Appendix A. Theoretical framework

This appendix presents a simple model of individual and joint decision making in the household. We use this model illustrate what each task measures. Section 1 focuses on Task-1 decisions, which elicit a coarse measure of willingness to pay for resource control in the household. Section 2 focuses on Task-2 decisions, which elicit the private and joint preferences for how to split resources between spouses. In both sections, we assume that individuals have caring preferences and derive utility from their own income/consumption as well as the income/consumption of their spouse.[1] We also initially assume that participants do not undo the decisions they make in Task 1 or 2 outside of the experiment. While this assumption is strong, it can be rationalized by strong household norms dictating that any income earned by spouses, or split between spouses, is for each person to keep and control as well as by income hiding between spouses. Both cases are consistent with a separate spheres model of intra-household bargaining where the outside option is not divorce, but rather the non-cooperative equilibrium (see Lundberg and Pollack 1993). We relax this assumption later on in each section. We also assume that the stakes at play are not sufficient to allow participants to change the bargaining weight of spouses in the intra-household bargaining process. For a model that allows the choices made in the experiment to change the bargaining weights of spouses see Almas et al (2018).[2]

A.1 Task 1: Willingness to pay to control household income

Let $U_i(I_i, I_{-i})$ denote the preferences of individual i, which depend on the income I_s controlled by each spouse $s = i, -i$. Assume also that i's preferences are given by

$$U_i(I_i, I_{-i}) = u_i(I_i) + \gamma_i u_{-i}(I_{-i})$$

$u_s(\cdot)$ is the utility derived from the income/consumption of each spouse and $\gamma_i \geq 0$ represents an altruism or caring parameter, which captures how much i cares about the income/consumption of $-i$.[3] Assume further that $u_s(\cdot)$ is strictly increasing and strictly concave in income/consumption for both $s = i, -i$.

Since the income controlled by each spouse is determined in part by the choices made in the experiment, let y_s denote the income controlled by spouse s outside of the experiment. We implicitly assume that preferences $u_s(\cdot)$ and income y_s are common knowledge between spouses. Let $y_i + y_{-i} = \overline{y}$ denote the total income controlled by both spouses outside of the experiment. An alternative interpretation for y_{-i} and $\overline{y}$ is that they represent the income known by i. If $-i$ hides income, we therefore assume that i is unaware of such income hiding.

Task 1 asks individuals to make two decisions. First, i must decide who should receive an amount of money x, i or $-i$. Second, i must choose between x given to the spouse chosen in decision 1, or $1.5x$ given to the spouse not chosen in decision 1. There are four possible decision scenarios in this task, each associated with a different set of optimality conditions. Let d_1 and d_2 denote decisions 1 and 2 respectively. The optimality conditions associated with the four decision scenarios are:

- *Scenario 1 (Self, Self):* $\{d_1, d_2\} = \{i, i\}$
  $d_1: \; u_i(y_i + x) + \gamma_i u_{-i}(\overline{y} - y_i) \geq u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + x)$
  $d_2: \; u_i(y_i + x) + \gamma_i u_{-i}(\overline{y} - y_i) \geq u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + 1.5x)$
- *Scenario 2 (Self, Spouse):* $\{d_1, d_2\} = \{i, -i\}$
  $d_1: \; u_i(y_i + x) + \gamma_i u_{-i}(\overline{y} - y_i) \geq u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + x)$
  $d_2: \; u_i(y_i + x) + \gamma_i u_{-i}(\overline{y} - y_i) \leq u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + 1.5x)$
- *Scenario 3 (Spouse, Self):* $\{d_1, d_2\} = \{-i, i\}$
  $d_1: \; u_i(y_i + x) + \gamma_i u_{-i}(\overline{y} - y_i) \leq u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + x)$
  $d_2: \; u_i(y_i + 1.5x) + \gamma_i u_{-i}(\overline{y} - y_i) \geq u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + x)$

[1] Since the experimental choices determine income rather than consumption, we assume that the income controlled by each spouse translates into their private consumption and use income and consumption interchangeably in this appendix.

[2] Almas et al (2018) present a cooperative model of intra-household decision making. We present a non-cooperative model in which individuals have caring preferences and there is no household public good. The insights would be similar if we used a non-cooperative model with at least one household public good consumed by both spouses. We focus on caring preferences because they directly map onto the choices participants make in the experiment. A similar model to the one we use is employed by Schaner (2017).

[3] Note that i may care about $-i$'s consumption due to altruism or because he/she wants to minimize the chance that $-i$ is unhappy and engages in retaliatory behavior towards i (e.g. engages in intimate partner violence).

- *Scenario 4 (Spouse, Spouse):* $\{d_1, d_2\} = \{-i, -i\}$
  $d_1: \ u_i(y_i + x) + \gamma_i u_{-i}(\overline{y} - y_i) \leq u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + x)$
  $d_2: \ u_i(y_i + 1.5x) + \gamma_i u_{-i}(\overline{y} - y_i) \leq u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + x)$

A.1.1 Willingness to sacrifice household resources to control income

Let v^* represent the amount of resources $-i$ needs to receive in order for i to be indifferent between options in d_2 of scenarios 1 and 2. That is, let v^* satisfy equation 1 below.

$$u_i(y_i + x) + \gamma_i u_{-i}(\overline{y} - y_i) = u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + v^*) \tag{1}$$

The optimality conditions in scenarios 1 and 2 allow us to impose bounds on v^*. Scenario 1 implies that $v^* \geq 1.5x$, while scenario 2 implies that $v^* \in [x, 1.5x]$. Therefore,

$$\{d_1, d_2\} = \begin{cases} Self, Self & if\ v^* \geq 1.5x \\ Self, Spouse & if\ 1.5x \geq v^* \geq x \end{cases}$$

A natural question to ask is how v^* changes with y_i, the amount of household resources controlled by i outside of the experiment. Differentiating equation 1, it can be shown that $\partial v^* / \partial y_i < 0$. This indicates that the more income i controls outside of the experiment, the less i is willing to sacrifice in order to receive the money. This theoretical property is expected due to the properties of $U_i(\cdot)$ and validates task 1 as measure of resource control in the household. It can also be shown that $\partial v^* / \partial \gamma_i < 0$. The more i cares about $-i$, the less i is willing to sacrifice to receive the money. Importantly, the analysis presented in this section is unaffected by relaxing the assumption of no undoing of choices outside of the experiment.

A.1.2 Willingness to sacrifice household resources not to control income

Let z^* represent the amount i needs to receive in order to be indifferent between options in d_2 of scenarios 3 and 4. That is, let z^* satisfy equation 2 below.

$$u_i(y_i + z^*) + \gamma_i u_{-i}(\overline{y} - y_i) = u_i(y_i) + \gamma_i u_{-i}(\overline{y} - y_i + x) \tag{2}$$

The optimality conditions in scenarios 3 and 4 allow us to impose bounds on z^*. Scenario 3 implies that $z^* \in [x, 1.5x]$, while scenario 4 implies that $z^* \geq 1.5x$. Therefore,

$$\{d_1, d_2\} = \begin{cases} Spouse, Spouse & if\ 1.5x \geq z^* \\ Spouse, Self & if\ 1.5x \geq z^* \geq x \end{cases}$$

Again, we can check how z^* changes with y_i, the amount of resources controlled by i outside of the experiment. Differentiating equation 2, it can be shown that $\partial z^* / \partial y_i > 0$. The more resources i controls outside of the experiment, the more money i is willing to sacrifice to let $-i$ receive the money. It can also be shown that $\partial z^* / \partial \gamma_i > 0$. The more i cares about $-i$, the more i is willing to sacrifice not to receive the money.

Relaxing the assumption of no undoing of choices outside of the experiment implies that no one should be willing to sacrifice household resources not to control income and thus $z^* = 0$. This is because a participant who prefers to have their spouse receive x in d_1 can always choose to receive $1.5x$ in d_2 and then give their spouse x or more outside of the experiment.

A.1.3 Ordering the four decision scenarios

The 4 decision scenarios described above can be ordered by the underlying latent variables they capture (v^* and z^*). Table 1 shows this ordering, which we use to analyze Task-1 results.

Table A1. Decision scenarios ordered by willingness to pay for resource control in the household

Order	$\{d_1, d_2\} =$	WTP for resource control $(v^* - x)$	WTP not to control resources $(z^* - x)$	Price paid for resource control
1	$Spouse, Spouse$		$z^* - x \geq 0.5x$	-0.5x
2	$Spouse, Self$		$0.5x \geq z^* - x \geq 0$	0
3	$Self, Spouse$	$0.5x \geq v^* - x \geq 0$		0
4	$Self, Self$	$v^* - x \geq 0.5x$		$0.5x$

Note: WTP denotes willingness to pay/sacrifice household resources. Order is increasing in WTP for resource control.

If there is undoing of choices outside of the experiment and $z^* = 0$, then categories 1 and 2 collapse into one.

A.2 Task 2: Dictator game

In Task 2, individuals must make a series of dictator game decisions which consist of choosing how much of an endowment $\overline{x}$ to keep. Let x_i denote the amount kept by i.

A.2.1 Private dictator game decision

When making a private decision in Task 2, i chooses the value of x_i that maximizes

$$U_i(y_i, x_i) = u_i(y_i + x_i) + \gamma_i u_{-i}(\overline{y} - y_i + \overline{x} - x_i)$$

The first order condition of this maximization problem is given by

$$u_i'(y_i + x_i) - \gamma_i u_{-i}'(\overline{y} - y_i + \overline{x} - x_i) = 0 \tag{3}$$

The second order condition is satisfied due to the properties of the utility function. Let x_i^* represent the value of x_i that satisfies equation 3. Differentiating equation 3, it can be shown that $\partial x_i^*/\partial y_i < 0$. That is, there is a negative relationship between the amount of resources i chooses to keep in the private dictator game and resource control in the household outside of the experiment. Due to the properties of $u_s(\cdot)$ for both spouses, it can also be shown that $\partial x_i^*/\partial \gamma_i < 0$. This is intuitive and indicates that the more i cares about $-i$, the less i will keep in the private dictator game.

Relaxing the assumption of no undoing of choices outside of the experiment changes the properties described above for some households only. For example, in households with aligned preferences any choice x_i^* is an equilibrium because participants are indifferent between who receives the money. Similarly, in households with perfect communication, where i tells $-i$ what they chose outside of the experiment, any choice x_i^* is an equilibrium because the choice can be undone outside of the experiment later on by the household. However, if spouse i hides income, then the theoretical properties derived above still hold. Based on previous literature, we expect a significant proportion of households to engage in income hiding.

A.2.2. Joint dictator game decision

When making a joint dictator game decision, spouses maximize the following household utility function

$$U_{hh}(y_i, x_i) = \mu U_i(y_i, x_i) + (1 - \mu) U_{-i}(y_i, x_i)$$

μ represent the bargaining weight of i and $(1 - \mu)$ the bargaining weight of $-i$. Inserting the preferences of each spouse and simplifying we have that

$$U_{hh}(y_i, x_i) = [\mu + (1 - \mu)\gamma_{-i}] u_i(y_i + x_i) + [\mu\gamma_i + 1 - \mu] u_{-i}(\overline{y} - y_i + \overline{x} - x_i)$$

The first order condition of this utility maximization problem is given by

$$[\mu + (1 - \mu)\gamma_{-i}] u_i'(y_i + x_i) - [\mu\gamma_i + 1 - \mu] u_{-i}'(\overline{y} - y_i + \overline{x} - x_i) = 0 \tag{4}$$

The second order condition is satisfied by the strict concavity of the utility function. Let x_{ij}^* denote the value of x_i that satisfies equation 4 (j stands for joint decision). A natural question to ask is how x_{ij}^* changes with y_i and with the bargaining weight of spouses. Due to the properties of $U_{hh}(\cdot)$, it can be shown that holding all other factors constant, $\partial x_{ij}^*/\partial y_i < 0$. Like in the private dictator game decision, the joint allocation to i is decreasing in the amount of resources i controls outside of the experiment.

Differentiating equation 4, we can also show that the relationship between x_{ij}^* and μ, the bargaining weight of i, can be positive or negative depending on preferences and the relative income/consumption of spouses.

If $\gamma_s = 1$ for $s = i, -i$, then both spouses have aligned preferences and x_{ij}^* is independent of μ. Under this scenario, individuals are indifferent between who receives the money.

If $\gamma_s < 1$ for $s = i, -i$, such that individuals care about each other but not as much as they care about themselves, then $\partial x_{ij}^*/\partial \mu > 0$. This says that the joint allocation each spouse receives is increasing in their bargaining weight if they are sufficiently selfish.

If $\gamma_s > 1$ for $s = i, -i$ then the opposite is true and $\partial x_{ij}^*/\partial \mu < 0$.

If $\gamma_s > 1$ for one spouse and $\gamma_s < 1$ for another, then the relationship between x_{ij}^* and μ will depend on relative income/consumption of both spouses and on preferences.

Relaxing the assumption of no undoing of choices outside of the experiment invalidates the theoretical properties described above for all households. This is because it is no longer incentive compatible for participants to reveal their true preferences in the experiment since any choice made by spouses in the joint dictator game can be undone at home after the experiment at no cost to the household.

A.3 Hypotheses

Based on the theoretical framework presented above, we derive 4 hypotheses to test in the experiment. Let h and w denote husband and wife respectively. All other notation is the same as above.

Because our study takes place in two settings where women have lower resource control than husbands outside of the experiment, we expect $y_h > y_w$ on average, which implies hypothesis 1.

H1: Women have a higher willingness to pay for resource control than men (i.e. $v_w^* > v_h^*$).

- If there is no undoing of choices outside of the experiment on average, we should also observe $z_w^* < z_h^*$.

Based on previous literature, we also expect income hiding to occur in a significant proportion of households and thus for the private dictator game decision to provide meaningful measure of resource control in the household on average. Together with the expected gender differences in resource control outside of the experiment (i.e. $y_h > y_w$), this implies hypothesis 2.

H2: Women will keep more than men in the private dictator game (i.e. $x_w^* > x_h^*$).

Since the decisions made by each participant in both tasks depend on y_i, we expect both measures to be correlated and to capture similar underlying latent variables.

H3: Willingness to pay for resource control is positively correlated with the amount individuals choose to keep in the private dictator game decision (i.e. $\partial x_i^*/\partial v_i^* > 0$).

- If there is no undoing of choices outside of the experiment on average, we should also observe a negative relationship between the amount individuals choose to keep in the private dictator game and willingness to pay not to control resources (i.e. $\partial x_i^*/\partial z_i^* < 0$).

Furthermore, we expect both measures of resource control to map onto proxies of y_i and to other measures of empowerment.

H4: Both experimental measures of resource control are negatively correlated with access to resources outside of the experiment (i.e. $\partial v_i^*/\partial y_i < 0$, and $\partial x_i^*/\partial y_i < 0$). Assuming that spouses are sufficiently selfish (i.e.$\gamma_s < 1$ for $s = i, -i$ in our model), we also predict a negative correlation between both experimental measures of resource control and other survey measures of empowerment.

- If there is no undoing of choices outside of the experiment on average, we should also observe a positive relationship between willingness to pay not to control resources and access to resources outside of the experiment (i.e. $\partial z_i^*/\partial y_i > 0$) as well as with other measures of empowerment.

Appendix B. The Ghana Experiment

B1. Experimental procedures

All spouses who expressed interest in being part of the randomized control trial conducted by a local agribusiness were invited to participate a "meeting". This meeting was the lab experiment were incentivized decisions were elicited. Invitations were made in person by an enumerator 1 or 2 days before the date of the session. Spouses were informed at the time of invitation that they could earn money by attending the meeting, and that the two spouses invited had to be the ones attending to be able to participate. A minimum show-up fee of 3 GHC ($0.78USD) was guaranteed for each person for attending the meeting.

Meetings were conducted in a central location in each village. Various sessions were administered in a village if necessary at different times. Upon arrival to a session, participants were asked to wait to be privately interviewed. The waiting area was separate from the interview area, and from the payment area. We prevented communication between participants waiting to be interviewed and those who already participated in the one on one interview.

Private decisions were elicited from both spouses by two enumerators who privately interviewed spouses at the same time. Each interview was conducted in a separate interview booth that ensured privacy. Twelve enumerators simultaneously conducted interviews in each "meeting". Enumerators were matched in pairs for the duration of data collection and were randomly assigned to couples in each village. Which enumerator interviewed the husband or the wife was rotated within each enumerator pair. We had a total of 3 female and 9 male enumerators eliciting incentivized decisions in the lab-in-the-field experiment. A complete interview with two spouses took approximately 30 minutes to complete.

B.2. Script

B.2.1 Consent

<< Information read aloud at the beginning of each session to all participants in the waiting area >>

Hello. Welcome to today's meeting. Thank you for arriving on time. My name is _____, I am a representative from IPA. I am here to assist in this data collection exercise which is part of the research project being conducted with IPA and _____. We will tell you more information about the meeting when you are called to meet with one of us one-on-one.

Before calling you to meet with us one on one we would like to read a consent form that will tell you a little bit about the purpose of this meeting. Please pay attention and ask questions at any time.

Consent

You have been invited to this meeting because you are currently participating in a research project conducted by researchers from IFPRI, IPA, and the World Bank. This meeting is part of a research project being conducted with everyone who expressed interest in renting land with irrigation and/or in receiving credit for agricultural inputs with _____. The events that take place during today's meeting will not affect your relationship with _____ in any way. We will not tell _____ or any of his staff what choices you or anyone else makes.

The objective of today's meeting is to collect some information for our research project. You are going to be asked to make choices in exchange for money. We are interested in studying the choices that you make. There are no right or wrong answers. We ask that you do what you think is best for you as the decisions that you make will determine the money that you can earn. We will provide you with detailed information about the decisions that you are asked to make once you agree to participate in this meeting.

You will be able to earn money for participating in today's meeting. A minimum sum of 3 GHC are guaranteed. The guaranteed amount is meant to cover any costs you may have needed to incur in order to be here today and will be paid to you individually regardless of the choices that you make.

Your participation in today's meeting is completely voluntary. You can decide to end your participation in this meeting at any time. You will earn the guaranteed 3 GHC regardless of whether or not you decide to end your participation in the meeting. If you choose not to participate in the meeting or end your participation at any time you will not be eligible to earn any additional money.

The choices that you make today will be confidential. We will not reveal to anyone outside our research team what choices you make.

If you end your participation in this meeting at any time we may keep a record of the decisions that you make up until that point in the meeting. Your decisions will not be revealed to anyone outside our research team even if you decide to end your participation in this meeting at any time.

We will give you the opportunity to ask questions and tell us whether you give consent to participate in the meeting when we call you to meet with us one on one.

Just so you know, the information I just read applies to you only if you were invited to participate in this meeting. Please do not wait around if you were not invited. We will not be able to accommodate you in a one on one interview if you were not invited ahead of time. Also know that we are not affiliated with any political organization. This has nothing to do with politics.

Registration

<< Read to spouses together after their names and id numbers are registered >>

I read a consent form to everyone who was waiting to be interviewed. Did you hear all the information that was provided?

<< If yes, proceed. If not, consent form was read again to participants >>

Do you have any questions about the information that was provided to you? Feel free to ask them now.

<< Answer questions >>

If you consent to participate in this meeting, please give verbal consent now.

<< *If consent is given:*>> As you have agreed to participate, I have recorded your names here on this roster and I am marking here that you have given consent.

If you have any other problems or questions, do not hesitate to contact our Project Manager using the contact information on this card.

<< *Give card* >>

<< If consent given, proceed with interview. Direct each spouse to an enumerator pair for the individual decision making part. Enumerator pairs need to rotate who elicits the decisions of the husband and wife. They should also rotate every other interview who elicits the joint decisions. >>

<< If no consent given >> If you would prefer not to participate in this meeting, you are free to go at this time.

<< If consent is not given, direct each spouse to payment enumerator. They will receive their guaranteed individual fee of 3 GHC. Participants who do not provide consent cannot participate in the meeting. If one spouse gives consent and the other one does not, then both spouses will not be allowed to make decisions in exchange for money and will be paid the individual 3 GHC fee. >>

B.2.2 Interview script used to elicit incentivized decisions

Hello. My name is _____, I am a representative from _____ and am here to assist in this data collection exercise which is part of the research project being conducted with _____.

Today's meeting will be divided in 3 tasks. In each task you will have to make one or more decisions in exchange for money. At the end of the meeting one of the 3 tasks will be randomly selected to count for payment. Which task counts for payment will be determined by the computer. We use a computer to determine which task is paid to ensure that everything is done in a fair and unbiased manner. Which task is paid will not be revealed to you or your ${spouse} to ensure that the choices that you make are private.

Any additional money that you earn will be will be paid to you in cash and in private at the end of the meeting. It is up to you whether you decide to tell your ${spouse} how much you earn or not. Even if you do choose to tell your ${spouse} how much you earned, there is no way that he/she will be able to know what decisions you made. This is because only one of the 3 tasks will be randomly chosen for payment, and one of these tasks is a lottery.

We will now proceed with task 1.

Task 1

Your task is to select a card from this set. The card that you select will determine the earnings that your ${spouse} will receive if this task is paid. Your ${spouse} will be asked to make a similar choice, and the card that he or she draws will determine the payment that you will receive.

These are the cards: << Show them >>. They have a value between 0 and 21GHC.

Each card is associated with a unique value. We will not reveal to you the value of the card that you draw. Likewise, we will not reveal to your ${spouse} the value of the card that your ${spouse} draws.

For example:

- This card may have a value of 21 GHC << show the card >>
- This card may have a value of 20.5 GHC << show the card >>
- This card may have a value of 20 GHC << show the card >>
- This card may have a value of 19.5 GHC << show the card >>

- And so on.

Since all values between 0 and 21 are equally likely to be selected, you and your ${spouse} can each receive any sum between 0 GHC and 21 GHC if this task is paid.

For example:

- You may both receive 0 GHC.
- You may both receive 0.5 GHC.
- You may both receive 1 GHC, and so on.

It is also possible that:

- You receive 0 GHC while your ${spouse} receives 0.5 GHC
- You receive 0 GHC while your ${spouse} receives 1 GHC.
- You receive 0 GHC while your ${spouse} receives 1.5 GHC.
- You receive 0 GHC while your ${spouse} receives 21 GHC
- OR
- You receive 21 GHC while your ${spouse} receives 0 GHC.

Any combination of values between 0 and 21 GHC is thus possible.

Please select a card, by pointing to it. Please do not flip it or look at its letter value.

<< Record choice, but do NOT show value to participant >>

Remember that this may be the task that is randomly selected for your payment. Therefore, when all tasks are completed, even if your ${spouse} knows how much you earn, he/she will still not know what decisions you have made in tasks 2 and 3.

For example, if a wife receives a high payment at the end, her husband cannot think this means that the wife mostly chose to keep money for herself. It could simply be the case that task 1 was chosen for payment and she got a high-value card draw. The same would apply to a husband, who receives a high payment in the end. The wife cannot think that the husband mostly chose to keep money for himself. It could simply be the case that task 1 was chosen for payment and he got a high value card draw.

We will now proceed with task 2.

Task 2

In this task you will have to make 2 decisions. One of the decisions that you and your ${spouse} make will be randomly selected to be paid if this task is paid. All the decisions that you and your ${spouse} make in this task are equally likely to be paid.

<< Decision 1: Pull out 10 GHC visual aid from booklet and have it ready for use >>

We would like to give your household 10 GHC << Hold up fake 10 GHC >>

Who would you choose to receive this money, yourself or your ${spouse}?

<< Record choice >>

<< Decision 2: Pull out 15 GHC visual aid from booklet and have it ready for use together with the 10 GHC visual aid >>

<< If answer is respondent >> What if instead we were offering to give your household 10 GHC if received by YOU << Hold up face 10 GHC>> or 15 GHC if received by YOUR ${spouse} << Hold up fake 15 GHC bill>>. Would that change your decision about who you choose to receive it?

<< Confirm >> Just to confirm, you chose X for <<you/your husband / your wife>> instead of Y for << your husband/ your wife/you>>. Is that correct?

<< If yes, record choice. If no, repeat explanation. >>

<< If answer is spouse >> What if instead we were offering to give your household 10 GHC if received by YOUR ${SPOUSE} << Hold up face 10 GHC>> or 15 GHC if received by YOU << Hold up fake 15 GHC bill>>. Would that change your decision about who you choose to receive it?

<< Confirm >> Just to confirm, you chose X for << you / your ${spouse} >> instead of Y for << your ${spouse} / you>>. Is that correct?

<< If yes, record choice. If no, repeat explanation. >>

We will now proceed with task 3.

Task 3

In this task you and your ${spouse} will make a total of 8 decisions. Each time you will have to decide how much money you would like to keep and how much you would like to allocate to another option. One of the 8 decisions that you and your ${spouse} make will be randomly selected to determine payments if this task is paid. All of the decisions are equally likely to be paid.

Do you have any questions? << Answer questions >>

We will now proceed with decision 1.

Decision 1 – Individual allocation decision

We would like to give 14 GHC to your household and would like to know how you would like divide this money between you and your ${spouse}. You can divide the money in 2 GHC increments.

For example, you can choose…

<< Show choices on visual aid booklet. Start at the top for husband and at the bottom for wife.>>

- 14 GHC for you and 0 GHC for your ${spouse}
- 12 GHC for you and 2 GHC for your ${spouse}
- 10 GHC for you and 4 GHC for your ${spouse}
- And so on…
- You can also choose 0 GHC for you and 14 GHC for your ${spouse}

If you give your ${spouse} 2GHC, how much would you get? << Check understanding and repeat explanation if necessary >>

Remember, there are no right or wrong decisions. Any allocation decision that you make is acceptable and is private. Privacy is ensured by the fact that any possible allocation that you can make could also have resulted if task 1 was paid. You and your ${spouse} will not know which task was paid.

Do you have any questions before we proceed? << Answer questions >>

Now please tell me, if this decision is the only one paid, what decision you would like to make? Please point to it on the menu.

<< Record decision >>

We will now proceed with decision 2.

Decision 2 (form A) – Individual investment decision, self[1]

We have 7 GHC to give YOU and would like to give you the opportunity to invest all, part, or none of the 7 GHC in account that multiplies your investment by 3 half of the time and by 0 half of the time. Whether the money you invest is multiplied by a factor of 3 will be determined by the flip of a coin. If the outcome is HEADS then your investment will be multiplied by 3. If it is TAILS you will lose your money. The flip of the coin will be done by the computer to ensure that everything is done in a fair an unbiased manner.

Your investment can be made in increments of 1 GHC. All earnings from this decision will be paid to YOU exclusively. << Show individual icon >>

These are your possible investment choices: << Show visual aid page 1 >>

- You could invest 0 GHC and keep all 7 GHC. Then YOU would get nothing from your investment decision.
- You could invest 1 GHC and keep 6 GHC. Then YOU would get 0 GHC from your investment decision if it the outcome of the coin flip is TAILS, and 3 if it is HEADS. This in addition to the money you kept.
- You could invest 2 GHC and keep 5 GHC. Then YOU would get 0 GHC from your investment decision if it the outcome of the coin flip is TAILS, and 6 GHC if it is HEADS. This in addition to the money you kept.
- And so on…
- You could also invest 7 GHC and keep 0 GHC. Then YOU would get 0 GHC from your investment if the outcome of the coin flip is TAILS, and 21 GHC if it is HEADS.

Adding what you keep and what you get from each possible investment opportunity we have the following table. << Show visual aid page 2 >>

It shows the total earnings associated with all possible investment scenarios.

- You could invest 0 GHC and keep all 7 GHC. Then YOU would earn 7 GHC if the outcome of the coin flip is TAILS or HEADS.

[1] Form B reversed the order of decision 2 and 3. Forms A and B were randomized across respondents.

- You could invest 1 GHC and keep 6 GHC. Then YOU would earn 6 GHC if the outcome of the coin flip is TAILS, and 9 GHC if it is HEADS.
- You could invest 2 GHC and keep 5 GHC. Then YOU would earn 5 GHC if the outcome of the coin flip is TAILS and 11 GHC if it is HEADS.
- And so on…
- You could also invest all 7 GHC and keep 0 GHC. Then YOU would earn 0 GHC if the outcome of the coin flip is TAILS and 21 GHC if it is HEADS.

If you invest 2GHC, how much would you get if the outcome of the coin flip is TAILS? If the outcome of the coin flip is HEADS? << Check understanding and repeat explanation if necessary >>

If you invest 5GHC, how much would you get if the outcome of the coin flip is TAILS? If the outcome of the coin flip is HEADS? << Check understanding and repeat explanation if necessary >>

As I said before, all of the earnings from this decision would be paid to YOU. << Show individual icon >>

Do you have any questions? << Answer questions >>

Remember, there are no right or wrong decisions. Any amount that you want to invest is acceptable and is private. Privacy is ensured by the fact that any possible outcome of your decision could also have resulted if task 1 was paid. You and your ${spouse} will not know which task is paid.

Now please tell me, if this decision is the only one paid, what amount, if any, would you like to invest? Please point to the choice on the menu.

<< Record choice >>

Decision 3 (form A) – Individual investment decision, household

Now I am going to give you the same investment opportunity as before, but now all earnings from the decision will be equally split between YOU AND YOUR ${SPOUSE}. << Should household icon >>

We have 7 GHC to give to your household and would like to give you the opportunity to invest all, part, or none of the 7 GHC in account that multiplies your investment by 3 half of the time and by 0 half of the time.

The possible choices and associated returns are the same as before << Show visual aid page 1 >>

The total payoffs associated with each choice are also the same << Show visual aid page 2 >>

The only difference is that the earnings from this decision would be equally split between YOU AND YOUR ${SPOUSE}. << Show household icon >>

Remember, there are no right or wrong decisions. Any amount that you want to invest is acceptable and is private. Privacy is ensured by the fact that any possible outcome of your decision could also have resulted if task 1 was paid. You and your ${spouse} will not know which task is paid.

Now please tell me, if this decision is the only one paid, what amount, if any, would you like to invest? Please point to the choice on the menu.

<< Record choice >>

We will now proceed with decisions 4 and 5, which will be jointly made by you and your ${spouse}. Your ${spouse} will have made the same decisions that you have made but will NOT know the choices you have made.

Please wait / follow me.

<< Send participant to the booth of the enumerator who will be eliciting the joint decisions,
or wait for both spouses to come to you if you are eliciting the joint decisions. >>

Decision 4 – Joint allocation decision

We are now going to ask you to make the same allocation decision you did before. << Show visual aid >>

We have 14 GHC to give to your household and would like to know how you would like divide this money between the both of you. The division will be made in increments of 2 GHC.

Do you have any questions? << Answer questions >>

I am now going to give you some privacy so that you can make your decision. Here is the menu of possible choices. Please take it with you and consider how you would like to divide the money if this was the only decision paid. The decision that you make together will be private, we will not reveal it to anyone else.

<< Leave spouses alone for a few minutes so that they can make a private choice and keep track of the time they take to reach a decision. >>

Please tell me, if this decision is the only one paid, what choice did you make? Please point to it on the menu.

<< Record decision >>

Decision 5 – Joint investment decision

We are now going to ask you to make the same investment decision you did before. << Show visual aid >>

We have 7 GHC to give to YOUR HOUSEHOLD and would like to give you the opportunity to invest all, part, or none of the 7 GHC in account that multiplies your investment by 3 half of the time and by 0 half of the time.

The possible choices and associated returns are the same as before << Show visual aid page 1 >>

The total payoffs associated with each choice are also the same << Show visual aid page 2 >>

The earnings from this decision would be equally split between YOU AND YOUR ${SPOUSE}. << Show household icon >>

Do you have any questions? << Answer questions >>

I am now going to give you some privacy so that you can make your decision. Here is the menu of possible choices. Please take it with you and consider how much you would like to invest if this decision is the only one paid. The decision that you make together will be private, we will not reveal it to anyone else.

<< Leave spouses alone for a few minutes so that they can make a private choice and keep track of the time they take to reach a decision. >>

Now please tell me, if this decision is the only one paid, what amount, if any, would you like to invest? Please point to the choice on the menu.

<< Record decision >>

Thank you. I will now ask that you wait for a few minutes in _____ << Indicate place >> until we calculate the payment that each of you should receive. We are going to pay you separately and in private. You can leave once we pay you.

<< Give payment enumerator the payment forms and inform registration desk that they can start eliciting the consent of a new set of respondents. >>

Payment

<<To be read once data from the decision forms has been entered into the tablet and the payment questionnaire for the respondent is pulled up >>

Ok. Please come with me.

<< Take participant to a private setting >>

This is your 3 GHC show-up fee. << Pay participant the show up fee >>

These are your decision earnings << Pay participant his or her decision earnings >>.

We are giving them to you separately because we want to make sure that you can keep your choices private. You can put it away now. << Encourage participant to put away the money>>

Remember that all the choices you made today are private. Your ${spouse} does not know what individual choices you made or how much money you have earned. Likewise, you do not know what individual choices your ${spouse} has made or how much money your ${spouse} has earned. Your ${spouse}, just like you, may have received as little as 3 GHC or as much as 24 GHC (including the show-up fee) due to task 1.

Please sign this receipt.

<< Receipt is kept by enumerator >>

B.3 Visual aids

Visual aids. Willingness to pay to control resources

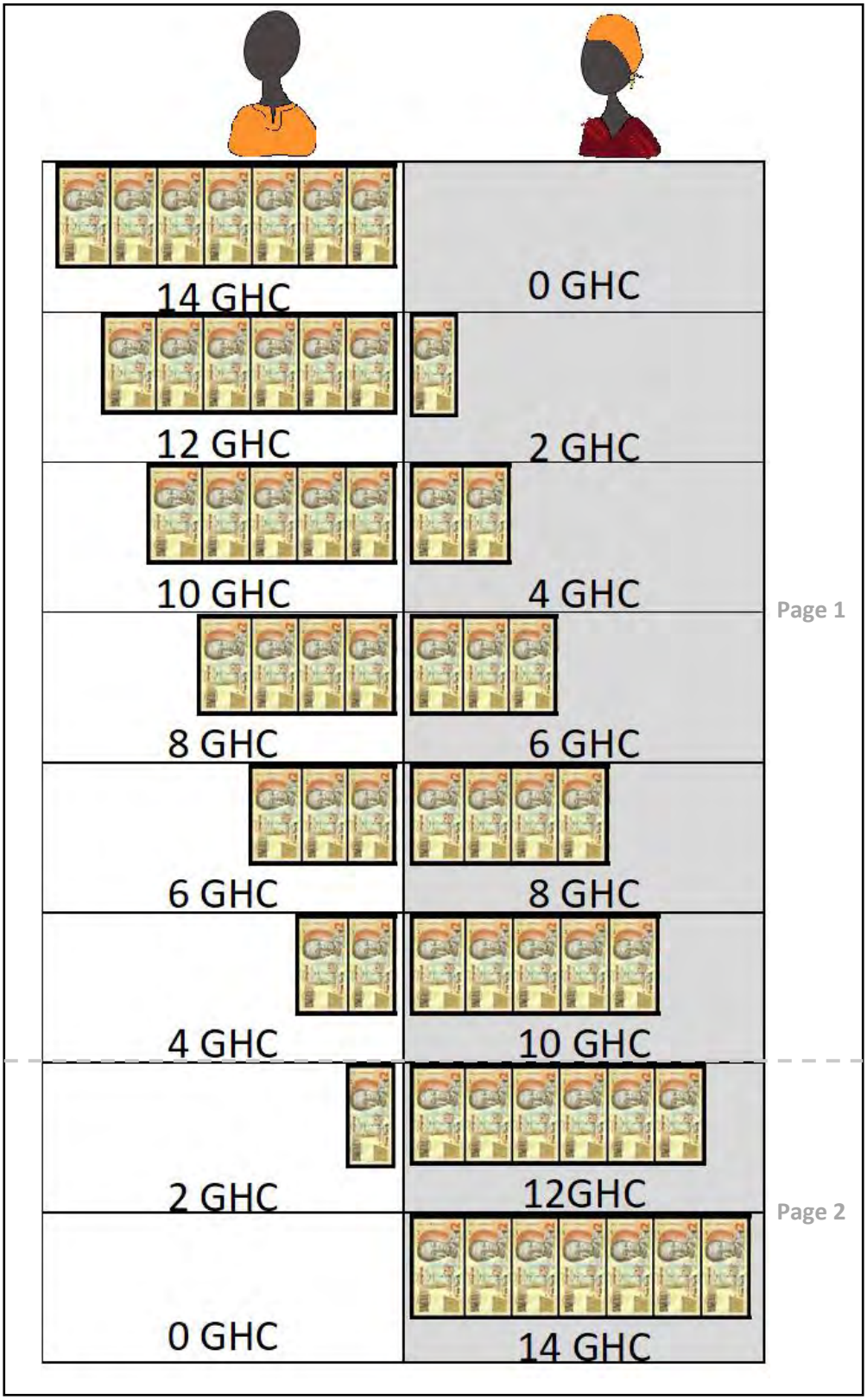
Image 1. Shown to participants when eliciting decision 1 (A5 page)

Image 2. Shown together with image 1 when eliciting decision 2 (A5 page)

Visual aid. Dictator game

Shown to participants when eliciting private and joint dictator game decisions (fold-out menu)

Dimensions: 8-3/4 X 15-1/4”



Visual aids. Investment decisions

Each image was printed on a separate A4 page.

Image 1. Individual icon shown to husband, when eliciting private decision for self

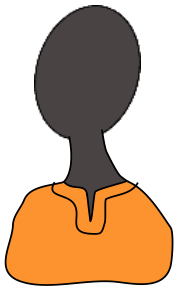


Image 1. Individual icon shown to wife, when eliciting private decision for self.

Image 1. Household icon shown to participants, when eliciting private and joint decisions for household

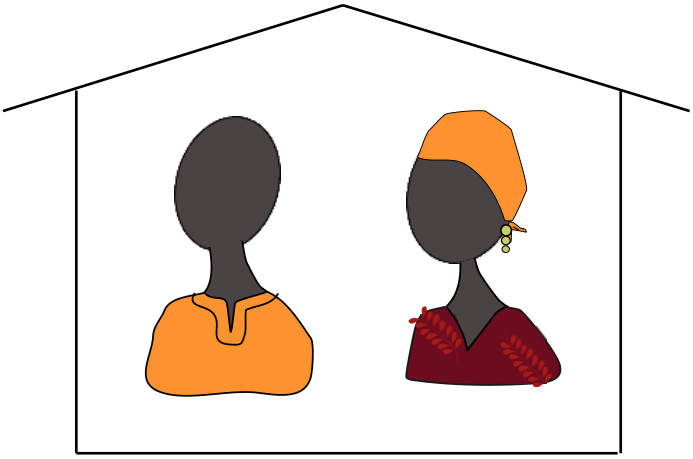
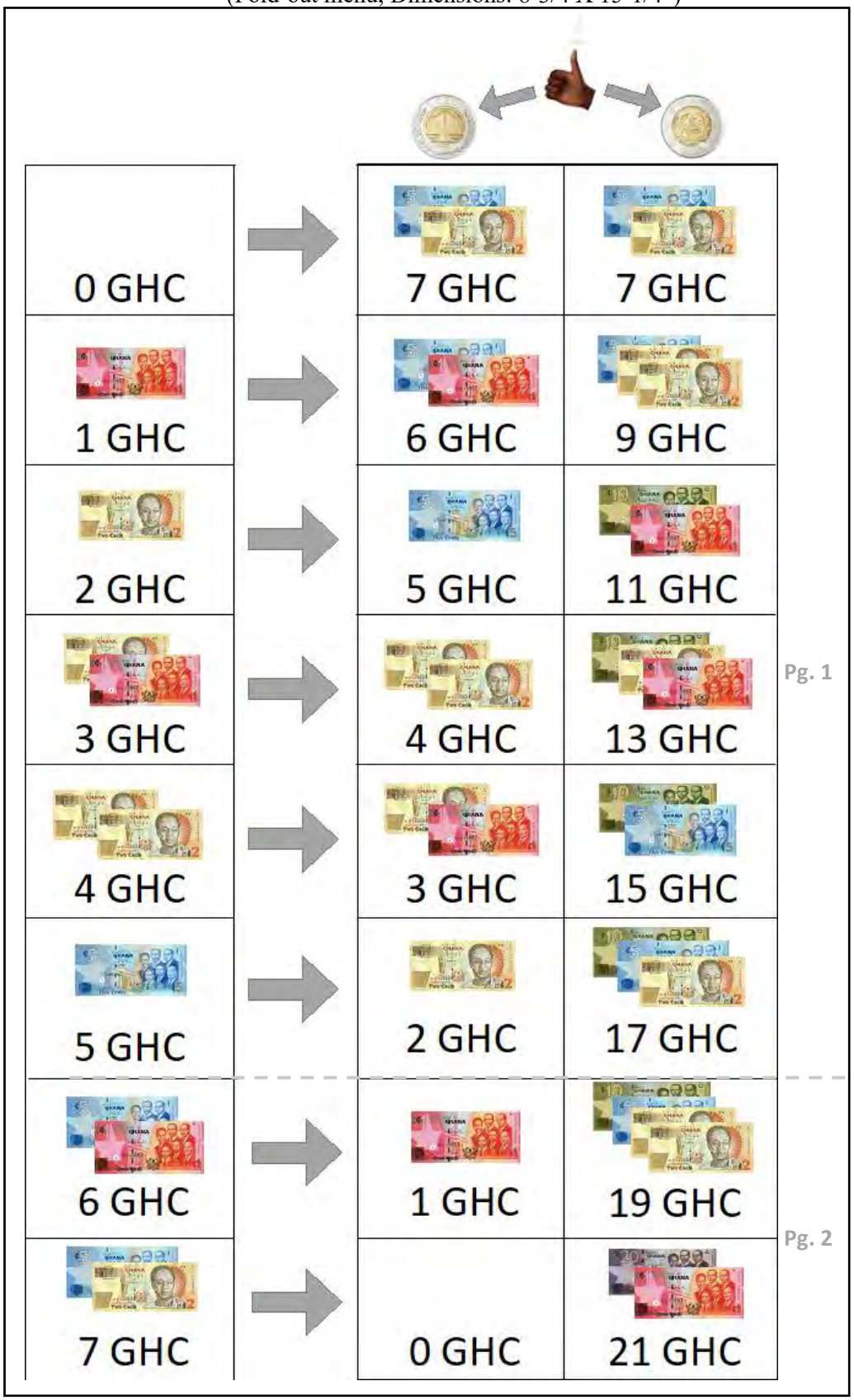


Image 2. Shown to participants when describing the choice set
(Fold-out menu, Dimensions: 8 3-4 X 15-1/4“)

Note: Visual aid page 1 in the interview script provided in section A.2.2.

Image 3. Shown to participants when describing the payoffs associated with each decision (Fold-out menu, Dimensions: 8-3/4 X 15-1/4")



Note: Visual aid page 2 in the interview script provided in section A.2.2.

Appendix C. The Uganda Experiment

C1. Experimental procedures

All spouses who were part of the baseline sample of the randomized control trial conducted by Ambler, Jones, O'Sullivan (2021) were given the opportunity to participate in the lab-in-the-field experiment. Unlike in our Ghana sample, the lab-in-the-field experiment was conducted at each couple's home, by one enumerator, together with a larger household survey about farm and family practices. Couples were recruited from lists of farmers associated with a local sugar company. Participants were first determined to be eligible and willing to participate and then proceeded with the lab-in-the-field experiment and baseline survey.[1] Attempts were made to schedule interviews 2-3 days in advance, but because locating many of the potential participants was difficult, ultimately most interviews occurred when the participants were located and available. Participants were informed that they would be able to earn money and were guaranteed a minimum payment of 1,000 UGX ($0.30USD).

Interviews for the lab-in-the-field experiment took place sequentially, before the larger household survey was administered. Procedures were as follows. First, both spouses were given some general information and we elicited consent to participate in the study. Then the spouse that was readily available and the couple agreed should go first was interviewed in private. After the first spouse made all private incentivized decisions, the second spouse was interviewed in private. Once private incentivized decisions were elicited from both spouses, the couple was brought together to make joint decisions. After making all incentivized decisions, the household survey was administered. This survey included private and joint interview modules. Participants were paid for their incentivized decisions after their involvement in the household survey concluded. It took approximately 30 minutes for the incentivized decisions to be elicited. However, the lab-in-the-field experiment and the household survey took approximately 3 hours.

C.2. Script

C2.1 Consent

<< Read to spouses together >>

This household has been identified as eligible to participate in the Farm & Family Balance Study, which is being conducted by the International Food Policy Research Institute (IFPRI), an international organization dedicated to research into the elimination of poverty and hunger in collaboration with the World Bank's Gender Innovation Lab (GIL). The objective of this study is to learn more about how households manage their farms and their income. If you choose to participate in this study, we would like to interview both of you today to learn more about these topics.

We will also first ask you to make choices in exchange for money. We are interested in studying the choices that you make. You will be able to earn money for participating and a minimum sum of 1,000 UGX is guaranteed for each of you.

We would like to conduct these interviews both together then separately and each in private, as we would like each of you to answer on your own without any influence from each other. Each interview should take approximately 1 hour and a half.

[1] Eligibility criteria were determined for the randomized control trial that followed. These criteria included active sugarcane farming, being married, having an active eligible sugarcane block, and having no outstanding loans against sugarcane blocks.

Some households who choose to participate in this study may be invited to a training later this year and/or may receive additional household visits in the future. This will not be the case for all households participating in the study and the selection will be by lottery. Nothing you say today will have any impact on your selection for other study activities. Households selected for these additional activities may benefit from that participation. Even if you are not selected for additional activities, your participation will help us to learn valuable things about your community that may result in improved programs and services in your area in the future. All participants in the study will be requested to complete another interview in about 18 months' time, which will also last about 1 hour and a half.

Your participation in this study is your choice. If you do choose to participate you can change your mind at any time. If any question we ask during the interview makes you uncomfortable, you can choose not to answer it. There are no penalties or benefits to you that will be affected by your choices regarding participation. Your choice to participate or not will not affect your relationship with your community.

All your information and any answers to interview questions will be kept strictly confidential. Only the research team at IFPRI and at the World Bank will have access to this information and it will not be shared with any other entity. Your answers will be associated only with a study ID number and not with your name. Only data that does not contain your name will continue to exist after the study is finished.

Do you have any questions at this time?

Do you agree to participate in this study?

If you have any questions, concerns, or complaints during the study, you are free to contact the individuals shown below.

<< Provide contact information >>

Do you have any questions at this time?

<< Ask to male respondent:>> Do you agree to participate in this study?

<< Ask to female respondent: >> Do you agree to participate in this study?

<< When BOTH respondents have given CONSENT, continue to next screen. If either respondent does NOT consent, STOP the interview. >>

C.2.2 Interview script used to elicit incentivized decisions

<< Read to spouses together >>

I want to ask you to make some decisions that will determine how much money each of you will earn. Based on your decisions, you could earn any amount between 0 and ${Z} UGX.[2] In addition to what you earn from your decisions, you will also receive 1,000 UGX as a thank you for participating, but each of you may earn as much as ${Z} UGX.

Before we begin I want to make sure that you understand a few important points.

[2] Z can acquire one of two values in the study, either 14,000 UGX or 28,000 UGX. Which value applies depends on the value of Y randomly assigned to the household in Tasks 3 & 4.

1. There are no right or wrong answers. We ask that you do what you think is best for you because the decisions that you make will determine the money that you earn.
2. The decisions you make will be completely confidential. No one besides the research team will know what you decided. Each of you will not know what decisions your spouse has made.
3. You will be paid your earnings in private, separately from your spouse. It is up to you whether you decide to let him/her know how much you earned. Even if you do choose to tell your spouse how much you have earned, there will be no way for him/her to know what decisions you made. This is because each of you will make several different decisions, but no one will know which decisions are randomly chosen to be paid.
4. Participation in the decision-making part of this interview is completely voluntary. If you do not wish to participate you can take the 1,000 UGX but you will not earn anything additional.

If you choose to participate, I will ask you to complete 4 tasks. In each task you will have to make one or more decisions in exchange for money. After we finish, one of the 4 tasks will be randomly selected to count for payment. Which task counts for payment will be determined by the computer. We use a computer to determine which task is paid to ensure that everything is done in a fair and unbiased manner. Which task is paid will not be revealed to either of you to ensure that the choices that you make are private.

Any additional money that you earn will be paid to you in cash and in private later today. It is up to you whether you decide to tell your spouse how much you earn or not. Even if you do choose to tell your spouse how much you earned, there is no way that he/she will be able to know what decisions you made. This is because only one of the 4 tasks will be randomly chosen for payment, and one of these tasks is a lottery.

<< Enter spouse readily available for interview>>

<< To spouse interviewed first:>> At this time I would like to speak privately with you.

<< To spouse not interviewed first >> Please excuse us for a short while and I will speak with you privately afterward.

<< Enumerator takes respondent to a private place where the decisions can be administered.>>

Task 1

Your task is to select a card from this set. The card that you select will determine the earnings that you could receive if this task is paid. Your ${spouse} ${will be asked \ has been asked} to make a similar choice, and the card that he/she ${draws \ drew will determine } the payment that he/she could receive.

These are the cards: << Show them and allow respondent to hold if they ask. >> They have a value between 0 and ${Z} UGX.

Each card is associated with a specific value. We will not reveal to you the value of the card that you draw. Likewise, we will not reveal to your ${spouse} the value of the card that your ${spouse} draws.

For example:

- Any card you choose may have a value of ${Z}, such as this one or this one. << Show the cards >>
- Also, any card you choose may have a value of ${Z1}, or ${Z2} or ${Z3} and so on.
- Any card could also be a lower number, or even zero.

The letter on the card does not indicate whether the value will be high or low.

Since all values between 0 and ${Z} are possible to be selected, you could receive any sum between 0 and ${Z} if this task is paid. Your ${spouse} could also receive any value between 0 and ${Z} if this task is paid. You could both receive the same value or very different values, since it is all up to chance.

Please select a card, by pointing to it.

<< Record choice >>

Remember that this may be the task that is randomly selected for your payment. Therefore, when all tasks are completed, even if your ${spouse} knows how much you earn, ${he\she} will still not know what decisions you have made in the other tasks.

You are now going to be asked to make some decisions that affect the money that you and your ${spouse} receive. These decisions will be private. For example, if a wife receives a high payment at the end, her husband cannot think this means that the wife mostly chose to keep money for herself. It could simply be the case that task 1 was chosen for payment and she got a high-value card draw. The same would apply to a husband, who receives a high payment in the end. The wife cannot think that the husband mostly chose to keep money for himself. It could simply be the case that task 1 was chosen for payment and he got a high value card draw.

We will now proceed with task 2.

<< You may now put the lottery cards away. >>

Task 2

In this task you will have to make 2 decisions. One of the decisions that you and your ${spouse} make will be randomly selected to be paid if this task is paid. All the decisions that you and your ${spouse} make in this task are equally likely to be paid.

<< Decision 2: Pull out 10,000 UGX from visual aid booklet and have it ready for use >>

We would like to give your household 10,000 UGX. << Point to $10,000 UGX.>>

Who would you choose to receive this money, yourself or your ${spouse}?

<< Record choice >>

<< Decision 2: If answer to Q1 was 'Myself' .>>

<< Prepare Decision 2 visual aids from booklet and have them ready for use. >>

What if instead we were offering to give your household $10,000 if received by YOU. << Point to 10,000 UGX >> or 15,000 UGX if received by your ${spouse}. <<Point to 10,000 & 15,000 UGX bills.>> Would that change your decision about who you choose to receive it?

To be clear, you can receive 10,000 UGX yourself, OR your ${spouse} can receive 15,000 UGX, but only one of you will receive the money.

Would you choose to receive 10,000 UGX yourself or have your ${spouse} receive 15,000 UGX?

<< Confirm >> Just to confirm, you chose ${choice} for ${yourself / your spouse} instead of ${not choice} for ${your spouse / yourself}. Is that correct?

<< If yes, record choice. If no, repeat explanation.>>

<< Decision 2: If answer to Q1 was 'My spouse'. >>

<< Prepare Decision 2 visual aids from booklet and have them ready for use .>>

What if instead we were offering to give your household 10,000 UGX if received by your ${spouse} << Point to 10,000 UGX >> or 15,000 UGX if received by you. << Point to 10,000 & 15,000 UGX bills. >> Would that change your decision about who you choose to receive it?

To be clear, your ${spouse} can receive 10,000 UGX, OR you can receive 15,000 UGX, but only one of you will receive the money.

Would you choose to have your ${spouse} receive 10,000 UGX or receive 15,000 yourself?

<< Confirm >> Just to confirm, you chose ${choice} for ${yourself / your spouse} instead of ${not choice} for ${your spouse / yourself}. Is that correct?

<< If yes, select response. If no, repeat explanation. >>

We will now proceed with task 3. << Flip the visual aid booklet page to prepare for Task 3. You should see "Tasks 3 and 4" written. >>

Task 3

In this task you will make one decision. If this task is paid either the decision made by you or the decision made by your ${spouse} will be randomly selected to be paid. Both the decision made by you and the one made by your ${spouse} in this task are equally likely to be paid.

We would like to give ${Y} UGX to your household and would like to know how you would like to divide this money between you and your ${spouse}. You can divide the money in ${Y/7} UGX increments.[3]

<< Turn page to show visual aid booklets. Point to the image of the man and the woman. >>

This picture shows how you can divide the money. At the top are pictures representing you and your ${spouse}. << Indicate on visual aid. >> Each row is one option that you can choose. For each option the money you would keep is shown on this side and the money your ${spouse} would keep is shown on this side.

For example, you can choose...

<< Show choices on visual aid booklet. Start at the bottom if speaking with wife. Start at the top if speaking with husband >>

[3] $Y = 14{,}000$ for 75% of the sample, who makes choices in 2,000 UGX increments. $Y = 28{,}000$ UGX for 25% of the sample who make choices in 4,000 UGX increments.

- ${Y} for you and 0 for your ${spouse}
- ${Y-Y/7} for you and ${Y/7} for your ${spouse}
- ${Y-2*Y/7)} for you and ${2*Y/7)} for your ${spouse}
- And so on...
- You can also choose 0 for you and ${Y} for your ${spouse}.

If you give your ${spouse} ${Y/7}, how much would you get? << If correct, say "That's correct". If not correct, repeat explanation starting with "We would like to give..." >>

Remember, there are no right or wrong decisions. Any allocation decision that you make is acceptable and is private. Privacy is ensured by the fact that any possible allocation that you can make could also have resulted if task 1 was paid. You and your ${spouse} will not know which task was paid.

Do you have any questions before we proceed? << Answer questions >>

Now please tell me, if this decision is the only one paid, what decision you would like to make? << Please tell me or point to it on the menu. >>

<< Record decision >>

We will now pause to ask the same questions of your spouse and return to you for the last task in a few minutes. Please wait here while I call your spouse to join us.

<< Now call or find second person. When second person has joined, say to the first person: >> Now your spouse will complete the same tasks that you have done but will NOT know the choices you have made. Please excuse us while I speak privately with your spouse. Thank you for your patience.

<< Repeat Tasks 1-3 with second person >>

<< To second person, after he/she makes decisions in Tasks 1-3 >> We will now proceed with Task 4, which will be a decision made jointly by you and your spouse. Your spouse has completed the same tasks that you done but will NOT know the choices you have made. Please wait here while I ask your spouse to join us.'

Task 4

We are now going to ask you to make the same allocation decision you did before. << Re-open visual aid book to the last page you were on (correct set for page Task 3 and 4). >>

We have ${Y} UGX to give to your household and would like to know how you would like to divide this money between the both of you. The division will be made in increments of ${Y/7} UGX.

Do you have any questions? << Answer questions. Remove page from visual aid booklet and give to respondents. >>

I am now going to give you some privacy so that you can make your decision. Here is the menu of possible choices. Please keep it with you and consider how you would like to divide the money if this was the only decision paid. The decision that you make together will be private, we will not reveal it to anyone else.

<< Leave spouses alone for a few minutes so that they can make a private choice and keep track of the time they take to reach a decision. >>

Please tell me, if this decision is the only one paid, what choice did you make?

<< Record time taken to reach decision and who announced the decision >>

<< Say to the person who did not announce the decision:>> Do you agree with this decision?

<< If no: >> In order for this to be a joint decision, you will both have to agree on how to divide the money. I will leave you for a few more minutes so that you can reach an agreement.

<< Record decision >>

Thank you for completing this decision-making exercise. We will now proceed with the interview. I will ask you to stay together here to answer together some questions about your household.

<< Close visual aid booklet and put it aside. Then proceed with household survey >>

Payment

<< Done in private with each respondent after they have finished answering all household survey questions >>

<< You are about to pay the respondent who completed their individual interview ${first/second}. This is the ${spouse interviewed first/second}.>>

<< Find a PRIVATE place away from view of the respondent to put the money in the envelope and fill in the paper receipt with the respondent's payment information. Then go back to respondent. >>

Thank you for answering all my questions. Now that we are finished together, I would like to give you the money you earned in the decision-making exercise at the beginning of our meeting.

Remember that you and your spouse completed 4 tasks each, and only one of those tasks has been selected to be paid. The selection of which task to pay was made by the computer. I have no control over which task was selected. In addition, if the first task was selected for payment, I have no control over the value of the card that you chose, that value is also determined by the computer. The final outcome for you resulted in a payment of ${P} shillings. Please sign this imprest form to confirm that you are receiving this amount.

<< Give the filled imprest form for signature. After signature, collect imprest form and give the envelope with cash. >>

Thank you for your time today.

C3. Visual aids

The visual aid material uses the same format as in the Ghana Experiment and is therefore not shown in this appendix.

Appendix D. Ethics

In this appendix we describe in detail the steps taken to minimize participant risks at each study site.

E.1 Ghana

The study and all data collection procedures conducted in Ghana were approved by the International Food Policy Research Institute IRB in Washington, DC and by the University of Ghana Ethics Committee for the Humanities (ECH).

In Ghana, the lab-in-the-field experiment was collected separately from survey data and thus used separate informed consent procedures. We elicited individual consent from both spouses together, to ensure that participation was common knowledge and agreed to by all parties. Private decisions were then elicited from spouses separately in private interview booths that maintained the privacy and confidentiality of individual decisions. Only joint decisions at the very end of the interview were made by spouses publicly in front of each other. Participants were informed of this in advance and could talk to their spouse in private before announcing a decision.

Interviews were scripted, to standardize the way we elicited decisions and to make sure that all enumerators explained in the same way how the privacy of decisions was guaranteed by design and could be maintained by spouses outside of the study. We had a different payment enumerator than the one who elicited decisions pay participants and did not inform enumerators or participants which choice made by the couple was randomly selected to be paid. Furthermore, we paid the show-up fee separately from decision earnings, asked participants to put the money away immediately after they were paid, while they were still in the presence of the enumerator, and did not give out receipts to participants which could inadvertently reveal to others the total amount participants earned. These three measures ensured that participants could hide income from their spouse or other members of the community if they wished to do so and minimized any risk participants might face if they chose to hide income or earned more money than others in their household or in the community.

The data used to construct the survey measures of empowerment we use were collected during a household survey visit that occurred separately from the lab-in-the-field experiment. Any data collected separately from spouses was elicited individually during private interviews. Data on intimate partner violence incidence was collected from wives only, using the Demographic and Health Surveys (DHS) survey module on domestic violence and following their recommendations for the ethical and responsible conduct of research. These recommendations are similar to the ones provided by the World Health Organization for research on domestic violence against women. We only deviated from DHS recommendations in three small ways. First, we did not provide information sheets to women who experienced domestic violence because doing so was deemed unsafe during survey design and conversations with local actors. Nevertheless, a list of resources and organizations available in the study area was developed and managed by the field team overseeing data collection such that a referral system could be available when needed. Second, we did not involve women's groups in our study or the training of enumerators. Third, we did not train male and female enumerators separately. Both men and women received the same specialized training because both male and female enumerators administered the domestic violence survey module to women. Having same sex enumerators collect data was not feasible for both the household survey and the lab-in-the-field experiment because of the number of male and female enumerators we were able to recruit and the timeline and resources available for data collection activities.

E.2 Uganda

The study and all data collection procedures in Uganda were approved by the International Food Policy Research Institute IRB in Washington, DC and the International Health Sciences University (now Clarke International University) IRB in Kampala, Uganda. Research approval was also obtained from the Uganda National Council for Science and Technology.

In Uganda, the lab-in-the-field experiment was conducted at the beginning of the baseline survey under the same consent procedures. We elicited consent from both spouses together, to ensure that participation was common knowledge and agreed to by all parties. The private decisions were then elicited from spouses separately in a setting that maintained the privacy and confidentiality of individual decisions. Only joint decisions at the end of lab-in-the-field section were made publicly in front of each other. Participants were informed of this in advance and could talk to their spouse in private before announcing a decision.

Interviews were scripted, to standardize the way we elicited decisions and to make sure that all enumerators explained in the same way how the privacy of decisions was guaranteed by design and could be maintained by spouses outside of the study. We did not inform participants which choice made by the couple was randomly selected to be paid. Furthermore, we paid the minimum earnings separately from decision earnings and did not give out receipts to participants which could inadvertently reveal to others the total amount participants earned. These measures ensured that participants could hide income from their spouse or other members of the community if they wished to do so and minimized any risk participants might face if they chose to hide income or earned more money than others in their household or in the community.

The data used to construct the survey measures of empowerment we use was collected during the household survey that immediately followed the lab-in-the-field decisions. Any data collected separately from spouses was elicited individually during private interviews. Specifically, data on marital quality, decision making, and intimate partner violence were conducted at the very end of the interview with multiple checks built into the survey instrument to ensure complete privacy during that survey module. Specialized training was also provided to enumerators to ensure the importance of privacy was understood by enumerators.

We conducted a short, three question module, on intimate partner violence incidence with women participants. We followed the DHS recommendations for ethical and responsible conduct of research, with three small deviations. The most important deviation was that both men and women were asked questions about the incidence of intimate partner violence. Men were asked only one short question and this decision was made because male attitudes and experience with IPV were of interest to main RCT. This was done with the knowledge and approval of the local IRB. Research procedures were designed with care to emphasize privacy and confidentiality and limit the possibility of any backlash. Second, we did not involve women's groups in our study or the training of enumerators. Third, we did not train male and female enumerators separately. Both men and women received the same specialized training because both male and female enumerators administered the domestic violence survey module to women. Having same sex enumerators collect data was not feasible for both the household survey and the lab-in-the-field experiment because of the number of male and female enumerators were able to recruit and the timeline and resources available for data collection activities.

Women who reported experiencing intimate partner violence were provided referrals to the Uganda Toll Free Domestic Violence Hotline or the Jinja-based Anti-Domestic Violence Coalition. In addition to concerns related to intimate partner violence, the research team considered concerns related to the participation in the lab-in-the-field experiment and to participation in the larger RCT which may have included a larger role in financial management on the part of the women. Households (including wives) were provided with contact information for the project in case of any conflicts that arose. Project staff also

maintained links with local officials and the partner sugar company to monitor for any possible issues and refer to the appropriate source. The sugar company additionally operated an Advisory Unit that was tasked with handling household conflicts related to sugarcane. These services were also available to households.

Appendix E: Multiple Hypothesis testing adjustments

To account for the number of hypotheses tested in this paper, we implement corrections for the family wise error rate (FWER) for all the tables in our main text, with the exception of Table 7 which we view as exploratory. We implement the correction method developed in List et al. (2019) and Barsbai et al. (2020). The corrections are conducted for each panel of each regression table, including all displayed coefficients. In Table 2, we include only the columns with control variables in the correction. The corrections are implemented using the mhtreg command in Stata, described in Barsbai et al. (2020). All corrections employ 10,000 repetitions. The tables that follow repeat the p-value from the original calculation, and show the FWER-adjusted p-value below.

Appendix Table E.1: Fixed Effects Regressions to Estimate Difference between Husband and Wife, MHT adjusted results

	(1)	(2)	(3)	(4)
	Pays to control resources	Pays to have spouse control resources	Percentage assigned to wife	Absolute distance to joint |J-I|
Panel A: Ghana				
Cofficient on "Wife"				
Initial p-value	0.024	0.000	0.045	0.000
FWER adjusted p-value	0.037	0.000	0.053	0.038
Panel B: Uganda				
Cofficient on "Wife"				
Initial p-value	0.032	0.000	0.002	0.000
FWER adjusted p-value	0.033	0.000	0.001	0.233
Control variables	Yes	Yes	Yes	Yes

Note: Initial p-values are for the coefficients and standard errors displayed in Table 2, columns 2, 4, 6, and 8. FWER adjusted p-values are corrected for the family wise error rate using the method detailed in List et al. (2019) and Barsbai et al. (2020) with 10,000 repetitions.

Appendix Table E.2: Relationship between Experimental Measures, MHT Adjusted Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable is							
	Wife pays to control resources				Wife pays to have husband control resources			
Panel A: Ghana								
Percent of endowment assigned to wife: wife								
Initial p-value	0.000	0.000			0.000	0.000		
FWER adjusted p-value	0.000	0.000			0.000	0.000		
Percent of endowment assigned to wife: husband								
Initial p-value		0.422				0.164		
FWER adjusted p-value		0.868				0.624		
Percent of endowment assigned to wife: joint								
Initial p-value		0.646				0.168		
FWER adjusted p-value		0.944				0.568		
Absolute difference: Joint allocation to wife - wife allocation to								
Initial p-value			0.025				0.801	
FWER adjusted p-value			0.165				0.799	
Absolute difference: Husband allocation to wife - wife allocation								
Initial p-value				0.031				0.687
FWER adjusted p-value				0.196				0.882
Panel B: Uganda								
Percent of endowment assigned to wife: wife								
Initial p-value	0.000	0.000			0.000	0.000		
FWER adjusted p-value	0.000	0.000			0.000	0.000		
Percent of endowment assigned to wife: husband								
Initial p-value		0.960				0.820		
FWER adjusted p-value		0.961				0.965		
Percent of endowment assigned to wife: joint								
Initial p-value		0.034				0.184		
FWER adjusted p-value		0.201				0.608		
Absolute difference: Joint allocation to wife - wife allocation to								
Initial p-value			0.198				0.025	
FWER adjusted p-value			0.581				0.162	
Absolute difference: Husband allocation to wife - wife allocation								
Initial p-value				0.117				0.571
FWER adjusted p-value				0.477				0.915

Note: Initial p-values are for the coefficients and standard errors displayed in Table 3. FWER adjusted p-values are corrected for the family wise error rate using the method detailed in List et al. (2019) and Barsbai et al. (2020) with 10,000 repetitions.

Appendix Table E.3: Correlation of Wife Experimental Measures with Survey Measures: Ghana, MHT Adjusted Results

	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
Panel A: Model 1					
Pays to control resources					
Initial p-value	0.278	0.147	0.542	0.818	0.796
FWER adjusted p-value	0.894	0.758	0.907	0.815	0.961
Pays to have spouse control resources					
Initial p-value	0.434	0.227	0.315	0.092	0.448
FWER adjusted p-value	0.939	0.861	0.889	0.595	0.927
Panel B: Model 2					
Percent of endowment assigned to wife: wife					
Initial p-value	0.331	0.324	0.866	0.002	0.954
FWER adjusted p-value	0.972	0.985	0.985	0.020	0.957
Percent of endowment assigned to wife: husband					
Initial p-value	0.644	0.280	0.272	0.860	0.333
FWER adjusted p-value	0.999	0.979	0.984	0.997	0.980
Percent of endowment assigned to wife: joint					
Initial p-value	0.703	0.780	0.548	0.059	0.637
FWER adjusted p-value	0.998	0.998	0.998	0.607	0.999
Panel C: Model 3					
Absolute difference: Joint allocation to wife - wife allocation to wife					
Initial p-value	0.944	0.969	0.562	0.111	0.859
FWER adjusted p-value	0.998	0.967	0.964	0.456	0.997
Panel D: Model 4					
Absolute difference: Husband allocation to wife - wife allocation to wife					
Initial p-value	0.852	0.921	0.337	0.840	0.243
FWER adjusted p-value	0.977	0.921	0.807	0.996	0.766

Note: Initial p-values are for the coefficients and standard errors displayed in Table 4. FWER adjusted p-values are corrected for the family wise error rate using the method detailed in List et al. (2019) and Barsbai et al. (2020) with 10,000 repetitions.

Appendix Table E.4: Correlation of Wife Experimental Measures with Survey Measures: Uganda, MHT Adjusted Results

	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
Panel A: Model 1					
Pays to control resources					
Initial p-value	0.000	0.009	0.694	0.000	0.653
FWER adjusted p-value	0.000	0.044	0.697	0.000	0.881
Pays to have spouse control resources					
Initial p-value	0.000	0.000	0.011	0.309	0.006
FWER adjusted p-value	0.000	0.000	0.050	0.659	0.032
Panel B: Model 2					
Percent of endowment assigned to wife: wife					
Initial p-value	0.000	0.000	0.102	0.000	0.013
FWER adjusted p-value	0.001	0.002	0.653	0.000	0.131
Percent of endowment assigned to wife: husband					
Initial p-value	0.352	0.029	0.660	0.548	0.540
FWER adjusted p-value	0.972	0.277	0.996	0.990	0.996
Percent of endowment assigned to wife: joint					
Initial p-value	0.773	0.675	0.541	0.740	0.932
FWER adjusted p-value	0.949	0.990	0.998	0.983	0.932
Panel C: Model 3					
Absolute difference: Joint allocation to wife - wife allocation to wife					
Initial p-value	0.010	0.000	0.287	0.070	0.006
FWER adjusted p-value	0.031	0.002	0.290	0.145	0.030
Panel D: Model 4					
Absolute difference: Husband allocation to wife - wife allocation to wife					
Initial p-value	0.021	0.007	0.440	0.920	0.013
FWER adjusted p-value	0.068	0.033	0.681	0.922	0.048

Note: Initial p-values are for the coefficients and standard errors displayed in Table 5. FWER adjusted p-values are corrected for the family wise error rate using the method detailed in List et al. (2019) and Barsbai et al. (2020) with 10,000 repetitions.

Appendix Table E.5: Correlation of Husband and Wife Experimental Measures with Survey Measures: Uganda, MHT Adjusted Results

	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
Panel A: Willingness to pay					
1 *Omitted category: Agree to max resources*					
2 Both pay for spouse to control					
Initial p-value	0.000	0.000	0.087	0.030	0.001
FWER adjusted p-value	0.000	0.000	0.846	0.650	0.034
3 Both pay for resource control					
Initial p-value	0.080	0.048	0.614	0.070	0.598
FWER adjusted p-value	0.819	0.688	1.000	0.800	1.000
4 Both pay for wife to control					
Initial p-value	0.118	0.000	0.740	0.000	0.615
FWER adjusted p-value	0.870	0.000	0.998	0.025	0.999
5 Both pay for husband to control					
Initial p-value	0.001	0.001	0.079	0.424	0.380
FWER adjusted p-value	0.057	0.039	0.802	0.996	0.993
6 Husband pays for wife to control resources, wife efficient					
Initial p-value	0.026	0.156	0.228	0.006	0.977
FWER adjusted p-value	0.740	0.962	0.988	0.169	0.995
7 Husband pays for husband to control resources, wife efficient					
Initial p-value	0.276	0.737	0.106	0.828	0.366
FWER adjusted p-value	0.985	0.999	0.867	0.997	0.998
8 Wife pays for wife to control resources, husband effcient					
Initial p-value	0.027	0.714	0.290	0.003	0.195
FWER adjusted p-value	0.426	1.000	0.990	0.113	0.975
9 Wife pays for husband to control resources, husband efficient					
Initial p-value	0.023	0.882	0.551	0.006	0.890
FWER adjusted p-value	0.606	0.971	1.000	0.207	0.998
Panel B: Dictator games					
1 *Omitted category: Both say self should receive more*					
2 Both say husband should receive more					
Initial p-value	0.000	0.000	0.033	0.000	0.003
FWER adjusted p-value	0.000	0.000	0.175	0.001	0.014
3 Both say wife should receive more					
Initial p-value	0.718	0.013	0.546	0.542	0.679
FWER adjusted p-value	0.716	0.082	0.953	0.906	0.900
4 Both say their spouse should					
Initial p-value	0.007	0.000	0.069	0.000	0.029
FWER adjusted p-value	0.062	0.000	0.297	0.000	0.164

Note: Initial p-values are for the coefficients and standard errors displayed in Table 6. FWER adjusted p-values are corrected for the family wise error rate using the method detailed in List et al. (2019) and Barsbai et al. (2020) with 10,000 repetitions.

Appendix F: Index creation and data details

This appendix provides additional information about the survey data we use in the study. Sections F1-F3 provide information about the survey measures of women's empowerment we use. Section F4 describes a control variable we use to capture food security.

F.1. Index creation

The survey measures examined in Tables 4 and 5 of this paper are analyzed through the creation of standardized indices to create a summary measure for each category of outcome. We use a method described by Kling, Liebman, and Katz (2007) (KLK method) to construct these measures. The procedure is as follows. Each component variable is standardized by subtracting its mean and dividing by its standard deviation. Then these components are summed, and this summed variable is again standardized by subtracting its mean and dividing by its standard deviation. The component variables and the categories are described in Appendix Table 1 for Ghana and in Appendix Table 2 for Uganda.

The method described above is applied directly in cases where component variables are binary or continuous. In cases where component variables are categorical, an additional technique is applied prior to standardization to create question-level indices for categorical variables as described in Heath, Hidrobo, and Roy (2018) and Roy et al. (2019) (HHR method). This method maintains the full variation in these variables without treating them as continuous. The method is as follows. Considering a variable with n response options, we create n-1 dummy variables. For example, the decision-making questions in both countries are coded as "Wife has no say," "Wife has less than equal say," or "Wife has equal or more say." From these three categories we create two binary variables: "Wife has less than equal say or more" and "Wife has equal or more say." The "left out" response is "Wife has no say." We then standardize each of these variables, take their average, and then standardize again. As such, cases where women have more decision-making power will have higher values. For categorical questions, these question-level indices are used as a component of the category indices described in the previous paragraph. The categorical variables for which we use this method are decision-making, preference agreement, and intimate partner violence (emotional and physical) in Ghana, and decision-making and marital quality variables in Uganda.

In the next subsections, we describe how we selected variables to be included in the index and provide the question text used to elicit each component variable in the household surveys.

F.2. Index component variable selection

We aimed to include all available indicators that were collected in the household surveys of the RCTs conducted at each study site which could represent any domain of empowerment, as described by Kabeer (1999). These include access to resources, agency, and achievements (defined as well-being outcomes).

For access to resources, the index in both countries is based on the ratio of wife's to husband's personal spending but also includes country-specific indicators such as control over sugarcane income (Uganda) and ownership of home or land and income ratio (Ghana). The country-specific questions were determined based on availability in the survey instruments.

For agency, the decision-making index is composed of questions from nearly identical decision-making modules in each country. Though we do include country-specific questions for other indicators, in this case we were able to make the indices comparable across countries by excluding a small number of categories that were available in one country but not the other, such as decision-making related to contraceptive use (Uganda) and decision-making related to extremely detailed aspects of agricultural production (Ghana).

Because achievements can be defined very broadly, we narrowed our focus to achievements related to intra-household dynamics. For example, we did not include educational attainment because, despite being a well-being outcome, this was determined long ago for our samples. We instead focus on intra-household achievements, such as the absence of physical intimate partner violence, which is available for both countries, plus other relevant measures available in only one country: psychological intimate partner violence (Ghana) and marital quality (Uganda).

Finally, as noted in the text, we include a measure of intrahousehold preference alignment. This is not directly related to empowerment, but preference alignment can be a sign of a cooperative household and is additionally another measure of preference alignment as measured by the dictator game. In Ghana, we measure preference alignment by directly asking each spouse how much they agree on a number of domains. In Uganda we ask for spending preferences and compare the responses of the spouses.

F.3. Question text for component variables

Below we provide the question text used to elicit each measure in plain text and any additional information used to create the index or measure we use in italics. Unless otherwise indicated, possible answer options are yes and no or numeric values.

F.3.a Ghana

Unless otherwise indicated, each question was asked privately to each respondent/spouse.

F.3.a.i Wife's access to resources

Asked to the wife only

a. Do you own any land either alone or jointly with someone else?
b. Do you own this or any other house either alone or jointly with someone else?
c. Would you say that the money that you earn is more than what your husband/partner earns; less than what he earns; or about the same?

Index creation: Question c is converted into a binary indicator for whether the wife earns as much or more than her husband. Questions a, b, and c are then combined with the ratio of wife's to husband's personal expenditure using the KLK method.

Personal expenditures ratio

Personal expenditures over the past 30 days are aggregated for each individual using their answers to the following questions. We then construct a ratio of the wife's total personal expenditures to that of her husband.

In the last 7 days, how much did you spend, in total, for yourself on…

- Non-alcoholic drinks: Sachet water, Bottled water, juice, soft drinks, minerals and malta, and non-alcoholic local brews
- Alcoholic drinks: Any kind of beer or wine and local brews /spirits
- Already prepared food
- Gifts or money given to friends OR family members outside the household

In the last 30 days, how much did you spend, in total, for yourself on…

- Toothpaste, razors, soaps, toilet paper, laundry soaps
- Hair products, hairdressing and haircuts

- Creams, colognes, perfumes, make-up, or any other thing like this
- Clothing, shoes, jewelry
- Health, medicine, medical expenses, and health insurance charges
- Fuel and transportation (petrol, oil, fares for transport, vehicle purchase and repair)
- Phone credit

F.3.a.ii Decision making

For each question below, the following answer codes were used.
(1) I decide alone
(2) I decide together with someone other than my husband
(3) My husband and I decide together, but I have the final word
(4) My husband and I decide together
(5) My husband and I decide together, but my husband has the final word
(6) My husband decides together with someone other than me
(7) My husband decides alone
(8) Someone different from us makes the decision

- Who usually decides how the money you earn will be used? [Here we are talking about wages, salaries, and (agricultural and non-agricultural) profits generated by you.]
- Who decides whether to invest your earnings in business or farming activities, and if so, how to invest them?
- Who usually decides how your husband's/partner's earnings will be used?
- Who usually makes decisions about health care for yourself?
- Who usually makes decisions about making major household purchases?
- Who usually makes decisions about visits to your family or relatives?

Index creation: In order to avoid judgement that sole decision making is better than joint decision-making, we first collapse the 7 answer categories into 3 categories: "wife has equal or more say" (answers 1, 2, 3, 4), "wife has say that is less than equal" (answer 5), or "wife has no say" (answers 6, 7, or 8). For each question, the three categories are combined into a single question index using the HHR method. Then the 6 question indices are combined into a single topic index using the KLK method.

F.3.a.iii. Agreement

For these questions, an answer scale from 1 (least) to 5 (most) is used.

- Think about how the household is currently spending money. To what extent do you and your husband agree on what to spend the household's money on?
- Think about how much of the household's income is used for savings and investments (e.g. livestock, business, farming). To what extent do you and your husband agree on the amount the household saves and invests?
- To what extent do you and your husband agree on which and how much of each crop to plant in the household land?
- To what extent do you and your husband agree on how much land is cultivated for the household?

Index creation: each of these four categorical questions is converted into an individual question index using the HHR method described above. Then the four question indices are combined into a single topic index using the KLK method described above.

F.3.a.iv. Intimate partner violence: Psychological & Physical

Asked to the wife only

Controlling behavior

For these questions, answer options are yes, no, or I don't know.

Please tell me if these apply to your relationship with your husband.

- He is jealous or angry if you talk to other men?
- He frequently accuses you of being unfaithful?
- He does not permit you to meet your female friends?
- He tries to limit your contact with your family?
- He insists on knowing where you are at all times?
- He does not trust you with any money?
- He refuses or denies to have sexual intercourse with you?

Emotional and physical violence

For each question below that is answered yes, the question is followed by

> "How often did this happen during the last 12 months: often, only sometimes, or not at all?"

In the analysis, the answer to each set of questions is then coded categorically as (1) never, (2) not in the last year, (3) sometimes in the last year, or (4) often in the last year.

Emotional abuse

Does your husband ever:

- say or do something to humiliate you in front of others?
- threaten to hurt or harm you or someone close to you?
- insult you or make you feel bad about yourself?

Physical intimate partner violence

Does your husband ever do any of the following things to you:

- push you, shake you, or throw something at you?
- slap you?
- twist your arm or pull your hair?
- punch you with his fist or with something that could hurt you?
- kick you, drag you or beat you up?
- try to choke you or burn you on purpose?
- threaten or attack you with a knife, gun, or any other weapon?
- physically force you to have sexual intercourse with him even when you did not want to?

Index creation: Each of the questions for emotional and physical violence are coded categorically, as described above. They are then converted into an individual question index using the HHR method. The psychological topic index is created from the 7 controlling behavior binary questions and the 3 emotional abuse question indices using the KLK method. The physical violence topic index is created using the 8 physical violence question indices using the KLK method.

F.3.b. Uganda

F.3.b.i. Wife's access to resources

Personal expenditures ratio

Each spouse is asked privately the expenditures questions below. The sum is used to create the ratio of wife's to husband's personal expenditures.

In the last 30 days, how much did you spend, in total on…

- Clothing, shoes, or jewelry for yourself
- Female respondent: Hair products, hairdressing, perfumes, creams, make-up, or any other beauty products for yourself // Male respondent: Hair cuts, colognes, shaving products, or any other self-care products for yourself.
- Tobacco or Alcohol for yourself or others outside this household (include any tobacco products and any kind of beer, wine, or local brew/spirits),
- Gifts or money given to your "natal" family (by "natal" we mean the family of the respondent's birth, NOT referring to in-laws)

Having say in use of cane income

We use the questions below to create a binary indicator for whether or not the woman has any say in how cane income is spent.

- Who has the final say about how money from sugarcane should be spent?
- Who else's opinions are considered when deciding how the money from sugarcane should be spent?

Index creation: the continuous ratio and the binary indicator are combined into a topic index using the KLK method.

F.3.b.ii Decision making

The answer options for the questions below are:
(1) I decide alone
(2) I decide together with someone other than my husband/ designated wife
(3) My husband/my designated wife and I decide together, but I have the final word
(4) My husband/my designated wife and I decide together
(5) My husband/my designated wife and I decide together, but my husband/wife has the final word
(6) My husband/my designated wife decides together with someone other than me
(7) My husband/my designated wife decides alone

- Who usually decides how the money you earn will be used? Here we are talking about wages, salaries, and business profits generated by you personally.
- Who usually decides how your husband's/wife's earnings will be used?
- Who usually makes decisions about health care for yourself?
- Who usually makes decisions about health care for your children?
- Who usually makes decisions about making major household purchases?
- Who usually makes decisions about making everyday household purchases?
- Who usually makes decisions about visits to your family or relatives?

Index creation: In order to avoid judgement that sole decision making is better than joint decision-making, we first collapse the 7 answer categories into 3 categories: "wife has equal or more say" (answers 1, 2, 3, 4), "wife has say that is less than equal" (answer 5), or "wife has no say" (answers 6, 7, or 8). For each question, the three categories are combined into a single question index using the HHR method. Then the 6 question indices are combined into a single topic index using the KLK method.

F.3.b.iii. Agreement

Each spouse was privately asked the four questions below. For each, agreement is a binary indicator that the two spouses gave the same answer for that question.

If you had a bit more money and you had to choose between the following two ways to use it, what would you choose?

- Option A: Spending on clothes, jewelry, hairstyling OR Option B: Enjoying luxury food and drink
- Option A: Education spending OR Option B: Savings for health emergencies
- Option A: Farm/Business investment OR Option B: Home construction/repair
- If you had a bit more land to use and you had to choose between the following ways to use it, what would you choose? 1=Grow sugarcane; 2=Grow other cash crops (coffee, cotton, tobacco, etc); 3=Grow food crops

Index creation: The 4 binary indicators are combined into a single topic index using the KLK method described above.

F.3.b.iv. Marital quality

On a scale from 1 to 10, where 1 is "Not at all true of me" and 10 is "Extremely true of me", how strongly do you agree with the following statements?

- Regarding major household decisions or issues, usually my husband and I will discuss these together
- I think that my husband contributes a lot to the wellbeing of this household
- My husband and I have talked about how to work together to improve our family's situation
- If I ever have personal concerns, I like to discuss them with my husband
- I have confidence in the stability of my relationship with my husband
- I strongly desire to promote the well being of my husband. Well being can be defined as: health, happiness, and prosperity.

Index creation: Each of the categorical questions is first converted to a question index using the HHR method, then all six question indices are included in a topic index using the KLK method.

F.3.b.v. Intimate partner violence: Physical

Asked to the wife only

For questions below that ask "how often," the answer responses are: 1= Most days; 2= Most weeks; 3= Most months; 4= Rarely; 5= Never

a. Has your husband ever hit, pushed, slapped, or thrown things at you?
b. In the past year, how often did your husband hit, push, slap, or throw things at you?

Index creation: questions a and b are combined into one categorical variable with the categories 1=Never, 2=Not in the last year, 3=Rarely in the last year, 4= Most months in the last year, 5=Most weeks in the last year, and 6=Most days in the last year. This variable is converted into an index using the HHR method, and serves as the outcome for this category.

F.4. Control variables

In this section we describe the food insecurity variable we include with our control variables. All other variables described in Table 1 are self-explanatory, so we do not include the relevant text question.

Food security

A large set of indicators of household food security are combined in a principal components analysis (PCA).[1] We use the first four eigenvectors from this analysis as controls in our regression.

The set of indicators used are:

- *the number of meals per day eaten by adults*
- *the number of meals per day eaten by children*
- *a binary indicator for worrying in the past 7 days about having enough food*
- *the number of days in the past week the household*
    - *relied on less preferred foods*
    - *limited portion sizes at mealtime*
    - *reduced number of meals eaten in a day*
    - *reduced consumption by adults so children could eat*
    - *borrowed food or relied on help*
- *a binary indicator for ever in the past 12 months having no food to feed the household*

[1] Filmer, Deon and Lant Pritchett. (2001) Estimating wealth effects without expenditure data or tears: An application to educational enrollments in states of India. Demography. 38: 115-132.