Spousal Control and Intra-Household Decision Making: An Experimental Study in the Philippines*

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Job Market Paper #1

Abstract

Savings decisions are observed at the household level, but little is understood about how such decisions are jointly made by the members of the household. This paper employs a new experimental design to examine two poorly understood factors in household spending and savings decisions: private information and communication between spouses. Married couples in the Philippines were given approximately a day's wage and asked to make financial decisions under three randomly assigned treatment conditions: private information-no communication ("private"); full information-no communication ("public"); and full information-full communication ("negotiation"). I find that men's decisions are highly responsive to changes in these conditions, whereas women's decisions remain stable. In private, the majority of men choose to save in their own accounts. In public, when their wives find out about their decision but can not affect it beforehand by communicating, men choose to consume their income. In negotiation, after communication with their spouse, the majority of men decide to save their income in their wives' account. The strong effect of information and communication on men can be understood through a monitoring framework, whereby wives are entrusted with enforcing a contract that requires husbands to turn over their income. Wives' monitoring is improved through both observability of income and communication at the moment of decision making. These results suggest that current household models are incomplete and that policy makers should put more weight on the conditions under which income allocation decisions are made.

JEL Codes: D190, J120, 0150, C900, C790

Keywords: Intra-Household, Bargaining, Experiments, Economic Development

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1 Introduction

Household outcomes depend on decisions made by spouses who may often disagree. Given these potential differences in preferences, the particular situations under which intra-household decisions are taken may matter a great deal for household outcomes. A large and growing literature in economics provides evidence from several countries that household savings and investment are significantly affected by how decision-making power is allocated between women and men. Particularly, when intra-household financial decisions are made by women, savings and investment are often greater and repayment of debt is more likely.[1]

Theoretical and empirical work in economics has generally overlooked the range of factors that influence intra-household decisions.[2] Most models of household decisions have either treated a household as an individual decision maker—ignoring intra-household decisions completely—or modelled household decisions as a bargaining process between agents who are able to make binding commitments, have full information, and are able to communicate.[3] These models, all of which predict that outcomes will be Pareto optimal, are contradicted by empirical evidence against Pareto optimality (Udry, 1996) and complete information (Goldstein and Udry, 1999, Boozer and Goldstein, 2003). More realistic assumptions, such as the possibility of private information and limited communication between spouses, may be needed.[4]

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[1] For example, income given to women is more likely to be used for investments in education, children's nutrition, and housing than income in the hands of men (Thomas (1990, 1994), Haddad and Hoddinott (1995), Khandker (1998), Duflo (2003)). Lundberg, Startz and Stillman (2001) find that households where a woman's bargaining power rises through her husband's retirement raise their savings rate. Hossain (1988), Hulme (1991), Gibbons and Kasim (1991), Khandker et al. (1995), and Armendariz de Aghion and Murdoch (2003) all find that microfinance loans made to women are significantly more likely to be repaid.

[2] There is, however, a substantial sociological literature on the processes of intra-household decision making, which emphasizes the importance of financial management structures in the family and the role that information and communication can play in making decisions within a marriage (see, for example, Dwyer and Bruce, 1988).

[3] See, for example, Manser and Brown (1980), McElroy and Horney (1981) and Lundberg and Pollak (1992). Chiappori (1992) and Browning and Chiappori (1998) do not make assumptions about the specific bargaining process or structure, but assume that the bargaining outcome will be efficient.

[4] As Bardhan and Udry argue, "If the efficient household model cannot adequately account for the intra-

Empirical work on intra-household bargaining has suffered from problems of endogeneity. Increasingly, empirical studies use plausibly exogenous shocks to one spouse's income to identify its effect on household outcomes and infer individual preferences.[5] However, who receives the income is only one factor which may affect the household outcome; other factors, which relate to the process of decision making, are less studied and more difficult to measure. Using self-reports and survey data to understand these other factors has observational problems; it is difficult to elicit honest responses from both spouses on survey questions about what truly happens in the household when income is allocated. Furthermore, it is difficult or impossible to observe information shared, or not shared, between spouses.

In order to gain insight into how information and communication affect intra-household decisions, I use an experimental approach. I observe intra-household financial decisions in a randomized field study. Subjects were given a sum of money, approximately a day's wage, and asked to make actual savings and consumption decisions.[6] The experiments were carried out with a sample of existing or previous clients—and their spouses—of a rural bank in the Philippines. Each subject was randomly assigned, along with his or her spouse, to one of three settings that had different limitations placed on the privacy of information and the possibility of spousal communication.

In the first condition (denoted "Private"), subjects are separated from their spouses at the onset of the experiment and do not know what their spouse is doing, whether their spouse has received any income, what decisions their spouse is making, or what outcomes he/she receives; as much information as is possible is kept private from the spouse. In the second condition ("Public"), subjects and their spouses enter the room together, learn about their

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household allocation of resources, it appears that it will be necessary to move towards more detailed, culturally and institutionally informed non-cooperative models of the interaction between household members" (Development Microeconomics, Oxford, 1999, p18).

[5]See, as examples in a growing literature, Duflo (2003), Duflo and Udry (2004), Rangel (2004).

[6]In this experiment, savings consisted of directly depositing their earnings into a bank account, and consumption consisted of receiving earnings in cash or pre-committing it to designated consumption in the form of gift certificates for food and apparel.

own and each others' payoffs and choice sets, and make simultaneous decisions; however, they cannot communicate or see the decisions the other is making until after their decisions have been made. In the third condition, ("Negotiation"), subjects and their spouses follow the same procedure as "Public", but they communicate before making their decisions and their decisions are immediately observable to each other. Due to random assignment, the distribution of individual and household characteristics is approximately the same across all treatment conditions. Any significant difference in outcomes, therefore, can be attributed to the difference in treatment condition.

I find that men's saving decisions are strongly influenced by conditions of full information and full spousal communication. In Private, the majority of men choose to save in their own accounts; in Public, when their wives find out about their decision but can not affect it beforehand by communicating, men choose to consume their income; and in Negotiation, after communication, the majority of men decide to save their income in their spouse's account. In contrast, women's decisions remain stable across settings.

The significant influence of full information and communication on men confirms that current models of household decision making are incomplete. Underlying the effect of information and communication appears to be the mechanism of monitoring; in my sample, women monitor the behavior of their husbands. This is consistent with the cultural setting of these experiments; in the Philippines, men are expected to turn their earnings over to their wives for budgeting and allocation, but women often complain that their husbands do not turn over all their income. The pattern of women as financial managers who monitor their husband's use of income is found in many developing countries and in low income U.S. and U.K. households.[7] Such a financial management system can be seen as a contract, agreed to

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[7] In 70% of British low income families, and in only 25% of higher income families, Pahl (1993) found that wives manage the finances in the family; husbands are expected to turn over their income to their wives to manage. In 70.5% of Indonesian couples, the wife decided all money matters (Hanna Papanek & Laurel Schwede (1988)). In supplementary surveys of my subjects in the Philippines, I find that 80% of households have the wife hold the income and do the budgeting; in 49% of households the wife also makes the

at the time of marriage, which the wife is expected to enforce.[8]

Monitoring is a common way to alleviate the problems of moral hazard and asymmetric information in contract enforcement. The experiments varied two important monitoring technologies: observability (between Private and Public) and communication (between Public and Negotiation). One effect of communication, if it is undertaken at the time of decision making, is that it clarifies the terms of the contract for the specific decision being made, and serves as a reminder of the commitment to the contract; given this clarification, the monitor could, for example, justify greater punishment if the contract is then explicitly defied. We would thus see monitors being more successful with enforcing contracts in a condition of full information and full communication, as in the Negotiation condition. The fact that men save the money in their spouse's account in Negotiation, but find ways to avoid turning over their income to their wives in the other conditions, is consistent with the use of communication as a monitoring technology. The fact that men choose to save in their own accounts in Private, when their choices won't be revealed to their wives, but in the Public condition commit their income to consumption - in forms that would be difficult to fully undo in subsequent budget allocations by their wives - is consistent with the importance of information in the monitor's task.

I propose a framework of income monitoring within the household, where observability of income and communication at the time of decision making make a significant difference in the monitor's effectiveness. This has implications for future research in household decision making and for policy. It implies that limited commitment and imperfect contractability are

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major decisions about saving or spending money. This is not necessarily a source of rents in the household: budgeting and deciding about saving can be an onerous task when money is short.

[8]The following quote illustrates the degree to which financial management and turning over income can be part of a marriage contract, particularly in cultural settings like the Philippines: "I give him his daily allowance. His cigarette and liquor consumption is part of our budget because he buys them on credit at the store. I am the one in-charge of paying our debts every payday. I believe that husbands should turn over their earnings to their wives. At the marriage ceremony the coins are turned over by the groom to the bride. What is the significance of the marriage rights if husbands won't turn over their earnings to their wives?"-Baby, a homemaker in Mauswagon, Philippines (Echavez, 1996)

more realistic assumptions in household decision making models. It argues that spouses who are expected to turn over income to their partner may have an incentive to hide shocks to income, particularly if such shocks are less observable. The possibility of such income hiding should be taken into account in household survey design, through asking spouses separately about income and expenditure, and analysis, through accounting for possible downward bias in income reported. Finally, it suggests that programs which transfer income solely to women and exclude men, as growing numbers of development programs do,[9] could achieve their aims by providing income to the husband and wife together and sufficiently strengthening women's monitoring technology, through full observability of income and - crucially- enforced spousal communication about how the income transfer should be used before it is dispersed. Such program design would avoid the unfortunate negative externalities that can arise from the exclusion of men, who lose relative earning power in the household as a result of these programs and may seek to recover their power through increased domestic violence.[10]

The remainder of the paper is organized as follows. Section 2 describes the experimental design: the setting, outcomes and conditions. Section 3 describes a conceptual framework of monitoring, through which we can view the experimental conditions and interpret the results. Section 4 then summarizes the main experimental results. Section 5 discusses implications of the results for future research and policy and concludes.

2 Experimental Design

2.1 Experimental Setting

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[9] Indeed, the World Bank in a recent report, "Engendering Development" (2001) encouraged such programs, arguing that providing income to women is a good investment with high private and social returns.

[10] There is qualitative evidence from PROGRESA, a large scale program in Mexico which gave income transfers to women, that some program households experienced higher incidents of domestic violence (Adato et al, 2000). As one local official of the program described to the researchers, 'you see that woman, her husband hits her because he wants the money,' and you see the other one, he gets angry because he doesn't want her to go here and there [for the PROGRESA meetings].' (p82)

The experiments were run with 146 married couples in the conference rooms of Green Bank, a rural private bank in Mindanao, the Philippines. The subject pool was drawn from previous and existing clients of Green Bank and their spouses. Recruiters went door-to-door and invited subjects and their spouses to a study for which they would receive a 40 pesos show up fee each and the opportunity to earn more money.[11] For approximately 100 of these households, who had been involved in a large scale randomized field experiment (Ashraf et al. 2004), I have extensive baseline survey data regarding level of household income, individual income, and all savings, loans, and financial assets information. Using this data, I find that subjects who took up the invitation to come to the experiment were not significantly different in most characteristics from those who were in the original sample but did not take up the invitation.[12] Appendix Table A1 shows the results of the determinants of take up of the experiment.

Once the couples were recruited, they arrived at the laboratory at a pre-arranged time for the experimental session. Experimental sessions were randomly assigned across days and session times.[13] After the experiment was completed, individual-level surveys were conducted with each subject either directly after the experiment was finished in the lab or in the subsequent two to three days in the homes of the subjects. These surveys were conducted with each spouse separately and privately. The questions included measures of education, occupation, income variability, immediate money needs, how income is received and how much, if any, is given to the spouse. Additional questions were asked about decision making and conflict in the household, including perceptions of patience, impulsiveness, and responsibility of one's spouse and problems with liquor and gambling.

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[11] 50 pesos=approx. $1USD. Recruiters did not specifiy amount of additional money that could be earned.

[12] Subjects who took up the experiment were not significantly different from those who didn't on the domains of age, education or place of residency. Female clients were slightly less likely to take up the invitation and, when total household income is controlled for, own contribution to household income has a negative effect on take-up of the experiment.

[13] Recruiters did not know what this schedule was.

Table 1 provides some summary statistics of the sample from both the baseline survey and the individual-level surveys. This was a broad sample of married couples, with substantial heterogeneity: subjects ranged from newlyweds to married for more than 50 years, from relatively poor for this region to relatively well off, from having completed only one year of education to those having graduated from college. Not all subjects were bank clients: only 39% of men and 47% of women had accounts at Green Bank. Both husband and wife work in the majority of these couples (approximately 70%); in 60% of all couples the husband brings in more income than the wife. Consistent with the sociology literature cited in Section 1, the wife is the one who holds the income in the family and does the budgeting in more than 80% of these couples. Finally, almost 40% of couples in the sample reported to having conflict over money issues in the household. Appendix Table A2 shows these summary statistics by treatment condition, for both households and for women and men separately; all but one variable means are statistically indistinguishable across conditions.[14]

2.2 Experimental Outcomes

Subjects earned the equivalent of a day's wage (200 pesos=$4), which they received at the end of the experiment, and another 200 pesos in 3 months' time, given to them in the form of a post-dated check from the bank. They are fully informed about their payment only once they enter their particular experimental condition. During the experiment, subjects were asked to make several decisions in advance about what they would like to do with both their earnings today and their earnings in 3 months' time. One of these decisions is randomly chosen to be implemented at the end of the experiment.[15] Subjects also receive a show up

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[14]The only variable which is statisically different across conditions is education; subjects in Negotiation have, on average, two years less education than subjects in the Private or Public conditions. Controlling for education, with dummies for all education groups, does not change the main experimental results. Table 3 reports these specifications.

[15]There are 8 decisions in all. In all conditions subjects had a 1/9 probability of getting an outcome in which any decision they made was irrelevant: they received what was called "luck of the draw". This

fee, which is used in an additional experimental outcome.

Subjects make a number of decisions about whether they prefer their earnings in 200 pesos cash today, directly deposited into a savings account of their choosing,[16] or as a time-limited gift certificate for designated consumption, in the form of food or apparel for self, as shown in Figure 2. Using the strategy method, several choices were elicited which traded off cash against savings, gift certificates for food against direct deposit, and apparel for self against direct deposit.[17] For example, subjects chose between getting a 200 pesos gift certificate for a "special good for self" or getting 200 pesos directly deposited into a savings account.[18] Subjects also decided about a 200 pesos gift certificate for food, redeemable at a large number of grocery stores, or getting 200 pesos directly deposited into a savings account. Both types of gift certificates expired within 1-2 weeks of the experiment, and thus were a way of committing the income to a particular consumption good.

For all savings deposit outcomes, subjects could choose to deposit it into their own account, their spouse's account or, if they didn't have an account, into a new account in their name. Subjects were also asked, in one of the decisions they made, to decide for their spouse what the spouse should do with the cash they receive today.[19]

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was done so that it was very difficult to know from the outcome someone received what their decisions had been, unless one saw all the decisions—thus allowing "plausible deniability" to the subjects in the privacy condition.

[16] The four choices for where savings could be deposited were: own existing account, a new account opened in own name, spouse's account, or a joint account.

[17] Other choices, not reported in the main text but reported in the Appendix, included cash against different values of gift certificates, accounts in the name of a child, and short and long horizon time preferences, evaluated using certified bank post-dated checks (with transaction costs equalized by requiring all subjects to come back 3 more times to the bank to "sign in" and receive 20 pesos (more than twice their fare to the bank) when they return: once in 2 weeks' time, once in 3 month's time, and once in 3 months + 2 week's time. Almost 90% of all subjects returned for these sign-in's and received their additional 20 pesos each time). In this paper, I focus on those outcomes which are related to trading off consumption against direct deposit saving, and refer to these additional outcomes only when they are compared with saving.

[18] This gift certificate is only redeemable in the women's apparel department for female subjects, and in the men's apparel department for male subjects. After several trials using different "private goods", this was what appeared to appeal to the broadest variety of both men and women as special, indulgent goods for themselves.

[19] Subjects were asked, through a series of discrete choices, for what amount of money should the spouse be willing to wait for two weeks, rather than getting the 200 pesos cash today. Subjects were told that if this

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2.3 Experimental Conditions

Subjects, upon arriving at the laboratory with their spouses, were randomly assigned to one of three conditions under which they made decisions about saving or spending an endowment. In the first condition ("Private") subjects were separated from their spouses upon arrival and told that the women were to be in one room and the men in a different room. Once the subjects were settled into their respective rooms, they were registered and told about how much money they were getting and which decisions they were going to be asked to make. Subjects are explicitly told at the beginning of the experiment that their spouse does not know whether they received any income or what choices they had, that their choices will be kept private and that they would be paid based on their choices before reuniting with their spouses. Outcomes and choices were obscured, and subjects were provided "plausible deniability" for their choices.[20] Contrary to the other conditions, subjects were given their outcomes separate from their spouse. Although spouses could attempt to learn the information when they went home, the outcomes were not fully verifiable and perfectly observable the way they were in the other two conditions.

In the second condition ("Public"), subjects and their spouses enter the room together, and each subject sits at a different table from his/her spouse in the same room. They both learn about their own and each others' payoffs and choice sets, and make simultaneous decisions; however, they cannot communicate or see the decisions the other is making until all decisions have been made. They know that their choices will be fully revealed to their spouse once the experiment is over. At the end of the decision making process, subjects

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decision was the one chosen, these choices would actually be implemented for their spouse. This decision, therefore, elicits a combination of the subject's desire for and their expectations of their spouse's behavior.

[20] As discussed, this was provided through the luck of the draw mechanism. In all conditions subjects had a 1/9 probability of getting an outcome in which any decision they made was irrelevant: they received what was called "luck of the draw". This was done so that it was very difficult to know from the outcome someone received what their decisions had been, unless one saw all the decisions. This feature interacted differently with the Private condition, since in the other two conditions spouses saw each other's entire range of choices.

meet with their spouse, show each other all the decisions they made, and discuss. They are not allowed to change any decision at this point. When the couple returns together to compare responses, local researchers fill a supplement detailing each subject's decision and their response to their spouse's decision, as well as any discussion or conflict between the spouses that ensued.

In the third condition, ("Negotiation"), subjects and their spouses follow the same procedure as "Public", but they are required to communicate before making their decisions and their decisions are immediately observable to each other. Couples are instructed to tell each other what they would like to do for each decision, discuss what would be best to do, and then to make their final (individual) decisions.[21]

Figure 1 provides a schematic diagram of the experimental design.

3   Theoretical Framework

3.1   Basic Setup

In order to interpret the results of the experiment I consider a simple theoretical framework. Consider a marriage between two players, a man (Player M) and a woman (player W). I will assume that at the beginning of marriage W and M contract about financial management in the household, and that the contract takes the following form: M will turn over his income to W and W will allocate it according to the family's needs and give M an allowance for his

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[21] A detailed supplement for each couple is coded by local researchers for each decision, encompassing: the initial position of each spouse, arguments used for persuasion by each side (if initial positions were different), who appeared to dominate the negotiation process, the ultimate decision taken by each spouse, and whether the final outcome appeared to be more a result of convergence of preferences through dialogue or domination of one spouse's preferences (or a mutual agreement to disagree, if final individual decisions remained different). Although some of these variables are necessarily subjective, the local researchers who were able to tell rather quickly in most cases under what category the negotiation process falls, and who appears to dominate. Analysis on these measures shows that who dominates the majority of decisions in the negotiation is significantly correlated with which spouse has more years of education.

needs. This contract could have arisen because W has a comparative advantage in budgeting, because M uses W as a commitment device[22], or for some other reason, but I will take its existence as given in this setting. Let any non-regular income shock which M receives in a given period (such as a bonus, a gift, unusually high number of clients in one day, or earnings received in an experiment) be Y. M has three available actions: $\{T, H, C\}$, where T is to turn over all the income to W, H is to hide all the income from W and use it for private consumption, and C is to commit the income to a form of private consumption, which has valuation βY, where $0 \leq \beta \leq 1$. The parameter β captures the idea that M is weakly worse off by constraining his consumption set.

I am interested in the following type of contract. If M turns the money over to W then she allocates a fraction θ to household consumption and M keeps fraction $1 - \theta$ for private consumption. The parameter θ can be thought as W's tax rate on M's income. If M plays H then, with probability p, W finds this out, performs the allocation as before, and imposes a punishment whose monetary equivalent is P. If M plays C then the probability of being caught is $\widehat{p}$, which is not necessarily equal to p. If he gets caught after playing C then W imposes punishment P and tries to reallocate the budget to undo his consumption commitment. W may not be able to fully reallocate the budget, which is captured by parameter α,.where $0 \leq \alpha \leq 1$. Hence, in this circumstance, M gets $(1 - \alpha\theta)Y$ for private consumption. For the moment, I take P to be exogenous. For simplicity I assume that both M and W are risk-neutral. Under this contract, M's expected utility is as follows:

$$
\mathbb{E}\left[U_M\right] = \begin{cases} (1-\theta)\,Y & \text{if turns over income} \\ (1-p)Y + p\left((1-\theta)Y - P\right) & \text{if hides income} \\ (1-\widehat{p})\beta Y + \widehat{p}\left((1-\alpha\theta)Y - P\right) & \text{if commits income} \end{cases}
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[22]In my surveys, the majority of men, when asked why it is that their wife holds the income in the family, respond that they would spend it if they held the money.

M's decision about which strategy to play will depend on the parameters. I state two propositions which characterize the optimal strategy for M.[23]

Proposition 1 *(1) M prefers strategy H to strategy T if and only if*

$$p \leq \frac{\theta Y}{\theta Y + P} \tag{1}$$

(2) M prefers stategy C to strategy T if and only if

$$\widehat{p} \leq \frac{Y(\beta + \theta - 1)}{Y(\beta + \alpha\theta - 1) + P} \tag{2}$$

(3) M prefers strategy H to strategy C if and only if

$$p \leq \frac{\widehat{p}(\theta\alpha Y + P - Y) + Y - (1 - \widehat{p})\beta Y}{\theta Y + P} \tag{3}$$

Men who face higher tax rates θ, who receive larger income shocks Y, and who get lower punishments P will be more likely to hide money or commit to consumption rather than turning over their money to their wives. They will prefer hiding to committing consumption if the value of the available consumption good as compared to cash, parameterized by β, is relatively low and the ability to reallocate the budget, parameterized by α, is relatively high.

Proposition 2 *(1) M prefers strategy H to strategy T if and only if*

$$P \leq \frac{\theta Y(1 - p)}{p} \tag{4}$$

(2) M prefers stategy C to strategy T if and only if

$$P \leq \frac{Y(\beta + \theta - 1) - \widehat{p}Y(\beta + \alpha\theta - 1)}{\widehat{p}} \tag{5}$$

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[23]Proofs are omitted because they follow immediately from the definition of utility.

(3) M prefers strategy H to strategy C if and only if

$$P \leq \frac{(1 - \widehat{p})\beta Y + p\theta Y + \widehat{p}Y(1 - \theta\alpha) - Y}{(p - \widehat{p})} \tag{6}$$

These conditions reformulate the previous conditions in terms of cutoff levels of punishment. Thus, Condition 4 shows that the threshold punishment level P for M to prefer hiding to turning over is increasing in the tax rate θ, the size of the income shock Y, and decreasing in probability p.

3.2   Experimental Treatments

In the experiment I vary two parameters: p and P. In the Private condition, spouses lack information about the other spouse's income received, choices made, and outcomes. Thus, in Private the income shock Y was at least partly unobserved such that $p < 1$. In Negotiation and Public, the income shock Y and all choices are fully observed and hence $p = 1$

In the Negotiation condition spouses were forced to communicate and discuss their preferences throughout the decision making-process. Communication could have many effects. In this framework, we focus on the effect of stating preferences explicitly on expected punishment. The difference between the Public and Negotiation condition captures the difference between explicit defiance and tacit defiance, the former of which might invoke greater punishment because it implies greater guilt. In the Public condition, without full certainty about the spouse's preferences or willingness to punish, the husband could plausibly deny guilt about knowingly breaking the contract. For any given sample of households with a distribution of P (which could be based on prior history and existing characteristics), the imposition of Negotiation acts to shift upwards *the entire distribution.*

The following table summarizes the values for p and P under the three experimental

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conditions:

Parameters	Private	Public	Negotiation
P	$\underline{P}$	$\underline{P}$	$\overline{P} > \underline{P}$
p	< 1	1	1

As stated, there is a distribution of the other exogenous variables (θ, β, α) among the population, but random assignment ensures that the expected distribution of these variables is the same across treatment conditions. Therefore, the different treatment conditions make the conditions given in Propositions 1 and 2 *more or less easy to satisfy*, given the distribution of parameters (θ, β, α) in the population. I discuss each pair of treatment conditions separately.

Case 1: Private to Public

Increasing p, while holding all other parameters constant, will lead to a larger proportion of men who commit income to consumption, rather than try to hide their money or turn it over, in the Public condition than in the Private condition. This would also predict that in households where wives make the savings decisions, or men have less bargaining power, (higher θ) men would be more likely to either try to consume income they receive, unless they to do so would be in explicit defiance, or hide it, if they are given the opportunity.

Case 2: Public to Negotiation

The key difference between the Negotiation condition and the Public condition lies in the extent of communication. As described above, we may expect that communication can lead to greater expected punishment if the husband does not comply with turning over his income.Increasing P, while holding all other parameters constant and with $p=1$, will lead to a larger proportion of men turning over income in the Negotiation condition as compared to

the Public condition, rather than committing it to consumption. Hiding money was not an option in these two conditions because all income and choices were revealed to the spouses.

Case 3: Private to Negotiation

In the Negotiation condition, both observability p and the level of punishment P increases in comparison to the Private condition   W's ability to monitor improves with both parameters and therefore combines the effects discussed in Case 1 and Case 2. Thus a larger proportion of men will choose turning over money rather than hiding income or committing it to consumption.

4   Results

Table 2 describes the main results of the experiment for savings outcomes, by the three treatment conditions and for men and women separately, using Fisher's exact p-values. The first row of results describe what percent of subjects chose to put the 200 pesos into a savings account rather than receiving a gift certificate for apparel, which could only be used for themselves (labeled "Gift Certificate for Self").

As Table 2 shows, men were much more likely to fall into the category of sacrificing cash for direct deposit than women were, and much more likely in the Private condition than in any other condition. Comparing Columns (3) and (4) to Columns (1) and (2), we can observe the effect of obscuring information, moving p from 1 to <1 in the above framework, on husbands and wives. Several important facts were purposely obscured in the Private condition: whether the spouse was receiving income, whether the spouse had the same choices available to them, what the spouse actually chose, and what the spouse actually got. These were designed to mimic situations in which spouses might receive temporary shocks to income and choices about what to do with that income that their spouse may not find out about. Spouses' choices and outcomes were not revealed to the spouse after

the experiment. Moving from Public to Private can therefore only tell us the net effect of obscuring information about spouse's income and choices, but cannot tell us definitively which aspect of the information was most important.

I find a strong effect of obscuring information on men's outcomes, but no significant effect on women's outcomes. Across all outcome variables, a large majority of men prefer to directly deposit their income in the Private condition but, importantly - and in contrast to the Negotiation condition- they choose to deposit it into their own accounts. The following section discusses this result. Columns (3) and (4) discuss the outcomes for men and women in the condition of full information, "Public," where choices were revealed to spouses after the experiment. In this Public condition, only 42 % of men, compared to 60% of women, prefer to deposit the 200 pesos they receive in the experiment into a savings account, rather than taking a gift certificate for themselves, consistent with much of the empirical literature cited previously that additional income given to men results in more selfish consumption whereas income in women's hands often results in increased savings for the household. The difference between men and women's outcomes is significant at 5% level. This result, however, changes significantly once decision-making contexts are changed.

Columns (5) and (6) describe outcomes once husbands and wives are able to bargain and communication is enforced, in the Negotiation condition: 72% of men and 70% of women now choose savings over a gift certificate for themselves. Although the difference in means is not significant for women, the almost doubling in means for men is significant at the 1% level. This is consistent with the prediction from the monitoring framework, whereby communication is used to explicitly state preferences and reinforce the contract. Indeed, the supplements on the Negotiation condition revealed strong statements women made to persuade their husbands to turn over their income by saving it in the wife's account, often repeating "remember you have a family" and sometimes saying a child's name repeatedly until the husband made his decision. These tactics, in many cases, appear to have worked:

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men overwhelmingly chose to deposit the income into their wives' accounts, rather than into their own account or a new account opened in their own name. Subjects' choices about whether they wanted the money deposited into their existing account, a new account opened in their name, their spouse's account or a joint account are analyzed in Table 7.

The subsequent rows in the table show the same pattern: in Public, the majority of men choose consumption, in subsequent forms of food[24] and cash, over directly depositing their money, but significantly shift to directly depositing their income in the Negotiation condition. The last row of outcomes describes choices of getting 200 pesos in cash immediately after the experiment, or direct depositing varying quantities into a savings account at the bank. Using the strategy method, subjects revealed the range in which they were indifferent between receiving cash or receiving a direct deposit into savings. Figure 3 shows the distribution of this outcome variable by treatment type, to describe how they were categerized in the table.

Subjects within each treatment condition tended to fall into three categories: those who always chose cash, to any amount offered for direct deposit into a savings account (referred to in the table as "strongly prefer cash"), those who choose direct deposit of 225 over 200 cash (referred to in the table as "weakly prefer cash"), those who prefer 200 pesos into direct deposit above 200 cash (referred to as "weakly prefer direct deposit"), and those who were willing to choose a direct deposit of less than 200 pesos (at 175, 150 and 125; as can be seen from the graph, the majority of subjects who were willing to go down to 175 pesos were willing to go all the way down to 125 pesos) rather than receive 200 pesos cash (referred to collectively as "strongly prefer direct deposit"). These subjects were thus essentially sacrificing money in order to make sure it is deposited into the savings account.[25]

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[24]Although food can be shared, and is thus not a strictly selfish good, it is a highly desirable consumption good among men in the Philippines. Other studies (Ligon and Dubois, 2004) have shown the degree to which husband's receive better quality, and quantity, of food in the household when their wages increase.

[25]In debriefing surveys after the experiments, subjects who responded in this way explained that the direct deposit was "segurado" and used the popular Filippino expression "Inig ang kuarto"- the money is hot- to describe why they felt that they did not trust themselves to deposit the cash into the savings account on their own, despite being at the bank.

These treatment effects for men across all outcomes remain highly significant at the 1% level when controlling for observable characteristics, such as age, education, bank account status, daily wage, liquidity constraints (whether the subject was able to pay for their expenses that week), and whether the couple has conflicts over money. Table 3 shows probit estimations of all outcomes from the main table when controlling for observables. These observables have relatively less explanatory power for men's outcomes, when compared to the effect of the treatment conditions, than they do for women's choices: women who have higher wage, lower education and more conflict within the household over money are more likely to choose savings under 200. The effects of information and communication through the treatment conditions on women's decisions, however, remain insignificant when controlling for observables.

The correlation between husband's decisions and his wife's decisions is on average between 0.10 and 0.4 in the Private and Public conditions, and between 0.8-0.95 in the negotiation condition. Correlations between spouses' outcomes across conditions and aggregated household outcomes across conditions are shows in Table 4. When the outcome variables are aggregated at the household level and compared, in Table A6, we see that increasing monitoring, through communication, increased savings in a coordinated account. Appendix Table A3 shows the differences between husbands' and wives' decisions.

Tables 5 and 6 are consistent with the prediction that in households where wives make the savings decisions, or men have less bargaining power, (higher θ) men would be more likely to either try to consume income they receive, unless to do so would be in explicit defiance, or hide it, if they are given the opportunity. Men with spouses who are more likely to make the savings decision—or even have more bargaining power in general—in the household exhibit a much sharper "u-shaped" effect from Private to Public than average. That is, the interaction of these household conditions with the treatment of making information public in the experiment causes men to save much less in the experiment. Furthermore, we can

see from Table 7 that men are much more likely to put the money into their own accounts when they save in Private, as are women, in fact. In the Public condition, men switch to consuming and women switch to saving in a more public (spouse or joint) account. In the Negotiation condition, couples either consume jointly or save jointly, and coordinate on one person's account (usually the wife's) in which to deposit the money.

As Table 7 shows, the majority of men save in their own account in the Private condition but switch to consumption in the Public condition. In the Negotiation condition, the majority of men who save, save in their spouse's account. Women on the other hand tend to switch from saving in their own account in the Private condition to saving in the spouse's or joint account in the Public condition. One thing we might be concerned about is the variation in the sample on who had personal savings accounts and whose spouses had accounts prior to the experiment; although the sample was randomly assigned to each condition, it was not stratified on the basis of spousal accounts and/or joint accounts. The regression below, Table 8, shows that the probability of saving in one's own personal account increases significantly if one had an account at Green Bank prior to the experiment. However, even controlling for account status, being randomly assigned to the Public condition significantly decreases men's probability of saving in their own account as compared to the base case of the Private condition. Being randomly assigned to the Negotiation condition also decreases men's probability of saving in their own account as compared to the Private condition, but with a smaller coefficient and only significant at the 10% level. However, what men choose as an alternatives to saving in their own account differs in the Public condition and the Negotiation condition; Table 7 shows that men prefer personal consumption to private savings in the Public condition, whereas they prefer saving in spouse/joint account to private saving in the Negotiation condition.

5   Conclusion

Using an experimental design I am able to elicit causal effects of spousal observability and communication on household choices. I find that women are relatively unresponsive to changes in monitoring situations, but men seem to behave strategically in response to the conditions. More specifically, men are likely to hide extra income if their spouse is unlikely to find out about it, but more likely to try to commit themselves to consumption if the spouse will observe their income. I suggest an interpretation in which hiding of income is a significant motive of actions of men, particularly when women are the financial managers in the family. Allowing for hideability of income and private information within the household has implications for the design and use of household survey data on income and on the interpretation of commonly observed informal savings institutions in developing countries, two applications which I explore below.

Private information can be applied to empirical work on intra-household decision-making and allocation. For example, I find some suggestive evidence of private information within the households in my sample, and recent work by Goldstein and Udry (2003) finds substantial differences in information within households. For evidence of private information, the ideal data set would be one in which both husband and wife are asked separately, and privately, about their own and their spouse's income and consumption. Goldstein and Udry (2003) did conduct one round of their household surveys in Ghana asking each module separately of wives and husbands, and found significant differences in information between husbands and wives about each other's income and expenditure. Unfortunately, this type of surveying is rarely done elsewhere when conducting household surveys; ordinarily, the only thing that husbands and wives are asked separately and privately about (and this only recently has become common practice) are the modules on decision making within the household.

However, even when household data comes only from the head of the household, ev-

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idence of private information about income and income hiding could be observed by the econometrician for household data sets which note whether the spouse was present when the survey was conducted. One could test whether there was a systematic downward bias on the incomes reported by men who were asked the survey when their spouse was present, compared to those who answered the survey questions privately. This, of course, has the challenge that heads of household who completed the survey with their spouse present may be different from those who completed the survey alone. Randomly assigning whether the spouse is present or not when the household survey is completed would help address this problem. Additionally, when household data sets can be matched to employer data sets one could check whether income reported by either spouse is systematically lower than that reported by the employer.

This type of measurement error in income, because it is non-random, can cause biased results when income is used as a right hand side variable. If income is under-reported due to concerns for keeping income information private and hidden from one's spouse, for example, one may mistakenly attribute outcomes to low income rather than to spousal conflict, which may itself have caused the reporting of low income. The presence of private information about income and expenditure in the household is important to take into account when both designing and analyzing household survey data.

Desire for hiding income in the household may also lead to a demand for committed savings. Understanding how private information interacts with existing household norms and structures about financial management can illuminate an emerging puzzle in the growing literature on Rotating Savings and Credit Associations (ROSCAs), informal savings organizations which are common around the world but which in some cultures are almost predominantly demanded by married women and in others are popular among both men and women. Anderson and Baland (2002) provide evidence that the motive of spousal control drives the demand for ROSCAs in Kenya, which are almost exclusively formed by women

and are much more likely to have married women than single women as members. Such informal savings clubs provide an opportunity for women to commit their money in advance and, the authors argue, keep it out of the control of their spouse who could make claims to it. Although in the majority of these cases, the women's husbands know about their participation in the savings clubs, there are other examples within Kenya of "secret savings societies" formed by women to keep extra income they earn in the workplace out of their husband's knowledge.[26]

In contrast, Ashraf, Karlan and Yin (2004) find that participation in informal savings clubs in the Philippines is more evenly balanced between men and women, and that married women are not more likely than single women to take part in such societies. This difference is likely due to the structure of financial decision making in these two cultures. Sociologists Papanek and Schwede (1988), in their study of informal savings groups in Indonesia, a culture in which women take on the role of financial manager in the household, argue that such groups serve very different purposes in different cultures.[27] This does not mean, of course, that spousal control is not an issue in the Philippines, but only that it would manifest in different forms. In cultures where men are the financial managers and women receive an allowance, informal savings groups provide a committed way for married women to save or hoard some of the money they receive. In cultures where women are the financial managers

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[26]K-Rep Development Agency in Kenya, who manages a number of village banks across the region, reports several cases of women's group savings accounts, where the identity and exact contribution amount of each member to the group's savings are kept secret. Anecdotally, individual women have also asked managers to keep their individual account passbooks at the bank, rather than taking them home, in order to hide the information from their husbands.

[27]They write, " the source of funds being saved through arisan-like groups is an important issue because the possibility of achieving a redirection of control over expenditures. In societies where household funds come primarily from male earnings and women have little say in decisions, women may achieve increased control by saving small amounts of household allowances, either accumulating them through a savings group or maintaining a secret hoard. But many Indonesian women already have considerable control over household budgets and expenditure decisions. Our respondents were saving mainly for capital goods that would benefit the whole household (including, of course, themselves) rather than any particular individuals. In this case arisan savings are part of a larger household financial strategy rather than a means of increasing women's personal control" (p81)

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and norms dictate that men turn over their income to their wife, men may desire ways to hide or keep some of their income private. I have proposed a monitoring framework whereby women try to monitor the degree to which men turn over all their income.

The results of this paper suggest that programs which transfer income solely to women and exclude men, as growing numbers of development programs do, could achieve their aims in an alternative way. Such programs could provide income to the husband and wife together, but sufficiently strengthen women's monitoring technology, through full observability of income and - critically- enforced spousal communication about how the income transfer should be used before it is dispersed. Designing income transfer programs in this way could avoid the negative externalities, such as increased domestic violence, that can arise from excluding men from such programs.

Previous empirical work which observes household outcomes and changes in member's incomes to draw conclusions about underlying preferences should be interpreted with caution, as such results can be determined as much by the bargaining process as by intrinsic preferences. Correspondingly, changes in bargaining process induced through changes in information - as in, for example, an intervention which reveals spouse's incomes - or communication - as in an income transfer program which requires joint decision making on certain financial outcomes - could interact with existing household structures of decision making to create vastly different outcomes.

6   Figures

Figure 1: Diagram of Experimental Design

	First Visit	

Husband & Wife enter Laboratory
Each receive 40 pesos show up fee.

Negotiation	Public	Private

Negotiation:

Subjects learn about own and spouses' income and choices sets

Husband and Wife discuss each experimental choice and make Individual Experiment Decisions

Exit

Public:

Subjects learn about own and spouses' income and choices sets

Individual Experiment Decisions | Individual Experiment Decisions

Husband & Wife Review Other's Decisions

Exit

Private:

Subject learns about own income and choice sets | Subject learns about own income and choice sets

Individual Experiment Decisions | Individual Experiment Decisions

Exit

- - - - → Wife

———— → Husband

All subjects participate in post-experiment survey about household characteristics and interactions.

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Figure 2: Experimental Choices

Present Consumption	**versus**	**Saving**	
			225 Pesos
			200 Pesos
200 Pesos Cash		Direct Deposit into Savings	175 Pesos
			150 Pesos
			125 Pesos
200 Pesos Gift Certificate for Food		200 Pesos Direct Deposit into Savings Account	
200 Pesos Gift Certificate for Self		200 Pesos Direct Deposit into Savings Account	

Note: Subjects chose whether they wanted the savings to be deposited into their own account, a new account in their name, their spouse's account, or a joint account.

Figure 3: Distribution of Preferences (All Conditions Pooled): Cash versus Direct Deposit

16.3%
2.1%
2.4%
17.7%
6.7%
54.7%

Cash Always

225 Direct Deposit over Cash

200 Direct Deposit over Cash

175 Direct Deposit over Cash

150 Direct Deposit over Cash

125 Direct Deposit over Cash
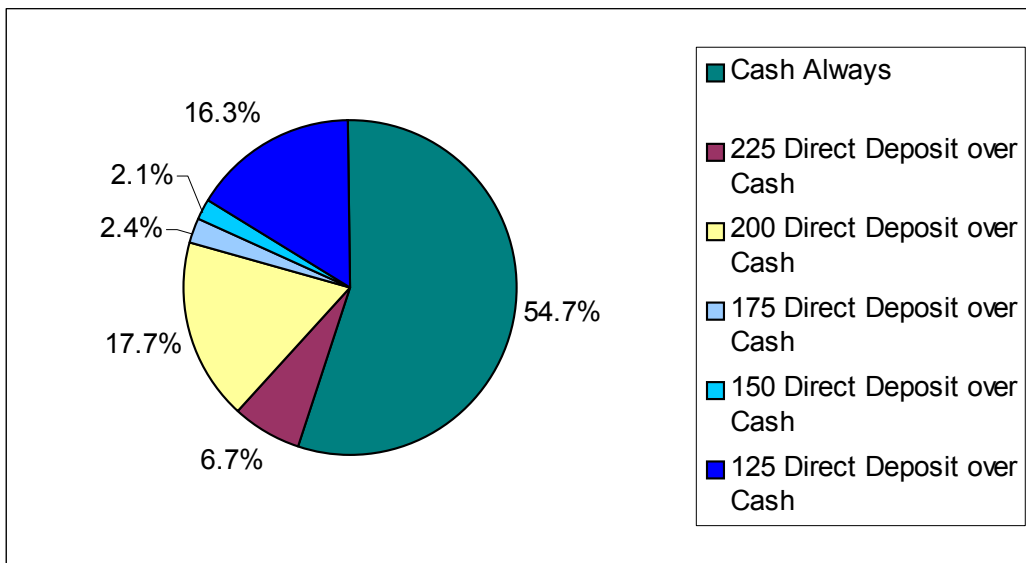
7 Tables

Table 1: Sample Summary Statistics

	Males (N=146)	Females (N=146)
Age	44.222	41.993
	(11.598)	(10.955)
Years Married	18.995	19.03
	(11.096)	(10.944)
	[N=131]	[N=131]
Number of Children	3.708	3.740
	(2.092)	(2.137)
Highest Grade Completed	10.379	11.411
	(3.262)	(3.369)
Daily Wage	370.475	401.990
	(1013.785)	(1509.505)
Median Daily Wage	*175*	*175*
Both Husband and Wife Work	0.738	0.724
	(0.441)	(0.448)
Husband Makes More Income than Wife	0.628	0.614
	(0.485)	(0.489)
Wife Holds Income in Household	0.834	0.841
	(0.373)	(0.367)
Wife Does Budgeting in Family	0.801	0.717
	(0.4)	(0.452)
Has an Account at Green Bank	0.386	0.469
	(0.489)	(0.501)
Couple has conflicts over money	0.356	0.393
	(0.481)	(0.49)
	[N=55]	[N=59]
Total Monthly Household Income*	8851.53	16042.44
	(5592.79)	(11986.98)
Total Savings*	1415.60	5138.729
	(3909.86)	(17295.81)

Means are in bold and standard deviations are in parentheses. The number of observations for variables with less than the total observations is shown in brackets.

Notes:

*These data come from baseline survey from Ashraf et al. (2004).

Table 2: Main Experimental Outcomes

	Private		Public		Negotiation	
	Male N=48 (1)	Female N=48 (2)	Male N=48 (3)	Female N=48 (4)	Male N=50 (5)	Female N=50 (6)
Prefer Direct Deposit over Self[a]	75.0%	62.5%	41.7%***	60.4%	71.4%+++	70.0%
Prefer Direct Deposit over Food[b]	60.4%	52.1%	21.7%***	41.7%	54.0%+++	56.0%
Direct Deposit into Savings Account						
Strongly Prefer Cash[c]	50.0%	56.3%	66.7%***	52.2%	54.0%	48.0%
Weakly Prefer Cash[d]	0.0%	12.5%	8.3%**	8.7%	6.0%*	4.0%
Weakly Prefer Direct Deposit[e]	17.0%	12.5%	12.5%	19.6%	20.0%	24.0%
Strongly Prefer Direct Deposit[f]	33.3%	18.8%	12.5%***	19.6%	20.0%	24.0%

***Significant at 1%, when compared to Private condition

**Significant at 5%, when compared to Private condition

*Significant at 10%, when compared to Private condition

+++Significant at 1%, when compared to Public condition

Notes: This table is a comparison of means across treatment groups for males and females.

[a]Percent of individuals who preferred direct deposit for 200 into savings account over gift certificate for self worth 200 pesos

[b]Percent of individuals who preferred direct deposit for 200 into savings accout over gift certificate for food worth 200 pesos

[c]Percent of individuals who prefer 200 pesos cash to any amount of direct deposit into savings account.

[d]Percent of individuals who prefer 200 pesos cash to direct deposit less than or equal to 200 pesos.

[e]Percent of individuals who prefer 200 pesos direct deposit to 200 pesos cash.

[f]Percent of individuals who prefer direct deposit for less than 200 pesos over 200 pesos cash.

Table 3: Main Experimental Outcomes, Controlling for Observables

Panel 1: Male

	Savings over Self[a]		Savings over Food[b]		Savings at 200+[c]		Savings at less than 200[d]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Public	-0.330***	-0.357***	-0.322***	-0.354***	-0.155	-0.174*	-0.174**	-0.242***
	(0.099)	-0.108	(0.092)	-0.099	(0.097)	-0.105	(0.068)	-0.069
Negotiation	-0.035	0.008	-0.056	-0.038	-0.029	-0.052	-0.100	-0.155**
	(0.104)	-0.118	(0.101)	-0.116	(0.099)	-0.111	(0.071)	-0.07
Green Bank Account		-0.092		-0.048		-0.025		0.025
		-0.074		-0.067		-0.055		-0.037
Daily Wage		0.087		0.058		0.017		-0.083
		-0.09		-0.095		-0.092		-0.072
Can Pay This Week's		0.097		0.219**		0.216**		0.068
Expenses		-0.093		-0.093		-0.089		-0.074
Couple has Conflicts Over		0.15		0.304***		0.180*		0.207**
Money		-0.092		-0.095		-0.094		-0.087
Education Group Dummies		YES		YES		YES		YES
Observations	144	138	145	139	145	141	145	128
Mean Dependent Variable	0.63	0.62	0.47	0.46	0.43	0.42	0.21	0.23

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Panel 2: Female

	Savings over Self[a]		Savings over Food[b]		Savings at 200+[c]		Savings at less than 200[d]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Public	-0.020	0.029	-0.104	-0.06	0.063	0.092	0.009	0.018
	(0.097)	-0.107	(0.101)	-0.11	(0.102)	-0.111	(0.086)	-0.085
Negotiation	0.076	-0.027	0.039	0.022	0.083	-0.018	0.053	-0.108
	(0.095)	-0.118	(0.101)	-0.116	(0.101)	-0.117	(0.085)	-0.08
Green Bank Account		0.097		0.224		0.086		0.061**
		-0.087		-0.193		-0.053		-0.026
Daily Wage		0.188*		0.167		0.16		0.189**
		-0.096		-0.102		-0.101		-0.086
Can Pay This Week's		0.004		-0.05		0.063		0.096
Expenses		-0.095		-0.097		-0.096		-0.071
Couple has Conflicts Over		-0.042		-0.042		0.123		0.118
Money		-0.094		-0.095		-0.096		-0.08
Education Group Dummies		YES		YES		YES		YES
Observations	146	130	146	143	146	141	144	130
Mean Dependent Variable	0.64	0.62	0.50	0.49	0.49	0.47	0.21	0.22

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Notes:

This table reports marginal effects from a probit estimation on binary outcomes, and shows the main effects of the experimental treatments on four main outcome variables, both alone and controlling for observable characteristics of the subject and the couple.

[a] Dummy for choosing direct deposit into savings account of 200 pesos over gift certificate for self worth 200 pesos.

[b] Dummy for choosing direct deposit into savings account of 200 pesos over gift certificate for food worth 200 pesos.

[c] Dummy for choosing direct deposit of 225 pesos and/or 200 pesos over receiving 200 pesos cash.

[d] Dummy for choosing direct deposit of less than 200 pesos (175, 150, 125) over receiving 200 pesos cash.

16 observations were dropped in (2) and (8) because education group=8 (completed elementary school) and education group=16 (completed college) predict failure perfectly.

Table 4: Correlations (Husband's Choice, Wife's Choice)

	Private	Public	Negotiation
Prefer Savings over Self[a]	0.1451	0.2520	0.9522
Prefer Savings over Food[b]	0.2408	0.3407	0.8796
Prefer Savings at Less than 200[c]	0.0072	-0.0283	0.7727
Prefer Savings at 200+[d]	0.0304	0.2652	0.8064

Notes: This table reports the correlation in main experimental outcomes between husband's decisions and wife's decisions.

[a]Dummy for choosing direct deposit into savings account of 200 pesos over gift certificate for self worth 200 pesos.

[b]Dummy for choosing direct deposit into savings account of 200 pesos over gift certificate for food worth 200 pesos.

[c]Dummy for choosing direct deposit of 225 pesos and/or 200 pesos over receiving 200 pesos cash.

[d]Dummy for choosing direct deposit of less than 200 pesos (175, 150, 125) over receiving 200 pesos cash.

Table 5: Heterogeneous Treatment Effects I

	Panel 1: Male			
	Savings over Self [a]	Savings over Food [b]	Savings at 200+ [c]	Savings at less than 200 [d]
	(1)	(2)	(3)	(4)
Wife Decides Savings x Negotiation	0.050	-0.172	-0.147	-0.014
	(0.241)	(0.228)	(0.201)	(0.181)
Wife Decides Savings x Public [1]	-0.455**	-0.403***	-0.397***	
	(0.204)	(0.139)	(0.104)	
Wife Decides Savings [2]	0.161	0.372**	0.158	0.060
	(0.158)	(0.157)	(0.162)	(0.137)
Public [3]	-0.241**	-0.229**	-0.062	-0.143*
	(0.115)	(0.112)	(0.114)	(0.081)
Negotiation [4]	-0.051	-0.028	0.002	-0.115
	(0.118)	(0.117)	(0.116)	(0.090)
Observations	145	146	146	136
Mean Dependent Variable	0.63	0.47	0.43	0.24

	Panel 2: Female			
	Savings over Self	Savings over Food	Savings at 200+	Savings at less than 200
	(1)	(2)	(3)	(4)
Wife Decides Savings x Negotiation	-0.023	-0.238	-0.362**	-0.150
	(0.211)	(0.191)	(0.145)	(0.108)
Wife Decides Savings x Public	0.321***	-0.024	-0.462***	-0.058
	(0.088)	(0.238)	(0.095)	(0.175)
Wife Decides Savings	-0.228	0.018	0.043	-0.082
	(0.152)	(0.156)	(0.156)	(0.116)
Public	-0.130	-0.110	0.170	0.016
	(0.117)	(0.119)	(0.118)	(0.096)
Negotiation	0.083	0.115	0.205*	0.091
	(0.117)	(0.121)	(0.119)	(0.099)
Observations	145	145	145	143
Mean Dependent Variable	0.65	0.50	0.48	0.21

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes:

Dependent variables:

[a] Dummy for choosing direct deposit into savings account of 200 pesos over gift certificate for self worth 200 pesos.

[b] Dummy for choosing direct deposit into savings account of 200 pesos over gift certificate for food worth 200 pesos.

[c] Dummy for choosing direct deposit of 225 pesos and/or 200 pesos over receiving 200 pesos cash.

[d] Dummy for choosing direct deposit of less than 200 pesos (175, 150, 125) over receiving 200 pesos cash.

[1] Wife Decides Savings*Public=1 in Panel 1, (4) predicts a zero outcome for "Savings at less than 200" perfectly and is therefore dropped in the probit regression.

[2] Dummy if subject answered "Wife" to question: "Who decides whether money will be saved or spent on something?"

[3] Dummy for random assignment to Public condition.

[4] Dummy for random assignment to Negotiation condition.

Excluded dummy is for random assignment to Private condition

Table 6: Heterogeneous Treatment Effects II

	Savings over Self [a]	Savings over Food [b]	Savings at 200+ [c]	Savings at less than 200 [d]
Panel 1: Male				
	(1)	(2)	(3)	(4)
Husband's Bargaining Power x Negotiation	0.046	-0.002	0.156*	-0.038
	(0.089)	(0.088)	(0.088)	(0.068)
Husband's Bargaining Power x Public	0.022	0.128	0.198**	0.060
	(0.095)	(0.101)	(0.098)	(0.078)
Husband's Bargaining Power	-0.014	-0.056	-0.120*	-0.037
	(0.072)	(0.070)	(0.073)	(0.051)
Public [1]	-0.339***	-0.341***	-0.182*	-0.180***
	(0.101)	(0.094)	(0.099)	(0.064)
Negotiation [2]	-0.026	-0.091	-0.038	-0.115*
	(0.107)	(0.104)	(0.102)	(0.070)
Observations	142	143	143	143
Mean Dependent Variable	0.62	0.48	0.42	0.20

	Savings over Self	Savings over Food	Savings at 200+	Savings at less than 200
Panel 2: Female				
	(5)	(6)	(7)	(8)
Husband's Bargaining Power x Negotiation	0.048	0.035	0.029	-0.051
	(0.080)	(0.084)	(0.083)	(0.071)
Husband's Bargaining Power x Public	0.146	0.234**	0.015	0.127
	(0.091)	(0.102)	(0.095)	(0.085)
Husband's Bargaining Power	-0.048	-0.081	-0.040	-0.009
	(0.061)	(0.067)	(0.066)	(0.055)
Public	-0.002	-0.120	0.038	-0.013
	(0.099)	(0.104)	(0.104)	(0.086)
Negotiation	0.076	0.036	0.068	0.030
	(0.096)	(0.103)	(0.102)	(0.085)
Observations	144	144	144	142
Mean Dependent Variable	0.65	0.49	0.49	0.21

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes:

This table shows the results from a dprobit estimation, calculated at the mean.

Husband's Bargaining Power: Index of bargaining power of husband, based on difference in age, education, and income, calculated as a score through principal components analysis.

[a] Dummy for choosing direct deposit into savings account of 200 pesos over gift certificate for self worth 200 pesos.

[b] Dummy for choosing direct deposit into savings account of 200 pesos over gift certificate for food worth 200 pesos.

[c] Dummy for choosing direct deposit of 225 pesos and/or 200 pesos over receiving 200 pesos cash.

[d] Dummy for choosing direct deposit of less than 200 pesos (175, 150, 125) over receiving 200 pesos cash.

[1] Dummy for random assignment to Public condition.

[2] Dummy for random assignment to Negotiation condition.

Excluded dummy is for random assignment to Private condition

Table 7: Breakdown of Savings Decision into Private Savings versus Public Savings

	Private		Public		Negotiation	
	Male	Female	Male	Female	Male	Female
Self versus Savings	N=44	N=46	N=44	N=43	N=37	N=39
Good For Self	27.27%	39.13%	63.64%	44.19%	37.84%	38.46%
Savings in Own Account	47.73%	52.17%	15.91%	27.91%	27.03%	43.59%
Savings in Spouse's/Joint Account	25.00%	8.70%	20.45%	27.91%	35.14%	17.95%
Cash versus Savings	N=47	N=48	N=48	N=44	N=50	N=50
Cash	51.06%	56.25%	66.67%	54.55%	54.00%	48.00%
Savings in Own Account	31.91%	39.58%	18.75%	22.73%	16.00%	40.00%
Savings in Spouse's/Joint Account	17.02%	4.17%	14.58%	22.73%	30.00%	12.00%
Food versus Savings	N=46	N=46	N=44	N=45	N=39	N=39
Food	41.30%	50.00%	79.55%	62.22%	58.97%	56.41%
Savings in Own Account	39.13%	43.48%	11.36%	17.78%	15.38%	35.90%
Savings in Spouse's/Joint Account	19.57%	6.52%	9.09%	20.00%	25.64%	7.69%

Note: This table breaks outcomes into proportion of subjects who chose consumption, proportion of subjects who chose saving in own account, and proportion of subjects who chose saving in spouse's account. The table reveals that men substituted from saving in own account in private to consuming in public. In negotiation, men saved predominantly in their spouse's account.

Table 8: Probit Regression on Probability of Saving in Own Savings Account

	Saving in Private Account[a]	
	Male	Female
Public Condition[1]	-0.951	-0.424
	(0.302)**	(0.275)
Negotiation Condition[2]	-0.600	-0.173
	(0.283)*	(0.276)
Had personal savings account at Green Bank	0.863	0.983
	(0.243)**	(0.232)**
Spouse has Green Bank Account	-0.432	-0.307
	(0.254)	(0.257)
Have Joint Account at Green Bank with Spouse	-0.669	0.211
	(0.655)	(0.546)
Constant	-0.131	-0.263
	(0.240)	(0.225)
Observations	143	144

Standard errors in parentheses

* significant at 5%; ** significant at 1%

Notes: This table reports results of a dprobit estimation, calculated at the mean, of saving in own account, controlling for account status.

[a]Dummy for saving in own account. This variable equals 1 for those subjects who choose to save in own bank account (either in pre-existing personal savings account or through opening new account in subject's own name). It equals 0 for those subjects who either save in spouse's account/joint account, or who choose personal consumption (cash, good for self, or gift certificate for food).
[1]Dummy for random assignment to Public condition.
[2]Dummy for random assignment to Negotiation condition.
Excluded dummy is for random assignment to Private condition

Table 9: Information Differences from Individual Surveys

	N	Mean	Standard Deviation	[Min,Max]
Husband Drinks but Wife Does Not Know[a]	277	0.065	0.247	[0,1]
Husband Gambles but Wife Does Not Know[b]	273	0.081	0.273	[0,1]
Husband Makes More Money but Wife Does Not Know[c]	259	0.340	0.475	[0,1]
Wife Makes More Money but Husband Does Not Know[d]	263	0.289	0.454	[0,1]
How Much Food in House? Differences[e]	287	-0.094	2.906	[-14,8]
Any Special Expenses this Week? Differences[f]	287	-0.066	0.479	[-1,1]
Can You Pay for Any Special Expenses? Differences?[g]	287	-0.056	0.589	[-1,1]

Notes: This table reports means of variables that were calculated as the difference between husband's answers and wife's answers to the same questions.

[a]Husband reports that he drinks alcohol but wife reports that he does not

[b]Husband reports that he gambles but wife reports that he does not.

[c]If husband's self-reported income is larger than wife's self-reported income, but wife does not report that husband's income is greater.

[d]If wife's self-reported income ins larger than husband's self-reported income, but husband does not report that wife's income is greater.

[e]How many days of food are left in the house according to wife minus how many days of food are left according to husband.

[f]Whether husband thinks there are exceptional expenses this week for the household minus whether wife thinks there are exceptional expenses.

[g]Whether husband believes that any exceptional expenses this week can be paid for by the households current resources minus wife's beliefs on the same.

A   Appendix Tables

Table A1: Experiment Sample Selection

	Dependent Variable: Take-up of Experimental Offer					
	(1)	(2)	(4)	(5)	(6)	(7)
Age	0.001	0.002	0.001	0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Highest grade completed	-0.001	0.005	-0.002	-0.008	-0.009	-0.008
	(0.014)	(0.013)	(0.014)	(0.013)	(0.013)	(0.013)
Total household income	0.177*		0.173*	-0.004	-0.001	-0.007
	(0.078)		(0.079)	(0.028)	(0.028)	(0.028)
Female	-0.200*	-0.157*	0.009	-0.167*	-0.152	-0.167
	(0.080)	(0.079)	(0.220)	(0.081)	(0.083)	(0.091)
Total self reported savings	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)
Own labor and pension income	-0.234*	-0.044	-0.228*			
	(0.100)	(0.047)	(0.099)			
Barangay						
Bading Pob	-0.020	-0.024	-0.026	-0.004	-0.002	-0.002
	(0.109)	(0.108)	(0.110)	(0.110)	(0.110)	(0.110)
San Vincente	0.120	0.137	0.111	0.133	0.127	0.124
	(0.088)	(0.087)	(0.089)	(0.088)	(0.088)	(0.089)
Pagatpatan	0.125	0.124	0.099	0.092	0.092	0.089
	(0.132)	(0.132)	(0.137)	(0.135)	(0.135)	(0.137)
Pangabugan	-0.155	-0.152	-0.162	-0.177	-0.170	-0.175
	(0.146)	(0.145)	(0.147)	(0.147)	(0.147)	(0.149)
Woman decides whether she can work outside the house						0.004
						(0.049)
Woman decides about large family purchases					-0.032	
					(0.052)	
Woman decides about buying expensive items				0.015		
				(0.045)		
Score of female decisionmaking power in household			0.488			
			(0.281)			
Female x Score of female decisionmaking power			-0.396			
			(0.345)			
Observations	203	203	203	194	194	193

Standard errors in parentheses

* significant at 5%; ** significant at 1%

Notes: This table shows the results from a dprobit regression on dummy variable for showing up to the experiment conditional on being offered to take part.

Mean Dependent Variable=0.58

Table A2: Summary Statistics by Treatment Condition

	Private N=48	Public N=48	Negotiation N=50	F-Stat P-Value
Age	42.083	42.198	45.770	0.1643
	(9.677)	(9.551)	(12.978)	
Years Married	18.426	18.275	21.180	0.3990
	(9.919)	(10.348)	(13.329)	
Number of Children	3.427	3.865	3.930	0.4584
	(2.176)	(2.090)	(2.181)	
Highest Grade Completed	11.396	11.469	9.890	0.0079
	(2.980)	(2.393)	(2.970)	
Daily Wage	436.93	289.30	431.30	0.6628
	(891.21)	(473.87)	(1191.11)	
[Median Daily Wage]	*200.00*	*170.00*	*150.00*	
Both Wife and Husband Work	0.750	0.740	0.700	0.8283
	(0.399)	(0.425)	(0.452)	
Wife Does the Budgeting	0.760	0.302	0.260	0.5533
	(0.342)	(0.446)	(0.407)	
Wife Makes More Income than Husband	0.292	0.760	0.870	0.8755
	(0.410)	(0.399)	(0.332)	
Wife Holds Income	0.885	0.719	0.800	0.1561
	(0.296)	(0.398)	(0.364)	
Wife Makes Decisions About Savings	0.542	0.479	0.530	0.7477
	(0.410)	(0.412)	(0.456)	
Couple has Conflicts Over Money	0.344	0.406	0.370	0.7424
	(0.402)	(0.395)	(0.402)	
Account at Green Bank	0.427	0.365	0.490	0.1457
	(0.326)	(0.322)	(0.294)	
	N=34	N=45	N=35	
Total Household Income	12482.26	12902.56	12237.89	0.9570
	(9100.70)	(8768.20)	(12567.28)	
Total Household Savings	5182.85	1564.24	3841.00	0.4488
	(20303.81)	(2184.10)	(11492.14)	

Standard errors in parentheses

Note: This table shows summary statistics of the sample across three treatment conditions and reports F statistics of whether these measures were significantly different across treatment conditions. The only measure which is significantly different across treatment conditions was education level. Table 3 controls for all education levels and finds little to no difference in treatment outcomes.

Table A3: Differences in Husband and Wife's Decisions

Wife's Choice - Husband's Choice			
	Private N=48	Public N=48	Negotiation N=50
Prefer Direct Deposit into Savings Account for 225 or 200 Pesos to 200 Pesos Cash (Standard Deviation) [min, max]	-0.063*** (-0.7) [-1,1]	0.167 (0.592) [-1,1]	0.060++ (0.312) [-1,1]
Prefer Direct Deposit into Savings Accountfor 175, 150, or 125 Pesos to 200 Pesos Cash	-0.137*** (0.612) [-1,1]	0.065 (0.530) [-1,1]	0.040++ (0.281) [-1,1]
Prefer Direct Deposit over Gift Certificate for Self	-0.126*** (0.606) [-1,1]	0.188 (0.604) [-1,1]	-0.020+++ (0.142) [-1,0]
Prefer Direct Deposit over Gift Certificate for Food	-0.084*** (0.613) [-1,1]	0.146 (0.542) [-1,1]	0.020++ (0.245) [-1,1]
Prefer Gift certificate for Food over Gift Certificate for Self	0.116** (0.481) [-1,1]	0.208 (0.501) [-1,1]	0.020+++ (0.141) [0,1]
Prefer 200 Pesos Now over 225+ Later	0.000*** (0.700) [-1,1]	0.178 (0.646) [-1,1]	0.104+++ (0.307) [0,1]

***Significant at 1%, when compared to Negotiation condition
**Significant at 5%, when compared to Negotiation condition
+++Significant at 1%, when compared to Public condition
++Significant at 5%, when compared to Public condition
Notes:

Each variable is constructed from two dummy variables of the experimental outcomes in Table 1: the husband's decision on the outcome variable subtracted from the wife's decision on the outcome variable. These couple-level variables can take on the discrete values of -1, 0 and 1; -1, for example, would denote that the husband chose in preference for the outcome, getting a 1, and the wife chose not, getting a zero.

Table A4: Savings Experimental Outcomes by Account Status

	Private		Public		Negotiation	
	Males	Females	Males	Females	Males	Females
	N=48	N=48	N=48	N=48	N=50	N=50
Prefer Direct Deposit over Self[a]	75.0%	62.5%	41.7%***	60.4%	71.4%+++	70.0%
for Bank Account Holders	78.0%	73.0%	59.0%	71.0%	65.0%	76.0%
for NonAccount Holders	73.0%	56.0%	33.0%***	55.0%	76.0%+++	62.0%
Prefer Direct Deposit over Food[b]	60.4%	52.1%	21.7%***	41.7%	54.0%+++	56.0%
for Bank Account Holders	67.0%	50.0%	47.0%	42.0%	45.0%	72.0%
for NonAccount Holders	57.0%	52.0%	17.0%***	42.0%	60.0%+++	33.0%
Direct Deposit into Savings Account						
Strongly Prefer Direct Deposit[c]	33.3%	18.8%	12.5%***	19.6%	20.0%	24.0%
for Green Bank Account Holders	27.8%	13.6%	11.7%	18.8%	10.0%	38%**
for NonAccount Holders	36.7%	24.0%	13.3%**	20.0%	26.7%	4.7%*
Deposit into Spouse's Account	15.4%	4.8%	12.5%	22.7%	0.522++***	15.4%
	(0.368)	(0.218)	(0.342)	(0.429)	(0.511)	(0.368)

* Significant at 10%, when compared to privacy treatment

+++ Significant at 1%, when compared to nonprivacy treatment

++ Significant at 5%, when compared to nonprivacy

Note: This table breaks down main experimental outcomes for account holders and non account holders.

Bank Account holders in each condition: N=19-20

Non-Account holders in each condition: N=25-30

[a]Percent of individuals who preferred direct deposit for 200 into savings account over gift certificate for self worth 200 pesos

[b]Percent of individuals who preferred direct deposit for 200 into savings accout over gift certificate for food worth 200 pesos

[c]Percent of individuals who prefer direct deposit for less than 200 pesos over 200 pesos cash.

Table A5: Full Experimental Outcomes

	Private		Public		Negotiation	
	Males N=48	Females N=48	Males N=48	Females N=48	Males N=50	Females N=50
Gift Certificate for Self Gift Certificate Less Than 200	12.77%	13.04%	8.51%	4.17%	2.00%**	2.04%**
Own Savings Account Gift Certificate Less Than 200	33.33%	18.75%	12.50%***	19.57%	20.00%	24.00%
Child's Savings Account Gift Certificate Less Than 200	25.53%	20.83%	18.75%	25.00%	18.00%	16.00%
Gift Certificate for Food Gift Certificate Less Than 200	12.50%	16.67%	14.58%	4.17%	4.00%	6.00%
Gift Certificate for Food over Gift Certificate for Self	77.10%	89.60%	70.80%	91.70%	86.00%	88.00%
Direct Deposit into Own Savings Account over Gift Certificate for Self	75.00%	62.50%	41.70%***	60.40%	71.40%+++	70.00%
Direct Deposit into Child's Savings Account over Gift Certificate for Self	53.20%	79.20%	54.20%	68.80%	60.00%	58.00%**
Direct Deposit into Own Savings Account over Gift Certificate for Food	60.40%	52.10%	21.70%***	41.70%	54.00%+++	56.00%
Direct Deposit into Child's Savings Account over Gift Certificate for Food	52.20%	66.00%	52.10%	56.30%	46.00%	50.00%*
Direct Deposit into Child's Savings Account over Direct Deposit into Own Savings Account	54.20%	72.90%	52.10%	59.60%	46.00%	48.00%+++
Patient	66.70%	64.60%	60.40%	79.20%*	64.00%	74.00%
Impatient	6.30%	8.30%	10.40%	4.20%	6.00%	6.00%
Impatient Now, Patient Later	37.50%	35.40%	37.50%	37.50%	40.00%	32.00%

***Significant at 1%, when compared to Private condition

** Significant at 5%, when compared to Private condition

* Significant at 10%, when compared to Private condition

+++ Significant at 1%, when compared to Public condition

++ Significant at 5%, when compared to Public condition

Note: This table shows the full set of experimental outcomes.

Table A6: Aggregated Outcomes at Household Level

	Private N=48	Public N=48	Negotiation N=50
Prefer Savings over Self	0.688	0.510	0.700
	(0.352)	(0.393)	(0.452)
Deposited Savings into Couple's Coordinated Account	0.135	0.240	0.330
	(0.287)	(0.372)	(0.470)
Prefer Savings over Food	0.563	0.344	0.550
	(0.394)	(0.388)	(0.487)
Deposited Savings into Couple's Coordinated Account	0.083	0.073	0.030
	(0.215)	(0.206)	(0.157)
Prefer Savings at 200+	0.469	0.417	0.490
	(0.363)	(0.390)	(0.479)
Deposited Savings into Coordinated Account	0.115	0.198	0.360
	(0.296)	(0.382)	(0.485)
Prefer Savings at less than 200	0.260	0.156	0.220
	(0.309)	(0.256)	(0.393)
Deposited Savings into Coordinated Account	0.073	0.083	0.170
	(0.206)	(0.215)	(0.373)

Standard errors in parentheses

Note: This table shows the main experimental outcomes, aggregated at the household level. It also shows the extent to which couples coordinated on whose account would receive the deposit.

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