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Discussion Paper

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Abstract

Agricultural development programs often aim to increase women’s incomes and to enhance their control over family resources by offering new work opportunities, but as an unintended negative consequence, these programs may further increase women’s already heavy workloads. By means of a lab-in-the-field experiment in rural Rwanda, we elicit men’s and women’s valuations of control over income, time use, and trade-offs between them. We find that women are willing to sacrifice more household income to increase their control over income than their husbands are. However, the magnitude of respondents’ valuations of control over income is low. On the other hand, both women and men place a high value on time, and this relationship does not vary by gender. Consequently, development programs introducing time-saving practices, technologies, and services may have more positive welfare impacts than programs that primarily increase control over monetary resources.

Keywords: Household economics, Experiment, Labor, Rwanda, Gender

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1 Introduction

Agricultural development programs that intend to increase women’s empowerment often do so by providing women with better economic opportunities. This may increase women’s monetary resources, as well as their control over income, which has been associated with improved household outcomes, especially for children (Smith et al., 2003; Unicef et al., 2011; Herforth and Harris, 2014; Njuki et al., 2022). However, better economic opportunities for women may also increase the amount of time women spend on paid work (Johnston et al., 2018). Most women already spend more time doing domestic chores and care work than their husbands, and new tasks often result in further restrictions on how women use their time (United Nations, 2020). This may, in turn, limit whether and how women can engage in other productive activities (Micere Njuki et al., 2016; Seymour, Malapit, and Quisumbing, 2020). An important question, therefore, is the extent to which increasing control over income at the expense of decreased time availability is valued by women and men.

To investigate this, we implement a lab-in-the-field experiment with 1,000 respondents in rural Rwanda. The experiment elicits valuations of two indicators of empowerment: control over income, and time use - and also quantifies how respondents value trade-offs between the two. This is not only of academic interest, but can also help policymakers make informed estimates of whether an increase in women’s control over income is large enough to justify an increase in their workload, and to understand the extent to which the costs of a potential agricultural development program are offset by the positive impacts associated with increasing women’s control over income. Additionally, we investigate whether valuations of control over income and time use capture different constructs from commonly used empowerment indicators. To that end, we explore the correlation between, on the one hand, survey-based measures of *levels* of control over income and time use, and, on the other hand, respondents’ *valuations* of them as revealed in the experiment.

The experiment elicits valuations of control over income by measuring how much income a respondent is willing to sacrifice in order to receive that income personally, instead of it being paid to the respondent’s spouse. More specifically, we ask respondents to make choices between receiving some amount of money for themselves or having larger amounts given to their spouse (Almås et al.,

2018). To elicit the valuation of time use, we use a modified approach to eliciting the valuation of time among the self-employed first developed in Agness et al. (2022). Agness et al. (2022) offer respondents the choice of providing labor for a day in return for a payment and thereby elicit respondents' valuation of giving up time. In contrast, we elicit respondents' valuation of freeing up time by eliciting each participant's willingness to pay for a day of hired labor. By providing one day of hired labor, we free up respondents' time during that day. Respondents can use this time however they like.

Additionally, to explore the possibility that the method of payment influences the valuation of control over income and time use, we randomly assign participants to either receive their experimental earnings in cash or in-kind. We find that respondents place a higher valuation on cash income than on in-kind income.

We find that women's willingness to pay for control over income is significantly higher than that of men, but neither women nor men sacrifice a large share of their income in order to obtain control over it in our setting. While our survey data indicate that women perceive having lower levels of control over income compared to men, we do not find a correlation between the *level* of control over income and our experimentally elicited *valuation* of control over income. We do, however, find a significant positive correlation between our experimental measure of willingness to pay for control over income and a survey-based measure of autonomy over income. This measure of autonomy over income captures the extent to which one's own intrinsic motivations to earn income prevail over motivations related to coercion or trying to please others. Similar measures of autonomy have been shown to be inconsistently correlated with survey-based measures of decision making and proxies for empowerment, such as age and education (Seymour and Peterman, 2018; Vaz et al., 2019). Our findings align with this evidence and suggest that measures of autonomy may, in fact, tap into respondents' values more directly than questions aimed at detecting levels of decision making or control over income.

Regardless of gender, respondents place a high value on their time. The willingness to pay to free up time is positive for both men and women, and, despite the fact that we document women having heavier workloads than men, we find no significant difference between men and women. We find no correlation between survey-based measures of respondents' perceived workload and

the experimentally elicited valuations of changes in time use. We do, however, find a positive relationship between levels of unpaid work and valuations of freeing up time. Also, for parents with more than one child, we do find that women value freeing up time more than men do.

Our paper relates to a growing body of literature on the impact of workload on women’s well-being and empowerment in developing countries. Traditional gender norms typically assign women greater responsibility for domestic chores and care work than men (Rost, Bates, and Dellepiane, 2015). These tasks are often unpaid, result in heavy workloads for women, and limit whether and how women can engage in other productive activities (Seymour, Malapit, and Quisumbing, 2020). At the same time, agricultural interventions that aim to enhance women’s empowerment tend to assign additional labor to women as a way of increasing their income. This increase in work-based activities often exacerbates women’s workload and time poverty, which are often used as indicators of disempowerment (Blackden and Wodon, 2006; Malapit et al., 2019).

There is evidence that an increase in labor participation on the extensive margin can have positive non-monetary impacts on women’s wellbeing (Hussam et al., 2021). However, on the intensive margin, moving from an already heavy workload to an even heavier one in exchange for increased income, or for increased control over income, may not increase wellbeing. Traditional time-use instruments capture the duration of activities and not how respondents value time allocation. The latter often depends on factors such as work effort or the choices people make about how to allocate their time (Njuki et al., 2022; Eissler et al., 2022; Sinharoy et al., forthcoming). Our experimental design allows us to measure the changes in wellbeing associated with changes in time use by eliciting respondents’ valuations of freeing up time.

Our work also relates to the literature on gender and climate, which has documented gender inequality in the reach, use, and benefits of climate information (Gumucio et al., 2020). Most of the existing research uses qualitative approaches to elicit perceived benefits of climate information (Tall, Coulibaly, and Diop, 2018) and does not quantify gender gaps in costs and benefits related to program design. Mutenje et al. (2019) provide a gender-disaggregated cost-benefit analysis for climate-smart agriculture (CSA) and find that women may choose to increase their workload when adopting labor-intensive CSA for cost reasons. However, their quantitative analysis focuses on the profitability of CSA investments at the household level and does not quantify the trade-offs

with individual-level effects of CSA on workloads, bargaining power, and control over income. By quantifying the valuations of control over income and freeing up time at the individual level, our experimental design provides a framework to help quantify the costs and benefits associated with the implementation of CSA.

Our experiment also sheds light on one of the mechanisms through which gender differences in labor market outcomes might occur. In developed countries, a growing literature documents gender differences in labor market outcomes and explores the sources of these differences. Goldin (2014) argues that in the United States, part of the gender wage gap is likely due to women being willing to accept lower salaries than men in exchange for increased flexibility at work. Our experimental design introduces variation in whether the participant can choose the timing of when hired laborers arranged through the experiment will help them on the farm, in order to explore whether the respondents value flexibility. Regardless of the gender of the respondent, we do not find a significant relationship between whether or not the timing of hired labor is flexible and the willingness to pay to free up time).

Finally, our work provides a method of strengthening impact evaluations and cost-benefit analyses of agricultural development programs. Impact evaluations and cost-benefit analyses often guide investments in agricultural development, but determining whether an investment is cost-effective in empowering women is challenging. We provide a paradigm that can help quantify beneficiaries' valuations of control over income and changes in time use. Our method helps take into account the monetary benefits associated with such changes and can increase the relevance of cost-benefit analyses of agricultural development programs. We find that both men and women place a high value on freeing up time. This indicates that agricultural development programs that introduce time-saving practices, technologies, and services may have more positive welfare impacts than programs that primarily increase control over income by offering additional work opportunities.

The remainder of this paper is structured as follows. Section 2 describes our experimental design and implementation. Section 3 presents our findings, and Section 4 discusses potential underlying mechanisms. Section 5 discusses some of the policy implications of our findings, and Section 6 concludes.

2 Experimental Design and Implementation

2.1 Context and sampling

The experiment was conducted in Rwanda between August 2021 and January 2022 in partnership with four agricultural cooperatives, each from a different region of the country. It was implemented in the context of a climate information service program led by the Alliance of Bioversity International and the International Center for Tropical Agriculture (ABC). Cooperatives were selected from a pool of cooperatives actively engaged in the climate information program with ABC, with the additional criteria that they facilitated maize production for their farmers and that they had at least 200 active members within the cooperative. We selected cooperatives such that there was representation of cooperatives from different provinces in the country.

The nature of our experiment required us to invite couples instead of individuals to participate. We therefore listed all married individuals within a cooperative, randomly selected 125 members per cooperative from this list, and invited them to participate together with their spouse (who was typically not listed as a member of the cooperative). This yielded a total sample of 250 respondents per cooperative (the cooperative members themselves and their spouses), for a total of 1,000 respondents.

The experiment had four waves, taking place during different parts of the growing season, and respondents were required to participate in every wave. Valuations of control over income, or changes in workload, may vary throughout the season, for example depending on respondents' time-varying liquidity needs and workloads. Therefore, we conducted the experiment with the same respondents at four different stages of the growing season in order to increase external validity. Attrition was low - only 2 out of our sample of 1,000 respondents dropped out. To maintain a constant sample across all four waves, we exclude these 2 respondents and their spouses from our analysis.

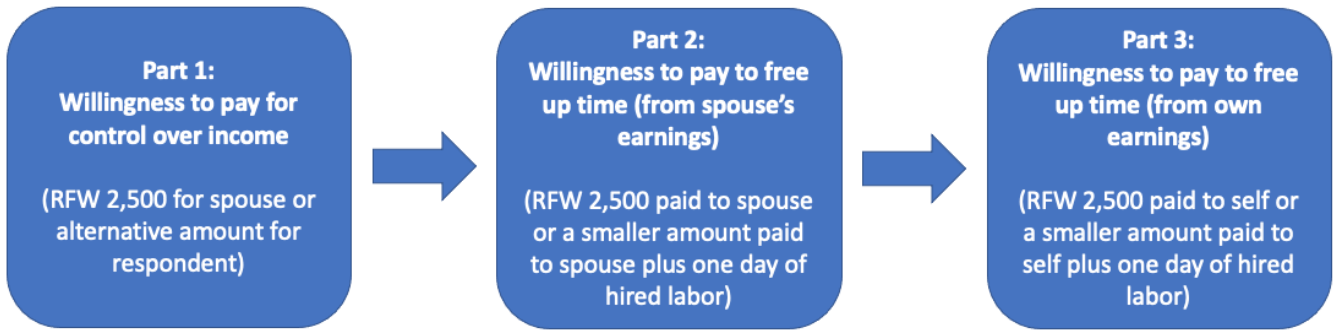
In each wave, we organized ten experimental sessions per cooperative, with 12 or 13 couples participating in each session. While respondents were invited as couples, we administered interviews and experimental tasks individually and ensured that members and spouses were separated while participating in the experiment. We randomized the session to which each couple was invited. If they indicated at the time of invitation that they would be unable to participate in the assigned

session, or that they were unable to come together as a couple (for instance, because of sickness or separation), a replacement couple was invited. This did not happen frequently. In total, out of 500 couples invited, 54 couples needed to be replaced before the first wave.

2.2 Parts of the experiment

Each wave consisted of three experimental parts, which are outlined in Figure 1 and explained in detail below.

Figure 1: Parts of the Experiment



2.2.1 Part 1 - Willingness to pay for control over income

In Part 1, we identify respondents' willingness to pay for control over household income ($WTP_{control_inc}$) by offering them a series of choices between being paid directly or being paid larger amounts indirectly via their spouse. Specifically, we ask respondents: "What do you prefer, Rwandan Franc (RWF) X paid to you, or RWF 2,500 paid to your spouse?" The amount of income that a respondent is willing to sacrifice in order to be paid directly, instead of via one's spouse, provides a measure of willingness to pay for control over income (Almås et al., 2018). To derive this amount, we elicit preferences using a multiple price list (see overview in Figure 2).

We calculate a respondent's $WTP_{control_inc}$ based on the point at which a respondent switches from choosing to be directly paid (option (A) in Figure 2) to being indirectly paid via their spouse (option (B) in Figure 2). Consider for instance a respondent who prefers option (A), being paid 1,750 RWF directly, in scenario 4, but prefers option (B), RWF 2,500 for one's spouse, in scenario 5. This person is willing to pay the difference of RWF 750 to gain control over income in scenario

4, but not the difference of RWF 1,000 to control that income in scenario 5. Thus, this respondent's $WTP_{control_inc}$ is at least RWF 750 but not more than RWF 1,000, and we assign them a $WTP_{control_inc}$ of RWF 750. For respondents who always choose (A), even in the last choice where they sacrifice RWF 1,500 to maintain control over income, we assign a $WTP_{control_inc}$ of RWF 1,500. We assign a negative $WTP_{control_inc}$ to respondents who choose option (B) in scenarios where this option does not increase total household income: -250 for those who switch from (A) to (B) in scenario 1, -500 for those who switch from (A) to (B) in scenario 0b, and -750 to those who choose to be paid via their spouse even in scenario 0a.

Scenarios 0a and 0b, in which a respondent sacrifices income if choosing to be paid through their spouse, were included in waves 2-4. In the first wave, 59% of female and 78.8% of male respondents always choose to be paid through their spouse, even in Scenario 1. and We added scenarios 0a and 0b in the second through fourth waves to explore whether respondents are mechanically choosing to be paid via their spouses without reflecting over the associated costs.

Figure 2: Part 1 - Willingness to pay for control over income

Scenario	(A) Amount (X) to you	(B) Amount to spouse	$WTP_{control_inc}$ if respondent switches from (A) in previous scenario to (B) here
0a	3,000 RWF	2,500 RWF	-750 RWF
0b	2,750 RWF	2,500 RWF	-500 RWF
1	2,500 RWF	2,500 RWF	-250 RWF
2	2,250 RWF	2,500 RWF	0 RWF
3	2,000 RWF	2,500 RWF	250 RWF
4	1,750 RWF	2,500 RWF	500 RWF
5	1,500 RWF	2,500 RWF	750 RWF
6	1,250 RWF	2,500 RWF	1000 RWF
7	1,000 RWF	2,500 RWF	1250 RWF

Notes: We assign a $WTP_{control_inc}$ of 1,500 RWF to respondents who choose (A) in every scenario.

2.2.2 Parts 2 and 3 - Willingness to pay to free up time

In Parts 2 and 3, we elicit respondents' valuations of freeing up time (WTP_{time}) by eliciting respondents' willingness to pay for a hired laborer to help out on their farm for one day in one of the

weeks following the experiment. We use the maximum amount that a respondent is willing to forgo for a day of labor as a measure of the value they attach to freeing up their time.

The existing literature provides no validated experimental measures for valuing the time of the self-employed. Thus far, the only attempt we are aware of is developed in Agness et al. (2022), who elicit respondents' valuations of their time by offering them additional work opportunities at varying wage rates. We use an adapted version of their measure, with the difference being that we offer respondents a reduction in workload in exchange for a reduction in their experimental earnings rather than offering additional work opportunities. Specifically, we present respondents with scenarios with varying costs of labor. Respondents are shown a multiple price list, and they choose whether to hire the laborer at that cost (see overview in Figure 3).

The experiment elicits two types of willingness to pay for freeing up time. In Part 2, labor costs, and thus the cost of reducing their workload, are deducted from the respondent's spouse's experimental earnings. In Part 3, the costs were instead covered by the respondent's own experimental earnings. This allows us to study whether a respondent values freeing up time differently depending on whether the costs are borne by the respondent directly versus by another household member. In other words, this shows us whether there is an interaction between control over income and the willingness to pay to free up time.

Respondents were presented with the choice between one day of hired labor for a varying cost that was deducted from their (or their spouse's) experimental earnings, versus earning RWF 2,500 without being provided any hired labor. Labor costs range from a minimum of RWF 0 (whereby laborers are fully subsidized by the project and experimental earnings are RWF 2,500 regardless of the respondent's choice to hire labor), in increments of RWF 250, to a maximum of RWF 1,500 (in which case experimental earnings after deducting labor costs are RWF 1,000, and respondents would be paying more than the going wage for one day of labor). Labor is arranged by the experimenters, who pay the laborers directly.

We tell respondents that one scenario will be randomly selected for payment. If they opt for labor in that scenario, then we arrange for a laborer to work in the respondent's fields for one day, and we deduct the labor cost associated with the randomly selected scenario from the respondent's (or their spouse's) experimental earnings. This method maintains incentive compatibility. Nonetheless, we

paid hired laborers a fixed RWF 1,000 per day, regardless of the labor costs that had been deducted from a respondent's (or spouse's) experimental earnings. Respondents know that the hired laborers are paid a fixed amount that is independent of their choices in the experiment. This allows us to vary the price of hired labor to respondents without impacting other attributes of the hired labor, such as their quality or effort.

Our measure of WTP_{time} is based on the scenario at which the respondent switches from preferring option B, in which the respondent chooses to pay some amount of money in order to receive one day of labor, to preferring option A, in which the respondent receives a fixed 2,500 RWF and no labor (see overview in Figure 3).

Figure 3: Parts 2 and 3 - Willingness to pay to free up time

Scenario	A. Receive _____ but no labor	B. Receive _____ + one day of labor	Cost of labor in this choice	WTP_{time} if switches from B in previous choice to A here
1	2,500 RWF	2,500 RWF	0 RWF	-250 RWF
2	2,500 RWF	2,250 RWF	250 RWF	0 RWF
3	2,500 RWF	2,000 RWF	500 RWF	250 RWF
4	2,500 RWF	1,750 RWF	750 RWF	500 RWF
5	2,500 RWF	1,500 RWF	1,000 RWF	750 RWF
6	2,500 RWF	1,250 RWF	1,250 RWF	1000 RWF
7	2,500 RWF	1,000 RWF	1,500 RWF	1250 RWF

Notes: In part 2, respondents choose how much of their spouse's experimental earnings they are willing to give up to free up their time. In part 3, respondents choose how much of their own experimental earnings they are willing to give up to free up their time.

2.3 Experimental Treatments

In each wave of the experiment, we randomly assign respondents to treatment groups. First, to control for potential differences in valuations depending on the medium of payment, we randomize by wave and session whether respondents receive their earnings in cash or in-kind, with each session having cash payments for two waves, and in-kind payments for the other two waves. Respondents do not know that they will receive cash payments in two waves and in-kind payments in the other two waves. They also do not know beforehand in which waves they will be paid in cash and in-kind,

respectively, but find out during the experimental instructions for that wave. For in-kind payments, we use soap. We opted for this commodity as it is a divisible good, is valued by respondents, and is unlikely to have a confounding effect on choices in the experiment, particularly those around agricultural workload.

In the second and third parts of the experiment, we randomize whether respondents are provided with the flexibility to choose the day in which the hired laborers will come, or if the laborers will come on a day selected by the experimenter. This is randomized at the session level.

2.4 Procedures and Additional Variables

Each part of the experiment begins with enumerators reading the instructions out loud in Kinyarwanda (the local language) to all participants. Thereafter, participants make their decisions, individually and in private, for that part of the experiment. After completing parts 1-3, a final series of incentivized choices is presented to elicit respondents' valuations of the in-kind good. Since respondents may value the in-kind good differently than cash income, we use this variable as a control variable in our analysis. To avoid wealth effects, we randomly select one of the four parts of the experiment in each wave to be paid out. Moreover, to allow respondents to hide their experimental earnings from their spouse, we truthfully tell respondents that we will randomly select either one of the parts of the experiment for payment, or that they will receive a fixed sum of RWF 1,000 as a participation fee. Thus, there is random noise in payments.

While enumerators prepare payouts after the last part of the experiment, individual surveys on topics that vary across the four waves are administered to participants. In the first wave, we collect survey-based measures of household and farm characteristics. In the second and third waves, we use the methodology of the project-level Women's Empowerment in Agriculture Index (pro-WEAI) (Malapit et al., 2019) to gather individual-level data on a range of topics including control over income, input in productive decisions, autonomy over income, and time use. Each wave includes survey questions on labor practices, labor use, and wages paid to laborers, as well as the time use module from the pro-WEAI to capture workload at varying points across the agricultural season. In our analysis, we focus in particular on survey-based measures of control over income and autonomy

over income. These measures are described in detail below.

2.4.1 Survey-based measure of control over income

We ask each respondent in our sample “How much input do you have in decisions about how to use income generated from _____” for each income-generating activity in which they report participation. Table 1 below contains the list of all income generating activities we ask about and reports the proportion of respondents that participate in each of these income-generating activities.

Table 1: Description of income-generating activities and the proportion of respondents that report participation in each activity

Activity Description	Proportion that reports participation in this activity
Staple grain farming and processing of the harvest: grains that are grown primarily for food consumption (rice, maize, wheat, millet)	0.962
Horticultural (gardens) or high value crop farming and processing of the harvest	0.611
Large livestock raising (cattle, buffaloes) and processing of milk and/or meat	0.455
Small livestock raising (sheep, goats, pigs) and processing of milk and/or meat	0.538
Poultry and other small animals raising (chickens, ducks, turkeys) and processing of eggs and/or meat	0.362
Fishpond culture	0.001
Non-farm economic activities (running a small business, self-employment, buy-and-sell)	0.185
Wage and salary employment (work that is paid for in cash or in-kind, including both agriculture and other wage work)	0.231

Responses were given on a 3-point scale, including: 1 (little to no input into decisions), 2 (input into some decisions), or 3 (input into most or all decisions). We generate our measure of control over income by taking the average of each respondent’s answers to these questions, considering all income-generating activities in which they participate.

2.4.2 Survey-based measure of autonomy over income

We ask each respondent in our sample to answer how similar they are to people we describe in 3 short vignettes. These vignettes are designed to probe how respondents weigh different motivations for using their income, e.g., to avoid punishment or social disapproval or to act on their own values (Alkire et al., 2013; Malapit et al., 2019). The vignettes are based on a measure of autonomy from psychology known as Self-Determination Theory (Ryan and Deci, 2000; Ryan and Deci, 2013).

Below are the 3 vignettes. Each vignette was adjusted slightly to match the respondent’s gender and to use familiar sounding names.

Vignette 1 “[PERSON’S NAME] uses her income how her spouse, or another person or group in her community tells her she must use it there. She does what they tell her to do.”

Vignette 2 “[PERSON’S NAME] uses her income in the way that her family or community expect. She wants them to approve of her.”

Vignette 3 “[PERSON’S NAME] chooses to use her income how she personally wants to, and thinks is best for herself and her family. She values using her income in this way. If she changed her mind, she could act differently.”

To calculate our measure of autonomy over income, we convert respondents’ answers into a numeric code. Each answer is assigned a code between 1 and 4, where 4 corresponds to the highest possible similarity between the respondent and the person described in the vignettes, and 1 corresponds to the highest possible difference between the respondent and the person described in the vignettes.

For each vignette, we assign each respondent the code corresponding to their answer. Following (Seymour and Peterman, 2018), we assign weights to each of these responses. The weights used correspond to the relative positions of each motivation on the self-determination continuum (Fig. 1 in Seymour and Peterman (2018)). The resulting autonomy over income score ranges from -9 to +9. Positive scores are interpreted as indications of autonomous motivation, and negative scores

as indications of controlled behavior.

2.4.3 Survey-based measure of time use

In each wave, we ask respondents to provide us with detailed information about their activities in the 24 hours before participating in the experiment. Each respondent's time use data is measured in 15 minute intervals. Table 2 below shows the list of possible activities, along with the proportion of respondents that report participating in each activity in the 24 hours before wave 1 of the experiment. To calculate the hours of paid work each respondent participates in, we add together all reported time spent on activities E-M. To calculate the hours of unpaid work each respondent participates in, we add together all reported time spent on activities N-S. We define total work as the sum of paid and unpaid work. Table A1 summarizes the amount of paid work, unpaid work, and total work respondents report participating in, broken down by gender and wave.

Table 2: Description of activities

Activity code	Activity Description	Proportion that reports participation in this activity in Wave 1
A	Sleeping and resting	0.997
B	Eating and drinking	0.971
C	Personal care	0.785
D	School (incl. homework)	0.063
E	Work as employed	0.053
F	Own business work	0.084
G	Staple grain farming	0.369
H	Horticultural (gardens) or high value crop farming	0.305
I	Large livestock raising (cattle, camel, donkey)	0.270
J	Small livestock raising (sheep, goats, pigs)	0.160
K	Poultry and other small animals raising (chickens, ducks, turkeys, rabbits)	0.015
L	Fishpond culture	0.001
M	Commuting (to/from work or school)	0.303
N	Shopping / getting service (incl. health services)	0.124
O	Weaving / sewing / textile care	0.004
P	Cooking	0.512
Q	Domestic work (incl. fetching water and fuel)	0.349
R	Caring for children	0.378
S	Caring for adults (sick, elderly)	0.008
T	Traveling (not for work or school)	0.161
U	Exercising	0.020
V	Social activities and hobbies	0.275
W	Religious activities	0.248
X	Other	0.488

2.5 Research questions and hypotheses

Our main research questions relate to whether $WTP_{control_inc}$ and WTP_{time} differ between women and men.

Hypothesis 1: $WTP_{control_inc}$ is higher for women than it is for men

Hypothesis 2: WTP_{time} is higher for women than it is for men

We also explore the extent to which $WTP_{control_inc}$ and WTP_{time} depend on whether experimental earnings are paid in cash or in-kind.

Hypothesis 3: $WTP_{control_inc}$ is higher when respondents are paid in cash than when respondents are paid in-kind

Hypothesis 4: WTP_{time} is higher when respondents are paid in cash than when respondents are paid in-kind

In the case of WTP_{time} , we also explore whether WTP_{time} depends on whether decisions are made regarding one's own income or payments going to one's spouse.

Hypothesis 5: WTP_{time} is higher when labor payments come from respondent's spouse's earnings than when labor payments come from respondent's own earnings

We address these research questions by comparing women's and men's $WTP_{control_inc}$ and WTP_{time} across the four waves of the experiment and across the experimental treatments.

We additionally study whether or not our survey-based measures of the level of control over income and the level of autonomy over income are correlated with $WTP_{control_inc}$. This allows us to explore whether the survey-based measures of control over income, autonomy over income, and the experimentally elicited valuation of control over income are capturing the same underlying concepts.

Hypothesis 6: $WTP_{control_inc}$ is correlated with our measure of control over income

Hypothesis 7: $WTP_{control_inc}$ is correlated with our measure of autonomy over income

In regards to WTP_{time} , our design allows us to test for correlations between between WTP_{time} and survey-based measures of workload. By comparing WTP_{time} to actual workloads, we can

explore the extent to which respondents' workloads correlate with their valuations of freeing up time.

Hypothesis 8: WTP_{time} is correlated with reported workload

In developed countries, women tend to value flexibility in when they work more than men do (Goldin, 2014). However, whether this finding holds in developing countries is an open question. Thus, the final research question that we investigate within the experiment is whether the finding from other contexts that women value flexibility in when they work more than men holds in a developing country context.

Hypothesis 9: WTP_{time} is higher in the flexibility treatment group than in the non-flexible treatment group

Hypothesis 10: WTP_{time} is higher for women in the flexibility treatment group than for men who are also in the flexibility treatment group

2.6 Empirical framework

2.6.1 Willingness to pay for control over income

We use the following empirical framework to test our hypotheses relating to $WTP_{control_inc}$.

$$WTP_{control_inc_ihct} = \alpha + \beta_1 Female_{ihc} + \beta_2 Cash_{tc} + \gamma \mathbf{X}_{ihct} + \tau_t + \eta_{ihc} + \varepsilon_{ihct} \quad (1)$$

$WTP_{control_inc_ihct}$ is the willingness to pay for control over income for individual i , in household h , in cooperative c , measured at time t . $Female$ is a binary variable that equals 1 if a respondent is female and 0 otherwise. $Cash$ is a binary variable that equals 1 if a respondent's experimental earnings in a particular wave of the experiment are paid in cash and 0 otherwise. \mathbf{X} is a vector of controls, some of which vary over time (e.g. experimentally elicited willingness to pay for the in-kind good) and some of which are time invariant (e.g. demographics). τ_t represents wave fixed effects. η_{ihc} is a random effect. ε_{ihct} is the idiosyncratic error term.

2.6.2 Willingness to pay to free up time

Similarly, we use the following empirical framework to test our hypotheses relating to WTP_{time} .

$$WTP_{time_ihct} = \phi + \delta_1 Female_{ihc} + \delta_2 Cash_{tc} + \delta_4 SelfPay_{ihtc} + \delta_5 Flexible_{ihtc} \\ + \delta_6 Female_{ihc} \times Flexible_{ihtc} + \omega X_{ihct} + \tau_t + \zeta_{ihc} + \epsilon_{ihct} \quad (2)$$

WTP_{time_ihct} is the willingness to pay to free up time for individual i , in household h , in cooperative c , measured at time t . $SelfPay$ is a binary variable that equals 1 if labor hired through the experiment is paid out of a respondent's earnings in wave t and 0 if paid out of the respondent's spouse's earnings. $Flexible$ is a binary variable that equals 1 if a respondent can choose when labor hired through the experiment will arrive and equals 0 if the respondent cannot choose when the labor hired through the experiment will arrive. \mathbf{X} is a vector of controls, some of which vary over time (e.g. experimentally elicited willingness to pay for the in-kind good) and some of which are time invariant (e.g. demographics). τ_t represents a wave fixed effect. ζ_{ihc} is a random effect. ϵ_{ihct} is the idiosyncratic error term.

3 Findings

3.1 Sample description

Table 3 presents baseline statistics for our sample. In total, 498 men and 498 women participated in all four waves of the experiment. On average, male respondents are about 4 years older than female respondents. We do not observe a strong gender gap in education or in Ubudehe (social class). Although Rwanda had 4 Ubudehe categories when the experiment was conducted, more than 96% of the respondents in our sample are in Ubudehe categories 2 or 3, indicating that they are neither in the poorest (category 1) or the least poor (category 4) category. Women report having significantly less control over income than men. On the other hand, there is not a significant gender difference in autonomy over income. Men report having significantly more paid work than women, while women report having significantly more unpaid work than men, adding up to a total higher

workload for women (c.f. Table 3 and Figures A3a-A3c).

In Figures A1a and A1b, we show that the majority of both men and women report having input into most or all decisions about how to use their household’s income. The average man’s control over income is 2.77 while the average woman’s control over income is 2.70, and this difference is significant (two tailed t-test, $t=2.44$, $p = 0.015$).

In Figures A2a and A2b, we show the distribution of autonomy over income, broken down by gender. When compared to the distribution of control over income (shown in Figures A1a and A1b), the variance of autonomy over income is relatively large.

Table 3: Descriptive Statistics

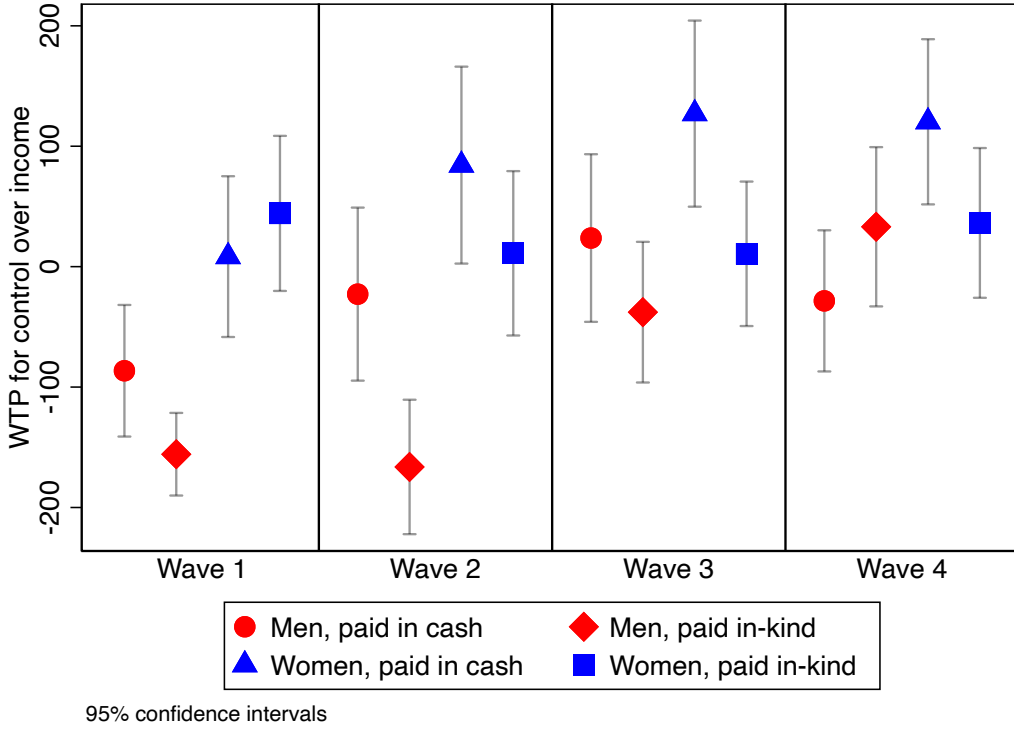
Variable	Male	Female	Difference
Age	46.749 (12.023)	42.795 (11.032)	-3.954*** (0.731)
Finished primary school	0.504 (0.500)	0.478 (0.500)	-0.026 (0.032)
Ubudehe	2.536 (0.571)	2.530 (0.571)	-0.006 (0.036)
Control over income	2.766 (0.383)	2.702 (0.437)	-0.064** (0.026)
Autonomy over income	0.956 (4.914)	0.823 (4.737)	-0.133 (0.306)
Hours of work in the last 24h	8.275 (3.978)	9.379 (3.527)	1.104*** (0.238)
Hours of paid work in the last 24h	7.383 (3.890)	4.945 (3.350)	-2.437*** (0.230)
Hours of unpaid work in the last 24h	0.892 (1.577)	4.434 (2.272)	3.542*** (0.124)
Observations	498	498	996

Notes: “Age” is each respondent’s age in years. “Finished primary school” is a binary variable that equals 1 if a respondent completed primary school and equals 0 otherwise. “Ubudehe” is an official measure of poverty in Rwanda and ranges from 1 (highest poverty) to 4 (lowest poverty). “Control over income” and “Autonomy over income” are survey-based measures of empowerment which are detailed in Sections 2.4.1 and 2.4.2. For this table, “Hours of work in the last 24h”, “Hours of paid work in the last 24h”, “Hours of unpaid work in the last 24h”, and “Number of activities in the last 24h” are all calculated from the first wave of the experiment. Measures of the gender differences in these variables for each of the four waves are included in Table A1.

3.2 Willingness to pay for control over income

Next, we turn to choices in the first part of the experiment. Figure 4 plots, by wave, the average $WTP_{control_inc}$ for men and women, depending on whether their earnings are paid in cash or in-kind. For the pooled sample (e.g. combining women and men) the average $WTP_{control_inc}$ is RWF 0.

Figure 4: WTP for control over income, by gender, wave, and payment method



When scenarios 0a and 0b are added in the second through fourth waves, and the personal cost of always choosing to be paid via one's spouse increases, the proportion of respondents that always choose to be paid via their spouse decreases substantially (see Figure A4).

Table 4 presents the estimates of Equation (1). In Column (1), we find that women's $WTP_{control_inc}$ is significantly higher than that of men. In Column (2), we show that $WTP_{control_inc}$ is significantly higher for respondents in the cash treatment than for respondents in the in-kind treatment, suggesting that the valuation of control over income is higher when that income can be spent more flexibly, and might be more difficult to control. In Column (3), controlling for the valuation of the in-kind good does not substantially change the estimated gender gap in $WTP_{control_inc}$, or the effect of being paid in cash. Column (4) shows that the gender difference in $WTP_{control_inc}$ remains after

controlling for demographic variables.

Table 4: Willingness to pay for control over income

	(1)	(2)	(3)	(4)
Female	113.2*** (16.18)	113.2*** (16.17)	120.8*** (16.54)	122.4*** (16.61)
Cash		58.12*** (15.95)	41.79*** (14.32)	41.75*** (14.32)
WTP for in-kind good (demeaned)			0.179*** (0.0238)	0.179*** (0.0238)
Constant	-102.4*** (16.09)	-130.4*** (16.10)	-132.2*** (16.05)	-105.7* (60.32)
Wave fixed effects	Yes	Yes	Yes	Yes
Demographics	No	No	No	Yes
Observations	3892	3892	3892	3892

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: Standard errors clustered by experimental session. This table reports the results of random effects regressions. “Cash” is an indicator for whether a respondent was paid in cash (as opposed to in-kind). “WTP for in-kind good (demeaned)” is each respondent’s valuation of the in-kind good in terms of cash, and is demeaned for ease of interpretation. “Demographics” includes each respondent’s age, Ubudehe category (social class), and a binary variable indicating whether or not a respondent completed primary school. The full results, including the coefficients for the demographic variables, are shown in Table A2.

We conclude that women are willing to give up more household income than men in exchange for receiving income directly, although the average valuation of being paid directly is small. The gender difference in $WTP_{control_inc}$ cannot be explained by differences in age, social class, education, method of payment, or valuation of the in-kind good.

3.3 Willingness to pay to free up time

Next, we turn to the second and third parts of the experiment, eliciting valuations of changes in workload (WTP_{time}). Willingness to pay to free up time is positive, with the average respondent being willing to pay RWF 580 for one day of labor (see Figure 5 for an overview).

Figure 5 plots WTP_{time} , by wave, for men and for women. On average, there is no gender difference in WTP_{time} .

Figure 5: Willingness to pay to free up time, by gender and wave

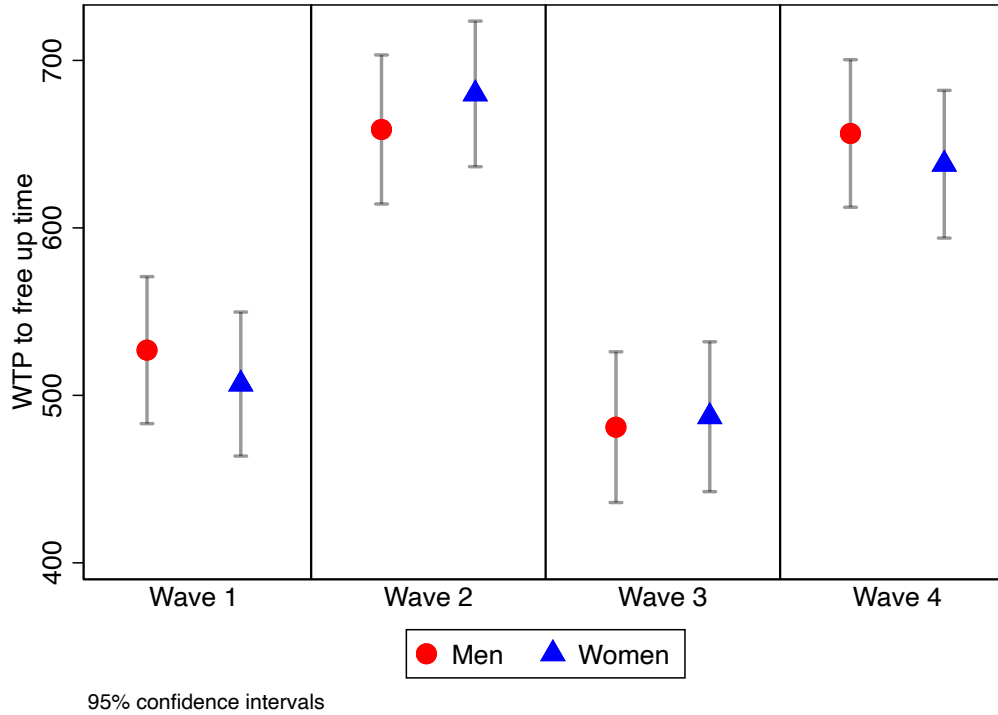


Table 5 presents the estimates of Equation (2). The main variable of interest is gender. In Column (1), we show that there is not a significant gender difference in WTP_{time} . In Column (2), we control for each respondent's valuation of the in-kind good in terms of cash and add indicators for whether respondents are paid in cash or in-kind, whether someone's own or spouse's earnings is used to pay the labor cost, and whether the respondent has flexibility in choosing what day the laborers would come. Regardless of specification, we do not find a significant gender difference in WTP_{time} .

In Figures A5a-A5d, respondents who always choose to receive cash even when the labor cost

is 0 are assigned a WTP_{time} of -250 RWF. Although we find that the average respondent places a relatively high value on freeing up their time, a significant number of respondents place a low value on freeing up their time. The heterogeneity in valuations of freeing up time cannot be fully explained by gender, age, social class, education, or our experimental treatments (see Table A3).

While research in developed countries has found that both men and women (but especially women) strongly value labor flexibility, we do not find significant differences in WTP_{time} based on the flexibility of labor. In Column (3) of Table 5, we interact gender with the source of labor payments and the flexibility indicator. In our sample, neither women nor men value freeing up time more when they have the flexibility to choose when the laborer will come.

Table 5: Willingness to pay to free up time

	(1)	(2)	(3)	(4)
Female	-5.899 (20.65)	-6.973 (20.91)	4.571 (27.45)	25.81 (26.97)
Cash		-45.84 (31.48)	-45.82 (31.49)	-45.87 (31.49)
Self pay for labor		-3.514 (4.826)	-2.259 (7.572)	-2.259 (7.575)
Flexible labor		-17.95 (54.60)	-7.201 (57.26)	0.800 (54.81)
WTP for in-kind good (demeaned)		-0.0225 (0.0226)	-0.0226 (0.0226)	-0.0224 (0.0225)
Female \times Self pay for labor			-2.510 (10.21)	-2.510 (10.21)
Female \times Flexible labor			-21.36 (42.30)	-19.43 (42.34)
Constant	518.4*** (20.28)	552.3*** (27.64)	546.5*** (28.61)	275.3*** (102.1)
Wave fixed effects	Yes	Yes	Yes	Yes
Demographics	No	No	No	Yes
Observations	7968	7968	7968	7968
Standard errors in parentheses				
* $p < .1$, ** $p < .05$, *** $p < .01$				

Notes: Standard errors clustered by experimental session. This table reports the results of random effects regressions. Each regression includes wave fixed effects. “Cash” is an indicator for whether a respondent was paid in cash (as opposed to in-kind). “Self pay for labor” is an indicator for whether the respondent would pay for the labor we provided out of their own earnings (=1) or out of their spouse’s earnings (=0). “Flexible labor” is an indicator for whether a respondent would be able to choose when laborers would come (=1) or would not be able to choose when laborers would come (=0). “WTP for in-kind good (demeaned)” is each respondent’s valuation of the in-kind good in terms of cash, and is demeaned for ease of interpretation. “Demographics” includes each respondent’s age, Ubudehe category (social class), and a binary variable indicating whether or not a respondent completed primary school. The full results, including the coefficients for the demographic variables, are shown in Table A3.

4 Potential Mechanisms

In this section, we look at potential mechanisms for the gender differences we observe in our experimental findings.

4.1 Willingness to pay for control over income

In our analysis of gender differences in $WTP_{control_inc}$, we found that women are willing to pay more for control over income than men. This is in line with the idea that if women are disempowered in the household, they may be willing to forgo more household income than men in order to be in control of the income. At the same time, women who do not value control over income as much as others may well end up in situations where they have less control over income, and the valuation of control over income will therefore likely capture a different construct from the levels of empowerment that women have.

To explore potential relationships between empowerment and $WTP_{control_inc}$, we measure empowerment (as related to income) in two different ways. First, we use a survey-based measure of each respondent’s control over income. This measure is discussed in detail in Section 2.4.1. Second, we use a survey-based measure of each respondent’s autonomy over income. This measure is discussed in detail in Section 2.4.2.

In Table 6, we test for a relationship between survey-based measures of control over income, autonomy over income, and $WTP_{control_inc}$. In columns (1) and (2), we find no significant relationship between control over income and $WTP_{control_inc}$. In columns (3) and (4), we find a significant positive relationship between autonomy over income and $WTP_{control_inc}$. Respondents with higher autonomy over income also tend to have a higher $WTP_{control_inc}$. Given that autonomy over income measures respondents’ internal motivations about how their income is spent, the relationship between autonomy over income and $WTP_{control_inc}$ is not surprising. Additionally, column (5) shows that when control over income and autonomy over income are included in the same specification, the significance of the coefficient on autonomy over income does not change substantially. This indicates that respondents view control over income and autonomy over income as distinct concepts.

Adding survey-based measures of levels of control over income and autonomy over income to

our regressions does not reduce the estimated gender gap in $WTP_{control_inc}$. Gender differences in these levels cannot explain the gender difference in $WTP_{control_inc}$.

Table 6: Willingness to pay for control over income, with survey-based control over income and autonomy over income

	(1)	(2)	(3)	(4)	(5)
Female	122.3*** (16.24)	123.1*** (16.54)	122.9*** (16.62)	122.9*** (16.67)	123.8*** (16.66)
Cash	41.75*** (14.32)	41.81*** (14.33)	41.79*** (14.33)	41.79*** (14.34)	41.85*** (14.35)
WTP for in-kind good (demeaned)	0.179*** (0.0238)	0.179*** (0.0237)	0.179*** (0.0238)	0.179*** (0.0238)	0.178*** (0.0237)
Control over income (standardized)	-0.680 (9.912)	16.66 (12.36)			18.83 (12.96)
Control over income (standardized) \times Female		-30.11 (18.47)			-32.24* (18.37)
Autonomy over income (standardized)			28.65*** (10.01)	29.02** (13.02)	30.08** (13.37)
Autonomy over income (standardized) \times Female				-0.741 (19.71)	-1.736 (20.02)
Constant	-105.6* (60.38)	-115.5** (58.14)	-100.8* (59.70)	-100.7* (59.86)	-111.1* (57.87)
Wave fixed effects	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes
Observations	3892	3892	3892	3892	3892

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: Standard errors clustered by experimental session. This table reports the results of random effects regressions. Each regression includes wave fixed effects. “Cash” is an indicator for whether a respondent was paid in cash (as opposed to in-kind). “WTP for in-kind good (demeaned)” is each respondent’s valuation of the in-kind good in terms of cash. Control over income (standardized) is each respondent’s average response to the level of input they have in deciding how to use their household’s income (ranges from 1 to 3) and is standardized to have a mean of 0 and a standard deviation of 1. Autonomy over income (standardized)” is a survey-based measure of autonomy over income and is standardized to have a mean of 0 and a standard deviation of 1. Although we had 1000 respondents in the first through third waves and 998 respondents in the fourth round, 23 respondents (for a total of 92 missing values across the four rounds) did not report any measure of control over income (this was measured in the second round). Thus, we dropped the corresponding observations from these regressions to maintain a constant sample between regressions.

4.2 Willingness to pay to free up time

We hypothesize that WTP_{time} is correlated with how much work respondents engage in outside of the experiment. In Table 7, we test for a relationship between hours of paid work, hours of unpaid work, and WTP_{time} . In column (1), there is no gender difference in WTP_{time} . However, in columns (2) and (3), after controlling for hours of paid and unpaid labor, WTP_{time} is significantly higher for women than it is for men. Regardless of gender, there is a significant relationship between the amount of unpaid labor respondents engage in and their WTP_{time} . When comparing men and women with equals amounts of paid and unpaid labor, women value freeing up time significantly more than men. However, since men have significantly less unpaid labor than women (see Figure A3c), the coefficient on the female indicator is comparing women with less unpaid labor than the average woman to men with more unpaid labor than the average man.

The finding that an increase in unpaid work is associated with a decrease in WTP_{time} for men but not for women may be related to gender differences in the nature of work being performed. For instance, in Table 8, we show that the primary driver of the gender difference in unpaid work is cooking: female respondents spent on average nearly 2.5 hours per day on cooking, versus about 9 minutes per day spent by male respondents.

It may also be the case that time spent taking care of children while simultaneously working on other tasks has different impacts on men and women, particularly in relationship to their WTP_{time} . We collect data from all respondents (both male and female) on the number of children in the household, broken down by age. If we assume (based on cultural norms) that women perform most of the childcare, the number of young children (under the age of 5) in the household should serve as a reasonable proxy for the amount of time women spend on childcare.

In columns (1) and (2) of Table A4, we show that for men and women with no children, there is no gender gap in WTP_{time} (this is indicated by the insignificant coefficient on the female indicator). However, men's WTP_{time} decreases significantly with each additional child in the household while women's WTP_{time} does not change significantly with each additional child in the household.

Table 7: Willingness to pay to free up time, with paid and unpaid labor

	(1)	(2)	(3)
Female	26.31 (26.83)	88.87** (37.63)	112.2*** (41.52)
Cash	-48.01 (31.44)	-49.55 (31.24)	-49.52 (31.37)
Self pay for labor	-2.259 (7.574)	-2.259 (7.575)	-2.259 (7.576)
Flexible labor	-0.142 (54.79)	-0.383 (54.77)	0.860 (54.28)
Female \times Self pay for labor	-2.510 (10.21)	-2.510 (10.21)	-2.510 (10.21)
Female \times Flexible labor	-18.15 (42.06)	-18.71 (43.04)	-19.57 (43.04)
Paid work in the last 24h (in hours, demeaned)		3.369 (3.887)	3.798 (5.071)
Unpaid work in the last 24h (in hours, demeaned)		-14.79** (6.221)	-34.72*** (11.94)
Paid work in the last 24h (in hours, demeaned) \times Female			-1.019 (7.430)
Unpaid work in the last 24h (in hours, demeaned) \times Female			27.45* (14.93)
Constant	277.8*** (103.4)	255.4** (101.5)	216.1** (96.58)
Wave fixed effects	Yes	Yes	Yes
Demographics	Yes	Yes	Yes
Observations	7968	7968	7968

Standard errors in parentheses
 $*$ $p < .1$, $**$ $p < .05$, $***$ $p < .01$

Notes: Standard errors clustered by experimental session. This table reports the results of random effects regressions. Each regression includes wave fixed effects. “Cash” is an indicator for whether a respondent was paid in cash (as opposed to in-kind). “Self pay for labor” is an indicator for whether the respondent would pay for the labor we provided out of their own earnings (=1) or out of their spouse’s earnings (=0). “Flexible labor” is an indicator for whether a respondent would be able to choose when laborers would come (=1) or would not be able to choose when laborers would come (=0).

Table 8: Gender differences in unpaid work, by hours spent on each activity in the last 24h

Variable	Male	Female	Difference
Shopping / getting service (incl. health services)	0.021 (0.224)	0.313 (0.757)	0.292*** (0.025)
Weaving / sewing / textile care	0.019 (0.414)	0.008 (0.114)	-0.011 (0.014)
Cooking	0.147 (0.546)	2.470 (1.284)	2.323*** (0.044)
Domestic work (incl. fetching water and fuel)	0.327 (0.911)	0.937 (1.392)	0.610*** (0.053)
Caring for children	0.372 (0.838)	0.656 (0.916)	0.283*** (0.039)
Caring for adults (sick, elderly)	0.006 (0.114)	0.050 (0.742)	0.044* (0.024)
Observations	996	996	1,992

Notes: Each of the work categories in this table were measured in each of the four waves of the experiment. However, the values in this table are from the first wave of the experiment.

5 Policy Implications

Many agricultural development programs assume that the level of control over income is a valid proxy for the valuation of control over additional income. We do not find any evidence supporting this relationship. However, we find a significant relationship between autonomy over income (e.g. the motivations underlying why someone spends their income the way they do) and how much participants value control over income. These findings highlight the importance of using multiple different indicators to develop a nuanced view of empowerment. When conducting cost-benefit analyses and analyzing the potential effects different interventions may have on empowerment, agricultural development programs should look not only at instrumental indicators like levels of control over income but should also look at intrinsic indicators like levels of autonomy over income.

While it may seem intuitive that those with heavier workloads will place a higher value on freeing up time, we do not find evidence for this relationship. Agricultural development programs that aim to increase empowerment through interventions that either offer additional work opportunities in exchange for increased control over income or introduce time-saving practices and technologies should keep this in mind when considering which interventions to use in different situations.

Our findings indicate that agricultural development programs can increase empowerment more *on average* by introducing labor and time-saving practices and technologies than by offering additional work opportunities in exchange for increased control over income. However, there is a large amount of heterogeneity in valuations of freeing up time that cannot be fully explained by gender, age, social class, education, or our experimental treatments (see Figures A5a-A5d and Table A3).

To account for the heterogeneity in valuations of freeing up time, these programs could potentially further increase their effect on empowerment by offering participants the choice between different types of interventions. Thus, participants who place a high value on freeing up their time may choose to adopt labor-saving practices and technologies while participants who prefer to increase their control over income at the expense of an increased workload may choose to accept additional work opportunities.

6 Conclusion

Agricultural development programs often aim to increase incomes and moreover, to enhance women’s control over the additional income. However, an unintended negative consequence of these programs may be that they increase women’s already heavy work burdens, which can be disempowering in itself.

With the aim of studying more closely the extent to which women and men prefer increasing their control over income, freeing up their time, or a combination of the two, we design and implement a lab-in-the-field experiment with 1,000 respondents in rural Rwanda. We find that women are willing to sacrifice more household income to gain control over income than their husbands, but the amount of income that they are willing to sacrifice is relatively modest.

We generate survey-based measures of control over income and autonomy over income and explore their relationship with willingness to pay for control over income. There is no correlation between control over income and willingness to pay for control over income. However, there is a significant positive correlation between autonomy over income and willingness to pay for control over income. This indicates that it is important to be cognizant of the multidimensional nature of empowerment when measuring empowerment and conducting cost-benefit analyses of agricultural development programs.

At the same time, we find that both women and men are willing to forgo a high amount of personal and household income in order to free up their time. Survey-based measures of time use show that women have considerably more unpaid work than men, while men have considerably more paid work than women, and that the willingness to pay to free up time decreases in the amount of unpaid labor a respondent engages in. Additionally, we find that when the amounts of paid and unpaid work are held constant, women are willing to forgo more household income than men to free up their time. This gender gap widens when there are children in the household. In future work, we plan to use qualitative data from interviews (with a sample of the respondents who participated in this experiment) to validate the metrics we collect both through the lab-in-the-field experiment and through the survey-based measures of empowerment.

Our measures of the valuation of control over income and time use should be of particular interest

to policymakers interested in quantifying the value of programs that introduce time-saving practices and technologies, or for impact evaluations that both increase workload and control over income. The wide range of valuations of control over income and time use that we find highlights the importance of taking these into account when constructing and implementing agricultural development programs.

We conclude that in the setting where the experiment was conducted, agricultural development programs that introduce time-saving practices and technologies may have greater positive impacts on empowerment than programs that primarily increase control over income at the expense of increased workloads.

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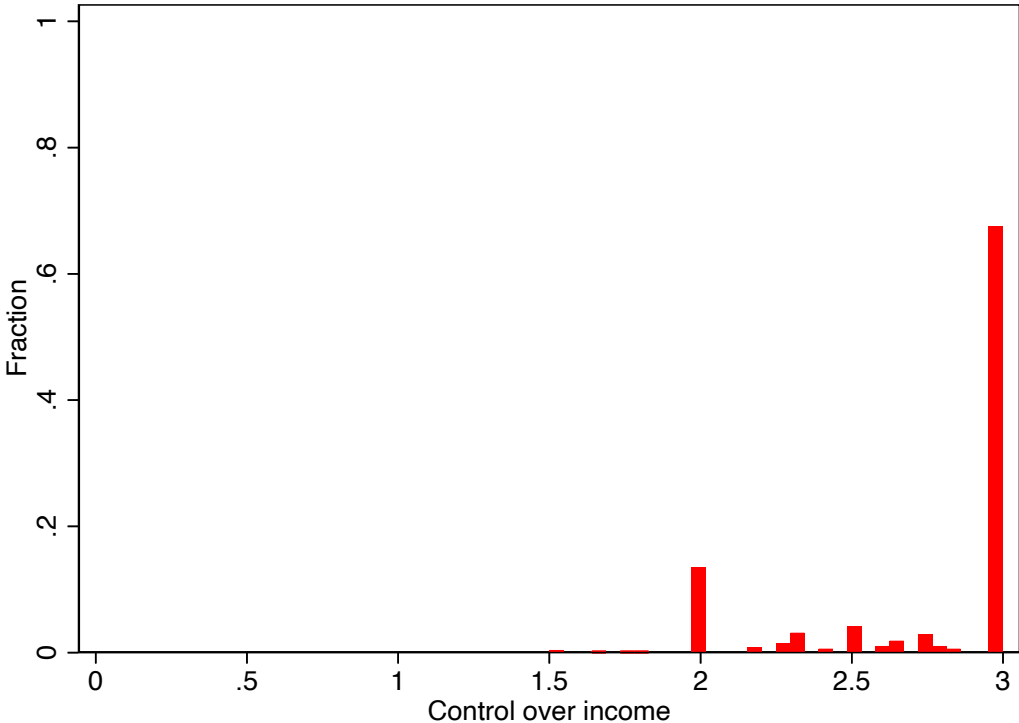
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A Tables and Figures

Figure A1: Control over income, by gender

(a) Distribution of control over income, for men



(b) Distribution of control over income, for women

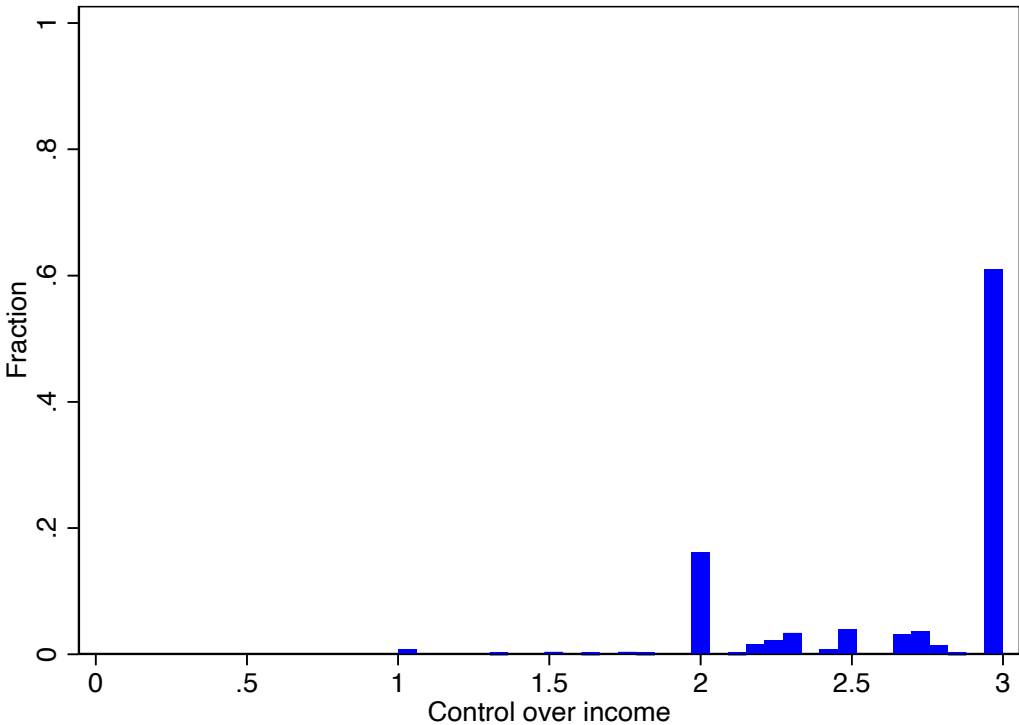
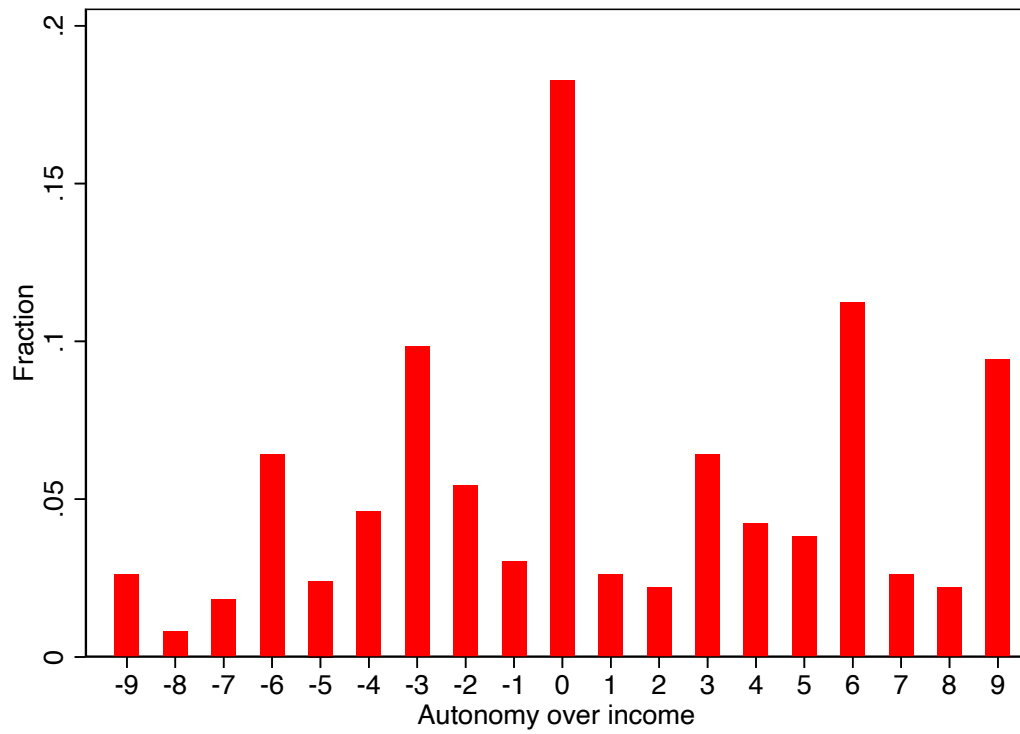


Figure A2: Autonomy over income, by gender

(a) Distribution of autonomy over income, for men



(b) Distribution of autonomy over income, for women

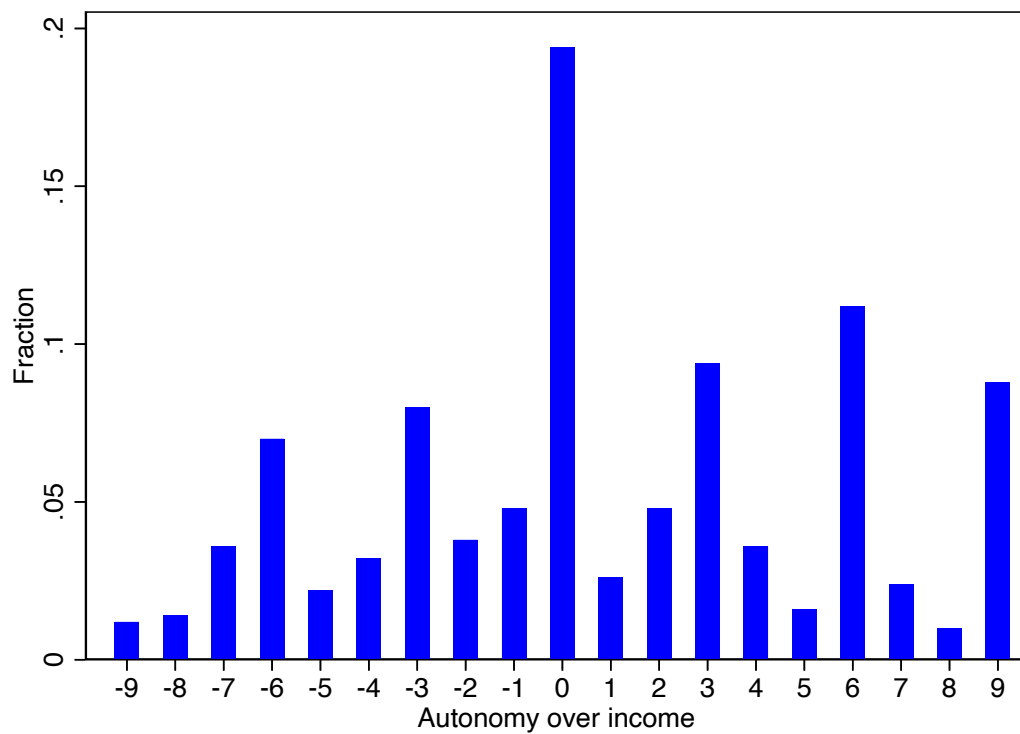
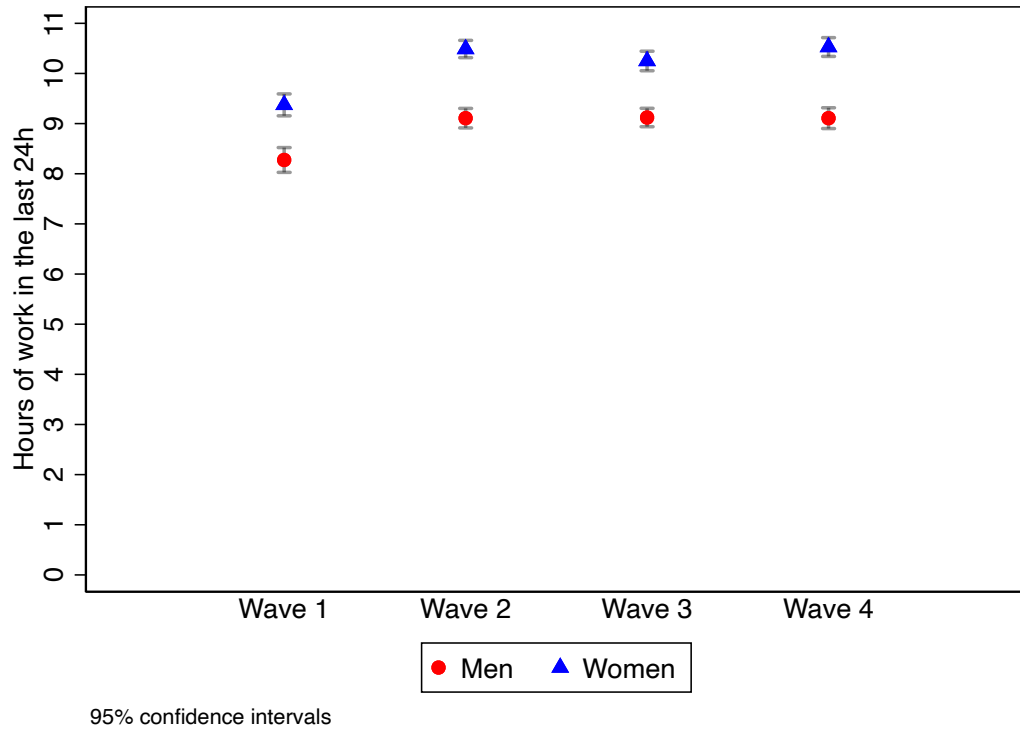
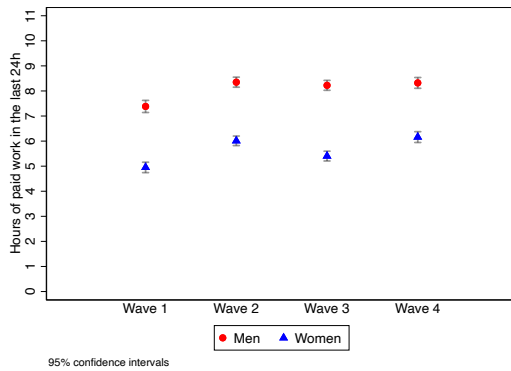


Figure A3: Amount of work in the last 24h, by gender and wave

(a) Hours worked in the last 24h, by gender and wave



(b) Hours of paid work in the last 24h



(c) Hours of unpaid work in the last 24h

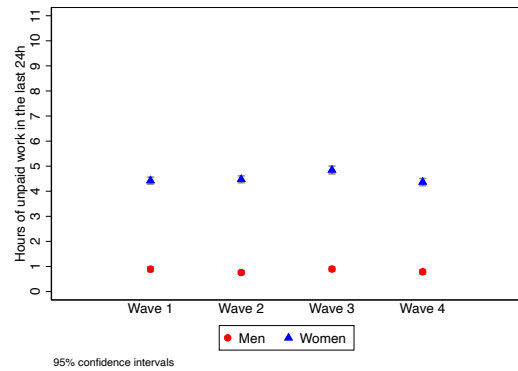


Table A1: Hours of work (paid and unpaid), by gender and wave

Variable	Male	Female	Difference
Wave 1: Hours of work in the last 24h	8.275 (3.976)	9.379 (3.525)	1.104*** (0.168)
Wave 2: Hours of work in the last 24h	9.108 (3.135)	10.488 (2.785)	1.380*** (0.133)
Wave 3: Hours of work in the last 24h	9.121 (2.948)	10.257 (3.138)	1.135*** (0.136)
Wave 4: Hours of work in the last 24h	9.108 (3.339)	10.544 (3.003)	1.436*** (0.142)
Wave 1: Hours of paid work in the last 24h	7.383 (3.888)	4.945 (3.348)	-2.437*** (0.163)
Wave 2: Hours of paid work in the last 24h	8.350 (3.220)	6.016 (3.066)	-2.334*** (0.141)
Wave 3: Hours of paid work in the last 24h	8.224 (3.182)	5.404 (3.151)	-2.820*** (0.142)
Wave 4: Hours of paid work in the last 24h	8.321 (3.464)	6.170 (3.470)	-2.152*** (0.155)
Wave 1: Hours of unpaid work in the last 24h	0.892 (1.576)	4.434 (2.271)	3.542*** (0.088)
Wave 2: Hours of unpaid work in the last 24h	0.759 (1.296)	4.473 (2.225)	3.714*** (0.082)
Wave 3: Hours of unpaid work in the last 24h	0.898 (1.375)	4.853 (2.524)	3.955*** (0.091)
Wave 4: Hours of unpaid work in the last 24h	0.787 (1.436)	4.374 (2.300)	3.587*** (0.086)
Observations	3,984	3,984	7,968

Figure A4: Proportion that always choose to be paid via their spouse, by gender and wave

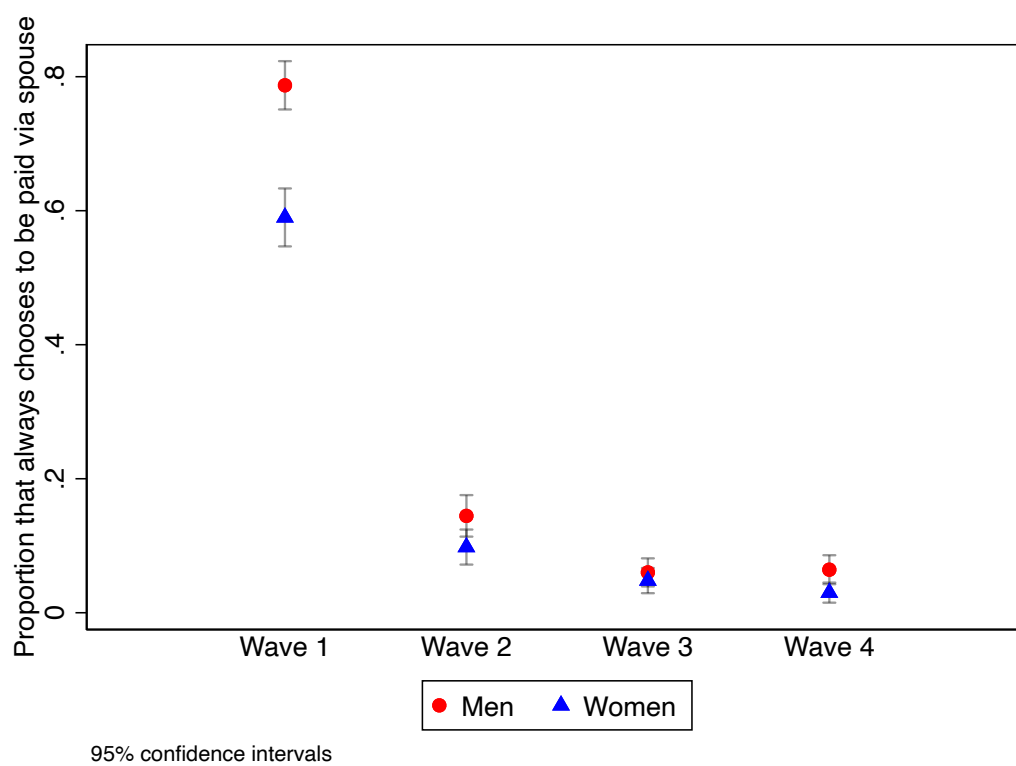


Table A2: Willingness to pay for control over income, including demographic coefficients

	(1)	(2)	(3)	(4)
Female	113.2*** (16.18)	113.2*** (16.17)	120.8*** (16.54)	122.4*** (16.61)
Wave 2	24.67 (28.43)	23.53 (26.54)	21.60 (25.47)	21.59 (25.49)
Wave 3	74.25*** (26.70)	74.08*** (26.11)	77.71*** (24.18)	77.72*** (24.19)
Wave 4	84.28*** (28.65)	81.41*** (29.05)	107.0*** (28.08)	107.1*** (28.10)
Cash		58.12*** (15.95)	41.79*** (14.32)	41.75*** (14.32)
WTP for in-kind good (demeaned)			0.179*** (0.0238)	0.179*** (0.0238)
Age				0.273 (0.733)
Finished primary school				-7.942 (13.85)
Ubudehe 2				-48.38 (43.30)
Ubudehe 3				-28.87 (44.82)
Ubudehe 4				-234.4*** (49.28)
Constant	-102.4*** (16.09)	-130.4*** (16.10)	-132.2*** (16.05)	-105.7* (60.32)
Observations	3892	3892	3892	3892

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: Standard errors clustered by experimental session. This table reports the results of random effects regressions. Each regression includes wave fixed effects. “Cash” is an indicator for whether a respondent was paid in cash (as opposed to in-kind). “WTP for in-kind good (demeaned)” is each respondent’s valuation of the in-kind good in terms of cash. “Age” is a respondent’s age, in years. “Finished primary school” is a binary variable that equals 1 if a respondent completed primary school and equals 0 otherwise. “Ubudehe” 2, 3, and 4 (“Ubudehe 1” is omitted) are fixed effects for each respondent’s social class.

Table A3: Willingness to pay to free up time, including demographic coefficients

	(1)	(2)	(3)	(4)
Female	-5.899 (20.65)	-6.973 (20.91)	4.571 (27.45)	25.81 (26.97)
Wave 2	155.6*** (30.73)	157.0*** (31.28)	157.0*** (31.28)	157.0*** (31.30)
Wave 3	-31.12 (41.82)	-31.63 (42.41)	-31.63 (42.42)	-31.62 (42.43)
Wave 4	131.3*** (50.34)	130.2** (51.40)	130.2** (51.41)	130.3** (51.37)
Cash		-45.84 (31.48)	-45.82 (31.49)	-45.87 (31.49)
Self pay for labor		-3.514 (4.826)	-2.259 (7.572)	-2.259 (7.575)
Flexible labor		-17.95 (54.60)	-7.201 (57.26)	0.800 (54.81)
WTP for in-kind good (demeaned)		-0.0225 (0.0226)	-0.0226 (0.0226)	-0.0224 (0.0225)
Female \times Self pay for labor			-2.510 (10.21)	-2.510 (10.21)
Female \times Flexible labor			-21.36 (42.30)	-19.43 (42.34)
Finished primary school				35.51* (20.74)
Age				5.388*** (1.335)
Ubudehe 2				1.266 (80.59)
Ubudehe 3				-5.150 (76.89)
Ubudehe 4				-5.280 (76.59)
Constant	518.4*** (20.28)	552.3*** (27.64)	546.5*** (28.61)	275.3*** (102.1)
Observations	7968	7968	7968	7968

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: Standard errors clustered by experimental session. This table reports the results of random effects regressions. Each regression includes wave fixed effects. “Cash” is an indicator for whether a respondent was paid in cash (as opposed to in-kind). “Self pay for labor” is an indicator for whether the respondent would pay for the labor we provided out of their own earnings (=1) or out of their spouse’s earnings (=0). “Flexible labor” is an indicator for whether a respondent would be able to choose when laborers would come (=1) or would not be able to choose when laborers would come (=0). The coefficients on “Pre-primary”-“Completed university” are fixed effects for the highest level of education achieved by respondents. “Age” is a respondent’s age, in years. “Finished primary school” is a binary variable that equals 1 if a respondent completed primary school and equals 0 otherwise. “Ubudehe” 2, 3, and 4 (“Ubudehe 1” is omitted) are fixed effects for each respondent’s social class.

Table A4: Willingness to pay to free up time, with number of children

	(1)	(2)
Female	13.56 (19.18)	-13.41 (27.66)
Children (0-5 years old)	-28.31 (17.43)	-47.58** (20.96)
Cash	-48.01 (31.46)	-47.87 (31.44)
Self pay for labor	-3.514 (4.827)	-3.514 (4.827)
Flexible labor	-12.57 (51.50)	-12.77 (51.51)
Female \times Children (0-5 years old)		33.16 (22.96)
Constant	344.9*** (81.80)	365.4*** (84.28)
Wave fixed effects	Yes	Yes
Demographics	Yes	Yes
Observations	7968	7968

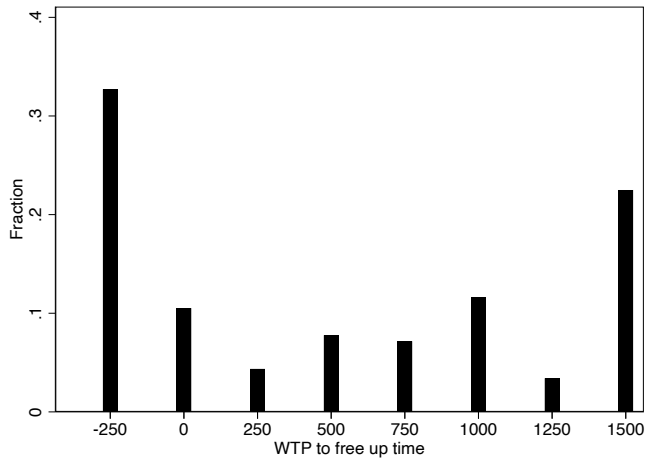
Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

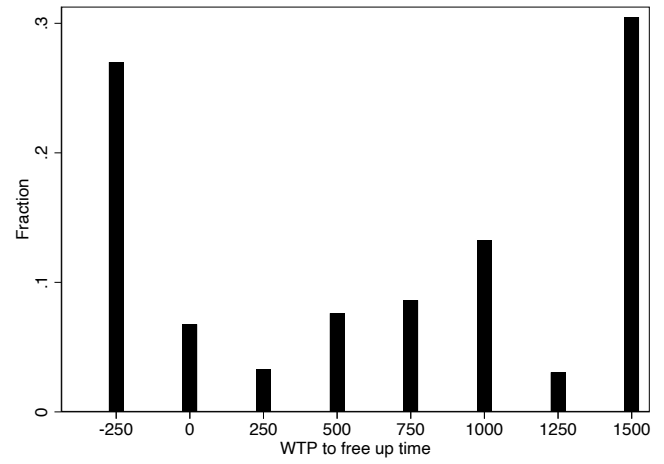
Notes: Standard errors clustered by experimental session. This table reports the results of random effects regressions. Each regression includes wave fixed effects and controls for age, education, and social class (Ubudehe). “Cash” is an indicator for whether a respondent was paid in cash (as opposed to in-kind). “Self pay for labor” is an indicator for whether the respondent would pay for the labor we provided out of their own earnings (=1) or out of their spouse’s earnings (=0). “Flexible labor” is an indicator for whether a respondent would be able to choose when laborers would come (=1) or would not be able to choose when laborers would come (=0). “Children (0-5 years old)” is reported by each respondent and measures how many children between 0 and 5 years old are in each respondent’s household.

Figure A5: Distribution of WTP_{time} by wave

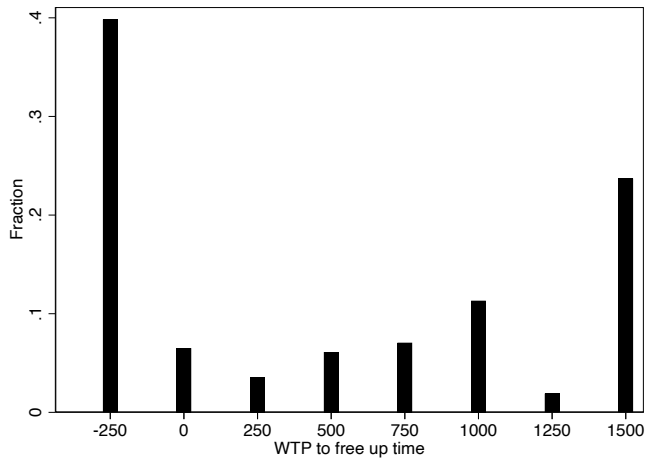
(a) Wave 1



(b) Wave 2



(c) Wave 3



(d) Wave 4

