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A Framed Field Experiment in Ghana

Berber Kramer

Isabel Lambrecht

Markets, Trade, and Institutions Division
Development Strategy and Governance Division

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AUTHORS

Berber Kramer (b.kramer@cgiar.org) is a Research Fellow in the Markets, Trade, and Institutions Division of the International Food Policy Research Institute (IFPRI), Washington, DC.

Isabel Lambrecht (i.lambrecht@cgiar.org) is a Research Fellow in the Development, Strategy and Governance Division of the International Food Policy Research Institute (IFPRI), Yangon, Myanmar.

Gender and Preferences for Non-Farm Income Diversification:

A Framed Field Experiment in Ghana

Berber Kramer[*] and Isabel Lambrecht[†]

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Abstract

Many rural development programs aim at improving women's economic empowerment in agriculture, but as rural income continues to diversify, women may prefer investing in non-farm activities. In a framed field experiment with 1,527 men and women in Ghana, we elicit preferences for investments in crop farming versus other business activities. We analyze whether gender differences in preferences for non-farm diversification, if any, can be ascribed to differential access to physical and human capital, and to what extent a gender gap is explained by differences in socio-economic characteristics, skills, perceptions and norms. Despite strong beliefs that men and women are more skilled in crop farming and non-farm businesses, respectively, many respondents invest in both farm and non-farm activities and we find only a small gender gap in revealed preferences for non-farm diversification. This gap can be largely explained by gender stereotyping around perceived skills. Increasing access to physical and human capital does not significantly affect preferences. We conclude that both men and women reveal a strong preference for diversified investments, which needs to be reflected in programs and policies aiming to improve women's economic empowerment.

JEL codes: C93, J24, O13, Q10

Keywords: field experiment; income diversification; women's empowerment; Ghana

[*] Markets, Trade and Institutions Division, International Food Policy Research Institute (IFPRI), 1201 Eye Street, NW, Washington, DC 20005, USA. T: +1 (202) 627-4364, E: B.Kramer@cgiar.org. [†] Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), 30C Thiri Mingalar Road, Kamaryut, Yangon, Myanmar. T: +95 9 251890394, E: I.Lambrecht@cgiar.org. We thank all respondents for their participation during scoping, pretesting and survey implementation. We acknowledge feedback and dedication to fieldwork implementation by AgroEco, especially Willem-Albert Toose, Christabel Akua Andoh and Nelson Duah, as well as Issifu Sulemana from the Zasilari Ecological Farm project. Doreen Kufoalor and Sarah Asare provided excellent research assistance. We are grateful to the constructive feedback from Melissa Hidrobo, Rob Vos, and participants at the 2018 Pathways to Gender Equality Conference hosted by American University and the Future of Work Conference hosted by the World Bank in Washington, DC. This work was undertaken as part of the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by the International Food Policy Research Institute (IFPRI). We thank the United States Agency for International Development (USAID) for their support for this study under the Ghana Strategy Support Program. This paper has not gone through IFPRI's standard peer-review procedure. The opinions expressed here belong to the authors, and do not necessarily reflect those of the GSSP, PIM, IFPRI, CGIAR, or USAID.

1. Introduction

Women in developing countries are less empowered than men among several dimensions, including sociocultural, economic, legal and political domains (Farre 2013; Peterman et al. 2015). Increasing women's income is considered key to their empowerment, but policymakers face multiple pathways to strengthening women's income-generating opportunities. In rural areas, one of the policy options is to improve women's farm income by enhancing their access to agricultural inputs, given that women's limited access to agricultural inputs has been shown to lower their agricultural productivity relative to men (Quisumbing 1996; Goldstein and Udry 2008; Croppenstedt et al. 2013). Another option, given rural households' ability to diversify their incomes through non-farm activities (Barrett et al. 2001), is to strengthen women's capacity to generate income through non-farm enterprises, particularly as the importance of the non-farm sector continues to increase in rural areas (Davis et al. 2016).

In comparing these alternative pathways, it is important to consider not only economic factors, for instance the difference in profitability or riskiness of crop farming versus non-farm activities, but also constraints posed by gendered perceptions and social norms (Folbre, 1994; Kabeer, 2016). Customary norms, beliefs and values result in gender-specific constraints which do not only assign different roles and responsibilities to men and women in their household and communities, but often also drive perceptions about men and women's inherent ability to successfully engaging in specific productive and reproductive activities (Agarwal, 1997; Fernandez, 2007; Fernandez & Fogli, 2009; Kabeer, 2016).Throughout the world, commercial crop farming is strongly stereotyped as a men's activity, whereas other income-generating activities, such as non-farm enterprises, may be less prone to such male-dominated gender stereotyping (Kabeer, 2016, Lambrecht 2016). The question therefore arises whether women, relative to men, would prefer economic empowerment through crop farming or through alternative income generating activities, and whether this choice is motivated by economic factors or by gendered perceptions and social norms.

We address this question by means of a framed field experiment with 1,527 participants from 799 farming households in two different regions in Ghana. The experiment was framed as a rural development program aiming to improve the income-generating capacity in targeted areas. Participants were informed that one man and one woman in their community would, through a

lottery, be selected to receive an in-kind investment grant. Prior to this lottery, all participants were asked to choose how to invest this grant, and these choices were binding for participants selected to receive the grant. We interviewed men and women separately in order to analyze gender gaps in revealed investment preferences. To explore whether gender gaps, if any, arise because of differential access to finance and human capital, the experiment also varied, within subjects, the total grant size and the availability of skills training. Finally, using survey data, we analyze whether the gender gap in revealed investment preferences is potentially related to demographic and socio-economic characteristics, gender norms and perceived skills.

Survey respondents hold strong beliefs that men (women) are more skilled at crop farming (operating other businesses), and that crop farming (operating other businesses) is a more suitable activity for men (women). Consistent with these norms and beliefs, we find that women invest more towards non-farm income diversification than men, but the difference is smaller than expected *a priori*: most participants choose to invest in a diversified portfolio of income-generating activities, with women investing more in crop farming and men investing more in other businesses than predicted by the strong gender norms and perceived gender differences in skills. Moreover, although small, the gender gap persists when experimentally increasing the value of the investment grant, and when offering the option to invest in training. This suggests that differences cannot be ascribed to constraints in accessing finance and human capital. Instead, a large share of the gender gap in investments can be explained by the strong norms and differences in perceived skills. Gender differences in socio-economic characteristics such as access to land and past training in farming versus non-farm activities cannot explain the gender gap.

Our framed field experiment relates to the literature in three distinct ways. First, we contribute to the experimental literature that focuses on investment grants and vocational training for increased income. We find an increasing number of studies on (gender differences in) the effects of investment grants or vocational training on either non-farm business performance, growth or profitability (de Mel *et al.*, 2009, 2012; Cho *et al.*, 2013; Fafchamps *et al.*, 2014, Karlan et al. 2015) or farm performance (Ambler *et al.*, forthcoming). Rural men and women engage in a variety of income generating activities, and their investment preferences may not be based solely on profit maximization or business performance. Rather, they may prefer investing in activities that exhibit other preferred characteristics such as, among others, workload intensity, diversification and risk

reduction, control over the returns to investment, the timing of revenues, or alignment with social norms (Nordman and Vaillant, 2014; Friedson-Ridenour and Pierotti, 2019). In this paper, we therefore take a step back from gender differences in *impacts* of grants or vocational training, and study *demand* for investments in physical capital and vocational training for alternative income-generating activities. Our findings shed light on the extent to which existing programs and policies to enhance economic empowerment are targeting the sectors that men and women prefer.

Second, complementing observational data on non-farm diversification (Barrett *et al.*, 2001; Nagler and Naude, 2017; Van den Broeck and Kilic, 2019), we elicit these preferences in a highly controlled setting that allows us to standardize and experimentally vary participants' access to both start-up capital and skills trainings. In one treatment, we increase the total value of the investment grant by a sizeable 150 percent. In another treatment, we provide participants with the opportunity to invest part of their grant in vocational trainings designed to strengthen skills in either crop farming or business. Beyond eliciting preferences in a standardized manner, this provides us with insights on the main constraints that participants perceive in deciding how to invest the grant. Specifically, the experimental treatments can help improve women's access to financial capital, and strengthen their farming skills, potentially relaxing important constraints to invest in crop farming. As such, the design allows us to analyze whether gender differences in investment preferences could be due to differential access to physical and human capital.

Third, in contrast to the option of using non-incentivized choice experiments, hypothetical survey questions or qualitative research methods to better understand preferences for non-farm diversification, we provide incentives for participants to reveal their true preferences for non-farm diversification. Stated preferences are likely subject to hypothetical bias (List and Gallet, 2001). For example, our finding of strong gender norms around the type of work that men and women should be doing would likely have resulted in a more pronounced gender gap in stated preferences, given that such norms could have influenced participants' stated answers. Nevertheless, even in the presence of incentives, our study shows that gender norms play a more important in explaining the gender gap than socioeconomic characteristics determining the profitability of different types of investments. This supports the conclusion that revealed investment preferences are influenced by gender norms and perceptions.

Our results are relevant to policy makers and practitioners as they shed light on two main issues. First, they inform the growing debate whether to support income generating capacities of rural populations through farm or non-farm pathways, and whether they require such investments in the form of financial or human capital. This is especially relevant given the growing recognition that non-farm income will play an increasingly important role in rural households' incomes. Second, our findings contribute to the debate on how to improve women's economic empowerment specifically. If there were sizeable gender differences in preferences for farm- versus non-farm income pathways, the targeting of gender-sensitive interventions could be improved by focusing either on the farm or on the non-farm sector. Based on our findings, we however conclude that both men and women value a diversity of income-generating activities. Neither the farm nor the non-farm sector is specifically appropriate for gender targeting. Hence, women can benefit from policies strengthening their empowerment in both agriculture and non-farm income diversification.

The remainder of this paper is structured as follows. In Section 2, we describe the methods used to conduct this study, including the experimental design and procedures. This section also introduces our theoretical predictions along with an empirical strategy used to test these predictions. Section 3 provides a description of the participant sample. Section 4 presents and discusses estimates of the gender gap in investment preferences, demand for training, and perceptions, beliefs and norms that potentially explain this gender gap. Section 5 concludes.

2. Methods

2.1 Experimental design

The field experiment was introduced as a pilot program aiming to improve the income-generating capacity of targeted communities. Field staff informed respondents that one man and one woman in their community would be selected, through a public lottery, to receive an in-kind investment grant of a specific cash value. Respondents could invest this grant in crop farming, other businesses, or a combination of the two. To elicit respondents' preferred allocation of the investment grant between the two types of activities, enumerators asked all respondents—prior to the lottery—to allocate 12 tokens between investments in crop farming and investments in other businesses. Lottery winners were asked to choose any inputs, materials and assets for their farm up to the amount that they had initially (prior to the lottery) allocated to crop farming; and to

choose other business assets, equipment or materials up to the amount initially allocated to other business activities. Field staff directly purchased these items on behalf of the farmers. As a result, allocations made during the interview were binding for lottery winners, ruling out a hypothetical bias that can be observed in non-incentivized choices.[1]

Table 1 summarizes the experimental design. For each respondent, we elicited allocations for six types of investment grants, with total values ranging between a sizeable 240 and 600 Ghanaian cedis (GHS), or US$ 56.40 and US$ 141, respectively.[2] In the first two allocations, the value of each token was either 20 GHS or 50 GHS. We varied this parameter to assess whether variation in the extent to which liquidity constraints are relaxed has an impact on the composition of investments. An increase of nearly US$ 85 in the grant should have been sufficient to overcome liquidity constraints to invest in essential inputs or capital for diversification in more profitable activities with fixed start-up costs that respondents could not finance from their own resources in the absence of the grant. For instance, inputs and labor under maize farming practices recommended by the Ministry of Food and Agriculture cost roughly $ 85 per acre (Karlan *et al.*, 2014), meaning that the increase in grant value could lead to increased investments in crop farming for a respondent with access to land but without resources to invest in inputs or labor. Likewise, among microenterprises in urban Ghana, grants of US$ 120 - US$ 133 were considered significant infusions of financial capital (Fafchamps *et al.*, 2014; Karlan *et al.*, 2015).[3]

In the third and fourth allocation, tokens took on a different value depending on the sector in which the participant chose to invest a token; in one choice, tokens invested in crop farming were worth GHS 20 and tokens invested in other business were worth GHS 50, whereas in the second choice, tokens invested in crop farming were worth GHS 50 and tokens invested in other business yielded

[1] If respondents preferred increasing their consumption in the short term over investing the grant, they could sell the received assets and inputs. We did not expect such behavior because participants were aware that the local partners involved in implementing the experiment—well-known NGOs that had been working with targeted communities for a long period of time—would be purchasing inputs and assets, and able to monitor the investment. Indeed, our local partners conducted qualitative follow-up interviews with grant recipients and found that none of the grant recipients interviewed had liquidated any of the inputs or assets received.

[2] During May 2017, one GHS was on average US$ 0.235, meaning that each token of 20 GHS was worth US$ 4.70 and each token of 50 GHS was worth US$ 11.75.

[3] Men and women could face different start-up capital requirements. In qualitative interviews, women typically reported having more opportunities to start businesses than men, but women focused mainly on small-scale businesses with limited capital requirements. Consistent with this hypothesis, women earn less non-farm income than men conditional on earning non-farm income (Canagarajah *et al.*, 2001). If men indeed prefer starting more capital-intensive businesses, increasing the grant value could have different impacts for men than for women.

only GHS 20. We introduced these two treatments to measure the extent to which respondents forgo resources in the sector with GHS 50 per token, in favor of the sector with GHS 20 per token, to assess to what extent a difference between sectors in the relative return on investment per token (or a difference in the relative cost of financial capital) would influence investment preferences.

Table 1: Experimental design

	No training available		**Training available (3 tokens)**
Value of tokens invested in **crop farming** (A)	Value of tokens invested in **other business** (B): Same value (allocations 1 and 2) (1)	Different value (allocations 3 and 4) (2)	Same value (allocations 5 and 6) (3)
20 GHS	A20-B20	A20-B50	A/B20-T
50 GHS	A50-B50	A50-B20	A/B50-T

Finally, in the last two allocations, respondents could choose to invest 3 tokens in a training of their choice to improve skills in either crop farming or other business, allowing us to assess the demand for investments in human capital and effects on respondents' preferred sectors. If there are gender differences in access to or perceptions of knowledge and skills on how to cultivate certain crops, or on how to run a business, the trainings could help overcome this difference in access to such knowledge and thereby bridge the gender gap.

Choices were visualized for the respondent by means of choice cards (Figure 1). We randomized between subjects whether crop farming or other business was located on the left side of the choice card, and whether the participant started with the allocation of GHS 20 versus GHS 50 tokens. We started with either the A20-B20 or the A50-B50 allocation and chose not to vary between subjects whether they started with the A20-B50, A50-B20, A/B20-T, or A/B50-T allocation. The first two choices were important in helping participants understand the experimental set-up, before moving into the remaining four choices, which were potentially more difficult to understand. Our results are robust to controlling for the order in which choices were made.

Note that we elicited preferences for crop farming versus other activities rather than preferences for farm versus non-farm activities. Although livestock rearing is also apparent as a farming activity in the study region, crop farming is a more wide-spread, land-intensive and seasonal

activity, generating income in bulk rather than in bits throughout the year. Access to land as well as cash needs are potentially important factors that vary by gender and could drive differences in allocations between men and women. In qualitative work prior to the experiment, many respondents classified livestock farming as having very similar attributes as non-farm activities. We therefore included livestock rearing, although a farming activity, in the "other business" category. After the first choice, respondents were asked to specify in more detail how they would allocate the grant, including the type of businesses in which they would invest. We will use those data to study robustness of our findings to a more comprehensive definition of farming that includes livestock rearing activities.

Figure 1: Example of choice card A50-B50

2.2 Procedures

The framed field experiment was conducted in two different locations in Ghana, Amenfi West and West Mamprusi, to capture a diversity of agro-ecologies and ethnicities. The Amenfi West district is part of the forest zone of Western Region and includes farmers from both matrilineal and patrilineal ethnic groups. The West Mamprusi district is part of the Northern Region in the Savannah and hosts patrilineal ethnic groups that vary in whether households are polygamous or monogamous. Amenfi West is well known for cocoa and oil palm cultivation, whereas in West Mamprusi, maize and millet are the main crops. None of these crops are considered either women's crops or men's crops (Doss 2002, Carr 2008, Lambrecht *et al.* 2018).

The experiment was implemented in collaboration with two local NGOs (one per region) with ongoing development activities in the targeted regions. In each region, we randomly selected 20 communities from a list of project communities that the NGO was working with. In each of these communities, 20 project households were randomly selected from a list of project households.[4] In monogamous or polygamous households, enumerators interviewed one man and one woman of the principal couple of the household. In polygamous households, instead of interviewing all wives, we randomly selected one wife among those available for an interview. In single-headed households, only the (female) household head was interviewed. Household members were interviewed separately and in private, and we did not provide opportunities to communicate with others on how to invest, as we were interested in a respondent's own revealed investment preferences, rather than behaviors influenced by others.[5]

The experiment was embedded in a survey consisting of three main parts. The first part, which could be answered by any adult household member, was a questionnaire about key household characteristics. In the second part, the household head and spouse (if any) were interviewed individually. This part included the main experiment, i.e. the allocations of the investment grant, followed by a similar but non-incentivized choice in which married respondents were asked to allocate the investment grant between crop farming and other business activities for their spouse.[6] In addition, we elicited beliefs on attributes associated with these two types of activities, as well as beliefs on the respondents' skills, and gender norms. The third part was a community questionnaire, which in each community was answered by five to eight key informants.

The six incentivized allocations were recorded on a choice card, jointly with the respondent's name, and sealed in an envelope. This envelope was kept by the enumerator to be used in a community lottery, through which we randomly selected one male and one female respondent from

[4] One community was replaced by another randomly selected community because of its proximity to a community already included in the sample, to minimize a spread of information before the experiment. Within a community, the sample was limited to households where the household head was below 65 years old, and where both husband and (at least one) wife could be interviewed (except for female-headed households). We replaced households not satisfying these criteria with randomly selected households from the list of project households in the same community.

[5] Even without communication, responses may have been influenced by social norms and implicit pressure from others, as respondents may have chosen the options that they believed would be more acceptable to others. The approach taken here—preventing any communication prior to or during preference elicitation—was minimizing such social influence among the possible range of options that we had to incentivize the preference elicitation.

[6] Informed consent was obtained from the respondents before the start of the interview, and again right before the start of the experimental section of the questionnaire. Respondents were carefully explained that they would not receive the money in cash, but the equivalent grant in-kind, if selected through the lottery.

the community. The lottery winners randomly drew one of their six choices to determine which allocation would be implemented. Through this mechanism, we were able to incentivize all allocations, important to reveal respondents' true preferences, without having to offer all participants the investment grant (which was not possible due to budget constraints), or paying out for each of the six allocations (which could have introduced wealth effects). We did not incentivize the final allocation, which asked married respondents to allocate the investment grant for their spouses, because of ethics concerns. We analyze this allocation only as a robustness check.

After finalizing the survey, the lottery winners were consulted by project staff to develop an investment plan and execute the choice made during the framed field experiment. In developing their investment plan, lottery winners chose inputs and assets for crop farming with a cash value equivalent to the amount they had allocated to "crop farming" for the selected choice; and likewise, they chose inputs and assets for other business activities with a value equivalent to the amount they had allocated to "other business" in that same choice. The project staff then purchased these inputs or assets on behalf of the winners and arranged for the skills trainings among winners who had paid three tokens for training. In this way, we enforced that the allocations made during the experiment were binding rather than hypothetical allocations of an investment grant.

2.3 Empirical Strategy

To estimate the gender gap in revealed investment preferences, we will estimate the following random effects model for allocation *i* by respondent *j* in household *k*:

$$Y_{ijk} = \alpha + Female_{jk}\beta + \mathbf{z}_{ijk}\gamma + Female_{jk} \times \mathbf{z}_{ijk}\delta + u_k + \varepsilon_{ijk} \qquad \text{(eq 1.)}$$

The main outcome variable of interest (Y_{ijk}) is the share of tokens invested in agriculture and (for the fifth and sixth choice in the experiment) whether the participant decides to invest in the three-day skills training for crop farming or other business. We regress these variables on a constant, a dummy variable $Female_{jk}$ that takes on a value equal to one if and only if respondent *j* is female, and on a vector of control variables $\mathbf{z}_{ijk}$ related to the experimental treatments varied between choices within subjects (i.e., the value of tokens invested in agriculture, the value of tokens invested in business, and—in regressions that include choices without and with training—whether

training is available).[7] We included these treatments in order to analyze the sensitivity of our results with respect to a participant's access to physical and human capital. The model further assumes a random effect defined at the household level u_k and an idiosyncratic error term ε_{ijk} clustered by community.[8] The estimate $\hat{\beta}$ quantifies the gender gap in preferences for non-farm diversification, and the estimate $\hat{\delta}$ estimates gender differences in the sensitivity to experimental treatments.

To examine to what extent the observed gender differences in the sectors of investment are systematically correlated with socioeconomic characteristics, perceptions and norms, we also estimate regressions of the following form for each of our outcome variables:

$$Y_{ijk} = \alpha + Female_{jk}\beta + \mathbf{x}_{jk}\phi + \mathbf{z}_{ijk}\gamma + Female_{jk} \times \mathbf{z}_{ijk}\delta + u_k + \varepsilon_{ijk} \qquad \text{(eq 2.)}$$

As in the former regression model (eq.1), $\hat{\beta}$ estimates the gender gap, but now controlling for additional characteristics $\mathbf{x}_{jk}$ of the individual making the allocations. We will control for potentially relevant socio-economic characteristics, as well as for perceived characteristics of crop farming and other business, the respondent's assessment of the own performance in crop farming and other business, and the respondents' view on men's and women's performance in crop farming and other business. These variables were not experimentally varied, meaning that we will be unable to draw causal inference. Nevertheless, we will analyze whether adding respondent characteristics reduces the magnitude of the gender gap (i.e, compare $\hat{\beta}$ from the first versus second regression model) as an indication of whether the gender gap is related to these characteristics.

3. Study context

3.1 Participant characteristics

Table 2 summarizes demographic and socio-economic characteristics of participants. The total sample consists of 1,527 respondents from 799 different households. Male participants are on

[7] We also include the following variables to test for robustness of our findings to the experimental design: enumerator effects, whether the interview was the first or second interview of the enumerator that day, whether the participant started the first choice with the high grant of 50 GHS per chip versus the low grant of 20 GHS per chip, whether crop farming was presented on the left or the right on the choice sheets, and an interaction of these latter two variables with a dummy variable indicating female participants.

[8] We are estimating a random effects model instead of a household fixed effects model because variables that vary within respondents ($\mathbf{z}_{ijk}$) are balanced and uncorrelated with household effects u_k by design. As a result, estimates derived through the random effects model are consistent and more efficient than estimates derived using fixed effects.

average 43 years of age, which is six years older than the average female participant. Education levels are low, with men having on average four and women only three years of education. About 17 and 9 percent of women are in a polygamous marriage and female headed, respectively.[9] In the sample, 16 percent of men and 27 percent of women belong to a matrilineal ethnicity. Nearly half of the households do not belong to an ethnic group that is native to their community. The respondents are generally either Christian or Muslim. Women expressed significantly more risk-averse preferences than men, which could have implications for investment preferences. Men and women however do not differ in their stated time preferences.[10]

In terms of income-generating activities, we observe a diversity of livelihoods. Most households cultivate land, hold farm animals, and many respondents engage not only in crop farming (the main income-generating activity for 96 percent of men and 78 percent of women), but also other business activities (about half of both male and female respondents). Hence, if participants invest the experimental grants towards their current activities, we will observe diversified investments, with limited gender differences. At the same time, most women do not hold a plot, potentially driving a preference for non-farm diversification. We do observe strong gender differences in other business activities. Men overwhelmingly practice livestock rearing (39 percent compared to 10 percent among women), whereas women are relatively more likely trading agricultural and non-agricultural goods (24 and 7 percent, respectively), holding a shop (5 percent) or processing food for sale (18 percent). Wage work is rare in the region, and mostly consists of casual labor (which is done by less than 1 percent of participants), justifying our focus on self-employment.

Table 3 shows farmers' participation in past training activities. Among men, we find high levels of previous exposure to training related to crop production, followed by training related to animal rearing and business management. Women have received significantly less training in each of these topics and engage significantly less often with agricultural extension officers than men.

[9] We observe differences in household characteristics between male and female respondents because we are including only one respondent—the female household head—and not also a male respondent from these female-headed households.

[10] We elicited risk preferences through a Binswanger lottery. This lottery included an option that was simply a mean-preserving spread of another option as an internal consistency check for participants' understanding. This option was selected by 9.5 percent of men and 9.6 percent of women, which is not a statistically significant difference in 'risk-seeking' behavior. We are excluding respondents who selected this option from the risk aversion measure presented in Table 2. We elicited time preferences by asking whether a participant preferred receiving a smaller amount of income paid monthly spread over a period of 6 months versus a larger lump-sum payment at the end of the 6 months, to capture the difference in timing of payments from crop farming versus other self-employment activities.

These findings could result from women having either less access to training and extension, or less interest and time than men. In case of the former, we would expect higher demand for the trainings in the experiment among women than among men.

Table 2: Participant characteristics

	Men	Women	
Age of respondent	43.14	36.75	***
Years of education completed	4.356	2.776	***
Polygamous	0.183	0.166	***
Female household head	0.000	0.089	***
Matrilineal	0.158	0.269	***
# children in hh (<=15y)	4.288	4.168	***
# adults in hh (>=16y)	3.486	3.441	**
Non-indigenous ethnicity	0.489	0.498	
Christian	0.452	0.521	***
Muslim	0.499	0.461	***
Traditionalist and other	0.049	0.019	***
Risk aversion (1 = most risk averse, 4 = least risk averse)	2.722	2.582	**
Time preference (1 = least patient, 4 = most patient)	3.007	2.972	
Total acreage cultivated (household)	9.293	8.922	***
Livestock ownership (household)	0.889	0.880	*
Plotholder	0.957	0.362	***
# income-generating activities	1.629	1.662	***
Main activity is farming	0.963	0.781	***
Does crop farming activity	0.992	0.909	***
Does other business activity [a]	0.499	0.536	
does livestock rearing	0.393	0.099	***
trades agricultural goods	0.063	0.240	***
trades non-agricultural goods	0.018	0.068	***
has provision shop/cold store	0.019	0.049	***
processes food for sale	0.012	0.174	***
other self-employment	0.065	0.034	**
Does wage employment	0.014	0.008	
Number of observations	728	799	

Notes: Stars denote significant gender differences in a two-sided *t*-test using clustered standard errors at community level at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. [a] Other business activity includes livestock rearing, trading of agricultural and non-agricultural goods, provision shop, cold store, food processing and other self-employment.

Table 3: Men and women's participation in training

	Men	Women	
In the past 5 years, did you receive training for …			
crop production?	0.835	0.589	***
animal rearing?	0.559	0.377	***
business management?	0.433	0.367	***
How often in the last 12 months did you receive training for …			
crop production?	5.404	2.437	***
animal rearing?	2.493	1.089	***
business management?	1.935	1.160	***
In the last 12 months, how often did you interact with an agricultural extension agent?	3.589	2.090	***
Number of observations	728	799	

Notes: Stars denote significant gender differences in a two-sided *t*-test with errors clustered at community level at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

3.2 Gender perceptions and norms

Table 4 presents evidence of strong gender stereotyping in beliefs about occupational skills. On the one hand, both men and women (but especially men) consider men to be better at farming. Women, on the other hand, are believed to be better at doing business, and at managing money; these beliefs are held even by most men. Most respondents, both male and female, believe themselves to be more skilled at crop farming than at other business activities, but women are less likely to hold this belief. Comparing crop farming with other business activities, men allocate more positive attributes to crop farming than women. Finally, only 13 percent of men would prefer their spouse to have crop farming as main occupation, whereas 65 percent of women prefer their husband to have crop farming as main occupation. Based on these stereotypes, we expect significant gender differences in investment preferences.

Table 4: Perceptions about men's and women's skills

		Men	Women	
Who is better at farming?	men	0.956	0.870	***
	same	0.032	0.086	***
	women	0.012	0.044	***
Who is better at doing business?	men	0.102	0.060	***
	same	0.058	0.101	***
	women	0.841	0.839	
Who is better at managing money?	men	0.202	0.156	**
	same	0.089	0.100	
	women	0.709	0.743	*
For which one do you think you have more skills?	other business	0.062	0.295	***
	indifferent	0.066	0.106	***
	crop farming	0.872	0.598	***
Score for positive perceptions about crop farming (0-18) [a]		9.701	8.311	***
What do you prefer as main occupation for your spouse? [b]	other business	0.712	0.114	***
	indifferent	0.159	0.235	***
	crop farming	0.129	0.651	***
Number of observations		*728*	*799*	

Notes: Stars denote significant gender differences in a two-sided *t*-test with standard errors clustered at community level at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. [a] Details of components of the score can be found in Appendix Table B1. [b] This question was not asked in single-headed households.

4. Preferences for non-farm diversification

4.1 Descriptive statistics

Table 5 and Appendix Figure B1 present for each choice set the share of tokens that the participant allocates to crop farming. In each choice set, women allocate a significantly smaller portion of the grant to crop farming than men, and this difference does not vary by quantile in the distribution of allocations (Appendix Figure B1). The cumulative distribution functions also show that most respondents, both men and women, diversify their investments over both crop farming and other

activities.[11] As a result, the gender gap is not as extreme as suggested by the strong gender norms and stereotypes around perceived skills in the two different sectors.

Table 5: Share of tokens allocated to crop farming by choice set and gender of respondent

Choice set	Men	Women	
A20-B20	0.615	0.475	***
A50-B50	0.596†	0.477	***
A20-B50	0.574†	0.453†	***
A50-B20	0.628	0.512†	***
A/B20-T	0.614	0.464	***
A/B50-T	0.610	0.465	***
Number of observations	728	799	

Notes: Stars denote significant gender differences in a two-sided *t*-test with clustered standard errors at community level at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. † Share allocated to crop farming in this choice set is significantly different from the share allocated to crop farming in choice set A20-B20 in a two-sided *t*-test with standard errors clustered at community level at $p < 0.10$.

After the first choice, respondents were asked to specify in detail how they would allocate the budget in case they would win the lottery. Table 6 shows how participants plan to invest resources allocated to crop farming. Both men and women plan to invest primarily in production on farmland that is currently being cultivated by a household member (87 and 82 percent, respectively), but since fewer women hold their own plots, women are more likely than men to invest in production on another's land, i.e. 98% of men invest in plots that they hold themselves, whereas only 41% of women do so.[12] Women are more likely to invest in production on newly acquired land (14 versus 10 percent), yet, the experimental grant is seldomly used to acquire farmland (reported by 4 percent of both men and women). Rather, they will use the grant to purchase agricultural inputs such as inorganic fertilizer (reported by 69 percent of participants), pesticides (55 percent) and seeds (39

[11] The most frequently observed allocation for both men and women is an equal allocation of tokens in each activity, but other interior choices are also often selected. Training causes a reallocation away from putting half (0.5) in agriculture into 0.25, 0.75 and corners (0, 1).

[12] Conditional on holding a plot and investing at least one token in crop farming, we see a statistically significant but in magnitude relatively small differences: 99.5% of male plotholders plan to invest in their own plot, versus 97% of female plotholders.

percent) or to hire tractor services (41 percent) and labor (38 percent). This suggests that land is either inaccessible or that access to land is less critical than access to other farm inputs.[13]

Table 6: Breakdown of crop farm investments by gender of respondent

	Men	Women	
On which plot will you make the investment?			
Land currently cultivated by household member	0.874	0.821	**
If on land cultivated by household: Respondent is plotholder	0.981	0.413	***
Land currently owned but not cultivated	0.030	0.027	
Land which will be acquired	0.096	0.140	**
How will you allocate the grant money?			
Acquiring land	0.037	0.041	
Fertilizer	0.715	0.654	**
Pesticides	0.568	0.527	*
Tractor services	0.411	0.413	
Hired labor	0.327	0.423	***
Seed	0.326	0.446	***
Other	0.123	0.077	***
Number of observations	706	702	

Notes: Stars denote significant difference between men and women in the share of participants making the investment at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ with standard errors clustered at community level.

Table 7 presents a breakdown of investments in other business activities. We find that allocations of men and women partially follow existing stereotypes. Men are more likely to invest in livestock rearing (47 percent), while women invest more in activities that support non-farm income diversification, primarily trading of agricultural products (44 percent), non-agricultural products and food processing activities (both 18 percent).

[13] In many villages in our sample, agricultural land markets are not yet (fully) commercialized: in more than half, land is not sold, in nearly a third, it is not rented, and in more than 40%, there are no sharecropping agreements. The price of an acre of land is on average 394 GHS, but ranges between 0 and 4000 GHS with a median of 30 GHS.

Table 7: Breakdown of other business investments by gender of respondent

Business investment sector	Men (1)	Women (2)	
Livestock rearing	0.468	0.061	***
Trading of agricultural goods	0.227	0.444	***
Trading of non-agricultural good	0.121	0.176	***
Provision shop	0.126	0.145	
Food processing	0.024	0.180	***
Cold store	0.007	0.007	
Other self-employment	0.077	0.049	*
Number of observations	586	716	

Notes: Stars denote significant gender differences in a two-sided *t*-test with clustered standard errors by community level at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

In the final two choices, respondents could invest three of their tokens in a training for either crop farming or other business activities. Table 8 summarizes the demand for these trainings by gender. Columns (1)-(2) show that the overall demand for training is high, with on average about 80 percent of men and about 75 percent of women choosing to invest in training. Choices were incentivized, meaning that participants chose to forgo some of their physical inputs for human capital formation.

Table 8: Share of men and women who choose agricultural or business training

	Any training			Agricultural training			Business training		
	Men (1)	Women (2)		Men (3)	Women (4)		Men (5)	Women (6)	
A/B20-T	0.797	0.728	***	0.511	0.342	***	0.286	0.387	***
A/B50-T	0.805	0.765†	**	0.495	0.334	***	0.310†	0.431†	***
Number of observations	728	799		728	799		728	799	

Notes: Stars denote significant difference between men and women in the share of participants choosing training at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. † Share of participants choosing this training is significantly different from the share of participants choosing this training in choice set A/B20-T in a two-sided *t*-test at $p < 0.10$.

Some of this could be due to an experimenter demand effect, particularly because demand is relatively price insensitive, but note that we are primarily interested in gender differences in the type of training that participants choose, which are identified assuming that men and women do not differ in the extent to which they bias their response to the enumerator. In Columns (3)-(6), we find a statistically significant and sizeable gender gap in the demand for the sector of training along

the same lines as for investments in physical inputs: men are significantly more likely to invest in an agricultural training, whereas women invest significantly more often in training for activities that provide non-farm income diversification.

4.2 Effects of increased access to capital on preferences for non-farm income diversification

This section analyses potential explanations for the observed gender gap in preferences for non-farm diversification, focusing on the hypothesis that the gender gap is related to differences in access to physical or human capital. Women may invest more in non-farm activities because they lack access to financial capital for crop farming, meaning that they need a larger start-up grant to make their investments in crop farming meaningful. Alternatively, they may (perceive that they) lack the knowledge or skills to invest profitably in crop farming. In that case, we would observe increased investments in crop farming among women in crop farming when training becomes available, driven by investments in both inputs for crop farming and the training itself.

In Table 9, we therefore estimate not only the gender gap in the share of the investment grant allocated to crop farming for our base choice (A20-B20), but also test for gender differences in the effects of increasing the grant size and introducing training.[14] In Column (1), our model with household random effects includes only the base choice A20-B20, in which tokens allocated to crop farming and other business activities are both worth 20 GHS. The point estimate for the constant term indicates that male participants invest 60.5 percent of their tokens in crop farming. Female participants invest 12.8 percentage points less (a reduction of more than 20 percent) in crop farming ($p < 0.01$).

In Column (2) we also include allocations whereby tokens allocated to crop farming and other business activities are both worth 50 GHS. If the lack of financial capital to invest in crop farming is the main reason for why women invest relatively less in crop farming under the A20-B20 scenario, we would expect a shift into crop farming when expanding the amount of start-up capital by 250 percent. We do not find evidence to support this hypothesis. Increasing the available funds

[14] We are using a linear regression with household random effects because this increases efficiency compared to using fixed effects. The random effects estimator is also unbiased and consistent because our independent variables are uncorrelated with unobserved household characteristics. This is because we interviewed a male and female respondent in nearly all households, making gender uncorrelated with household characteristics, and because treatments were varied within subjects, making also these variables uncorrelated with individual and thus household characteristics.

reduces the share allocated to crop farming by 1.9 percentage points ($p < 0.05$) among male participants—a small effect relative to the estimated gender gap under the A20-B20 scenario—but does not affect the share allocated to crop farming among women ($p = 0.824$). Thus, an increase in start-up capital affects the composition of investments only to a limited extent among men. Increasing the amount of financial capital available to women does not close the gender gap in preferences for investing in crop farming versus non-farm income diversification.

Table 9: Gender gap in investment preferences

	Dependent variable: Share of investment grant allocated to crop farming					
	A20-B20	A20-B20 vs. A50-B50	A20-B20 vs. A50-B20	A20-B20 vs. A20-B50	A20-B20 vs. A/B20-T	A50-B50 vs. A/B50-T
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.128***	-0.130***	-0.113***	-0.121***	-0.130***	-0.103***
	(0.022)	(0.020)	(0.019)	(0.021)	(0.022)	(0.017)
High grant		-0.019**	0.013	-0.041***		
		(0.008)	(0.008)	(0.014)		
… X Female		0.021*	0.024*	0.019		
		(0.012)	(0.012)	(0.014)		
Training					-0.001	0.014**
					(0.007)	(0.007)
… X Female					-0.010	-0.026**
					(0.012)	(0.010)
Constant	0.605***	0.612***	0.572***	0.630***	0.614***	0.598***
	(0.033)	(0.033)	(0.033)	(0.034)	(0.036)	(0.034)
p-value for effect | Female = 1						
- High grant		0.824	0.001***	0.021**		
- Training					0.321	0.153
Number of observations	1527	3054	3054	3054	3054	3054
R-squared (within)	0.159	0.129	0.114	0.118	0.124	0.116

Notes: Linear model with household random effects and standard errors in parentheses clustered by community. We control for "Starts with high grant", "Business shown on left of choice sheet", the interaction of these two variables with "Female", as well as enumerator effects and whether the interview was conducted in the morning or in the afternoon. Stars denote coefficients significantly different from zero at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Although we do not observe an effect of increased access to financial capital on the gender gap in terms of investments in land-intensive crop farming activities, we may observe effects in terms of investments in livestock rearing versus non-farm businesses, both included as other businesses. In

Appendix Table B2, we therefore decompose allocations from the first choice—after which participants were asked to specify in more detail how they were planning to use the grant—into investments in crop farming, livestock and non-farm businesses, and estimate gender gaps under both the low-grant versus the high-grant scenario. Grant size does not affect crop farming allocations, but relaxing financial constraints closes the gender gap in the other two sectors, as it leads men to invest less in livestock and more in non-farm businesses, without affecting women's allocations. This closes the gender gap in preferences for non-farm diversification. However, there could still be gender gaps in the profitability of these non-farm businesses; men's shift into non-farm businesses when relaxing financial constraints suggests that male-dominated businesses are more capital-intensive and potentially more profitable than female-dominated businesses.

Returning to Table 9, in Column (3), we compare allocations in the base choice A20-B20 with allocations in the scenario whereby tokens allocated to crop farming are worth 50 GHS, but tokens allocated to business are worth 20 GHS. In this scenario, a respondent with equal returns on investments of the experimental grant in both sectors should choose to allocate the full investment grant to crop farming. Although among men, we do not observe a significant shift in investments, we do observe an increase in crop farming investments of 3.7 percentage points ($p < 0.01$), or 32.7 percent of the base choice gender gap, among women. Thus, offering women strong incentives to invest in crop farming, by conditioning the increase in available financial capital to investing it in crop farming, affects investments, but does not fully close the gender gap in investment preferences.

In Column (4), we compare allocations in the base choice with allocations when tokens allocated to other businesses are worth 50 GHS. Increasing the amount of financial capital available for other business activities reduces the share allocated to crop farming among both men ($p < 0.01$) and women ($p < 0.05$). Nonetheless, also for this treatment, the estimated effect sizes are small relative to the gender gap in the base choice, and both men and women forego significant amounts of start-up capital by choosing an allocation that is relatively close to their initial allocation. Thus, both men and women reveal a strong preference for diversified investments instead of focusing on

either crop farming or other income-generating activities, and we find limited evidence supporting the hypothesis that women invest less in crop farming due to a lack of start-up capital.[15]

In Columns (5) and (6), we analyze how trainings affect allocations, comparing the A20-B20 and A50-B50 choice sets with similar choice sets whereby training is available, A/B20-T and A/B50-T, respectively. In Column (5), focusing on the low-grant scenario, the availability of training does not affect investment preferences among either men or women. By contrast, in the high-grant scenario in Column (6), they respond differently to training availability: whereas men *increase* the share of the grant allocated to crop farming by 1.4 percentage points ($p < 0.05$), women *reduce* their allocation to crop farming by 1.2 percentage points ($p = 0.152$). Thus, improved access to human capital formation does not unlock investments in crop farming among women, and the provision of training widens the gender gap rather than closing it, as the availability of training leads men (women) to specialize in a stereotypical male (female) sector, in which they perceive themselves to be more skilled already than the other gender.

Table 10 estimates gender gaps in the demand for training, and implications of training availability for investments for crop farming versus other businesses. In Columns (1)-(2), we estimate linear probability models of farmers' choice whether to invest in training for crop farming and business, respectively. Compared to men, women are a significant 18.5 percentage points ($p < 0.01$) less likely to invest in farm training in the low-grant scenario, and an increase in the size of the grant does not affect the demand for such training. The gender gap in the demand for business training is smaller, as women are 7.6 percentage points ($p < 0.10$) more likely to invest in business training than men in the low-grant scenario. In the high-grant scenario, both men and women are more likely to choose business training, and the gender gap increases to 9.5 percentage points.

In Columns (3) to (6), we estimate the effect of including the training option on the share of the investment grant that is allocated to crop farming or other business. As in Table 9, Columns (3) and (5) include any tokens allocated to training in determining the share allocated to crop farming

[15] Appendix A describes a basic model to conceptualize the allocations made in the experiment. The model assumes that investments from the experimental grant face diminishing marginal returns. As a result, participants diversify their investments in both sectors, and the gender gap in investments will not be as large as it would have been under an assumption of constant marginal returns to investment, even when intuitively, we would expect strong gender gaps based on prevailing norms and stereotypes. Diminishing marginal returns also predict a relatively limited response to an increase in the supply of capital (i.e. an increase in the value of tokens from 20 to 50 GHS), or to the introduction of training, cushioning gender differences in the response to our experimental design.

or business, respectively.[16] By contrast, Columns (4) and (6) measure the share invested in crop farming or other business activities excluding any tokens allocated to training. As in Table 9, we find a persistent gender gap in allocations where women are more than 12 percentage points less likely to invest in crop farming compared to men. In Columns (3) and (5), men do not change their allocations when the training option is provided, but women invest 1.2 percentage points less in crop farming ($p = 0.128$). Columns (4) and (6) show us that, once excluding tokens allocated to training from the analyses, men and women do not change the relative share of the remaining tokens allocated to inputs in crop farming and business.

Table 10: Gender gap in the demand for and impact of training

	Dependent variable: Respondent chooses training in		Dependent variable: Share of grant invested in:			
			Crop farming		Other business	
	Crop farming [a]	Other business [a]	incl training [b]	excl tokens in training [b]	incl training [b]	excl tokens in training [b]
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.185***	0.076*	-0.126***	-0.126***	0.126***	0.126***
	(0.040)	(0.041)	(0.019)	(0.019)	(0.019)	(0.019)
High grant	-0.016	0.025**	-0.012*	-0.009	0.012*	0.009
	(0.010)	(0.011)	(0.006)	(0.007)	(0.006)	(0.007)
… X Female	0.009	0.019	0.013	0.013	-0.013	-0.013
	(0.013)	(0.014)	(0.008)	(0.009)	(0.008)	(0.009)
Training			0.006	0.000	-0.006	0.000
			(0.006)	(0.006)	(0.006)	(0.006)
… X Female			-0.018**	-0.010	0.018**	0.010
			(0.008)	(0.008)	(0.008)	(0.008)
Constant	0.649***	0.287***	0.615***	0.605***	0.385***	0.395***
	(0.054)	(0.058)	(0.035)	(0.034)	(0.035)	(0.034)
p-value for effect | Female = 1						
- High grant	0.589	0.001***	0.785	0.394	0.785	0.394
- Training			0.128	0.171	0.128	0.171
Nr of observations	3054	3054	6108	6108	6108	6108
R-squared (within)	0.0679	0.0401	0.1128	0.1063	0.1128	0.1063

[a] Observations include training choices A/B20-T and A/B50-T; [b] Observations include choices A20-B20, A50-B50, A/B20-T and A/B50-T. *Notes:* Linear model with household random effects and standard errors in parentheses clustered by community. We control for "Starts with high grant", "Business shown on left of choice sheet", and the interaction of these variables with "Female", as well as enumerator effects and whether the interview was conducted in the morning or in the afternoon. Stars denote coefficients significantly different from 0 at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

[16] Column (3) in Table 10 includes all observations that are included in Columns (5) and (6) of Table 9.

Summarizing, our results are indicative of a modest gender gap in investment preferences for non-farm income diversification. This gender gap prevails regardless of whether we increase access to either financial capital or to human capital. Preferences among both men and women are relatively insensitive to improving access to both financial or human capital, and increased access to human capital widens the gender gap rather than bridging it, as participants are more likely to invest in a training for the sector in which they perceive to be already more skilled than the other gender, i.e. crop farming for men, and other business activities for women. We conclude that participants prefer diversifying their investment choices into both crop farming and other businesses, instead of specialization, even when constraints to access financial and human capital are partly relaxed.

4.3 Other determinants of preferences for non-farm income diversification

Having ruled out differences in access to financial and human capital for crop farming as the main driver of the gender gap in preferences for non-farm diversification, we ask the question whether other variables can explain women's stronger preference for non-farm diversification relative to men. In Table 11, we therefore analyze to which extent the gender gap in allocations is correlated with participants' current occupation, socio-economic characteristics, risk and time preferences, perceptions of crop farming versus non-farm businesses, perceived skills, and gendered norms. In the first column, we show the results of a regression without additional explanatory variables, including only the first choice as a base of comparison. Columns (2) – (4) focus on the role of socio-economic characteristics as well as risk and time preferences. Columns (5) – (8) focus on the role of perceptions and norms.

In Column (1), the gender gap in allocations is 13.2 percentage points. This gap reduces to 10.8 percentage points in Column (2), which controls for current occupations, including a variable indicating whether the respondent is a plotholder and a variable to indicate whether s/he operates a business. The gender gap however remains statistically significant, meaning that existing occupations of participants cannot fully explain why women invest relatively more in non-farm diversification. Moreover, the effects of these control variables are not very strong: plotholders invest only 3.8 percentage points more in crop farming, and business operators reduce investments in crop farming by a mere 2.1 percentage points.

Table 11: Explaining the gender gap in respondents' first choice

	Dependent variable: share of tokens invested in crop farming							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Female	-0.132***	-0.108***	-0.114***	-0.100***	-0.081***	-0.074***	-0.038	-0.027
	(0.020)	(0.023)	(0.022)	(0.023)	(0.018)	(0.020)	(0.036)	(0.031)
High Grant	-0.019	-0.017	-0.017	-0.015	-0.022	-0.017	-0.021	-0.022
	(0.017)	(0.017)	(0.018)	(0.018)	(0.016)	(0.016)	(0.017)	(0.015)
… X Female	-0.003	-0.002	-0.004	-0.003	0.002	-0.003	-0.001	0.002
	(0.022)	(0.022)	(0.023)	(0.023)	(0.021)	(0.021)	(0.023)	(0.019)
Plotholder		0.038**		0.024				
		(0.019)		(0.019)				
Currently operates a business		-0.021**		-0.025**				
		(0.012)		(0.012				
Age			0.003***	0.003***				
			(0.001)	(0.001)				
Risk aversion				-0.006				
				(0.005)				
Risk loving (dummy)				-0.002				
				(0.020)				
Time preference				-0.002				
				(0.005)				
Farm characteristics score					0.035***			0.029***
					(0.002)			(0.002)
Farm skills						0.115***		0.062***
						(0.011)		(0.010)
Own gender is better at business							-0.038***	-0.013**
							(0.010)	(0.008)
Own gender is better at farming							0.020	0.007
							(0.015)	(0.013)
Constant	0.602***	0.575***	0.478***	0.473***	0.212***	0.512***	0.552***	0.212***
	(0.032)	(0.039)	(0.050)	(0.053)	(0.027)	(0.029)	(0.036)	(0.026)
Education & extension controls	No	No	Yes	Yes	No	No	No	No
p-value for effect high grant | Female = 1	0.160	0.188	0.194	0.224	0.165	0.172	0.155	0.141
Number of observations	1527	1527	1527	1520	1527	1527	1527	1527
R-squared (within)	0.1565	0.1539	0.1640	0.1628	0.3472	0.2376	0.1680	0.3666

Notes: Choices are limited to first choice made by the respondent. Linear model with household random effects and standard errors clustered by community, standard errors in parentheses. We control for "Business shown on left of choice sheet", interaction of this variable with "Female", enumerator effects, and whether the interview was conducted in the morning or in the afternoon. "Education & extension controls" represents a set of variables including "Education (in years)", "Received crop-related training in last 12 months", "Received livestock-related training in last 12 months", "Received business-related training in last 12 months", and "Number of interactions with extension officer in last 12 months". Stars denote coefficients significantly different from 0 at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Similarly, in Column (3), where we control for age, educational level, respondents' participation in training activities and contact with extension officers, the gender gap reduces slightly to 11.4 percentage points, but remains statistically significant. Only age is significant in explaining the allocation, but we do not find a significant impact of education, participation in any training activities. Even when combining all socio-economic explanatory variables, as well as risk and time preferences in Column (4), although observing a further reduction of the gender gap to 9.8 percentage points, we are unable to fully relate women's relative preference for non-farm diversification to socio-economic characteristics or economic preferences.

Columns (5) – (8), focusing on perceptions and norms, reveal smaller gender gaps. Controlling for positive perceptions about characteristics of crop farming reduces the gender gap to 8.1 percentage points in Column (5), and when respondents feel they have better skills for farming compared to other businesses, they invest a higher share into crop farming, reducing the gender gap to 7.4 percentage points in Column (6). In Column (7), we control for gender norms, i.e. whether a respondent thinks his/her own gender is better skilled in a given sector compared to the opposite gender. This renders the gender gap insignificant, which is driven by the negative association between the belief of who is better at running a business and investments in crop farming. Combining all variables that proxy for perceptions and norms in one analysis in Column (8) reduces the gender gap to a statistically insignificant 2.7 percentage points.

In a similar fashion, Table 12 associates the demand for *farm training* (as opposed to the share of tokens invested in farming) with socio-economic characteristics, perceptions and norms.[17] In Column (1), women are 18.4 percentage points less likely to choose farm training than men. The gender gap reduces to 12.4 percentage points in Column (2), where we control for respondents' current occupations. In Column (3), human capital is not a strong contributor to the gender gap in farm training demand. Although age of the farmer, having had a farm training in the past 5 years and contact with the extension agent in the past 12 months are all three significantly correlated with our outcome variable, controlling for these variables does not eliminate the gender gap, which remains significant at 17.2 percentage points. Combining the variables from Columns (2) and (3)

[17] Given that the gender gap in demand for business training is relatively small and significant only at $p < 0.10$ in Table 8, we refer the readers to Appendix Table B3 for similar regressions on business training.

along with risk and time preferences in Column (4) does not further reduce the gender gap compared to the estimate in Column (2).

Table 12: Explaining the gender gap in demand for farm training

	Dependent variable: person invests in crop farming training							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Female	-0.184***	-0.124***	-0.172***	-0.124***	-0.120***	-0.107**	-0.061	-0.047
	(0.041)	(0.043)	(0.043)	(0.045)	(0.041)	(0.044)	(0.084)	(0.083)
High Grant	-0.044	-0.041	-0.037	-0.031	-0.048**	-0.041	-0.046*	-0.046**
	(0.027)	(0.027)	(0.026)	(0.026)	(0.024)	(0.025)	(0.027)	(0.023)
… X Female	-0.015	-0.014	-0.017	-0.017	-0.008	-0.014	-0.013	-0.009
	(0.048)	(0.048)	(0.048)	(0.048)	(0.045)	(0.045)	(0.047)	(0.042)
Plotholder		0.100***		0.086***				
		(0.030)		(0.031)				
Operates a business		-0.026		-0.032				
		(0.027)		(0.027)				
Age			0.003**	0.002*				
			(0.001)	(0.001)				
Crop training in last 12 m			-0.003**	-0.003***				
			(0.001)	(0.001)				
# interactions w ext officer in last 12m			0.005**	0.004*				
			(0.003)	(0.003)				
Farm characteristics score					0.045***			0.036***
					(0.003)			(0.003)
Farm skills						0.154***		0.090***
						(0.016)		(0.017)
Own gender is better at business							-0.041*	-0.009
							(0.022)	(0.021)
Own gender is better at farming							0.033	0.014
							(0.035)	(0.036)
Constant	0.658***	0.574***	0.569***	0.536***	0.167***	0.537***	0.593***	0.170**
	(0.061)	(0.067)	(0.076)	(0.080)	(0.062)	(0.062)	(0.077)	(0.068)
Education	No	No	Yes	Yes	No	No	No	No
Preferences	No	No	No	Yes	No	No	No	No
p-value for effect | Female = 1								
High grant	0.094*	0.119	0.127	0.175	0.077*	0.096*	0.086*	0.072*
# observations	1527	1527	1527	1520	1527	1527	1527	1527
R-sq. (within)	0.0802	0.0829	0.0835	0.0854	0.1693	0.1339	0.0809	0.1863

Notes: Choices are limited to first choice made by the respondent. Linear model with household random effects and standard errors (in parentheses) clustered by community. We control for "Business shown on left of choice sheet", the interaction of this variable with "Female", enumerator effects and whether the interview was conducted in the morning or in the afternoon. "Education" includes "Education (in years)", "Received livestock-related training in last 12 months" and "Received business-related training in last 12 months". "Preferences" includes risk aversion, time preference, and an indicator for risk-loving participants. Stars denote coefficients significantly different from 0 at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

In Column (5), controlling for farmers' scoring of positive characteristics of crop farming, the observed gender gap in farm training demand is reduced to 12 percentage points, and the gap reduces further to 10.7 percentage points when controlling for whether the person believes s/he has better farm skills in Column (6). The gender gap reduces even further, to an insignificant 5.4 percentage points (p = 0.469) when controlling for whether the participant believes that his/her own gender is better at a respective sector in Column (7). Combining these variables in Column (8) renders the gender gap even smaller (4.7 percentage points) and again insignificant (p = 0.570).

Based on the share of tokens invested in crop farming in participants' first choice, as well as the demand for training, we conclude that the gender gap is mainly related to differences in perceived characteristics of crop farming versus other business activities, and by differences in the extent to which respondents believe to be better skilled in these two sectors. Controlling for these variables strongly reduces the estimated gender gap in preferences to a level at which the gender gap is no longer statistically distinguishable from zero, even though without controlling for these variables, a significant gender gap persists when increasing the level of financial capital as determined by the size of the investment grant, or when increasing the availability of human capital by providing access to training in both crop farming and other business activities.

4.4 Potential bias from limited understanding

Results could be biased in case participants did not fully understand the experimental tasks. In this section, we conduct a range of robustness checks to analyze whether our findings could be driven by a lack of understanding of the experimental tasks. First, to assess whether participants understood the set-up of the choice cards, we analyze to what extent they make different allocations when they are choosing an allocation for their spouse compared to when they are allocating the tokens between crop farming and other business for themselves. Based on the strong gender stereotyping, we would expect that female respondents would prefer their husbands to allocate a larger share to crop farming than they allocate to crop farming themselves; whereas male respondents would prefer their wives to allocate a larger share to other businesses than they themselves allocate to other business; unless participants are inert and do not shift their allocations towards the preferred sector for their spouse.

To analyze this, we estimate in Table 13 a random effects model for the share of the grant allocated to crop farming, including only the first choice and the spouse choice, which were identical except

for the latter asking about allocations that respondents would prefer their spouses to make. Column (1) includes all participants; Column (2) includes those whose tokens were worth 20 GHS each; and Column (3) includes participants with tokens worth 50 GHS each. In the first choice, women allocate a significant 14.6 percentage points less to crop farming. When men make an allocation for their wife, they allocate even less—21.6 percentage points—to crop farming. Vice versa, women allocate significantly more to crop farming when choosing an allocation for their husbands. This indicates that both men and women significantly shift their allocations towards gender stereotypical investments when choosing for their spouse. This a first indication of the insensitivity to experimental treatments not being driven by a lack of understanding.

Table 13: Gap in own investment preferences (1st choice) versus preferred allocation for spouse

	Dependent variable: Share of investment grant allocated to crop farming		
	All choices	A20-B20	A50-B50
	(1)	(2)	(3)
Female	-0.146***	-0.142***	-0.135***
	(0.019)	(0.026)	(0.020)
Allocation for spouse	-0.216***	-0.201***	-0.232***
	(0.013)	(0.016)	(0.019)
… X Female	0.421***	0.409***	0.433***
	(0.021)	(0.032)	(0.026)
Constant	0.609***	0.607***	0.578***
	(0.031)	(0.038)	(0.030)
Number of observations	2918	1484	1434
R-squared (within)	0.2819	0.2725	0.2928

Notes: Linear model with household random effects and standard errors in parentheses clustered by community. We control for "Business shown on left of choice sheet", the interaction of this variable with "Female", whether the interview was conducted in the morning or in the afternoon and enumerator effects. In Column (1), we also control for "Starts with high grant" and its interaction with "Female". Stars denote coefficients significantly different from zero at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

As a second indication, upon completion of the experimental task, enumerators were asked to which extent they agreed that the participant had understood the instructions. Enumerators reported their perception of a participant's understanding on a scale from 1 (strongly disagree) to 4 (strongly agree). Only in 0.9% of the cases (a total of eleven participants), the enumerator either disagreed strongly or disagreed. In Appendix Table B4, we control for a dummy variable indicating these eleven participants as well as its interaction with the dummy variable indicating female

respondents, to correct for potential imbalance of understanding across men and women. The estimated gender gap in preferences for non-farm income diversification, as well as the effects of increasing the investment value per token or offering training, do not change compared to the estimates presented in Table 9.

These enumerator perceptions display limited variation, could present an overly positive view of respondent understanding if enumerators believed that supervisors would use the perceptions to assess their performance, could exhibit gender biases, and may in fact have been based on how the participant responded to the introduction of training and the increase in the grant value. As another robustness check, we therefore use alternative proxies that potentially signal limited understanding, and test whether they significantly impact responses through interaction effects and subgroup analyses. To start, we study whether results differ depending on the extent to which a participant has completed any education (Appendix Table B5). Next, we focus on respondents who chose to allocate an equal number of tokens in both sectors in their first choice, which may be considered a potential signal for participants with limited understanding (Appendix Table B6). Finally, we single out so-called inert respondents, i.e. respondents with interior allocations that did not vary throughout the first four choice sets (Appendix Table B7).

Restricting ourselves to participants with education in Table B5, the estimated gender gap in the share invested in crop farming in the base choice (in which tokens are worth 20 GHS) does remain significant and comparable to estimates in Table 9. In Tables B6 and B7, the estimated gender gap becomes more pronounced, but the difference never exceeds more than 18 percentage points, suggesting that limitations in understanding cannot explain why the estimated gender gap is smaller than expected a priori. Although an increase in grant value and the introduction of training has similar effects in Tables B6 and B7 as in Table 9, we do find differences in Table B5. Increasing the value of tokens invested in agriculture (Column 3) or tokens invested in other business (Column 4) does not have a significant effect among the more educated subsample, suggesting that the weak response to these treatments is not driven by a lack of understanding.

In sum, enumerators' direct assessment of their respondents' understanding of the choice task and the observation of different and gender-sensitive allocations in the spouse choices are indicative of most respondents understanding the choice task. Moreover, our main findings are robust to

limiting the sample to respondents that are more likely to fully understand the experimental set-up. We therefore do not expect that problems of misunderstanding severely biased our results.

5. Discussion and conclusion

Many rural development programs aim to improve women's economic empowerment in agriculture, but commercial agriculture often remains stereotyped as a male-dominated activity. In this paper, we studied whether men versus women prefer investing in crop farming versus other self-employment activities and analyze whether gender differences in preferences for non-farm diversification, if any, can be ascribed to differences in access to human and financial capital. In addition, we study to what extent choices can be explained by existing occupations, demographics and skills, versus perceptions and social norms. We studied these questions by means of a framed field experiment with 1,527 participants in two different regions in Ghana, in which we informed participants that they could be randomly selected to receive an investment grant in the form of inputs for crop farming, other businesses, or both; and we asked them to make a binding choice on how to invest this grant in case of being selected.

We found that there exist clear gender norms which dictate that women should, and are better at, running other businesses, while men are better at crop farming. Women indeed did allocate a significantly larger portion of the grant towards other business activities compared to men, and when men invested in other businesses, they were more likely to invest in livestock rearing (47%) while women invested more often in trading of agricultural products (44%), non-agricultural products (18%) and food processing activities (18%). These gaps were however not as large as expected a priori, given strong preferences for diversification among both men and women, even when diversification implied forgoing resources in a sector where the investment grant would have been relatively larger.

We ruled out that women's relative preference for non-farm diversification is driven by their limited access to financial or human capital in crop farming. Expanding access to financial capital did not affect the share of the investment grant that women allocated to crop farming, leaving the gender gap in crop farming investments unaffected. Further, we found a higher demand for training among men compared to women and introducing trainings widened the gender gap rather than closing it, as men were more likely to invest in farm training, while women were more likely to invest in business training. It is important to note, though, that neither type of training could be

classified as a specific male or female domain; a significant number of both men and women invested in farm training, and likewise, large numbers of both genders invested in other business training. Finally, the provision of this opportunity to expand human capital led to only small changes in investment preferences for farm and off-farm inputs.

In the experiment, increasing investment grants for only one type of activity also had limited effects on allocations. Men and women sacrificed significant financial resources by investing in both crop farming and other business activities, even when one of these activities yielded substantially lower investment grants. Social norms and gender stereotyping of crop farming as a male-dominated activity likely cause disutility from investments in crop farming to women. Consistent with this theory, we ascribed gender differences in preferences to differences in beliefs and preferences related to characteristics and gendered perceptions related to the different sectors. For instance, men associated more positive attributes to crop farming, whereas women associated more positive attributes to other business opportunities. Further, both men and women believed that men are more skilled in crop farming while women are more skilled in other businesses. Men also ranked themselves more skilled than others in crop farming, while women ranked themselves more skilled in other business activities. These gender differences in perceptions explained a large share of the gender gap in preferences for non-farm income diversification.

Our findings hold several lessons for policy makers and donor organizations. First, although gender norms strongly favor women's engagement in non-farm business activities and men's engagement in farming activities, these norms are not strictly enforced in practice, and both men and women value a diversity of income-generating activities. Thus, policies that improve women's ability to access both farm and non-farm assets, thereby strengthening women's empowerment in both land-intensive crop farming activities and in other business activities that do not require access to land, would not be misplaced. However, in designing such policies, it is important to note that we do observe strong gender differences in the types of non-farm businesses in which participants invest. Empowering rural communities through both farm and non-farm income diversification is hence not by definition gender-neutral; the targeted types of non-farm businesses will determine the extent to which a program appeals to men, women, or both.

Second, both men and women valued vocational training and were willing to forego a significant part of their in-kind grant to receive such training. At the same time, while increasing human

capital is often considered critical in stimulating investments in either agriculture or non-farm diversification, offering vocational training did not have significant effects on preferences between sectors, and did not lead to increased specialization of activities. Moreover, the gender gap in both investment and training preferences was associated with perceptions of men being more skilled at crop farming and women being more skilled in non-farm business activities. This finding suggests that when offering trainings for crop farming to improve women's empowerment in agriculture, it is important, from a gender perspective, to accompany such interventions with policies that debunk gender stereotypes and perceptions of men being more skilled at crop farming.

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Appendix A – Conceptual Framework

This appendix describes a model for the choices that participants are making in the experiment. We introduce a basic model for investments in capital (which can be either human or physical) for crop farming and other businesses. We assume that investments face diminishing marginal returns. This model feature can explain why participants diversify investment in both sectors. We will show that it can also explain why we see a limited response to an increase in the supply of financial capital (i.e. an increase in the value of tokens), explaining why choices are not very responsive to our experimental parameters even when the increase in the supply of financial capital is only applicable for one sector, and we would intuitively expect participants to shift their allocations into the sector where more start-up capital is available.[18]

Consider an individual who maximizes income from farming and other activities by investing k_F units of a 12-token investment grant, worth p_F GHS per token, in land-intensive (tree) crop farming, and k_O units of this grant, worth p_O GHS per token, in other activities, which do not require land as a primary input, but which can potentially leverage existing investments in other businesses.[19] Denote the amount of land available for (tree) crop farming as $L \geq 0$, the amount of capital already invested in other businesses as $K \geq 0$, the amount of capital from the experimental grant invested in (tree) crop farming as $x_F = k_F p_F$, and the amount of capital from the experimental grant invested in other activities as $x_O = k_O p_O$. Income generated from the investment grant of 12 tokens is:

$$Y = f(x_F; L) + g(x_O; K), \qquad x_j = k_j p_j, \qquad k_F + k_O = 12$$

where $f(\cdot)$ and $g(\cdot)$ are twice differentiable, increasing and concave production functions. Note that we interpret the amount of land available for (tree) crop farming and the amount of capital invested in other businesses as predetermined variables, and abstract from investments beyond the 12-token grant given to participants in the experiment; we assume that land and capital invested in other businesses will influence the shape of the production function, determining decisions in the experiment, but that allocations in the experiment do not affect the base allocation for households' own capital, rather that the grant from the

[18] We abstract from risk and self-insurance as an explanation for diversification, or from the asymmetry in how investments in crop farming versus other business increase individual income: one could argue that investments in crop farming increase someone's control over joint crop farming income as well as the output from crop farming itself, whereas investments in other businesses increase someone's private income.

[19] We will not model a household in which two members receive the experimental grant. Only one man and one woman from 20 households surveyed in the community would win the grant. Thus, the probability of both husband and wife winning the grant was 2.5%.

experiment are treated as additional resources that does not lead to a shift in a household's investment allocation.[20]

The FOC that needs to be satisfied in an optimum is:

$$f'(x_F; L)p_F - g'(x_O; K)p_O \geq 0$$

First suppose the returns to capital are constant, $f''(x; L) = g''(x; K) = 0$, so that $f'(x; L) = f'(x_F; L)$ and $g'(x_O; K) = g'(x; K)$ for all $\in [0,12]$, then there is no interior solution. The decision-maker invests in the sector with the highest returns to capital, which is land-intensive (tree) crop farming if $f'(x; L)p_F > g'(x; K)p_O$, other activities if $g'(x; K)p_O > f'(x; L)p_O$, and we *may* obtain an interior solution with diversification between land-intensive (tree) crop farming and other activities if and only if $f'(x; L)p_F = g'(x; K)p_O$; although the decision-maker will be indifferent between interior solutions and the corner solutions in that case.

Instead, we assume that the returns to capital are decreasing, $f''(x; L), g''(x; K) < 0$. In that case, an interior solution exists if and only if,

$$f'(12; L)p_F - g'(0; K)p_O < 0 < f'(0; L)p_F - g'(12; K)p_O,$$

and this solution is characterized by the following FOC in which the decision-maker equalizes the marginal return on units invested in the two types of activities:

$$f'(x_F; L)p_F - g'(x_O; K)p_O = 0 \Leftrightarrow k_F = \phi(p_F, p_O; L, K, \mathbf{z})$$

whereby $\phi(\cdot)$ is the function that represents the solution to the decision-making problem, i.e. it maps several parameters onto the optimal number of experimental tokens to be invested in (tree) crop farming. This number will depend on the value of tokens invested in farming, p_F, the value of tokens invested in other business, p_O, the amount of land that the household can access in agricultural production, L, the amount of capital that the household has invested in other business, K, and $\mathbf{z}$, a vector of parameters that characterize the marginal returns $f'(\cdot)$ and $g'(\cdot)$. These factors may vary between men and women. Specifically, we assume that the relative returns to investment in crop farming compared to the investment in other businesses are higher for men compared to women: men are relatively more productive than women in crop farming, whereas women are relatively more productive than men in other businesses:[21]

[20] We also assume that there is no wage work through which individuals can earn money. Less than 1% of the participant sample reported earning wage income.

[21] This could be because men have better access to land than women, $L_m \geq L_w$ when marginal returns to capital invested in (tree) crop farming are increasing in the amount of land, $\partial f'(x_F; L)/\partial L > 0$, or because women already

$$\frac{f'_m(x_F;L)}{g'_m(12-x_F;K)} > \frac{f'_w(x_F;L)}{g'_w(12-x_F;K)} \; \forall \, x_F \in \{0,12\}, L, K \geq 0$$

In the first two choices in the experiment, the value of tokens invested in (tree) crop farming is the same as the value of tokens invested in other activities, $p_O = p_F$, meaning that the marginal productivity in the two activities is equalized, $f'(x_F;L) = g'(x_O;K)$. By the assumption above, we can write for any optimal amount invested in crop farming by women, x_F^w:

$$1 = \frac{f'_w(x_F^w;L^w)}{g'_w(x_O^w;K^w)} = \frac{f'_m(x_F^m;L^m)}{g'_m(x_O^m;K^m)} > \frac{f'_w(x_F^m;L^m)}{g'_w(x_O^m;K^m)} \Leftrightarrow x_F^w < x_F^m \Leftrightarrow k_F^w < k_F^m$$

Thus, under the assumptions above, men will invest more tokens in crop farming, and fewer tokens in other business, compared with women, so that $f'_m(x_F^m;L) = g'_m(x_O^m;K)$, and the difference will be more pronounced among households with greater inequalities between men and women in landholdings and prior capital investments in other businesses.

Differentiating the FOC with respect to the value per token invested indicates how the low-stakes allocation, with $p = 20$, will differ from the high-stakes allocation, with $p = 50$:

$$f'(x_F;L) + pf''(x_F;L)\left(k_F + \frac{\partial k_F}{\partial p}p\right) - g'(x_O;K) - pg''(x_O;K)\left(k_O - \frac{\partial k_F}{\partial p}p\right) = 0$$

$$\frac{\partial k_F}{\partial p} = \frac{f'(x_F;L) - g'(x_0;K) + x_F f''(x_F;L) - x_O g''(x_O;K)}{-p^2\left(f''(x_F;L) + g''(x_O;K)\right)} = \frac{k_F f''(x_F;L) - k_O g''(x_O;K)}{-p\left(f''(x_F;L) + g''(x_O;K)\right)}$$

whereby the latter equality follows from the FOC $f'(x_F;L) = g'(x_O;K)$. Because the denominator is strictly positive, the sign of the numerator will determine whether an increase in the value per token will increase or decrease the number of tokens invested in farming. This will depend on the initial allocation, k_F/k_O (the higher the initial allocation to other activities, the more the farmer will allocate towards farming under increased prices), and on the extent to which an activity exhibits decreasing marginal returns, with the activity with returns diminishing relatively slower receiving a larger allocation. Given our assumption that men invest more in (tree) crop farming, we thus expect a greater response to an increase in the overall value per token by women, yet this might be offset in case men exhibit much slower declines in relative returns from farming compared to other businesses.

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have invested more in businesses, when marginal returns to capital invested in other activities are increasing in the amount of capital already invested in other business, $\partial g'(x_O;K)/\partial K > 0$.

In the second set of choices, the value of tokens invested increases only for one activity, either (tree) crop farming or other activities. Differentiating the FOC with respect to p_F yields the following equation:

$$f'(x_F; L) + p_F f''(x_F; L)\left(k_F + \frac{\partial x_F}{\partial p_F} p_F\right) + p_O^2 g''(x_O)\frac{\partial x_F}{\partial p_F} = 0$$

$$\frac{\partial x_F}{\partial p_F} = \frac{f'(x_F; L) - x_F\left(-f''(x_F; L)\right)}{-(f''(x_F; L)p_F^2 + g''(x_O)p_O^2)}$$

In words, an increase in the value of tokens invested in farming will increase the number of tokens invested in farming more if the marginal productivity of farming investments is high, the initial level of investments in farming is relatively low, and the absolute value of the second derivative, i.e. the extent to which marginal returns from investments in farming are diminishing, is not too large.

Likewise, we can derive an expression for the response in tokens invested in farming with respect to an increase in the price of other activities:

$$p_F^2 f''(x_F; L)\frac{\partial x_F}{\partial p_O} - g'(x_O) - p_O g''(x_O)\left(k_O - \frac{\partial x_F}{\partial p_O} p_O\right) = 0$$

$$\frac{\partial x_F}{\partial p_O} = \frac{-\left(g'(x_O) - x_O\left(-g''(x_O)\right)\right)}{-(f''(x_F; L)p_F^2 + g''(x_O)p_O^2)}$$

In words, an increase in the value of tokens invested in other activities will reduce the number of tokens invested in farming more if the marginal productivity of other investments is high, the initial level of investments in other activities is relatively low, and the absolute value of the second derivative, i.e. the extent to which marginal returns from investments in other activities are diminishing, is not too large.

Appendix B – Additional Figures and Tables

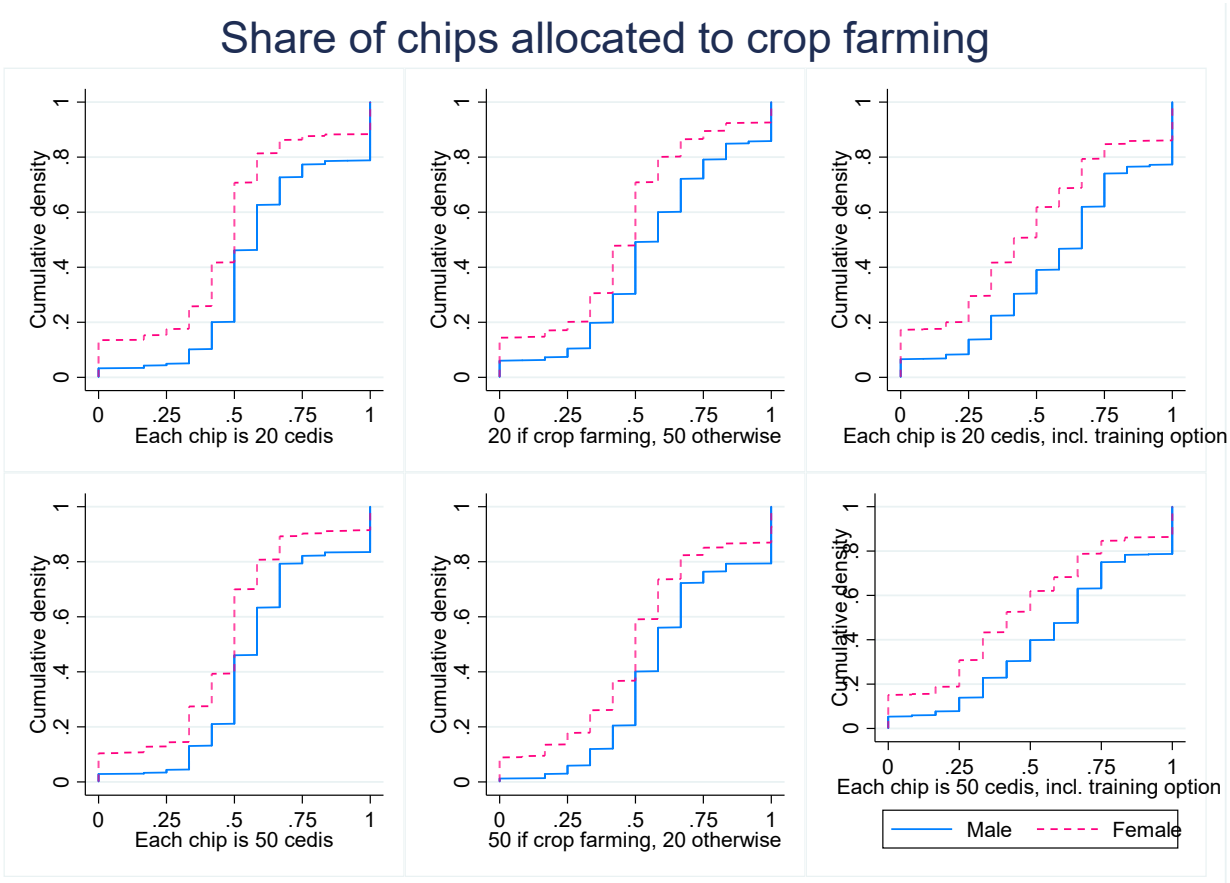

Figure B1: Cumulative density of share allocated to crop farming by gender for each choice

Table B1: Components of score of positive characteristics of crop farming

Question		Value	Men	Women	
Which one will give you the highest profits in case of a normal harvest?	Other business	0	0.305	0.413	***
	Indifferent	1	0.164	0.200	**
	Crop farming	2	0.531	0.387	***
Which one will give you the highest profits in case of a good harvest?	Other business	0	0.167	0.205	**
	Indifferent	1	0.077	0.123	***
	Crop farming	2	0.756	0.672	***
Which one will give you the highest profits in case of a bad harvest?	Other business	0	0.599	0.677	***
	Indifferent	1	0.087	0.099	
	Crop farming	2	0.314	0.223	***
Which one helps you better to pay for day to day expenditures?	Other business	0	0.517	0.601	***
	Indifferent	1	0.111	0.137	**
	Crop farming	2	0.372	0.263	***
Which one helps you better to pay for school expenditures?	Other business	0	0.253	0.306	***
	Indifferent	1	0.159	0.168	
	Crop farming	2	0.589	0.527	***
Which one is riskier in terms of how much income you earn?	Other business	2	0.539	0.464	***
	Indifferent	1	0.111	0.169	***
	Crop farming	0	0.350	0.367	
Which one is more tiring?	Other business	2	0.072	0.054	
	Indifferent	1	0.022	0.061	***
	Crop farming	0	0.906	0.884	
For which one can others better estimate how much money you make?	Other business	2	0.295	0.323	*
	Indifferent	1	0.152	0.155	
	Crop farming	0	0.553	0.522	**
For which one do you have more control over how the money is spent?	Other business	0	0.186	0.411	***
	Indifferent	1	0.174	0.182	*
	Crop farming	2	0.640	0.408	***
Number of observations			728	799	

Notes: Stars denote significant gender differences in a two-sided *t*-test using clustered standard errors at community level at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table B2: Gender gap in crop farming, livestock and non-farm business (first choice only)

	Dependent variable: share of tokens invested in …		
	Crop farming	Livestock	Non-farm business
	1	**2**	**3**
Female	-0.132***	-0.162***	0.295***
	(0.020)	(0.016)	(0.027)
High grant	-0.019	-0.052***	0.071***
	(0.017)	(0.019)	(0.021)
… X Female	-0.003	0.054***	-0.051**
	(0.022)	(0.018)	(0.024)
Constant	0.602***	0.157***	0.241***
	(0.032)	(0.020)	(0.038)
p-value for effect | Female = 1			
High grant	0.160	0.786	0.185
Number of observations	1527	1527	1527
R-squared (within)	0.1565	0.2640	0.3986

Notes: Choices are limited to first choice made by the respondent. Linear model with household random effects and standard errors clustered by community, standard errors in parentheses. We control for "Business shown on left of choice sheet" and the interaction of this variable with "Female", as well as enumerator effects and whether the interview was conducted in the morning or in the afternoon. Stars denote coefficients significantly different from 0 at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table B3: Explaining the gender gap in demand for non-farm business training

	Dependent variable: person invests in non-farm business training							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Female	0.068*	0.027	0.048	0.024	0.003	-0.001	-0.12	-0.137*
	(0.041)	(0.046)	(0.042)	(0.046)	(0.041)	(0.045)	(0.080)	(0.079)
High Grant	-0.016	-0.018	-0.026	-0.031	-0.011	-0.018	-0.013	-0.012
	(0.031)	(0.031)	(0.031)	(0.031)	(0.027)	(0.030)	(0.032	(0.027)
… X Female	0.093**	0.092**	0.098**	0.099**	0.086**	0.092**	0.093**	0.089**
	(0.043)	(0.043)	(0.043)	(0.044)	(0.042)	(0.041)	(0.043)	(0.040)
Plotholder		-0.067**		-0.037				
		(0.033)		(0.032)				
Currently operates a business		0.027		0.038				
		(0.025)		(0.025)				
Age			-0.005***	-0.005***				
			(0.001)	(0.001)				
Education (years)			0.010***	0.009***				
			(0.004)	(0.004)				
Crop training in last 12 m			0.004***	0.004***				
			(0.001)	(0.001)				
Livestock training in last 12 m			-0.006**	-0.006**				
			(0.003)	(0.003)				
Business training in last 12 m			0.002	0.002				
			(0.003)	(0.003)				
# interactions w ext officer in last 12m			-0.004	-0.004				
			(0.003)	(0.003)				
Risk Aversion				0.019**				
				(0.010)				
Risk Loving				0.058				
				(0.045)				
Time Preference				0.012				
				(0.012)				
Farm characteristics score					-0.045***			-0.038***
					(0.003)			(0.003)
Farm skills						-0.138***		-0.068***
						(0.017)		(0.017)
Own gender is better at business							0.051**	0.020
							(0.024)	(0.021)
Own gender is better at farming							-0.061*	-0.047
							(0.034)	(0.036)
Constant	0.307***	0.358***	0.460***	0.439***	0.803***	0.414***	0.406***	0.842***
	(0.061)	(0.068)	(0.074)	(0.082)	(0.069)	(0.064)	(0.076)	(0.077)
p-value for effect | Female = 1								
High grant	0.029**	0.038**	0.036**	0.051*	0.024**	0.027**	0.021**	0.015**
# observations	1527	1527	1527	1520	1527	1527	1527	1527
R-squared (within)	0.0504	0.0489	0.0546	0.0515	0.1044	0.1091	0.0533	0.1167

Notes: Choices are limited to first choice made by the respondent. Linear model with household random effects and standard errors clustered by community, standard errors in parentheses. We control for "Business shown on left of choice sheet" and the interaction of this variable with "Female", as well as enumerator effects and whether the interview was conducted in the morning or in the afternoon. Stars denote coefficients significantly different from 0 at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table B4: Robustness check controlling for respondents' understanding of choice task

	A20-B20	A20-B20 vs. A50-B50	A20-B20 vs. A50-B20	A20-B20 vs. A20-B50	A20-B20 vs. A/B20-T	A50-B50 vs. A/B50-T
	1	**2**	**3**	**4**	**5**	**6**
Female	-0.128***	-0.131***	-0.113***	-0.120***	-0.131***	-0.104***
	(0.022)	(0.020)	(0.019)	(0.021)	(0.022)	(0.017)
High grant		-0.019**	0.013	-0.040***		
		(0.008)	(0.008)	(0.014)		
… X Female		0.021*	0.024*	0.019		
		(0.012)	(0.012)	(0.014)		
Training					0.000	0.015**
					(0.007)	(0.007)
… X Female					-0.010	-0.026**
					(0.012)	(0.010)
Did not understand	0.006	0.019	0.022	0.178*	0.005	-0.055
	(0.090)	(0.093)	(0.057)	(0.101)	(0.083)	(0.123)
… X Female	0.044	0.021	-0.002	-0.092	0.019	0.060
	(0.132)	(0.094)	(0.090)	(0.111)	(0.109)	(0.058)
… X High grant		-0.061	-0.125**	-0.106		
		(0.081)	(0.055)	(0.102)		
… X Training					-0.192***	-0.084
					(0.062)	(0.084)
Constant	0.606***	0.613***	0.572***	0.629***	0.614***	0.599***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.037_	(0.034)
p-value for effect | Female = 1						
- High grant		0.778	0.001***	0.028**		
- Training					0.393	0.173
p-value for joint significance of interaction of did not understand with						
- Design effects	0.357	0.009***	0.239	0.138	0.674	0.061**
No. of Obs.	1527	3054	3054	3054	3054	3054
R-squared (within)	0.1608	0.1309	0.115	0.1189	0.1255	0.1168

Notes: Linear model with household random effects and standard errors in parentheses clustered by community. We control for "Starts with high grant", "Business shown on left of choice sheet", the interaction of these two variables with "Female" and "Did not understand", as well as enumerator effects and whether the interview was conducted in the morning or in the afternoon. Stars denote coefficients significantly different from zero at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table B5: Robustness check controlling for education of respondents

	A20-B20	A20-B20 vs. A50-B50	A20-B20 vs. A50-B20	A20-B20 vs. A20-B50	A20-B20 vs. A/B20-T	A50-B50 vs. A/B50-T
	1	**2**	**3**	**4**	**5**	**6**
Female	-0.114***	-0.119***	-0.094***	-0.108***	-0.113***	-0.098***
	(0.027)	(0.026)	(0.023)	(0.028)	(0.028)	(0.026)
High grant		-0.021**	-0.009	-0.017		
		(0.009)	(0.010)	(0.013)		
… X Female		0.020*	0.018	0.025*		
		(0.012)	(0.012)	(0.014)		
Training					-0.008	0.018*
					(0.011)	(0.010)
… X Female					-0.012	-0.025**
					(0.012)	(0.010)
No education	0.015	0.038	0.009	0.049**	0.033	0.055*
	(0.026)	(0.026)	(0.025)	(0.025)	(0.030)	(0.031)
… X Female	-0.025	-0.026	-0.031	-0.031	-0.035	-0.021
	(0.022)	(0.024)	(0.020)	(0.023)	(0.025)	(0.030)
… X High grant		0.004	0.043***	-0.048***		
		(0.010)	(0.013)	(0.011)		
… X Training					0.013	-0.008
					(0.017)	(0.011)
Constant	0.599***	0.600***	0.573***	0.610***	0.608***	0.581***
	(0.035)	(0.037)	(0.036)	(0.037)	(0.040)	(0.038)
p-value for effect | Female = 1						
High grant		0.924	0.371	0.449		
Training					0.245	0.477
p-value for joint significance of interaction with no education						
- design effects	0.297	0.813	0.455	0.873	0.874	0.605
No. of Obs.	1527	3054	3054	3054	3054	3054
R-squared (within)	0.1633	0.2966	0.1198	0.1235	0.1275	0.1179

Notes: Linear model with household random effects and standard errors in parentheses clustered by community. We control for "Starts with high grant", "Business shown on left of choice sheet", the interaction of these two variables with "Female" and "No education", as well as enumerator effects and whether the interview was conducted in the morning or in the afternoon. Stars denote coefficients significantly different from zero at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table B6: Robustness check controlling for respondents choosing an equal allocation in the first choice

	A20-B20	A20-B20 vs. A50-B50	A20-B20 vs. A50-B20	A20-B20 vs. A20-B50	A20-B20 vs. A/B20-T	A50-B50 vs. A/B50-T
	1	**2**	**3**	**4**	**5**	**6**
Female	-0.177***	-0.175***	-0.153***	-0.162***	-0.177***	-0.140***
	(0.025)	(0.022)	(0.022)	(0.023)	(0.024)	(0.019)
High grant		-0.019**	0.010	-0.040***		
		(0.008)	(0.008)	(0.015)		
… X Female		0.021*	0.023*	0.019		
		(0.012)	(0.012)	(0.014)		
Training					-0.003	0.011
					(0.008)	(0.008)
… X Female					-0.010	-0.026**
					(0.012)	(0.010)
Equal allocation in 1st choice	-0.148***	-0.118***	-0.118***	-0.134***	-0.135***	-0.106***
	(0.018)	(0.021)	(0.019)	(0.020)	(0.021)	(0.020)
… X Female	0.168***	0.151***	0.137***	0.137***	0.159***	0.126***
	(0.024)	(0.020)	(0.019)	(0.020)	(0.025)	(0.023)
… X High grant		-0.002	0.011	-0.002		
		(0.009)	(0.012)	(0.013)		
… X Training					0.006	0.010
					(0.016)	(0.014)
Constant	0.660***	0.658***	0.616***	0.679***	0.665***	0.638***
	(0.036)	(0.036)	(0.036)	(0.037)	(0.040)	(0.036)
p-value for effect | Female = 1						
- High grant		0.785	0.006***	0.055*		
- Training					0.259	0.116
p-value for joint significance of interaction of equal allocation in 1st choice						
- design effects	0.171	0.785	0.711	0.145	0.118	0.668
No. of Obs.	1527	3054	3054	3054	3054	3054
R-squared (within)	0.1769	0.1489	0.1291	0.1296	0.1402	0.1275

Notes: Linear model with household random effects and standard errors in parentheses clustered by community. We control for "Starts with high grant", "Business shown on left of choice sheet", the interaction of these two variables with "Female" and "Equal allocation in first choice", as well as enumerator effects and whether the interview was conducted in the morning or in the afternoon. Stars denote coefficients significantly different from zero at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table B7: Robustness check controlling for inert respondents

	A20-B20	A20-B20 vs. A50-B50	A20-B20 vs. A50-B20	A20-B20 vs. A20-B50	A20-B20 vs. A/B20-T	A50-B50 vs. A/B50-T
	1	**2**	**3**	**4**	**5**	**6**
Female	-0.145***	-0.145***	-0.127***	-0.137***	-0.145***	-0.118***
	(0.023)	(0.021)	(0.021)	(0.022)	(0.024)	(0.019)
High grant		-0.020**	0.016*	-0.045***		
		(0.008)	(0.009)	(0.015)		
… X Female		0.021*	0.024**	0.018		
		(0.012)	(0.012)	(0.014)		
Training					-0.001	0.011
					(0.008)	(0.007)
… X Female					-0.010	-0.026**
					(0.012)	(0.010)
Inert respondent	-0.090***	-0.081***	-0.066***	-0.096***	-0.102***	-0.106***
	(0.025)	(0.023)	(0.024)	(0.022)	(0.027)	(0.025)
… X Female	0.117***	0.102***	0.100***	0.114***	0.101***	0.103***
	(0.021)	(0.023)	(0.023)	(0.021)	(0.028)	(0.029)
… X High grant		0.009	-0.030***	0.035***		
		(0.006)	(0.010)	(0.011)		
… X Training					0.002	0.021
					(0.018)	(0.013)
Constant	0.625***	0.630***	0.588***	0.650***	0.635***	0.619***
	(0.034)	(0.033)	(0.034)	(0.034)	(0.037)	(0.034)
p-value for effect | Female = 1						
High grant		0.947	0.001***	0.013**		
Training					0.353	0.088
p-value for joint significance of interaction with inert respondent						
- design effects	0.295	0.609	0.158	0.451	0.869	0.959
No. of Obs.	1527	3054	3054	3054	3054	3054
R-squared (within)	0.1654	0.134	0.1215	0.1021	0.1287	0.1207

Notes: Linear model with household random effects and standard errors in parentheses clustered by community. We control for "Starts with high grant", "Business shown on left of choice sheet", the interaction of these two variables with "Female" and "Inert respondent", as well as enumerator effects and whether the interview was conducted in the morning or in the afternoon. Stars denote coefficients significantly different from zero at * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

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www.ifpri.org

IFPRI HEADQUARTERS
1201 Eye Street, NW
Washington, DC 20005 USA
Tel.: +1-202-862-5600
Fax: +1-202-862-5606
Email: ifpri@cgiar.org