

Experimental measures of intra-household resource control*

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Abstract. We study experimental measures of preferences for intra-household resource control among spouses in Ghana and Uganda. We implement two incentivized tasks: (1) a game that measures willingness to pay for resource control in the household, and (2) private and joint dictator games that measure preferences for resource allocation and the extent to which those preferences are reflected in joint decisions. Behavior in the two tasks is correlated, suggesting that they describe similar underlying latent variables. In Uganda the experimental measures are robustly correlated with a range of household survey measures of resource control and women's empowerment and suggest that simple private dictator games may be as informative as more sophisticated tasks and survey modules. In Ghana, the experimental measures are not predictive of survey indicators, suggesting that context may be an important element of whether experimental measures are informative.

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1. Introduction

Measuring individual decision power within households is difficult but important from a theoretical perspective and as an element of women's empowerment. Economists typically use one of two approaches to study and empirically identify how much say someone has in the household. One approach consists of using rich consumption data sets, which also often contain information on labor supply, leisure, prices, and home production, to estimate household models of behavior (Chiappori and Mazzocco 2017). These models can identify the pareto weights associated with individual preferences in intra-household bargaining models, which have a natural interpretation as the relative say or decision power each person has in the household. Another empirical approach uses rich household survey data with modules designed to measure specific aspects of intra-household behavior such as individual agency, access to resources, decision-making power over expenditure categories, marital quality, and intimate partner violence to try to capture both decision power directly and broader measures of empowerment. In this paper, we investigate a third approach, studying whether two simple, incentivized measures of preferences for resource control elicited from spouses in a lab-in-the-field experiment provide an alternative way to measure individual decision-making power, access to resources, and more broadly, women's level of empowerment within households.

Our lab-in-the-field experiment consists of two incentivized tasks. Task 1 measures willingness to pay for resource control in the household by having participants make two binary decisions. During the first decision participants choose which spouse should receive a sum of money. During the second decision, a tension between household income maximization and preferences for resource control is introduced: we ask participants whether paying 50 percent more money to the household, conditional on all resources being paid to the spouse not chosen in the first decision, would change their decision. This simple two-step decision provides a coarse measure of willingness to pay for intra-household resource control. The second task asks participants to make two dictator game decisions in which they divide a sum of money between the couple. One decision is made in private and one jointly by spouses. Private dictator game decisions allow us to measure individual preferences for resource control and the degree of preference alignment between spouses. The private and joint decisions allow us to study how much influence each spouse has over the joint resource allocation decision made by the spouses. One of the decisions made by spouses in the experiment was randomly selected to be paid.

Dictator games provide an appealing way to elicit incentivized measures of resource control in the household due to their simplicity. However, because there is no tension between household income maximization and resource control decisions, dictator game choices can be undone at home at no monetary cost to the household. To address this issue and make it incentive compatible for participants who desire

more resource control to reveal their true preferences in the experiment, a lottery was conducted which could determine earnings for the couple. This lottery allowed participants to control the privacy of their decisions and hide income from each other outside of our study.

The experiment was conducted in two study sites located in Ghana and Uganda, with a total of 3,387 couples. Both study samples were chosen because they include participants from a population where there are important gender asymmetries within households. Additionally, understanding intra-household resource allocations is particularly important in the developing world, where household dynamics interact with social programs aimed at poverty alleviation and economic development. The experiments were conducted in the context of a baseline survey for a large research project at both study sites. These surveys included extensive data on intra-household decision making and women's role in the household, which we use to study how our incentivized measures of preferences for resource control align with traditional survey measures of empowerment.

Results reveal robust gender differences in preferences for resource control within households. Across study sites, we find that women pay a higher price for resource control than men, and that they have lower influence over joint decisions in the dictator game. These results indicate that women have lower resource control in the household and have less influence over joint decisions in the experiment.

Since dictator game choices can be undone at home at no cost to the household, and participants who do not hide income need not reveal their true preferences in the experiment, we study the correlation between dictator game choices and our experimental measure of willingness to pay for resource control. This allows us to assess the validity of dictator game choices as measures of resource control in the household. Results reveal a strong correlation between how much women choose to keep for themselves in the dictator game and the price paid for resource control in both study sites. There is also a positive correlation between the price women pay for resource control and lower influence over joint dictator game decisions in both countries. This exercise validates dictator game decisions as a measure of preferences for resource control in the household and tells us that both variables are picking up similar underlying latent variables.

Intra-household resource control is an important element of empowerment within a household. We therefore also study the correlation of our experimental measures with a range of survey indicators of women's empowerment. Using household survey data, we construct indices of a broad range of variables representing different domains of women's empowerment, including access to resources, decision-making

power, preference alignment, marital quality, and intimate partner violence. We then study how predictive our experimental measures are of these survey measures of empowerment.

Results reveal no systematic correlation between our experimental measures of resource control and the survey empowerment indices in Ghana. However, we find strong and systematic correlations in Uganda. The price a woman pays for resource control is negatively associated with empowerment based on the survey measures. The strongest and most robust correlations show that women who keep more for themselves in the private dictator game are less empowered, suggesting that they intend to take advantage of the opportunity to hide income. Similar correlations are documented when considering the distance between private and joint dictator game decisions and the alignment of husband and wife preferences. When we examine the correlation of these survey measures with household types defined by both husband and wife choices, we find that, irrespective of husbands' choices, it is consistently true that wives' choices to keep money for themselves or pay to control resources are associated with lower empowerment, indicating that it is primarily the wives' choices that predict empowerment.

Our paper contributes to the literature along several dimensions. First, while previous studies have used lab-in-the-field experiments to elicit incentivized measures of preferences for intra-household resource control and bargaining power (e.g. Schaner 2017, Almas et al 2018; see section 2), most studies elicit only one measure, typically after an intervention has occurred, and sometimes from one spouse only. We collect two incentivized measures of preferences for resource control from both spouses before any intervention has occurred and conduct a systematic investigation of how the measures correlate with each other and with a set of rich household survey variables. Several papers have conducted similar exercises to study how experimental and survey measures compare at the individual level (e.g. Dohmen et al 2011, Vieider et al 2015, and Falk et al 2016, Buser et al 2020). We bring this approach to the growing literature that makes use of intra-household experiments.¹

Second, we conduct our experiment in two study sites, using a large sample of households located in two different countries, which provides some information about the generalizability of our findings. For example, the robust correlation between the price paid for resource control and dictator game decisions that we find in both countries gives credence to our validation of dictator games as a measure of resource control in the household. While previous work has used dictator games to study intra-household decision-making

¹ Papers using a specific incentivized task to study aspects of intra-household behavior and resource control have reported correlations between the survey measures and the experimental measures they collect. However, there is typically not a systematic reporting of correlations between variables. In section 2 we provide a review of the literature that also describes the correlations documented by past studies.

and to proxy intra-household bargaining power (e.g. Schaner 2017), they have not directly investigated what dictator games measure when played by spouses. The differences between the correlation of survey and experimental variables across study samples is also informative for researchers seeking to understand when incentivized measures of preferences for resource control may be able to capture behavior of interest outside of the experiment. The Ugandan sample, in which we document strong correlations between the experimental measures and survey indicators, is one where households are involved in commercial farming and accustomed to monetary transactions. Conversely, the Ghanaian sample is heavily reliant on subsistence farming and has a relatively non-monetized economy, suggesting that such experimental measures may be less useful in situations where financial literacy is low. We find suggestive evidence for this explanation by documenting that the results in Ghana are more similar to those in Uganda among subsets of the Ghanaian population that are more educated and have some savings.

The paper proceeds as follows. Section 2 reviews the literature using lab-in-the-field experiments to measure aspects of resource control in the household. Section 3 describes the experiment. Section 4 describes the experimental data. Section 5 analyzes the correlation of the experimental measures with survey measures and section 6 concludes.

2. Background on experimental measures of intra-household resource control

The use of lab experiments to study various aspects of intra-household decision making is a growing area of research.² In this section we discuss the development of experimental tasks that directly or indirectly measure preferences for resource control in the household, specifically among married couples.³

A primary class of tasks used by researchers to directly measure preferences for resource allocation in the household are dictator games. In a standard dictator game, the decisionmaker divides an endowment between themselves and another person. When the game is played with strangers, it measures altruism. However, when played among spouses the game speaks to the dictator's willingness to share resources with their spouse and thus his or her preference for resource control in the household. A joint decision on

² Some examples include studies that test properties of household models (Peters et al. 2004, Bateman and Munro 2005, Iversen et al. 2011), study the role of informational asymmetries within households (e.g., Ashraf 2009, Castilla and Walker 2013, Ambler 2015, Hoel 2015, and Castilla 2019), or examine preference heterogeneity and joint decisions in the domains of risk and time (e.g., Carlsson et al 2012, 2013). More recent work has also studied social learning in the household (Conlon et al 2021).

³ This review is not exhaustive. We restrict attention to experiments conducted with couples, that elicit decisions over money rather than real effort or consumption, and that study resource control separately from risk or time preferences. For a more comprehensive review of the literature using intra-household experiments see Munro (2018).

allocation of the endowment following private decisions made by each spouse can also be used to measure resource control by quantifying how close the joint allocations are to the private preferences of each spouse.

It is true that in a household where either the preferences of spouses are perfectly aligned, spouses pool income, or spouses perfectly communicate with each other, it does not matter who controls income. In such cases, the standard dictator game need not measure preferences for resource control. However, in a household where there is not perfect preference alignment and at least one spouse hides income, dictator game choices can reveal information about intra-household dynamics. In one example in a study in rural Kenya, Schaner (2017) uses the standard dictator game to elicit private and joint decisions from spouses and construct an experimental estimate of the bargaining power of each spouse. She finds that this measure is positively correlated with a demographic proxy of bargaining power (constructed from within-couple differences in age, education, literacy, and income), but uncorrelated or negatively correlated with survey measures related to decision-making power in spending and saving decisions.⁴

The dictator game is useful in its simplicity but suffers from the drawback that, in some households, decisions can be reversed outside of the game at no cost. As such, it may not be incentive compatible for spouses in these households to reveal their true preferences in the experiment. Another stream of experimental measures introduces a trade-off between maximizing household resources and controlling income to overcome this problem. One such game is the modified dictator game, in which the amount transferred by the decisionmaker is multiplied by an amount greater than one, such that total household resources are maximized when the decisionmaker transfers income to their partner. The game thus measures willingness to sacrifice household resources to control income. The main drawback of this approach is that it cannot distinguish whether higher transfers result from a lower desire for resource control, other-regarding preferences, or efficiency concerns.

Modified dictator games have been used to study whether households maximize joint income in various countries and study samples such as Uganda (Iversen et al 2011), Ethiopia (Kebede et al 2014), France (Cochard et al 2016), and India (Mani 2020). They have also been used to study the resource allocation decisions made by spouses. In rural Kenya, for example, Hoel (2015) elicits choices in modified dictator games under public and private information conditions and shows that more knowledge about resources at home is associated with higher levels of opportunism in the lab in this subset of households. On the other

⁴ Another study that uses the standard dictator game to study intra-household decision-making but only elicits private decisions from spouses is Holden and Bezu (2013), who document a positive relationship between the amount spouses allocate to the wife in the dictator game and attitudes about women's land rights in Ethiopia.

hand, in urban Zambia, Jack et al. (2018) find that households that make higher transfers and thus behave more efficiently in a private modified dictator game are more sensitive to water prices in a field experiment that provides financial incentives for households to consume less water. Additionally, the intra-household efficiency measure is positively correlated with survey measures of joint decision making.

A related task, which is perhaps the most commonly used in the literature to indirectly measure resource control in the household, is the linear public goods game. In this game, each partner receives an endowment and must decide how to allocate it between a private and a joint account. All contributions made to the joint account are multiplied (for example by 1.5) and are split equally between partners, while money placed in the private account is kept by the decision maker, introducing a tension between household income maximization and retaining control over resources. A spouse who wishes to maximize household resources should contribute everything to the joint account, while a spouse who wishes to retain control over resources may instead choose to sacrifice some household income by keeping part or all of the endowment.⁵

Analysis of correlations between behavior in public goods games and field behavior has shown mixed findings. For example, Castilla (2019) conducts an experiment in India that combines a linear public good game with an ultimatum game and documents some positive correlations between women's cooperation in the lab and survey measures of decision-making power at home. However, Lowes (2018) finds the opposite result in an urban sample located around the matrilineal belt in the Democratic Republic of Congo. In matrilineal households, where women have higher outside options and thus higher bargaining power relative to patrilineal households, the cooperation rates of husbands and wives are lower, yet the well-being of matrilineal women is higher. Hoel et al. (2021) investigate semi-nomadic pastoralist households in Senegal and find that households that are more cooperative in public goods games display a lower degree of inefficiency in household milk production but report less collaborative decision making at home.

⁵ The linear public goods game has been used by researchers to study whether spouses maximize joint income (Iversen et al 2011, Kebede et al 2014, Munro et al 2014, Lopez et al 2015), income concealing in the household (Castilla 2019), and the role of social norms and spite in intra-household resource control decisions (Mani 2020). It has also been used to compare spousal cooperation rates across different types of households (e.g. Barr et al 2019, Munro et al 2019, Lowes 2018, Hoel et al 2021, and Lecoutere and Jassogne 2019). Barr et al (2019) and Munro et al (2019) compare monogamous and polygamous households, Lowes (2018) compares households with different kinship systems, while Hoel et al (2021) and Lecoutere and Jassogne (2019) classify households into types based on their lab behavior and study the correlation between these types and smallholder agricultural practices in the field. Another study that examines the correlation between lab measures of intra-household resource control and agricultural practices is Lenjiso et al (2016), but they use a coordination game instead of a public goods game.

Recent studies have employed a new approach comprised of binary decisions to directly measure willingness to sacrifice household resources to control income.⁶ For example, Fiala and He (2017) and Fiala (2018) ask participants to choose between X paid to them or MX paid to their spouse. As in linear public good games and modified dictator games, parameter $M = 1.5$ introduces a tension between resource control and household income maximization. Almas et al (2018) instead have participants make similar decisions but in a series of binary choices designed to more precisely elicit willingness to sacrifice household resources to control income. The first decision asks participants to choose between $(1/M_1)X$ paid to them or X paid to their spouse. As in other studies, $M_1 > 1$ to ensure that there is a trade-off between retaining resource control and maximizing household resources. Depending on the choice made by the decision maker, the next choice changes M_{k+1} up or down. The experiment ends when the participant starts to switch between choices, and thus signals that they have reached a range of indifference between options.

While Fiala and He (2017) use their lab experiment to test the unitary model of the household, Fiala (2018) uses it to identify income hiding in the household and examine heterogeneous treatment effects of an RCT conducted with microenterprise owners in Uganda.⁷ Almas et al (2018) instead use their lab experiment to measure the impact of a cash transfer program in Macedonia. Results show that wives who received the cash transfer were willing to forego less to control income than women who did not receive the transfer. However, this measure is not robustly correlated with survey measures of resource control.

Almas et al (2018) make an important methodological contribution, but similar to other tasks, the method is not capable of perfectly measuring intra-household resource control. This is because a zero willingness to sacrifice household resources to control income may mean several things. It may be an indicator of preference alignment in the household, of full resource control by wives, or of wives having such low bargaining power that they are not willing to forego household resources control income. Furthermore, the measure by design does not truncate willingness to pay for resource control at zero. There is a large fraction of households (approximately 35%) where wives have a negative willingness to pay for resource control (they pay to have their spouse control resources). The Almas et al (2018) design is also not easy to implement in samples where literacy levels are low.

⁶ Binary decisions have also been used to study the trade-off between equality and efficiency in intra-household resource allocation. See, for example, Beblo et al (2015) and Cochard et al (2016).

⁷ This RCT provided loans, grants, and training to participants and showed no impact of any capital treatment on the average enterprise owner. Analysis of heterogeneous treatment effects, however, revealed positive impacts for men who are not willing to sacrifice household resources to control income, and negative impacts for men who do. The opposite is true for women; those who maximize household resources in the lab experiment show negative impacts of the capital treatments, while those who do not show positive impacts.

More recent papers in the literature have used variations of the Almas et al. (2018) measure to elicit willingness to pay for intra-household resource control in other study samples and using slightly different procedures. For example, Jayachandran et al. (2021) conduct a study in rural northern India with a sample of married women where they document negative willingness to pay in approximately 60% of the sample. Qualitative work suggested that the negative willingness to pay was associated with strong household norms regarding husbands making household finance decisions, or wives fearing that their husbands would find out that they received the money. In analysis designed to develop a short survey module to measure agency, the authors find that the lab measures perform poorly, but qualitative interviews perform much better.

Other work conducted by Barr et al. (2020) reveals similar findings. In a study that investigates income hiding among spouses in Zambia, Barr et al. (2020) have either the husband or the wife in a household make a series of binary decisions which vary the tradeoff between resource control and household income maximization. Unlike Almas et al. (2008) or Jayachandran et al. (2021), however, there is no stopping rule in the experiment; all participants make all binary decisions. Results reveal that 30% of participants have negative willingness to pay for resource control in the one decision where choosing to control resources is the efficient choice in the experiment. Results also reveal that wives are more likely to demand resource control than husbands across all decisions. In the subsample of choices where there is tension between household income maximization and resource control, on average participants are willing to sacrifice 17.6% of household resources in order to control income.⁸

The existing literature has described useful experimental measures of intra-household resource control and provided some mixed evidence on their correlation with survey-based measures. The experiment we conduct builds upon these studies by conducting a within-subject experiment that elicits multiple measures of preferences for resource control from the same couples, allowing us to investigate how the different experimental measures correlate with each other and with household behavior outside of the experiment. The first task incorporates a tradeoff between household income and resource control and is similar to Almas et al (2018). However, we make some modifications to simplify the task and adapt it to a population with lower literacy levels. These modifications were necessary with our study samples and make the

⁸ In an additional example, Riley (2020) uses an incentivized measure of resource control based on Almas et al (2018) to identify income hiding in the household in a sample of female microfinance borrowers in Uganda. She then uses this binary income hiding variable together with some survey measures to construct an index that measures the degree of pressure women experience to share money with others at baseline. The study shows positive impacts of a program that offers direct loan deposits into the mobile money accounts on business capital and profits. Treatment effects are stronger among women who experience above median pressure to share income with others. The share of women that display a negative willingness to pay for resource control is not reported in the paper.

experimental measure easier to elicit in developing country settings, but do make our measure a much coarser proxy of willingness to pay for intra-household resource control. While these measures are growing in use, the documented negative willingness to pay for resource control has raised questions about their interpretation. Importantly, we do not recode negative willingness to pay decisions and instead ask what negative willingness to pay for resource control captures. The second task measures preferences for resource control using the standard dictator game, incorporating private decisions followed by a joint decision.⁹ The next section describes our experimental design in detail.

3. The experiment

3.1 Experimental design

We designed a lab-in-the-field experiment to elicit two incentivized measures of preferences for intra-household resource control from spouses. Each measure was collected using a separate experimental task, which consists of one or more decisions that could determine earnings for both spouses. Participants knew at the beginning of the experiment that they would be making several decisions and that only one decision made by the couple would be randomly selected to be paid. They were also informed that a separate lottery could determine the earnings of both spouses, and that neither they nor their spouse would find out whether a lottery or a decision determined earnings and whose decision was chosen to be paid. Below we describe the tasks and what they are designed to measure. The goal of the paper will be to investigate how these measures correlate with each other and how they map onto household behavior outside of the experiment.

3.1.1 Task 1: Willingness to pay to control resources

Task 1 measures individual willingness to sacrifice household resources to control income using a two-step procedure. The first decision asks individuals to choose who in the household should receive a sum X of money, themselves or their spouse. The second decision asks participants if $1.5X$ paid to the spouse not chosen in stage 1 would change their decision. Specifically, if the decision maker chooses to be the recipient in stage 1, we ask the decision maker in stage 2 to choose between X paid to them or $1.5X$ paid to their spouse. If instead the decision maker chooses not to be the recipient in stage 1, then we ask the decision maker in stage 2 to choose between $1.5X$ paid to them versus X paid to their spouse. Participants knew at the beginning of the task that they would be making two decisions but not what each decision entailed.

Payoffs in the experiment were chosen in such a way that the average amount of resources earned by the household was roughly equivalent to twice the daily wage that participants could have earned in the study

⁹ Like Schaner (2017), we elicit private and joint decisions from spouses. However, our choice set is different because we prevent the equal split from being a choice option.

area. This made the decision meaningful and ensured that the two decisions elicited from spouses introduced an important tradeoff between household income maximization and the preference over who in the household should control income. If the decision-maker chooses to give up $0.5X$ to receive income, then the participant is willing to sacrifice at least 50% of the endowment to control income. If the decision maker chooses to give up $0.5X$ to let their spouse receive the income, then the participant is willing to pay $-0.5X$ to control resources (or to give up at least 50% of the endowment not to control income). In Appendix A, we present a theoretical appendix that distinguishes between the price paid to control resources and the underlying willingness to pay variable that the price paid captures. There are four possible decision scenarios in this task, each associated with a possible range of values for the underlying willingness to pay variable.

This task was designed to identify willingness to pay for resource control in the household. Either spouse is likely to give up resources to maintain control if they do not believe that the money will be spent in accordance with their preferences if given to their spouse. Cases where the respondent does not choose to give up income are indicative of a household where the benefit of maintaining control is not greater than the resources that would be lost, and suggestive of a more cooperative relationship. Finally, the choice to give up income in order for the respondent's spouse to maintain control could be suggestive of self-control problems on the part of the decisionmaker or strong preferences coupled with no undoing of choices outside of the experiment. By strong preferences we mean altruistic preferences strong enough to lead spouses to sacrifice household income to have their preferences enacted or strong household norms regarding who should receive the money. In Appendix A we present a theoretical examination of the decision environment where we go over each possible decision scenario and argue that no undoing of choices outside of the experiment can be rationalized both by income hiding as well as by strong household norms regarding how income is used and controlled once it is earned and split between spouses.¹⁰

3.1.2 Task 2: Dictator game

Task 2 asks participants to make two decisions. In each decision participants must divide a sum Y of money between themselves and their spouse. The choice set available to participants does not change across the decisions; it is discrete, contains 8 choices, and by design excludes an even split between spouses as a choice option. This design choice forces participants to choose an unequal resource division and was done

¹⁰ Error could, of course, also explain why some participants are willing to pay for their spouse to control resources (pay a negative price for resource control). However, error is not one-sided and should also manifest itself as a positive price paid for resource control.

to reduce any experimenter demand effect that may arise from participants' potential perception that an equal split of resources is preferred by the experimenter.

Choices were first made individually by each spouse in private, and then jointly by spouses after they were given the opportunity to deliberate face to face away from others. Participants did not know when making their private decision that they would be repeating the same decision together with their spouse. Stakes were similar to Task 1. However, the stakes in Task 1 and Task 2 were not identical, in order to frame decisions in the two tasks differently and to accommodate the desired design features.

Private dictator game decisions reveal individual preferences for resource allocation between spouses in the game. The difference between private and joint decisions allows us to study how private and joint decisions differ and thus how much influence each spouse has over joint dictator game decisions in the experiment. As highlighted in the previous section, one drawback to this task is that, because there is no tension between household income maximization and resource control in the dictator game, choices can be undone outside of the experiment by spouses at no monetary cost to the household.¹¹ However, in households where there is competition over resource control and at least one spouse hides income, it is incentive compatible for participants to reveal their true preferences in the private dictator game.

3.1.3 Lottery

Before spouses made the incentivized choices in each of the tasks discussed above, we conducted a lottery that pays (z_A, z_B) to spouses. Variable z_i is independently and uniformly distributed over $[0, \bar{Z}]$ where $i = A, B$ denotes the two spouses and \bar{Z} represents the maximum earnings that can result from a decision made by a spouse in the experiment. This lottery was implemented by having each spouse draw a lettered card from a deck, where each letter had a unique value associated with it. Participants did not learn the outcome of the lottery, only that all possible payment outcomes in the experiment could result either from decisions made by either spouse or from random chance. This lottery is a crucial design feature because it allows participants to control the privacy and confidentiality of their decisions outside of the experiment.¹²

¹¹ This is problematic for joint decisions in all types of households, and for private decisions in households where spouses pool income, have perfectly aligned preferences, or communicate perfectly with each other, because all choices in the game are theoretically equivalent in these scenarios. See Appendix A for a theoretical discussion of this issue.

¹² We chose to implement the lottery using a deck of cards to make it salient to participants that a lottery was conducted and that they could hide income from their spouses outside of the experiment if they wished to do so. Each card in the lottery had a code associated with it. This code was entered by enumerators in the tablet used to record decisions. Neither the participant nor the enumerator knew what value was associated with each card and code during the study.

3.1.4 Other experimental design features

The lottery was implemented first, to explain to participants in subsequent tasks that their private decisions could not be revealed directly or indirectly to their spouse during or after the experiment. After the lottery was conducted, Tasks 1 and 2 were conducted in fixed order. At the end of the experiment, either the lottery or one of the decisions made by spouse A or B in Task 1 or 2 was randomly selected to be paid.¹³

No feedback about earnings or the decisions was provided to participants throughout the experiment. Payment was done in private at the end of the study, using procedures that guaranteed the privacy and confidentiality of decisions. For example, spouses never learned which task or decision was randomly selected to count for payment, or what private decisions their spouse made in the study. They were also not provided copies of receipts to avoid any risk with others seeing their earnings.

3.2 Study samples

We conducted the lab-in-the-field experiment described above using two study samples. One sample includes 1,024 couples who had expressed interest in participating in a randomized controlled trial conducted by an agribusiness in the Upper East Region of Ghana. When households expressed interest in participating in the RCT, they were asked to sign up as a couple. Interest in the trial was based on the couple's desire to rent irrigated land and their willingness to have a potential rental contract randomly assigned to either the husband or wife. In polygamous households, the household could choose which wife would be enrolled. Household surveys regarding decision-making and preference alignment were conducted during in-home visits between March and September 2016. Once households in a village had been interviewed, the lab-in-the-field experiment invited couples to a "meeting." This meeting took place in a central location in the village and simultaneously elicited incentivized decisions from spouses. Private interviews were conducted first, by two enumerators who privately interviewed each spouse in a separate interview booth. Joint decisions were elicited afterwards, by one enumerator after spouses were brought together. Thereafter, participants were paid. An interview with each couple took approximately 30 minutes to complete in Ghana. A detailed description of the experimental procedures used in this study site is provided in Appendix B.

Our second study sample includes 2,363 couples who were part of randomized controlled trial conducted near Jinja, Uganda (Ambler, Jones, and O'Sullivan 2021).¹⁴ The trial sample included small-scale sugarcane

¹³ In one of our study sites, Ghana, Task 2 also elicited investment decisions from spouses. These decisions measure risk preferences and are described in detail in Appendix B.

¹⁴ The trial examines the impact of a pair of interventions designed to increase women's empowerment.

contract farmers who held contracts with a specific, large sugarcane buyer. If located, each contract farmer registered with this buyer was enrolled in the study, conditional on being married. One husband and one wife were enrolled per study household. In polygamous households, the wife most involved in sugar production participated. The lab-in-the-field experiment was implemented together with the baseline survey of the RCT, between July and September 2016. Households were interviewed at their homes, by one enumerator. Incentivized decisions were elicited first, followed by the household survey. The spouse readily available, who the couple agreed should be interviewed first, made private decisions first. Afterwards, the second spouse was interviewed privately. After both spouses made their private decisions, the couple was brought together to make the joint decision. Afterwards, the enumerator proceeded with the household survey. It took approximately 30 minutes for the enumerator to elicit incentivized decisions from both spouses, and approximately 2.5 hours for the household survey to be administered. Participants were paid at the end of the household survey; however, payment was not contingent upon participation in the household survey. A detailed description of the experimental procedures used in Uganda is provided in Appendix C.

Table 1 summarizes some basic characteristics of the participating households. The characteristics show some similarities between the households in the two countries. Households are only slightly larger in Ghana (9.13 members compared to 8.7 members), and approximately one third of households are polygamous in both samples. Couples have been married approximately two years longer in Ghana. Despite these similarities, education levels are very different. In Ghana, education is extremely low; 58% of husbands have no formal education. In Uganda, that is true of only 6% of men in the sample. This is indicative of a major difference between the two samples. The Ghanaian sample is composed primarily of households engaged in subsistence agriculture who reside in a remote area, while the Ugandan sample is defined by its engagement in commercial agriculture.¹⁵

Within sample, there are gender differences in individual characteristics in both countries. Women are younger and have lower education than men; they also have lower personal savings in both countries. Women are also far less likely to report having individual income than men in Uganda. However, in Ghana most men and women report having individual income. This reflects the norms surrounding agricultural cultivation and land use in Ghana where husbands and wives cultivate different plots of land and control the agricultural income generated by their plot (see e.g. Udry 1996). However, only 15% of women in Ghana report earning as much or more than their husbands (Appendix Table 1). Additionally, in both

¹⁵ All households in the Uganda sample have a relationship with a large sugar company that is based outside Jinja, a small to medium sized city with an active economy.

countries women's personal expenditures are less than their husbands' (Appendix Tables 1 and 2). In general, these measures show that in both countries women have less initial control of income and access to resources than their husbands. There is variation within the samples regarding women's agency, as measured by whether women have equal or more say than their husbands in a range of decisions, but in both countries the pattern is that 60 to 80% of women have at least equal say for most types of decisions. In Uganda, this falls to 50% or less for decision making regarding household purchases and for use of own or husband's earnings. The combination of differences in age, education, savings, and these other income and access to resources measures indicate that women are, in general, less empowered than men in both study samples, but do have some role in decision making.

There are several important experimental design differences between study sites. First, the Ghana experiment was designed and piloted first and in addition to collecting incentivized measures of resource control, it also elicited two private and one joint investment decisions from spouses. These investment decisions measure risk preferences and were conducted in conjunction with the dictator game decisions. Participants made their private dictator game decision first, followed by two private investment decisions. Thereafter participants were brought together to make the joint dictator game decision and a joint investment decision sequentially.¹⁶ Participants learned at the beginning of the task how many decisions they would make but not what each decision entailed. Decisions were described in detail only when participants were presented with a decision.

Second, implementation procedures were different in our Ghana and Uganda study sites. In Ghana the baseline survey was conducted in two parts, the first was conducted approximately one to three months prior to the collection of the experimental measures and the second was conducted two to three months after. We use survey data from the first visit to construct the survey measures of empowerment.¹⁷ The Ghana experiment was conducted in central locations with several couples participating at the same time. Multiple enumerators were at each session and thus spouses were interviewed simultaneously. This setup provided a high degree of control over experimental procedures and allowed us to collect data from all households residing in the same geographical area in a short time. The Uganda experiment was conducted by one enumerator per couple at each couple's home during the same visit as the baseline survey. As such

¹⁶ Investment decisions were elicited using similar procedures to Ambler, Godlonton, Recalde (2021). Participants chose how much of an endowment W to invest in an account that pays three times the amount invested with 50% probability and 0 otherwise. W represents approximately the daily wage in the study area. Only the order of private investment decisions was randomized across couples; the order of all other decisions and tasks was fixed. See Appendix B for a script and experimental procedures used to elicit all decisions in Ghana.

¹⁷ In the event that a registered household had not received the first survey visit prior to the lab-in-the-field experiment, we conducted the corresponding household survey immediately after the couple participated in the experiment.

the investment decisions were not included to reduce the time spent, and implementation procedures were modified as needed. However, the way in which incentivized decisions were elicited was not changed across study sites.

A third difference between study sites are the payoffs used to elicit decisions. In Ghana, the stakes at play in Tasks 1 and 2 were $X = 10 \text{ GHC}$ and $Y = 14 \text{ GHC}$ respectively. These values do not change across households in Ghana, but they do in Uganda where $X = 10,000 \text{ UGX}$ in all households, while Y could be either $14,000 \text{ UGX}$ or $28,000 \text{ UGX}$. One fourth of the sample in Uganda was randomized into the high stakes environment.¹⁸ The stakes were designed to be roughly comparable across sites with Y in Ghana equal to approximately $\$3.66\text{USD}$ and the low-stakes Y in Uganda equal to approximately $\$4.14\text{USD}$. This translates to similar expected earnings across all households at each study site, which is approximately twice the daily wage a participant could have earned in the study area.

3.3 Ethics

The experimental measures of intra-household resource control and survey measures of empowerment we construct using household survey data involve primary data collection that is sensitive in nature because it can create conflict in the household or exacerbate it. We took several steps to minimize this risk and safeguard the safety of participants. As described in section 1 and subsection 3.2, the experimental and survey data we use was collected in two randomized controlled trials (RCTs) conducted in Ghana and Uganda. Ethical approval of the research was obtained under the umbrella of the larger RCTs conducted at each study site. We had ethical clearance to conduct our research from the International Food Policy Research Institute's Institutional Review Board and from local ethical review boards in Ghana and Uganda.¹⁹

The design and implementation of the lab-in-the-field experiments was done in such a way that any disputes, conflict, or potential risk to participants that could arise as a result of the lab-in-the-field experiment was minimized. For example, we used a lottery at the beginning of the experiment and scripts to elicit decisions that explained to participants how the privacy and confidentiality of their individual decisions was guaranteed. We also paid participants in private and did not provide receipts to participants

¹⁸ Though definitive conclusions are somewhat limited by power, in general we do not document consistent differences across low and high stakes in Uganda for any of our analyses.

¹⁹ All authors were employed at the International Food Policy Research institute at the time of data collection. In Ghana approval to conduct the research was obtained from the University of Ghana Ethics Committee for the Humanities (ECH). In Uganda approval was obtained from the IRB at the International Health Sciences University (now Clarke International University) and research approval was also obtained from the Uganda National Council for Science and Technology.

to minimize the risk that their earnings were inadvertently revealed to others after the experiment. Show-up fees (minimum earnings) were also paid separately from decision earnings to make it easier for participants to hide income if they wished to do so outside of the experiment.

When collecting household survey data, we followed best practices for the responsible conduct of research on intimate partner violence, in line with guidance provided by the Demographic and Health Surveys (DHS) Program. For example, in Ghana we asked intimate partner violence questions using the DHS Program survey module on domestic violence. In Uganda, we included a much shorter intimate partner violence module but also generally followed DHS recommendations.²⁰

Finally, we gave additional specialized training to enumerators in both countries to conduct the household survey and elicit intimate partner violence incidence questions as well as to conduct the lab-in-the-field experiment. Principal investigators of the RCTs were directly involved in this specialized training in both study sites. In Appendix D we provide more information about the steps taken to ensure the responsible conduct of research at each study site and minor deviations from best practices that occurred due to feasibility, sample characteristics, and staffing constraints.

4. Results: Examining the experimental data

In this section we describe the experimental data in both countries to characterize behavior in the experiment and understand differences by gender. We then conduct an analysis to assess how well the experimental measures perform relative to each other.

4.1 Describing the data

Figure 1 shows the distribution of the price paid to control resources (Task 1) for Ghana in Panel A and Uganda in Panel B.²¹ The variable can acquire three values: 0.5 indicates that the participant sacrificed 50% of the endowment to control resources, 0 indicates that the participant did not give up resources to assign control to either themselves or their spouse, and -0.5 indicates that the participant gave up resource control to their spouse (paid not to control resources). Panel A reveals that in Ghana, the majority of both husbands and wives do not sacrifice resources to determine who in the household should control income. Around 30% of husbands pay a negative price for resource control, i.e. they pay for their wife to control resources,

²⁰ The one exception was that the survey in Uganda included one question for men regarding IPV. More details are available in Appendix D.

²¹ For a full histogram of choices, which distinguishes between the four possible decision scenarios see Appendix Figure 1.

while 15% pay to maintain resource control themselves. The wives' responses show that 20% pay for their husband to control resources while 20% pay to maintain control themselves. Thus, the overall distribution of choices shows that women pay a higher price for resource control than men.

In Uganda, the distributions of responses look different, but tell a similar story: women pay a higher price for resource control than men. Panel B shows that about 40% of both husbands and wives do not pay to shift control of resources. 40% of husbands and approximately 35% of wives pay to have their spouse control resources, and around 20% of husbands and 24% of wives pay to maintain resource control.

The distribution of choices by gender tells us that women are generally more willing to pay for resource control than men in our data. The data also allows us to compare the choices made within households. For example, those that behave efficiently and maximize household income in the experiment represent 35% of households in Ghana and 22% of households in Uganda. Households where women pay a higher price for resource control than their husbands represent 35% of households in Ghana and 29% of households in Uganda, while households where men pay a higher price for resource control than wives represent 21% and 24% of households in the Ghana and Uganda samples, respectively. These patterns that include both positive and negative willingness to pay for resource control are consistent with other studies. Barr et al. (2020), for example, also document this pattern in both men and women in Zambia.

Next, we examine choices in the dictator game. We use the share of the endowment assigned to the wife as our main variable to make the analysis comparable across countries and to normalize the difference in stakes in the Uganda sample. Figure 2 shows histograms of the amounts assigned to the wife by the wife, by the husband, and in the joint decision separately. In Ghana, the three distributions are fairly similar, but suggest that joint decisions assign more to the wife than individual decisions. In Uganda, the differences between men's and women's allocation are larger and show that women assign themselves more money than men assign them. Joint decisions in Uganda are more common towards the middle of the choice set.

The within-household differences in allocation decisions are examined in Figure 3. The Joint-minus-Husband difference (J-H) shows the largest mass at zero in both samples; for 60% of men in Ghana and almost 50% of men in Uganda, private and joint decisions coincide. The Joint-minus-Wife difference (J-W) also shows a mass at zero that is modal, but smaller for women than men. Approximately 30% of wives make the same choice individually as they do jointly with their spouse. Since joint decisions should coincide with individual decisions in households where individual preferences are perfectly aligned, we also plot the difference between Husband-minus-Wife (H-W) decisions. This variable shows that spouses in

approximately 20% of households have perfectly aligned preferences in both study sites. These figures reveal that more men than women have full say over joint decisions (their private and joint decisions coincide), but that even when we exclude households with aligned preferences (husband and wife decisions are equal), there are both men and women with full say over the joint decision.²²

To better understand the difference between wife and husband responses within households we conduct a series of regressions to estimate the average gender difference in responses using household fixed effects. We examine two indicators from each task: a binary variable taking the value of one if the respondent paid a positive price to control resources (Price paid = 0.5 in Figure 1), a binary variable equal to one if the respondent paid not to control resources (Price paid = -0.5 in Figure 1), the percent of the endowment allocated to the wife in the private dictator game decision, and the absolute value of the distance between the private allocation to the wife and the joint allocation to the wife. We estimate the following equation:

$$y_{ih} = \beta wife_{ih} + \gamma_{ih} + \delta_h + \varepsilon_h$$

Where y_{ih} is one of the described outcome variables for individual i in household h . $wife_{ih}$ is an indicator that the respondent is the wife, γ_{ih} is a vector of individual-level control variables that includes age group, years of schooling, whether the individual reports any personal income, and savings, and δ_h is the household fixed effect. β is an estimate of the within-household difference between wife and husband responses. Standard errors are clustered at the household level. The results are reported in Table 2 with Ghana in Panel A and Uganda in Panel B. To account for the number of analyses and hypotheses tested we additionally present p-values adjusted for the family wise error rate (FWER) using the method described in List et al. (2019) and Barsbai et al. (2020). We apply this correction over all hypothesis tests presented in each regression panel of our main tables.²³ These p-values are presented in tables in Appendix E.

The results related to the willingness to pay task are reported in columns 1 through 4. Columns 1 and 2 show regressions estimating the probability that wives and husbands pay to control resources, without and with control variables, respectively. Columns 3 and 4 show the same for the probability of paying for the spouse to control resources. Focusing on the results with control variables, the estimates show that in Ghana a woman is five percentage points more likely to pay for resource control than her husband, and approximately nine percentage points less likely than he is to pay for her spouse to control resources. We

²² The private decisions made by both spouses coincide with the joint decision made by the couple in 18% of the households in Ghana and 14% of the households in Uganda.

²³ In Table 2, we apply the FWER correction only for regressions with control variables.

document the same pattern in Uganda, though the magnitudes of the coefficients are sometimes smaller. In Appendix Table 3 we present estimates of an ordered logit model where the dependent variable can acquire 4 values, corresponding to the 4 choices participants can make in the experiment. Results are similar.

In columns 5 through 8 of Table 2, we examine the responses in the dictator game, reporting the percentage assigned to the wife in columns 5 and 6, and the absolute distance between the private allocation to wife and the joint allocation to wife in columns 7 and 8. In Ghana, a woman assigns slightly *less* to herself than her husband assigns to her, on the order of two percentage points. However, the distance from the wife allocation to the joint allocation is also larger for a woman, by around 8 percentage points. This is a substantial difference, particularly when compared to the average among husbands of 9 percentage points. In Uganda, a woman does allocate more to herself than her husband assigns to her (by five percentage points) and experiences a larger gap between private and joint allocation of seven percentage points, roughly 50 percent of husbands' average. All but one coefficient (on absolute distance in Uganda) remain statistically significant with FWER p-values (Appendix Table E.1).

The results presented here show that women are more likely to pay for resource control than their husbands which indicates that they have lower control over household income outside of the experiment. They are also less likely to pay for their spouse to control resources. At the same time, women experience larger differences between their private allocation and the joint allocation in the dictator game, which is indicative of lower influence over decisions regarding household resources.

4.2 Correlation between experimental measures

By design, Task 1 measures willingness to pay for resource control in the household. However, as indicated in Section 3.1.2, dictator game choices need not identify preferences for resource control in households where spouses do not hide income because choices can be undone at home by participants at no cost to the household. In this section, we study the extent to which behavior in the willingness to pay task is correlated with behavior in the dictator game. Studying this correlation allows us to assess the extent to which dictator game choices reflect preferences for resource control in the household, and to study the extent to which these measures are picking up similar or different aspects of household behavior.

To investigate the correlation between measures, we estimate an OLS regression model with two indicators from the willingness to pay task as the dependent variables of interest and an indicator from the dictator game as an independent variable. We also include individual and household level control variables. The individual controls (as in the previous regressions) include age group, years of schooling, whether the

individual reports any personal income, and personal savings. The household controls are measures of food security, household income, and household savings.²⁴ The models are run separately for wives' responses and husbands' responses. The results for wives are shown in Table 3, with Ghana in Panel A and Uganda in Panel B. The corresponding models using husband responses are in Appendix Table 4.²⁵

Columns 1 through 4 of Table 3 show correlations with the indicator for paying to control resources and columns 5 through 8 with the indicator for paying for the spouse to control resources. The first two columns of each set examine the correlation with the percentage assigned to the wife by the wife in the private dictator game decision, both without and with controls for the percentage assigned to the wife by the husband and the percentage assigned to the wife in the joint decision. The next two columns examine the absolute distance between the wife's allocation to herself and the joint allocation to the wife and the absolute distance between the wife's and husband's private allocations to the wife. In both cases, we include an indicator to control for the sign of the difference (not shown), though excluding it does not substantially change the results.

In Ghana we document strong correlations between the experimental measures. The percent of the endowment assigned by wives to themselves is strongly positively correlated with them paying to control resources. Interestingly, additionally controlling for the husband's allocation to the wife and the joint allocation to the wife does not change this relationship. We also document a positive correlation of paying to control resources with the absolute distance between the wife's private allocation and the joint allocation, as well as with the absolute distance between the wife's allocation and the husband's allocation. In Uganda a similar pattern is documented between wives paying to control resources and their allocation to themselves as well as with the distance measures, though the magnitudes of the coefficients are smaller. The results in columns 5-8 regarding paying for spousal control of resources show generally opposite patterns, as expected, though the results are somewhat less robust. These consistent correlations suggest that paying for the spouse to control resources is a meaningful behavior, and not simply noise or measurement error. All FWER-adjusted p-values remain significant, except those in columns 3, 4, and 7 (Appendix Table E.2). In Appendix Table 5 we present ordered logit models that combine the analysis of both dependent variables into a single model and shows similar results. Overall, the analysis presented in

²⁴ Summary statistics for control variables are shown in Table 1. In the analysis we use the first four components from a principal components analysis for food insecurity as controls (see Appendix F for details). As these are not descriptive, Table 1 presents a simple indicator for experiencing any food insecurity. In Ghana, household income is a self-reported estimate. In Uganda we construct household income by summing wage income, household enterprise income, sugarcane revenue, and revenue from production of other crops.

²⁵ We present the results for wives as our leading models because some of the survey measures used in section 5 are elicited from wives only. It is also not uncommon in the literature to elicit measures from wives only.

this section indicates that dictator game choices and the willingness to pay task are capturing some of the same underlying latent variation.

The corresponding analysis of husbands' responses is presented in Appendix Tables 4 and 6. Appendix Table 4 shows that men whose wives allocate more of the endowment to themselves are less likely to pay to maintain control over resources in both countries. The joint allocation to the wife is also negatively correlated with the husband paying to control resources, as is the husband's allocation to the wife in Uganda only. We also document that larger differences between the joint allocation to the wife or the wife's allocation to the wife and the husband's allocation to the wife are negatively correlated with paying for resource control in Uganda. In Ghana these coefficients are positive, but statistically significant only for the latter. We also note correlations in the opposite direction for paying for the wife to control resources. In general, the male responses indicate that resources are allocated to women in households where men have less interest in controlling resources.

5. Results: Experimental choices and survey measures

The study of women's role in the household and their empowerment has driven the development of survey-based methods to measure various components of these concepts. In this piece of our analysis, we study the correlation of our experimental measures with a range of survey indicators of women's empowerment in the household. To do this, we take advantage of the rich baseline data collected in both countries and create standardized indices to represent the three key domains of empowerment as described by Kabeer (1999). These are: *access to resources*, which is our first index of interest, *agency*, represented by an index for decision-making power, and *achievements*, represented by indices for marital quality and (absence of) intimate partner violence. We also include an index for intra-household preference alignment. While this does not directly measure empowerment, more closely matched preferences may be a sign of a more cooperative household. Further, this measure also provides a comparison for preference alignment as measured by the dictator game.

Each index is composed of several indicators, which are combined following the method described in Kling, Liebman, and Katz (2007). For variables with categorical outcomes, we first create a question-level outcome index that preserves the full variation in each variable, without treating them as continuous, following a method developed in Heath, Hidrobo, and Roy (2020) and Roy et al. (2019). Because the surveys were not the same in each country, the variables that comprise each index vary somewhat. A full

list of the variables in each index and their means are reported in Appendix Tables 1 and 2. A detailed description of variable selection, index construction, and questions used are provided in Appendix F.

5.1 Correlation of experimental choices and survey responses

The empirical strategy is the same as in the previous section, but the outcome variables are the survey measure indices, and the independent variables of interest are each of the experimental variables in turn. As before, we focus on wife's responses. The results for Ghana are in Table 4 and for Uganda in Table 5. The corresponding results for husband's responses are in Appendix Tables 7 and 8.^{26, 27} Model 1 examines the relationship between the willingness to pay variables and the survey outcomes. The indicators for both a positive and negative price paid for resource control are included, with zero price paid for resource control as the omitted category. Model 2 examines the percent allocated to the wife in the dictator game by the wife, husband, and in the joint decision. Models 3 and 4 examine the absolute difference between the wife's allocation to herself and the joint allocation or the husband's allocation respectively. Models 3 and 4 also include a control for the direction of that distance (not reported).

In Ghana we find very little evidence of any robust correlation between the experimental measures and the survey measures (Table 4). The same is also generally true of the husband's responses (Appendix Table 7). However, in Uganda (Table 5) there are strong patterns of correlation. Wives paying to control resources is negatively correlated with their access to resources and marital quality and is positively correlated with women's decision-making power. Conversely, wives paying for spousal control of resources is positively correlated with access to resources, decision making, and preference agreement, while negatively correlated with intimate partner violence incidence. These results suggest that paying for resource control is an indication of lower female empowerment, though the correlation with decision making is not consistent.²⁸ The correlations with paying for spouse to control resources also reveal that it is not disempowered women who pay for their spouse to receive the money, but rather more empowered women who have less interest in controlling resources. These correlations (in combination with the correlation with dictator game preferences in Table 3) suggest that paying for spouse to control resources is meaningful behavior. As

²⁶ Some of the outcomes are collected for both husbands and wives, in which case we use the husband response in the husband regression and the wife response in the wife regression. In Ghana these variables are preference alignment and decision making. In Uganda they are marital quality and decision making.

²⁷ In models B and D, the independent and dependent variables are the same in the husband and wife models, except for the cases noted where we use husband's reports for the outcome variable. The estimates differ slightly from the wife regressions because the individual-level controls are different. However, the results are essentially the same and included in the husband response tables only for completeness.

²⁸ This inconsistent result disappears when an ordered logit model that exploits the full variation of choices is used to examine the correlation between willingness to pay for resource control and the decision-making power index. See Appendix Table 11.

described in Section 3.1.1, these choices could be driven by strong individual preferences regarding who should control resources, coupled with strong household norms regarding allocation rules not being undone once made. These individual preferences could reflect altruism or norms regarding who should receive the money in the household. Paying not to control resources could also reflect self-control issues on the part of the respondent. See Appendix A.

Examining the indicators from the dictator game (Model 2), we find that the percentage assigned to the wife by the wife is negatively correlated with her access to resources, decision making power, and marital quality. It is also positively related to intimate partner violence incidence. This indicates that women with low levels of empowerment assign higher amounts to themselves in the private dictator game. There is no strong pattern for the husband or joint allocations, suggesting that the women's allocation to herself alone is a more reliable indicator of low empowerment. This may be because joint decisions can be easily undone outside of the experiment and do not allow for income hiding. The fact that women who allocate larger amounts to themselves privately pay a higher price for resource control and appear to be less empowered using household survey variables suggests that income hiding may be a key feature of their private dictator game decision.

We note these same significant correlations for distance from joint decision in Model 3 (access to resources, decision making power, marital quality, intimate partner violence) and distance from husband's decision in Model 4 (access to resources, decision making power, and intimate partner violence).²⁹ All correlations in Table 5 remain significant when FWER adjustments are applied, with the exception of the association of wife's allocation to herself with intimate partner violence in Model 2 and the joint minus wife allocation with the marital quality index in Model 3 (Appendix Table E.4). The husband responses (Appendix Table 8) tell a less robust story. Altogether, these results suggest that in Uganda, the experimental measures are good proxies of a broad range of women's empowerment indicators, but do not necessarily pick up specific elements of household behavior. Women's responses are more predictive than men's, and in fact, if a study were conducted where men were not available for interview, women's allocations to themselves could be used independently, as they perform similarly to the measures that include husbands' allocations.

²⁹ The positive correlation between heterogeneity in preferences for resource control and intimate partner violence incidence, is consistent with results from other papers in the literature which find that intra-household preference heterogeneity is associated with worse household outcomes. For example, Serra-Garcia (2020) finds a positive correlation between heterogeneity in risk preferences and marital instability in a representative sample of the German population, while Schaner (2015) finds that heterogeneity in time preferences is associated with inefficient household savings decisions in Kenya.

In Appendix Tables 9-12 we present models that examine the correlation between the survey measures of empowerment and the categorical willingness to pay variable using ordered logit models. In these models, the dependent variable is the category of willingness to pay for resource control and the independent variable is each survey measure. Appendix Tables 9 and 10 show results for wives and husbands in Ghana, while Appendix Tables 11 and 12 show results for wives and husbands in Uganda. Appendix Table 11 shows that by exploiting the full variation of choices of the willingness to pay measure, there is no longer an anomalous correlation between wives' willingness to pay for resource control and their decision-making power; the ordered logit models show robust correlations in the hypothesized direction between willingness to pay for resource control and all survey measures of empowerment in Uganda.

5.2 Concordance between experimental measures within households

In the results presented so far, we have limited our analyses to the experimental choices of one spouse at a time, focusing on the choices made by the wife, with the husband's choices analyzed in appendix tables. In this section we investigate the correlations of the survey measures with household "types" as defined by different combinations of husband and wife decisions in the experimental tasks, and consider whether this analysis provides further insight into the results. The categories defined from the experimental measures are different, but otherwise the specification is the same as in Tables 4 and 5. We focus on Uganda because we did not document significant correlations in the Ghana sample, and we present the results in Table 6. The Ghana results are presented in Appendix Table 13 for reference. However, it should be noted that due to the large number of categories and corresponding hypothesis tests, many of these correlations do not survive FWER corrections (see Appendix Table E.5). As such the patterns should be considered suggestive.

We first use the price paid to control resources by husbands and wives to classify households into nine types. These categories and their distribution in the Uganda sample are displayed in the first two columns of Panel A of Table 6. Decisions where a spouse pays a price of zero for resource control are classified as "efficient" and cases where both spouses behave "efficiently" and agree to maximize household resources constitute our benchmark category (21.8% of households) in the regression. This is comparable to the benchmark category in Tables 4 and 5 of the individual maximizing household resources. Results, presented in Panel A of Table 6 for Uganda, show a number of patterns. First, the types that include a wife paying for herself to control resources (line 3, 7.4% of the sample; line 4, 10.2%; and line 8, 6.1%)³⁰ display the same associations as the "wife pays to control resources" variable from Table 5, namely lower access to resources and marital quality, and the anomalous positive association with decision making in lines 3 and 4. This is

³⁰ Line 3 is "both pay for resource control"; line 4 is "both pay for wife to control resources"; line 8 is "wife pays for wife to control resources, husband is efficient."

true regardless of whether her husband competes with her for control, supports her control, or acts efficiently. This supports the interpretation that women's desire to hide income is associated with lower levels of empowerment, and that the husband's preferences are less informative about her empowerment.

This analysis also allows for a more in-depth investigation of cases where one or both spouses pay for the other spouse to control resources. In particular it allows us to speak to the possibility that such choices are motivated by strong preferences driven by altruism or household norms regarding who should receive the money.³¹ The case where both spouses pay for their spouse to control resources (line 2, 17.4% of the sample) can be considered an indication of altruistic types who are not competing for resource control and display higher levels of empowerment across all measures. Cases that may be indicative of a norm of husband control of resources (line 5, 6.7% of the sample; line 9, 10.8%)³² or a norm of wife control of resources (line 6, 13% of the sample)³³ are all associated to some extent with higher levels of empowerment relative to the benchmark category of both spouses paying a price of zero for resource control, but the pattern is not as robust as the case where both spouses pay for the other to control resources. This provides some suggestive evidence that altruistic households and household norms regarding who controls resources are associated with households where women are more empowered, relative to cases where women hide income, and even relative to households that maximize household resources in the experiment.

This pattern also speaks to the question of whether respondents' motives for controlling income in the experiment is driven by a desire to see their preferences enacted in the household or a desire for decision-making power itself, suggesting that for many of our respondents, a desire to see their preferences enacted plays an important role. For example, altruistic spouses derive utility from giving money to their spouses, to the extent that they are willing to sacrifice resources to do so. However, for those who keep money for themselves, our results cannot disentangle the two explanations.

In Panel B of Table 6 we use the dictator game decisions to classify households into types based on agreement between choices. The omitted category is households that disagree on who should receive the money and where both spouses want to keep more than 50% of the endowment themselves (33.7% of cases). The other three categories are: spouses disagreeing and wanting their spouse to receive more money

³¹ Note that altruism or household norms regarding who should receive the money could only be driving this behavior under the assumption that experimental choices are not "undone" outside of the experiment. Self-control issues and error are other explanations not addressed here.

³² Line 5 is "both pay for husband to control resources"; line 9 is "wife pays for husband to control resources, husband is efficient."

³³ Line 6 is "husband pays for wife to control resources, wife is efficient."

(16.9% of cases), spouses agreeing that the wife should receive more money than the husband (14.8% of cases), and spouses agreeing that the husband should receive more money than the wife (34.6% of cases). Results are overall similar to Panel A. Households where spouses disagree and say their spouse should receive more money (line 2, altruistic types), and households where both say husbands should receive more (line 3, possibly indicative of norm of husband control) are associated with higher levels of women's empowerment relative to the omitted category. However, when both spouses agree the wife should receive more money, we see an increase in decision making power relative to the omitted category, but no differences for the other outcomes. This is consistent with the results in Panel A where any case where the wife is keeping money for herself is associated with lower empowerment regardless of her husband's choice, but the decision-making result suggests that wives are somewhat better off in cases where husbands also assign them income.

5.3 Discussion

These results suggest that experimental measures are sometimes useful as simple proxies of women's resource control in the household. They show promise in Uganda, where the experimental measures are highly correlated with survey measures of empowerment. In both countries, the consistency across measures suggests that they are measuring similar or correlated phenomenon and not necessarily different aspects of intra-household dynamics. One contribution of this study is to show that both positive and negative willingness to pay to control resources are informative of household behavior. While our analysis provides some guidance for what types of households might display negative willingness to pay, understanding this behavior is an important area for future research. However, our results also show that the measure may not ultimately be more informative than a simple dictator game. Dictator games in which women make allocations to themselves privately appear to be good proxies for resource control as they are correlated with other experimental measures and a range of survey measures. This occurs even though, theoretically, dictator game choices may not be the best measures of intra-household resource control as choices can be undone at home at no monetary cost to the household.

One of the interesting components of these results is the difference that we observe between countries. Though correlations between the experimental measures are documented in both countries, they are larger in magnitude in Ghana. In Uganda we observe much stronger correlation between survey measures and experimental measures, suggesting that the experimental measures in Uganda do a better job at mirroring household behavior outside of the experiment. Possible reasons for this difference include implementation differences between the two experiments; in Ghana the experiment was part of a separate lab-based session with multiple enumerators and survey data was collected separately, at a different point in time than the

experimental data, while in Uganda the experiment was part of the survey with one enumerator. The sample size was also different, affecting statistical power. In general, the implementation in Uganda is a more realistic setup for projects with limited resources that wish to incorporate experimental measures into survey work. As such, the results indicating that games conducted in this way can produce useful data are encouraging for researchers.

Contextual differences between the two samples may also play an important role in the usefulness of the experimental measures. The sample in Ghana is more rural and remote, and characterized by a reliance on subsistence farming. There are also large differences in education, with the majority of the Ghana sample reporting that they have no formal schooling. In Uganda the households are all involved in some level of commercial farming and most have attended school. This difference means not only that the Ugandan households are somewhat more empowered overall, but they are also more familiar with money as a component of their day-to-day lives. Because these games focused on money, and the women in the Ghana sample may have been less accustomed to such choices, the games may have not performed as well in picking up meaningful aspects of their relationships.

To examine this explanation, we conduct heterogeneity analysis to study whether the patterns in Ghana might be more similar to those in Uganda among households that “look” more like the Uganda households, specifically considering financial literacy or familiarity with money. We are able to employ two measures: whether or not the wife has any education and whether or not she reports any savings. We then analyze how the correlations with survey measures vary with these variables. In Table 7 we present the results for Model 2 (dictator games) in Ghana, as those were the most robust correlations in the full Uganda sample. We also report the results for Model 1 (willingness to pay task) in Appendix Table 14. For completeness, we also include the corresponding tables for Uganda in Appendix Tables 15 and 16.

All tables are constructed in a similar manner. Results using the schooling interaction term are in columns 1 through 5, and results using the savings interaction terms are in columns 6 through 10. We show a fully saturated regression model where the schooling or savings variable is interacted with each independent variable such that the coefficients express the correlation for each group. For both schooling and savings, the “any” group (any schooling or any savings) are the group of interest as they are more like the Uganda sample. Though the patterns are not as robust as in Uganda, there is some evidence that experimental measures are performing better among those in these “any” groups. Women who assign more to themselves have lower levels of agreement with their husbands and experience higher levels of psychological violence. Though other correlations aren’t statistically significant, they follow the same pattern as in Uganda with

the exception of women's access to resources. We view these results as exploratory and do not perform FWER corrections, and as such they should not be over-interpreted. However, in general, this analysis provides some evidence that household characteristics may drive some of the differences between countries. Less clear patterns are evident in the willingness to pay measure presented in Appendix Table 14.³⁴

6. Conclusion

In this paper we examine two types of experimental measures of intra-household resource control: dictator game choices and a task that measures willingness to pay for resource control. We elicit both measures from the same participants in two research settings in Ghana and Uganda. We find that the two measures correlate with each other, suggesting that they describe similar underlying latent variables. We also show that both tasks are correlated with survey measures of women's empowerment in the Uganda sample. Our work supports the use of the dictator game choices, including a simple private decision made by the wife only, as proxies for intra-household resource control, suggesting that more complex measures may not add much additional information. The consistent patterns in our data also indicate that the finding of negative willingness to pay for resource control is meaningful, reveals that households do not undo choices outside of the experiment, and can be consistent with household models. See Appendix A.

The results also highlight the need for further research to better understand when incentivized measures are most appropriate relative to other methods of measuring women's empowerment. In general, our study shows that simple incentivized measures can be effective proxies for women's empowerment. Though it costs money to incentivize these measures, lengthy survey modules highlighting different domains of empowerment and resource control are also expensive. As such, the "best" measure may depend on the goals of the researcher. At the same time, the differences we note across contexts also indicate that researchers should carefully consider the setting when designing incentivized measures as part of a research program. Lab-in-the-field measures where participants earn money may not capture meaningful household behavior outside of the experiment in settings where everyday transactions are largely not monetized, or where literacy and education levels are low. Future studies should investigate the role of context in the usefulness of incentivized measures such as the ones studied in this paper.

³⁴ In the Uganda sample (Appendix Tables 15 and 16) we document similar patterns in both groups, with no consistent evidence of varying effects.

References

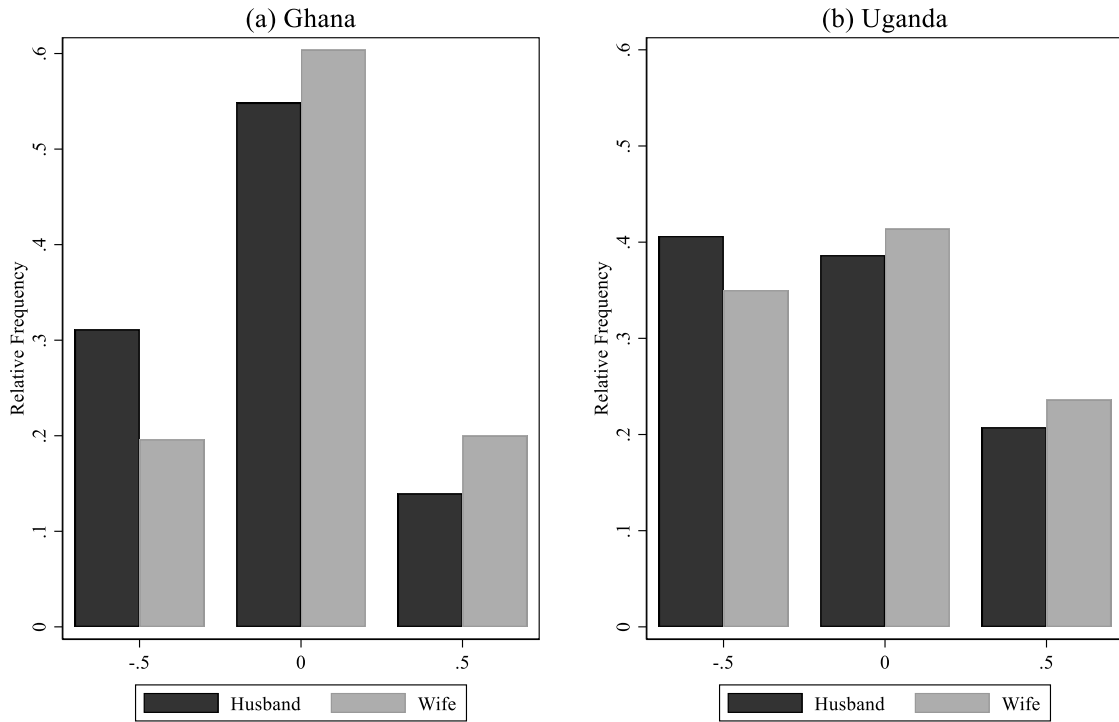
- Almas, I., Armand, A., Attanasio, O., & Carneiro, P. (2018). Measuring and changing control: Women's empowerment and targeted transfers. *The Economic Journal*, 128(612), F609–F639.
- Ambler, K. (2015). Don't tell on me: Experimental evidence of asymmetric information in transnational households. *Journal of Development Economics*, 113, 52–69.
- Ambler, K., Godlonton, S., & Recalde, M. P. (2021). Follow the leader? A field experiment on social influence. *Journal of Economic Behavior & Organization*, 188, 1280-1297.
- Ambler, K., Jones, K., & O'Sullivan, M. (2021). Increasing Women's Empowerment: Implications for Family Welfare. IZA Discussion Paper 14861.
- Ashraf, N. (2009). Spousal control and intra-household decision making: An experimental study in the Philippines. *American Economic Review*, 99(4), 1245–77.
- Barsbai, T., Licuanan, V., Steinmayr, A., Tiongson, E., & Yang, D. (2020). Information and the Acquisition of Social Network Connections. NBER Working Paper 27346.
- Barr, A., Dekker, M., Janssens, W., Kebede, B., & Kramer, B. (2019). Cooperation in polygynous households. *American Economic Journal: Applied Economics*, 11(2), 266–83.
- Barr, A., Dekker, M., Mwansa, F., & Zuze, T. L. (2020). Financial decision-making, gender and social norms in Zambia: Preliminary report on the quantitative data generation, analysis and results (No. 2020-06). CeDEx Discussion Paper Series.
- Bateman, I., & Munro, A. (2005). An experiment on risky choice amongst households. *The Economic Journal*, 115(502), C176–C189.
- Beblo, M., Beninger, D., Cochard, F., Couprie, H., & Hopfensitz, A. (2015). Efficiency-equality trade-off within French and German couples: A comparative experimental study. *Annals of Economics and Statistics/Annales d'Économie et de Statistique*, 117/118, 233–252.
- Buser, T., Niederle, M., & Oosterbeek, H. (2020). Can competitiveness predict education and labor market outcomes? Evidence from incentivized choice and survey measures. Working Paper.
- Carlsson, F., He, H., Martinsson, P., Qin, P., & Sutter, M. (2012). Household decision making in rural China: Using experiments to estimate the influences of spouses. *Journal of Economic Behavior & Organization*, 84(2), 525–536.
- Carlsson, F., Martinsson, P., Qin, P., & Sutter, M. (2013). The influence of spouses on household decision making under risk: An experiment in rural China. *Experimental Economics*, 16(3), 383–401.
- Castilla, C. (2019). What's yours is mine, and what's mine is mine: Field experiment on income concealing between spouses in India. *Journal of Development Economics*, 137, 125–140.
- Castilla, C., & Walker, T. (2013). Is ignorance bliss? The effect of asymmetric information between spouses on intra-household allocations. *American Economic Review*, 103(3), 263–68.

- Chiappori, P.-A., & Mazzocco, M. (2017). Static and intertemporal household decisions. *Journal of Economic Literature*, 55(3), 985–1045.
- Cochard, F., Couprie, H., & Hopfensitz, A. (2016). Do spouses cooperate? An experimental investigation. *Review of Economics of the Household*, 14(1), 1–26.
- Conlon, J. J., Mani, M., Rao, G., Ridley, M. W., & Schilbach, F. (2021). Learning in the Household (No. w28844). National Bureau of Economic Research.
- Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., & Wagner, G. G. (2011). Individual risk attitudes: Measurement, determinants, and behavioral consequences. *Journal of the European Economic Association*, 9(3), 522–550.
- Falk, A., Becker, A., Dohmen, T., Huffman, D., & Sunde, U. (2016). The Preference Survey Module: A Validated Instrument for Measuring Risk. Working Paper.
- Fiala, N. (2018). Business Is Tough, but Family Is Worse: Household Bargaining and Investment Decisions in Uganda. Working Paper.
- Fiala, N., & He, X. (2017). Unitary or noncooperative intrahousehold model? Evidence from couples in Uganda. *The World Bank Economic Review*, 30(1), S77–S85.
- Heath, R., Hidrobo, M., & Roy, S. (2020). Cash transfers, polygamy, and intimate partner violence: Experimental evidence from Mali. *Journal of Development Economics*, 143, 102410.
- Hoel, J. B., Hidrobo, M., Bernard, T., & Ashour, M. (2021). What do intra-household experiments measure? Evidence from the lab and field. *Journal of Economic Behavior & Organization*, 188, 337-350.
- Hoel, Jessica B. (2015). Heterogeneous households: A within-subject test of asymmetric information between spouses in Kenya. *Journal of Economic Behavior & Organization*, 118, 123–135.
- Holden, S. T., & Bezu, S. (2013). Joint land certification and intra-household decision-making: Towards empowerment of wives?
- Iversen, V., Jackson, C., Kebede, B., Munro, A., & Verschoor, A. (2011). Do spouses realise cooperative gains? Experimental evidence from rural Uganda. *World Development*, 39(4), 569–578.
- Jack, K., Jayachandran, S., & Rao, S. (2018). Environmental externalities and free-riding in the household. National Bureau of Economic Research.
- Jayachandran, S., Biradavolu, M., & Cooper, J. (2021). Using machine learning and qualitative interviews to design a five-question women's agency index (No. w28626). National Bureau of Economic Research.
- Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, 30(3), 435–464.
- Kebede, B., Tarazona, M., Munro, A., & Verschoor, A. (2014). Intra-household efficiency: An experimental study from Ethiopia. *Journal of African Economies*, 23(1), 105–150.

- Kling, J. R., Liebman, J. B., & Katz, L. F. (2007). Experimental analysis of neighborhood effects. *Econometrica*, 75(1), 83–119.
- Lecoutere, E., & Jassogne, L. (2019). Fairness and efficiency in smallholder farming: The relation with intrahousehold decision-making. *The Journal of Development Studies*, 55(1), 57–82.
- Lenjiso, B. M., Smits, J., & Ruben, R. (2016). Transforming gender relations through the market: Smallholder milk market participation and womens intra-household bargaining power in Ethiopia. *The Journal of Development Studies*, 52(7), 1002–1018.
- List, J.A., Shaikh, A.M. & Xu, Y. (2019). Multiple hypothesis testing in experimental economics. *Experimental Economics*, 22, 773–793.
- Lopez, M. C., Munro, A., & Tarazona-Gomez, M. (2015). Us and Them: Experimental evidence on what creates efficiency in choices made by married couples. Tokyo, National Graduate Institute for Policy Studies, GRIPS Discussion Paper, 15–10.
- Lowes, S. (2018). Matrilineal kinship and spousal cooperation: Evidence from the matrilineal belt. Working Paper.
- Mani, A. (2020). Mine, yours or ours? The efficiency of household investment decisions: An experimental approach. *The World Bank Economic Review*, 34(3), 575–596.
- Munro, A. (2018). Intra-Household Experiments: A Survey. *Journal of Economic Surveys*, 32(1), 134–175.
- Munro, A., Kebede, B., Tarazona, M., & Verschoor, A. (2019). The lion’s share: An experimental analysis of polygamy in northern Nigeria. *Economic Development and Cultural Change*, 67(4), 833–861.
- Munro, A., Kebede, B., Tarazona-Gomez, M., & Verschoor, A. (2014). Autonomy and efficiency. An experiment on household decisions in two regions of India. *Journal of the Japanese and International Economies*, 33, 114–133.
- Peters, H. E., Ünür, A. S., Clark, J., & Schulze, W. D. (2004). Free-riding and the provision of public goods in the family: A laboratory experiment. *International Economic Review*, 45(1), 283–299.
- Riley, E. (2020). Resisting social pressure in the household using mobile money: Experimental evidence on microenterprise investment in Uganda. Working paper.
- Roy, S., Hidrobo, M., Hoddinott, J., Koch, B., & Ahmed, A. (2019). Can transfers and behavior change communication reduce intimate partner violence four years post-program? Experimental evidence from Bangladesh. IFPRI Discussion Paper, 1869.
- Schaner, S. (2015). Do opposites detract? Intrahousehold preference heterogeneity and inefficient strategic savings. *American Economic Journal: Applied Economics*, 7(2), 135–74.
- Schaner, S. (2017). The cost of convenience? Transaction costs, bargaining power, and savings account use in Kenya. *Journal of Human Resources*, 52(4), 919–945.
- Serra-Garcia, M. (2020). Risk Attitudes and Conflict in the Household.

- Udry, C. (1996). Gender, Agricultural Production, and the Theory of the Household. *Journal of Political Economy*, 104(5), 1010–1046.
- Vieider, F. M., Lefebvre, M., Bouchouicha, R., Chmura, T., Hakimov, R., Krawczyk, M., & Martinsson, P. (2015). Common components of risk and uncertainty attitudes across contexts and domains: Evidence from 30 countries. *Journal of the European Economic Association*, 13(3), 421–452.

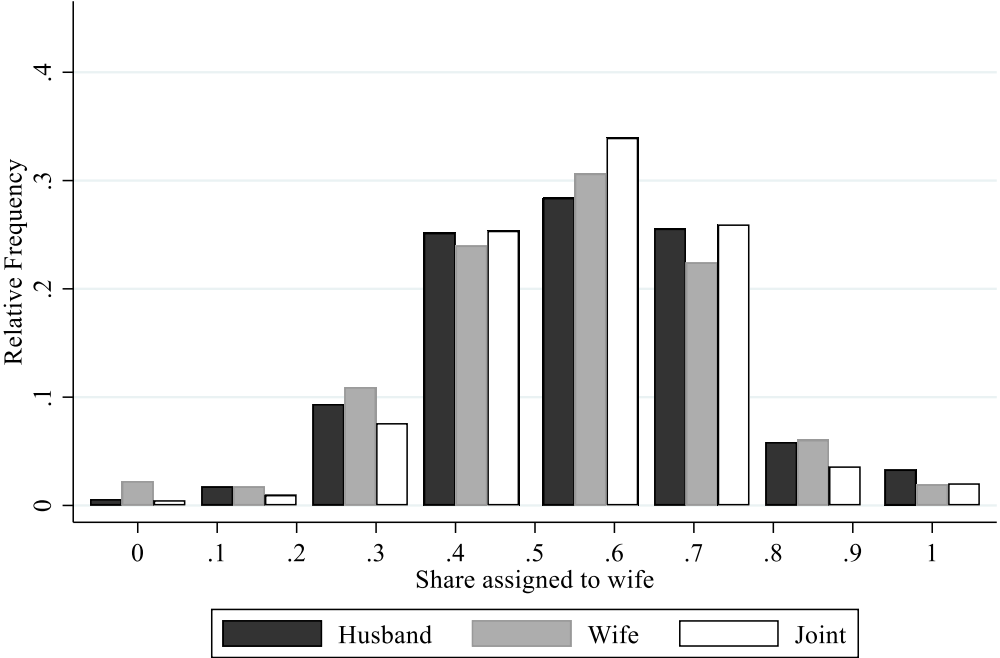
Figure 1. Price paid for resource control, Task 1



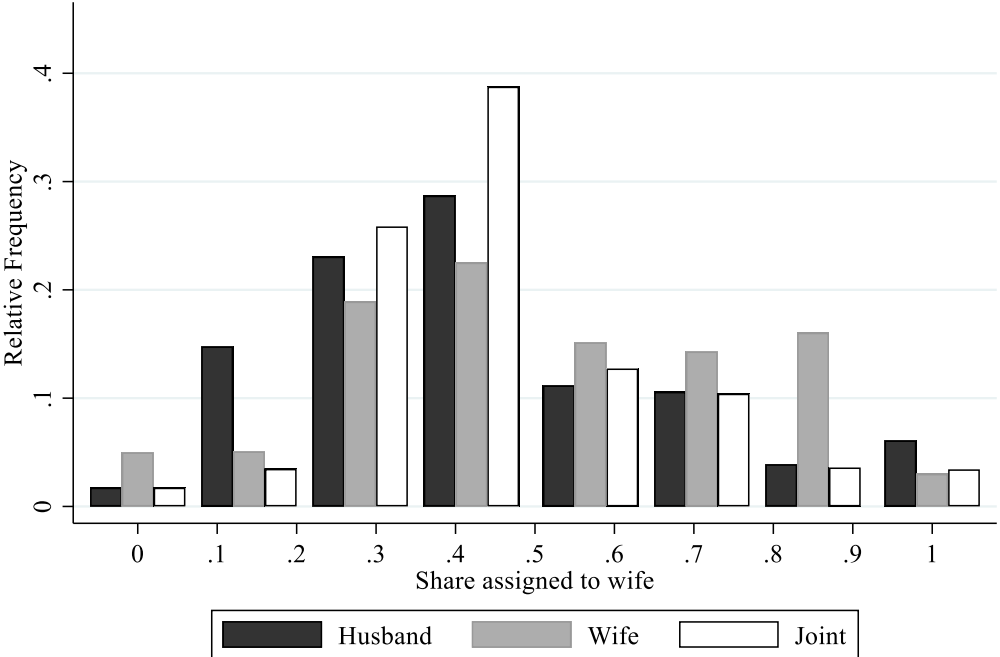
Notes: The price paid for resource control can acquire value $P \in \{-0.5, 0, 0.5\}$ when the spouse is willing to sacrifice P (as a share of the endowment) to receive the money. A positive (negative) value indicates paying to receive (not receive) the money. The distributions are significantly different between husbands and wives in both panels (Chi-squared $p < 0.001$).

Figure 2. Dictator game decisions, Task 2

(a) Ghana

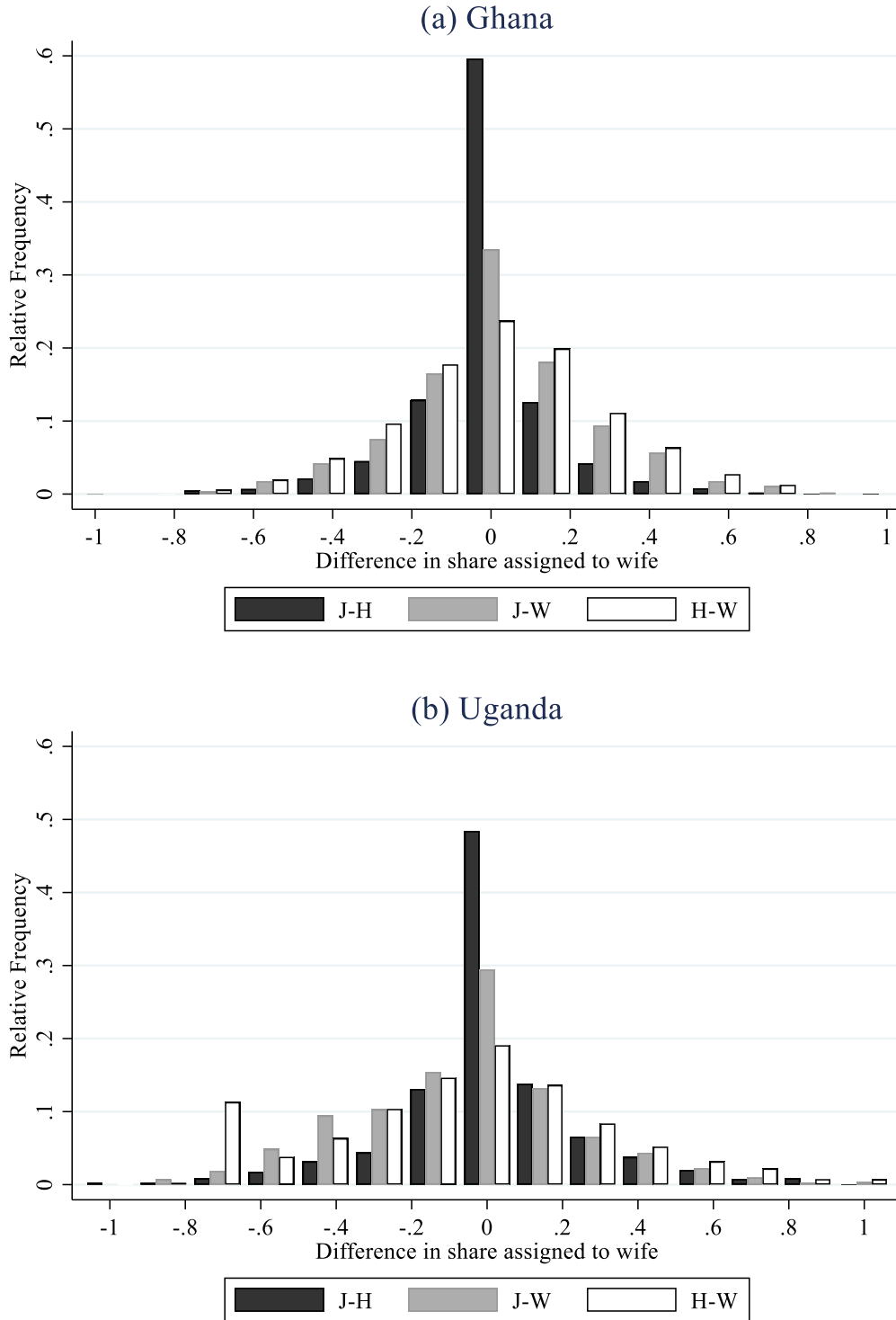


(b) Uganda



Note: Husband and Wife indicate the private decisions made by spouses. Joint indicates the decision made jointly by the couple, after they make private decisions.

Figure 3. Intra-household differences in dictator game decisions, Task 2



Note: J, H, and W denote the joint, husband, and wife decisions respectively (shown in Figure 2). J-H and J-W denote the difference between the joint decision made by the couple and the private decision made by the husband and by the wife respectively. H-W is the difference between the private decisions made by spouses.

Table 1: Summary Statistics

	<i>Ghana</i>		<i>Uganda</i>	
<i>Household characteristics</i>				
Household size	9.13		8.70	
Polygamous household	0.33		0.34	
Years of marriage	21.7		19.5	
Any food insecurity	0.57		0.66	
<i>Individual characteristics</i>				
	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>Men</i>
Age group				
Under 25	0.07	0.01	0.10	0.01
25 to 39	0.49	0.34	0.46	0.30
40 to 64	0.40	0.45	0.42	0.60
65 or older	0.04	0.19	0.02	0.09
Years of schooling				
Has no schooling	0.76	0.58	0.18	0.06
Did not complete primary school	0.92	0.81	0.56	0.40
Reports individual income	0.71	0.70	0.25	0.94
Personal savings (USD)	34	118	50	216

Note: Savings are reported in USD. Any food insecurity indicates reporting any of the issues listed in Appendix F Section 4. There are 1,024 households in the Ghana sample and 2,363 households in the Uganda sample.

Table 2: Fixed Effects Regressions to Estimate Difference between Husband and Wife

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Willingness to pay task</i>				<i>Dictator game</i>			
	Pays to control resources		Pays to have spouse control resources		Percentage assigned to wife		Absolute distance to joint J-I	
<i>Panel A: Ghana</i>								
Coefficient on "Wife"	0.0605***	0.0492**	-0.115***	-0.0946***	-0.0216***	-0.0218**	0.0799***	0.0799***
Standard error	(0.0164)	(0.0217)	(0.0187)	(0.0253)	(0.00828)	(0.0109)	(0.00684)	(0.00902)
R-squared	0.515	0.518	0.530	0.537	0.505	0.506	0.560	0.565
Number of observations	2,048	2,048	2,048	2,048	2,048	2,048	2,048	2,048
Mean outcome: husbands	0.14		0.312		0.565		0.0929	
<i>Panel B: Uganda</i>								
Coefficient on "Wife"	0.0288**	0.0461**	-0.0563***	-0.0936***	0.0704***	0.0512***	0.0759***	0.0719***
Standard error	(0.0112)	(0.0215)	(0.0131)	(0.0264)	(0.00783)	(0.0162)	(0.00598)	(0.0122)
R-squared	0.573	0.576	0.570	0.572	0.416	0.420	0.509	0.512
Number of observations	4,726	4,726	4,726	4,726	4,726	4,726	4,726	4,726
Mean outcome: husbands	0.207		0.406		0.444		0.145	
Control variables	No	Yes	No	Yes	No	Yes	No	Yes

Note: J indicates joint allocation to wife, I indicates individual allocation to wife. Responses are at the individual level and include a fixed effect for household, as well as controls for age group, years of schooling, whether the individual reports any personal income, and personal savings. Robust standard errors are clustered at the household level. *** Significant at the 1% level, ** 5% level, * 10% level.

Table 3: Relationship between Experimental Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Dependent variable is</i>							
	Wife pays to control resources				Wife pays to have husband control resources			
<i>Panel A: Ghana</i>								
Percent of endowment assigned to wife: wife	0.443*** (0.063)	0.445*** (0.064)			-0.418*** (0.066)	-0.424*** (0.065)		
Percent of endowment assigned to wife: husband		0.063 (0.079)				-0.112 (0.081)		
Percent of endowment assigned to wife: joint		-0.041 (0.089)				0.131 (0.095)		
Absolute difference: Joint allocation to wife - wife allocation to wife			0.192** (0.085)				-0.019 (0.076)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.176** (0.081)				-0.030 (0.074)
R-squared	0.073	0.073	0.048	0.045	0.058	0.060	0.029	0.027
Number of observations	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024
<i>Panel B: Uganda</i>								
Percent of endowment assigned to wife: wife	0.242*** (0.033)	0.231*** (0.035)			-0.405*** (0.038)	-0.400*** (0.040)		
Percent of endowment assigned to wife: husband		-0.002 (0.041)				-0.010 (0.045)		
Percent of endowment assigned to wife: joint		0.100** (0.047)				-0.072 (0.054)		
Absolute difference: Joint allocation to wife - wife allocation to wife			0.054 (0.042)				-0.107** (0.048)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.055 (0.035)				-0.023 (0.040)
R-squared	0.044	0.046	0.026	0.030	0.064	0.065	0.034	0.039
Number of observations	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363

Note: Unless otherwise indicated, responses are from the wife. Dependent variables are from the willingness to pay to control resources task. Independent variables are from the dictator game task. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Table 4: Correlation of Wife Experimental Measures with Survey Measures: Ghana

	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
<i>Panel A: Model 1</i>					
Pays to control resources	0.086 (0.080)	0.120 (0.083)	-0.046 (0.075)	-0.019 (0.081)	-0.024 (0.094)
Pays to have spouse control resources	0.062 (0.079)	0.102 (0.084)	0.072 (0.072)	-0.131* (0.078)	0.080 (0.106)
R-squared	0.036	0.015	0.016	0.031	0.022
<i>Panel B: Model 2</i>					
Percent of endowment assigned to wife: wife	0.155 (0.160)	-0.176 (0.178)	-0.032 (0.188)	0.554*** (0.178)	0.007 (0.121)
Percent of endowment assigned to wife: husband	0.089 (0.193)	0.215 (0.199)	0.296 (0.269)	0.035 (0.199)	-0.137 (0.142)
Percent of endowment assigned to wife: joint	0.084 (0.220)	0.061 (0.218)	-0.200 (0.333)	-0.481* (0.254)	0.126 (0.266)
R-squared	0.036	0.015	0.017	0.044	0.021
<i>Panel C: Model 3</i>					
Absolute difference: Joint allocation to wife - wife allocation to wife	-0.013 (0.188)	0.008 (0.191)	-0.135 (0.232)	0.359 (0.225)	-0.022 (0.122)
R-squared	0.035	0.015	0.015	0.037	0.020
<i>Panel D: Model 4</i>					
Absolute difference: Husband allocation to wife - wife allocation to wife	0.036 (0.191)	-0.019 (0.192)	0.153 (0.160)	0.038 (0.186)	-0.191 (0.163)
R-squared	0.035	0.012	0.015	0.030	0.021
Number of observations	1,024	1,024	1,024	1,024	1,024

Note: Unless otherwise indicated, responses are from the wife. Model 1 includes responses from the willingness to pay to control resources task. Models 2-4 include responses from the dictator game task. Dependent variables are standardized indices of variables in each category as described in Appendix F. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Table 5: Correlation of Wife Experimental Measures with Survey Measures: Uganda

	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
<i>Panel A: Model 1</i>					
Pays to control resources	-0.064*** (0.015)	0.137*** (0.053)	0.021 (0.054)	-0.314*** (0.055)	0.018 (0.039)
Pays to have spouse control resources	0.051*** (0.012)	0.247*** (0.048)	0.121** (0.048)	0.046 (0.045)	-0.083*** (0.031)
R-squared	0.056	0.031	0.016	0.080	0.026
<i>Panel B: Model 2</i>					
Percent of endowment assigned to wife: wife	-0.086*** (0.023)	-0.330*** (0.087)	-0.140 (0.086)	-0.320*** (0.084)	0.144** (0.058)
Percent of endowment assigned to wife: husband	0.023 (0.025)	0.209** (0.095)	0.041 (0.094)	0.055 (0.091)	-0.040 (0.066)
Percent of endowment assigned to wife: joint	-0.009 (0.031)	0.046 (0.109)	0.071 (0.117)	0.038 (0.114)	0.007 (0.080)
R-squared	0.039	0.031	0.015	0.067	0.025
<i>Panel C: Model 3</i>					
Absolute difference: Joint allocation to wife - wife allocation to wife	-0.069** (0.027)	-0.370*** (0.103)	-0.108 (0.102)	-0.180* (0.099)	0.189*** (0.069)
R-squared	0.036	0.027	0.014	0.064	0.025
<i>Panel D: Model 4</i>					
Absolute difference: Husband allocation to wife - wife allocation to wife	-0.052** (0.022)	-0.222*** (0.083)	-0.064 (0.083)	0.008 (0.080)	0.143** (0.057)
R-squared	0.037	0.024	0.014	0.066	0.026
Number of observations	2,363	2,363	2,363	2,363	2,363

Note: Unless otherwise indicated, responses are from the wife. Model 1 includes responses from the willingness to pay to control resources task. Models 2-4 include responses from the dictator game task. Dependent variables are standardized indices of variables in each category as described in Appendix F. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Table 6: Correlation of Husband and Wife Experimental Measures with Survey Measures: Uganda

	<i>Category mean</i>	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence index
<i>Panel A: Willingness to pay</i>						
1 <i>Omitted category: Agree to maximize resources</i>	0.218					
2 Both pay for spouse to control resources	0.174	0.077*** (0.018)	0.415*** (0.067)	0.113* (0.067)	0.125* (0.064)	-0.132*** (0.040)
3 Both pay for resource control	0.074	-0.047* (0.026)	0.198** (0.093)	0.046 (0.085)	-0.171* (0.089)	0.041 (0.075)
4 Both pay for wife to control resources	0.102	-0.037* (0.022)	0.281*** (0.077)	-0.036 (0.081)	-0.322*** (0.086)	-0.020 (0.054)
5 Both pay for husband to control resources	0.067	0.074*** (0.024)	0.369*** (0.109)	0.159* (0.086)	-0.104 (0.103)	-0.060 (0.061)
6 Husband pays for wife to control resources, wife efficient	0.130	0.035* (0.019)	0.096 (0.064)	-0.077 (0.071)	0.169*** (0.061)	0.004 (0.049)
7 Husband pays for husband to control resources, wife efficient	0.066	0.031 (0.025)	-0.036 (0.086)	-0.143 (0.096)	0.025 (0.084)	0.046 (0.065)
8 Wife pays for wife to control resources, husband efficient	0.061	-0.073** (0.030)	-0.053 (0.089)	-0.109 (0.095)	-0.304*** (0.096)	0.091 (0.070)
9 Wife pays for husband to control resources, husband efficient	0.108	0.046** (0.021)	0.010 (0.069)	-0.040 (0.078)	0.185*** (0.064)	0.017 (0.053)
R-squared		0.064	0.053	0.024	0.094	0.036
<i>Panel B: Dictator games</i>						
1 <i>Omitted category: Both say self should receive more</i>	0.337					
2 Both say their spouse should receive more	0.169	0.046*** (0.017)	0.277*** (0.062)	0.107* (0.064)	0.268*** (0.054)	-0.080** (0.040)
3 Both say wife should receive more	0.148	0.007 (0.018)	0.151** (0.059)	0.035 (0.063)	0.047 (0.066)	-0.014 (0.047)
4 Both say husband should receive more	0.346	0.052*** (0.014)	0.236*** (0.051)	0.109** (0.051)	0.177*** (0.051)	-0.105*** (0.034)
R-squared		0.044	0.037	0.020	0.076	0.033
Number of observations		2,363	2,363	2,363	2,363	2,363

Note: Dependent variables are standardized indices of variables in each category as described in Appendix F. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables for the wife: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses.

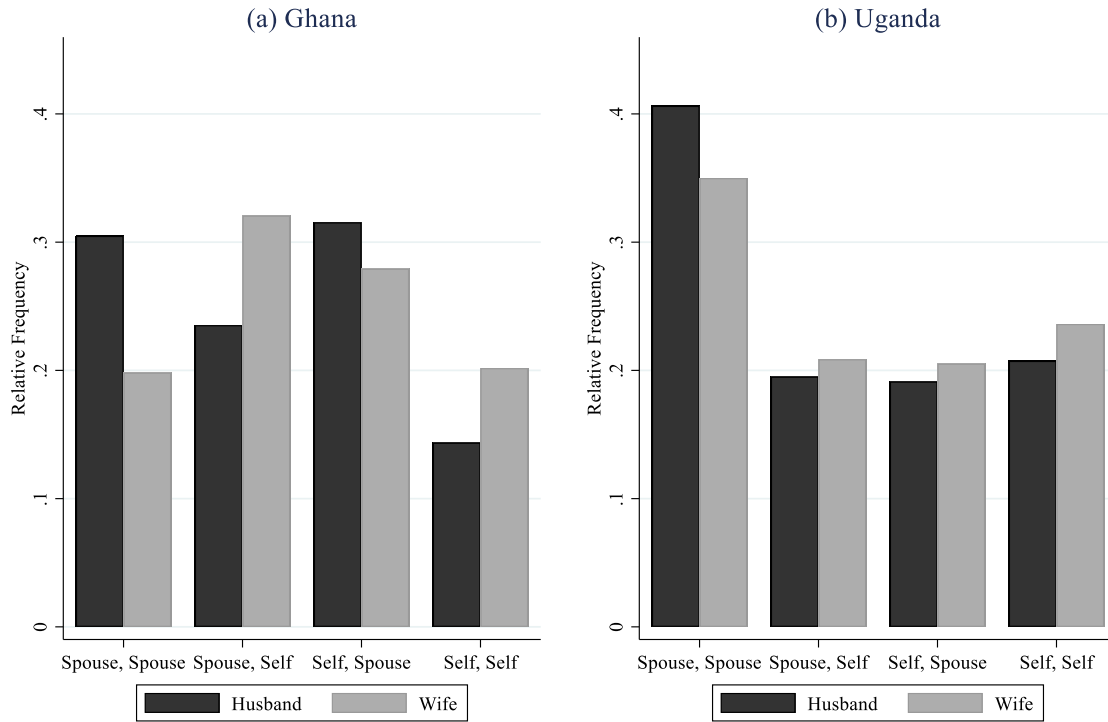
*** Significant at the 1% level, ** 5% level, * 10% level.

Table 7: Heterogeneity of Correlation of Dictator Game Measures with Survey Measures: Ghana

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Interaction term: Schooling					Interaction term: Savings				
	<i>Dependent variable is</i>									
	Wife's access to resources index	Decision making index	Agreement index	Psychologic al violence incidence index	Physical violence incidence index	Wife's access to resources index	Decision making index	Agreement index	Psychologic al violence incidence index	Physical violence incidence index
<i>Interaction term: None X ...</i>										
Percent of endowment assigned to wife: wife	0.135 (0.75)	-0.184 (-0.92)	0.142 (0.62)	0.438* (2.23)	-0.0262 (-0.22)	0.151 (0.61)	0.00230 (0.01)	-0.0860 (-0.26)	0.386 (1.57)	-0.0853 (-0.50)
Percent of endowment assigned to wife: husband	0.275 (1.27)	0.276 (1.18)	0.393 (1.25)	0.0746 (0.36)	-0.255 (-1.87)	-0.164 (-0.53)	0.119 (0.41)	-0.0560 (-0.18)	-0.286 (-1.25)	-0.253 (-1.12)
Percent of endowment assigned to wife: joint	0.0108 (0.04)	0.239 (0.94)	-0.338 (-0.85)	-0.281 (-1.13)	0.221 (0.74)	0.244 (0.65)	0.491 (1.39)	0.129 (0.25)	-0.0912 (-0.32)	0.421 (0.78)
<i>Interaction term: Any X ...</i>										
Percent of endowment assigned to wife: wife	0.232 (0.68)	-0.145 (-0.38)	-0.642* (-2.41)	0.960* (2.36)	0.121 (0.38)	0.146 (0.70)	-0.343 (-1.47)	-0.0123 (-0.06)	0.648** (2.66)	0.0600 (0.35)
Percent of endowment assigned to wife: husband	-0.612 (-1.54)	0.0652 (0.20)	-0.127 (-0.38)	-0.0176 (-0.03)	0.310 (0.77)	0.304 (1.20)	0.242 (0.89)	0.582 (1.40)	0.247 (0.79)	-0.0692 (-0.35)
Percent of endowment assigned to wife: joint	0.452 (0.99)	-0.525 (-1.22)	0.391 (1.30)	-1.184 (-1.65)	-0.266 (-0.47)	-0.0166 (-0.06)	-0.245 (-0.90)	-0.412 (-1.00)	-0.702 (-1.92)	-0.0690 (-0.30)
P-value Wife: None = Any	0.801	0.928	0.0246	0.249	0.654	0.989	0.340	0.850	0.446	0.545
P-value Husband: None = Any	0.0512	0.597	0.240	0.878	0.190	0.242	0.756	0.207	0.174	0.551
P-value Joint: None = Any	0.401	0.132	0.126	0.229	0.449	0.571	0.0996	0.408	0.183	0.390
R-squared	0.0395	0.0194	0.0233	0.0498	0.0231	0.0375	0.0198	0.0196	0.0490	0.0221
Number of Observations	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024

Note: The model includes responses from the dictator game task. Dependent variables are standardized indices of variables in each category. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Figure 1. Category of willingness to pay for resource control, Task 1



Note: The x axis shows the four possible decision scenarios, ordered by the underlying willingness to pay variable they capture (see Appendix A Table A1). Participants who choose “Spouse, Spouse” in decision 1 and 2 of Task 1 have a strong willingness to pay for their spouse to control resources. Participants who choose “Spouse, Self” have a weak willingness to pay for their spouse to control resources. Participants who choose “Self, Spouse” have a weak willingness to pay for resource control, and participants who choose “Self, Self” have a strong willingness to pay for resource control. These 4 possible decision scenarios translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively (see Figure 1).

Appendix Table 1: Survey Measures Index Components: Ghana

	Mean	SD	Min	Max
Agreement: Wife reports couple agrees on (1 -5 scale, 5 is agree)				
Spending	1.462	0.746	1	5
Saving/Investing	1.412	0.696	1	5
Crop choice	1.443	0.675	1	5
Land use	1.385	0.672	1	5
Intimate partner violence: Psychological (behavior ever occurred?)				
<u>Controlling behaviors</u>				
Jealous of talking to other men	0.235	0.424	0	1
Frequently accuses infidelity	0.076	0.266	0	1
Does not allow meeting female friends	0.162	0.369	0	1
Limits her contact with her family	0.069	0.254	0	1
Insists on always knowing whereabouts	0.445	0.497	0	1
Does not trust her with money	0.111	0.315	0	1
Refuses sex	0.085	0.280	0	1
<u>Emotional abuse</u>				
Humilates her in front of others	0.141	0.349	0	1
Threatens her	0.064	0.246	0	1
Insults her	0.335	0.472	0	1
Reports any psychological violence	0.710	0.454	0	1
Intimate partner violence: Physical (behavior ever occurred?)				
Pushing/shaking/throwing things	0.037	0.189	0	1
Slapping	0.011	0.106	0	1
Twisting arm / pulling hair	0.024	0.152	0	1
Punching	0.061	0.239	0	1
Kicking/dragging/beating	0.180	0.385	0	1
Choking/burning	0.041	0.198	0	1
Threatening with weapon	0.084	0.277	0	1
Reports any physical violence	0.209	0.407	0	1
Wife's access to resources				
Wife owns house	0.309	0.462	0	1
Wife owns land	0.312	0.464	0	1
Wife earns as much or more than husband	0.149	0.356	0	1
Personal expenditure ratio (Wife/Husband)	0.440	0.280	0	1
Decision making: Wife has equal or more say on...				
Use of own earnings	0.802	0.398	0	1
Use of husband earnings	0.589	0.492	0	1
Own healthcare	0.646	0.479	0	1
Major purchases	0.604	0.489	0	1
Visits to own family	0.700	0.459	0	1
Investment in business vs family	0.794	0.405	0	1

Note: The table shows representative summary statistics for these variables. The statistics are shown for descriptive purposes and some do not enter the index in the form shown. For index construction, categorical variables are first converted to question-level indices that take advantage of the full variation in responses, with a category index then calculated across questions. For clarity here, one mean is shown to best summarize the data in a succinct manner. This applies to agreement, psychological intimate partner violence, physical intimate partner violence, and decision making. Full details on index creation, including question texts for component variables, are provided in Appendix F.

Appendix Table 2: Survey Measures Index Components: Uganda

	Mean	SD	Min	Max
Agreement: Husband and Wife agree on				
Whether to spend on clothes or entertainment	0.693	0.461	0	1
Whether to spending on education or health	0.767	0.423	0	1
Whether to spend on business/farm or house quality	0.616	0.486	0	1
How to use land	0.450	0.498	0	1
Marital quality: Wife's report (1 - 10 scale, 10 is agree)				
We discuss household decisions/issues together	7.986	2.467	1	10
Husband contributes a lot to household wellbeing	8.202	2.374	1	10
We have talked about how to improve family situation	8.084	2.412	1	10
I like to discuss personal concerns with Husband	7.259	2.787	1	10
I have confidence in the stability of our relationship	7.959	2.628	1	10
I strongly desire to promote the wellbeing of Husband	8.703	2.106	1	10
Intimate partner violence: Hit/pushed/slapped/thrown things?				
Wife report: Ever	0.182	0.386	0	1
Wife report: In past year	0.092	0.289	0	1
Husband report: In past year	0.073	0.260	0	1
Wife's access to resources				
Personal expenditures ratio (Wife/Husband)	0.426	0.334	0	1
Wife reports having any say in use of cane income	0.776	0.417	0	1
Decision making: Wife has equal or more say on...				
Use of own earnings	0.460	0.499	0	1
Use of husband earnings	0.432	0.495	0	1
Own healthcare	0.761	0.426	0	1
Children's healthcare	0.746	0.436	0	1
Major purchases	0.508	0.500	0	1
Minor purchases	0.658	0.474	0	1
Visits to own family	0.666	0.472	0	1

Note: The table shows representative summary statistics for these variables. The statistics are shown for descriptive purposes and some do not enter the index in the form shown. For index construction, categorical variables are first converted to question-level indices that take advantage of the full variation in responses, with a category index then calculated across questions. For clarity here, one mean is shown to best summarize the data in a succinct manner. This applies to marital quality and decision making. Full details on index creation, including question texts for component variables, are provided in Appendix F.

Appendix Table 3: Fixed Effects Ordered Logit Model: Difference in Willingness to Pay for Resource Control between Husband and Wife

	(1)	(2)
	<i>Dependent variable is</i>	
	Category of willingness to pay for resource control	
<i>Panel A: Ghana</i>		
Coefficient on "Wife"	0.343***	0.240**
Standard error	(0.0807)	[0.113]
Number of observations	1,510	1,510
<i>Marginal effects</i>		
(1) Strong WTP for spouse to control resources	-0.0645*** (0.0151)	-0.0450** (0.0212)
(2) Weak WTP for spouse to control resources	-0.0211*** (0.00495)	-0.0147** (0.00694)
(3) Weak WTP for resource control	0.0331*** (0.00777)	0.0231** (0.0109)
(4) Strong WTP for resource control	0.05245*** (0.0123)	0.0366** (0.0173)
<i>Panel B: Uganda</i>		
Coefficient on "Wife"	0.220***	0.332***
Standard error	(0.0567)	[0.111]
Number of observations	3,012	3,012
<i>Marginal effects</i>		
(1) Strong WTP for spouse to control resources	-0.0479*** (0.0123)	-0.0721*** (0.0242)
(2) Weak WTP for spouse to control resources	-0.00682*** (0.00176)	-0.0103*** (0.0034)
(3) Weak WTP for resource control	0.0155*** (0.00399)	0.0234*** (0.0078)
(4) Strong WTP for resource control	0.0392*** (0.0101)	0.0591*** (0.0198)
Control variables	No	Yes

Note: WTP stands for willingness to pay. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. The number of observations differs from those presented in Table 2 because the feologit command in stata (Baetschmann et al. 2020) drops households where there is no variation in choices from the estimation sample. Control variables are as in Table 2. Standard errors are clustered at the household level. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 4: Relationship between Experimental Measures: Husband Responses

	<i>Dependent variable is</i>							
	Pays to control resources				Pays to have spouse control resources			
<i>Panel A: Ghana</i>								
Percent of endowment assigned to wife: wife	-0.328***	-0.172**			0.458***	0.365***		
	(0.061)	(0.073)			(0.076)	(0.090)		
Percent of endowment assigned to wife: husband		0.050				0.072		
		(0.063)				(0.070)		
Percent of endowment assigned to wife: joint		-0.347***				0.206**		
		(0.077)				(0.104)		
Absolute difference: Joint allocation to wife - husband allocation to wife			0.053				0.093	
			(0.094)				(0.115)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.151**				-0.164**
				(0.074)				(0.081)
R-squared	0.060	0.079	0.031	0.046	0.072	0.077	0.045	0.050
Number of observations	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024
<i>Panel B: Uganda</i>								
Percent of endowment assigned to wife: wife	-0.289***	-0.250***			0.523***	0.387***		
	(0.030)	(0.035)			(0.041)	(0.047)		
Percent of endowment assigned to wife: husband		-0.114***				-0.035		
		(0.034)				(0.041)		
Percent of endowment assigned to wife: joint		-0.189***				0.397***		
		(0.040)				(0.057)		
Absolute difference: Joint allocation to wife - husband allocation to wife			-0.184***				0.331***	
			(0.043)				(0.059)	
Absolute difference: Husband allocation to wife - wife allocation to wife				-0.104***				0.109***
				(0.033)				(0.040)
R-squared	0.046	0.060	0.026	0.031	0.082	0.103	0.038	0.060
Number of observations	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363

Notes: The dependent variables are from the willingness to pay for resource control task. Independent variables are from the dictator game task. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether individual reports any individual income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 5: Relationship between Experimental Measures: Ordered logit model, Wife Responses

	(1)	(2)	(3)	(4)
	<i>Dependent variable is</i>			
	Category of willingness to pay for resource control			
Panel A: Ghana				
Percent of endowment assigned to wife: wife	2.412*** (0.311)	2.435*** (0.314)		
Percent of endowment assigned to wife: husband		0.409 (0.390)		
Percent of endowment assigned to wife: joint		-0.431 (0.460)		
Absolute difference: Joint allocation to wife - wife allocation to wife			0.757* (0.398)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.901** (0.373)
Number of observations	1,024	1,024	1,024	1,024
<i>Marginal effects for main variable of interest</i>				
(1) Strong WTP for spouse to control resources	-0.362*** (0.048)	-0.365*** (0.049)	-0.116* (0.061)	-0.138** (0.057)
(2) Weak WTP for spouse to control resources	-0.202*** (0.027)	-0.204*** (0.027)	-0.066* (0.035)	-0.079** (0.033)
(3) Weak WTP for resource control	0.192*** (0.025)	0.193*** (0.025)	0.063* (0.033)	0.076** (0.031)
(4) Strong WTP for resource control	0.372*** (0.050)	0.376*** (0.050)	0.119* (0.063)	0.142** (0.059)
Panel B: Uganda				
Percent of endowment assigned to wife: wife	1.686*** (0.156)	1.606*** (0.160)		
Percent of endowment assigned to wife: husband		-0.157 (0.177)		
Percent of endowment assigned to wife: joint		0.566*** (0.210)		
Absolute difference: Joint allocation to wife - wife allocation to wife			0.404** (0.183)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.251 (0.155)
Number of observations	2,363	2,363	2,363	2,363
<i>Marginal effects for main variable of interest</i>				
(1) Strong WTP for spouse to control resources	-0.365*** (0.032)	-0.347*** (0.033)	-0.090** (0.041)	-0.055 (0.034)
(2) Weak WTP for spouse to control resources	-0.027*** (0.006)	-0.026*** (0.006)	-0.007** (0.003)	-0.004 (0.003)
(3) Weak WTP for resource control	0.102*** (0.010)	0.097*** (0.010)	0.026** (0.012)	0.016 (0.010)
(4) Strong WTP for resource control	0.290*** (0.026)	0.275*** (0.027)	0.071** (0.032)	0.044 (0.027)

Note: WTP stands for willingness to pay. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Independent variables are from the dictator game task. Control variables are as in Table 3. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 6: Relationship between Experimental Measures: Ordered logit model, Husband Responses

	(1)	(2)	(3)	(4)
<i>Dependent variable is</i>				
Category of willingness to pay for resource control				
Panel A: Ghana				
Percent of endowment assigned to wife: wife	-2.215*** (0.335)	-1.621*** (0.401)		
Percent of endowment assigned to wife: husband		-0.012 (0.331)		
Percent of endowment assigned to wife: joint		-1.323*** (0.443)		
Absolute difference: Joint allocation to wife - wife allocation to wife			-0.429 (0.502)	
Absolute difference: Husband allocation to wife - wife allocation to wife				0.591 (0.364)
Number of observations	1,024	1,024	1,024	1,024
<i>Marginal effects for main variable of interest</i>				
(1) Strong WTP for spouse to control resources	0.447*** (0.065)	0.325*** (0.079)	0.089 (0.104)	-0.121 (0.074)
(2) Weak WTP for spouse to control resources	0.065*** (0.014)	0.047*** (0.014)	0.013 (0.016)	-0.018 (0.011)
(3) Weak WTP for resource control	-0.255*** (0.037)	-0.185*** (0.046)	-0.052 (0.061)	0.070 (0.043)
(4) Strong WTP for resource control	-0.257*** (0.042)	-0.187*** (0.047)	-0.051 (0.059)	0.069 (0.043)
Panel B: Uganda				
Percent of endowment assigned to wife: wife	-2.187*** (0.176)	-1.759*** (0.196)		
Percent of endowment assigned to wife: husband		-0.147 (0.165)		
Percent of endowment assigned to wife: joint		-1.560*** (0.232)		
Absolute difference: Joint allocation to wife - wife allocation to wife			-1.362*** (0.238)	
Absolute difference: Husband allocation to wife - wife allocation to wife				-0.507*** (0.157)
Number of observations	2,363	2,363	2,363	2,363
<i>Marginal effects for main variable of interest</i>				
(1) Strong WTP for spouse to control resources	0.488*** (0.035)	0.385*** (0.040)	0.318*** (0.054)	0.116*** (0.036)
(2) Weak WTP for spouse to control resources	0.002 (0.007)	0.003 (0.005)	-0.001 (0.005)	-0.000 (0.002)
(3) Weak WTP for resource control	-0.145*** (0.012)	-0.114*** (0.013)	-0.097*** (0.017)	-0.035*** (0.011)
(4) Strong WTP for resource control	-0.345*** (0.028)	-0.274*** (0.031)	-0.220*** (0.038)	-0.081*** (0.025)

Note: WTP stands for willingness to pay. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Independent variables are from the dictator game task. Control variables are as in Table 3. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 7: Correlation of Experimental Measures with Survey Measures: Ghana, Husband Responses

	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
<i>Panel A: Model 1</i>					
Pays to control resources	0.067 (0.096)	-0.270*** (0.101)	-0.057 (0.108)	0.074 (0.090)	-0.051 (0.078)
Pays to have spouse control resources	0.018 (0.069)	-0.125* (0.068)	0.006 (0.073)	0.023 (0.074)	0.030 (0.075)
R-squared	0.030	0.020	0.011	0.027	0.024
<i>Panel B: Model 2</i>					
Percent of endowment assigned to wife: wife	0.148 (0.161)	-0.221 (0.172)	0.110 (0.198)	0.535*** (0.174)	-0.024 (0.116)
Percent of endowment assigned to wife: husband	0.095 (0.194)	0.072 (0.202)	0.012 (0.174)	0.021 (0.201)	-0.148 (0.141)
Percent of endowment assigned to wife: joint	0.111 (0.222)	0.358 (0.229)	0.131 (0.215)	-0.478* (0.257)	0.117 (0.249)
R-squared	0.031	0.016	0.012	0.041	0.024
<i>Panel C: Model 3</i>					
Absolute difference: Joint allocation to wife - husband allocation to wife	0.240 (0.237)	-0.449* (0.230)	0.149 (0.224)	0.174 (0.303)	-0.141 (0.192)
R2	0.031	0.014	0.011	0.027	0.026
<i>Panel D: Model 4</i>					
Absolute difference: Husband allocation to wife - wife allocation to wife	-0.001 (0.190)	-0.050 (0.199)	0.313* (0.187)	0.066 (0.183)	-0.201 (0.167)
R-squared	0.030	0.013	0.014	0.028	0.025
Number of observations	1,024	1,024	1,024	1,024	1,024

Note: OLS estimates of each survey index as a function of the experimental variables included in each model. All regressions also include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Husband responses are used for agreement and decision making. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 8: Correlation of Experimental Measures with Survey Measures: Uganda, Husband Responses

	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
<i>Panel A: Model 1</i>					
Pays to control resources	0.014 (0.016)	-0.075 (0.055)	0.050 (0.056)	-0.113* (0.059)	-0.008 (0.042)
Pays to have spouse control resources	0.035*** (0.013)	0.207*** (0.046)	0.040 (0.047)	-0.052 (0.044)	-0.080*** (0.031)
R-squared	0.026	0.050	0.014	0.029	0.026
<i>Panel B: Model 2</i>					
Percent of endowment assigned to wife: wife	-0.090*** (0.023)	-0.051 (0.087)	-0.152* (0.085)	-0.064 (0.088)	0.151*** (0.058)
Percent of endowment assigned to wife: husband	0.023 (0.025)	0.012 (0.096)	0.023 (0.094)	0.153* (0.090)	-0.025 (0.066)
Percent of endowment assigned to wife: joint	-0.004 (0.032)	0.176* (0.106)	0.059 (0.118)	0.189* (0.108)	0.012 (0.080)
R-squared	0.030	0.038	0.015	0.031	0.026
<i>Panel C: Model 3</i>					
Absolute difference: Joint allocation to wife - husband allocation to wife	0.065** (0.031)	0.206* (0.108)	0.148 (0.114)	0.128 (0.112)	0.008 (0.079)
R-squared	0.027	0.039	0.014	0.029	0.025
<i>Panel D: Model 4</i>					
Absolute difference: Husband allocation to wife - wife allocation to wife	-0.052** (0.022)	0.083 (0.098)	-0.071 (0.083)	0.014 (0.086)	0.154*** (0.058)
R-squared	0.027	0.037	0.014	0.031	0.027
Number of observations	2,363	2,363	2,363	2,363	2,363

Note: OLS estimates of each survey index as a function of the experimental variables included in each model. All regressions also include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether the individual reports any personal income, and individual savings. Husband responses are used for marital quality and decision making. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 9: Correlation of Willingness to Pay for Resource Control with Survey Measures: Ordered Logit Model, Ghana, Wife Responses

	<i>Survey measure</i>				
	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
<i>Dependent variable is category of willingness to pay for resource control</i>					
Survey measure	0.010 (0.055)	0.009 (0.060)	-0.094** (0.046)	0.073 (0.054)	-0.073 (0.080)
Number of observations	1,024	1,024	1,024	1,024	1,024
<i>Marginal effects for main variable of interest</i>					
(1) Strong WTP for spouse to control resources	-0.002 (0.008)	-0.001 (0.009)	0.015** (0.007)	-0.011 (0.008)	0.011 (0.012)
(2) Weak WTP for spouse to control resources	-0.001 (0.005)	-0.001 (0.005)	0.008** (0.004)	-0.007 (0.005)	0.007 (0.007)
(3) Weak WTP for resource control	0.001 (0.005)	0.001 (0.005)	-0.008** (0.004)	0.006 (0.005)	-0.006 (0.007)
(4) Strong WTP for resource control	0.002 (0.009)	0.001 (0.010)	-0.015** (0.007)	0.012 (0.009)	-0.012 (0.013)

Note: WTP stands for willingness to pay. Each column presents estimates of an ordered logit model of willingness to pay for resource control as a function of the survey measure presented in that column. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Control variables are as in Table 4. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 10: Correlation of Willingness to Pay for Resource Control with Survey Measures: Ordered Logit Model, Ghana, Husband Responses

	<i>Survey measure</i>				
	Wife's access to resources index	Decision making index	Agreement index	Psychological violence incidence index	Physical violence incidence index
<i>Dependent variable is category of willingness to pay for resource control</i>					
Survey measure	-0.011 (0.056)	-0.061 (0.057)	0.003 (0.072)	-0.010 (0.063)	-0.048 (0.041)
Number of observations	1,024	1,024	1,024	1,024	1,024
<i>Marginal effects for main variable of interest</i>					
(1) Strong WTP for spouse to control resources	0.002 (0.012)	0.013 (0.012)	-0.001 (0.015)	0.002 (0.013)	0.010 (0.008)
(2) Weak WTP for spouse to control resources	0.000 (0.002)	0.002 (0.002)	-0.000 (0.002)	0.000 (0.002)	0.002 (0.001)
(3) Weak WTP for resource control	-0.001 (0.007)	-0.007 (0.007)	0.000 (0.009)	-0.001 (0.008)	-0.006 (0.005)
(4) Strong WTP for resource control	-0.001 (0.007)	-0.007 (0.007)	0.000 (0.008)	-0.001 (0.007)	-0.006 (0.005)

Note: WTP stands for willingness to pay. Each column presents estimates of an ordered logit model of willingness to pay for resource control as a function of the survey measure presented in that column. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Control variables are as in Table 4. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 11: Correlation of Willingness to Pay for Resource Control with Survey Measures: Ordered Logit Model, Uganda, Wife Responses

	<i>Survey measure</i>				
	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
	<i>Dependent variable is category of willingness to pay for resource control</i>				
Survey measure	-0.986*** (0.144)	-0.117*** (0.043)	-0.092** (0.038)	-0.263*** (0.048)	0.513*** (0.149)
Number of observations	2,363	2,363	2,363	2,363	2,363
<i>Marginal effects for main variable of interest</i>					
(1) Strong WTP for spouse to control resources	0.218*** (0.031)	0.026*** (0.010)	0.021** (0.009)	0.058*** (0.010)	-0.115*** (0.033)
(2) Weak WTP for spouse to control resources	0.017*** (0.004)	0.002** (0.001)	0.002** (0.001)	0.005*** (0.001)	-0.009*** (0.003)
(3) Weak WTP for resource control	-0.062*** (0.009)	-0.008*** (0.003)	-0.006** (0.003)	-0.017*** (0.003)	0.033*** (0.010)
(4) Strong WTP for resource control	-0.173*** (0.025)	-0.021*** (0.007)	-0.016** (0.007)	-0.046*** (0.008)	0.091*** (0.026)

Note: WTP stands for willingness to pay. Each column presents estimates of an ordered logit model of willingness to pay for resource control as a function of the survey measure presented in that column. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. All control variables are as in Table 5. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 12: Correlation of Willingness to Pay for Resource Control with Survey Measures: Ordered logit model, Uganda, Husband Responses

	<i>Survey measure</i>				
	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
	<i>Dependent variable is category of willingness to pay for resource control</i>				
Survey measure	-0.305** (0.136)	-0.255*** (0.043)	-0.014 (0.038)	-0.040 (0.050)	0.490*** (0.165)
Number of observations	2,363	2,363	2,363	2,363	2,363
<i>Marginal effects for main variable of interest</i>					
(1) Strong WTP for spouse to control resources	0.072** (0.032)	0.060*** (0.010)	0.003 (0.009)	0.010 (0.012)	-0.116*** (0.039)
(2) Weak WTP for spouse to control resources	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.002)
(3) Weak WTP for resource control	-0.022** (0.010)	-0.018*** (0.003)	-0.001 (0.003)	-0.003 (0.004)	0.036*** (0.012)
(4) Strong WTP for resource control	-0.050** (0.022)	-0.041*** (0.007)	-0.002 (0.006)	-0.007 (0.008)	0.080*** (0.027)

Note: WTP stands for willingness to pay. Each column presents estimates of an ordered logit model of willingness to pay for resource control as a function of the survey measure presented in that column. The dependent variable can acquire four ordered values which map onto the following willingness to pay task decisions: (1) Spouse, Spouse; (2) Spouse, Self; (3) Self, Spouse; and (4) Self, Self. These categories translate into a price paid for resource control (as a share of the endowment) of -0.5, 0, 0, and 0.5 respectively. See Appendix Figure 1 and Table A1 in Appendix A for more information about the ordered variable. Control variables are as in Table 5. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 13: Correlation of Husband and Wife Experimental Measures with Survey Measures: Ghana

	<i>Category mean</i>	Wife's access to resources index	Decision making index	Agreement index	Psychological violence index	Physical violence index
<i>Panel A: Willingness to pay</i>						
1 <i>Omitted category: Agree to maximize resources</i>	0.345					
2 Both pay for spouse to control resources	0.069	-0.009 (0.120)	-0.032 (0.141)	0.001 (0.140)	-0.090 (0.125)	0.082 (0.120)
3 Both pay for resource control	0.031	0.019 (0.170)	-0.210 (0.199)	-0.019 (0.118)	0.300* (0.226)	0.077 (0.108)
4 Both pay for wife to control resources	0.062	0.226 (0.130)	0.005 (0.148)	0.071*** (0.102)	-0.107* (0.111)	-0.037 (0.062)
5 Both pay for husband to control resources	0.030	0.258 (0.190)	0.165 (0.165)	0.313 (0.085)	-0.190 (0.139)	-0.030 (0.072)
6 Husband pays for wife to control resources, wife efficient	0.181	-0.055 (0.092)	-0.152 (0.089)	-0.026** (0.120)	0.093 (0.105)	0.049 (0.082)
7 Husband pays for husband to control resources, wife efficient	0.078	0.010 (0.133)	-0.361 (0.130)	0.244 (0.080)	0.099 (0.115)	-0.067 (0.097)
8 Wife pays for wife to control resources, husband efficient	0.107	-0.005 (0.111)	0.118 (0.105)	-0.050 (0.110)	0.011 (0.106)	-0.047 (0.152)
9 Wife pays for husband to control resources, husband efficient	0.097	0.020 (0.114)	-0.009 (0.118)	0.112 (0.090)	-0.072 (0.110)	0.110 (0.179)
R-squared		0.043	0.035	0.030	0.040	0.029
<i>Panel B: Dictator games</i>						
1 <i>Omitted category: Both say self should receive more</i>	0.223					
2 Both say husband should receive more	0.146	-0.147 (0.100)	0.221* (0.117)	-0.069 (0.097)	-0.055 (0.102)	0.060 (0.094)
3 Both say wife should receive more	0.389	-0.022 (0.083)	0.109 (0.086)	-0.017 (0.074)	-0.066 (0.087)	0.005 (0.099)
4 Both say their spouse should receive more	0.242	0.072 (0.094)	0.137 (0.095)	-0.032 (0.102)	-0.193** (0.091)	-0.047 (0.093)
R-squared		0.042	0.024	0.022	0.037	0.027
Number of observations		1,024	1,024	1,024	1,024	1,024

Note: Dependent variables are standardized indices of variables in each category as described in Appendix F. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables for the wife: age group, years of schooling, whether the individual reports any personal income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 14: Heterogeneity of Correlation of Willingness to Pay Measures with Survey Measures: Ghana, Wife Responses

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Interaction term: Schooling					Interaction term: Savings				
	<i>Dependent variable is</i>									
	Wife's access to resources index	Decision making index	Agreement index	Psychologic al violence incidence index	Physical violence incidence index	Wife's access to resources index	Decision making index	Agreement index	Psychologic al violence incidence index	Physical violence incidence index
<i>Interaction term: None X ...</i>										
Pays to control resources	0.0205 (0.23)	0.125 (1.34)	-0.0597 (-0.68)	-0.0257 (-0.30)	-0.0869 (-1.27)	0.0393 (0.35)	0.318* (2.48)	-0.0464 (-0.38)	-0.0929 (-0.86)	-0.00575 (-0.07)
Pays to have spouse control resources	0.0729 (0.78)	0.0423 (0.44)	0.0526 (0.59)	-0.0563 (-0.59)	0.132 (0.95)	0.0846 (0.71)	0.0406 (0.35)	-0.0373 (-0.29)	-0.198 (-1.86)	0.214 (0.99)
<i>Interaction term: Any X ...</i>										
Pays to control resources	0.347 (1.93)	0.0951 (0.52)	0.0108 (0.08)	0.0197 (0.10)	0.232 (0.69)	0.130 (1.15)	-0.0630 (-0.60)	-0.0477 (-0.52)	0.0467 (0.40)	-0.0377 (-0.24)
Pays to have spouse control resources	0.0285 (0.19)	0.284 (1.61)	0.138 (1.22)	-0.354** (-3.00)	-0.0675 (-0.65)	0.0419 (0.40)	0.161 (1.34)	0.170* (2.21)	-0.0702 (-0.63)	-0.0378 (-0.65)
P-value Pays to control: None = Any	0.101	0.886	0.659	0.834	0.338	0.564	0.0212	0.993	0.369	0.851
P-value Pays to have spouse control: None = Any	0.805	0.230	0.555	0.0512	0.270	0.788	0.467	0.166	0.406	0.263
R-squared	0.0389	0.0172	0.0175	0.0340	0.0270	0.0364	0.0226	0.0178	0.0345	0.0239
Number of Observations	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024

Note: The model includes responses from the willingness to pay for resource control task. Dependent variables are standardized indices of variables in each category. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether individual reports any personal income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 15: Heterogeneity of Correlation of Dictator Game Measures with Survey Measures: Uganda, Wife Responses

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Interaction term: Schooling				Interaction term: Savings					
	<i>Dependent variable is</i>									
	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
<i>Interaction term: None X ...</i>										
Percent of endowment assigned to wife: wife	-0.152** (-2.78)	-0.0252 (-0.13)	0.0993 (0.50)	-0.632** (-3.10)	0.135 (0.90)	-0.0933* (-2.28)	-0.458** (-2.85)	-0.141 (-1.03)	-0.239 (-1.71)	-0.0608 (-0.64)
Percent of endowment assigned to wife: husband	-0.0563 (-0.85)	0.208 (0.96)	0.0742 (0.31)	-0.188 (-0.80)	-0.0960 (-0.51)	0.0200 (0.46)	0.168 (0.95)	0.0958 (0.64)	0.194 (1.21)	-0.0491 (-0.47)
Percent of endowment assigned to wife: joint	0.0237 (0.30)	-0.00293 (-0.01)	-0.128 (-0.45)	0.256 (1.02)	0.0322 (0.16)	-0.00152 (-0.03)	-0.0457 (-0.22)	-0.0174 (-0.09)	-0.141 (-0.72)	-0.0534 (-0.44)
<i>Interaction term: Any X ...</i>										
Percent of endowment assigned to wife: wife	-0.0712** (-2.77)	-0.393*** (-4.08)	-0.190* (-2.01)	-0.251** (-2.73)	0.147* (2.35)	-0.0754** (-2.69)	-0.268** (-2.69)	-0.157 (-1.45)	-0.369*** (-3.48)	0.262*** (3.53)
Percent of endowment assigned to wife: husband	0.0412 (1.53)	0.201 (1.90)	0.0297 (0.29)	0.111 (1.13)	-0.0288 (-0.42)	0.0299 (0.98)	0.226* (2.10)	-0.00388 (-0.03)	-0.0319 (-0.29)	-0.0362 (-0.42)
Percent of endowment assigned to wife: joint	-0.0153 (-0.45)	0.0556 (0.47)	0.112 (0.88)	-0.00555 (-0.04)	0.00191 (0.02)	-0.0178 (-0.47)	0.0986 (0.80)	0.135 (0.91)	0.153 (1.08)	0.0311 (0.29)
P-value Wife: None = Any	0.182	0.0958	0.184	0.0879	0.942	0.718	0.312	0.928	0.461	0.00740
P-value Husband: None = Any	0.175	0.980	0.862	0.239	0.739	0.851	0.779	0.604	0.247	0.923
P-value Joint: None = Any	0.647	0.850	0.439	0.353	0.893	0.804	0.549	0.526	0.225	0.602
R-squared	0.0405	0.0317	0.0160	0.0683	0.0253	0.0448	0.0323	0.0173	0.0681	0.0288
Number of Observations	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363

Note: The model includes responses from the dictator game task. Dependent variables are standardized indices of variables in each category. All regressions include the following household level control variables: food security measure, household income, and household savings. They also include the following individual level control variables: age group, years of schooling, whether individual reports any personal income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

Appendix Table 16: Heterogeneity of Correlation of Willingness to Pay Measures with Survey Measures: Uganda, Wife Responses

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Interaction term: Schooling				Interaction term: Savings					
						<i>Dependent variable is</i>				
	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index	Wife's access to resources index	Decision making index	Agreement index	Marital quality index	Intimate partner violence incidence index
<i>Interaction term: None X ...</i>										
Pays to control resources	-0.115** (-3.26)	0.0859 (0.76)	0.00158 (0.01)	-0.297* (-2.26)	0.0925 (1.03)	-0.0859*** (-3.39)	0.247** (2.71)	0.0244 (0.29)	-0.187* (-2.27)	-0.00577 (-0.09)
Pays to have spouse control resources	0.0161 (0.51)	0.212 (1.93)	0.212 (1.82)	0.0762 (0.67)	0.0431 (0.62)	0.0460* (2.07)	0.465*** (5.23)	0.111 (1.41)	0.0726 (0.93)	-0.0439 (-0.84)
<i>Interaction term: Any X ...</i>										
Pays to control resources	-0.0520** (-3.05)	0.149* (2.53)	0.0288 (0.48)	-0.317*** (-5.29)	0.00209 (0.05)	-0.0430* (-2.24)	0.0710 (1.16)	0.00657 (0.09)	-0.401*** (-5.39)	0.0388 (0.75)
Pays to have spouse control resources	0.0579*** (4.29)	0.254*** (4.81)	0.103* (1.97)	0.0394 (0.82)	-0.109** (-3.21)	0.0551*** (3.75)	0.120* (2.24)	0.123* (2.06)	0.0342 (0.64)	-0.107** (-2.87)
P-value Pays to control: None = Any	0.108	0.618	0.839	0.888	0.367	0.175	0.108	0.870	0.0555	0.586
P-value Pays to have spouse control: None = Any	0.224	0.728	0.393	0.765	0.0500	0.731	0.000864	0.908	0.684	0.323
R-squared	0.0573	0.0311	0.0169	0.0800	0.0273	0.0621	0.0367	0.0182	0.0819	0.0268
Number of Observations	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363	2,363

Note: The model includes responses from the willingness to pay for resource control task. Dependent variables are standardized indices of variables in each category. All regressions include the following household level control variables: food security measure, wealth measure, household income, and household savings. They also include the following individual level control variables: age group, schooling, individual income, and individual savings. Robust standard errors are in parentheses. *** Significant at the 1% level, ** 5% level, * 10% level.

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 $y_i + y_{-i} = \bar{y}$ denote the total income controlled by both spouses outside of the experiment. An alternative interpretation for y_{-i} and \bar{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):* $\{d_1, d_2\} = \{i, i\}$
 $d_1 : u_i(y_i + x) + \gamma_i u_{-i}(\bar{y} - y_i) \geq u_i(y_i) + \gamma_i u_{-i}(\bar{y} - y_i + x)$
 $d_2 : u_i(y_i + x) + \gamma_i u_{-i}(\bar{y} - y_i) \geq u_i(y_i) + \gamma_i u_{-i}(\bar{y} - y_i + 1.5x)$
- *Scenario 2 (Self, Spouse):* $\{d_1, d_2\} = \{i, -i\}$
 $d_1 : u_i(y_i + x) + \gamma_i u_{-i}(\bar{y} - y_i) \geq u_i(y_i) + \gamma_i u_{-i}(\bar{y} - y_i + x)$
 $d_2 : u_i(y_i + x) + \gamma_i u_{-i}(\bar{y} - y_i) \leq u_i(y_i) + \gamma_i u_{-i}(\bar{y} - y_i + 1.5x)$
- *Scenario 3 (Spouse, Self):* $\{d_1, d_2\} = \{-i, i\}$
 $d_1 : u_i(y_i + x) + \gamma_i u_{-i}(\bar{y} - y_i) \leq u_i(y_i) + \gamma_i u_{-i}(\bar{y} - y_i + x)$
 $d_2 : u_i(y_i + 1.5x) + \gamma_i u_{-i}(\bar{y} - y_i) \geq u_i(y_i) + \gamma_i u_{-i}(\bar{y} - y_i + x)$

¹Since 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.

²Almas 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).

³Note 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):* $\{d_1, d_2\} = \{-i, -i\}$
 $d_1 : u_i(y_i + x) + \gamma_i u_{-i}(\bar{y} - y_i) \leq u_i(y_i) + \gamma_i u_{-i}(\bar{y} - y_i + x)$
 $d_2 : u_i(y_i + 1.5x) + \gamma_i u_{-i}(\bar{y} - y_i) \leq u_i(y_i) + \gamma_i u_{-i}(\bar{y} - y_i + x)$

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.

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

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,

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

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.

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

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,

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

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	<i>Spouse, Spouse</i>		$z^* - x \geq 0.5x$	$-0.5x$
2	<i>Spouse, Self</i>		$0.5x \geq z^* - x \geq 0$	0
3	<i>Self, Spouse</i>	$0.5x \geq v^* - x \geq 0$		0
4	<i>Self, Self</i>	$v^* - x \geq 0.5x$		$0.5x$

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 \bar{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

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

The first order condition of this maximization problem is given by

$$u'_i(y_i + x_i) - \gamma_i u'_{-i}(\bar{y} - y_i + \bar{x} - x_i) = 0 \quad (3)$$

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

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

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

$$[\mu + (1 - \mu)\gamma_{-i}]u'_i(y_i + x_i) - [\mu\gamma_i + 1 - \mu]u'_{-i}(\bar{y} - y_i + \bar{x} - x_i) = 0 \quad (4)$$

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 where 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, self¹

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 and 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 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 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 $\{\text{spouse}\}$ 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 $\{\text{SPOUSE}\}$. << 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 $\{\text{SPOUSE}\}$. << 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 $\{\text{spouse}\}$ 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"

The visual aid is a 2x9 grid of options for a Dictator (left) and a Responder (right). The Dictator's options range from 14 GHC to 0 GHC, and the Responder's options range from 0 GHC to 14 GHC. The grid is split into Page 1 (top 6 rows) and Page 2 (bottom 3 rows).

Dictator (GHC)	Responder (GHC)
14	0
12	2
10	4
8	6
6	8
4	10
2	12
0	14

Page 1 (rows 1-6)
Page 2 (rows 7-9)

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

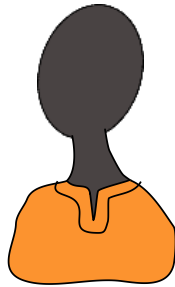


Image 1. Individual icon shown to wife, when eliciting private decision for self.

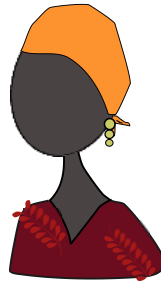


Image 1. Household icon shown to participants, when eliciting private and joint decisions for household

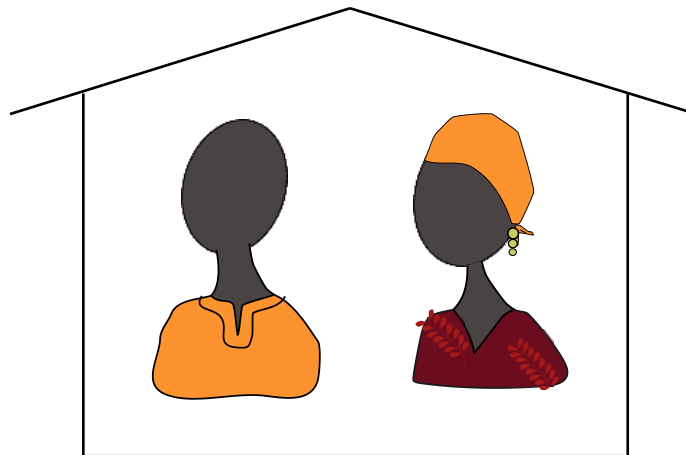


Image 2. Shown to participants when describing the choice set
 (Fold-out menu, Dimensions: 8 3/4 X 15-1/4“)

	0X	3X
		
0 GHC	0 GHC	0 GHC
	0 GHC	3 GHC
1 GHC		
	0 GHC	6 GHC
2 GHC		
	0 GHC	9 GHC
3 GHC		
	0 GHC	12 GHC
4 GHC		
	0 GHC	15 GHC
5 GHC		
	0 GHC	18 GHC
6 GHC		
	0 GHC	21 GHC
7 GHC		

Page 1

Page 2

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")

0 GHC	→	7 GHC	7 GHC
1 GHC	→	6 GHC	9 GHC
2 GHC	→	5 GHC	11 GHC
3 GHC	→	4 GHC	13 GHC
4 GHC	→	3 GHC	15 GHC
5 GHC	→	2 GHC	17 GHC
6 GHC	→	1 GHC	19 GHC
7 GHC	→	0 GHC	21 GHC

Pg. 1

Pg. 2

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 $\{spouse\}$ $\{will\ be\ asked\ \backslash\ has\ been\ asked\}$ to make a similar choice, and the card that he/she $\{draws\ \backslash\ drew\ will\ determine\ }$ 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 $\$ \{ \text{choice} \}$ for $\$ \{ \text{yourself} / \text{your spouse} \}$ instead of $\$ \{ \text{not choice} \}$ for $\$ \{ \text{your spouse} / \text{yourself} \}$. 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 $\$ \{ \text{spouse} \}$ << 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 $\$ \{ \text{spouse} \}$ 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 $\$ \{ \text{spouse} \}$ receive 10,000 UGX or receive 15,000 yourself?

<< Confirm >> Just to confirm, you chose $\$ \{ \text{choice} \}$ for $\$ \{ \text{yourself} / \text{your spouse} \}$ instead of $\$ \{ \text{not choice} \}$ for $\$ \{ \text{your spouse} / \text{yourself} \}$. 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 $\$ \{ \text{spouse} \}$ will be randomly selected to be paid. Both the decision made by you and the one made by your $\$ \{ \text{spouse} \}$ 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 $\$ \{ \text{spouse} \}$. 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 $\$ \{ \text{spouse} \}$. << 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 $\$ \{ \text{spouse} \}$ 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
<i>Panel A: Ghana</i>				
Coefficient 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
<i>Panel B: Uganda</i>				
Coefficient 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)
	<i>Dependent variable is</i>							
	Wife pays to control resources				Wife pays to have husband control resources			
<i>Panel A: Ghana</i>								
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
<i>Panel B: Uganda</i>								
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
<i>Panel A: Model 1</i>					
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
<i>Panel B: Model 2</i>					
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
<i>Panel C: Model 3</i>					
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
<i>Panel D: Model 4</i>					
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
<i>Panel A: Model 1</i>					
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
<i>Panel B: Model 2</i>					
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
<i>Panel C: Model 3</i>					
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
<i>Panel D: Model 4</i>					
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 efficient					
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.