Control over future payouts and willingness to pay for insurance:

Experimental evidence from Kenyan farmers

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Control over future payouts and willingness to pay for insurance: Experimental evidence from Kenyan farmers

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1 Introduction

The Kenyan economy relies heavily on its agricultural sector. Agriculture contributes 22.4 percent of the country's GDP, with a majority of the producers being smallholder farmers (KNBS, 2022). This leaves both the economy and the farmers who make up the economic base facing significant risk. Shock events in the recent past underscore this truth. Notably, Kenya experienced significant drought events in 2008-2011 (MOALF, 2021), 2016-2017 (Uhe et al., 2018), and 2020-2022 (FAO, 2021). Such shocks have immediate and lasting effects on farmer well-being (Rosenzweig and Binswanger, 1993; Carter, 1997; Morduch, 1995; Hoddinott, 2006; Janzen and Carter, 2019; Malacarne and Paul, 2022), underscoring the pressing need to strengthen the resilience of smallholder farmers.

The increased incidence of drought has made it even more crucial that farmers have tools to transfer the risks they face to financial markets. Financial inclusion (e.g. bank account ownership, access to formal credit markets, access to insurance markets, mobile money coverage) among vulnerable rural populations, however, is often low (Lotto, 2022). Innovations in the design and provision of financial technologies have sought to make tools more accessible to smallholder farmers for whom existing products were not available or were prohibitively expensive. These efforts often make use of information and communications technologies to reduce the cost of offering products and to extend their reach into more distant communities (Benami and Carter, 2021).

One prominent tool in the effort to increase the resilience of smallholding farmers is agricultural insurance. Agricultural insurance is available in a variety of forms in Kenya, including conventional, loss-verified contracts and index-based contracts linked to rainfall or remotely-sensed indices. Uptake, however, remains low. Less than one percent of farmers were reported to have agricultural insurance in 2020 and only eight companies were offering agricultural insurance in Kenya, despite all general insurers having the licenses to do so (KNBS, 2022).

This does not make Kenya unique. Agricultural insurance products designed with smallholding farmers in mind, particularly index insurance products, have expanded rapidly in recent decades. Jensen and Barrett (2017), however, note that, despite covering millions of farm households across more than a dozen countries, demand for index insurance products tends to be low, reliant on subsidies, and price sensitive. In addition, the design and delivery mechanisms of most existing agricultural insurance schemes limit uptake among women, as well as their ability to benefit from these schemes (Timu and Kramer, 2023). To design insurance products in such a way that they benefit both men and women, it is crucial to understand how insurance demand is impacted by product attributes that could make it more gender-responsive.

We contribute to our understanding of demand for agricultural insurance in a number of ways. First, we

use data from a set of Becker-DeGroot-Marschak auctions (Becker, DeGroot and Marschak, 1964) to estimate willingness to pay (WTP) for an agricultural insurance product among a population of smallholding farmers in which the product is well-known and commercially available. While only 18% of participants report having had agricultural insurance in the past, around half of the sample exhibit a WTP in the vicinity of the commercial price of agricultural insurance in the region where the study takes places.

Second, we estimate the effect of an important design element – payout recipient and method – on WTP for insurance. Our experimental auction involves three products that differ in who controls future payouts. The first product would make a payout to a farmer's personal mobile money account, the second would make a payout to the farmer's spouse's account, and the third would deposit a payout in the farmer's rotating savings and credit association (ROSCA) account. We find that own control of future payouts is associated with a substantially higher WTP. Sending payments to a spouse's account decreases WTP by 29% and paying into a ROSCA decreases WTP by 54%, relative to sending payments directly into one's own account.

While the insurance market itself may not have a reason to prefer one payment method over another, and may prefer to pay the beneficiary directly for any insurance claims, the question on how WTP varies with the recipient of insurance payouts is relevant for a number of reasons. The first is eminently practical. Payment into a mobile money account facilitates rapid and low cost distribution of indemnities without requiring proximate access to a bank or insurance agent. At the same time, not all individuals in a household necessarily have their own mobile money account, which may result in payments being made to a spouse's (or other household member's) mobile money account. In Kenya, for instance, women were 5.1 percentage points less likely to use mobile money in 2021 than men.[1] This gap is likely even wider when focusing on account ownership instead of mobile money use.

The question of how WTP depends on who receives insurance payouts is also relevant for the development objectives that organizations designing, subsidizing, or implementing insurance programs aim to achieve. An organization may, for example, place value on making payments to women in the household — based on the literature regarding how different household members prioritize resources (Thomas, 1990, 1993; Duflo, 2003, 2012) — or wish to exploit the savings- or bargaining-potential of a ROSCA (Anderson and Baland, 2002; Schaner, 2017). According to the 2021 FinAccess Household Survey, mobile money account ownership among ROSCAs increased from 5.8 in 2019 to 12.7 in 2021, making it increasingly more feasible to make insurance payouts into ROSCA accounts.[2]

We also contribute to our understanding of household empowerment, control over resources, and valuation of investment in agricultural risk reduction. Both of the literatures referenced above, concerning the priorities

[1] See the 2021 FinAccess Kenya Household Survey, https://finaccess.knbs.or.ke/gender-gap, accessed on May 17th, 2023.

[2] Report accessed on May 17th 2023 through the following link: https://www.knbs.or.ke/wp-content/uploads/2021/12/2021-Finaccess-Household-Survey-Report.pdf.

of different household members and the use of ROSCAs, suggest that household decision-making dynamics and gender might interact strongly with preferences for control over insurance payments. Indeed, a growing literature documents that individuals, particularly women, sacrifice household income in exchange for control over that income (c.f., Almås et al., 2018). The question is to what extent this can be explained by gender gaps in empowerment. Using elements from the Women's Empowerment in Agriculture Index (WEAI) (Malapit et al., 2019), we study whether the magnitude of the preference for payment into one's own account differs based on gender parity in the household, parity in control of income, parity in autonomy of income, and respondent-level empowerment. The measures are also interacted with a respondent's reported gender to allow for differences between male and female respondents. We find little evidence of systematic differences across gender or measures of empowerment.

The rest of the paper proceeds as follows. Section 2 describes the context in which the data were collected and the experimental exercise used to elicit WTP for insurance. Section 2.1 then describes our approach to estimating WTP for control over insurance payments. Section 3 discusses the results and Section 4 concludes.

2 Data

The data on which the analysis is based come from a project implemented by Agriculture and Climate Risk Enterprise (ACRE) Africa and the Kenya Agricultural and Livestock Research Organization (KALRO) in seven counties in Kenya in cooperation with the International Food Policy Research Institute (IFPRI) and Wageningen University. The project's counties (Figure 1) were spread across three regions : Bungoma and Busia counties in the western region, Meru, Embu and Tharaka Nithi counties in the upper eastern region, and Machakos and Makueni counties in the lower eastern region.

In the project, ACRE Africa works with champion farmers (lead farmers in their villages) to market and sell insurance policies. Each champion farmer was equipped with a smartphone and registered between 150 and 250 small farmers. At the beginning of every season, the champions market and sell seed and insurance products to farmers within their villages. On average, households report planting just over 1.5 acres, predominantly in maize. Notably, 43.8% of respondents report having received crop insurance training, but only 18.5% of respondents report having ever had crop insurance.

The list of small farmers registered by champion farmers was randomly split into two: an eligible sample and an ineligible sample. Without knowing which was which, champion farmers then shortlisted twenty farmers from each list. The shortlist from the eligible sample was then invited to participate in research activities.[3] This paper draws data from a variety of activities, the most important of which is an incentivized

[3]While this approach to selection may seem less than ideal, we rely on primarily within-respondent variation in our empirical

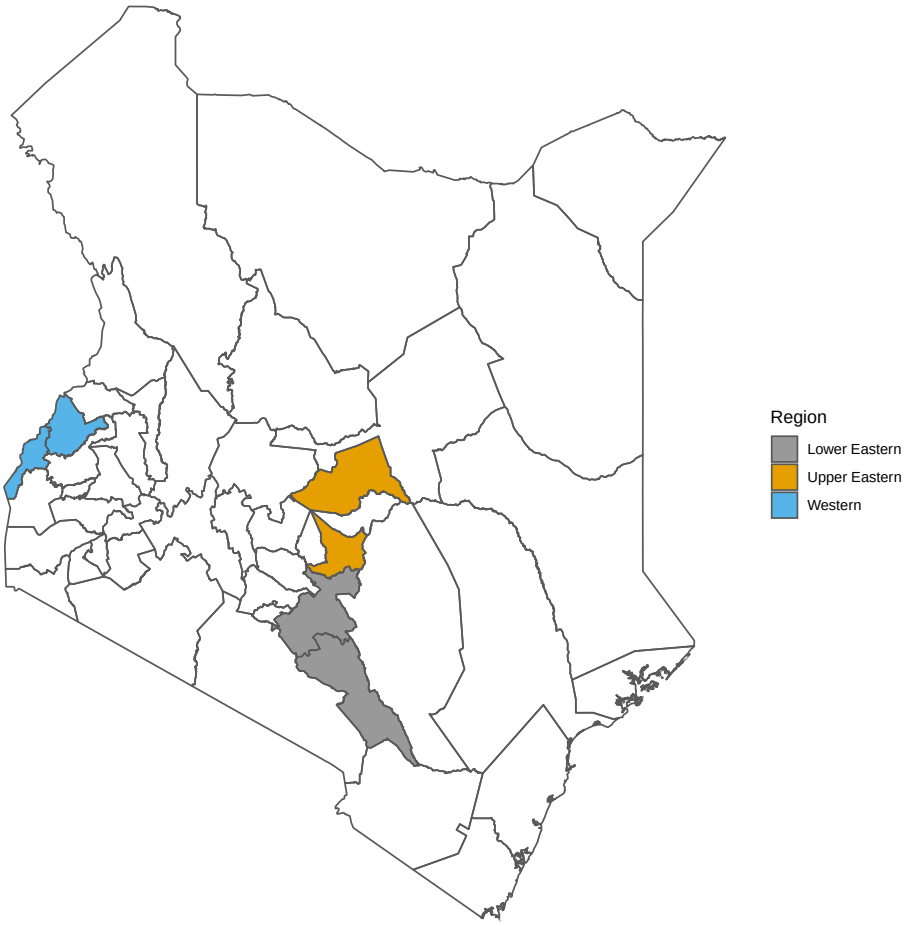

Figure 1: Study Area

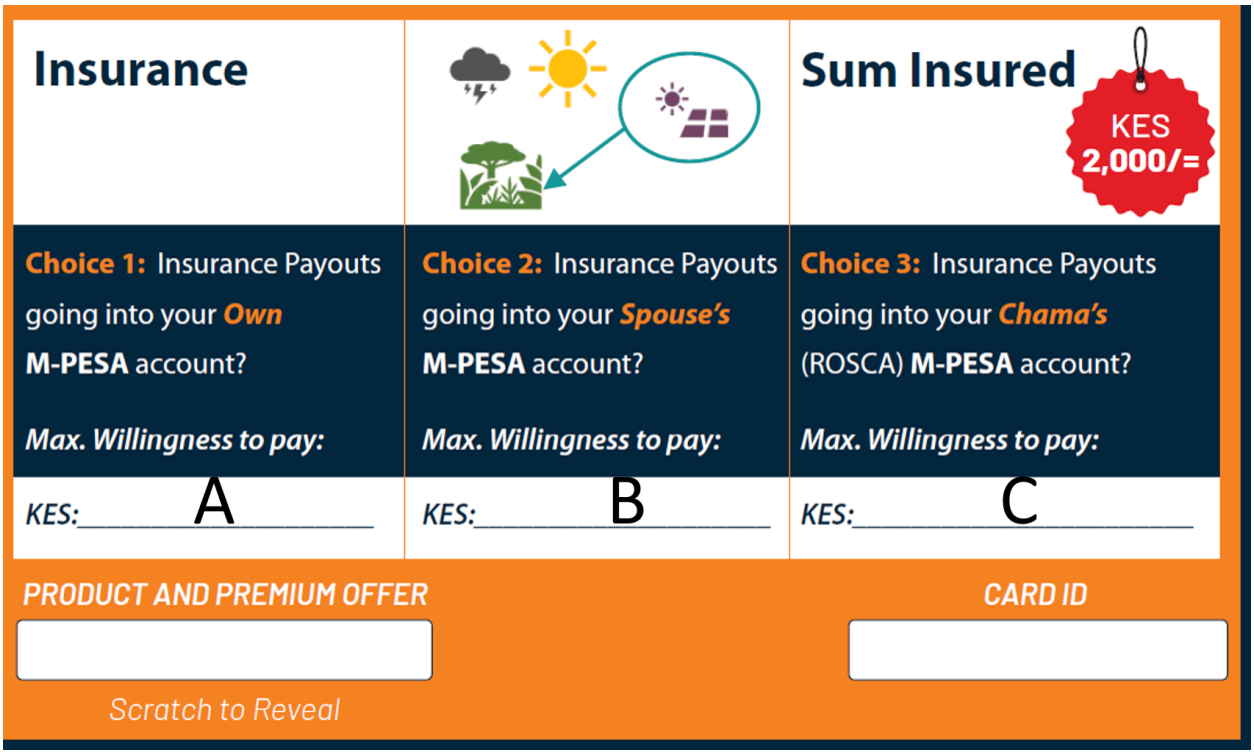

Figure 2: Experimental Auction Card

Becker-DeGroot-Marschak auction (Becker, DeGroot and Marschak, 1964). In the experimental auction, farmers write their maximum WTP for each of three insurance products on the scratch card depicted in Figure 2. The three insurance products all carry a sum insured of 2,000 Ksh (20 USD), which is comparable to a product sold by ACRE Africa in the region known as BIMA PIMA/BIMA SALAMA. At this level of indemnity, the insurance provides protection for the cost of the farmer's seeds, not the full value of harvest.

The three insurance products differ only in how any eventual indemnity payments would be made. Under the first product, payments would be made to the respondent's own mobile money account. Under the second product, payments would be made into the respondent's spouse's mobile money account. The final product would make payments into the respondent's ROSCA account. After the respondent provides the enumerator with their WTP for each product, the ink on the card is removed to reveal the randomly selected product and the offer price. Farmers purchase the product if their WTP price is equal to or higher than the offer price but do not purchase the product if their WTP is lower than the offer price.[4]

approach. The selection criteria were designed to take into account that champion farmers needed to visit participating smallholders multiple times during the season.

[4]The first product (payment into the respondent's own account) was always the one revealed. The data come from a larger project studying weather-based index insurance (WBI) and picture-based insurance (PBI, Ceballos, Kramer and Kivuva (2023)). The study involves two treatment groups (PBI and WBI) as well as a control group in which participating farmers could purchase the ACRE Africa BIMA PIMA/BIMA SALAMA product. This section uses data from the two treatment arm groups only. There are no statistically significant differences across the PBI and WBI treatments. An indicator for PBI/WBI is included in the control set of any regression specification without individual fixed effects.

The data in this paper come from experiments carried out at the beginning of the short rains season in 2021 (September 2021), as the champions were selling insurance and seeds to their communities. A few subsets of experimental participants are worth noting. First, a portion of farmers participating in the experiment had also completed a detailed household survey the previous year. Additionally, a subset of households from that survey were selected to have both male and female household members complete the questions required to construct the Women's Empowerment in Agriculture Index (WEAI) (Malapit et al., 2019). Male and female representatives of the household responded separately to this module.

As such, there are three possible groups for which we can study WTP for insurance and control of future payments:

I. The full set of respondent who completed the WTP activity

II. The set of respondents for which it is possible to match households characteristics from the broader survey (A subset of I.)

III. The set of respondents for which it is possible to match WEAI indicator data (A subset of II.)

Table 1 summarizes the three relevant samples, noting average WTP for each of the three insurance products, experience with agricultural insurance, general agricultural plans for the upcoming season, and, where possible, respondent demographics. The analysis below uses each sample where relevant, relying on the full sample where possible and using the more restricted samples when household characteristics are needed to investigate heterogeneity.

Table 1: Summary Statistics

	Full Sample	Matched Demographics	Matched WEAI
WTP			
Own Account	236.301	223.622	241.172
	(188.267)	(162.212)	(189.905)
Spouse Account	175.132	159.648	171.244
	(187.546)	(180.731)	(196.494)
ROSCA Account	130.453	104.355	112.225
	(210.744)	(182.531)	(206.100)
Summary Statistics			
Crop insurance training (%)	0.438	0.429	0.434
	(0.496)	(0.495)	(0.496)
Have had crop insurance (%)	0.185	0.192	0.192
	(0.388)	(0.394)	(0.394)
Won practice round bid (%)	0.303	0.308	0.335
	(0.460)	(0.462)	(0.473)
Plan to grow crops (%)	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)
Total acres planned	1.559	1.596	1.549
	(1.379)	(1.586)	(1.549)
Intercropping (%)	0.442	0.455	0.455
	(0.497)	(0.498)	(0.499)
Plan to grow maize	0.875	0.908	0.926
	(0.331)	(0.290)	(0.262)
Maize acres planned	1.031	1.062	1.013
	(0.595)	(0.636)	(0.579)
Female (%)		0.592	0.514
		(0.492)	(0.500)
Has non-farm Income (%)		0.543	0.568
		(0.499)	(0.496)
Phone Ownership (%)		0.966	0.970
		(0.182)	(0.172)
Married (%)		0.863	0.946
		(0.344)	(0.226)
Primary Edu. (%)		0.434	0.429
		(0.496)	(0.496)
Secondary Edu. (%)		0.425	0.466
		(0.495)	(0.500)
No Edu. (%)		0.059	0.028
		(0.236)	(0.166)
Age 18 to 35 (%)		0.219	0.199
		(0.414)	(0.400)
Age 35 - 55 (%)		0.546	0.588
		(0.498)	(0.493)
Age 55+		0.236	0.212
		(0.425)	(0.409)
Observations	1,361	682	418

2.1 Methodology

The experimental auction results in three WTP values for each individual, corresponding to the three auction rounds: One for payment to the respondent's own account, one for payment into the respondent's spouse's account, and one for payment into a ROSCA account.We reshape the data to "long" form, with one row for each respondent in each round of the auction. Without any estimation, the long form data can be used to plot empirical demand functions for insurance, conditional on control over future payments. Figure 3 plots the fraction of respondents willing to purchase insurance at various prices, conditional on control over future payouts. Like the unconditional means in Table 1, a clear preference for payment into one's own account is visible in Figure 3, with payment into a ROSCA being the least preferred.

To control for the many differences that exist across individuals and communities, we start by using a "within individuals" approach to estimating differences in WTP for insurance. Equation 1 is estimated with dummy variable fixed effects via both Ordinary Least Squares and censored regression (Tobit). The WTP data is heavily censored, as can be seen in Figure 3, both at zero and at the full market value of the insurance (200 Ksh).

$$WTP_{ir} = \beta_1 S_{ir} + \beta_2 R_{ir} + \alpha_i + \epsilon_{ir} \tag{1}$$

The variable S_{ir} is equal to one if insurance payments in round r were made to the respondent's spouse and zero otherwise. The variable R_{ir} is equal to one if insurance payments in round r were made to a ROSCA and zero otherwise. Defined in this way, the coefficients on β_1 and β_2 will return the difference in WTP associated with insurance payments going to a respondent's spouse or ROSCA relative to the respondent receiving the payment herself/himself. Finally, α_i is the respondent fixed effect and ϵ_{ir} is the error term. Standard errors are clustered at the respondent level.

As our later analysis will investigate heterogeneous responses related to gender and women's empowerment, we also estimate Equation 2, which replaces individual fixed effects with a set (X) of respondent- and household-specific control variables. The gender and empowerment variables do not vary within a household across auction rounds and cannot be studied using Equation 1. If the estimates from Equations 1 and 2 differ greatly, it would provide evidence that unobservable factors likely confound our study of the heterogeneous response dimensions. Similar estimates will increase our confidence in the the validity of the heterogeneous response specifications.

$$WTP_{ir} = \beta_1 S_{ir} + \beta_2 R_{ir} + X'C + \alpha_0 + \epsilon_{ir} \tag{2}$$

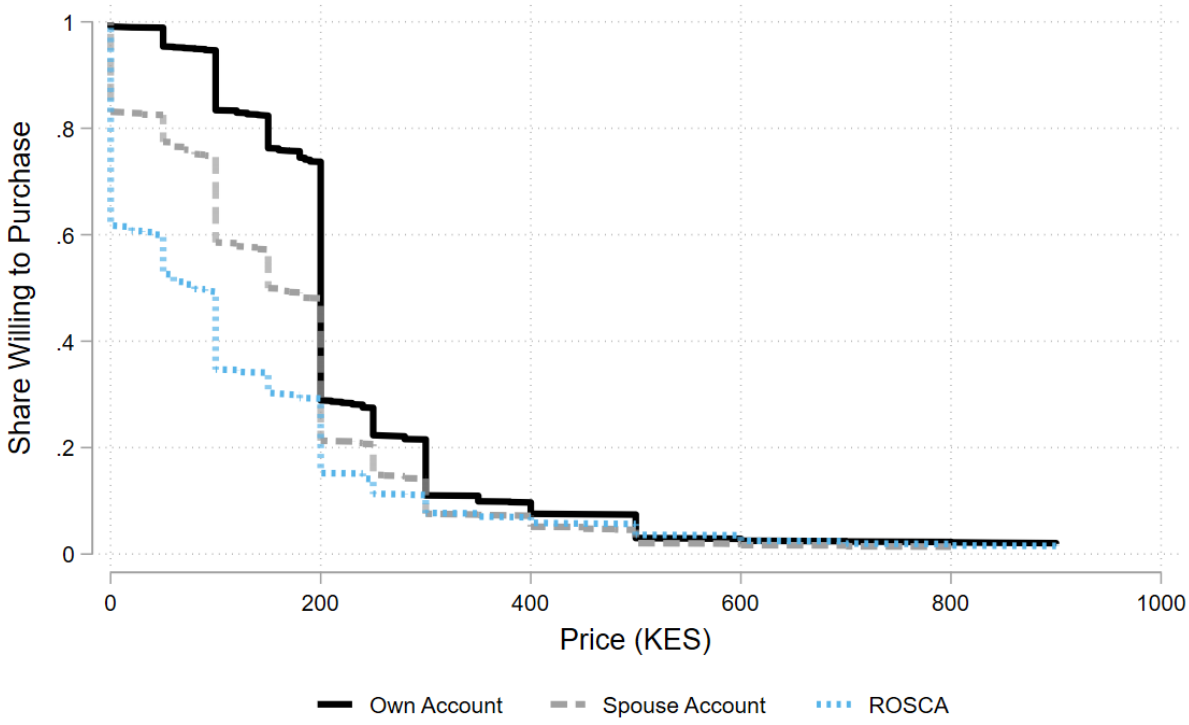

Figure 3: Demand for insurance by control over future payouts

We will also compare the estimates returned by the full sample (Table 1, Column 1) to estimates returned by samples restricted to households for which it is possible to match demographics (Table 1, Column 2) and WEAI data (Table 1, Column 3). Table 1 shows that the matched and unmatched portions of the sample are reasonably well balanced. Still, obtaining similar estimates from the three samples in specifications where their use is possible will increase our confidence in scenarios where the full sample cannot be used due to the lack of demographic and WEAI data.

Having established a baseline set of results, we move on to consider heterogeneous effects along the dimensions of respondent gender and empowerment within the household (Equation 3). To the WTP-related variables from the previous equations, we add an indicator for the respondent being female (F_i) and an indicator for failing to reach gender parity within the household (NGP_i). The NGP_i variable is defined at the household level and constructed using data from both spouses as described in Malapit et al. (2019). In brief, a female respondent's empowerment score across three domains (intrinsic agency, instrumental agency, and collective agency) is compared to that of her husband/the household's male respondent. Gender parity is reached if the two empowerment scores are commensurate.[5]

$$\begin{aligned} WTP_{ir} = \beta_1 S_{ir} + \beta_2 R_{ir} + \beta_3 F_i + \beta_4 NGP_i + \\ S_{ir}[\gamma_1 F_i + \delta_1 NGP_i + \rho_1 F_i \cdot NGP_i] + \\ R_{ir}[\gamma_2 F_i + \delta_2 NGP_i + \rho_2 F_i \cdot NGP_i] + X'C + \alpha_0 + \epsilon_{ir} \end{aligned} \tag{3}$$

The impact on WTP of facing a round in which payouts are made to one's spouse rather than to oneself is then:

$$\Delta_S = \beta_1 + \gamma_1 F_i + \delta_1 NGP_i + \rho_1 F_i \cdot NGP_i \tag{4}$$

and similarly for payment into a ROSCA:

$$\Delta_R = \beta_2 + \gamma_2 F_i + \delta_2 NGP_i + \rho_2 F_i \cdot NGP_i \tag{5}$$

We construct estimates of the effect payment to one's spouse or ROSCA separately for male and female

[5]In addition to failing to reach gender parity, we also run specifications using the following alternative WEAI indicators:

- The percent of WEAI indicators in which a respondent was deficient (*ci* score, defined at the respondent level).
- An indicator for deficiency in "Autonomy of Income" (defined at the respondent level)
- An indicator for deficiency in "Control of Income" (defined at the respondent level)

The results for these specifications appear in the Appendix.

respondents from households with and without gender parity in Table 5. The table includes explicit tests for equal effects among male and female respondents with and without gender parity.[6]

3 Results

Table 2 compares fixed effect estimates from OLS and Tobit models on the three possible samples. Within each model type, estimates are similar across all three samples. Payment into a spouse's account or ROSCA account is associated with large and statistically significant decreases in WTP. Treating WTP of zero and at-or-beyond 200 Ksh as censored roughly doubles the magnitude of the coefficient estimates.

Note that mean WTP for an insurance product that would deposit benefits to the respondent's own account is around 235 Ksh in both restricted samples (median = 200 Ksh). Using the matched WEAI sample to illustrate, in the OLS specification payment into one's spouse's account is associated with a 30% reduction in WTP relative to payment into one's own account. Payment into a ROSCA account reduces WTP by 55%. If, instead, we use the Tobit results, payment into a spouse's account reduces WTP by 64% and payment into a ROSCA effectively reduces WTP to zero.

As noted above, the fixed effect approach is not feasible for heterogeneity analysis laid out in Equation 3. Table 3 and Figure 4 explore the extent to which replacing fixed effects with a household-specific control set changes the estimation results. Given the level of censoring, we focus on the Tobit results. For both the demographic-matched sample and the WEAI-matched sample, coefficient estimates are modestly larger in magnitude when using a set of observable controls rather than individual fixed effects. Qualitatively, however, there are no changes to the overall story. Directing payments to either a spouses account or ROSCA results

[6]Construction of estimates for sub-groups and tests related to the equality of effects across subgroups were done using Stata's *lincom* command after estimating the specification in Equation 3.

Table 2: Fixed Effect OLS and Tobit Comparison on Different Samples

	OLS			Tobit		
	Full	Matched Dem.	Matched WEAI	Full	Matched Dem.	Matched WEAI
Payment to:						
Spouse	-61.17***	-63.97***	-69.93***	-126.1***	-137.8***	-149.9***
	(4.873)	(6.157)	(6.801)	(6.508)	(9.401)	(13.24)
ROSCA	-105.8***	-119.3***	-128.9***	-243.3***	-266.3***	-289.5***
	(7.598)	(9.659)	(14.06)	(9.109)	(13.06)	(18.29)
Indiv. FE	Yes	Yes	Yes	Yes	Yes	Yes
N	4083	2046	1254	4083	2046	1254

Notes: Outcome is WTP in KES. Reference category is payment into respondent's own account.
Standard errors (in parentheses) are clustered at the respondent level.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Fixed Effect Tobit vs Control Set Tobit Comparison

	Fixed Effects			Control Set	
	Full	Matched Dem.	Matched WEAI	Matched Dem.	Matched WEAI
Payment to					
Spouse	-126.1***	-137.8***	-149.9***	-159.5***	-170.8***
	(6.508)	(9.401)	(13.24)	(12.76)	(18.03)
ROSCA	-243.3***	-266.3***	-289.5***	-292.5***	-316.3***
	(9.109)	(13.06)	(18.29)	(17.13)	(23.71)
Indiv. FE	Yes	Yes	Yes	No	No
Control Set	No	No	No	Yes	Yes
Observations	4083	2046	1254	1728	1062

Notes: Outcome is WTP in KES. Reference category is payment into respondent's own account.
Standard errors (in parentheses) are clustered at the respondent level.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

in large and statistically significant decreases in WTP for insurance.[7]

We now estimate the heterogeneous effects model detailed in Equation 3. In particular, we are interested in whether the extent to which payment into a spouse's account or a ROSCA account affects WTP for insurance depends on respondent gender and the respondent's household's gender parity. Column 3 of Table 4 contains the results of estimating Equation 3 as a Tobit model. Previous fixed effect and control set estimates are provided in columns 1 and 2 for comparison. As the relationships of interest now depend on various coefficients, Table 5 contains estimates and hypothesis tests for a number of relevant groups. Notably, while the spread between effect sizes for male and female respondents widens slightly among households without gender parity (for both spouse/ROSCA effects), we fail to reject the null hypothesis of no difference in effects along the gender dimension in all cases. Figure 5 demonstrates the same point in the form of a coefficient plot.

[7]The control set for specifications in Table 3 includes: Total acres of agricultural production, insurance treatment (PBI or WBI), an indicator for whether or not the respondent won or lost the practice round auction, the respondent's reported gender, an indicator for off-farm income, marital status, education, age, an indicator for having received insurance training, and an indicator for having ever had agricultural insurance.

Table 4: Heterogeneous Effects - Gender Parity

	(1)	(2)	(3)
Payment to			
Spouse (S)	-149.9***	-170.8***	-169.1***
	(13.24)	(18.03)	(28.39)
ROSCA (R)	-289.5***	-316.3***	-308.8***
	(18.29)	(23.71)	(35.33)
Female (F)		-1.435	-9.036
		(18.24)	(27.78)
No GP			32.57
			(30.79)
S x F			5.595
			(34.11)
S x No GP			-42.19
			(42.80)
S x F x No GP			62.80
			(58.23)
R x F			-14.56
			(37.45)
R x No GP			-24.21
			(47.25)
R x F x No GP			14.29
			(57.60)
Indiv. FE	Yes	No	No
Control Set	No	Yes	Yes
Observations	1254	1062	966

Notes: Tobit model estimates. Outcome is WTP in KES. Reference category is payment into respondent's own account. Standard errors in parentheses clustered at the respondent level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Heterogeneous Effects - Gender Parity - Comparisons

	Estimate	(SE)	P-value
Payment to Spouse Account			
Male, Gender Parity (β_1)	-169.10	28.39	<0.0001
Female, Gender Parity ($\beta_1 + \gamma_1$)	-163.51	26.36	<0.0001
Male, No Gender Parity ($\beta_1 + \delta_1$)	-211.29	39.30	<0.0001
Female, No Gender Parity ($\beta_1 + \gamma_1 + \delta_1 + \rho_1$)	-142.90	41.37	.0006
Test - Effects equal for Male/Female Respondents			
With Gender Parity ($\gamma_1 = 0$))	5.59	34.11	0.8697
Without Gender Parity ($\gamma_1 + \rho_1 = 0$)	68.39	51.82	0.1872
Payment to ROSCA			
Male, Gender Parity (β_2)	-308.84	35.33	<0.0001
Female, Gender Parity ($\beta_2 + \gamma_2$)	-323.40	31.29	<0.0001
Male, No Gender Parity ($\beta_2 + \delta_2$)	-333.05	45.60	<0.0001
Female, No Gender Parity ($\beta_2 + \gamma_2 + \delta_2 + \rho_2$)	-302.80	48.94	<0.0001
Test - Effects equal for Male/Female Respondents			
With Gender Parity ($\gamma_2 = 0$)	-14.56	37.45	0.6974
Without Gender Parity ($\gamma_2 + \rho_2 = 0$)	-0.2761	53.64	0.9959

Notes: Outcome is WTP in KES. Reference category is payment into respondent's own account. All coefficients estimated via Tobit with Controls, n= 966 Standard errors (in parentheses) are clustered at the respondent level.

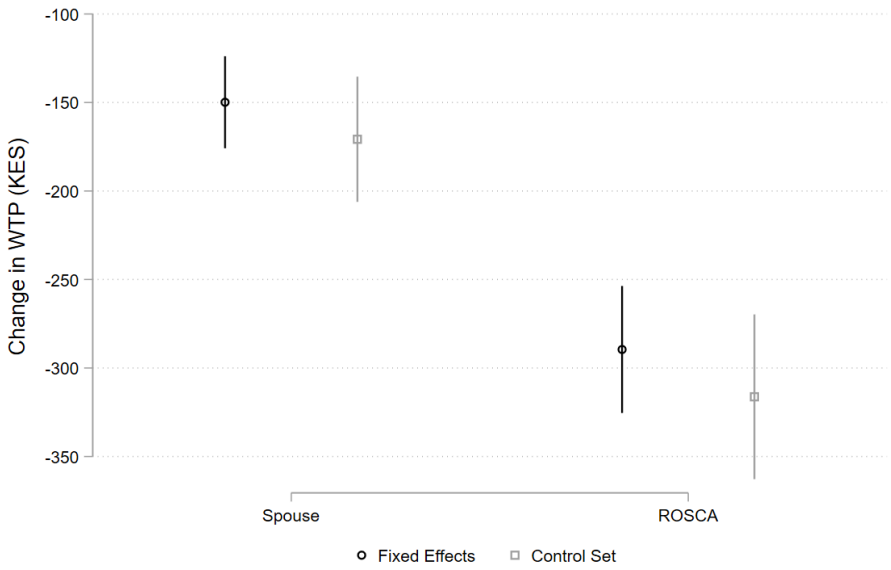

Figure 4: Changes in WTP associated with payment into a spouse's or ROSCA account relative to a respondent's own account.

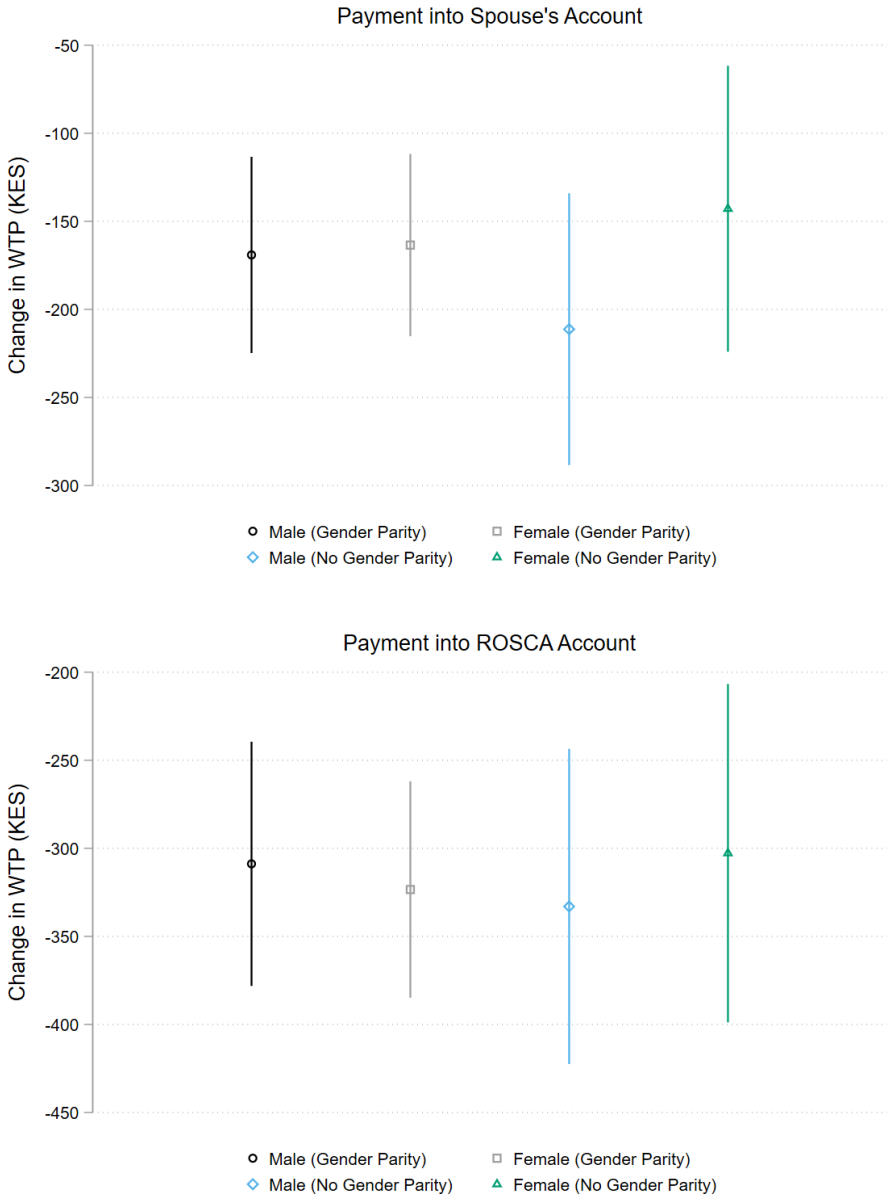

Figure 5: Heterogeneous effects by gender and gender parity on the decrease in WTP associated with payment into a spouse's or ROSCA account rather than a respondent's own account

4 Discussion and Conclusions

In this paper, we used an incentivized auction experiment to estimate WTP for agricultural insurance. Within the experiment, we study how control of future insurance payments affects WTP for insurance. Payment into an account other than that of the direct beneficiary could come about in a variety of ways. Mobile payments are increasingly common as they minimize transaction costs and allow for the rapid distribution of indemnities after a loss event. Mobile payments, however, require mobile money accounts and access to mobile phones. While mobile phone penetration is high, not all individuals within agricultural households have sole control over a mobile phone or mobile money account.

Payment into an account other than that of the direct beneficiary could also reflect the goals and values of program designers and policy makers. As noted in Section 1, a robust literature exists documenting that different household members demonstrate different priorities in their allocation of resources. This has been used to guide the design of various cash transfer programs, which often target payments to women in the household from the belief that women have a higher propensity to direct resources toward shared household goods.

Our results suggest that WTP for insurance falls substantially if the payout will be controlled by someone other than the policy holder. Payment to a respondent's spouse rather than to the respondent himself/herself reduced WTP for insurance by 64% and payment into a ROSCA reduced WTP to practically zero. The estimated effects were not economically or statistically different across male and female respondents.

The results also suggest that no simple relationship exists between empowerment measures (as captured by pro-WEAI) and WTP for agricultural insurance. In specifications allowing for the interaction of control over insurance payments, respondent gender, and pro-WEAI empowerment measures, the preference for payment into one's own account persists for both male and female respondents. This is true for respondents from households reaching and failing to reach gender parity. We find no statistically significant differences between male and female respondents, regardless of the household's gender parity status. This finding is robust to using two individual measures of empowerment — Autonomy of Income and Control of Income — rather than the household measure of gender parity. Such a result is, however, consistent with both a null effect and non-monotonic effects within the sample. If for example, some respondents with low levels of empowerment increase their preference for control of payouts while others, perhaps having internalized their lack of empowerment as justified, have a preference for payouts to go to their spouse, then we could easily observe the same null effect as if no relationship existed at all.

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Appendix

Table A.1: Heterogeneous Effects - Respondent CI Score

	(1)	(2)	(3)
Payment to			
Spouse (S)	-149.9***	-170.8***	-162.1***
	(13.24)	(18.03)	(37.83)
ROSCA (R)	-289.5***	-316.3***	-325.0***
	(18.29)	(23.71)	(46.77)
Female (F)		-1.435	-16.45
		(18.24)	(28.01)
Inadequacy Score (CI)			101.5
			(122.0)
S x F			61.87
			(56.43)
S x CI			-123.6
			(156.0)
S x F x CI			-124.4
			(220.5)
R x F			1.563
			(58.60)
R x CI			27.35
			(179.5)
R x F x CI			-44.07
			(221.7)
Indiv. FE	Yes	No	No
Control Set	No	Yes	Yes
Observations	1254	1062	966

Notes: Tobit model estimates. Outcome is WTP in KES. Reference category is payment into respondent's own account. Standard errors in parentheses clustered at the respondent level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.2: Heterogeneous Effects - Control of Income

	(1)	(2)	(3)
Payment to			
Spouse (S)	-149.9***	-170.8***	-189.1***
	(13.24)	(18.03)	(31.49)
ROSCA (R)	-289.5***	-316.3***	-336.5***
	(18.29)	(23.71)	(38.44)
Female (F)		-1.435	-12.47
		(18.24)	(27.43)
Inadeq. in Control of Income (Inc)			-36.14
			(27.31)
S x F			33.67
			(36.29)
S x Inc			6.071
			(38.63)
S x Female x Inc			-17.46
			(50.25)
R x F			17.41
			(39.92)
R x Inc			44.73
			(43.71)
R x F x Inc			-69.95
			(51.27)
Indiv. FE	Yes	No	No
Control Set	No	Yes	Yes
Observations	1254	1062	1062

Notes: Tobit model estimates. Outcome is WTP in KES. Reference category is payment into respondent's own account. Standard errors in parentheses clustered at the respondent level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.3: Heterogeneous Effects - Income

	(1)	(2)	(3)
Payment to			
Spouse (S)	-149.9***	-170.8***	-201.7***
	(13.24)	(18.03)	(32.42)
ROSCA (R)	-289.5***	-316.3***	-298.7***
	(18.29)	(23.71)	(35.41)
Female (F)		-1.435	-19.90
		(18.24)	(25.78)
Inadeq. in Autonomy in Income (A)			5.210
			(25.28)
S x F			48.34
			(37.37)
S x A			19.58
			(37.71)
S x F x A			-13.32
			(46.79)
R x F			-23.87
			(39.27)
R x A			-41.91
			(41.79)
R x F x A			64.83
			(46.83)
Indiv. FE	Yes	No	No
Control Set	No	Yes	Yes
Observations	1254	1062	966

Notes: Tobit model estimates. Outcome is WTP in KES. Reference category is payment into respondent's own account. Standard errors in parentheses clustered at the respondent level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$