The Impact of Information on Female Empowerment in Low-Income Households in Kenya: A Pilot Study

Tiril Johansen Gudevold and Ida Elisabeth H. Kjørholt

Supervisor: Ingvild Almås

Master Thesis in Economics

NORWEGIAN SCHOOL OF ECONOMICS

Abstract

This thesis studies how targeting cash transfers to women affects their empowerment under private and common information structures in low-income households in Kenya. It is based on a research project which consists of a lab experiment followed by qualitative interviews. Women's empowerment is measured through their willingness to pay for receiving a cash transfer. In the lab, they can either choose their husbands as the recipient of the transfer, or give up a portion of the amount in order to keep it themselves. In the treatment group, the husbands will be informed about the outcome of the experiment, while this information can be kept private in the control group. This experimental design enables us to elicit the effect different information structures might have on empowerment.

The results from the lab experiment do not show any systematic differences in behavior under the two information structures. However, the qualitative interviews reveal that information might still have a certain effect on women's empowerment. We also find evidence that women in low-income households in Kenya on average have a low level of empowerment.

Women who initially are little empowered in the household seem to keep the cash transfer themselves. For these women, a cash transfer might affect their empowerment more when the husband is not informed about it. Women with initially high empowerment tend to give the cash transfer to their husbands, and different information structures do not appear to influence their empowerment noticeably. We therefore conclude that despite the lack of statistical significance, different information structures still seem to matter for women with relatively low empowerment.

Acknowledgements

Contents

1 Introduction

1.1 Gender Inequality in Low-Income Households

In many parts of the world, women still have limited influence in household decision-making, and the allocation of resources among household members usually favors men (Kishor and Subaiya, 2008). For instance, 1/3 of married women in Malawi and 1/5 of married women in India are not involved in this decision-making process at all. Even though a large share of women have entered the labor force in the past quarter century, this has not resulted in equal earnings and employment opportunities for both genders (The World Bank, 2012). The above-mentioned inequalities have several plausible explanations, such as social status and tradition. Nonetheless, a study made by the Demographic and Health Surveys Program indicates that income, assets, age and education are the main factors determining the individual household members' decision and bargaining power (Kishor and Subaiya, 2008).

By increasing the resources controlled by women in households, several beneficial outcomes are observed. Thomas (1990) finds it more likely that unearned income is spent on the family's health if it is targeted directly to the woman of the household rather than her spouse. Another study of a South African social pension program suggests that money targeted to women has a larger impact on the anthropometric[1] status of girls than of boys (Duflo, 2003). The UN made it one of their millennium development goals to promote gender equality by 2015. In doing so, they also address the importance of empowering women by targeting money directly to them (UN, 2015).

Targeting money to a specific spouse in order to achieve a certain result suggests that income is not pooled and distributed in a way that both spouses benefit equally from. Almås et al. (2015) support this view, and show that women are willing to pay in order to receive a cash transfer themselves rather than their spouse receiving it. In this study, women participate in an experiment where they choose between receiving an amount X themselves or giving an amount Y to their spouse. If sequentially repeated, this method elicits the values that make the women indifferent between receiving the money themselves and giving it to their spouses. Almås et al. (2015) use these values as a way to measure women's empowerment. The results support the believed positive

---

[1]The term anthropometric refers to a person's body measures relative to weight.

6

empowerment effect of targeting money directly to women.

One aspect that Almås et al. (2015) do not take into account is the potential effect different information structures in the household might have on empowerment. Is there a possibility that women behave differently if their husbands are informed about the cash transfer, and if so, how will this affect their empowerment? To our knowledge, there is little further research on the exact mechanisms that cash transfers targeted to women have on their empowerment.

1.2   The Female Empowerment Pilot

The Female Empowerment Pilot aims to study how targeting cash transfers to women affects their empowerment under private and common information structures in the household. The study is carried out through a lab experiment followed by qualitative interviews, some in groups and some individually. The pilot is part of a larger research project led by Ingvild Almås (NHH), Alex Armand (University of Navarra) and Orazio Attanasio (University College London). We developed the experimental design in collaboration with these researchers. In addition, the two of us have initiated and formed the qualitative interviews as well as administrated and conducted the project.

In the experiment, the women make a sequence of choices regarding a cash transfer. As in Almås et al. (2015), they can either choose to receive the money themselves or choose their husband as the recipient. For the sake of simplicity, these two choices are referred to as *keeping* and *giving* the cash transfer throughout this thesis. The novelty of the Female Empowerment Pilot design lies in the controlled and randomized information structure. Women in the treatment group are told that their husbands will be informed about the outcome of the experiment. The remaining women in the control group can keep this information private, as their husbands will not be informed about either their participation in the experiment nor its outcome. This makes it possible to elicit the effect different information structures might have on willingness to pay for receiving the cash transfer.

A woman's willingness to pay reflects her level of empowerment. A high willingness to pay indicates that she has little bargaining power in the household. If her influence over the allocation of resources is limited, it reduces her incentive to maximize total

household income. If this is the case, she might prefer to give up a portion of the cash transfer in order to receive it herself. Thus, a high willingness to pay can be interpreted as low empowerment. Low willingness to pay, on the other hand, indicates that the spouses have more equal bargaining power when allocating resources. In this situation, the woman would gain from maximizing total household income, regardless of the recipient of the cash transfer. Thus, her incentive to give up a portion of the transfer in order to receive it herself is reduced. A low willingness to pay therefore implies high empowerment.

The manner in which different information structures in the household affect women's empowerment provides valuable policy implications. If women in fact become more empowered when their husbands are not informed about the cash transfer, this should be taken into consideration when shaping social cash transfer programs.

The qualitative interviews following the lab experiment will attempt to collect as much information as possible about the women's understanding of the experiment, the reasoning behind their choices, and their general empowerment and role in the household. The findings from these interviews will compliment the results from the lab experiment.

1.3 Research Question

The Female Empowerment Pilot is conducted on a sample of 64 women in low-income households in Nairobi, Kenya. It aims to answer the following research question:

> *When introducing a cash transfer, do women show differences in empowerment depending on common or private information in the household? How are they empowered by the transfer under these information structures?*

The results will provide valuable insights into women's influence over financial decisions in the household, and how different information structures affect their empowerment. Further, this can implicate resource allocation in the household when the woman is subject to a cash transfer, and whether this allocation is affected by her husband having information about the transfer.

1.4 Outline

The remainder of this thesis is organized in the following way: Chapter 2 presents relevant theory on household models, empirical evidence and a theoretical framework of the experimental design. Chapter 3 describes the methodology used in the project, as well as its design. Chapter 4 presents the predictions of the project, and Chapter 5 describes its implementation. In Chapter 6, the findings are presented and analyzed. Chapter 7 concludes.

2 Theory

This chapter provides a literature overview of household models followed by empirical evidence. It further constructs a theoretical framework on which the Female Empowerment Pilot is built.

2.1 Literature and Empirical Evidence

Literature on decision-making and resource allocation within the household is generally reflected through unitary and non-unitary models. This section presents the most influential models and provides empirical evidence.

2.1.1 The Unitary Model

Traditionally, the household has been viewed as a collection of individuals with a common understanding of how to combine time and goods optimally. This view is known as the unitary model, based on the fundamental work of Samuelson (1956). The model assumes that the household maximizes a single utility function with respect to a common budget constraint without distinguishing between decision-makers. Even though acknowledging that individuals might have different preferences, the unitary model does not take these into account. The household as a whole will therefore, according to this model, act as a single individual. The model also considers the household members' income to be pooled (Chiappori et al., 1993). In economics, this term can be used in different ways. This literature overview uses the definition from Bonke and Browning (2009), where income pooling refers to household decisions being made independent of who receives the income. This means that household behavior will not change if income is redistributed from one member to another. Finally, the unitary model assumes the market demand to satisfy the Slutsky conditions, accounting for adding-up, homogeneity, symmetry and negativity of the Slutsky matrix (Browning et al., 2014).

The work of Gary Becker provides a similar conclusion to that of Samuelson (Chiappori and Donni, 2009). In the Rotten Kid Theorem, Becker (1974) introduces a benevolent dictator who acts altruistic towards the rest of the household members. This assumption of *caring* suggests that the head of the household takes the individual members' preferences into account when distributing resources (Becker, 1974). Regardless of the approach, the unitary model is widely used because of its simplicity. At the same time,

this is also the reason why it is criticized. Particularly income pooling and aggregated individual preferences are considered unrealistic assumptions (Chiappori et al., 1993).

2.1.2   Non-Unitary Models

The alternatives to the unitary model take the household members' individual preferences and their possible egoistic behavior into account. This prevents the household from acting as an individual. These assumptions allow for various outcomes, with differing efficiency levels. The non-unitary approaches can be separated into two main branches: cooperative and non-cooperative models (Rode, 2011).

Cooperative Models

The cooperative models assume household members to have individual preferences. However, as the members interact on a regular basis, presumably well aware of each other's preferences, they are expected to find ways to reach efficient outcomes together. The models do not prevent resources to be unequally allocated among the household members and recognize that allocation will depend on the respective members' influence in the decision-making process. Nevertheless, as a result of full information, they expect all resources to be allocated. Thus, cooperative models are based on the assumption of a Pareto efficient decision-making process in the sense that when resources have been allocated, no alternative decision would have been preferred by *all* the household members (Browning et al., 2014).

A dominant cooperative approach is the collective household model. This model is based on two fundamental assumptions. First, it assumes a stable decision-making process. This means that the individuals' preferences cannot rapidly change from one moment to the other. Secondly, this stability leads to a Pareto efficient outcome. For this to be achievable, the household members must know the preferences and actions of each other. Additionally, they need to act cooperatively in order to take advantage of mutually beneficial opportunities. This can be done through a binding agreement, which refers to agreements built on mutual care and trust, social norms, or laws (Browning et al., 2014). The outcome of the decision process depends on a predetermined sharing rule. This sharing rule reflects the respective household members' power in the bargaining phase and the result of the consumption phase. The variables determining this rule are not specified and may vary among households (Chiappori, 1992).

Non-Cooperative Models

The non-cooperative models differ from cooperative models by the absence of pooled budget constraints. Thus they allow for inefficient outcomes. There are no binding agreements between the household members, and each member maximizes his or her individual utility based on an individual budget constraint. This can result in multiple equilibriums, some being Pareto efficient and others not (Rode, 2011). It is not given that each member will have full information and can observe each other's preferences and actions. The non-cooperative models will generally not satisfy neither income pooling nor the Slutsky conditions (Browning et al., 2014).

2.1.3 Empirical Evidence

The empirical evidence for the predictions offered by the household models is typically divided into two categories. The first studies whether observed behavior can be explained by a unitary model. The second studies whether observed behavior can be explained by a cooperative or non-cooperative model. While the unitary model has been widely and easily rejected by disproving income pooling, fewer studies have been carried out to test for Pareto efficiency (Rode, 2011).

If the household members' income is pooled, the income should have the same impact on demand regardless of who the recipient is (Thomas, 1990). However, several studies show that men and women spend their income differently, and thereby disproving this assumption. In a British child benefit scheme, Lundberg et al. (1997) find that children benefit if their mothers control a larger share of the household resources. When resources are transferred to the women, they observe an increase in spending on women's and children's clothing relative to men's clothing. Based on these findings, they conclude that the income received by each spouse has a significant effect on family expenditure patterns (Lundberg et al., 1997). Thomas (1990) detects a greater health effect on families where unearned money is targeted to the woman rather than to the man. Based on survey data on family health and nutrition in Brazil, the study finds the child survival probabilities to be almost twenty times larger when income is targeted to women (Thomas, 1990). These findings reject the hypothesis of income pooling, and hence the unitary model.

Other studies also support the rejection of the unitary model. In the previously men-

tioned study by Almås et al. (2015), an experiment was conducted on women eligible for a social cash transfer program in low-income households in urban Macedonia. Through the program, households receive financial support if their children are enrolled in secondary school. The recipients of the cash transfers are randomized at a municipality level to either the woman or the household head, generally being the man. In the lab experiment, female empowerment is measured through women's willingness to pay for receiving the cash transfer themselves rather than having their husbands receiving it, as explained in the introduction. The findings indicate the willingness to pay to be greater than 0, which supports the rejection of the unitary model (Almås et al., 2015).

Targeting cash transfers has also been studied under different information structures. Through an experimental study in the Philippines, Ashraf (2009) examines the effect of asymmetric information in financial decisions. In the experiment, the participants are asked to deposit a sum of money directly to either their own account or their spouses' account, or to commit to consumption. The participants are randomly selected to make the financial choices in three different settings. The first setting is private, which means that the spouses cannot communicate with each other and their choices are kept secret. The second setting is public. In this setting, the spouses learn about each other's decisions but are still not able to communicate. The final setting allows for negotiation, and the spouses can communicate before making the financial decision. Here, information about their decisions and payoffs is shared with their spouse. When decisions and payoffs are kept private, Ashraf finds men to be more likely to deposit the money into their own accounts. When forced to communicate, men are more likely to deposit the money into their wife's account. However, this is observed in marriages where the women control savings decisions. This control structure is the norm in the Philippines, and most men are expected to turn their earnings over to the women for budgeting. Thus, Ashraf finds that these effects are mainly explained by the control structure, which varies among countries, and not necessarily by gender. The results still provide valuable indications that spouses respond strategically to changes in information and communication, and their household control structure will affect how they behave (Ashraf, 2009).

The above-mentioned empirical evidence rejects the unitary model but does not go beyond this rejection by testing for Pareto efficiency in allocation of resources. One study that addresses this implication of efficiency in collective models is done by At-

tanasio and Lechene (2014). The authors consider the conditional cash transfer program PROGRESA, a welfare program in rural Mexico, to estimate and test the restrictions of the collective model. The results indicate that the model cannot be rejected, which points to it being appropriate in studies of household behavior and impact assessment of different policies (Attanasio and Lechene, 2014).

Iversen et al. (2011), on the other hand, cast doubt on the efficiency of many household models. In a study from 240 couples in East Uganda, they find that gains from cooperation are not maximized. In addition, they observe that the gains are larger when women are in control of allocating the household budget. These findings contradict both the unitary and cooperative household models (Iversen et al., 2011).

2.2   Theoretical Framework

This section presents a theoretical framework on which the Female Empowerment Pilot is based. First, a simple non-unitary household model consisting of two decision-makers is introduced. Next, it predicts how a cash transfer affects the share of income contribution, total income, the sharing rule and individual utility, depending on who the recipient of the transfer is. Furthermore, these predictions are given for two different cases. In the first case, the cash transfer is of common information within the household, while it can be kept private in the second case.

2.2.1   A Simple Non-Unitary Model

We assume a household with two potential income earners who are also potential decision-makers, a woman A and a man B.[2] The total income of the household is given by $x=x_A+x_B$, where x_A is the woman's income and x_B is the man's income. We further assume that all of the household's income is spent each month, so that total income equals total expenditure. The household budget constraint for income allocation is then given by:

$$x = p_A q_A + p_B q_B, \tag{1}$$

where p_A and p_B are the prices for private goods consumed by household member A and B respectively, and q_A and q_B are the vectors of private goods consumed by the

---

[2]This traditional gender arrangement is merely an example. The income earners might just as well be two men or two women.

members (Browning, Chiappori and Weiss, 2014).[3]

As explained in the literature, the unitary model maximizes a single household utility function, which can be given by $U(q_A, q_B)$. However, from empirical data we know that the unitary model has been widely rejected. In our model, we therefore want to allow the woman and man to have their own individual preferences over the allocation of household income, so that they maximize the two utility functions $u^A(q_A, q_B)$ and $u^B(q_A, q_B)$ respectively. We also want to exclude the unreasonable expectation of income pooling and open up for the more realistic possibility that there exists a sharing rule, ρ, which indicates the share of the total income that the woman actually has the power to control. Logically, we assume that the size of ρ depends on how large the woman's income contribution is relative to the man's. We therefore define a distribution factor f, which is the woman's share of total household income. Denoting initial variables with subscript 0, we can write:

$$f_0 = \frac{x_0^A}{x_0^A + x_0^B}. \tag{2}$$

In this simple model, we assume both individual preferences and prices p_A and p_B to be fixed. The demand for private goods q_A and q_B will therefore solely depend on the sharing rule ρ, which again depends on the distribution factor f. The solution to the two members' problems can thus be written as the demand functions $q_A = q_A(\rho_0(f_0), x_0)$ and $q_B = q_B(\rho_0(f_0), x_0)$. We then derive the woman's indirect utility function by plugging these demand functions into her utility function. She maximizes the indirect utility function:

$$v^A = u^A\Big[q_A\big(\rho_0(f_0), x_0\big), q_B\big(\rho_0(f_0), x_0\big)\Big], \tag{3}$$

which can be written:

$$v^A = v\big(\rho_0(f_0), x_0\big). \tag{4}$$

---

[3]Public goods are often added as an extension to the simple household models (Browning et.al., 2014). For the sake of simplicity, we exclude consumption of public goods from the model when deriving the framework.

2.2.2 Introducing a Cash Transfer

The woman now makes a decision regarding a cash transfer, as introduced by Almås et al. (2015). She can either choose that her husband receives an amount E, or that she receives the same amount but at a cost w. Thus, if she keeps the transfer herself, she receives $(1-w)E$.

We define f' to be the revised distribution factor f that we observe if the woman receives the cash transfer of $(1-w)E$ herself:

$$f' = \frac{x_0^A + (1-w)E}{x_0^A + x_0^B + (1-w)E}. \tag{5}$$

Similarly, we define f'' to be the woman's share of total household income when the husband receives the cash transfer E:

$$f'' = \frac{x_0^A}{x_0^A + x_0^B + E}. \tag{6}$$

The cash transfer also affects the household's total income. We define x' as the total income when the woman receives $(1-w)E$, and x'' as the total income when the husband receives E:

$$x' = x_0^A + x_0^B + (1-w)E \tag{7}$$

$$x'' = x_0^A + x_0^B + E. \tag{8}$$

Cash Transfer in a Cooperative Model

In the collective model, which is a cooperative household model, the man and woman have full information about the size and sources of the household income. We will refer to this as *common* information in the household. The two members also have individual preferences, and although income might not be equally allocated between them, the sharing rule ρ ensures by assumption that they will reach a Pareto efficient outcome together.

Within our simple framework, the collective model predicts that after deciding the recipient of the cash transfer, the woman maximizes the following indirect utility function:

$$v_{ci}^A = v(\rho(f)x). \tag{9}$$

In this function, x depends on the recipient of the cash transfer. If the woman receives the transfer, its value is x'. If the husband receives it, its value is x''. ρ is the revised share of the total income that the woman decides over as a result of the new income distribution, which either takes on the value f' or f''. The new size of ρ thus depends on the woman's decision. If she keeps the cash transfer herself, her decision power is assumed to increase to ρ'. If she decides that the man should get the transfer, it decreases to ρ''. In this way we can write $\rho'' \leq \rho_0 \leq \rho'$.

Cash Transfer in a Non-Cooperative Model
If household behavior is modeled from a non-cooperative point of departure, then no binding agreements between the household members are assumed (Browning et al., 2014). The model allows for asymmetric information, or *private* information, in the household. Because of this, the optimal income allocation is not necessarily Pareto efficient.

Within these frames, the woman can keep money to herself without informing the husband about it. In the extreme case, we assume that the woman hides all of the money and maximizes the indirect utility function:

$$v_{pi}^A = v(\rho_0(f_0)x_0 + (1-w)E), \tag{10}$$

where the initial income x_0 remains the same, as well as her bargaining power over the initial income, ρ_o. In addition, the woman receives an amount $(1-w)E$ that she completely decides over.

3 Methodology

This chapter provides an overview of the methods used in the Female Empowerment Pilot. It addresses the quantitative lab experiment and qualitative interviews, and then describes the research design.

3.1 Experimental Method

This section aims to describe the experimental method applied in the first part of the pilot, namely the lab experiment. It first briefly presents the main benefits of the method. Then it introduces treatment analysis and addresses the problem of external validity.

3.1.1 Control and Randomization in the Lab

Lab experiments have gained extensive influence in economics in recent years, and they are currently a dominant approach for research in the field. One of the main reasons for this impact is that they provide control. By regulating environmental factors in the lab, researchers are able to reduce other underlying motives that the participants may have. As a result, they can establish potential causal relationships. The second beneficial feature of lab experiments is that they allow for randomization. This ensures that the observed relationships are indeed causal, and not just due to correlation (Cappelen and Tungodden, 2012).

Lab experiments can have various designs. Among these, a treatment analysis is by many considered to be the gold standard of experimental methods in terms of obtaining valid findings about causal relationships (Dragset and Ellingsen, 2009). Central for the method is randomization of participants into a control group and a treatment group.[4] If the number of participants in each group is sufficiently large, the randomization ensures that the two groups' characteristics are as similar as possible on both observable and unobservable levels. Both groups are then brought into the controlled environment of the lab. The treatment group is subject to an intervention, while the control group receives none. If we find that the intervention has a significant effect on the treatment group compared to the control group, the probability is high that the

---

[4]There can be several treatment groups, but for the sake of simplicity we choose to take only one into account in this explanation.

intervention was successful, and that an actual causal relationship has been revealed (Dragset and Ellingsen, 2009).

Angrist and Pischke (2008) offer a framework which illustrates the mechanisms and benefits of treatment analysis. They present i as an individual in the population of study. This individual is randomly assigned to either a treatment group, $D_i = 1$, or a control group, $D_i = 0$. The outcome from being in the treatment group is Y_{1i}, and the outcome from being in the control group is Y_{0i}. The effect of the treatment can thus be found by calculating $Y_{1i} - Y_{0i}$. However, as i is only assigned to one of the groups, either treatment or control, we are not able to observe both outcomes for each individual. What we need to do is to compare the observed differences in average outcomes for both groups, given by the equation:

$$E[Y_{1i}|D_i = 1] - E[Y_{0i}|D_i = 0], \tag{11}$$

which can be rewritten as:

$$[E(Y_{1i}|D_i = 1) - E(Y_{0i}|D_i = 1)] + [E(Y_{0i}|D_i = 1) - E(Y_{0i}|D_i = 0)]. \tag{12}$$

The expression in brackets to the left gives us the average causal effect of the treatment for the individuals in the treatment group. Hence it shows the average difference between the individuals who have been treated, $E(Y_{1i}|D_i = 1)$, and what would have happened if they had not been treated, $E(Y_{0i}|D_i = 1)$. However, it would not be possible to determine the exact reason for the observed difference. It can be caused by both the treatment effect and *selection bias*, which is the expression in the brackets to the right. Selection bias tells us the difference in average Y_{0i} between those who were treated and those who were not. If this difference is substantial, the conclusion of the intervention might not be accurate. Most empirical economic research therefore aims at overcoming selection bias in order to isolate the actual treatment effect (Angrist and Pischke, 2008).

The problem with selection bias can be solved by randomly assigning individuals to the treatment or control group, so that D_i is independent of potential outcomes, and $E(Y_{0i}|D_i = 1) = E(Y_{0i}|D_i = 0)$. The randomization therefore ensures that the two groups become as equal as possible in both observable and unobservable properties.

19

Knowing this, the expression can be rewritten as:

$$[E(Y_{1i}|D_i = 1) - E(Y_{0i}|D_i = 1)] = [E(Y_{1i}|D_i = 1) - E(Y_{0i}|D_i = 0)] \tag{13}$$

$$E(Y_{1i} - Y_{0i}|D_i = 1), \tag{14}$$

which eliminates the selection bias problem and hence allows us to conclude that the difference in outcome Y_{1i} and Y_{0i} is solely due to the treatment.

3.1.2 External Validity

With the increased importance of economic lab experiments, this experimental method has been subject to criticism. A large share of this criticism concerns the phenomenon of *external validity*, which is a research result's ability to be generalized to other settings (Cappelen and Tungodden, 2012). In contrast to other sciences, economic lab experiments have humans as their object of study. Human behavior may be affected by several factors that differ systematically between the controlled environment of the lab and the real conditions outside of the lab. A common criticism of the method is therefore that the results obtained in the lab cannot necessarily be adapted to the real world (Levitt and List, 2007).

One reason that external validity might not fully apply for the experimental method is the so-called *Hawthorne effect*. This is the change in behavior that occurs when experiment participants know that they are being observed, and attempt to behave in the way that they think is expected of them. A second concern with the method is that participants in economic experiments often are subject to relatively weak monetary incentives, and that the situation simulated in the lab therefore might seem unrealistic. Finally, if a sample drawn from a population does not hold the same characteristics of that population, it is not suitable to represent it. In such a situation, the result of an experiment might not apply for the population as a whole, and will thus lack validity. The frequent use of student samples illustrates this problem. Students are one of the easiest social groups to recruit for economic experiments, and they constitute the majority of the samples (Cappelen and Tungodden, 2012). Students have different characteristics from many other groups in the society, and one can thus question if results drawn from their sample is applicable to the overall population (Falk and Heckman, 2009).

The challenges discussed above are not addressed or studied specifically in the Female Empowerment Pilot, but thorough measures are taken to avoid problems related to external validity. The economic incentives will for instance consist of a sufficient amount of real money so that the participants know that their choices will have real consequences. A brief discussion of the project's external validity is given in Section 6.4.1.

3.2 Qualitative Interviews

The following section provides a brief description of the qualitative interview as a research technique. It also discusses the two interview forms used in the Female Empowerment Pilot closely, namely individual and group interviews.

3.2.1 The Qualitative Approach

The purpose of qualitative interviews is to seek insight and understanding of a research problem. The method is exploratory in the sense that it addresses problems not clearly defined without aiming to provide conclusive evidence to a research question. The aim might be to develop hypotheses for later quantitative studies, or to get a deeper understanding of experimental findings (Flick, 2014). This research approach is therefore well suited for new topics where little research has been done (Saunders et al., 2012).

Interviews can range from highly structured conversations with detailed questionnaires, to less structured conversations with fewer guidelines (Yin, 2011). If an interview is highly structured, it usually entails a carefully scripted interaction between the interviewer and the participant. A scripted interaction means that the interviewer follows a complete questionnaire, which lists all the questions in a particular order. Additionally, the interviewer will try to behave in the same manner in every interview to assure that each participant is treated similarly. Alternatively, the interview can be less structured. These interviews are not fully scripted, giving the interviewer flexibility in the interview setting. He or she might still have a questionnaire, but is not obliged to follow it strictly. The questions are meant as guidelines and the interviewer does not need to adopt a uniform behavior for every interview (Yin, 2011).

Interviews can be done individually or in groups. The advantages and challenges vary depending on the type of interview and these are addressed in the following.

3.2.2 Individual Interviews

In individual interviews, the interviewer follows a more or less scripted questionnaire, depending on the preferred structure of the conversation. The goal is to get the participant to answer questions as freely as possible (Flick, 2014). There are several advantages of interviewing one participant at the time. First of all, it can be essential in order to make the participant feel comfortable and willing to share his or her views. Secondly, these interviews allow for in-depth conversations with immediate follow-up questions and clarifications (Marshall and Rossman, 2011).

Individual interviews also have limitations. These encounters are intimate and will not provide valuable information unless the participant feels comfortable in the situation and answers questions freely (Marshall and Rossman, 2011). Problems may also arise if questions come across as provoking to the participant or if they are being asked at an inappropriate moment (Flick, 2014).

3.2.3 Group Interviews

A group interview, usually referred to as a *focus group*, is a gathering of individuals who share common experiences or common views (Yin, 2011). The interview is led by a moderator, who strives to create a non-threatening environment and achieve interaction between the participants. These interviews are seen as a highly efficient method to collect qualitative data as shared views and mutual opinions can be assessed quickly within the groups. In addition, the method usually provides a quality control through participants' reactions to each other's statements. As a consequence, extreme or false views are usually weeded out (Flick, 2014).

On the downside, group interviews are demanding to conduct. To interview several people at the same time is a challenging task. The interviewer must strive to induce all participants to share their views, and also make sure that none of them dominate the conversation (Yin, 2011). To properly manage this, and at the same time be able to take notes from the session, it is recommended to conduct the interviews in pairs. Finally, group interviews allow for fewer questions as it is more time consuming to

interview a larger number of participants simultaneously (Flick, 2014).

3.3   Research Design

This section introduces the project plan of the Female Empowerment Pilot. It further presents the designs of the lab experiment and the qualitative interviews respectively. It also describes the project's subject pool.

3.3.1   Project Plan

The pilot was designed to study whether common or private information in the household affects female empowerment, and consisted of a lab experiment followed by qualitative interviews. It was implemented during the course of two weeks in February 2016 at the Busara Center for Behavioral Economics in Nairobi, Kenya. A pre-analysis plan for the project was developed prior to the implementation and can be found in Appendix D.

The pilot aimed to recruit approximately 60 married women of all age groups to participate in the research study. All of them took part in the lab experiment. Then, 20 of them were interviewed in groups the same day, and 30 individually in their houses approximately a week later. As we found 50 interview objects to be sufficient for collecting qualitative data for the pilot, the remaining 10 participants were not interviewed.

In the development of the design, some of the information we made use of comes from conversations with employees at Busara. The research center has long experience with field studies in and around Nairobi, and has extensive knowledge of the socioeconomic conditions in the area. We therefore consider them a well-suited source of information, and we find it appropriate to refer to them in some parts of this section.

3.3.2   Lab Experiment

The lab experiment is based on the design of Almås et al. (2015). In the experiment, the participating women choose between alternative A and alternative B in a sequence of incentivized choice situations. Choosing alternative A means keeping a certain amount X themselves and choosing alternative B means that another amount Y will be given to their husbands. X varies across rounds, while Y remains constant. If the participants choose alternative A in one round, X decreases in the next round. If the participant

instead chooses alternative B in one round, X increases in the next round. The objective of this design is to as closely as possible identify the women's willingness to pay to receive money to themselves instead of their husbands receiving it. When all the choices are made, one of the decisions is randomly selected to determine actual payment.

Determination of Alternatives

At the experiment's point of departure, alternative A is always 700 KES[5] (amount X), and alternative B is 750 KES (amount Y). The fixed amount of 750 KES is based on the average income of a day's work in Kibera, which according to Busara is around 600-800 KES. If the participant chooses money to herself in the first round, X is reduced to 25 percent of its initial size. If the participant continues to choose money to herself in the second round, X is again reduced to 25 percent of its size in the second round. This pattern continues for as long as the participant chooses money to herself, but stops if X in the next round is reduced with less than 8 KES. For an illustration, see 'Always to herself' in Figure 1.

If the participant instead chooses to switch and give money to her husband from round three and onwards, X increases to the average of the amounts offered in the two previous rounds. If the participant switches back to taking money for herself, the amount X offered in the next round will again be the average of the two amounts offered in the two previous rounds. If the participant instead chooses to give money to her husband, X is the average of the amount offered in the previous round and the round in which the participant last chose money for herself. The experiment stops when the X that should have been offered in the next round deviates with less than 8 KES from the previous round's X. Examples of sequences where the woman switches are given under 'Switcher 1' and 'Switcher 2' in Figure 1.

If the participant chooses money to her husband in the first round, X increases by 50 KES in the next round. If the participant continues to give to her husband, X is once again increased by 50 KES. If she again chooses to give to the husband in the third round, the experiment stops. For an illustration, see 'Always to husband' in Figure 1. Screenshots from the choice situations are given in Figure 5 and 6 in Appendix A.

---

[5]KES refers to Kenyan shillings.

Always to husband | **Switcher 1** | **Switcher 2** | **Always to herself**

Always to husband		Switcher 1		Switcher 2		Always to herself	
Participant	Husband	Participant	Husband	Participant	Husband	Participant	Husband
700	[750]	[700]	750	[700]	750	[700]	750
750	[750]	175	[750]	[175]	750	[175]	750
800	[750]	438	[750]	44	[750]	[44]	750
Stop		[569]	750	[110]	750	[11]	750
		504	[750]	77	[750]	Stop	
		[536]	750	94	[750]		
		520	750	102	[750]		
		[512]	750	Stop			
		Stop					

Figure 1: Willingness to pay - Example of sequences.

Information Treatment

The novelty of our experimental design lies in the information treatment. The participants are subject to a treatment analysis and randomly assigned to either a treatment or control group with *common* or *private* information respectively, as described in Section 2.2.2.

In the control group, the husband is not informed about his wife's participation in the experiment or the resulting outcome. The only situation in which he is informed is if the woman selects him to be the receiver of the cash transfer, or if she decides to tell him about it herself. The woman is informed about this in the beginning of the experiment, and she thus has the opportunity to keep information *private*.

In the treatment group, the husband is informed about the wife's participation and the outcome of the experiment, and we thus consider them to have *common* information about this. The woman is informed about this in the beginning of the experiment. Screenshots from the experiment can be seen in Figures 7, 8 and 9 in Appendix A.

In the case where the husband is to be informed about the woman's participation in the experiment, either because she belongs to the treatment group or has selected him to be the receiver of the cash transfer, we send him this information in a text

message. It informs him that the payment is randomly selected. The purpose of this is to make sure he understands that the payment does not necessarily represent all the choices that his wife made in the lab. Knowing this, there is no point of comparing her payment with that of other women who also participated in the experiment. By mentioning random selection in the message, the woman is therefore less likely to be subject to potential repercussions.

3.3.3 Qualitative Interviews

The lab experiment is followed by qualitative interviews with a majority of the participants. The aim of the interviews is to investigate possible reasons for the decisions that were made in the lab, and to study to what extent the participants understood the nature of the experiment. In a broader sense, we also want to gain general knowledge of the women's relative power in the household, both when making financial decisions and in other situations. To be able to reveal these components, the interview questions are divided into three subgroups: reasoning behind choices, household economy, and general empowerment indicators. As the purpose of the interviews is to explore, the questions are meant as guidelines, and some deviation from the exact questions is expected. All interview questions can be found in Appendix B.

The Interview Form
The reason for conducting both individual and group interviews lies in the advantages of each interview form. While the individual interviews allow for in-depth conversations, the group interviews will quickly collect a great amount of data. Additionally, many of the questions touch upon topics that might be uncomfortable for the participants, such as domestic violence and bargaining power in financial decisions. According to theory, participants might talk more freely when the interviews are done individually. On the other hand, one brave participant of a group interview might start up an enlightened conversation, which could make the other participants feel comfortable in sharing their own views as well. As a result, both interview forms might be useful in order to avoid missing out on valuable information.

3.3.4 The Subject Pool

The research sample is randomly drawn from the Kibera subject pool of Busara's database. Kibera is an informal settlement located in southern Nairobi and is the

largest urban slum in East Africa. According to Busara's own database, the pool consists of approximately 8,700 subjects, where around 62 percent are women. The subjects are spread across 11 different villages in Kibera that share similar socioeconomic characteristics. These are Kianda, Soweto, Gatwekera, Kisumu Ndogo, Lindi, Laini Saba, Siranga, Undugu, Makina, Mashimoni and Raila.

The Kenya Population and Housing Census produced by the Kenya National Bureau of Statistics (2009) has measured the population of Kibera to be around 355,000 spread out in almost 110,000 households. The population consists of a mix of different ethnic tribes, where Luhya and Luo people constitute the majority. Over 93 percent are either Protestant or Catholic Christians, while 5 percent are Muslims (APHRC, 2012).

Many of the inhabitants of Kibera live in extreme poverty, have poor housing conditions and lack access to basic services such as clean water and electricity. The African Population and Health Research Center (APHRC) has produced a report which provides statistics related to several different factors in the informal settlement, including living conditions. Of the 706 men and women who are surveyed, 27.6 percent report that lack of proper housing is their main concern, and almost 19 percent that they are in need of clean water. 23.5 percent say that they lack either proper toilet facilities or garbage disposal systems (APHRC, 2012).

Among Kiberian women from 15-49 years old, 61 percent report that they are currently married, and around 9 percent have been married before. The median age for first time marriage is 21 years old. Over 50 percent of the women either have no education or have only completed primary school. Approximately 44 percent of the women have completed secondary school. Over half of the women are unemployed (APHRC, 2012). According to Busara, the source of income of those who report to be working is primarily from casual labor and small scale retail shops.

4   Predictions and Hypotheses

This chapter presents predictions and hypotheses of the Female Empowerment Pilot. It first defines a woman's willingness to pay for receiving a cash transfer, and then predicts how common and private information affects her initial maximization problem. It also identifies her willingness to pay according to the two household models, and attempts to conclude *if* and *how* it will differ in the two cases. Finally, hypotheses and subsidiary research questions are developed based on these predictions.

4.1   Defining Willingness to Pay

In the lab experiment, the woman in the household is asked to make several sequential decisions regarding a cash transfer. As described in Section 2.2.2 in the theoretical framework, she chooses between her husband receiving an amount E, or herself receiving the same amount but at a cost w, so that she ends up getting $(1 - w)E$. If this cost is allowed to vary across a sufficient sequence of choices, it will eventually elicit her willingness to pay for receiving the transfer herself instead of her husband receiving it. We thus define w as the woman's willingness to pay. At this point she is indifferent between herself or her husband receiving the money, and we can therefore write:

$$v^A(x', \rho(f')) = v^A(x'', \rho(f'')). \tag{15}$$

The left-hand side corresponds to the indirect utility of the woman when she receives an amount $(1 - w)E$ and her contribution to the total household income increases to f'. The right-hand side is the indirect utility of the woman when her husband receives an amount E and her contribution decreases to f''. If she gives the cash transfer to her husband, her utility will be the same independent of treatment. The right-hand side is hence the same under both information structures. For Equation 15 to hold, the same must therefore apply if she keeps the transfer herself. This means that the left-hand side also must be equal in the two cases.

4.2   Predictions for the Treatment Group

If there is common information in the household, as imposed on the treatment group, the husband is informed that either he or his wife receives a cash transfer as an outcome

of the lab experiment. He is also informed about its size, independent of who the recipient of the transfer is. Under the assumptions that the two members interact with each other and also have knowledge about each other's preferences, we can thus expect the woman to behave according to the predictions of the collective household model. After deciding the recipient of the cash transfer, the woman thus maximizes:

$$v_{ci}^A = v(\rho(f)x), \tag{16}$$

which combined with the husband also maximizing his utility, leads to a Pareto efficient outcome for the household. The size of both total income x and the sharing rule ρ depends on the decision the woman makes, as described in Section 2.2.2. If she chooses money to herself, x and ρ increase to x' and ρ'. If she chooses money to her husband, x increases to x'' and ρ decreases to ρ''

4.3 Predictions for the Control Group

If the woman alone controls the information given to the husband she can choose to keep the cash transfer private. This situation thus allows her to hide the money from him. The only circumstance under which the husband will be informed, is if she decides to tell him or if she gives the money to him.

Keeping the Cash Transfer

In the extreme case, the woman is likely to act according to the predictions of the non-cooperative household model. She will then keep the cash transfer herself, hide the money from the husband and maximize the indirect utility function:

$$v_{pi}^A = v(\rho_0 x_0 + (1 - w)E), \tag{17}$$

where the initial income x_0 remains the same, as well as her decision power over the initial income, ρ_o. In addition, the woman receives an amount $(1 - w)E$ that she completely decides over.

Giving the Cash Transfer

If the husband receives the cash transfer, both of the household members will know,

and they will thus have common information. In this case, the same cooperative predictions that are given for the treatment group apply. Hence, in all situations where the husband receives the money, the utility for the woman will be identical independent of treatment.

4.4 Identifying Willingness to Pay in the Two Treatments

We know from Equation 15 that the utility for the woman when receiving the cash transfer and paying exactly what she is willing to pay, is identical for both treatments and independent of model. We can thus predict the willingness to pay from both the collective and non-cooperative models by the following identity:

$$v_{pi}^A(w_1, \cdot) = v_{ci}^A(w_2, \cdot). \tag{18}$$

Substituting for v_{pi}^A and v_{ci}^A:

$$v^A\Big(\rho_0 x_0 + (1 - w_1)E\Big) = v^A\Big[\big(\rho_0 + \Delta\rho(f)\big)\big(x_0 + \Delta x\big)\Big] \tag{19}$$

$$(1 - w_1)E = \rho_0 \Delta x + \Delta\rho(x_0 + \Delta x). \tag{20}$$

The expression $\Delta\rho\Delta x$ can be eliminated for simplicity, as it represents an infinitesimal change, which means that it is infinitely small and cannot be separated from 0. We continue by finding expressions for Δx and $\Delta\rho$:

$$\Delta x = (1 - w_2)E \tag{21}$$

$$\Delta\rho = \frac{\partial\rho}{\partial f}\frac{\partial f}{\partial x_A}\Delta x_A = \frac{\partial\rho}{\partial f}\frac{x_B}{x^2}(1 - w_2)E. \tag{22}$$

Substituting these expressions into Equation 20 yields:

$$(1 - w_1)E = \rho_0(1 - w_2)E + x_0\frac{\partial\rho}{\partial f}\frac{x_B}{x^2}(1 - w_2)E \tag{23}$$

$$(1 - w_1) = \rho_0(1 - w_2) + \frac{\partial\rho}{\partial f}(1 - f)(1 - w_2) \tag{24}$$

$$(1 - w_1) = (1 - w_2)\Big[\rho_0 + \frac{\partial \rho}{\partial f}(1 - f)\Big]. \tag{25}$$

If the expression in brackets is < 1, it means that $w_2 < w_1$. This would indicate that when the woman has private information about the cash transfer, she has a higher willingness to pay for money to herself compared to when information about the transfer is common in the household.

We know that both the sharing rule ρ and the distribution factor f are between 0 and 1. Thus, whether $\rho_0 + \frac{\partial \rho}{\partial f}(1 - f)$ is in fact < 1 is determined by the relationship between the two. It is not possible for us to establish exactly how the size of ρ depends on f, as this varies individually across participants. One thing that can be said, however, is that it is highly unlikely that an increase in f leads to a decrease in ρ, and we therefore exclude the possibility that $\frac{\partial \rho}{\partial f} < 0$.

If a small increase in the woman's income share has a large effect on the sharing rule, this means that ρ is convex in f and that $\frac{\partial \rho}{\partial f}$ could be larger than 1. If this is the case, the expression in brackets is > 1, and the woman will have a higher willingness to pay when she cannot hide the money. Even though this possibility cannot be ruled out, we consider it to be unlikely.

In the literature, ρ and f are often assumed to have a linear relationship, as shown in Chiappori and Ekeland (2009). We therefore proceed with the assumption of linearity. This makes $\frac{\partial \rho}{\partial f}$ smaller than or equal to 1. The expression in brackets is then $\leq$ 1, which indicates that the average woman's willingness to pay for money to herself is higher when information is private than when it is common.

4.5 Hypotheses

This section presents the main hypothesis which is developed to answer the research question from Section 1.3. It also suggests additional tests which outcomes can supplement the findings from the main hypothesis. Finally, it presents four subsidiary research questions which will be answered by findings from the qualitative interviews.

4.5.1 Main Hypothesis

The main hypothesis of the Female Empowerment Pilot is developed based on our predictions. It is presented in the following, where the alternative hypothesis is one-sided:

H_0: There is no difference in willingness to pay, w, between the control and the treatment group. The participants in the two groups will make similar decisions regarding the cash transfer, and the average outcome of the experiment is thus independent of common or private information.

H_1: On average, the participants in the treatment group have a lower willingness to pay for receiving the cash transfer than those in the control group.

We test the main hypothesis by running an Ordinary Least Squares (OLS) regression. OLS is a common method for estimating the parameters in a regression model. The estimates are obtained by minimizing the sum of squared residuals. This means that the differences between the observed responses and the responses predicted are minimized (Wooldridge, 2013). We run the following regression:

$$w = \beta_0 + \beta_1 treatment + \varepsilon, \tag{26}$$

where the dependent variable w is the woman's willingness to pay for receiving the cash transfer instead of the husband receiving it. The variable *treatment* is a dummy that equals 1 if the participant is in the treatment group, and 0 if the participant is in the control group. ε is the error term. The null hypothesis and the alternative hypothesis can then be written mathematically as:

$$H_0 : \beta_1 = 0$$

$$H_1 : \beta_1 < 0$$

If H_0 is rejected, the estimated value of the treatment coefficient β_1 should be negative and significant, meaning that the participants in the treatment group on average have a lower willingness to pay to receive the cash transfer themselves compared to the control group.

4.5.2 Additional Testing

We also run additional tests to supplement the findings from the main hypothesis. First, we test if the average willingness to pay for the whole sample is significantly larger than 0. If this is the case, our study can reject the unitary household model. More importantly, however, it gives an indication of the general empowerment level of the sample. We test this by conducting a one-sample t-test on the willingness to pay variable, w. This test has the following null and alternative hypotheses, where the alternative hypothesis is one-sided:

$$H_0\text{: The average willingness to pay} = 0$$

$$H_1\text{: The average willingness to pay} > 0$$

Further, we compare the average willingness to pay for the whole sample with the corresponding mean in the study of Almås et al. (2015) in Macedonia to see if they differ. This gives an indication of their level of empowerment relative to a reference point. We do this by conducting a two-sample t-test with independent means and unequal variances on the average willingness to pay in both countries. The formula we use to conduct this test can be found in Appendix C. In the null and alternative hypotheses, μ_1 denotes the mean of w in Kenya, and μ_2 denotes the comparable mean in Macedonia. The hypotheses are formulated as follows, with a two-sided alternative hypothesis:

$$H_0\text{: } \mu_1 - \mu_2 = 0$$

$$H_1\text{: } \mu_1 - \mu_2 \neq 0$$

Finally, we run a multiple OLS regression which includes demographic variables. This allows us to test whether these variables have significant effects on the dependent variable w, and how large these potential effects are. Demographic features that will be tested are the participants' age, their educational background, how many children they have and what ethnic tribe they belong to. These variables are denoted *age*, *education*, *children* and *tribe*. The regression is given by:

$$w = \beta_0 + \beta_1 treatment + \beta_2 age + \beta_3 education + \beta_4 children + \beta_5 tribe + \varepsilon. \tag{27}$$

For each demographic variable i, the following null and alternative hypotheses apply:

$$H_0\text{: } \beta_i = 0$$

$$H_1\text{: } \beta_i \neq 0$$

4.5.3 Subsidiary Research Questions

The qualitative interviews will attempt to answer the following research questions:

Q1: *How does the information treatment affect the participants?*

Q2: *How is the distribution factor, f, of total household income between men and women?*

Q3: *What financial decisions are usually made by men and women in the household, and who has the final say?*

Q4: *Is domestic violence, punishment of children and divorce common in the women's neighborhoods, and what are the women's perspectives on these matters?*

The answers to these questions will help explain the underlying reasons for the result of the main hypothesis.

5 The Implementation

The Female Empowerment Pilot was implemented during the course of two weeks in February 2016 at the Busara Center for Behavioral Economics in Nairobi, Kenya. This chapter first describes the sample. Further, it explains the implementation of the lab experiment and the qualitative interviews.

5.1 The Sample

A total of 90 women were invited over the phone to participate in the experiment. Out of these, 66 women showed up, which gives a show up rate of 73.3 percent. All women who participated received a show up fee of 100 KES, as well as transportation money, the size of which varied from 100 to 150 KES, depending on their punctuality.

Because marital status was self-reported over the phone, there was a certain risk that the women could be dishonest regarding this matter. As far as we can tell, however, only one of the women was untruthful about her marital status.[6] Eliminating her reduced the sample size to 65.

When registering at Busara before the experiment, each of the women had to write down their own and their husbands' phone numbers. This to ensure that we had the correct contact information and hence make the information treatment seem credible. We experienced one woman who refused to give up her husband's phone number. We then had no way of contacting him, and this essential shortage was likely to prevent the treatment from working. We thus assumed the observation to be invalid and excluded the participant from the experiment. This further reduced the sample size to 64.

Table 1 gives an overview of the descriptive statistics of the sample. Column 1, 2 and 3 present averages, medians and standard deviations for the entire sample, Column 4 and 5 give minimum and maximum values observed in each category, and Column 6 gives total number of observations. All of the characteristics are based on self-reported data given by the participants in a questionnaire conducted by Busara prior to the experiment.

---

[6]This woman was a widow, and admitted to having been dishonest on the phone regarding her marital status. We cancelled her participation before she was able to proceed with the experiment.

Table 1: Descriptive statistics of sample characteristics

	(1) Mean	(2) Median	(3) St.Dev.	(4) Min	(5) Max	(6) Obs.
Age (years)	35.17	34	7.44	23	58	64
Children (number)	3.02	3	1.73	0	8	64
Education (years)	9.47	10	2.93	0	14	64
Education (shares):						
Primary school level	0.375		0.488	0	1	64
Secondary school level	0.563		0.500	0	1	64
College level	0.031		0.175	0	1	64
No education	0.031		0.175	0	1	64
Ethnic tribes (shares):						
Luhya	0.52		0.50	0	1	64
Kamba	0.08		0.27	0	1	64
Kikuyu	0.02		0.13	0	1	64
Nubian	0.08		0.27	0	1	64
Kisii	0.03		0.18	0	1	64
Luo	0.25		0.44	0	1	64
Mijikenda	0.02		0.13	0	1	64
Taita	0.02		0.13	0	1	64

Note: In Kenya, primary school is 8 years and secondary school is 4 years. In the table, primary school level means that the highest education the participant has obtained is within the eight years of primary school. She thus has minimum one year of education and maximum 8 years. In the same way, secondary school level means that she has minimum 9 years and maximum 12 years of education. A participant on college level has had more than 12 years of education.

5.2 The Lab Experiment

The lab experiment took place indoors at Busara's facilities in Nairobi during the course of two days. 43 women participated the first day and 21 the second day.[7] Each participant was personally accompanied by a Kenyan research assistant who was handed a tablet with the experiment software. All of the assistants started the session by reading the instructions out loud in either English or Swahili, depending on the participants'

---

[7]The number of participants deviate slightly from the project plan due to a larger show-up rate than expected.

preferred language. Of the 64 women, 17 selected English and 47 selected Swahili.

Randomization

Each of the women who were invited to participate in the experiment possessed a unique survey ID number in Busara's subject pool. These numbers were randomized and integrated in the experiment software prior to the implementation. The treatment group ended up consisting of 27 participants, and the control group 37.

Transferring of reward

The reward transfers were made via M-Pesa, which is a highly prevalent mobile money transfer and banking service in Kenya and other African countries (Jack and Suri, 2010). The first 43 participants received payment two working days after participation, and the last 21 participants received payment after one working day. At the same time of payment, the information text messages were given to either the woman, the man or both, depending on whether the participant was in the control or treatment group, as well as the recipient of the cash transfer.

5.3   The Qualitative Interviews

31 of the first 43 participants were interviewed individually approximately a week after their lab session had ended. The interviews were carried out by Kenyan research assistants in the participants' own houses in Kibera. Of these participants, 18 were in the control group and 13 in the treatment group. The remaining 21 participants were divided into groups of 5-8 and interviewed together directly after the lab experiment. These interviews took place at Busara, and these were also conducted by Kenyan research assistants. Participants in the group interviews were mixed. Some had been exposed to the information treatment, and some had not.

6 Findings and Analysis

This chapter aims to analyze the main findings from the Female Empowerment Pilot. It presents results from the lab experiment and the qualitative interviews and discusses these. Further, it attempts to answer the main research question and suggests policy implications. Finally, it evaluates the project and provides notes for further research.

6.1 Quantitative Analysis

This section presents results from the lab experiment. It first explains how some of the central variables have been generated. Then it reports from the testing of the main hypothesis and puts forward findings from additional testing. Finally, it discusses the results.

6.1.1 Generating Variables

In order to run statistical tests on the data extracted from the lab experiment, it is necessary to clean the data set and generate some of the essential variables that are used when running the regression analyses. First, we generate a dummy variable, *treatment*, in order to identify if the participants belong to the treatment group or control group. The dummy is binary and has the value 1 if the participant is in the treatment group, and the value 0 if she belongs to the control group.

Next, we generate the variable for willingness to pay, w. This represents the point where the woman is indifferent between keeping the cash transfer herself and giving it to her husband, as defined in Section 4.1. We find this point based on the sequence of choices that the participants have made in the lab, as these allow us to observe when they choose to switch the recipient of the cash transfer. The exact switching point cannot be determined as that would require extensive testing. However, the experiment design allows us to elicit a relatively small interval in which the switching point is located. We determine the switching point to be an arithmetic mean of the upper and lower level of this interval. Taking the starting point of 750 KES into consideration, we find the willingness to pay with the following formula:

$$\frac{\text{Starting Point} - \text{Switching Point}}{\text{Starting Point}} = \text{Willingness to Pay}. \tag{28}$$

As an example, we observe a participant who keeps 126 KES herself, but then gives 750 to her husband when she is offered 118 KES. From the research design, we know that the amount possible to give to the husband is constant. Consequently, the husband will always receive 750 KES if the participant chooses to give the money to him. Knowing this, we can determine the woman's switching point to lie somewhere between 118 and 126 KES. Her switching point is then 122 KES, and we use this number to calculate her willingness to pay:

$$\frac{750 \text{ KES} - 122 \text{ KES}}{750 \text{ KES}} = 0.8373. \tag{29}$$

In this example, the participant's willingness to pay is 0.8373. This can be interpreted as the maximum percentage of the cash transfer the participant is willing to give up in order to keep the money herself. If she has to give up more than 83.73 percent of 750 KES, she will choose to give 750 KES to her husband instead.

If we, on the other hand, observe that a participant never changes the recipient of the cash transfer, we will only know the upper or the lower bound of the switching point interval. The other bound will occur outside of the range that we can observe, and can thus not be measured. In this situation, we censor the participant's switching point to be either the lowest amount kept to herself or the highest amount given up when choosing the husband as the recipient. For example, if the participant always chooses to keep the cash transfer herself, her censored switching point is set to be 11 KES, which is the lowest amount she is offered in the lab. When this is the case, the participant has the following willingness to pay:

$$\frac{750 \text{ KES} - 11 \text{ KES}}{750 \text{ KES}} = 0.9853. \tag{30}$$

As we can see, the participant is willing to give up almost the entire cash transfer in order to receive the money herself. From this, we cannot simply conclude that her willingness to pay is 1, and that she does not have a switching point at all. It is possible that she would have switched if offered a lower amount than 11 KES. However, if the participant does have a switching point, we know that it must be lower than 11 KES, and thus relatively close to 0 KES.

If the participant always chooses to give the cash transfer to her husband, her censored switching point is the highest amount she is offered, which in our experiment is 800 KES. When this is the case, the participant's willingness to pay is close to 0:

$$\frac{750 \text{ KES} - 800 \text{ KES}}{750 \text{ KES}} = -0.0667. \tag{31}$$

In this example, the participant chooses to give 750 KES to her husband instead of 800 KES to herself, which gives a slightly negative willingness to pay. This can be interpreted as a total lack of willingness to pay for keeping the transfer herself. In fact, she is willing to give up money in order for the husband to be the recipient of the transfer. Similar to the previous example, we cannot rule out the possibility of the participant having a switching point beyond the boundaries that we can measure. However, we know that this switching point must be higher than 800 KES.

6.1.2 Presentation of Results

Main Hypothesis

As stated in Section 4.5.1, our main hypothesis is that the participants in the treatment group on average have a lower willingness to pay for keeping the cash transfer themselves than those in the control group. We test this hypothesis with a robust OLS regression model, as given in Equation 26. When the model is robust, it means that less emphasis is given to extreme observations, which prevents it from being overly sensitive to these (Wooldridge, 2013). In the model, w is the dependent variable and *treatment* is the only independent variable. Since *treatment* is binary, its estimated coefficient tells us the difference in average w between the participants in the treatment and control group, everything else being held equal. The average willingness to pay in the two groups is illustrated in Figure 2, and the distribution of participants' willingness to pay is presented in Figure 3. The estimated regression model is presented in Table 2.

In Figure 2, we see that the average willingness to pay is slightly larger in the control group compared to the treatment group. Investigating this difference further, we proceed to plot the distributions of the participants' willingness to pay in the two groups. However, the distributions look similar and do not clearly reveal how the participants' willingness to pay differs in the two groups, as seen in Figure 3.
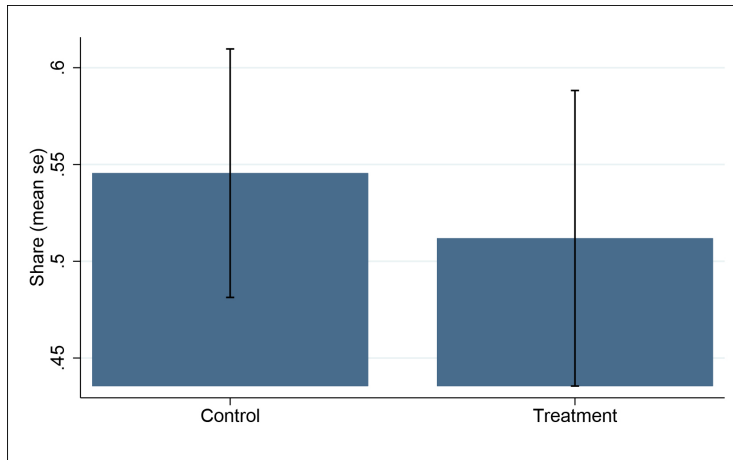
Figure 2: Average willingness to pay.
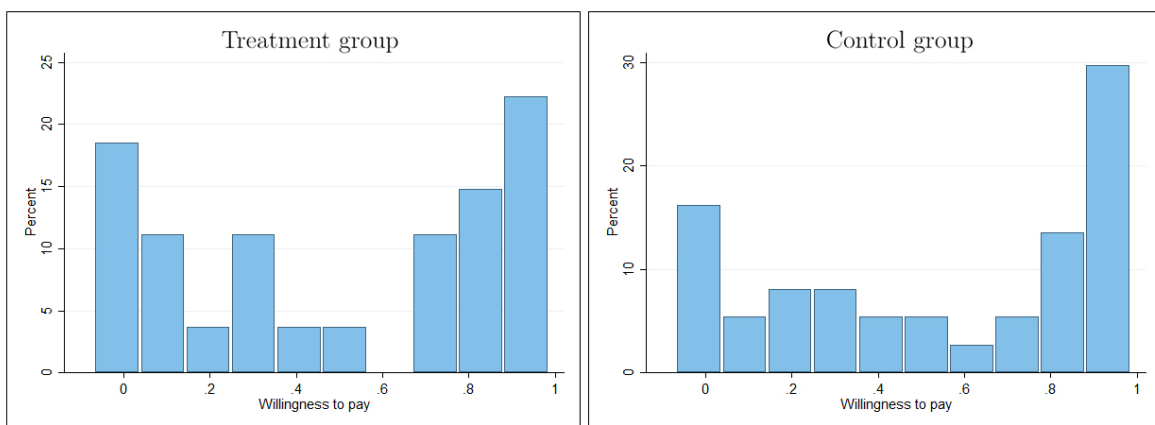
Figure 3: Distribution of participants' willingness to pay.

From running the regression in Equation 26, we learn that the average willingness to pay for the control group is 54.55 percent and 51.19 percent for the treatment group, as seen in Table 2. The treatment coefficient is negative and indicates that willingness to pay on average is 3.36 percentage points lower in the treatment group. However, the p-value for the treatment coefficient is 0.74. This means that the difference between the two groups is not statistically significant, not even on a 10 percent significance level. We thus fail to reject H_0 for our main hypothesis.

Table 2: Willingness to pay

Treatment	- 0.0336
	(0.0997)
Constant	0.5455
	(0.0643)
R^2	0.0018
Number of Observations	64

Robust standard errors in parentheses

P-value for treatment coefficient = 0.737

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table reports results from a robust OLS regression of women's willingness to pay for a cash transfer to themselves instead of their husbands receiving it. Treatment is a dummy variable and has the value 1 if the subject belongs to the treatment group and 0 if the subject is in the control group. The constant represents the participants in the control group, and shows their average willingness to pay.

Table 3: Willingness to pay – Switchers

Treatment	- 0.0092
	(0.1005)
Constant	0.4605
	(0.0656)
R^2	0.0002
Number of Observations	47

Robust standard errors in parentheses

P-value for treatment coefficient = 0.928

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table reports results from a robust OLS regression of women's willingness to pay for a cash transfer to themselves instead of their husbands receiving it. In contrast to Table 2, this regression has only been run on participants for which we have observed a switching point. It has thus excluded the participants who always give or always take. Treatment is a dummy variable and has the value 1 if the subject belongs to the treatment group and 0 if the subject is in the control group. The constant represents the participants in the control group, and shows their average willingness to pay.

We run the same regression again, but this time we exclude the censored participants. This allows us to observe what effect *treatment* has on w when we only consider participants from which we can observe a switching point. The results from this regression are presented in Table 3. When only the switchers are included in the regression, the number of observations decreases to 47. We find an average willingness to pay of 46.05 percent for the control group, as seen in Table 3. Furthermore, the participants in the treatment group have on average less than one percentage point lower willingness to pay than the participants in the control group. The p-value of 0.93 is far too high to indicate any evidence against the null hypothesis.

Additional Testing

When testing if the average willingness to pay in the sample is significantly larger than 0, we estimate a mean of 53.13 percent. The one-sample t-test produces a one-tailed p-value < 0.001. This means that we can reject the null hypothesis that the sample mean is equal to 0. We thus conclude that the mean is significantly larger than 0.

When comparing the mean in willingness to pay for the whole sample with the corresponding mean for the sample in Macedonia, it is 33.63 percentage points lower.[8] The two-sample t-test rejects the null hypothesis that the average willingness to pay is the same for the two samples, as shown in Appendix C. It is significantly larger in Kenya.

Finally, we test whether demographic variables affect the participants' willingness to pay. The sample consists of 8 different ethnic tribes. As there are only 64 participants, we do not have enough data to draw any conclusions based on these tribes. We therefore exclude this variable and run a multiple OLS regression on the whole sample where we only include the independent variables *treatment*, *education*, *age* and *children*. The results are presented in Table 4.

---

[8]This number is the difference between the means in the Kenyan and Macedonian sample: 0.531 - 0.195 = 0.3363.

Table 4: Willingness to pay – Demographics

	(1)	(2)
Treatment	- 0.0434	- 0.0522
	(0.0993)	(0.0976)
Education (years)	- 0.0406***	
	(0.0160)	
Primary education		- 0.2224
		(0.1350)
Secondary education		- 0.4183***
		(0.1555)
College		- 0.0263
		(0.1660)
Age (years)	0.0056	0.0059
	(0.0074)	(0.0075)
Children (number)	- 0.0055	0.0083
	(0.0330)	(0.0340)
Constant	0.7548	0.6387
	(0.3244)	(0.3004)
R^2	0.1095	0.1347
Number of Observations	64	64

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table reports results from a robust OLS multiple regression predicting women's willingness to pay for a cash transfer to themselves instead of their husbands receiving it. In the first column, the regression includes the variables treatment, years of education, age and number of children. In the second column, the regression includes the variables treatment, number of children, age, primary education, secondary education and college.

As seen in Column 1 of Table 4, *education* has a significant effect of -4.06 percentage points on willingness to pay at a 1 percent significance level. This means that the probability of rejecting H_0 of no effect when this is in fact true is less than 1 percent. The estimated coefficient for *education* is interpreted as the decrease in w for every year of additional schooling. Apart from this variable, none of the remaining demographic variables seem to have any significant effect on willingness to pay.

We wish to investigate closer which level of education has the largest effect on willingness to pay. Finally, we therefore run the same OLS regression, but this time we split *education* into three separate variables, namely *primary*, *secondary* and *college*. By doing this, we examine the effect each level of education has on the dependent variable. From the results presented in Column 2 of Table 4, we see that *secondary* has a significant effect of -41.83 percentage points on w, and this at a 1 percent significance level. *Primary* and *college* have no significant effect. However, *primary* has a p-value of 0.105, which means that it has a pronounced effect at an almost 10 percent significance level. Thus, this variable also seems to be of some relevance.

6.1.3 Discussion of Results

Main Hypothesis

From the presentation of results it seems that the participants in the treatment group on average are 3.36 percentage points less willing to pay for receiving the cash transfer themselves than the participants in the control group. As argued in Section 1.2, a woman's willingness to pay for a cash transfer can reflect her level of empowerment. If a participant is less willing to give up a portion of the amount in order to keep the cash transfer herself, we assume that she has a greater influence in the household resource allocation. A low degree of willingness to pay therefore corresponds with a high level of empowerment. Following this line of thought, we find that the less she is willing to give up, the more empowered she is. Based on this reasoning, the treatment group appears slightly more empowered than the control group, which is in line with our main hypothesis. Due to randomization, the participants should have the same observable and non-observable features. If one group seems more empowered than the other, this can therefore be explained by the treatment.

However, as the identified effect of 3.36 percentage points is not significant, we cannot

prove that it actually exists. We therefore fail to reject the null hypothesis that there is no difference in willingness to pay between the control and treatment group. Still, this does not necessarily mean that different information structures do not play a role on women's willingness to pay. It could be that this effect indeed exists, but that we have not been able to detect it. A sample of 64 participants might be too little to reveal it, especially if the effect is small. With a larger sample, the treatment effect may turn out to be significant. This is addressed more closely in Section 6.4, where we discuss possible shortcomings and perform power calculations to estimate the necessary sample size. After all, we still find the direction of the treatment effect to be slightly negative, which corresponds with our predictions. However, lack of significance prevents us from determining whether this effect in fact exists.

Additional Testing

The results show an average willingness to pay for the whole sample of 53.13 percent. This number, which is significantly higher than 0, indicates that the participants are willing to give up more than half of the cash transfer in order to receive it themselves. This finding suggests that the unitary model can be rejected. In addition, the participants appear to be relatively little empowered in their household.

Comparing the average willingness to pay in Kenya with the corresponding mean from Almås et al. (2015) in Macedonia, the evidence of low female empowerment is strengthened. In Macedonia, the women's average willingness to pay was measured to be about 20 percent. The participants in the Kenyan low-income households, on the other hand, are willing to give up a significantly larger amount. Hence, the Kenyan women appear to be considerably less empowered in the household than the women in Macedonia. Identifying the reason for this, however, requires further research.

The first thing worth noticing from testing demographic variables is that this does not change the estimated coefficient for *treatment* considerably. Hence, the treatment and the control group seem to be highly similar in characteristic properties, which means that the randomization has worked sufficiently.

As seen in the previous section, education seems to matter the most out of the demographic variables. It has a highly significant negative effect on willingness to pay and secondary school explains a large share of this. Primary education also seems to

46

matter to some degree, although it is only close to being significant. When we observe that education reduces willingness to pay, it is reasonable to assume that this could be due to higher income earnings for the woman, because higher education tends to equal greater career prospects. In our framework, this would be represented by an increase in the woman's income x_A relative to the man's income, x_B. This would again on average increase the distribution factor f for every additional year of education women in our sample hold. Because we assume f to have a positive linear relationship with the sharing rule ρ, a larger income share would thus eventually result in a proportionally higher bargaining power for the woman in the household. In addition to increased income, it is also possible that education can affect ρ in other ways. Even if the woman is unemployed, a higher level of education could potentially affect her bargaining skills in the household and give her more influence over resource allocation.

Although it seems likely that increased education equals higher empowerment in the household, we cannot draw this conclusion based on the information we hold alone. There is a possibility that women with a higher degree of education are more likely to understand the rules of the lab experiment. If this is the case, the more educated women would be able to make different choices in the lab than the rest of the sample, which again could cause misleading effects. However, we consider this explanation to be unlikely. In the lab, the women had one assistant each helping them read the experiment instructions in their preferred language, answer questions and make sure that they understood the experiment rules clearly. This weakens the idea of education leading to better understanding of the rules of the experiment as a possible reason for the observed effect.

Education might also affect the women's ability to assess the choices presented in the lab experiment. They might be better equipped when weighing the different options and calculating the outcome. However, the experiment does not require much mathematical skills as the women are simply choosing between two amounts in each round. Even though we cannot exclude that education might be beneficial in the decision-making process, the task they are asked to carry out is rather simple. Because of this, we do not consider education to have a pronounced impact on the women's ability to weigh and assess the different choices.

When investigating the results, college experience seems to have no effect on willingness

to pay. If willingness to pay would decrease in line with increased education, which our first result suggests, this might seem strange. However, the descriptive statistics in Table 1 show that only two participants in the total sample of 64 women have reached college level. Due to this modest representation, it is therefore not possible for us to predict anything concrete about these women in the real population.

Concluding Remarks

To conclude, the direction of the treatment effect is in line with our main hypothesis. However, we cannot reject the null hypothesis that willingness to pay is equal in the two groups due to lack of significance. Furthermore, we find the average willingness to pay in our sample to be significantly different from 0, which allows us to reject the unitary model. The willingness to pay is also significantly larger than that in the study of Almås et al. (2015) in Macedonia. Based on these findings, we interpret the overall female empowerment in low-income households in Kenya to be low. We also observe that years of education play a significant negative role on willingness to pay. Thus, we find it likely that education has a positive significant effect on empowerment.

6.2 Qualitative Analysis

This section first provides necessary clarifications for presenting and interpreting the findings from the interviews. Then, the results are presented and discussed in light of the subsidiary research questions from Section 4.5.3.

6.2.1 Clarifications

In the following we present answers from both individual and group interviews interchangeably. Prior to the interviews, we were uncertain of which interview form would be most effective in retrieving information, and if one form would give more open and truthful answers than the other. However, we see similar patterns in both forms when assessing the answers. Participants seem to answer freely and we do not observe offended reactions to personal questions. We therefore find it unnecessary to distinguish between the answers from the two interview forms.

In the interviews, the women frequently use the term *trust*. We experience that it is used in two different ways. First, it can mean that the woman expects her husband to give her full information about income, and not hide the money. She thus trusts

that he will behave according to the predictions of the collective household model. This does not necessarily mean that the spouses agree on spending or that the woman's bargaining power is high. Secondly, trust can imply that the woman either agrees with the way the husband spends the income or that she trusts the two of them to come to an agreement. The latter indicates that she believes her bargaining power to be adequate. When the women use the term trust, we interpret the meaning to be one of the two mentioned above, or both of them at the same time. Throughout the presentation of results, we will clarify which meaning we believe applies.

6.2.2 Presentation of Results

The findings are organized in five parts. They address the impact of the information treatment, income and employment, financial decisions, domestic violence, discipline of the children and marital relationship.

The Impact of the Information Treatment
In the interviews, the women in the control group were asked whether it affected their choices in the lab experiment that their husbands were *not* informed about their payments. The women in the treatment group, on the other hand, were asked whether it affected their choices that their husbands actually *were* informed about their payments. In all cases, the women denied that the information treatment had any impact on their decisions. Not a single participant reported that it would have made any difference to her choice if she was exposed to the other information structure.

Of the women in the control group giving the cash transfer to their husbands, we see a clear trend of trust being reported as an important condition for their decisions. In these cases, trust seems to imply both openness about income as well as agreement on household spending. These women state that they simply chose the highest amount, independent of recipient. This indicates that they refrain from hiding the money and therefore behave according to the predictions of the collective household model. The following statement by one of the participants fits this description:

> "I based my decisions on how we live together, do things together and how
> we trust one another. When we disagree, we sit down and deliberate on how
> to overcome any issue arising."

This being said, however, several women in the control group decided to keep the money

to themselves. The information structure in this group allows them to hide the money and behave according to the predictions of the non-cooperative household model. In these cases, the women tend to give lack of trust as the reason for this behavior. They expect the husband to hide information about the money, which appears to give them the incentive to act in the same manner. Many of the women therefore admit to the convenience of the husband not having information about the cash transfer. One of them says:

> "It would be hard to get the money from him once he receives it."

In the treatment group, there were also women who kept the cash transfer themselves, even though their husbands were informed about the payment. One participant gives the following reason:

> "My husband would not have told me that he got money. If he had gotten it, he would buy alcohol for himself."

In some of these cases, the women report that their husbands then proceeded to reduce the amount of money they would usually provide them with. For these women, the cash transfer thus makes no financial difference and their purchasing power remains constant. One participant states:

> "He reduced the money he leaves at home once he found out that I received some cash."

Other women in the treatment group report that they were uncertain about how their husbands would respond to them keeping the money. One of them states that she saw it as an opportunity to increase her disposable amount, even if her husband might end up controlling a share of it:

> "I was trying my luck."

Income and Employment

All of the interviewed women more or less rely on their husbands for financial security, and many give a general impression of him being the head of the household. Many women report that their husbands provide them with weekly or monthly allowances, for which they budget their spending. When estimating monthly expenses, the women reveal large differences in income across households. One participant also explains that it is hard to estimate the monthly income as she is unemployed and her husband does not have a steady income:

> *"Sometimes you only have rice because he is not always working, it is only casually. Sometimes he gets some work, and sometimes he does not."*

Most of the interviewed women are unemployed, and the amount they can allow to spend on personal items varies greatly. On average, the women claim to spend more than twice as much on personal items as their husbands. However, the numbers vary, and this participant expresses a tight budget for private spending:

> *"It is difficult because I am not working. I depend on the money I am given for food. He only leaves behind 130 KES per day. If I get a cleaning job once a week, which pays me about 200-300 KES, then I would use that for personal items."*

Even though most women are financially dependent on their husbands, a minority reports finding jobs from time to time. Some of the participants even reveal an entrepreneurial mindset and state to run their own business. One of them makes and sells detergents, and when asked how she would spend the cash transfer, she answers:

> *"I would boost my business."*

Financial Decisions in the Household

When it comes to financial decisions in the household, food seems to be the main responsibility for most women. Almost 75 percent of those who were interviewed report this. Many of them also say that they are involved in decisions regarding children's clothing and school material. With a few exceptions, they report that their husbands are responsible for paying rent, school fees for the children and other bills.

When the women state that they are in charge of making financial decisions in the household, most of them appear to be talking about the actual budgeting and shopping of the goods, and not necessarily the providing of income for the total household budget. One woman says:

> *"My husband gives me money to pay rent and money to buy food, but it is me who will decide which money to go to which food."*

A common arrangement thus appears to be that the man provides the woman with a certain amount of money, and that her role is to plan for how to spend this money on essential household goods. One participant explains this further:

> *"My husband is the breadwinner, so after buying food, he decides what we should do with the rest of the cash. He makes all the decisions."*

A majority of 76 percent of the women says that they usually agree with their husbands on how household resources should be spent. For instance, one of the women presents the following statement:

> *"We normally agree. We must sit down and discuss how money should be spent."*

Other women indicate that even if they agree with their husbands regarding financial decisions, this only concerns the part of the total household budget that they actually are allowed to influence. In most answers, the women imply that they do not know how large the entire household income is, nor all of the things that it is spent on. One woman explains why she is reluctant to ask about the rest of the income:

> *"You should not ask what the remaining (income) will be spent on. If you do, there will be a fight."*

The husband therefore generally seems to be in control of the total household budget. Though most women have a certain bargaining power over parts of it, he usually decides how large those parts should be. Over 60 percent of the women say that the man always has the final say when it comes to financial decisions. Most of them justify this with him being the main income earner. One woman puts it in this way:

> *"He makes the final decision, because he is the one who works."*

Another woman denies that income share is a crucial factor in this regard. She believes that simply being the head of the household is what gives the husband the final say:

> *"Normally in a household, it is the man who will have the final say, even if the woman is making more money."*

Domestic Violence and Discipline of Children

Over 3/4 of the women report that men often or occasionally beat their wives if they leave home or spend money without telling them. However, only 1/10 say that they think this violence is justified. Among those who oppose it, one woman says:

> *"He is not justified to hit her, but he has a right to question why she left without telling him."*

The participants who think the man has a right to beat his wife claim that the women are aware of what is right and wrong and have to take responsibility for their own actions. One of the women who believes this punishment to be fair, states the following:

> "He is justified to beat his wife if she argues with him. She is supposed to explain where she is, otherwise she is supposed to be beaten."

In their answers, the majority of the women express that they often quarrel with their husbands regarding disciplining of the children. The topics of argument seem to concern the use of punishment, and to what degree it should be executed. Many women give the general impression of being in favor of violent punishment, and that their husbands are too gentle with the children. One woman says that she and her husband disagree on the following:

> "My husband does not like whipping. He prefers to talk, but when you talk to a child they do not listen."

Marital Relationship

More than 40 percent of the participants report that it is rather common for married women in their neighborhood to get a divorce. Around 30 percent, on the other hand, consider a divorce to be highly unlikely, while the remaining say that it only happens rarely. The women disagree on which of the spouses usually initiate the divorce, but there seems to exist a common understanding between them of when women are justified in leaving their husbands. According to them, the socially accepted reasons are lack of financial support and infidelity, as explained by this participant:

> "Try to imagine that your husband becomes unfaithful or gets into a relationship with another woman. You are left alone to take care of the children and everything else, including rent. Then you decide it is better to be on your own."

Other participants also stress the importance of the husband supporting them financially. For one of them, it is crucial that her husband is the main provider in the household:

> "If I am making more money than my husband, I better be on my own."

6.2.3 Discussion of Results

In the following we attempt to answer the subsidiary research questions based on the findings from the qualitative interviews.

Q1: How Information Affects Participants

From the presentation of results it seems that the information treatment did not have any impact on the participants' actual decisions in the lab. None of them admit to have been influenced by the different information structures. Even though some women make decisions precisely according to our predictions, many completely contradict them. Not in any one case does a woman attribute her decisions to the information structure she is exposed to.

As the interview answers are self reported, there is a possibility that the women are not answering truthfully. For instance, we cannot know for certain that the women who keep the money themselves in the control group would have done the same if they were in the treatment group. However, as the interviews reveal, many women express other reasons for keeping the cash transfer themselves, regardless of the information given to their husbands. This is clearly illustrated by the several women in the treatment group who chose to keep the cash transfer themselves even when they knew the husband would be informed. In these cases, other reasons than information seem to dominate their decisions.

Although the women disregard that information has influenced their choices, many in the control group clearly express the convenience of their husbands not being informed about the cash transfer. We observe that the women who claim not to trust their husbands tend to keep the cash transfer themselves. This lack of trust can be due to limited openness about income as well as disagreement on household spending, or both, as clarified in 6.2.1. For instance, several women explain that their husbands reduced their allowance when they received information about the cash transfer. This indicates that the information treatment has a certain negative effect, even though this effect is not decisive for determining the recipient of the cash transfer.

Q2: The Income Distribution in the Household

Based on the interviews, a majority of the women appear to rely on their husbands

financially, and most of them are unemployed. Even though some women report to have work from time to time, this seems to apply only to a small fraction of them. The examples of female entrepreneurs running their own businesses are outnumbered by those who do not contribute to the household income at all. When considering these findings, the women's income distribution factor, f, appears small.

However, the total income of the household varies across the sample, and in some cases it appears to be highly irregular. This makes the income distribution hard to determine. Also, we do not have detailed information about the husband's income. In some households, he is also periodically unemployed. This factor makes the income distribution between the spouses even harder to assess. Nevertheless, the husband stands out as the main financial provider in most cases regardless of the consistency of his work.

Q3: Financial Decisions and Final Say

From the interviews we find that when it comes to financial decisions in the household, women are usually in charge of budgeting for food and other household essentials. This indicates that the woman has certain areas of responsibility and financial decision power. However, the man is the primary source of income, and he usually controls the amount of which she budgets. As a result, the women generally come across as financially dependent on their husbands, and their decision power therefore only seems to apply within the limits that he sets.

Furthermore, most women report that their husbands have the final say in financial decisions. Some of them justify this with him being the main provider of income. However, a few argue that this is not a result of income distribution, but simply because the man is the head of the household. Who makes the final decision therefore also appears to be dependent on gender. This further strengthens the assumption of women being submissive to the man in financial decision-making.

Q4: Domestic Violence, Child Discipline and Divorces

From the presentation of results, a majority of the women confirm that domestic violence is common. However, only a small fraction of them justify this behavior. The fact that this seems to be common practice therefore suggests that women lack power to prevent such actions. In light of these findings, their empowerment within this area therefore comes across as weak.

Most women claim to disagree with their husbands on disciplining the children, but this disagreement mainly seems to concern the level of punishment. We find little indication of the husbands trying to take control of the punishment, and the women appear to be in charge of this task. As a consequence, they seem empowered regarding this matter.

As presented in the previous section, almost half of the women state divorce to be common in their neighborhood. This signals that many women feel free to abandon marriages if they find it necessary, which speaks in favor of their empowerment. When inquired about the matter, most of the interviewed women consider themselves justified to leave if the husband is unfaithful or fails to provide financial support. However, not one participant mentions lack of romantic feelings as a valid reason for splitting up. Romantic relations aside, we cannot rule out other possible reasons for staying in a marriage, such as norms and traditions. Nevertheless, many of the interviewed women seem to strongly depend on their husbands financially. For them, marriage seems to serve a practical purpose, which limits their independence.

6.3 Analysis and Policy Implications

This section aims to answer the research question of the Female Empowerment Pilot by combining results from the quantitative and qualitative research. Based on this analysis, it attempts to provide implications for policy development.

6.3.1 Analysis of Research Question

As presented in Section 1.3, the research question of the pilot is worded as follows:

> *When introducing a cash transfer, do women show differences in empowerment depending on common or private information in the household? How are they empowered by the transfer under these information structures?*

Addressing the first part of the research question, the results from the lab experiment do not show any systematic differences in willingness to pay between the two groups with different information structures. Even though we observe a negative trend for the treatment group, which is in line with our main hypothesis, this effect is neither large nor significant.

However, the qualitative interviews reveal that information might still impact women's empowerment. As seen in the discussion of results, all the interviewed women deny that information influenced their decisions in the lab experiment. Yet, many still prefer the cash transfer to be kept secret from their husbands. When the husband was informed about the outcome of the experiment, several women also experienced economic repercussions. These findings indicate that information might still affect women's empowerment to some degree, even though we were not able to elicit this exact mechanism in the lab.

Based on the results from the lab experiment, women in both the control and treatment group are on average willing to give up more than 50 percent of the cash transfer in order to be the recipient of it. This willingness to pay is significantly larger than 0, which allows us to reject the unitary household model. It is also significantly larger than the results from Almås et al. (2015) in Macedonia. As previously argued, such a high willingness to pay can be interpreted as low empowerment. This conclusion is further strengthened by the results from the qualitative interviews. The women reveal a generally strong financial dependence on their husbands. They do, however, appear to have a certain financial bargaining power, and they also hold the main responsibility for budgeting in the household. Nevertheless, this seemingly only applies to whatever share of the total income their husbands decide to give them. As argued in the discussion of the qualitative results, this suggests that many women are submissive to their husbands. Combining all these findings, the women's overall empowerment in the household appears to be low.

In the following we address the second part of the research question by analyzing *how* the women might be empowered by a cash transfer under different information structures. We argue that this will depend on their initial level of empowerment. Our inference of their empowerment level is based on both their low willingness to pay for the cash transfer in the lab as well as the impression they give in the qualitative interviews. We begin discussing the impact of a cash transfer for the women who seem to have a relatively high empowerment. Further, we do the same for the women with low empowerment.

In our findings, we observe that women with a relatively high level of empowerment

usually choose their husbands as the recipients of the cash transfer. These women seem to have a higher bargaining power and general influence in the household than the women who keep the money themselves, which makes them more empowered. They therefore tend to act according to the collective household model and maximize total income regardless of information structure. When introducing a cash transfer, it is reasonable to assume that these women will achieve an increased purchasing power as a result of the increased total income. This might also lead to a rise in bargaining power. However, as these women already have a relatively high empowerment, a cash transfer might not constitute a large difference for the household's sharing rule, ρ.

In households where women have relatively low empowerment, we observe that they often keep the cash transfer themselves. This decision seems to be made regardless of information structure. However, information still seems to affect these women's empowerment to some extent. When information is *private*, many prefer to hide the money from their husbands, which is in line with the predictions of our framework. Some of these women express fear that their husbands will reduce their allowance if they know about the cash transfer, and that the secrecy is necessary for them to control the money. In such cases, it seems that private information can play an essential role for the women in order to gain higher empowerment. When the husband has no information about the transfer, he will provide the woman with the same amount as before. Since the woman now receives the cash transfer in addition to this financial support, she is thus able to obtain a higher disposable amount, some of which she can completely decide over. This gives her an overall greater purchasing power. It is unlikely that her bargaining power changes due to the cash transfer, as it does not improve the household sharing rule. This means that her influence over the resource allocation does not increase. Nevertheless, hiding the cash transfer increases her disposable income. When information is private, a cash transfer thus improves these women's initially low empowerment.

When information in the household is *common*, we observe that women with an initially low empowerment still choose to keep the cash transfer themselves. This behavior deviates from the predictions of our framework. In such cases, it is uncertain how the transfer might affect their empowerment. If the husband reduces whatever amount he usually leaves behind, the woman's financial situation will not change considerably. Her purchasing power could stay the same, and her bargaining power might even decrease due to an increase in total income relative to her disposable amount. As a consequence,

the cash transfer might not have a positive effect on her empowerment. In the extreme case where her bargaining power decreases, it might even become lower. When this happens, the husband ends up being the one controlling the transfer, even though she was the initial recipient of it. If the husband does not reduce the initial allowance much, on the other hand, the woman could potentially control a higher amount than before. Even if her bargaining power remains the same, her increased purchasing power suggests that her empowerment has improved. In conclusion, the exact effect a cash transfer has on the woman's empowerment when information is common, will depend on the husband's response. When information is common, it is thus uncertain how a cash transfer affects these women's empowerment.

In conclusion, women who initially have a low empowerment appear to become more empowered by a cash transfer if information is kept private instead of common. Even if this does not lead to an improvement of the household sharing rule, the women still end up with a larger disposable amount. For the women with a presumably higher empowerment, we see a tendency of them giving the cash transfer to their husbands, independent of information structure. Therefore, different information structures seem to matter more for women with relatively low empowerment. Based on our findings, these women will have a higher expected empowerment if their husbands are uninformed about the cash transfer.

6.3.2   Policy Implications

The purpose of the Female Empowerment Pilot is to facilitate for further research. The policy implications it can offer are therefore limited. That being said, a few findings are worth noticing for future policy developments. Even if we do not find evidence that information has an effect on willingness to pay for a cash transfer, we still find indications that it might be beneficial for low empowered women if their husbands are not informed.

Based on empirical data, we know that income pooling has been widely rejected, and that women and men spend their income differently. Studies find that children in particular will benefit more if the woman controls a larger share of the total household income. If a policy maker wants a woman with low empowerment to benefit from receiving a cash transfer, this policy is thus more likely to be successful if her husband does not know about it. It is important to remember, however, that this will not necessarily

increase her bargaining power in the household. Nor is it certain that the cash transfer will affect her empowerment in the long term. If the cash transfer program comes to an end, she might be empowered to the same degree as before she received financial support. This policy implication is therefore not necessarily solving the problem of low empowerment, even though it could make women more financially independent while ongoing.

In Section 6.1, we also found that education has a highly significant negative effect on willingness to pay. Even if this might mean that higher educated women are more likely to understand the lab experiment, we argue that education actually increases their level of empowerment. This is due to increased bargaining power, for instance as a result of increased income contribution. Promoting and facilitating education for women therefore seems to be a wise measure in order to increase their empowerment in the long term. Exactly in what way education impacts empowerment is, however, subject to further research.

6.4 Evaluation and Further Research

This section evaluates the Female Empowerment Pilot. It begins with discussing possible weaknesses with the design and implementation of the project. Then, it points out parts that need to be improved and highlights valuable experiences.

6.4.1 Possible Shortcomings

When reviewing the Female Empowerment Pilot in retrospect, we see that the design and implementation of the lab experiment might have certain weaknesses. Even though the experiment design has been thoroughly worked on, the implementation process still offered challenges. One of our concerns deals with the external validity of the project. The participating women were asked to make decisions regarding cash transfers corresponding to the average income of a day's work in Kibera. There is a chance that this monetary incentive was too weak to imitate a realistic cash transfer. If this is true, the results derived from the project might not be applicable to a real world situation. However, we have reason to believe that this amount is of significance to the women. Busara's general experience with conducting economic experiments suggests that the amount was sufficiently large. For instance, they informed us that the average rent per month of a house in Kibera is around 1000 KES, which our monetary incentive

constitutes a large share of. Based on their advice, we consider the monetary incentive to be of an appropriate size.

There is also a chance that the participants in the project changed their behavior in the lab because they were aware that they were being observed, the so-called Hawthorne effect. We made an effort to avoid this by letting each participant be personally accompanied by only one Kenyan research assistant, and also assuring them that their identity would be kept anonymous. Even so, the women knew that their respective research assistant was observing their choices, and we cannot completely rule out the possibility of a Hawthorne effect.

During project implementation, we also encountered a concrete obstacle concerning registration of phone numbers. We arranged for the participants to write down their own and their husbands' number when they arrived in the lab right before their session started. In retrospect, we see that this might have had an unfortunate effect on the experiment results, as the participants could have been primed by having recently written down their husbands' phone number. A better idea would perhaps be to ask for the phone numbers some time in advance, for instance during the subject pool recruitment process.

The qualitative interviews might also have had a potential shortcoming. As the interviews were conducted by Kenyan research assistants in Swahili, there was no obvious reason for us to take part in them as we do not understand the language. Aside from the language barrier, we were also uncertain if our presence would disturb or affect the conversations in any way, as detected in a study done by Cilliers et al. (2014). In a paper referred to as 'The white-man effect' the authors study the effect of white researchers' presence in field experiments in Africa. In the study, participants attend a dictator game, generally used to measure altruism in behavioral experiments. In this game, one player has to decide how to split an endowment with a second player. When carried out in Sierra Leone, the authors find the mere presence of a white researcher to affect the amount given to the other player. When a white researcher is present, the amount given increases by 19 percent (Cilliers et al., 2014).

Nevertheless, as our project is a pilot study, our attendance could provide valuable insight about group interviews as a research method. Consequently, we decided to take

part in two out of three group interviews. After the interview sessions, the research assistants gave us their feedback. According to them, our presence resulted in a distinct change in the participants' behavior. When we attended the group interviews, participants had asked whether we could understand what they were saying, and also questioned our intentions for being there. When we were absent, the participants had in contrast seemed more comfortable, and the interview lasted considerably longer.[9] Even though these findings support the results from Cilliers et al. (2014), we cannot exclude other possible causes to this change in behavior based on this observation alone. Perhaps this group consisted of women more talkative and less skeptical that would have behaved in a similar matter even if we had been present. Nonetheless, we cannot rule out that our presence might have affected the women and their responses in two out of three group interviews, which is a possible shortcoming with the data from the group interviews.

6.4.2 Notes for Further Research

The Female Empowerment Pilot did not detect a significant information treatment effect. However, with a small sample size of only 64 participants, this outcome is not surprising, and the result does not necessarily mean that an effect is non-existent. We might be able to detect it with a larger sample, as would be the case for further research and a large-scale implementation. To determine how large the sample size must be in order to detect an effect of the same size that we have observed, we therefore conduct a power calculation. The treatment group has the mean 0.5119 while the control group has a mean of 0.5455. We find the standard deviation for the treatment group to be 0.7975 and the equivalent numbers for the control group is 0.5144.[10] With a power of 80 percent and a 5 percent significance level, we find a necessary sample of 9,866 participants in total. The control and treatment group consist of 4,933 participants each. This is a large number, and indicates that the effect might be too small to be of any economic interest.

---

[9]When we were present, the two group interviews lasted 53 and 48 minutes. When we were absent, the interview lasted almost 90 minutes.

[10]We calculate the standard deviations (SD) for the two groups by using the formula $SD = SE*\sqrt{n}$, where SE are the respective standard errors from Table 2 and n is the total sample size.

However, since our estimated effect is not significant, we cannot say anything about its real size. If the actual effect is larger than we have been able to find, one could detect it with a smaller sample size than we have calculated above. In addition, due to the small sample size of the pilot, the standard deviations of the treatment and control groups appear to be unreasonably large. We therefore find it interesting to estimate sample sizes for other given effects and standard deviations. In particular, we find it appropriate to apply the standard deviation of the sample of Almås et al. (2015) in Macedonia, and compare it to the arithmetic mean of our standard deviations from Kenya. This is because the Macedonia study is similar to ours and has a larger sample. Also, the treatment and control group in Kenya are close to equal in size, and we find the arithmetic mean suitable to apply in comparison.
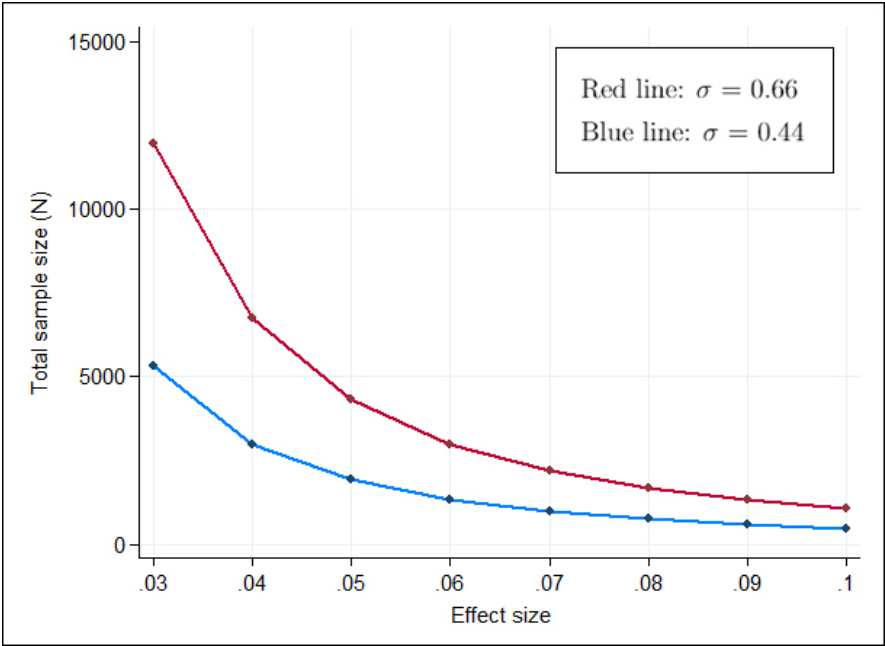
t-test assuming $\sigma_1 = \sigma_2 = \sigma$
$H_0 = \mu_1 = \mu_2$ versus $H_1 = \mu_1 > \mu_2$

Figure 4: Estimated total sample size for a two-sample means test.

Figure 4 presents power calculations for different experimental effects. The x-axis denotes the possible effect sizes, and the y-axis plots the required sample size to detect the given effects, using a one-sided test with power $p = 0.80$ and significance level $\alpha = 0.05$. The blue line has standard deviation $\sigma = 0.44$, which equals that of the Macedonian sample. The red line has standard deviation $\sigma = 0.66$, which is the arithmetic mean

63

of the standard deviations in the Kenyan sample.[11] Figure 4 shows that the required sample size decreases in line with a decreasing standard deviation and an increasing effect size. It illustrates that with the standard deviation of the Macedonian sample, we would need less than half the sample size that we initially calculated above to detect our observed effect of 3.36 percentage points. An additional power calculation gives us a precise sample size of 4,244 with this lower standard deviation.

When assessing the qualitative analysis, information still seems to have a certain influence on women's empowerment in the household. This gives motivation for further research on the topic. Yet, our results indicate that this pilot did not hold the appropriate design to elicit the mechanisms of how information plays a role. For future research, the design should therefore be considerably adjusted. Even though we find women to care about what information is given to their husbands, this was not crucial for their decisions in the lab. As a result, different approaches should be investigated to develop an applicable design for further research.

When conducting experiments abroad, translation may cause challenges. In the Female Empowerment Pilot, lab instructions and interview questions were translated into Swahili. Even if several native speakers read through the texts and assured us that they were accurately translated, we encountered one noteworthy language barrier. In the instructions, the participants were informed that the payment they would obtain from the experiment was randomly selected from all of their choices. However, the expression *random selection* does not translate well to Swahili. Because of this, the Kenyan research assistants struggled to agree on how to translate it properly. Even though they landed on an option that was believed to be suitable, some participants in one of the group interviews expressed difficulties understanding this. One woman said that she did not understand how one of her options had been selected, and she was upset with the small amount that she had received. However, the participant still claimed to understand the instructions, and therefore we do not think that this translation misguided her in the experiment. Still, when conducting further research it would be useful to find alternative ways to explain expressions that are not easily translated.

---

[11]We find the arithmetic mean of the standard deviations in the Kenyan sample with the following calculation:

$$\sigma_{Kenya} = \frac{(\sigma_{treatment} + \sigma_{control})}{2} = \frac{(0.7975 + 0.5144)}{2} = 0.66$$

While conducting the research in Nairobi, we received valuable assistance from the staff at Busara and locals in Kibera. This provided us with first-hand knowledge on socioeconomic and cultural factors, which would have been hard for us to obtain by ourselves. We acknowledge how valuable this cooperation was for our project. For further research in Kenya or other developing countries, we consider such a collaboration with local organizations and people to be of great help.

7 Conclusion

The main objective of the Female Empowerment Pilot has been to study how different information structures affect women's empowerment when they are subject to a cash transfer. In addition, it attempted to investigate how women in low-income households can be empowered by such a transfer, as well as provide insight into their influence over financial decisions and general empowerment in the household. The project was carried out in Nairobi, Kenya in February 2016 and consisted of a lab experiment followed by qualitative interviews, some in groups and some individually.

Women's empowerment is measured through their willingness to pay for receiving a cash transfer. They can either choose their husbands as the recipient of the transfer, or give up a portion of the amount in order to keep it themselves. In the treatment group, the husbands will be informed about the transfer, while this information can be kept private in the control group. The results from the lab do not show any systematic differences in willingness to pay between two groups with private and common information. Even though the direction of the treatment effect is negative, and therefore in line with our hypothesis, it is neither large nor significant. As a consequence, we cannot prove that this effect actually exists, and hence we fail to reject the null hypothesis that there is no difference in willingness to pay between the two groups.

Even though we do not detect systematic differences in behavior under the two information structures, the qualitative interviews reveal that information might still have a certain effect on women's empowerment. All the interviewed women deny that information influenced their decisions in the lab experiment, yet many still prefer the cash transfer to be kept secret from their husbands. When the husbands are informed about the outcome of the experiment, several women also report to suffer financially because of it. These findings thus indicate that information might still affect women's empowerment to some degree, even though we were not able to elicit this exact mechanism.

The results from the lab experiment also provide us with knowledge of the participants' average level of empowerment. The women are willing to give up more than 50 percent of the cash transfer in order to be the recipient of it, independent of being in the treatment or control group. This number is significantly larger than 0, and the unitary household model is thus rejected. The average willingness to pay is also significantly

larger than the corresponding result from Almås et al. (2015) in Macedonia. In the thesis, we argue that high willingness to pay reflects a low empowerment. Based on the participants' high willingness to pay, we therefore conclude that this is the case for women in low-income households in Kenya.

When testing demographic variables, we find education to have a highly significant negative effect on willingness to pay. This is interpreted as education being an empowering factor for women in low-income households. We argue that this is mainly caused by them contributing with a larger share of the total income. In addition, their increased empowerment can also be explained by an improvement in general bargaining skills as a result of increased education.

In the qualitative interviews, women reveal a strong financial dependence on their husbands. Few women bring regular income to the household and the most common arrangement is that the husband is the main provider. The women do, however, appear to have a certain financial bargaining power, and they also hold the main responsibility for budgeting in the household. Nevertheless, this seemingly only applies to whatever share of the total income her husband decides to give her. In addition, questions about divorce reveal that some women consider marriage to mainly serve a practical purpose. A strong majority also reports domestic violence to be common even though they usually do not consent to such actions. Based on these findings, we argue that women are somewhat submissive to their husbands, and that their overall empowerment in the household is limited.

When assessing how women are empowered by a cash transfer, we argue that those who initially have low empowerment seem to keep the cash transfer themselves. Their expected empowerment is higher when information is kept private rather than common, even though the household sharing rule remains the same. The women with initially high empowerment tend to give the cash transfer to their husbands, and the different information structures do not appear to influence their empowerment noticeably. We therefore conclude that despite the lack of statistical significance, different information structures still seem to matter to a certain degree for women with relatively low empowerment. These findings offer implications for policy developments. If a cash transfer program targets women with low empowerment, our research suggests that the most optimal result will be achieved if the husband is not informed about the transfer.

References

Almås, I., Armand, A., and Attanasio, O. (2015). Identifying the effect of targeted money transfers on women's empowerment.

Angrist, J. D. and Pischke, J.-S. (2008). *Mostly Harmless Econometrics: An Empiricistís Companion.* Princeton University Press.

APHRC (2012). Population and health dynamics in Nairobi's informal settlements: Report of the Nairobi cross-sectional slums survey. Technical report, African Population and Health Research Center, Nairobi, Kenya.

Ashraf, N. (2009). Spousal control and intra-household decision making: An experimental study in the Philippines. *American Economic Review*, 99(4):1245–1277.

Attanasio, O. P. and Lechene, V. (2014). Efficient responses to targeted cash transfers. *Journal of Political Economy*, 122(1):178–122.

Becker, G. S. (1974). A theory of social interactions. *The Journal of Political Economy*, 82:1063–1093.

Bonke, J. and Browning, M. J. (2009). Pooling of income and sharing of consumption within households.

Browning, M., Chiappori, P.-A., and Weiss, Y. (2014). *Economics of the Family*, volume 4 of *10*. Cambridge University Press, 1 edition.

Cappelen, A. W. and Tungodden, B. (2012). Adferdsøkonomi og økonomiske eksperimenter. *Magma*, 15(5):26–30.

Chiappori, P.-A. (1992). Collective labor supply and welfare. *Journal of Political Economy*, 100(3):437–467.

Chiappori, P.-A. and Donni, O. (2009). Non-unitary models of household behavior: A survey of the literature.

Chiappori, P.-A. and Ekeland, I. (2009). The microeconomics of efficient group behavior: Identification. *The Journal of The Econometric Society*, 77(3):763–799.

Chiappori, P.-A., Lawrence Haddad, J. H., and Kanbur, R. (1993). Unitary versus collective models of the household: Time to shift the burden of proof? *Quarterly Journal of Economics*, 10(1):1–19.

Cilliers, J., Dube, O., and Siddiqi, B. (2014). The white-man effect: How foreigners presence affects behavior in experiments. *Journal of Economic Behavior Organization*.

Dragset, S. and Ellingsen, S. (2009). Forståelse av kvantitativ helseforskning - en introduksjon og oversikt. *Nordisk Tidsskrift for Helseforskning*, 5(2):100–113.

Duflo, E. (2003). Grandmothers and granddaughters: Old-age pensions and intrahousehold allocation in South Africa. *World Bank Economic Review*, 17(1):1–25.

Falk, A. and Heckman, J. J. (2009). Lab experiments are a major source of knowledge in the social sciences. *Science*, 326(5952):535–538.

Flick, U. (2014). *An Introduction to Qualitative Research*. Sage Publications.

Iversen, V., Jackson, C., Kebede, B., Munro, A., and Verschoor, A. (2011). Do spouses realise cooperative gains? experimental evidence from rural uganda. *World Development*, 39(4):569–578.

Jack, W. and Suri, T. (2010). The economics of M-Pesa.

Kishor, S. and Subaiya, L. (2008). Understanding women's empowerment: A comparative analysis of demographic and health surveys data. Technical Report 20, DHS Comparative Reports, Calverton, Maryland, USA.

Levitt, S. D. and List, J. A. (2007). What do laboratory experiments measuring social preferences reveal about the real world? *Journal of Economic Perspectives*, 21(2):153–174.

Lundberg, S. J., Pollak, R. A., and Wales, T. J. (1997). Do husbands and wives pool their resources?: Evidence from the United Kingdom child benefit. *Journal of Human Resources*, 32(3):463–480.

Marshall, C. and Rossman, G. B. (2011). *Designing Qualitative Research*. Sage Publications.

Rode, A. (2011). Literature review: Non-unitary models of the household (theory and evidence).

Samuelson, P. A. (1956). Social indifference curves. *Quarterly Journal of Economics*, 70(2):1–22.

Saunders, M., Lewis, P., and Thornhill, A. (2012). *Research methods for business students*. Pearson Education.

The World Bank (2012). World development report: Gender equality and development. Technical report, The World Bank, Washington DC., USA.

Thomas, D. (1990). Intra-household resource allocation: An inferential approach. *The Journal of Human Resources*, 24(4):635–664.

UN (2015). The millennium development goals report. Technical report, United Nations, New York, USA.

Wooldridge, J. M. (2013). *Introductory Econometrics A Modern Approach*. South-Western Cengage Learning.

Yin, R. K. (2011). *Qualitative Research from Start to Finish*. The Guilfor Press.
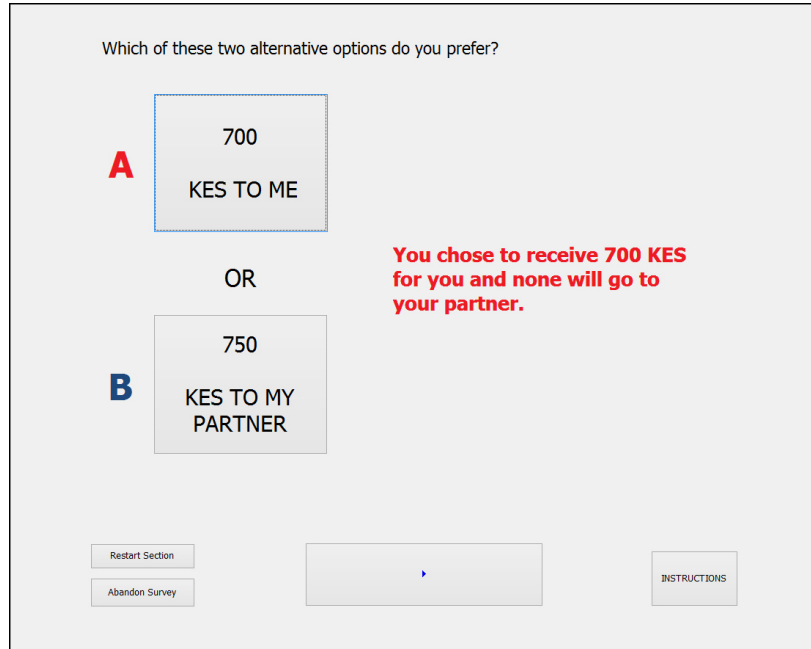
A Experiment Screenshots

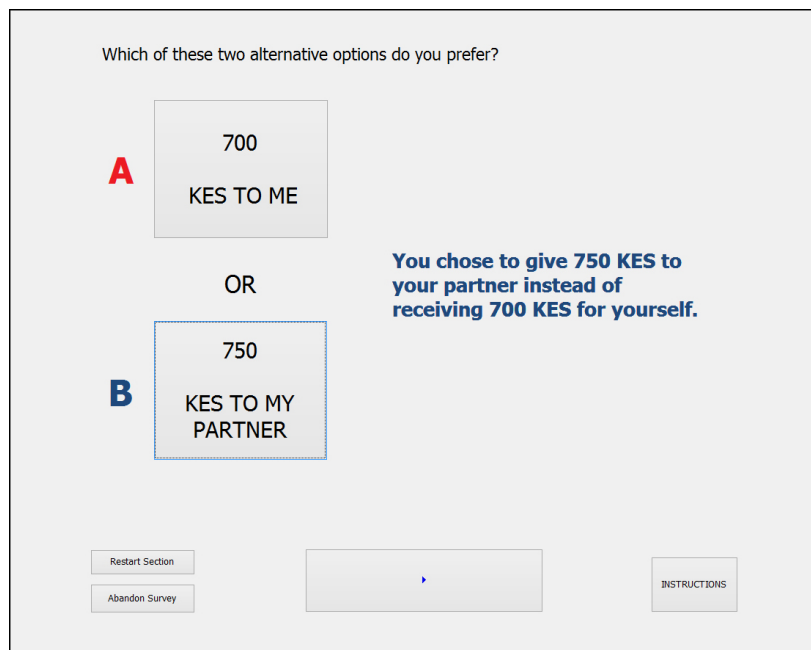Figure 5: Example of choice situation: Keeping the money herself.

Figure 6: Example of choice situation: Giving the money to the husband.
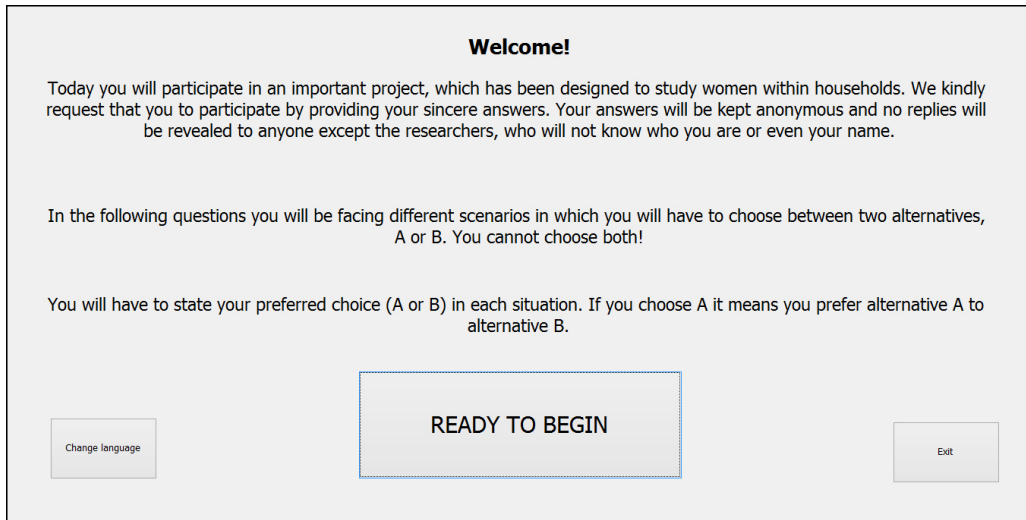
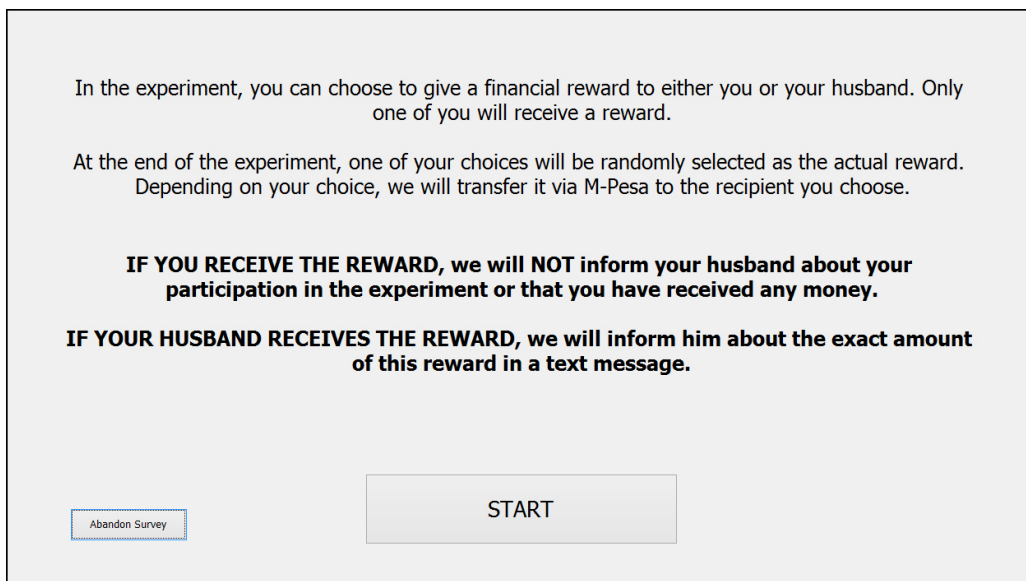Figure 7: The introduction of the experiment (similar for both groups).

Figure 8: Experiment instructions for the control group.

In the experiment, you can choose to give a financial reward to either you or your husband. Only one of you will receive a reward.

At the end of the experiment, one of your choices will be randomly selected as the actual reward. Depending on your choice, we will transfer it via M-Pesa to the recipient you choose.

IF YOU RECEIVE THE REWARD, we will inform your husband about the exact amount of this reward in a text message.

IF YOUR HUSBAND RECEIVES THE REWARD, we will inform him about the exact amount of this reward in a text message.

Abandon Survey

START

Figure 9: Experiment instructions for the treatment group.

B   Qualitative Interviews

Group Interviews

The groups will consist of participants from both treatment and control group and thus the questions will be the same for all group interviews.

Questions for the Group Interviews

Reasoning behind choices

1. How did you find the instructions?

2. Do you have suggestions to how they could be improved?

3. When you chose between transferring money to yourself or money to your spouse, what did you base your decisions on?

4. Did you have any difficulties making the choices?

    a. If yes: what was difficult and why?

    b. If no: why was it easy?

Household economy

5. If it was up to you only, what would you spend the money from the experiment on?

6. If you received the money, what will the money be spent on? If your husband received the money, what do you think the money will be spent on?

7. Will your husband influence the spending, and in what way?

8. In your household, how much of the total income is being spent on personal items that only you use, and not the rest of the family?

9. In your household, how much of the total income is being spent on personal items that only your husband uses, and not the rest of the family?

10. On a monthly basis, how much does your household spend on your children's:

    a. Education?

    b. Food?

    c. Activities?

    d. Clothes?

11. In your household, how much of the total income is being spent on food?

12. Which financial decisions do wives normally make in the household?

13. Which financial decisions do husbands normally make in the household?

14. In your social circle, do husbands and wives usually agree on what their money

should be spent on?

15. If they disagree, who has the final say?

16. In a typical household in your neighborhood, who earns more, the husband or the wife?

General empowerment indicators

17. In your neighborhood, how likely is it that a married woman would divorce her husband?

18. Does it happen that you and your spouse argue about discipline of the children? If yes, what do you usually disagree on?

19. Sometimes a husband is annoyed or angered by things that his wife does. In your opinion, is a husband justified in hitting or beating his wife if she argues with him? Does this often happen in your neighborhood?

20. In your opinion, is a husband justified in hitting or beating his wife if she leaves the house without telling him? Does this often happen in your neighborhood?

21. In your opinion, is a husband justified in hitting or beating his wife if she spends money without telling him? Does this often happen in your neighborhood?

Individual interviews

The questions for the individual interviews will vary slightly depending on if the participant belongs to the treatment or control group.

Questions for the Treatment Group (Common Information)

Reasoning behind choices

1. When you chose between transferring money to yourself or money to your spouse, what did you base your decisions on?

2. Did you have any difficulties making the choices?

    a. If yes: what was difficult and why?

    b. If no: why was it easy?

3. How much did it influence your choices that we informed your husband about the financial reward in the experiment?

4. How would it affect your choices if we did not inform your husband about the financial reward?

Household economy

5. Did you choose to transfer the money to yourself or your husband?

6. (If she chooses the money to herself):

    a. Why did you choose to take the money to yourself?

    b. Did you tell your husband about the money?

    c. How did you spend the money?

    d. Did your husband influence the decision?

7. (If she chooses to transfer the money to her husband):

    a. Why did you choose to transfer the money to your husband?

    b. If it was up to you only, what would you spend the money on?

    c. What was the money spent on?

8. In your household, how much of the total income is being spent on personal items that only you use, and not the rest of the family?

9. In your household, how much of the total income is being spent on personal items that only your husband uses, and not the rest of the family?

10. In your household, how much of the total income is being spent on your children?

11. On a monthly basis, how much does your household spend on your children's:

    a. Education?

    b. Food?

    c. Activities?

    d. Clothes

12. Which financial decisions do you normally make in the household?

13. Which financial decisions do you normally need your husband's approval on?

14. Which financial decisions does your husband normally make in the household?

15. Do you and your husband usually agree on what your money should be spent on?

16. If you disagree, who has the final say?

17. If you could participate in the experiment one more time, would you have made different choices?

General empowerment indicators

18. In your neighborhood, how likely is it that a married woman would divorce her husband?

19. Does it happen that you and your spouse argue about discipline of the children? If yes, what do you usually disagree on?

20. Sometimes a husband is annoyed or angered by things that his wife does. In your opinion, is a husband justified in hitting or beating his wife if she argues with him? Does this often happen in your neighborhood?

21. In your opinion, is a husband justified in hitting or beating his wife if she leaves the house without telling him? Does this often happen in your neighborhood?

22. In your opinion, is a husband justified in hitting or beating his wife if she spends money without telling him? Does this often happen in your neighborhood?

Questions for the Control Group (Private Information)

Reasoning behind choices

1. When you chose between transferring money to yourself or money to your spouse, what did you base your decisions on?

2. Did you have any difficulties making the choices?

 a. If yes: what was difficult and why?

 b. If no: why was it easy?

3. How much did it influence your choices that we that we did not inform your husband about the financial reward in the experiment?

4. How would it affect your choices if we informed your husband about the financial reward in the experiment?

Household economy

5. Did you choose to transfer the money to yourself or your husband?

6. (If she chooses the money to herself):

 a. Why did you choose to take the money to yourself?

 b. Did you tell your husband about the money?

 c. How did you spend the money?

 d. Did your husband influence the decision?

7. (If she chooses to transfer the money to her husband):

 a. Why did you choose to transfer the money to your husband?

 b. If it was up to you only, what would you spend the money on?

 c. What was the money spent on?

8. In your household, how much of the total income is being spent on personal items that only you use, and not the rest of the family?

9. In your household, how much of the total income is being spent on personal items

that only your husband uses, and not the rest of the family?

10. In your household, how much of the total income is being spent on your children?

11. On a monthly basis, how much does your household spend on your children's:
    a. Education?
    b. Food?
    c. Activities?
    d. Clothes

12. Which financial decisions do you normally make in the household?

13. Which financial decisions do you normally need your husband's approval on?

14. Which financial decisions does your husband normally make in the household?

15. Do you and your husband usually agree on what your money should be spent on?

16. If you disagree, who has the final say?

17. If you could participate in the experiment one more time, would you have made different choices?

General empowerment indicators

18. In your neighborhood, how likely is it that a married woman would divorce her husband?

19. Does it happen that you and your spouse argue about discipline of the children? If yes, what do you usually disagree on?

20. Sometimes a husband is annoyed or angered by things that his wife does. In your opinion, is a husband justified in hitting or beating his wife if she argues with him? Does this often happen in your neighborhood?

21. In your opinion, is a husband justified in hitting or beating his wife if she leaves the house without telling him? Does this often happen in your neighborhood?

22. In your opinion, is a husband justified in hitting or beating his wife if she spends money without telling him? Does this often happen in your neighborhood?

C   Two-Sample T-Test

Two-sided test, independent means and unequal variances

Formulas

First, we calculate the t-statistic t by the following formula:

$$t = \frac{(\overline{x_1} - \overline{x_2}) - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}},$$

where $\overline{x_1}$ are $\overline{x_2}$ the two independent sample means, and s_1 and s_2 are the sample standard deviations of two sets of data of size n_1 and n_2 respectively. The degrees of freedom of t is $df = n_1 + n_2$ - 2.

The critical value is $\pm\, t_{\alpha/2}$, where α denotes the significance level. We reject the null hypothesis in favor of the alternative if $t < $ - $t_{\alpha/2}$ or $t > t_{\alpha/2}$. Comparing the t-statistic to the critical values is equivalent to comparing the p-value to the significance level α.

Testing sample means in Macedonia and Kenya

First, we calculate the t-statistic:

$$t = \frac{(0.531 - 0.195) - 0}{\sqrt{\frac{0.390^2}{64} + \frac{0.336^2}{768}}} = \mathbf{6.684},$$

where 0.531 and 0.195 are the respective sample means from Kenya and Macedonia. The sample standard deviation from Kenya is 0.390, and the corresponding number from the Macedonian sample is 0.336. The Kenyan sample size is 64, while the Macedonian is 768. From these sample sizes, we find the degrees of freedom to be 64 + 768 - 2 = 830. With a 5 percent significance level, we get a critical value of $\pm$ 1.97.

Since $t > 1.97$, we reject the null hypothesis that the average willingness to pay is the same for the two samples. It is significantly larger in the sample from Kenya.

Appendix D
Pre-Analysis Plan
Private money or household money?
Pilot

Project managers:
Ingvild Almås, Alex Armand and Orazio Attanasio

Research assistants:
Tiril J. Gudevold and Ida E. Kjørholt*

Spring 2016

Contents

---

*Gudevold and Kjørholt serve as research assistants on this research project and are contributing substantially to the preparation of this document as well as the conduction of the pilot study.

Abstract

This document describes the analysis plan for a pilot studying whether informing husbands about spousal income affects the women's behavior in a willingness to pay elicitation game. The game elicit the willingness to pay for receiving a transfer instead of having the spouse receiving it and was proposed by Almås, Armand, Attanasio and Carneiro (2015). For the treatment group, information about earnings from the experiment is revealed to the spouse, whereas for the control group, no information is revealed. The aim is to study if there is any sign of hiding or whether targeted transfers seems to go into the collective household pot. These results will inform us whether the collective model set-up is reasonable or models that assume hiding of money is more appropriate. We also conduct in-depth interviews with the participants after the experiment in order to further search for an understanding of the environment and mechanisms at play.

1 Introduction

A recent study shows that women, on average, are willing to pay part of a transfer offered to them in order to receive it instead of their spouse receiving it (Almås et al, 2015). This indicates that a transfer to them give them power over spending. However, the exact empowerment mechanism, i.e., how money transfers give them power, is not easy to nail down without knowing whether the woman hides the money she receives, i.e., she spends them outside of any household decision mechanism, or whether the money are included in the household budget and through the increase in her contribution increases her power over household decisions.

The research project described in this plan search to contribute to enlighten the question of mechanisms and help us qualify the model choice, by observing the effect on decision making and allocation of household consumption with and without the husbands being informed about women's earnings.

We observe women's actions in two different scenarios; when the spouse is informed about the outcome of the experiment and when the spouse is not informed. This allows us to study whether the participants become more willing to pay for receiving the transfer themselves when the knowledge about the outcome is private. If this is the case, we have an indication that money hiding is taking place.

2 Research Strategy

The research project is implemented in February 2016 at the Busara Center for Behavioral Economics in Nairobi, Kenya.

We recruit 60 women living in low income households in and around Nairobi. The participants are recruited from Busara's subject pool. They are married women from low income households in Kibera, the largest slum in East Africa. Each participant is accompanied by an assistant, who reads the instructions out loud in either English or Swahili and helps with the practicalities throughout the experiment. The lab experiment is conducted in approximately 15 smaller sessions.

The first 40 participants are interviewed individually approximately a week after the sessions have ended. The interviews are carried out by Kenyan research assistants in the participants' own houses. The remaining 20 participants are divided into groups of five to eight and interviewed together directly after the session has ended. These interviews take place at Busara, also these by Kenyan research assistants.

3 Theoretical Framework

We assume that each household has two (potential) income earners, which are also the (potential) decision makers, a woman and a man. The total income of the household is given by $x = x_A + x_B$, where x_A is the woman's income and x_B is the man's income. We assume that all of the household's income is spent each month, so that total income equals total expenditure.

We define the distribution factor f, which is the share of total household income that the woman contributes with. Denoting initial pre-experimental variables with subscript 0, we can write:

$$f_0 = \frac{x_0^A}{x_0^A + x_0^B}. \tag{1}$$

In the experiment, the woman makes several decisions regarding a cash transfer (see Almås et al (2015) and examples given below). She can either choose that her husband receives an amount E, or that she receives the same amount but at a cost. The cost varies across choice situations. Through the sequence of choices, the woman elicit her willingness to pay, defined as a share of the total amount, denoted s. If she pays exactly her willingness to pay to receive the payment, she receives $(1-s)E$.

We define f' to be the revised f that we observe if the woman receives the cash transfer of $E(1-s)$ to herself:

$$f' = \frac{x_0^A + (1-s)E}{x_0^A + x_0^B + (1-s)E}. \tag{2}$$

Similarly, we define f'' to be the woman's share of total household income when the husband receives a cash transfer E:

$$f'' = \frac{x_0^A}{x_0^A + x_0^B + E}. \tag{3}$$

Since the cash transfer also affects the household's total income, we define x' as the total income when the wife receives $(1-s)E$, and x'' as the total income when the husband receives E:

$$x' = x_0^A + x_0^B + (1-s)E, \tag{4}$$

$$x'' = x_0^A + x_0^B + E, \tag{5}$$

We know that the willingness to pay is defined such that the woman is indifferent between the husband receiving the payment and herself receiving it at the cost of s. We will denote the sharing rule ρ, indicating the share of resources that the wife has the power over. With this we can write the following:

$$v^A(x', \rho(f')) = v^A(x'', \rho(f'')). \tag{6}$$

The left hand side corresponds to the indirect utility of the woman when she receives an amount $(1-s)E$ and her contribution to the total household income increases to f'. The right hand side is the indirect utility of the woman when her partner receives an amount E and her contribution decreases to f''.

3.1 With common knowledge

With common knowledge in the household, we assume that the two household members pool their income. In such a case, the husband is to be informed that either he or the wife receives a cash transfer as an outcome of the lab experiment. He is also to be informed about its size, independent of who the transfer is targeted to.

We consider a simple version of the collective household model where the woman maximizes:

$$v_{ck}^A = v(\rho(f)x). \tag{7}$$

Here, x either has the value x' or x'', depending on who the woman targets the cash transfer to. ρ is the revised share of the total income that the woman decides over, as a result of the new income distribution f. The new size of ρ depends on the woman's decision: If she targets the cash transfer to herself, her decision power is assumed to increase to ρ'. If she decides that the man should get the transfer, it decreases to ρ''. In this way we can write $\rho'' \leq \rho_0 \leq \rho'$.

3.2 With private knowledge

With private information to the woman, the husband is not informed that the woman has received a cash transfer in the lab. In the extreme case, the woman chooses to hide all the money and maximize:

$$v_{pk}^A = v(\rho_0 x_0 + (1-s)E), \tag{8}$$

where the initial income x_0 remains the same, as well as her decision power over the initial income, ρ_o. In addition, the woman receives an amount $E(1-s)$ that she completely decides over.

3.3 Identifying the willingness to pay in the two models

We know that if the husband gets the money, both parties know it and it would always be the model without hiding that is applied. Hence, the utility for the woman is identical in both treatments. Then, we know from Equation 6, that the utility for the woman when receiving the money and paying exactly what she is willing to pay, is also identical for both treatments and independent of model. We can thus predict the willingness to pay from the two models by the following identity:

$$v_{pk}^A(s_1, \cdot) = v_{ck}^A(s_2, \cdot). \tag{9}$$

We could solve for this equality directly which gives us the following relationship between s_1 and s_2:

$$(1-s_1) = (1-s_2)\left[\rho_0 + \frac{\partial \rho}{\partial f}\left((1-f) + \frac{x_B E}{x^2}(1-s_2)\right)\right]. \tag{10}$$

We could also look at the changes implemented by the experiment and use a first order Taylor approximation:

$$(1-s_1)E = \rho_0 \Delta x + x_0 \Delta \rho = \rho_0(1-s_2)E + x_0 \frac{\partial \rho}{\partial f}\frac{x_0^B}{x_0^2}(1-s_2)E. \tag{11}$$

Which can be simplified to:

$$(1 - s_1) = (1 - s_2) \left[\frac{\partial \rho}{\partial f} \frac{x_0^B}{x_0} + \rho_0 \right] = (1 - s_2) \left[\frac{\partial \rho}{\partial f} (1 - f) + \rho_0 \right]. \qquad (12)$$

This means that if $\partial \rho / \partial f (1 - f) + \rho < 1$ then $s2 < s1$, that is, if the woman can hide the money, she has a higher willingness to pay. If ρ is a linear function of f, then the maximum value of $\partial \rho / \partial f$ is 1 and as both ρ and f are shares and related, it may be reasonable to assume that this is true. Hence, the theory guides us to hypothesis that if hiding of money takes place, the women should be more willing to pay in the private information (control) treatment.[1]

4 Design

The participants take part in two stages of the research project: one lab experiment and one qualitative interview.

4.1 Lab Experiment

The participants are randomly assigned to either the treatment or the control group.

- **Control group: Private knowledge**

  The husband does not receive information about the wife's participation nor the outcome of the experiment. The only situation in which he is informed about the outcome is if the woman selects him to be the one to receive the cash transfer, or if she decides to tell him about it herself. The woman is informed about this in the beginning of the experiment.

- **Treatment group: Common knowledge**

  The husband is informed about the wife's participation and the outcome of the experiment, and the woman is informed about this in the beginning of the experiment. However, the husband is told that the payment from the experiment is randomly selected from several possible outcomes, and that it does not necessarily represent all the choices that the woman has made in the lab. Because of this, it serves no purpose to compare her payment with that of other women who also participated in the experiment.

4.1.1 Instructions control group

At the beginning of each session, the following instruction appear on the tablet screen:

Today you will participate in an important project, which has been designed to study women in households. We kindly request you to participate by providing your sincere answers. Your answers will be kept anonymous and no replies will be revealed to anyone except the researchers, who will not know who you are or even your name.

In the following questions you will be facing different scenarios in which you will have to choose between two alternatives, A or B. You cannot choose both. You will have to state your preferred choice (A or B) in each situation. If you choose A it

---

[1]However, if the woman is in a situation where she can affect the sharing rule a lot by increasing her salient income (assuming ρ is not linear in f and that she is at a convex part of the curve), and/or if she already has a low share of the income, $\partial \rho / \partial f (1 - f) + \rho$, the expression may be equal to or larger than 1, and the woman may be more willing to pay when she cannot hide. We regard the latter as less likely (at least if looking at averages across all women in our sample), but we cannot rule it out without making the mentioned assumptions.

means you prefer alternative A to alternative B.

In the experiment, you can choose to give a financial reward to either you or your husband. Only one of you will receive a reward. Depending on your choice, we will transfer the reward via M-Pesa to the recipient you choose. If your husband receives the reward, we will inform him about the exact amount of this reward in a text message. If you receive the reward, we will not inform him about your participation in the experiment or that you have received any money.

Choice situations: The participants had to choose between alternative A and alternative B in a sequence of choice situations. We refer to Almås et al (2015) for a full description of the experimental design, but we have included an example of a choice situation in Figure 1.
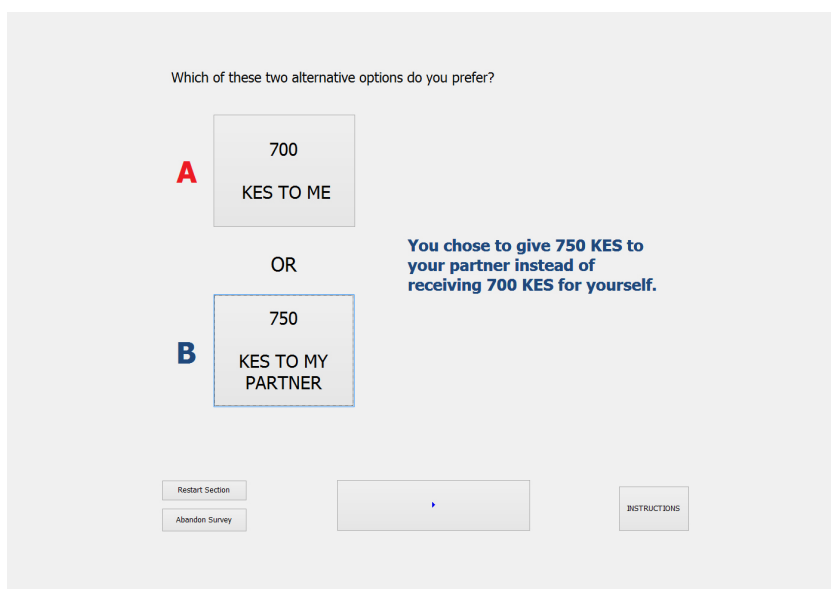

Figure 1: **Screenshot.** Example of choice situation

Note: The figure shows an example of a choice situation. For examples of whole sequences of choice situations, please see Almås et al (2015).

Text messages control group:

SMS (if husband receives the reward):
Your wife has participated in one of the experiments at Busara Center. Based on random selection, you will receive KES (amount) via M-Pesa.

No SMS is sent to the husband if the woman receives the reward.

4.1.2 Instructions treatment group

At the beginning of each session, the following instruction appear on the tablet screen:

Today you will participate in an important project, which has been designed to study women in households. We kindly request you to participate by providing your sincere answers. Your answers will be kept anonymous and no replies will be revealed to anyone except the researchers, who will not know who you are or even your name.

In the following questions you will be facing different scenarios in which you will have to choose between two alternatives, A or B. You cannot choose both. You will have to state your preferred choice (A or B) in each situation. If you choose A it means you prefer alternative A to alternative B.

In the experiment, you can choose to give a financial reward to either you or your husband. Only one of you will receive a reward. Depending on your choice, we will transfer the reward via M-Pesa to the recipient you choose. If your husband receives the reward, we will inform him about the exact amount of this reward in a text message. If you receive the reward, we will also inform your husband about the exact amount of this reward in a text message.

Choice situations: As for the treated, the participants in the control group had to choose between alternative A and alternative B in a sequence of choice situations. Again we refer to Almås et al (2015) for a full description of the experimental design and Figure 1 for an example of a choice situation.

Text messages treatment group:

SMS (if husband receives the reward):
Your wife has participated in one of the experiments at Busara Center. Based on random selection, you will receive KES (amount) via M-Pesa.

SMS (if husband does not receive reward)
Your wife has participated in one of the experiments at Busara Center. Based on random selection, she will receive KES (amount) via M-Pesa.

4.2   Qualitative Interviews

After the experiment, some of the participants are interviewed in groups, whereas others are interviewed in their homes a week later. In appendix [B in the master thesis], we provide a list of questions meant as guidelines for the qualitative interviews. As this section of the design is highly exploratory, some deviation from the exact questions is to be expected.

5   Empirical strategy

5.1   Research question

The experiment is designed to study whether common or private knowledge in the household affects the choices that the woman makes in the lab, and her decision power over the cash transfer that she or her husband receive as a result of her choices in the lab. This is tested trough one main hypothesis that concerns the woman's decision making in the lab directly, and several subsidiary hypotheses (based on the qualitative interviews) that deal with her decision power over the total household income.

5.1.1 Main hypothesis (based on lab experiment)

The project tests the following main hypothesis:

- H_0: There is no difference in willingness to pay, s, between the control and the treatment group. The participants on average choose to target the cash transfers similarly in the two groups, and the average outcomes of the experiment is thus independent of common or private knowledge.

- H_1: The participants in the treatment group on average have a lower willingness to pay for receiving the cash transfer than in the control group.

5.1.2 Subsidiary research questions (based on qualitative interviews)

- Who has more power over financial decisions taken in the household, the husband or the wife?

- If the husband and wife disagree on what to spend money on, who will have the final say?

- Are women who give a general impression of being less empowered in the household also likely to have less power in financial decisions?

- Do women who give a general impression of being less empowered in the household have a higher willingness to pay, s, to receive the cash transfer to themselves?

5.2 Specifications and analysis

5.2.1 Main hypothesis

We test the main hypothesis by running the following regression:

$$s = \beta_0 + \beta_1 T + \beta_2 X + \epsilon \tag{13}$$

where the dependent variable s is the woman's willingness to pay for receiving the cash transfer instead of the husband receiving it. T is a dummy variable that equals 1 if the participant is in the treatment group, and equals 0 if the participant is in the control group. The independent variable X consists of the participant's background variables.