head has Primary education	0.131***	0.138***	0.093**	0.103***
	(0.037)	(0.036)	(0.037)	(0.040)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Household head has Secondary education	0.018	0.017	0.033	0.007
	(0.011)	(0.011)	(0.030)	(0.012)
Household head has Tertiary education	0.000	-0.000	0.000	0.002
	(0.001)	(0.001)	(0.000)	(0.003)
Household head disability	0.008	0.015	0.025	0.059**
	(0.026)	(0.025)	(0.050)	(0.030)
Dependency ratio	-0.059	-0.068	-0.114*	-0.031
	(0.064)	(0.059)	(0.062)	(0.071)
Household Male Labor Use (Number)	0.041	0.045	-0.024	0.051
	(0.048)	(0.048)	(0.039)	(0.046)
Household Female Labor Use (Number)	0.160**	0.068	-0.027	0.057
	(0.078)	(0.078)	(0.096)	(0.113)
Household Child Labor Use (Number)	0.012	0.003	-0.038**	0.034
	(0.019)	(0.017)	(0.019)	(0.026)
Hired Labor Use (Number)	-0.010	-0.017	0.011	-0.029
	(0.032)	(0.029)	(0.054)	(0.032)
Number of Fields Managed by the household	-0.125	-0.052	-0.175	0.096
	(0.105)	(0.104)	(0.143)	(0.153)
Total number of crops produced	-0.192	-0.197	0.313*	-0.588***
	(0.122)	(0.121)	(0.183)	(0.166)
Household used any purchased seed	0.019	0.022	-0.026	0.012
	(0.037)	(0.036)	(0.044)	(0.053)
Plots that Use Chemical Fertilizer (% of total)	-0.014	-0.006	0.045*	0.023
	(0.014)	(0.015)	(0.024)	(0.025)
Plots that Use Pesticide (% of total)	-0.180***	-0.150***	-0.250***	-0.201***
	(0.054)	(0.050)	(0.068)	(0.072)
Export crops dummy (1 if Household produced any export crop)		-0.106		
		(0.093)		
Constant	1.410**	1.017*	-0.628	1.165*
	(0.603)	(0.591)	(0.644)	(0.670)
Observations	3936	3936	2823	2749

*Note: ***/**/* indicate statistical significance at the 1/5/10 percent level respectively.*

In Table 10, we present results from the decomposition of each decile of the productivity distribution, using the RIF method. We see that the simple overall average productivity is lower for female-headed households in the bottom six deciles (10th to 60th) but is not significantly lower than male-headed households in the top three productivity deciles. In our 2016 data, there is a significant correlation (at the 5 percent level) between the number of assets that households own and their agricultural productivity, suggesting a close relationship between poverty and low productivity as in 2008. This implies that the productivity gender gap is present among the poorest households in 2016.

Similar to the finding from the mean decomposition, the smaller amount of land cultivated by female-headed household reduces the gender gap in all productivity deciles. A notable finding is that female-headed households' lower use of household male labor leads to a widening of the gender gap in the lower half of

the productivity distribution, even when controlling for marriage status – while it closes the gap in the top decile. The female disadvantage in tertiary education works to close the gap in the bottom half of the distribution. The lower use of chemical fertilizer contributes to the gap in all but the lowest decile. Lower rates of marriage work to increase the gap in the lowest- and highest-productivity households. The lower number of fields managed by the household, lower adoption of export crops and lower use of pesticide all work to increase the gap in all deciles. However, their contribution to explaining the gap is always stronger in the bottom deciles, clearly driving the relative female productivity advantage in the top of the distribution.

Within the structure effect, we see that male-headed households across the distribution, especially at the very bottom and top, get a bigger productivity advantage from higher returns to land area cultivated. Male household heads' higher returns to not being single are observed across the distribution except for the very top and bottom, while their higher returns to primary education emerge for the bottom seven percentiles (with higher returns to secondary education emerging for the 20th, 40th and 50th percentiles). Higher returns to the use of pesticide in female-headed households work to close the gap for the lower half of the distribution, while returns to chemical fertilizer use are highly dependent on households' locations in the distribution. Indeed, they work to close the gap for the 60th and 70th percentiles but increase it for the 20th percentile.

We also see that female-headed households in the middle of the distribution get a bigger productivity advantage from higher returns to export crop production. Moreover, higher returns to the number of crops cultivated by female-headed households closes the gender gap for the lower end (20th percentile) and upper end (90th percentile) of the distribution, while returns to the number of fields close the gap for the 30th percentile only. Female household heads' returns to male household labor use are also highly distribution dependent, with lower returns working to widen the gap at the bottom of the distribution but closing the gap at the very top.

In Appendix Tables A.5 and A.6, we provide RIF results separately for export and food crops. This disaggregation highlights that while the overall gender gap among lower productivity households is being driven by both export crops and food crops gaps, the gender gap remaining in the middle of the distribution (40th to 60th percentiles) is being driven by food crops only.

The lower use of pesticide among female-headed households mattering more strongly at the bottom of the distribution comes primarily from export crops. The importance of fewer male household workers for these same households is notable only for the 20th and 30th percentiles of the export-crop productivity distribution, while it matters for all the bottom half of the food crop productivity distribution. Similarly, while the lower number of fields for females only matters for the first decile for export crops, it matters significantly across the food-crop productivity distribution.

Within the structure effect, the lower returns to marriage in the lower half of the distribution are driven by export crops. Moreover, while female-headed households get a productivity advantage for food crops from their higher returns to the total number of crops produced, they get lower returns to the number of export crops produced, which contributes to the export-crop gap at the top of the distribution. Lower returns to the number of fields for the poorest female-headed households work to increase the food-crop productivity gap, while higher returns to the number of fields close the export-crop gap among the richest households. Lastly, higher returns to land area cultivated drive the food-crop productivity advantage of male-headed households across the distribution.

Table 10. RIF decomposition of the gender differential in agricultural productivity with region fixed effects (2016)

	Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
overall									
Male headed households	10.260***	10.872***	11.252***	11.532***	11.805***	12.020***	12.258***	12.544***	12.995***
	(0.063)	(0.049)	(0.041)	(0.037)	(0.032)	(0.031)	(0.033)	(0.039)	(0.042)
Female Headed households	9.850***	10.533***	10.947***	11.275***	11.566***	11.843***	12.138***	12.508***	12.971***
	(0.175)	(0.101)	(0.094)	(0.089)	(0.081)	(0.075)	(0.078)	(0.095)	(0.111)
difference	0.411**	0.339***	0.305***	0.257***	0.239***	0.177**	0.119	0.037	0.024
	(0.181)	(0.109)	(0.099)	(0.094)	(0.083)	(0.079)	(0.081)	(0.098)	(0.118)
% gap	**34%**	**29%**	**26%**	**23%**	**21%**	**16%**	**11%**	**4%**	**2%**
explained	0.201	0.145	0.123	0.188**	0.096	0.083	0.018	0.034	-0.051
	(0.182)	(0.126)	(0.104)	(0.095)	(0.086)	(0.078)	(0.085)	(0.090)	(0.115)
unexplained	0.210	0.194	0.182	0.069	0.143	0.095	0.102	0.003	0.075
	(0.249)	(0.164)	(0.131)	(0.121)	(0.109)	(0.100)	(0.096)	(0.106)	(0.145)
explained									
Log [Total land area cultivated in ha]	-0.375***	-0.310***	-0.349***	-0.340***	-0.319***	-0.305***	-0.312***	-0.361***	-0.404***
	(0.075)	(0.054)	(0.046)	(0.040)	(0.037)	(0.037)	(0.039)	(0.046)	(0.066)
Household head age (years)	0.006	-0.039*	-0.014	-0.025*	-0.013	-0.008	-0.020	-0.043**	-0.028
	(0.036)	(0.021)	(0.017)	(0.015)	(0.013)	(0.013)	(0.014)	(0.018)	(0.024)
Married	0.268**	0.139	0.083	0.066	0.007	0.042	-0.000	-0.016	0.112*
	(0.136)	(0.092)	(0.072)	(0.063)	(0.055)	(0.051)	(0.052)	(0.061)	(0.061)
Divorced/Separated	-0.021	-0.010	-0.001	-0.011	-0.003	-0.010	-0.003	0.002	-0.015
	(0.029)	(0.018)	(0.015)	(0.014)	(0.011)	(0.011)	(0.011)	(0.012)	(0.016)
Widowed	-0.136	-0.130	-0.060	0.035	-0.002	-0.013	0.015	0.086	0.032
	(0.190)	(0.109)	(0.086)	(0.073)	(0.063)	(0.060)	(0.063)	(0.072)	(0.083)
Household head has Primary education	-0.010	-0.006	-0.006	-0.006	0.001	-0.000	0.001	0.002	-0.002
	(0.010)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)
Household head has Secondary education	-0.045**	-0.020	-0.013	-0.011	-0.008	-0.004	0.001	0.011	0.003
	(0.020)	(0.014)	(0.011)	(0.009)	(0.008)	(0.008)	(0.009)	(0.011)	(0.014)
Household head has Tertiary education	-0.015*	-0.010*	-0.007**	-0.006**	-0.004*	-0.003	-0.002	-0.003	-0.003
	(0.009)	(0.005)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Household head disability	-0.018	-0.005	-0.011	-0.003	0.002	0.000	0.004	0.006	0.002
	(0.015)	(0.010)	(0.009)	(0.008)	(0.006)	(0.006)	(0.007)	(0.008)	(0.009)
Dependency ratio	-0.018	-0.016	-0.014	-0.005	-0.004	-0.003	-0.003	0.008	0.015

Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]									
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
	(0.020)	(0.015)	(0.013)	(0.012)	(0.011)	(0.010)	(0.011)	(0.013)	(0.016)
Household Male Labor Use (Number)	0.151	0.161**	0.118**	0.085**	0.078**	0.035	0.002	-0.018	-0.095*
	(0.096)	(0.065)	(0.051)	(0.042)	(0.038)	(0.037)	(0.037)	(0.042)	(0.055)
Household Female Labor Use (Number)	0.004	0.000	-0.025	-0.007	-0.000	0.013	0.028	0.017	0.014
	(0.040)	(0.031)	(0.027)	(0.027)	(0.021)	(0.021)	(0.022)	(0.024)	(0.031)
Household Child Labor Use (Number)	0.004	-0.001	-0.001	-0.001	0.001	0.004	0.005	0.010	0.004
	(0.009)	(0.008)	(0.007)	(0.006)	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)
Hired Labor Use (Number)	0.007	0.006	0.005	0.004	0.004	0.004	0.002	0.003	0.002
	(0.010)	(0.009)	(0.007)	(0.006)	(0.006)	(0.005)	(0.004)	(0.004)	(0.003)
Number of Fields Managed by the household	0.067**	0.068***	0.045**	0.060***	0.043***	0.039***	0.030**	0.035***	0.029*
	(0.027)	(0.021)	(0.019)	(0.016)	(0.013)	(0.013)	(0.012)	(0.014)	(0.016)
Total number of crops produced	0.009	0.001	0.004	-0.002	0.001	0.003	0.007	0.000	0.006
	(0.017)	(0.012)	(0.012)	(0.010)	(0.008)	(0.008)	(0.009)	(0.008)	(0.010)
	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Household used any purchased seed	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
Plots that Use Chemical Fertilizer (% of total)	0.014	0.026**	0.027**	0.034***	0.037***	0.027***	0.030***	0.026**	0.034**
	(0.016)	(0.013)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.016)
Plots that Use Pesticide (% of total)	0.120***	0.081***	0.086***	0.068***	0.063***	0.053***	0.052***	0.053***	0.052**
	(0.033)	(0.024)	(0.021)	(0.018)	(0.017)	(0.016)	(0.016)	(0.018)	(0.023)
Export crops dummy (1 if Household produced any export crop)	0.209***	0.187***	0.225***	0.222***	0.193***	0.178***	0.164***	0.177***	0.148***
	(0.078)	(0.051)	(0.045)	(0.041)	(0.037)	(0.035)	(0.035)	(0.038)	(0.047)
unexplained									
	0.336**	0.206***	0.240***	0.227***	0.172***	0.110**	0.166***	0.182***	0.292***
Log [Total land area cultivated in ha]	(0.142)	(0.077)	(0.061)	(0.050)	(0.044)	(0.048)	(0.049)	(0.061)	(0.100)
Household head age (years)	-0.225	-0.142	0.077	0.007	0.126	-0.012	-0.197	-0.242	-0.114
	(0.777)	(0.419)	(0.359)	(0.342)	(0.304)	(0.258)	(0.243)	(0.310)	(0.334)
Married	0.208	0.333*	0.320**	0.419***	0.399***	0.485***	0.551***	0.539***	0.231
	(0.318)	(0.180)	(0.147)	(0.134)	(0.121)	(0.115)	(0.128)	(0.166)	(0.183)
Divorced/Separated	0.070	0.064*	0.073**	0.083***	0.077***	0.064**	0.071**	0.067**	-0.006
	(0.063)	(0.039)	(0.035)	(0.032)	(0.027)	(0.026)	(0.028)	(0.034)	(0.041)
Widowed	0.387	0.389***	0.310**	0.436***	0.377***	0.431***	0.459***	0.446***	0.189
	(0.266)	(0.151)	(0.127)	(0.115)	(0.097)	(0.095)	(0.104)	(0.127)	(0.150)
	0.179*	0.208***	0.167***	0.211***	0.180***	0.140***	0.086**	0.068	0.067

Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]									
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
Household head has Primary education	(0.106)	(0.065)	(0.048)	(0.047)	(0.041)	(0.038)	(0.037)	(0.043)	(0.059)
Household head has Secondary education	-0.013	0.058*	0.033	0.043**	0.034**	0.021	0.017	0.003	-0.018
	(0.017)	(0.031)	(0.023)	(0.019)	(0.017)	(0.015)	(0.012)	(0.012)	(0.019)
Household head has Tertiary education	-0.004	-0.003	-0.003	-0.002	-0.001	-0.000	-0.002	0.006	0.006
	(0.004)	(0.004)	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)	(0.006)	(0.007)
Household head disability	0.136*	0.036	-0.014	-0.021	0.014	0.035	0.058*	0.004	-0.008
	(0.080)	(0.047)	(0.042)	(0.042)	(0.034)	(0.033)	(0.034)	(0.037)	(0.049)
Dependency ratio	0.075	-0.003	0.108	0.056	-0.009	-0.122*	-0.128*	-0.166*	-0.182**
	(0.149)	(0.095)	(0.086)	(0.082)	(0.076)	(0.073)	(0.071)	(0.089)	(0.092)
Household Male Labor Use (Number)	0.239	0.210**	0.114*	0.031	-0.010	-0.031	-0.037	-0.004	-0.108*
	(0.175)	(0.086)	(0.065)	(0.056)	(0.050)	(0.044)	(0.045)	(0.048)	(0.060)
Household Female Labor Use (Number)	0.143	-0.027	0.016	0.102	0.120	0.075	0.096	0.148	0.013
	(0.217)	(0.136)	(0.116)	(0.132)	(0.107)	(0.095)	(0.094)	(0.098)	(0.138)
Household Child Labor Use (Number)	-0.073	-0.010	-0.022	0.012	0.017	0.004	0.010	0.046**	0.028
	(0.046)	(0.031)	(0.026)	(0.021)	(0.022)	(0.020)	(0.019)	(0.023)	(0.032)
Hired Labor Use (Number)	0.081	-0.032	0.009	-0.010	-0.050	-0.067	-0.034	-0.077*	0.002
	(0.075)	(0.047)	(0.049)	(0.048)	(0.046)	(0.049)	(0.049)	(0.044)	(0.058)
Number of Fields Managed by the household	-0.154	0.272	-0.448**	-0.222	-0.190	0.100	0.170	0.079	-0.084
	(0.285)	(0.215)	(0.195)	(0.162)	(0.157)	(0.160)	(0.154)	(0.169)	(0.207)
Total number of crops produced	-0.180	-0.377*	0.303	0.013	-0.027	-0.086	-0.225	-0.251	-0.604***
	(0.335)	(0.227)	(0.190)	(0.172)	(0.180)	(0.171)	(0.187)	(0.171)	(0.208)
Household used any purchased seed	0.026	0.010	0.042	0.056	0.057	0.092*	0.017	-0.046	0.030
	(0.102)	(0.069)	(0.063)	(0.064)	(0.051)	(0.047)	(0.049)	(0.053)	(0.063)
Plots that Use Chemical Fertilizer (% of total)	0.028	0.046*	0.042	0.035	-0.007	-0.048*	-0.044*	-0.031	-0.051
	(0.032)	(0.025)	(0.027)	(0.023)	(0.021)	(0.026)	(0.025)	(0.025)	(0.036)
Plots that Use Pesticide (% of total)	-0.318**	-0.383***	-0.199***	-0.227***	-0.208***	-0.035	-0.033	0.021	-0.102
	(0.139)	(0.089)	(0.075)	(0.067)	(0.074)	(0.071)	(0.061)	(0.076)	(0.107)
Export crops dummy (1 if Household produced any export crop)	-0.150	0.051	-0.089	-0.205*	-0.173*	-0.089	-0.175*	-0.181	-0.009
	(0.260)	(0.157)	(0.124)	(0.104)	(0.095)	(0.105)	(0.098)	(0.122)	(0.152)
Constant	8.737***	2.059*	0.477	0.054	0.235	0.254	-0.072	0.026	1.069
	(1.413)	(1.107)	(0.878)	(0.706)	(0.662)	(0.639)	(0.569)	(0.580)	(0.802)
Observations	3936	3936	3936	3936	3936	3936	3936	3936	3936

*Note: ***/**/* indicate statistical significance at the 1/5/10 percent level respectively.*

3.3 Changes between 2008 and 2016

Between 2008 and 2016, we note a reduction in the gender gap between female- and male-headed households. The unconditional gender difference in productivity drops from 21 percent in 2008 (favoring male-headed households) to 18 percent in 2016. This constitutes a 14 percent drop over the past decade. A larger change is observed once introducing region fixed effects and controlling for household and farm characteristics. Then, the estimated gap goes from 31 percent in 2008 to 21 percent in 2016: a 32 percent reduction. The change in the gap becomes even larger when introducing export crop adoption by the household as a covariate: in this case, the gender gap in agricultural productivity goes from 27 percent in 2008 to no longer being significant in 2016.

When looking at the gender gap along the productivity distribution, we find that while gender gaps are significant for all deciles in 2008, they are concentrated among the less productive – and thus poorest - households in 2016. This is true for export crop productivity, where we find a significant gap in all *but* the bottom two deciles in 2008, while in 2016 we *only* find a significant gap for the 20th and 30th deciles. A similar but slightly more nuanced pattern emerges for food crops, where in 2008 we saw a gap in all *but* the bottom decile, while in 2016 we see a significant gap in the 30th, 40th, and 60th deciles.

Overall, the decrease in the agricultural productivity gender gap is coming both from export crop and food crop production, though the former is more responsible for its reduction. The conditional gender gap within food crops drops from 40 percent in 2008 to 19 percent in 2016, while that within export crops drops from 17 percent to being no longer significant.

During the same period, our data suggest that a change occurred in covariates that are positively related to productivity for women: the use of pesticide by female-headed households went from 26 percent that of male-headed households to 66 percent that of men-headed households in 2016. There was 64 percent more female household labor in female-headed households than in male-headed households in 2008, versus 93 percent more in 2016. In addition, we see an increase in the relative rates of widowhood among female-headed households: from 23 times the male rate in 2008 to 44 times the male rate in 2016. We also note decreases in the relative rate of divorce/separation, and an increase in the relative rate of being single/never married. The latter goes from 83 percent that of male-headed households in 2008 to 1.5 times that of male-headed households in 2016.

On a more cautionary note, we see that in 2016, women also have relatively less total land area cultivated: they go from 56 percent of that of male-headed households in 2008 to 48 percent in 2016. Moreover, the total number of fields managed by the household goes from 97 percent that of male-headed households in 2008 to 83 percent in 2016. Since their production does not decrease proportionately, this results in a relative increase in female household heads' *efficiency* over the past decade, but of course does not speak to impacts on their absolute welfare levels (such as poverty rates or income). We find no substantial changes in male-female differences in terms of the dependency ratio, disability rates, male household labor, hired labor, fertilizer and export crop adoption across the two years.

In terms of our decomposition of the drivers of agricultural productivity, there are some drivers of the gender gap that stay constant over the past decade, along with notable changes. The lower levels of total land area cultivated by female-headed households work to reduce the gender gap in productivity in every single decile, both in 2008 and 2016. This is true within both food crops and export crops. Moreover, female-headed households' lower use of pesticide works to increase the gender gap in every decile in both

years, as does their lower use of fertilizer in all but the very bottom decile. When examining the results separately by crop type, the effect is somewhat more consistent for export crops.

While lower rates of marriage among female-headed households do not show up as a driver in 2008's distribution analysis, they work to increase the gender gap in the bottom and top deciles in 2016. In 2008, the lower use of male household labor widens the gap all along the distribution. Lower household male labor still widens the gap in 2016, but only towards the bottom half of the distribution – which is where the gap remains. This effect is particularly strong for food crops: while in 2016 lower levels of male labor are a driver of the gap only for the 20th and 30th deciles for export crops, they are a driver for the bottom five deciles, plus the 80th decile, for food crops.

Another interesting finding related to labor use is that while the higher use of female household labor by female-headed households works to reduce the gap in all but the top two deciles in 2008, it no longer does so in 2016, either for food or export crops. Moreover, only in 2016 do female-headed households seem to benefit from lower levels of education, particularly tertiary education (though the incidence of tertiary education is trivial in rural areas of Côte d'Ivoire, so precise estimation is difficult). This is entirely explained by export crops, where it holds for every decile, while it does not hold for any part of the distribution for food crops.

A key change over the past decade is the emergence of total number of fields managed by the household as a driver: while in 2008 there was no big difference in this variable between female-and male-headed households, in 2016 female-headed households have approximately a half-field less than their male counterparts, and this works to increase the gender gap in every decile of the productivity distribution. This comes almost entirely from food crops: while in export crops it matters only for the bottom decile, for food crops it increases the gender gap in every single decile of the distribution, and substantially so.

Another substantial change occurred for export crop adoption as a driver of the gender gap. Interestingly, whether a household cultivates export crops drove the gap at the lower end (10th and 20th deciles) and upper end (80th and 90th deciles) of the distribution in 2008, exhibiting a U-shaped relationship with the gender gap. In 2016, export crop cultivation drives the productivity gap for every decile in the distribution but matters significantly less at the top of the distribution. Top-decile female household heads in 2016 are relatively more likely to cultivate export crops, which partly drives the productivity advantage of women-headed households at the top of the productivity distribution.

While female-headed households saw no effect, or a positive effect, from returns to land area cultivated in 2008, in 2016 they witness lower returns in every decile of the distribution, despite their smaller land size. This comes entirely from food crop cultivation. Moreover, returns to the household head's marriage status start mattering a lot more: while in 2008 marriage status is only weakly related to the gender gap, in 2016 female-headed households see lower returns to not being single—i.e., being married, divorced, separated or widowed—in every single decile except for the very top and bottom. Lower returns to marriage are large and matter up to the 60th decile for export crops in 2016, while in food crops they matter more for the middle-top of the distribution.

Moreover, while in 2008 female-headed households saw no effect or positive returns to their education levels, in 2016 they see no effect or negative returns, particularly for primary education. This may be connected to the fact that while primary education shows up as having no impact on agricultural productivity overall, female-headed households increased their relative primary education rates over the past decade. Specifically, they moved from the likelihood of having primary education being 50 percent that of a male household head in 2008, to 75 percent in 2016. While returns to pesticide either do not matter

or increase the gender gap in 2008, they emerge as one of the main drivers of closing the gender gap, particularly in the bottom half of the distribution, in 2016. This holds for both export and food crops.

Finally, differential returns to the household dependency ratio do not show up as a driver anywhere along the distribution in 2008. In 2016, they continue not to matter for food crops, but higher returns to the dependency ratio work to close the gap in the top half of the export crop productivity distribution in 2016. Returns to crop diversification, measured as the number of crops produced by the household, contribute to widening the export-crop male advantage in 2016, especially at the very top of the distribution. Interestingly, this factor decreases the gender gap in food crop productivity across the distribution. Lastly, in 2008, lower returns to female labor use mattered across the distribution for export crops, while they do not anymore in 2016.

4 Conclusion

Between 2008 and 2016, we notice substantial changes among the population of female-headed households engaged in agricultural production. Relative to male-headed households, female-headed households in Côte d'Ivoire have witnessed changes in household structure, with the decrease in the relative rate of divorce being offset by a large relative increase in the rate of widowhood and in the proportion of women never having been married. Female-headed households, relative to male-headed households, have also made large strides in primary education, though less so in gaining secondary education.

Within agriculture, we notice large increases in certain factors of production and a decrease in others. Most notably, while female-headed households are still behind male-headed households for fertilizer and pesticide use, female-headed households are starting to catch up. For example, their use of pesticide relative to male-headed households has more than doubled between 2008 and 2016. This may be related to the big government push on including women more in agriculture programs over the past decade, through initiatives such as the West Africa Agricultural Productivity Program (WAAPP) and the Côte d'Ivoire Agricultural Support Project (PSAC).

Another productive resource whose relative rate of use has further increased compared to male-headed households is that of female household labor. At the same time, female-headed households have experienced substantial land losses, with the total land area cultivated and the number of fields managed by the households reducing relative to male-headed households. This change, along with the change in household structure – notably the increase in the rate of widowhood – may have been caused by the Second Ivorian Civil War, which afflicted the country in 2010-2011.

Changes in these factors of production have had impacts for the value drawn from land. We observe a 10-percentage point drop in the conditional gender gap across the decade, with remarkable changes in both the gender gap in food crop productivity and in export crop productivity. Female-headed households have gone from a 40 percent food-crop gap and 17 percent export-crop gap compared to male-headed households in 2008, to respectively 19 percent and a statistical zero now. Indeed, when introducing export crop adoption into our analysis as a covariate in both years, the overall gender gap drops from 27 percent in 2008 to being statistically indistinguishable from zero now.

Another interesting finding, which deserves more extensive exploration in future research, is that labor inputs emerge as more crucial for food crop productivity, relative to non-labor inputs mattering for export crop productivity. The big gain in chemical fertilizer and pesticide among female-headed households thus helps to explain the disappearance of the export crop productivity gap – whereas the food crop gap has

reduced by less and relative labor inputs have remained fairly constant between male- and female-headed households over the past decade.

However, our headline result of a large reduction in the agricultural productivity gender gap masks heterogeneity and lurking issues that will be key for policy makers in the coming years.[5] First, while our results focus on women's productivity, their efficiency gains relative to men must be put in perspective with the relative land loss they experienced during the same period. Women have become more efficient, but they are given less to work with. The land loss suffered by female-headed households is also starting to impact food crop productivity, where the gender gap remains high: the lower number of fields managed by the household emerges as a big driver in 2016, perhaps due to higher exposure to risk. Strengthening women's land rights, either through spousal co-titling, direct land transfer or safeguarding of inheritance rights, should be a key policy priority within agricultural programming in the country.

In addition to the remaining gender gap in food crop productivity, the RIF decomposition highlights that we still see large gender gaps among lower-productivity households in 2016. Since our productivity measure is closely related to income and asset-based poverty, as covered in Section 3, this means that targeting the poorest half of female-headed households, in particular as regards their food crop production, should be a key policy priority.

What does our analysis have to say about what the remaining drivers of the gender gap for these households are? In addition to the lower number of fields managed by the household, as discussed above, the other main driver is lower use of male household labor. Indeed, labor constraints, in particular lower use of *male* labor, have emerged as a key cause of the gender gap across Sub-Saharan Africa (O'Sullivan 2014). This result has also been shown to hold for Côte d'Ivoire; agriculture programs in the country should consider implementing creative solutions such as labor vouchers and directly engaging husbands to reach the last mile in gender-egalitarian poverty reduction (Carranza et al. 2017).

Further, decision-makers in the agriculture sector should focus on better gender integration within export crop cultivation. Indeed, 'occupational segregation' across crop types can be considered the key driver of the productivity gap in Côte d'Ivoire: whether one accounts for export crop adoption by households or not determines whether female-headed households face a 21 percent productivity gap or no productivity gap (Tables 7 and 8). In the specific context of Côte d'Ivoire, our results suggest that by targeting export crop female producers, notably by increasing their use of inputs, agricultural policies have been successful at reducing gender inequality.

Moving more women into the export crop sector, which does not appear to have happened over the past decade, could be an avenue to further reduce gender inequality in the country and in the region. Implementing strategies that tailor extension services to female farmers' needs, facilitate their access to markets and engage husbands as allies to encourage women to "cross-over" to high-value export crop cultivation should be at the top of the agenda in Côte d'Ivoire's next National Development Plan.

Lastly, our analysis highlights the importance of collecting gender-specific data in household surveys and recording the gender of the main decision maker and/or owner for the important units of economic production in the household, such as agricultural plots and businesses. The 2008 data, where this information is available, show that productivity gaps are larger when conducting the analysis by gender of the plot owner or plot manager. However, our data in 2016 do not allow for an analysis of gender gaps except for by headship. This is a limitation, since most women do not live in female-headed households

[5] The Africa Gender Innovation Lab is currently leading experiments on each of these key issues in Sub-Saharan Africa.

and resources are not always shared equally among household members. Unpacking gendered outcomes at the individual level is necessary for effectively diagnosing the causes and solutions to empower women and reduce poverty.

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6 Appendix

Table A.1a. OLS regressions of agricultural productivity on female plot manager without control variables (2008)

	Log [Self-reported Productivity (XOF/ha)]					
	(1)	(2)	(3)	(4)	(5)	(6)
	All crops	Export crops	Food crops	All crops	Export crops	Food crops
Female plot manager	-0.401***	-0.106	-0.448***	-0.330***	0.067	-0.400***
	(0.029)	(0.091)	(0.031)	(0.030)	(0.084)	(0.031)
Constant	11.322***	11.294***	11.334***	11.427***	11.450***	11.396***
	(0.016)	(0.030)	(0.019)	(0.088)	(0.171)	(0.087)
Region fixed effect	No	No	No	Yes	Yes	Yes
Adjusted R-squared	0.015	0.000	0.021	0.069	0.081	0.089
% gap	**33%**	**10%**	**36%**	**28%**	**-7%**	**33%**
Observations	21770	5097	16618	21770	5097	16618

Table A.1b. OLS regressions of agricultural productivity on female plot manager with control variables (2008)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Female plot manager	-0.668***	-0.605***	-0.133	-0.667***
	(0.029)	(0.029)	(0.085)	(0.031)
Log [Plot size in ha]	-0.583***	-0.622***	-0.634***	-0.615***
	(0.010)	(0.011)	(0.021)	(0.012)
Age (years)	0.007***	0.006***	0.005***	0.006***
	(0.001)	(0.001)	(0.002)	(0.001)
Married	-0.026	-0.028	0.120	-0.071
	(0.046)	(0.046)	(0.096)	(0.049)
Divorced/Separated	-0.007	-0.010	0.139	-0.030
	(0.068)	(0.068)	(0.141)	(0.073)
Widowed	-0.049	-0.070	-0.120	-0.074
	(0.065)	(0.065)	(0.134)	(0.071)
Manager has Primary education	0.054*	0.036	-0.018	0.055
	(0.032)	(0.032)	(0.062)	(0.035)
Manager has Secondary education	0.051	0.042	0.123*	-0.066
	(0.040)	(0.040)	(0.071)	(0.045)
Manager has Tertiary education	0.393**	0.372**	0.604***	0.060
	(0.167)	(0.159)	(0.224)	(0.208)
Manager disability	-0.110*	-0.118*	0.136	-0.209***
	(0.064)	(0.062)	(0.107)	(0.071)
Dependency ratio	0.004	0.004	-0.017	0.018
	(0.014)	(0.014)	(0.026)	(0.015)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Household Male Labor Use (Number)	0.005	0.008	0.024	0.021
	(0.012)	(0.012)	(0.022)	(0.013)
Household Female Labor Use (Number)	0.062***	0.064***	0.022	0.065***
	(0.011)	(0.011)	(0.023)	(0.012)
Household Child Labor Use (Number)	0.014	0.014	-0.001	0.003
	(0.019)	(0.018)	(0.036)	(0.020)
Hired Labor Use (Number)	0.001	0.001	0.020***	0.000
	(0.001)	(0.001)	(0.006)	(0.001)
Number of farms per manager	-0.036***	-0.045***	-0.069***	0.100
	(0.011)	(0.010)	(0.012)	(0.070)
Total number of crops produced	-0.073***	-0.055***	0.057***	-0.217***
	(0.011)	(0.011)	(0.015)	(0.071)
Manager used any purchased seed	-0.283***	-0.240***	-0.119	-0.229***
	(0.057)	(0.057)	(0.133)	(0.058)
Plots that Use Chemical Fertilizer dummy	0.352***	0.331***	0.370***	0.223***
	(0.045)	(0.044)	(0.072)	(0.053)
Plots that Use Pesticide dummy	0.610***	0.534***	0.554***	0.440***
	(0.036)	(0.037)	(0.054)	(0.051)
Export crops dummy (1 if manager produced any export crop)		0.354***		
		(0.031)		
Constant	11.398***	11.292***	11.489***	11.347***
	(0.089)	(0.088)	(0.185)	(0.092)
Region fixed effect	Yes	Yes	Yes	Yes
Adjusted R-squared	0.328	0.336	0.388	0.331
% gap	**49%**	**45%**	**12%**	**49%**
Observations	21770	21770	5097	16618

Table A.2a. OLS regressions of agricultural productivity on female plot owner without control variables (2008)

	Log [Self-reported Productivity (XOF/ha)]					
	(1)	(2)	(3)	(4)	(5)	(6)
	All crops	Export crops	Food crops	All crops	Export crops	Food crops
Female plot Owner	-0.375***	-0.151	-0.429***	-0.309***	0.025	-0.406***
	(0.037)	(0.102)	(0.038)	(0.037)	(0.093)	(0.038)
Constant	11.306***	11.277***	11.329***	11.458***	11.486***	11.470***
	(0.018)	(0.032)	(0.021)	(0.103)	(0.176)	(0.109)
Region fixed effect	No	No	No	Yes	Yes	Yes
Adjusted R-squared	0.011	0.001	0.018	0.067	0.079	0.093
% gap	**31%**	**14%**	**35%**	**27%**	**-3%**	**33%**
Observations	16798	4492	12273	16798	4492	12273

Table A.2b. OLS regressions of agricultural productivity on female plot owner with control variables (2008)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Female plot Owner	-0.611***	-0.556***	-0.116	-0.655***
	(0.038)	(0.037)	(0.096)	(0.040)
Log [Plot size in ha]	-0.571***	-0.606***	-0.627***	-0.599***
	(0.012)	(0.013)	(0.023)	(0.014)
Age (years)	0.006***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.002)	(0.001)
Married	0.037	0.032	0.220**	-0.065
	(0.055)	(0.055)	(0.105)	(0.061)
Divorced/Separated	0.046	0.043	0.215	-0.008
	(0.077)	(0.078)	(0.151)	(0.086)
Widowed	-0.024	-0.045	-0.067	-0.067
	(0.075)	(0.075)	(0.146)	(0.083)
Owner has Primary education	0.035	0.021	0.008	0.019
	(0.036)	(0.036)	(0.065)	(0.041)
Owner has Secondary education	0.003	-0.001	0.096	-0.115**
	(0.045)	(0.045)	(0.076)	(0.053)
Owner has Tertiary education	0.366**	0.356**	0.606***	0.032
	(0.171)	(0.165)	(0.228)	(0.216)
Owner disability	-0.107	-0.122*	0.162	-0.254***
	(0.073)	(0.071)	(0.110)	(0.085)
Dependency ratio	-0.005	-0.004	-0.019	0.003
	(0.015)	(0.015)	(0.028)	(0.017)
Household Male Labor Use (Number)	0.020	0.024*	0.028	0.032**
	(0.013)	(0.013)	(0.024)	(0.015)

	Log [Self-reported Productivity (XOF/ha)]			
	(1)	(2)	(3)	(4)
	All crops	All crops	Export crops	Food crops
Household Female Labor Use (Number)	0.055***	0.057***	0.021	0.063***
	(0.012)	(0.012)	(0.025)	(0.014)
Household Child Labor Use (Number)	0.018	0.017	-0.007	0.011
	(0.021)	(0.020)	(0.039)	(0.023)
Hired Labor Use (Number)	0.006	0.006	0.019***	0.004
	(0.005)	(0.005)	(0.005)	(0.004)
Number of farms per Owner	-0.035***	-0.041***	-0.070***	0.183**
	(0.011)	(0.010)	(0.012)	(0.075)
Total number of crops produced	-0.068***	-0.053***	0.059***	-0.297***
	(0.012)	(0.012)	(0.016)	(0.076)
Owner used any purchased seed	-0.242***	-0.205***	-0.080	-0.205***
	(0.065)	(0.065)	(0.137)	(0.068)
Plots that Use Chemical Fertilizer dummy	0.340***	0.325***	0.359***	0.227***
	(0.050)	(0.049)	(0.078)	(0.060)
Plots that Use Pesticide dummy	0.608***	0.541***	0.552***	0.446***
	(0.040)	(0.041)	(0.057)	(0.060)
Export crops dummy (1 if Plot Owner produced any export crop)		0.303***		
		(0.034)		
Constant	11.422***	11.314***	11.383***	11.462***
	(0.104)	(0.104)	(0.196)	(0.112)
Region fixed effect	Yes	Yes	Yes	Yes
Adjusted R-squared	0.318	0.325	0.377	0.325
% gap	**46%**	**43%**	**11%**	**48%**
Observations	16798	16798	4492	12273

Table A.3: RIF decomposition of the Gender Differential in Agricultural Productivity with region fixed effects - Export crops only (2008)

	Log [Self-reported Productivity (XOF/ha)]-Export crops								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
overall									
Male headed households	9.439***	10.103***	10.604***	10.990***	11.327***	11.600***	11.908***	12.259***	12.634***
	(0.081)	(0.073)	(0.070)	(0.059)	(0.052)	(0.048)	(0.047)	(0.045)	(0.049)
Female Headed households	9.324***	9.953***	10.360***	10.712***	10.994***	11.304***	11.702***	11.972***	12.424***
	(0.155)	(0.164)	(0.136)	(0.125)	(0.132)	(0.124)	(0.123)	(0.120)	(0.112)
difference	0.116	0.150	0.244*	0.278**	0.333**	0.296**	0.206*	0.287**	0.210*
	(0.167)	(0.164)	(0.137)	(0.128)	(0.130)	(0.122)	(0.121)	(0.117)	(0.111)
% gap	**11%**	**14%**	**22%**	**24%**	**28%**	**26%**	**19%**	**25%**	**19%**
explained	0.046	0.188	0.145	0.178	0.173	0.118	0.042	0.053	0.007
	(0.173)	(0.165)	(0.138)	(0.130)	(0.111)	(0.099)	(0.094)	(0.091)	(0.114)
unexplained	0.070	-0.038	0.098	0.101	0.160	0.178	0.164	0.234*	0.203
	(0.226)	(0.190)	(0.156)	(0.160)	(0.139)	(0.129)	(0.123)	(0.123)	(0.139)
explained									
Log [Total land area cultivated in ha]	-0.272***	-0.263***	-0.257***	-0.221***	-0.192***	-0.176***	-0.173***	-0.188***	-0.242***
	(0.076)	(0.070)	(0.066)	(0.056)	(0.049)	(0.045)	(0.044)	(0.048)	(0.063)
Household head age (years)	-0.036	-0.025	-0.014	-0.046***	-0.032**	-0.025*	-0.029*	-0.034**	-0.034*
	(0.029)	(0.023)	(0.019)	(0.017)	(0.015)	(0.014)	(0.015)	(0.015)	(0.018)
Married	0.074	0.110	0.114	0.109	0.057	-0.037	-0.043	-0.024	0.010
	(0.128)	(0.114)	(0.109)	(0.089)	(0.079)	(0.069)	(0.072)	(0.068)	(0.085)
Divorced/Separated	0.024	0.016	-0.008	-0.016	-0.015	0.010	-0.005	0.018	0.013
	(0.035)	(0.027)	(0.022)	(0.021)	(0.019)	(0.018)	(0.019)	(0.017)	(0.020)
Widowed	0.054	-0.002	-0.021	0.010	0.020	0.055	0.038	0.050	0.041
	(0.152)	(0.138)	(0.110)	(0.103)	(0.091)	(0.083)	(0.082)	(0.078)	(0.092)
Household head has Primary education	0.002	-0.004	-0.013	-0.007	0.004	0.002	-0.001	-0.011	-0.020
	(0.017)	(0.013)	(0.013)	(0.011)	(0.010)	(0.009)	(0.010)	(0.010)	(0.012)
Household head has Secondary education	-0.003	-0.000	0.001	0.010	0.004	0.007	0.011	0.011	0.004
	(0.016)	(0.012)	(0.010)	(0.010)	(0.008)	(0.008)	(0.008)	(0.009)	(0.011)
Household head has Tertiary education	0.001	-0.001	0.001	0.003	0.004*	0.004*	0.006**	0.006**	0.005
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.005)
Household head disability	-0.002	-0.003	-0.004	-0.002	-0.004	-0.001	0.000	-0.000	0.004
	(0.004)	(0.004)	(0.005)	(0.003)	(0.005)	(0.002)	(0.002)	(0.002)	(0.005)
Dependency ratio	-0.010	-0.006	-0.014	0.003	0.006	0.005	0.005	0.013	0.015

	Log [Self-reported Productivity (XOF/ha)]-Export crops								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
	(0.013)	(0.010)	(0.010)	(0.007)	(0.007)	(0.007)	(0.007)	(0.009)	(0.010)
Household Male Labor Use (Number)	0.063	0.091*	0.067	0.046	0.044	0.018	-0.004	-0.019	0.088**
	(0.069)	(0.052)	(0.044)	(0.042)	(0.035)	(0.030)	(0.027)	(0.028)	(0.044)
Household Female Labor Use (Number)	0.021	0.038	-0.017	-0.017	-0.014	-0.033**	-0.026*	-0.009	-0.013
	(0.043)	(0.030)	(0.023)	(0.020)	(0.016)	(0.016)	(0.013)	(0.015)	(0.022)
Household Child Labor Use (Number)	0.001	0.002	-0.001	0.000	0.001	-0.001	-0.002	-0.001	-0.001
	(0.002)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)	(0.003)
Hired Labor Use (Number)	0.008	0.008	0.007	0.007	0.005	0.005	0.004	0.004	0.002
	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)
Number of Fields Managed by the household	-0.071	-0.036	-0.018	-0.009	0.005	-0.005	-0.004	0.000	-0.003
	(0.054)	(0.032)	(0.022)	(0.017)	(0.011)	(0.010)	(0.010)	(0.010)	(0.013)
Total number of crops produced	-0.008	-0.047	-0.051	-0.047	-0.051*	-0.039*	-0.039*	-0.046*	-0.039
	(0.031)	(0.035)	(0.034)	(0.030)	(0.029)	(0.024)	(0.023)	(0.026)	(0.026)
Household used any purchased seed	-0.012	-0.013	-0.009	-0.001	-0.004	-0.001	0.002	0.006	0.000
	(0.010)	(0.008)	(0.006)	(0.005)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)
Plots that Use Chemical Fertilizer (% of total)	0.019	0.018*	0.028**	0.031***	0.031***	0.025***	0.026***	0.021**	0.020
	(0.013)	(0.011)	(0.011)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.013)
Plots that Use Pesticide (% of total)	0.090***	0.112***	0.087***	0.063***	0.063***	0.067***	0.070***	0.077***	0.064***
	(0.024)	(0.024)	(0.022)	(0.019)	(0.017)	(0.016)	(0.016)	(0.017)	(0.020)
unexplained									
Log [Total land area cultivated in ha]	-0.383**	-0.079	-0.287**	-0.160	-0.190	-0.056	0.026	0.022	-0.092
	(0.193)	(0.163)	(0.124)	(0.104)	(0.127)	(0.107)	(0.112)	(0.124)	(0.168)
Household head age (years)	-0.383	-0.127	-0.176	-0.837**	-0.696	-1.507***	-1.112***	-1.038**	-0.836
	(0.613)	(0.547)	(0.452)	(0.389)	(0.480)	(0.468)	(0.420)	(0.428)	(0.533)
Married	0.060	-0.044	-0.057	0.138	0.155	0.044	0.216	0.136	0.134
	(0.144)	(0.158)	(0.142)	(0.146)	(0.146)	(0.157)	(0.158)	(0.144)	(0.197)
Divorced/Separated	0.093	0.015	0.038	0.072	0.060	0.028	0.097	0.043	0.022
	(0.073)	(0.068)	(0.062)	(0.062)	(0.056)	(0.065)	(0.068)	(0.060)	(0.080)
Widowed	0.133	-0.089	-0.055	0.092	0.027	0.006	0.193	0.085	0.053
	(0.236)	(0.235)	(0.217)	(0.213)	(0.203)	(0.213)	(0.219)	(0.203)	(0.286)
Household head has Primary education	-0.003	-0.022	-0.039	-0.061	-0.085**	-0.099**	-0.123***	-0.159***	-0.071*
	(0.051)	(0.040)	(0.042)	(0.039)	(0.042)	(0.039)	(0.044)	(0.045)	(0.042)
	-0.030	-0.010	-0.022	-0.045**	-0.039*	-0.023	-0.018	-0.030	-0.069**

Log [Self-reported Productivity (XOF/ha)]-Export crops									
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
Household head has Secondary education									
	(0.020)	(0.015)	(0.015)	(0.018)	(0.021)	(0.020)	(0.022)	(0.025)	(0.034)
Household head has Tertiary education	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household head disability	0.032	0.013	-0.006	-0.040**	-0.040*	-0.001	0.026	0.025	-0.007
	(0.026)	(0.021)	(0.016)	(0.019)	(0.022)	(0.021)	(0.022)	(0.022)	(0.027)
Dependency ratio	0.103	-0.053	-0.104	-0.066	0.055	-0.009	-0.018	-0.003	0.025
	(0.145)	(0.095)	(0.086)	(0.080)	(0.084)	(0.082)	(0.088)	(0.079)	(0.082)
Household Male Labor Use (Number)	-0.038	-0.041	-0.131**	-0.057	-0.044	-0.015	-0.046	-0.005	-0.045
	(0.075)	(0.055)	(0.052)	(0.054)	(0.054)	(0.053)	(0.048)	(0.049)	(0.077)
Household Female Labor Use (Number)	0.608*	0.297	0.519**	0.577***	0.511***	0.273	0.401***	0.245*	0.302
	(0.360)	(0.237)	(0.229)	(0.214)	(0.195)	(0.178)	(0.140)	(0.140)	(0.186)
Household Child Labor Use (Number)	0.002	-0.005	-0.017	0.001	0.015	0.003	0.014	0.001	0.046
	(0.026)	(0.020)	(0.023)	(0.019)	(0.020)	(0.016)	(0.019)	(0.016)	(0.032)
Hired Labor Use (Number)	-0.084*	-0.071**	-0.031	0.013	-0.015	-0.047	-0.042	-0.009	-0.019
	(0.049)	(0.035)	(0.031)	(0.040)	(0.035)	(0.032)	(0.036)	(0.030)	(0.033)
Number of Fields Managed by the household	-0.885	-0.462	-0.799	-1.378***	-0.777**	-0.336	-0.696**	-0.539*	-1.078**
	(0.744)	(0.515)	(0.508)	(0.414)	(0.374)	(0.335)	(0.329)	(0.300)	(0.447)
Total number of crops produced	1.077*	0.337	0.914	1.128**	0.416	0.040	0.231	0.277	0.663
	(0.633)	(0.568)	(0.561)	(0.449)	(0.380)	(0.343)	(0.324)	(0.341)	(0.458)
Household used any purchased seed	0.055	-0.011	0.040	0.008	0.044*	0.028	0.021	0.001	0.001
	(0.067)	(0.038)	(0.030)	(0.023)	(0.026)	(0.023)	(0.021)	(0.022)	(0.024)
Plots that Use Chemical Fertilizer (% of total)	-0.016	-0.003	0.014	0.014	0.027	0.018	0.001	0.016	0.049
	(0.022)	(0.020)	(0.022)	(0.022)	(0.024)	(0.023)	(0.024)	(0.031)	(0.036)
Plots that Use Pesticide (% of total)	0.046	0.027	0.004	-0.003	-0.005	0.012	0.007	-0.039	-0.033
	(0.040)	(0.032)	(0.028)	(0.032)	(0.047)	(0.042)	(0.043)	(0.045)	(0.048)
Constant	-0.277	0.411	0.381	0.505	0.093	1.093	0.828	1.579*	1.318
	(1.008)	(1.007)	(0.778)	(0.737)	(0.763)	(0.858)	(0.981)	(0.820)	(1.027)
Observations	3588	3588	3588	3588	3588	3588	3588	3588	3588

Table A.4: RIF decomposition of the Gender Differential in Agricultural Productivity with region fixed effects - Food crops only (2008)

	Log [Self-reported Productivity (XOF/ha)]-Food crops								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
overall									
Male headed households	9.766***	10.493***	10.886***	11.180***	11.478***	11.726***	11.993***	12.288***	12.770***
	(0.082)	(0.059)	(0.048)	(0.044)	(0.042)	(0.039)	(0.038)	(0.038)	(0.048)
Female Headed households	9.626***	10.161***	10.579***	10.872***	11.157***	11.414***	11.739***	12.030***	12.459***
	(0.097)	(0.084)	(0.080)	(0.079)	(0.077)	(0.071)	(0.072)	(0.070)	(0.073)
difference	0.140	0.331***	0.308***	0.308***	0.321***	0.311***	0.254***	0.257***	0.311***
	(0.112)	(0.088)	(0.079)	(0.076)	(0.074)	(0.070)	(0.071)	(0.073)	(0.081)
% gap	**13%**	**28%**	**27%**	**27%**	**27%**	**27%**	**22%**	**23%**	**27%**
explained	-0.502***	-0.271***	-0.155**	-0.074	-0.074	-0.067	-0.045	-0.028	-0.188**
	(0.134)	(0.099)	(0.078)	(0.076)	(0.074)	(0.070)	(0.072)	(0.070)	(0.095)
unexplained	0.643***	0.602***	0.463***	0.382***	0.395***	0.378***	0.299***	0.285***	0.499***
	(0.143)	(0.109)	(0.090)	(0.090)	(0.085)	(0.081)	(0.080)	(0.089)	(0.115)
explained									
Log [Total land area cultivated in ha]	-0.584***	-0.410***	-0.318***	-0.282***	-0.257***	-0.251***	-0.253***	-0.281***	-0.451***
	(0.086)	(0.054)	(0.040)	(0.034)	(0.030)	(0.029)	(0.031)	(0.036)	(0.062)
Household head age (years)	-0.007	-0.009	-0.011	-0.019**	-0.018**	-0.006	-0.013	-0.012	-0.035***
	(0.014)	(0.011)	(0.010)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.012)
Married	-0.031	0.006	-0.019	0.021	0.010	0.015	-0.019	-0.068	-0.141
	(0.090)	(0.068)	(0.058)	(0.055)	(0.050)	(0.053)	(0.053)	(0.063)	(0.101)
Divorced/Separated	-0.011	-0.015	0.002	0.002	-0.003	-0.009	0.005	0.034*	0.044
	(0.032)	(0.024)	(0.019)	(0.017)	(0.017)	(0.017)	(0.017)	(0.020)	(0.031)
Widowed	-0.007	0.007	0.032	0.042	0.018	-0.006	0.048	0.082	0.121
	(0.088)	(0.068)	(0.059)	(0.058)	(0.056)	(0.055)	(0.055)	(0.057)	(0.085)
Household head has Primary education	-0.008	-0.005	0.002	-0.001	-0.004	0.004	0.013*	0.012	-0.003
	(0.013)	(0.010)	(0.008)	(0.007)	(0.006)	(0.006)	(0.007)	(0.008)	(0.010)
Household head has Secondary education	-0.011	-0.015	-0.006	-0.011	-0.008	-0.001	0.001	-0.000	-0.009
	(0.014)	(0.010)	(0.008)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)
Household head has Tertiary education	0.002	0.002	-0.001	-0.000	-0.001	-0.000	-0.002	-0.001	-0.001
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Household head disability	-0.001	-0.000	-0.000	0.000	0.001	0.001	0.005	0.006*	0.011*
	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.006)
Dependency ratio	0.001	-0.001	0.004	0.001	-0.006	-0.008	-0.008	-0.007	-0.019

	Log [Self-reported Productivity (XOF/ha)]-Food crops								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
	(0.013)	(0.010)	(0.009)	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.013)
Household Male Labor Use (Number)	0.112**	0.102**	0.095***	0.101***	0.120***	0.123***	0.105***	0.107***	0.115**
	(0.054)	(0.041)	(0.033)	(0.030)	(0.028)	(0.029)	(0.028)	(0.033)	(0.050)
Household Female Labor Use	-0.067**	-0.041**	-0.033**	-0.022**	-0.018*	-0.016	-0.010	-0.000	0.002
(Number)	(0.029)	(0.020)	(0.013)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.015)
Household Child Labor Use (Number)	-0.002	0.000	0.001	0.001	-0.000	0.000	0.000	0.001	0.001
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Hired Labor Use (Number)	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.002
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Number of Fields Managed by the	0.078*	0.053*	0.036*	0.026*	0.025*	0.030*	0.010	0.012	0.009
household	(0.043)	(0.030)	(0.021)	(0.016)	(0.015)	(0.018)	(0.010)	(0.013)	(0.010)
Total number of crops produced	-0.034	-0.023	-0.015	-0.010	-0.015	-0.023*	-0.003	-0.003	0.014
	(0.023)	(0.016)	(0.013)	(0.010)	(0.011)	(0.013)	(0.010)	(0.012)	(0.012)
Household used any purchased seed	-0.003	-0.006	-0.005	-0.005	-0.005	-0.003	-0.004	-0.004	-0.005
	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
Plots that Use Chemical Fertilizer (%	-0.009	-0.001	0.009	0.011*	0.014**	0.014**	0.010*	0.002	0.011
of total)	(0.010)	(0.008)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)
Plots that Use Pesticide (% of total)	0.067**	0.056***	0.055***	0.045***	0.041***	0.038***	0.048***	0.056***	0.073***
	(0.027)	(0.019)	(0.014)	(0.012)	(0.011)	(0.011)	(0.012)	(0.014)	(0.020)
unexplained									
Log [Total land area cultivated in ha]	-0.201*	-0.134*	0.025	0.070	0.100**	0.071	0.062	0.054	-0.149
	(0.113)	(0.080)	(0.063)	(0.051)	(0.042)	(0.046)	(0.046)	(0.054)	(0.091)
Household head age (years)	-0.710**	-0.256	-0.338	-0.167	0.050	-0.048	-0.398	-0.206	-0.134
	(0.328)	(0.306)	(0.291)	(0.258)	(0.277)	(0.264)	(0.261)	(0.260)	(0.265)
Married	0.189	0.116	-0.010	-0.069	0.084	0.026	0.106	0.012	-0.102
	(0.164)	(0.125)	(0.116)	(0.109)	(0.111)	(0.111)	(0.116)	(0.112)	(0.152)
Divorced/Separated	0.026	0.012	-0.026	-0.011	0.054	0.023	0.025	0.021	-0.038
	(0.062)	(0.050)	(0.047)	(0.046)	(0.043)	(0.043)	(0.046)	(0.046)	(0.063)
Widowed	0.231	0.124	0.017	-0.072	0.068	0.046	0.090	0.048	-0.077
	(0.148)	(0.109)	(0.106)	(0.106)	(0.104)	(0.106)	(0.109)	(0.109)	(0.151)
Household head has Primary education	0.006	0.011	-0.011	-0.037	0.002	-0.004	-0.027	-0.018	-0.040
	(0.043)	(0.034)	(0.029)	(0.029)	(0.025)	(0.023)	(0.023)	(0.027)	(0.031)

	Log [Self-reported Productivity (XOF/ha)]-Food crops								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
Household head has Secondary education	0.046	0.018	0.003	-0.005	-0.000	-0.007	-0.013	-0.013	-0.020
	(0.030)	(0.019)	(0.015)	(0.013)	(0.012)	(0.012)	(0.011)	(0.011)	(0.016)
Household head has Tertiary education	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household head disability	-0.002	0.001	-0.005	0.004	-0.007	-0.012	-0.022	-0.025*	0.013
	(0.020)	(0.016)	(0.015)	(0.014)	(0.014)	(0.013)	(0.013)	(0.015)	(0.011)
Dependency ratio	0.016	0.050	0.042	-0.019	-0.056	-0.053	-0.063	0.019	0.042
	(0.104)	(0.080)	(0.067)	(0.069)	(0.066)	(0.069)	(0.066)	(0.070)	(0.096)
Household Male Labor Use (Number)	0.068	0.024	0.063	0.006	-0.034	0.008	-0.001	-0.034	-0.050
	(0.058)	(0.042)	(0.041)	(0.036)	(0.033)	(0.035)	(0.037)	(0.041)	(0.052)
Household Female Labor Use (Number)	0.023	-0.092	-0.183*	-0.002	-0.023	-0.007	-0.048	-0.116	-0.240*
	(0.148)	(0.130)	(0.110)	(0.107)	(0.095)	(0.102)	(0.101)	(0.121)	(0.144)
Household Child Labor Use (Number)	0.001	0.015	0.003	0.012	0.006	0.019	-0.011	-0.008	0.019
	(0.021)	(0.018)	(0.016)	(0.013)	(0.016)	(0.018)	(0.017)	(0.022)	(0.016)
Hired Labor Use (Number)	0.001	-0.010	-0.004	-0.013	-0.002	-0.012	0.003	0.025	0.015
	(0.024)	(0.023)	(0.024)	(0.027)	(0.024)	(0.024)	(0.023)	(0.021)	(0.026)
Number of Fields Managed by the household	0.395	0.119	0.130	0.079	-0.122	-0.349	-0.296	-0.186	0.426
	(0.322)	(0.247)	(0.233)	(0.220)	(0.236)	(0.277)	(0.271)	(0.340)	(0.262)
Total number of crops produced	-0.280	-0.071	-0.147	-0.388*	-0.029	0.351	0.270	0.127	-0.333
	(0.378)	(0.322)	(0.269)	(0.225)	(0.230)	(0.265)	(0.264)	(0.326)	(0.263)
Household used any purchased seed	-0.007	-0.014	0.033	0.031	0.029	0.005	-0.013	-0.014	-0.041
	(0.033)	(0.034)	(0.028)	(0.023)	(0.018)	(0.019)	(0.018)	(0.022)	(0.029)
Plots that Use Chemical Fertilizer (% of total)	-0.027	-0.016	-0.021	-0.008	-0.008	0.006	0.024*	0.009	0.018
	(0.018)	(0.015)	(0.013)	(0.013)	(0.012)	(0.016)	(0.014)	(0.016)	(0.022)
Plots that Use Pesticide (% of total)	0.007	0.038	0.008	0.016	0.007	0.012	-0.016	0.003	-0.044
	(0.025)	(0.026)	(0.021)	(0.021)	(0.018)	(0.018)	(0.018)	(0.023)	(0.031)
Constant	1.171*	0.896	1.671***	1.467***	0.427	0.591	0.672	0.725	1.146*
	(0.684)	(0.614)	(0.488)	(0.453)	(0.428)	(0.452)	(0.442)	(0.463)	(0.687)
Observations	4601	4601	4601	4601	4601	4601	4601	4601	4601

Table A.5: RIF decomposition of the Gender Differential in Agricultural Productivity- Export crops only (2016)

	Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]-Export crops								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
overall									
Male headed households	10.447***	11.015***	11.398***	11.620***	11.874***	12.089***	12.347***	12.635***	12.983***
	(0.069)	(0.052)	(0.039)	(0.037)	(0.037)	(0.034)	(0.035)	(0.038)	(0.036)
Female Headed households	10.246***	10.611***	11.113***	11.577***	11.884***	12.182***	12.448***	12.659***	12.878***
	(0.116)	(0.137)	(0.151)	(0.135)	(0.112)	(0.096)	(0.102)	(0.094)	(0.084)
difference	0.200	0.405***	0.286*	0.043	-0.010	-0.094	-0.101	-0.024	0.104
	(0.133)	(0.142)	(0.153)	(0.137)	(0.115)	(0.098)	(0.106)	(0.099)	(0.092)
% gap	**18%**	**33%**	**25%**	**4%**	**-1%**	**-10%**	**-11%**	**-2%**	**10%**
explained	0.323	0.069	0.078	-0.001	-0.045	-0.019	-0.006	0.032	-0.061
	(0.240)	(0.172)	(0.162)	(0.145)	(0.128)	(0.114)	(0.107)	(0.107)	(0.104)
unexplained	-0.123	0.336	0.208	0.044	0.035	-0.075	-0.096	-0.056	0.165
	(0.263)	(0.221)	(0.210)	(0.186)	(0.152)	(0.136)	(0.130)	(0.134)	(0.125)
explained									
Log [Total land area cultivated in ha]	-0.274***	-0.211***	-0.198***	-0.155***	-0.164***	-0.167***	-0.169***	-0.182***	-0.209***
	(0.071)	(0.054)	(0.041)	(0.035)	(0.036)	(0.036)	(0.036)	(0.040)	(0.043)
Household head age (years)	-0.033	-0.021	-0.017	-0.012	-0.008	-0.007	-0.020	-0.033	-0.026
	(0.054)	(0.036)	(0.025)	(0.023)	(0.023)	(0.023)	(0.023)	(0.026)	(0.030)
Married	0.169	0.091	-0.014	0.070	0.012	0.031	0.055	0.055	0.147**
	(0.161)	(0.118)	(0.080)	(0.076)	(0.076)	(0.078)	(0.078)	(0.079)	(0.066)
Divorced/Separated	-0.010	-0.013	-0.001	-0.011	-0.003	-0.004	0.002	-0.000	-0.002
	(0.016)	(0.012)	(0.009)	(0.010)	(0.009)	(0.009)	(0.008)	(0.009)	(0.007)
Widowed	0.236	0.001	0.079	-0.094	-0.063	-0.081	-0.067	0.012	-0.082
	(0.263)	(0.179)	(0.151)	(0.132)	(0.113)	(0.107)	(0.107)	(0.104)	(0.095)
Household head has Primary education	-0.019	-0.011	-0.007	-0.002	0.001	0.000	-0.002	0.001	0.002
	(0.015)	(0.010)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)
Household head has Secondary education	-0.038*	-0.017	-0.011	-0.013	-0.017	-0.005	-0.004	-0.000	-0.009
	(0.021)	(0.015)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)
Household head has Tertiary education	-0.014*	-0.007*	-0.005*	-0.006**	-0.005**	-0.003*	-0.004**	-0.004***	-0.003***
	(0.008)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Household head disability	-0.020	-0.032*	-0.003	-0.002	-0.004	-0.007	0.012	0.011	0.002
	(0.022)	(0.018)	(0.013)	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)	(0.016)
Dependency ratio	-0.001	-0.007	-0.005	-0.004	-0.003	0.006	0.004	0.009	0.006

Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]-Export crops									
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
	(0.009)	(0.009)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)	(0.009)	(0.007)
Household Male Labor Use (Number)	0.058	0.146**	0.091**	0.042	0.035	0.028	-0.015	-0.065	-0.050
	(0.066)	(0.060)	(0.045)	(0.039)	(0.042)	(0.041)	(0.042)	(0.048)	(0.054)
Household Female Labor Use (Number)	0.010	-0.014	-0.009	-0.010	-0.014	0.004	0.009	0.013	0.009
	(0.027)	(0.018)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)
Household Child Labor Use (Number)	0.001	0.001	0.000	0.001	0.002	0.002	0.001	0.001	0.001
	(0.002)	(0.003)	(0.001)	(0.003)	(0.005)	(0.004)	(0.003)	(0.002)	(0.003)
Hired Labor Use (Number)	0.012	0.008	0.010	0.009	0.006	0.007	0.003	0.001	0.003
	(0.011)	(0.008)	(0.009)	(0.008)	(0.006)	(0.006)	(0.004)	(0.004)	(0.004)
Number of Fields Managed by the household	0.036*	0.019	0.010	0.014	0.003	-0.005	-0.008	-0.008	-0.001
	(0.020)	(0.013)	(0.009)	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)	(0.009)
Total number of crops produced	0.009	0.009	0.009	0.005	0.009	0.013	0.012	0.013	0.009
	(0.011)	(0.010)	(0.011)	(0.006)	(0.010)	(0.015)	(0.014)	(0.014)	(0.010)
Household used any purchased seed	-0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)
Plots that Use Chemical Fertilizer (% of total)	0.029	0.038**	0.023**	0.031***	0.034***	0.034***	0.025**	0.031**	0.037**
	(0.020)	(0.015)	(0.011)	(0.011)	(0.012)	(0.013)	(0.012)	(0.013)	(0.015)
Plots that Use Pesticide (% of total)	0.107***	0.076***	0.081***	0.060***	0.052**	0.041*	0.036*	0.029	0.028
	(0.039)	(0.029)	(0.024)	(0.022)	(0.022)	(0.021)	(0.021)	(0.022)	(0.022)
unexplained									
Log [Total land area cultivated in ha]	-0.086	0.108	0.133	0.211	0.076	0.098	0.020	0.201	0.061
	(0.213)	(0.222)	(0.204)	(0.184)	(0.151)	(0.134)	(0.134)	(0.137)	(0.155)
Household head age (years)	-0.473	0.036	0.085	0.185	-0.164	0.028	-0.195	-0.045	-0.387
	(0.534)	(0.651)	(0.612)	(0.528)	(0.394)	(0.393)	(0.329)	(0.277)	(0.319)
Married	0.286**	0.328**	0.309**	0.320**	0.295**	0.296***	0.173	0.119	0.215
	(0.146)	(0.139)	(0.130)	(0.147)	(0.117)	(0.105)	(0.114)	(0.119)	(0.135)
Divorced/Separated	0.039	0.022	0.030	0.026	0.021	0.043	-0.002	0.001	0.013
	(0.035)	(0.038)	(0.034)	(0.035)	(0.028)	(0.026)	(0.025)	(0.026)	(0.026)
Widowed	0.408	0.279	0.260	0.238	0.233	0.292*	0.030	-0.081	0.169
	(0.328)	(0.289)	(0.247)	(0.255)	(0.193)	(0.174)	(0.177)	(0.177)	(0.197)
Household head has Primary education	0.026	0.111	0.144**	0.232***	0.192***	0.120**	0.036	0.005	0.074
	(0.077)	(0.080)	(0.068)	(0.067)	(0.053)	(0.048)	(0.044)	(0.042)	(0.049)
	-0.005	0.066	0.067	0.053	0.033	0.029	0.029	0.022	0.013

Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]-Export crops									
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
Household head has Secondary education	(0.008)	(0.059)	(0.061)	(0.049)	(0.030)	(0.027)	(0.028)	(0.022)	(0.013)
Household head has Tertiary education	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household head disability	0.291***	0.112	0.043	0.066	-0.004	-0.062	-0.009	-0.084*	-0.078
	(0.104)	(0.087)	(0.087)	(0.075)	(0.063)	(0.063)	(0.058)	(0.050)	(0.051)
Dependency ratio	0.021	0.124	-0.034	-0.089	-0.228**	-0.149*	-0.132*	-0.217***	-0.358***
	(0.121)	(0.117)	(0.120)	(0.113)	(0.096)	(0.078)	(0.072)	(0.080)	(0.093)
Household Male Labor Use (Number)	-0.005	-0.009	-0.042	-0.092	-0.098	-0.111*	0.056	0.049	-0.016
	(0.068)	(0.067)	(0.069)	(0.069)	(0.060)	(0.060)	(0.054)	(0.053)	(0.050)
Household Female Labor Use (Number)	-0.023	-0.037	-0.036	-0.067	-0.030	0.029	-0.032	0.005	0.002
	(0.210)	(0.174)	(0.180)	(0.172)	(0.133)	(0.117)	(0.101)	(0.095)	(0.099)
Household Child Labor Use (Number)	-0.048*	-0.050*	-0.072**	-0.017	0.006	-0.020	-0.003	-0.028	-0.074**
	(0.027)	(0.028)	(0.032)	(0.038)	(0.028)	(0.024)	(0.023)	(0.021)	(0.032)
Hired Labor Use (Number)	0.110	0.040	-0.007	-0.030	-0.101	-0.015	0.046	-0.046	0.035
	(0.068)	(0.098)	(0.099)	(0.093)	(0.081)	(0.080)	(0.061)	(0.046)	(0.042)
Number of Fields Managed by the household	0.174	-0.016	-0.404	-0.093	-0.230	-0.082	0.107	-0.714***	-0.465**
	(0.241)	(0.258)	(0.275)	(0.308)	(0.233)	(0.215)	(0.152)	(0.162)	(0.189)
Total number of crops produced	0.020	0.047	0.486*	0.424	0.258	0.196	0.112	0.664***	0.480**
	(0.301)	(0.306)	(0.294)	(0.322)	(0.257)	(0.239)	(0.220)	(0.200)	(0.212)
Household used any purchased seed	-0.021	-0.133	-0.047	0.014	0.002	0.030	-0.044	-0.057	-0.002
	(0.078)	(0.082)	(0.083)	(0.084)	(0.073)	(0.064)	(0.058)	(0.051)	(0.048)
Plots that Use Chemical Fertilizer (% of total)	0.031	0.060	0.101**	0.056	0.036	0.021	0.026	0.035	0.021
	(0.036)	(0.047)	(0.044)	(0.045)	(0.034)	(0.033)	(0.033)	(0.029)	(0.029)
Plots that Use Pesticide (% of total)	-0.234**	-0.353***	-0.585***	-0.368***	-0.307***	-0.110	-0.163**	-0.137*	0.000
	(0.111)	(0.119)	(0.127)	(0.116)	(0.091)	(0.084)	(0.080)	(0.080)	(0.100)
Constant	-0.224	-1.319	-0.807	-1.273	-0.342	-0.875	-1.077	0.773	-0.060
	(0.661)	(1.005)	(1.475)	(1.237)	(1.066)	(0.993)	(1.039)	(0.925)	(0.465)
Observations	2823	2823	2823	2823	2823	2823	2823	2823	2823

Table A.6: RIF decomposition of the Gender Differential in Agricultural Productivity with region fixed effects - Food crops only (2016)

	Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]-Food crops								
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
overall									
Male headed households	10.048***	10.747***	11.153***	11.400***	11.671***	11.934***	12.236***	12.563***	13.101***
	(0.091)	(0.064)	(0.046)	(0.046)	(0.045)	(0.046)	(0.043)	(0.047)	(0.071)
Female Headed households	9.924***	10.606***	10.959***	11.196***	11.518***	11.775***	12.123***	12.428***	13.192***
	(0.249)	(0.098)	(0.094)	(0.091)	(0.094)	(0.090)	(0.090)	(0.104)	(0.195)
difference	0.124	0.141	0.194*	0.204**	0.154	0.159*	0.114	0.135	-0.092
	(0.261)	(0.116)	(0.102)	(0.097)	(0.097)	(0.095)	(0.094)	(0.109)	(0.200)
% gap	**12%**	**13%**	**18%**	**18%**	**14%**	**15%**	**11%**	**13%**	**-10%**
explained	-0.018	0.235*	0.091	0.159	0.022	-0.078	-0.129	-0.228	-0.528**
	(0.224)	(0.127)	(0.100)	(0.103)	(0.107)	(0.116)	(0.115)	(0.139)	(0.217)
unexplained	0.142	-0.094	0.103	0.045	0.132	0.237*	0.243*	0.363**	0.436*
	(0.310)	(0.162)	(0.129)	(0.127)	(0.130)	(0.141)	(0.135)	(0.159)	(0.265)
explained									
Log [Total land area cultivated in ha]	-0.426***	-0.255***	-0.282***	-0.224***	-0.276***	-0.283***	-0.280***	-0.278***	-0.509***
	(0.096)	(0.064)	(0.048)	(0.047)	(0.049)	(0.051)	(0.055)	(0.069)	(0.110)
Household head age (years)	0.025	0.019	0.009	0.008	-0.013	0.008	0.007	-0.015	0.019
	(0.044)	(0.026)	(0.020)	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)	(0.031)
Married	0.383*	0.107	0.041	0.026	0.038	0.034	-0.029	-0.026	0.170*
	(0.208)	(0.104)	(0.080)	(0.074)	(0.072)	(0.073)	(0.078)	(0.076)	(0.099)
Divorced/Separated	-0.086*	0.005	0.015	0.000	-0.021	-0.015	0.002	-0.015	-0.083*
	(0.044)	(0.029)	(0.022)	(0.020)	(0.021)	(0.021)	(0.019)	(0.022)	(0.045)
Widowed	-0.292	-0.072	-0.063	0.061	0.013	-0.035	-0.010	-0.029	-0.210
	(0.244)	(0.111)	(0.089)	(0.083)	(0.080)	(0.079)	(0.082)	(0.088)	(0.132)
Household head has Primary education	-0.017	-0.008	-0.014*	-0.012*	-0.007	-0.004	0.002	0.002	0.007
	(0.014)	(0.009)	(0.008)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.011)
Household head has Secondary education	-0.026	-0.025	-0.016	-0.011	-0.004	-0.003	-0.008	-0.015*	-0.003
	(0.026)	(0.016)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.015)
Household head has Tertiary education	-0.003	-0.005	-0.006	-0.003	-0.004	-0.003	-0.003	-0.003	0.000
	(0.007)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)
Household head disability	-0.013	0.001	-0.005	-0.007	0.002	0.001	-0.002	-0.001	-0.020
	(0.013)	(0.010)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.015)
Dependency ratio	-0.007	-0.016	0.001	-0.017	-0.010	-0.021	-0.028*	-0.023	-0.009

Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]-Food crops									
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
	(0.028)	(0.019)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.017)	(0.029)
Household Male Labor Use (Number)	0.231**	0.234***	0.146***	0.148***	0.117**	0.059	0.078	0.105*	0.013
	(0.111)	(0.069)	(0.052)	(0.053)	(0.055)	(0.053)	(0.055)	(0.061)	(0.089)
Household Female Labor Use (Number)	-0.005	0.051	0.033	-0.001	0.000	-0.008	-0.001	0.003	0.052
	(0.054)	(0.038)	(0.029)	(0.030)	(0.029)	(0.030)	(0.031)	(0.033)	(0.048)
Household Child Labor Use (Number)	0.005	0.006	0.005	0.006	0.001	0.004	-0.000	0.001	-0.016
	(0.015)	(0.009)	(0.008)	(0.009)	(0.008)	(0.008)	(0.009)	(0.010)	(0.016)
Hired Labor Use (Number)	0.008	0.008	0.006	0.005	0.006	0.005	0.004	0.003	0.003
	(0.012)	(0.011)	(0.009)	(0.007)	(0.009)	(0.008)	(0.006)	(0.005)	(0.005)
Number of Fields Managed by the household	0.293***	0.196***	0.128***	0.151***	0.139***	0.120***	0.125***	0.133***	0.193***
	(0.090)	(0.054)	(0.041)	(0.034)	(0.033)	(0.033)	(0.032)	(0.035)	(0.057)
Total number of crops produced	-0.106	-0.060	-0.001	-0.048	-0.031	-0.016	-0.020	-0.049**	-0.048
	(0.088)	(0.054)	(0.037)	(0.029)	(0.026)	(0.024)	(0.023)	(0.024)	(0.044)
Household used any purchased seed	0.000	-0.000	-0.000	-0.000	0.000	-0.000	0.000	0.000	0.001
	(0.002)	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.005)
Plots that Use Chemical Fertilizer (% of total)	-0.009	0.029*	0.018	0.018	0.022*	0.038***	0.034**	0.040**	0.039
	(0.025)	(0.017)	(0.012)	(0.012)	(0.013)	(0.014)	(0.014)	(0.016)	(0.025)
Plots that Use Pesticide (% of total)	0.030	0.031	0.039**	0.026	0.039**	0.034*	0.032*	0.008	0.053*
	(0.034)	(0.023)	(0.018)	(0.017)	(0.018)	(0.018)	(0.017)	(0.018)	(0.031)
unexplained									
Log [Total land area cultivated in ha]	0.129	0.073	0.076*	0.174***	0.164***	0.178***	0.193***	0.203***	0.388***
	(0.114)	(0.056)	(0.046)	(0.051)	(0.050)	(0.058)	(0.064)	(0.074)	(0.141)
Household head age (years)	0.961	0.275	0.183	-0.200	-0.153	-0.258	-0.698**	-0.739**	-0.807*
	(0.975)	(0.392)	(0.335)	(0.348)	(0.327)	(0.320)	(0.325)	(0.329)	(0.454)
Married	-0.038	0.121	0.235	0.331**	0.363**	0.298*	0.371*	0.350*	-0.002
	(0.550)	(0.217)	(0.181)	(0.167)	(0.162)	(0.170)	(0.192)	(0.208)	(0.329)
Divorced/Separated	0.052	-0.025	0.033	0.083**	0.073**	0.074*	0.060	0.071	0.046
	(0.080)	(0.049)	(0.040)	(0.039)	(0.037)	(0.041)	(0.040)	(0.045)	(0.084)
Widowed	0.125	0.157	0.215*	0.317***	0.364***	0.349***	0.364***	0.401***	0.236
	(0.340)	(0.144)	(0.124)	(0.115)	(0.109)	(0.117)	(0.131)	(0.149)	(0.263)
Household head has Primary education	0.274**	0.131**	0.062	0.086*	0.119***	0.137***	0.075	0.059	0.015
	(0.134)	(0.060)	(0.048)	(0.049)	(0.045)	(0.051)	(0.048)	(0.043)	(0.086)
	-0.017	0.002	-0.013	0.013	0.041**	0.029*	0.013	-0.002	-0.021

Y= RIF estimate of Log [Self-reported Productivity (XOF/ha)]-Food crops									
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
Household head has Secondary education	(0.030)	(0.020)	(0.016)	(0.024)	(0.019)	(0.017)	(0.013)	(0.017)	(0.033)
Household head has Tertiary education	-0.002	-0.003	-0.003	-0.000	0.001	0.002	-0.001	0.009	0.017
	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.009)	(0.017)
Household head disability	0.138*	0.035	0.020	-0.015	0.059	0.046	0.077*	0.075*	0.074
	(0.079)	(0.046)	(0.040)	(0.039)	(0.042)	(0.044)	(0.044)	(0.041)	(0.069)
Dependency ratio	-0.263	-0.131	0.054	-0.013	0.105	0.130	0.031	-0.063	-0.157
	(0.178)	(0.108)	(0.097)	(0.104)	(0.105)	(0.100)	(0.103)	(0.104)	(0.170)
Household Male Labor Use (Number)	0.051	0.124*	0.073	0.119*	0.067	0.025	0.020	0.034	-0.066
	(0.137)	(0.066)	(0.066)	(0.066)	(0.067)	(0.062)	(0.061)	(0.056)	(0.098)
Household Female Labor Use (Number)	-0.520*	-0.140	-0.082	-0.024	0.241*	0.146	0.215	0.359**	0.171
	(0.274)	(0.149)	(0.130)	(0.144)	(0.141)	(0.146)	(0.148)	(0.151)	(0.246)
Household Child Labor Use (Number)	-0.012	0.011	0.011	-0.001	0.034	0.007	0.017	0.082**	0.144***
	(0.073)	(0.034)	(0.032)	(0.030)	(0.031)	(0.032)	(0.033)	(0.036)	(0.053)
Hired Labor Use (Number)	-0.023	0.010	0.027	-0.049	-0.086*	-0.097*	0.016	-0.054	-0.026
	(0.090)	(0.049)	(0.047)	(0.052)	(0.046)	(0.052)	(0.048)	(0.051)	(0.087)
Number of Fields Managed by the household	0.736	0.599**	0.073	0.024	0.119	-0.003	0.160	-0.055	-0.472
	(0.486)	(0.284)	(0.222)	(0.216)	(0.200)	(0.217)	(0.250)	(0.178)	(0.379)
Total number of crops produced	-0.977*	-0.699**	-0.203	-0.341	-0.395*	-0.414*	-0.595**	-0.619***	-0.857**
	(0.566)	(0.321)	(0.219)	(0.219)	(0.206)	(0.240)	(0.288)	(0.187)	(0.379)
Household used any purchased seed	0.061	-0.021	0.087	0.051	0.090	0.048	-0.061	-0.077	-0.055
	(0.182)	(0.078)	(0.073)	(0.074)	(0.065)	(0.062)	(0.057)	(0.065)	(0.106)
Plots that Use Chemical Fertilizer (% of total)	0.151*	0.093**	0.045	0.026	-0.018	-0.043	-0.060	-0.021	0.006
	(0.090)	(0.040)	(0.032)	(0.030)	(0.031)	(0.035)	(0.037)	(0.038)	(0.052)
Plots that Use Pesticide (% of total)	-0.290*	-0.257***	-0.095	-0.124	-0.210**	-0.116	-0.144	-0.179*	-0.467***
	(0.164)	(0.095)	(0.086)	(0.090)	(0.094)	(0.110)	(0.105)	(0.093)	(0.164)
Constant	8.520***	2.216**	0.886	0.697	0.067	0.209	0.905	0.760	1.847*
	(2.037)	(1.085)	(0.734)	(0.824)	(0.718)	(0.760)	(0.704)	(0.615)	(1.077)
Observations	2749	2749	2749	2749	2749	2749	2749	2749	2749