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Smoothing, discounting, and demand for intra-household control for recipients of conditional cash transfers

Diego Aycinena[a], Szabolcs Blazsek[b], Lucas Rentschler[c] and Betzy Sandoval[d]

[a]Faculty of Economics, Universidad del Rosario, Bogota, Colombia; [b]School of Business, Universidad Francisco Marroquín, Guatemala City, Guatemala; [c]Department of Economics and Finance, Utah State University, Logan, USA; [d]Vernon Smith Center of Experimental Economics, Universidad Francisco Marroquín, Guatemala City, Guatemala

ABSTRACT

Inter-temporal preferences are important determinants of investment decisions, including investments in human capital. Yet, little is known about these preferences for recipients of conditional cash transfers (CCTs). We simultaneously estimate utility curvature (preference for consumption smoothing), discounting, and present biasedness for such recipients. We also introduce a financially motivated method of measuring willingness to forgo funds to control household finances. We find that female participants in a CCT program in Guatemala have very high degrees of utility curvature and low discount factors, which may lead to low levels of investment by participants in the human capital of the household. We also find that intra-household conflict is not significantly related to consumption smoothing, discounting, or present bias.

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1. Introduction

Conditional cash transfer (CCT) programs have become one of the most popular tools to reduce poverty in developing countries, covering hundreds of millions of individuals.[1] CCT programs typically involve the targeted transfer of money to households living in poverty, in exchange for compliance with program mandates, such as regular medical checkups and school attendance. These programs aim to break the intergenerational transmission of extreme poverty by increasing investments in human capital for younger generations (Gertler, 2004).

There is a prominent role in human capital investment for time-preference parameters: discount factor (the degree of discounting delaying outcomes), utility curvature (preference to smooth consumption over time), and present biasedness (higher discounting of the future if choices involve present outcomes).[2] Accumulating human capital requires years of continued investment in an illiquid asset whose returns are

CONTACT Lucas Rentschler lucas.rentschler@usu.edu Department of Economics and Finance, Utah State University, USA

[1]Stampini and Tornarolli (2012) estimate that there were more than 120 million beneficiaries of CCTs in Latin America in 2011. As of 2013, there were 19 countries in Latin America employing CCTs. Worldwide, the total number of countries using CCTs rose from 27 in 2008 to 52 in 2013 (Gertler, 2004).

[2]Throughout this paper, we use the term "time preferences" to refer to the parameters underlying inter-temporal decision making. We also use the terms "utility curvature" and "consumption smoothing" interchangeably.

Supplemental data for this article can be accessed here.

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obtained far in the future. This can be especially challenging for low-income households that are vulnerable to income shocks (Banerjee & Duflo, 2007; Dercon, 2002; Fafchamps & Lund, 2003; Morduch, 1995). In the context of CCTs, Janvry, Finan, Sadoulet, and Vakis (2006) find that target households of PROGRESA (Mexico's CCT program) are highly exposed to shocks: Over 20% of the heads of households were unemployed at least once and about 10% were unemployed more than once, for a 36-month period. They were also highly exposed to droughts that affected 60% (25%) of households at least once or more than once, over the course of a 2-year period. Furthermore, 25% of households were exposed to other low-frequency disasters (e.g., earthquake, hurricane, flood, or plague).

In the presence of shocks and incomplete financial markets, individuals with strong preferences to smooth consumption over time may, on the margin, be reluctant to allocate resources to illiquid investments such as child education, health, and nutrition. Foster (1995) reports that shocks due to floods in rural Bangladesh affect the growth of children from households with limited access to credit. Jensen (2000) finds that adverse agricultural conditions in Ivory Coast affect investment in children by reducing school enrollment rates between one third and one half and by doubling malnutrition rates.[3] Thus, preferences for consumption smoothing by CCT recipients, who have limited access to credit and insurance and who are vulnerable to income shocks, are an important determinant of their investments in human capital. Furthermore, given that returns are realized far in the future, time preferences of CCT recipients are also an important determinant of these investments. The typically direct and relatively immediate financial payments that CCT programs provide suggest that, at least implicitly, such considerations are a component of program design. Despite the large body of the literature related to CCT programs, to our knowledge, the present study is the first with a focus on the time preferences of CCT recipients.

Microeconomic rationales behind CCT programs include (i) persistently incorrect beliefs regarding the expected returns to investments in human capital in targeted households and (ii) these expected returns are heavily discounted by household decisions makers (Fiszbein et al., 2009). To date, the former has received more attention.[4] The latter, heavy discounting of the future on the part of household decision makers, is connected to time preferences. The latter can also be viewed as a result of conflicting time preferences between adults and children within the home. This view is related to the literature on conflicting preferences within households, and the consequent inefficiencies in intra-household resource allocation.[5]

The relationship between intra-household conflict and time preferences has received relatively little attention in the literature. Schaner (2015) examines the link between intra-household differences in time preferences and savings decisions. Schaner reports that couples with different savings preferences tend to use more costly savings

[3]See also Guiso, Jappelli, and Terlizzese (1996), Jacoby and Skoufias (1997), and Rose (1999).
[4]See, for example, Jensen (2010).
[5]Conflicting risk preferences may also cause underinvestment in the human capital of children, depending on the risk perception of expected returns to education relative to labor market opportunities. Attanasio and Kaufmann (2010) show that risk perceptions from a parental perspective matter for high school attendance in Mexico. For more on the literature related to intra-household conflict, see: Thomas (1990), Ashraf (2009), Martinez (2013), Ashraf, Aycinena, Martínez, and Yang (2015), and Ambler, Aycinena, and Yang (2015).

mechanisms.[6] If nonaligned preferences within a household are a source of conflict, how might such conflict be related to the patience, preference for smoothing consumption, and present-biasedness of CCT recipients? We are particularly interested in the preferences of women who exhibit demands for intra-household control. Preferences could differ by demand for intra-household control for two reasons. First, conflict within the home could directly influence the preferences of women. That is, preferences could be endogenously determined. In fact, Voors et al. (2012) find that people who have been exposed to violent conflict are less risk averse, and have lower discount rates. Second, preferences of women in households with conflict may differ from those of their peers in some way, and perhaps they themselves are the source of conflict. Although we are unable to disentangle these possible explanations and we make no claims of causality, examining preferences and intra-household conflict provides insight into the factors behind the convention of dispersing CCT funds to women (Fiszbein et al., 2009).

In this work, we report the results of an artifactual field experiment that allows us to estimate discounting, utility curvature, and present biasedness, as well as the presence of intra-household conflict for a sample of female CCT recipients in Guatemala. We measure time preferences using a version of the convex time budget (CTB) introduced by Andreoni and Sprenger (2012). This procedure allows us to simultaneously estimate curvature, discount factors, and present biasedness.[7]

Our measure of intra-household conflict with respect to women captures the willingness of a participant to forgo funds to ensure that a windfall profit is dispersed directly to the participant, rather than another household member. We allow the participant to specify how this windfall profit is to be dispensed over time. Any positive willingness to forgo funds to have them directly dispersed to herself is evidence of unaligned preferences in the household with regards to how to allocate resources, as opposed to when to allocate them.

This paper makes three primary contributions to the literature. First, we provide the first estimation of time-preference parameters of CCT recipients. Our estimates contribute to the literature evaluating CCT programs as such preferences will affect the investment behavior of recipients and particularly with respect to human capital. There is evidence that CCT programs have a positive impact on child health (Gertler, 2004) and education (Barham, Macours, & Maluccio, 2013; Barrera-Osorio, Linden, & Saavedra, 2017; Galiani & McEwan, 2013). However, there seems to be ample room for improvement in CCT program design (Attanasio, Meghir, & Santiago, 2012; Barrera-Osorio, Bertrand, Linden, & Perez-Calle, 2011; Janvry & Sadoulet, 2004). Increased understanding of the preferences of CCT recipients should inform efforts to improve program design. Second, we introduce a financially motivated task to

[6]There are several important differences between Schaner (2015) and the present paper. First, Schaner (2015) does not directly elicit a measure of control, but rather uses differences in discount factors as a (potential) source of conflict. In our study, we directly elicit a preference for intra-household control that is not strictly limited to differences in time preferences, but is more general and may encompass differences in preferences, for example, over expenditure categories or savings mechanisms. Second, Schaner (2015) elicits preferences for both members of married couples; we restrict our attention to a sample of women who are recipients of CCT. Finally, Schaner (2015) focuses on differences in discount factors while our focus is more comprehensive, as it encompasses discount factors, preferences for consumption smoothing, and present biasedness.

[7]Aycinena, Blazsek, Rentschler, and Sprenger (2018) show the importance of jointly estimating these three parameters (especially utility curvature) for predicting large-stakes behavior regarding inter-temporal choices.

determine the presence of intra-household conflict. This issue is of particular importance since CCT programs typically disperse funds to women under the assumption that funds are more likely to lead to increases in investments in the human capital of children. That is, CCT programs implicitly assume the presence of intra-household conflict in at least a subset of recipient households.[8] Third, we evaluate whether or not intra-household conflict is related to the time preference parameters of CCT recipients.

We find that CCT recipients exhibit a high preference for smoothing and low discount factors. These findings, of a strong preference for consumption smoothing and relative impatience, are likely to lead to lower levels of investment in human capital. We also find that the presence of intra-household conflict has no statistically significant correlation with smoothing, present-biasedness or discounting.

The remainder of this paper is organized as follows: Section 2 discusses the CCT program from which our sample is drawn and describes our specific sample. Section 3 presents the experimental design. Section 4 presents the results. Section 5 concludes.

2. Context of study and sample

2.1. Conditional cash transfer program

Mi Bono Seguro (My Security Bonus) is a targeted CCT program overseen by the Guatemalan Ministry of Social Development (MIDES is the Spanish acronym).[9] It aims to improve human capital accumulation by promoting investments in health and education for poor households with pregnant women or children under the age of 16 years. This program offers two types of conditional transfer: an education transfer and a health transfer. To obtain the health transfer, all children under 15 years, and all pregnant or breastfeeding woman, must attend regular medical check-ups. To obtain the education transfer, all children between the ages of 6 and 15 years must have a school attendance rate of at least 90%. Households may be eligible for both transfers.[10] Each transfer entitles a household to GTQ150 (approximately USD19.2 or PPP$37) per month, provided all household members comply with the conditions.[11] Although transfers are supposed to be delivered bi-monthly, in practice there are often delays. As is conventional with these programs, funds are almost always dispersed to adult women within a recipient household. Exceptions are rare, and are only made when there is no adult woman present. For example, if a mother has passed away, or if a mother is less than 18 years of age, then funds will be dispersed directly to an adult

[8]Note that policymakers seem to believe that the unitary model may not hold and as a result they allocate CCT funds to women within the household. This policy makes two implicit assumptions. First, the preferences of household members are not perfectly aligned. Second, the preferences of women are more aligned with policy goals relative to the preferences of men within the household.

[9]This program started in 2008 under the name *Mi Familia Progresa* (My Family Progresses) and was renamed as *Mi Bono Seguro* in 2012. It uses geographic targeting and proxy means testing for eligibility.

[10]In addition to the described conditions, the rules of the program state that the transfers must be used to enhance the welfare of the family, and household members must attend informational sessions and comply with other administrative requirements.

[11]The local currency for Guatemala is the Guatemalan quetzal, denoted as GTQ. The average market exchange rate for the relevant period, from February to March 2013, was GTQ7.8177per 1 USD, as reported by the Central Bank of Guatemala. We also report transfers in international dollars at purchasing power parity (PPP$), using the 2013 PPP conversion factor for private consumption (GTQ4.0499per one international dollar) from the World Development Indicators.

male in the household. As of 2012, *Mi Bono Seguro* covered about 758,000 families, and also covered over 90% of the municipalities in all but one department of Guatemala.

2.2. Sample

Our final sample comprises 169 female beneficiaries of the *Mi Bono Seguro* CCT program.[12] Experimental sessions were run in seven different municipalities across three departments: El Progreso, Escuintla, and Sacatepéquez.[13] The average age of participants is 35.85 years with a standard deviation of 8.99 and a range from 20 to 65. Participants report very low levels of formal education: 21.3% never attended school, 72.19% did not complete sixth grade, and less than 12.43% have any education in excess of sixth grade. Despite their lack of formal education, participants reported relatively high levels of literacy: 77.51% report being able to read and write. To assess numeracy, we asked participants to calculate three separate sums ($8 + 5$; $20 + 50$; $55 + 36$). Only 28.9% correctly answered all the three questions. The distribution of the number of correct answers is detailed in Table 1. To ensure that participants were able to understand the experimental procedures, these involved images and one-on-one interaction when decisions were made.

A full 69.82% of participants were married or living with a partner, and 76.27% of these reported that they were not the head of the household. Table 2 contains a breakdown of marital status, as well as whether or not participants identified themselves

Table 1. Numeracy of participants.

Correct answers	Frequency	Percentage
0	31	18.34%
1	21	12.43%
2	68	40.24%
3	49	28.99%
Total	169	100.00%

Note: To measure numeracy, participants were asked to compute three sums: $8 + 5; 20 + 50; 55 + 36$.

Table 2. Marital status and head of household.

		Conditional on marital status	
	Marital status	Head of household	Not head of household
Married or living with partner	69.82%	23.73%	76.27%
Divorced or separated	14.79%	88.00%	12.00%
Widowed	6.51%	90.91%	9.09%
Never married	8.88%	93.33%	6.67%

[12]Given the tight control over the CCT database of recipients by political authorities, we had no say on recruitment. Our sample was recruited directly by MIDES local staff. With the help of *Fundación Capital* (an international development organization), we coordinated with a MIDES official who gave instructions within the organization. We were not specific about the objectives of the experiment (other than understanding how people make financial decisions) and that they would receive a show-up fee and the possibility of earning additional funds. No MIDES personnel were allowed to act as observers during sessions and the study participants only reported their decisions in privacy to the experiment assistants.

[13]We started with a sample of 206 individuals (for whom we had both CBT data and intra-household control data), but discarded from the analysis four males, fifteen for whom data on family income was missing, six due to missing age, eleven who showed no variation in the CTB experimental task, and one with a missing record for one of the questions of the intra-household control elicitation task.

Table 3. Distribution of household income.

GTQ	USD	Count	Percentage	Cumulative
<GTQ500	<USD64	47	27.81%	27.81%
GTQ501–GTQ1, 000	USD65–USD127	69	40.83%	68.64%
GTQ1, 001–GTQ2, 000	USD128–USD255	38	22.49%	91.12%
GTQ2, 001–GTQ3, 000	USD256–USD382	12	7.10%	98.22%
>GTQ3, 000	> USD382	3	1.78%	100.00%
Total		169	100.00%	

Note: The mean GTQ/USD exchange rate is used, as obtained from the Central Bank of Guatemala.

as the head of household, conditional on this status. The average number of children per household was 3.15. Consequently, household size can be considered as large, with an average of 5.5 members, a standard deviation of 2.02, and a range from 2 to 18. As expected, household income was reported to be very low. Table 3 contains the distribution of self-reported income range categories. Median reported household monthly income is in the range from GTQ500 to GTQ1, 000 (from USD64 to USD128) and 90.8% of households reported monthly income below GTQ2, 000 (USD256). Given the poverty these households face, it is not surprising that participants reported very low usage of saving mechanisms in their households. Only 10.65% reported using formal mechanisms (i.e., through financial institutions) and only 8.30% reported having savings outside of the formal financial system. Furthermore, only 2.37% reported that their household had a regular savings plan. As aforementioned, participants were recruited directly by local staff from MIDES, and they were not informed about the purpose of the experiment or the types of questions to be asked.

Due to the requirements of *Mi Bono Seguro*, our sample was not representative for Guatemala. To illustrate this, we compared our sample with the 2011 National Survey of Living Conditions (ENCOVI is the Spanish acronym).[14] We restrict attention to female ENCOVI respondents between 20 and 64 years of age to maximize comparability. Table 4 compares marital status between the ENCOVI sample and ours. As expected, participants in our experiment were more likely to be, or had been, married. Quality of housing for participants in our study was much lower than that of ENCOVI respondents, suggesting that our sample was comprised of poorer households. Table 5 reports the type of structure a households inhabits. Our sample was less likely to live in

Table 4. Marital status of ENCOVI sample and our sample.

	ENCOVI sample		Our sample	
	Frequency	Percentage	Frequency	Percentage
Married or living with partner	10,557	67.36%	118	69.82%
Separated or divorced	1,481	9.45%	25	14.79%
Widowed	944	6.02%	11	6.51%
Single	2,680	17.10%	15	8.88%
No response	10	0.06%	0	0.00%
Total	15,672	100.00%	169	100.00%

Note: National Survey of Living Conditions (ENCOVI).

[14]ENCOVI is a national representative household survey focused on living standards measurement (LSM) run by the National Institute of Statistics (INE is the Spanish acronym) of Guatemala. As might be expected, there are comparison limitations between our sample data and the ENCOVI data. ENCOVI is a national representative survey that was implemented between March and August of 2011, 2 years before our field work began. This is, however, the latest LSM household data set available from INE.

Table 5. Living quarters of ENCOVI sample and our sample.

	ENCOVI sample		Our sample	
	Frequency	Percentage	Frequency	Percentage
Formal house	14,321	91.38%	112	66.27%
Apartment	60	0.38%	7	4.14%
Renting a room	162	1.03%	14	8.28%
Rancho	365	2.33%	10	5.92%
Improvised house	761	4.86%	25	14.79%
Other/unknown	3	0.02%	1	0.59%
Total	15,672	100.00%	169	100.00%

Note: National Survey of Living Conditions (ENCOVI).

Table 6. Exterior walls of living quarters for the ENCOVI sample and our sample.

	ENCOVI sample		Our sample	
	Frequency	Percentage	Frequency	Percentage
Cinder blocks	8,759	55.89%	89	52.66%
Wood	2,007	12.81%	10	5.92%
Adobe	3,269	20.86%	10	5.92%
Sheet metal	526	3.36%	40	23.67%
No response	0	0.00%	1	0.59%
Other	1,111	7.09%	19	11.24%
Total	15,672	100.00%	169	100.00%

Note: National Survey of Living Conditions (ENCOVI).

a formal house, and was much more likely to live in an improvised structure. To further illustrate this difference, Table 6 reports the primary material used to construct the exterior walls of a households living quarters. Of note is the increased prevalence of the use of sheet metal for construction among our sample.

3. Experimental design

Participants earned an initial payment of GTQ50. Participants then performed two independent experimental tasks. The first task elicited time preference parameters using the convex time budget (CTB) introduced by Andreoni, Kuhn, and Sprenger (2015). The second task elicited willingness to forgo funds for intra-household control of a cash windfall.[15]

3.1. Convex time budget

In the convex time budget, participants were presented with a series of 24 questions, one of which was randomly selected for payment. In each question, there were six points uniformly distributed along an intertemporal budget constraint regarding money at time t and at time $t + k$. Each of these times denotes a number of days after the experiment. The relative price of money at time t was held constant across all six options, and participants were instructed to choose their most preferred option. Two values of t were considered, $t = 0$ and $t = 35$, and for each of these two different lags were considered, $k = 35$ and $k = 63$. For a given t and $t + k$ participants were presented

[15]There was an additional task not reported here; it was basically a hypothetical modified convex time budget based on future choices.

Table 7. Summary of CTB task.

	1	2	3	4
t	0	0	35	35
k	35	63	35	63
MRT1	1.05	1.00	1.05	1.00
MRT2	1.11	1.05	1.11	1.05
MRT3	1.18	1.11	1.18	1.11
MRT4	1.25	1.33	1.25	1.33
MRT5	1.43	1.67	1.43	1.67
MRT	1.82	2.22	1.82	2.22

with six questions, each corresponding to a different relative price of money at time t. We denote the marginal rate of transformation as MRT. With reference to the Online Appendix, in each question, one option is GTQ125 at time $t + k$, and GTQ25 at time t (each including the participation payment of GTQ25); the other options involve shifting GTQ20 from time $t + k$ to time t at a constant relative price until only GTQ25 remains at time $t + k$.[16] Table 7 summarizes the parameters used in the CTB. Figure 1 illustrates the six relevant intertemporal budget constraints for $t = 0$ and $k = 35$.

As many participants showed low levels of literacy and numeracy, we presented all choices in the CTB using both numbers and pictures of the associated quantities of money. Figure 2 contains an example question as it was presented to participants. Note that each option specified the amount at time t and the amount at time $t + k$; as well as the total amount. To further ensure that participants understood the task, assistants asked each participant the questions individually, resolved any questions as they arose and recorded the participant's decision.

To guarantee that the transaction costs associated with obtaining the two associated payments were the same, the GTQ50 participation payment was evenly divided between the payment at time t and the payment at time $t + k$. Payments were implemented via post-dated checks made out to the participant.[17]

We varied three items between experimental sessions to control for order effects. First, for each pair of t and $t + k$, we varied the order in which participants viewed the associated six questions. In some sessions the relative price of money at time t was decreasing over the six questions, and in other sessions it was increasing. We refer to this as the decreasing opportunity cost (DOC) treatment. Second, in some sessions the options within a given question were ordered such that the amount at time t was monotonically decreasing, and in other sessions it was increasing. We refer to this as the decreasing soon amount (DSA) treatment. Third, in some sessions, the GTQ25 that was added to both the payment at time t and time $t + k$ was explicitly shown in each question, and in others it was not. Note that this information was provided to

[16]The amounts discussed here include the GTQ50participation payment, split evenly: GTQ25 at time t and GTQ25 at time $t + k$.

[17]There was a problem with the implementation of the post-dated check payment mechanism, as some participants were able to cash checks earlier than the dates indicated on them. This would have been problematic for our parameter estimates if participants had anticipated that this was a possibility. More specifically, if that was the case, then we would expect that they would have chosen the option that would allow them to maximize the total amount of money over sooner and later payments. That is, as long as the MRT was greater than one, they would have chosen the minimum sooner payment of GTQ25and a later payment of GTQ125. However, this is not what we observed. We ran regressions on early check cashing and found no statistically significant correlation between cashing checks early and choosing options that would concentrate amounts on later payments. Results are available upon request.

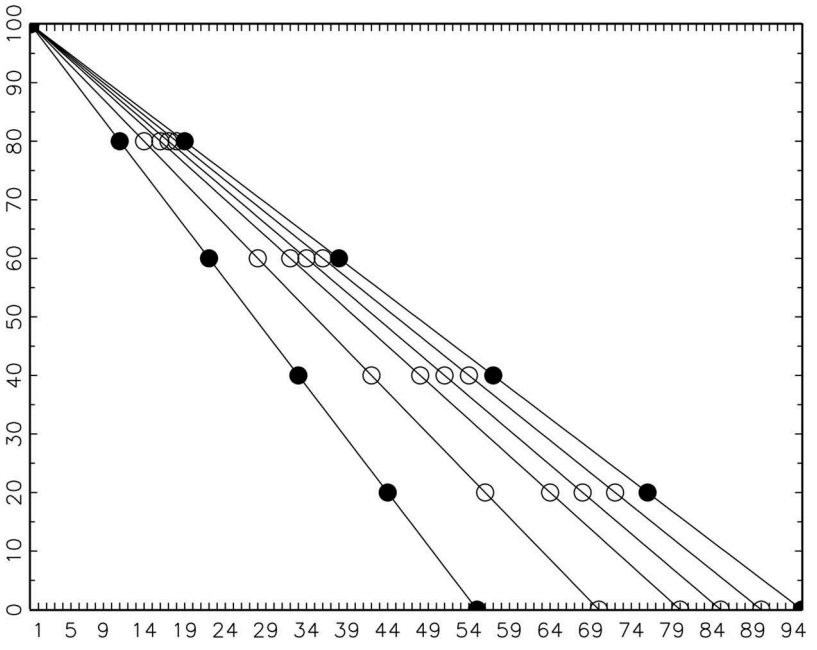


Figure 1. Budget constraints associated with $t = 0$ and k=35.

participants prior to the CTB. This treatment simply varied the salience of the participation fee. We refer to this treatment as the included participation fee (IPF) treatment. Given the importance of the background consumption parameter, we estimate separate models including or excluding the participation fee.

3.2. Intra-household control

In the intra-household control task, there were six possible scenarios, one of which was to be randomly chosen for payment. In a given scenario, the household of each participant in the session had a one in thirty chance of winning a lump sum of money ranging up to GTQ1, 200 (USD153; PPP$296), which represented eight *bonos seguros* or over 1 month of self-reported household income for the median participant. In each scenario, a participant's task was to indicate how they would like to divide payment over 6 months. They could choose a lump sum payment for the full amount, 2 equal tri-monthly payments, 3 equal bi-monthly payments, 6 equal monthly payments, 12 equal bi-weekly payments or they could customize their payment schedule. We varied the order in which these options were presented and referred to this as the increasing cost of control treatment (ICC). Payments were to take place on predetermined dates. No payments from this task were available on the day of the experiment; the first payment was to be received 7–20 days after the experiment (either the 8th or the 22nd of each of the relevant months). Subsequent payments (depending on the option selected) would take place 2 weeks, 1 month, 2 months, or 3 months after the first payment. Crucially, there was no reduction in the sum of payments for choosing to

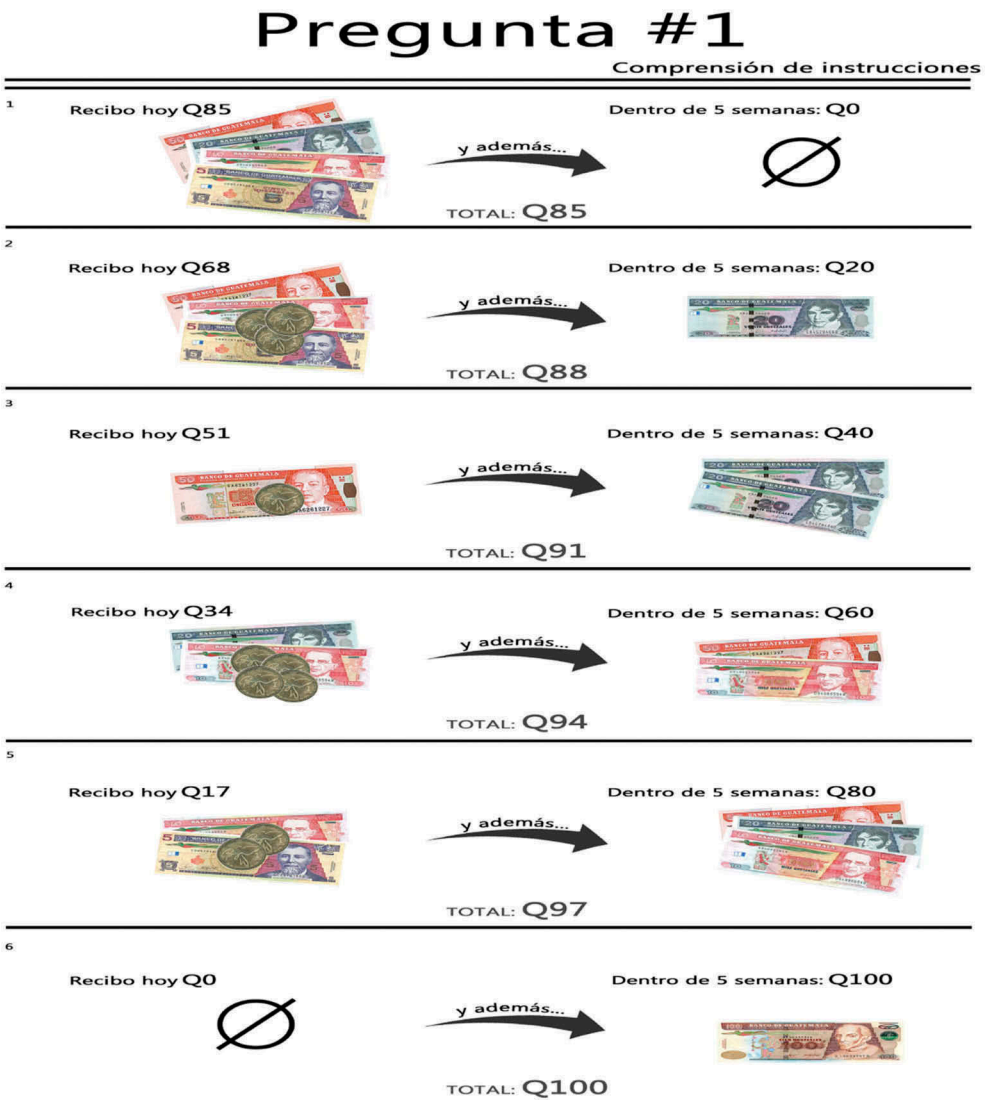


Figure 2. Example CTB question, as presented to participants.

Note: This is a sample image of Question 1 (Pregunta 1) in one of the treatments. For each option, the left column shows the amount at time t, and the right column shows the amount at time $t + k$. For this question, $t = 0$and $k = 35$. Thus, the first option reads "Receive today GTQ85in addition to GTQ0in 5 weeks" ("Recibo hoy GTQ85 y además dentro de 5 semanas GTQ0").

receive payment earlier. In fact, as each payment involved a separate check, the associated transaction costs would make spreading payments over time costly.[18]

In the first scenario, each participant was asked how they would divide payment if the amount of money was GTQ1, 200 and all the checks were written out directly to her. After the participant had provided her answer, we asked for the name of the head of her household. If she reported that she was the head of the household, then we asked

[18]Aycinena et al. (2018) find that spreading payments over time is correlated to preference for consumption smoothing.

for the name of the household member who would be responsible for financial decision making in her absence. We did not inform participants why we wanted this information. We refer to this person as the alternative recipient.

After determining the alternative recipient, we asked how she would divide payment if the amount of money would be GTQ1, 200, but all the checks were to be written out to the alternative recipient.[19] In the following four scenarios the participant was asked to choose between the outcome specified in scenario two, in which the checks would be written out to the alternative recipient, or to determine a payment schedule for a reduced sum of money (GTQ1, 080, GTQ900 GTQ720, or GTQ480) that would be paid in checks written in her name. We refer to the difference between GTQ1, 200 and the amount a participant would receive if the checks were written in her name as the price of intra-household control.

Preferences within the household could have differed along two dimensions: when to spend household income and what goods or services should be purchased with household income. The intra-household control task was able to differentiate between these two potential disagreements because even if the awarded amount was not in the participant's name, she would still impose a schedule for releasing the funds. Thus, if she was willing to forgo funds to ensure they would be disbursed directly to her, then this decision would be indicative of unaligned preferences regarding what goods and services to spend the money on.

3.3. Sessions and protocols

As participants arrived, they were asked for informed consent. After welcoming participants and giving a general introduction, the session leader read instructions for the CTB, which were also projected at the front of the room.[20] Afterwards, assistants asked each participant to answer several questions to ensure understanding. Assistants then individually elicited answers for the first six questions (which were associated with $t = 0$ and $k = 35$). As noted earlier, as many participants were illiterate, it was important that assistants provided individual support and showed decision sheets for each question, which illustrated the available options with pictures of the relevant monetary amounts in quetzals. Once all participants had answered the first six questions, the session leader explained the changes for the following six questions and the assistants individually elicited participant responses. This process continued until all 24 questions of the CTB had been answered.

Once the CTB task was complete, the session leader read instructions for the intra-household control task. After projecting a slide illustrating how payments in the first scenario could be divided over time, assistants individually elicited participant decisions

[19]One might expect that if participants could anticipate the purpose of asking for the name of the alternative recipient, then they would name someone favorable to their interests. In this case, our measure of willingness to forgo funds for intra-household control is a lower bound. Anecdotally, several participants expressed discontent over the possibility of having checks written out to the alternative recipient, indicating that either they did not choose their alternative recipient strategically, or they did not have an available name they could provide of someone whose preferences coincided with their own.

[20]Online Appendix A shows the text of the instructions for both experimental tasks, translated from the original Spanish version.

for this scenario and obtained the name of the alternative recipient. This process was then repeated for the remaining five scenarios.

Upon completion of both experimental tasks, participants had a short break with beverages and snacks provided. Afterwards, a bingo cage was used to determine the question from the CTB task that would be paid, the scenario from the intra-household control task that would be paid, as well as the participant who would receive payment from this scenario (if any). Assistants then asked each participant a series of survey questions. As participants completed this survey, they were called individually to receive their checks, and to sign the relevant receipts.[21] We ran a total of 10 sessions with 16–24 participants per session. Each session lasted between 3 and 4 hours.

4. Results

4.1. Individual and aggregate choices

Given the low level of education and numeracy in our sample, we first examine individual choices for variation and consistency (demand monotonicity). We discarded 11 out of 169 (5.3%) participants who showed no variation in all 24 questions of the CTB. This lack of variation was also observed for one out of 64 (1.6%) individuals in Andreoni et al. (2015).[22] Over half of observed choices in the CTB are at a corner (51.6%) and 9% of individuals selected a corner solution for all of their choices. This proportion of corner choices is considerably lower than that observed in Andreoni et al. (2015) (86.8%) or in Andreoni and Sprenger (2012) (70%), where 58% and 37% of participants, respectively, made no interior allocations. Our results regarding the proportion of corner choices are closer to those of Janssens, Kramer, and Swart (2015) (54%) in an artifactual field experiment that uses a simpler version of the CTB with a rural population in Kenya, and somewhat higher than in a similar experiment by Giné, Goldberg, Silverman, and Yang (2018) based in Malawi (30.5%).

Next, we assess the consistency of choices within the CTB with regards to demand monotonicity.[23] For a given t and $t+k$, we deem a pair of choices to be inconsistent if a participant selected options that shift additional money from time $t+k$ to t when the relative price of doing so increases.[24] Figure 3 illustrates the frequency of consistent choices in the CTB. Of note is that the modal percentage of consistent choices is 100%. However, this figure illustrates that there is a nontrivial portion of inconsistent choices. On average, an individual's choices are consistent 81% of the time. The median fraction of choice consistency is 86.7%, and for 82% of individuals their choices are consistent over two thirds of the time. These results are in line with those of Giné et al. (2018), who report

[21] At this time, additional data were also collected from participants for use in a different study, as reported in Aycinena and Rentschler (2018).

[22] For each of the four distinct t and $t+k$ combinations, there are six associated questions. We find that 17.4%, 12.8%, and 10.1% show no variation within one, two or three of this distinct combinations, respectively. These individuals are not discarded and remain in our analysis.

[23] For the demand monotonicity analysis, we assume a deterministic choice model rather than a stochastic choice model. If we assumed a stochastic choice model, we would have to analyze monotonicity in the context of a choice probability function.

[24] Specifically, we compare all the pairwise choice combinations within the six questions corresponding to a distinct t and $t+k$ combination. We assess the consistency of each pairwise comparison. We thus end up with 60 pairwise choice combinations and establish the proportion of those that meet consistency.

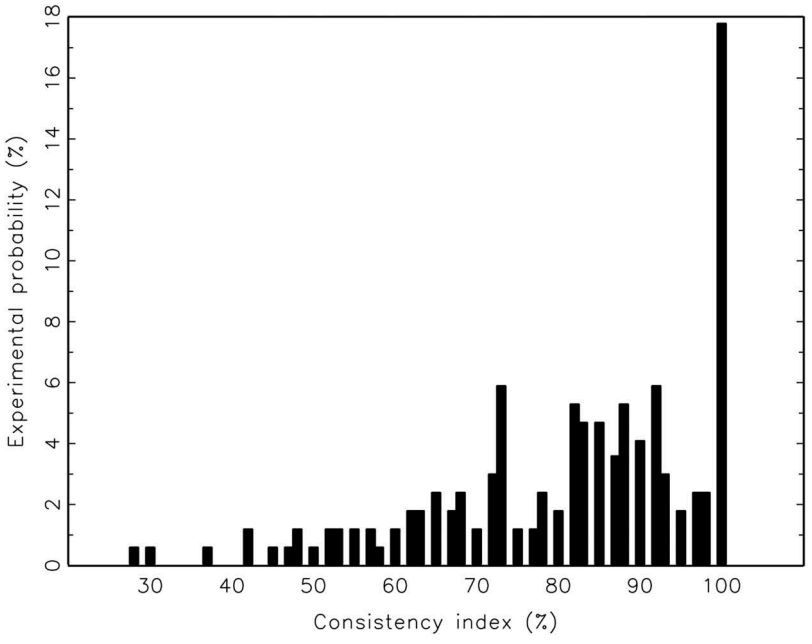


Figure 3. Percentage of consistent choices.

a mean fraction of choice consistency of 81% and a median of 88%, although they have a higher proportion of individuals with fully consistent choices (31.3%).[25]

As we observe some choices that violate demand monotonicity, it is worth investigating whether or not participants were, on average, responding to relative prices. Table 8 presents the estimates for several ordered probit models where the dependent variable is the choice of allocating money at time $t + k$ in the CTB, controlling for the relative price of money at time $t + k$, t, k treatment variables and municipality.[26] Across all specifications, when the relative price of money at time $t + k$ increases, participants, on average, lower the amount of money allocated to the same time. Participants also allocate more money to time $t + k$ for the shorter delay ($k = 35$), as expected.[27] Note that if the sooner payment is in the present ($t = 0$), choices do not differ, suggesting no present biasedness. Thus, although there is some individual inconsistency in our data, aggregate behavior is consistent with the comparative statics of the model. It is particularly important to keep this in mind when interpreting individual level parameter estimates.

In the intra-household control task, we find very low levels of inconsistency: only 7.7% (13 out of 169) of participants expressed choices that are inconsistent.[28] Overall, we find

[25]The comparison with Giné et al. (2018) should be made with care, as they use a reduced number of choices with a greater number of options per choice, as well as different protocols. Both of these results seem in line with the re-test reliability literature; see Wilcox (2010).

[26]Note that this relative price of money at time $t + k$ is the reciprocal of the MRT previously specified.

[27]Methodologically, it is noteworthy that two of our treatment variables (the order of the six questions in terms of the MRT and the explicit inclusion of the participation fee) show a statistically significant effect on allocation choices. This seems consistent with findings from behavioral economics and suggests that these factors should be addressed when eliciting time-preference parameters with similar populations.

[28]For this task, inconsistent choices mean intransitive revealed preferences (i.e., switching more than once in this multiple price list task).

Table 8. Ordered probit estimates of choice in CTB.

	(1)	(2)	(3)
Relative price of money (MRT) at $t + k$	−1.40***	3.82***	4.11***
Square of relative price of money (MRT2) at $t + k$	(0.14)	(0.82)	(0.86)
		−3.55***	−3.77***
		(0.58)	(0.60)
Shorter delay for later payment ($k = 35$)	0.17***	0.10*	0.10*
	(0.04)	(0.04)	(0.04)
Sooner payment today ($t = 0$)	0.09	0.09	0.09
	(0.05)	(0.05)	(0.05)
Decreasing soon amount (DSA)			−0.29
			(0.15)
Decreasing Opportunity Cost (DOC)			−0.19
			(0.16)
Show-up included explicitly (dummy)			0.71**
			(0.27)
Surveyor fixed effects	No	No	Yes
Municipality fixed effects	No	No	Yes
Observations	4,053	4,053	4,053
Log-likelihood	−6,616.13	−6,604.61	−6,477.58
Clusters	169	169	169

Note: The choice variable can take values between 1 and 6. Choice $= 1$: Payment concentrated at time t. Choice $= 6$: Payment concentrated at time $t + k$. Robust standard errors clustered at the individual level are reported in parentheses. *, **, and *** indicate significance at the 5%, 1%, and 0.1% levels, respectively.

Table 9. Demand for intra-household control.

	Frequency		Percentage	
Price of control	Give up control	Pay for control	Give up control	Pay for control
GTQ120	113	56	66.86%	33.14%
GTQ300	124	45	73.37%	26.63%
GTQ540	139	30	82.25%	17.75%
GTQ720	140	29	82.84%	17.16%

Note: Total prize is GTQ1, 200.

that a full 39.33% of participants were willing to sacrifice a positive amount of money to maintain control of the funds. Table 9 provides a breakdown by the price of maintaining control. Of particular interest is the fact that 17.16% of participants were willing to forgo GTQ720 (60% of the available GTQ1, 200) to maintain control. Figure 4 illustrates the demand for intra-household control by plotting the percentage of the samples who were willing to sacrifice against the percentage that must be sacrificed. Table 10 presents the regression results of price on demand for intra-household control. As expected, as the price of control increases, the probability that a study participant is willing to sacrifice control declines. Note that this is robust to controlling for the relationship to alternative recipient, marital status, order of alternatives, municipality, inconsistent choices, and research assistant fixed effects. Our measure of intra-household control provides a lower bound estimate of true demand for intra-household control for two reasons. First, as noted earlier, if participants could have anticipated the motive for asking for the name of the head of the household, they could have acted strategically by naming someone whom they trusted or with whom they shared their interests. Second, checks were made payable to the person identified as the head of the household, but were handed out to participants. This gives participants some bargaining power, as the checks cannot be cashed by the head of the household unless the participant gives them the checks.

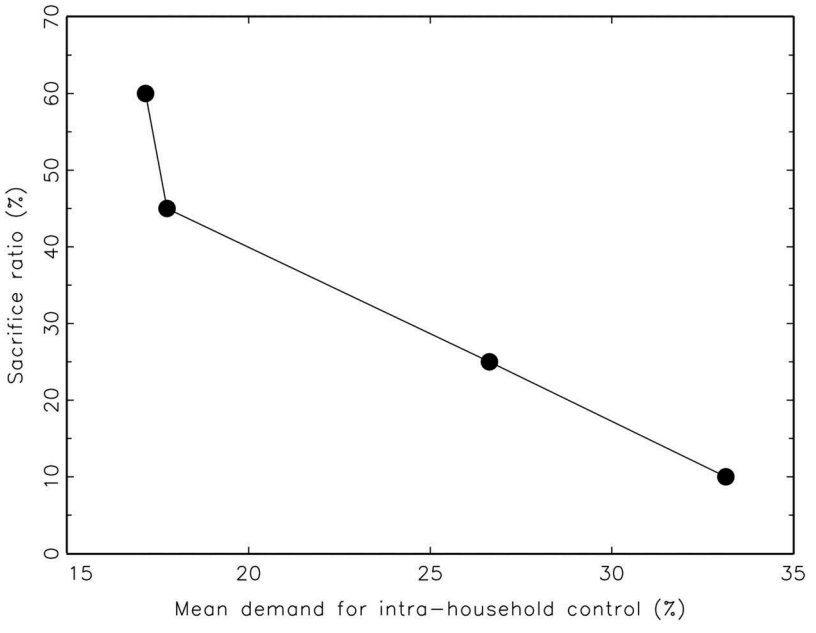


Figure 4. Demand for intra-household control.

4.2. Estimation strategy

If a woman is willing to give up a positive amount of money to ensure that checks from the intra-household control task are written directly to herself we say that she demands intra-household control. We are interested in comparing the time-preference parameters of those women who demanded intra-household control to those who did not. Thus, participants are assigned to one of two clusters, denoted by $j = 0, 1$. The first cluster, $j = 0$, includes participants with no demand for intra-household control. The second cluster, $j = 1$, includes participants with demand for intra-household control.

The amount of money participant i obtains at time t from the CTB task is denoted by x_{it}. Preferences over the sooner payment x_{it} and the later payment x_{it+k} are modeled using the following time-separable quasi-hyperbolic utility function (Laibson, 1997)[29]:

$$U(x_{it}, x_{it+k}) = \begin{cases} x_{it}^{\alpha} + \beta\delta^{k} x_{it+k}^{\alpha} & \text{if } t = 0 \\ x_{it}^{\alpha} + \delta^{k} x_{it+k}^{\alpha} & \text{if } t > 0. \end{cases} \quad (1)$$

Utility curvature (preference to smooth consumption over time) is measured by α, β measures present-biasedness, and $\delta \in (0, 1)$ is the annual discount factor. We assume

[29]It should be noted that the model is about consumption, but we are using income as an incentive. Restricting incentives to consumption would be almost impossible in terms of logistics, especially for relatively rural populations. However, given the low level of income, the lack of savings and liquidity constraints of this sample, we believe that income should be a good proxy for consumption. If liquidity is not a binding constraint, then inter-temporal choices in the CTB task should be restricted to corner choices that maximize income by arbitraging market interest rates for lending or borrowing. The proportion of corner choices in our sample is lower than in many other samples; furthermore, interior choices are informative of large-stake choices outside of the CTB task (Aycinena et al., 2018). It should be further noted that eliciting time preferences using income is a common method in the experimental literature examining time preferences (Andersen, Harrison, Lau, & Rutström, 2008; Andreoni & Sprenger, 2012).

Table 10. Probit estimates of demand for intra-household control (reporting marginal effects).

	(1)	(2)	(3)
Price of intra-household control	−0.34***	−0.44***	−0.36***
	(0.07)	(0.07)	(0.07)
Husband is alternative recipient		−0.17*	−0.14*
		(0.08)	(0.07)
Father is alternative recipient		0.14	0.21**
		(0.11)	(0.08)
Married		0.16*	0.15*
		(0.07)	(0.07)
Order of alternatives		0.09	0.08
		(0.06)	(0.06)
Municipality		0.00	0.00
		(0.03)	(0.02)
Dummy for inconsistent choice			0.29***
			(0.07)
Observations	676	624	676
Log-likelihood	−362.20	−296.59	−338.33
Clusters	169	156	169

Note: Order of alternatives is equal to one if the alternative recipient receiving the full amount (GTQ1, 200) is the first option. Specification (2) drops inconsistent observations. Robust standard errors clustered at the individual level are reported in parentheses. *, **, and *** indicate significance at the 5%, 1%, and 0.1% levels, respectively.

an annual scale for both t and k. As the CTB is a discrete choice task, our main estimates α, β, and δ use an interval censored Tobit model. This approach follows that of Andreoni et al. (2015), although we assume that the error term is heteroscedastic and, when applicable, varies by the cluster of the participant. This assumption ensures identification of all parameters, as well as improving model fit. In the interest of brevity, we relegate a detailed description of our estimation procedure and econometric models to Online Appendix B. In addition, for the individual level estimates, we also estimate parameters using ordinary least squares and non-linear least squares.

4.3. Aggregate parameter estimates

First, we estimate the average utility function for our whole sample. We do so by estimating two sets of models. In the first model, α, β, and δ are assumed to not depend on demand for intra-household control. In the second model, α, β, and δ are assumed to differ across the two clusters. That is, we investigate whether time-preference parameters differ on average depending on whether or not a participant has demand for intra-household control.[30] As previously mentioned, given the importance of the background parameter of consumption, we estimate three versions of each set of models. That is, we vary whether we include the participation fee in all amounts at each t and $t + k$ for all participants, whether we include it only for those for whom it was explicitly displayed (IPF = 1), or exclude it for all. This last version allows a more

[30]We also estimate models, both with and without clustering by demand for intra-household control, where we parameterize the discount factor δ by setting $\delta(Z_i) = \exp(Z_i)$ where Z_i is a vector of individual-specific explanatory variables. This vector includes the four treatment variables (DOC, DSA, IFP, and ICC), an education dummy, age, age squared, household size, household income (categorical), and a household savings dummy. Results of these additional models can be found in Online Appendix C.

Table 11. Parameter estimates and statistical tests.

	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
α_0	0.52***	0.60***	0.71***	0.54***	0.64***	0.73***
	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
α_1				0.46***	0.53***	0.068***
				(0.06)	(0.04)	(0.03)
β_0	1.10***	1.09***	1.09***	1.13***	1.12***	1.12***
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
β_1				1.05***	1.05***	1.04***
				(0.05)	(.04)	(0.04)
$\delta 0$	0.57***	0.67***	0.56***	0.51***	0.60***	0.51***
	(0.01)	(0.09)	(0.08)	(0.09)	(0.09)	(0.08)
$\delta 1$				0.71***	0.84***	0.69***
				(0.20)	(0.22)	(0.18)
$\sigma 1$	1.62***	1.70***	2.56***	1.59***	1.66***	2.52***
	(0.08)	(0.07)	(0.12)	(0.08)	(0.06)	(0.12)
$\sigma 2$	1.47***	1.66***	2.31***	1.47***	1.68***	2.33***
	(0.06)	(0.06)	(0.10)	(0.06)	(0.06)	(0.10)
Log-likelihood	−6,644.08	−6,637.76	−6,627.59	−6,641.21	−6,630.46	−6,624.63
Akaike information criterion	13,304.17	13,291.52	13,271.17	13,304.41	13,282.93	13,271.26
*H*0: Equality of fit[a]				(1a) = (2a)	(1b) = (2b)	(1c) = (2c)
Statistic				1.17	1.85	1.18
p-value				0.24	0.12	0.24
*H*0: $\alpha 0 = \alpha 1$						
Statistic				1.28	2.24*	1.32
p-value				0.20	0.02	0.19
*H*0: $\beta 0 = \beta 1$						
Statistic				1.31	1.32	1.31
p-value				0.19	0.19	0.19
*H*0: $\delta 0 = \delta 1$						
Statistic				−0.89	−0.97	−0.91
p-value				0.37	0.33	0.36
*H*0: $\beta 0 \leq 1$						
Statistic	3.73***	3.76***	3.65***	3.79***	3.89***	3.72***
p-value	0.00	0.00	0.00	0.00	0.00	0.00
*H*0: $\beta 1 \leq 1$						
Statistic			1.07		1.07	1.01
p-value			0.14		0.14	0.16

Note: Models with (a) include the split show-up payment (GTQ25 in the early payment and GTQ25 in the late payment) as the background consumption parameter for all participants. Models with (b) include the show-up payment only for the participants who explicitly included the payment in the tables of the experiment. Models with (c) exclude the show-up payment for all participants. Robust standard errors are reported in parentheses. [a] We use the non-nested likelihood-ratio test of Vuong (1989). * and *** indicate significance at the 5% and 0.1% levels, respectively.

direct comparison with other results found in the literature with different sample populations, such as Andreoni and Sprenger (2012) or Andreoni et al. (2015).

Models 1a, 1b, and 1c in Table 11 present average parameter estimates of α, β, and δ. Several factors are worth noting. First, participants exhibit much higher preferences for consumption smoothing than is typically observed in the developed world. The average parameter for estimated utility curvature is in the range of $\hat{\alpha} = [0.52 - 0.71]$.[31] The most comparable estimate is found in Andreoni et al. (2015), which reports $\hat{\alpha} = 0.87$ for a population of undergraduate students at a university in the United States. Andreoni and Sprenger (2012), in a similar experimental task with a more finely discretized choice space, report $\hat{\alpha} = 0.98$ for a similar sample of undergraduates. Our estimate is also lower than estimates using comparable methods in developing countries. An adaptation of the CTB used in the Philippines by Sawada and Kuroishi (2015)

[31]The sensitivity of the estimate of α to the background consumption parameter is noteworthy.

shows α as 0.738 and 0.854, depending on the estimation method. Second, the annualized discount factor exhibited in our data is close to the most comparable estimate from the literature. In particular, we find $\hat{\delta} = [0.56 - 0.67]$, while Andreoni et al. (2015) report $\hat{\delta} = 0.63$. Note that estimates of δ vary considerably in the literature, even when using similar experimental methods: Andreoni and Sprenger (2012) report $\hat{\delta} = 0.32$, while Sawada and Kuroishi (2015) report $\hat{\delta} = 0.99$. Lastly, we find no evidence that CCT recipients are present biased, on average. In particular, we find that $\hat{\beta}$ is very robust to including show-up payment, as estimates range between 1.09 and 1.10. Estimates are significantly greater than one ($p < 0.001$).[32] That is, participants prefer, on average, to shift monetary payments to the future. Neither Andreoni et al. (2015) nor Andreoni and Sprenger (2012) find evidence of present bias (β of 1.00 and 1.03, respectively), but this may be due to the timing of payments (see Balakrishnan, Haushofer, & Jakiela, 2017). Sawada and Kuroishi (2015) do find evidence of present biasedness, with estimates of β of 0.74 and 0.85.

To the best of our knowledge, Model 1 reports the first simultaneous estimates of time-preference parameters (utility curvature, discounting, and present biasedness) for CCT recipients. These results provide some insight into the mechanisms underlying the observed efficacy of CCT programs. In particular, the high level of utility curvature and high discounting of the future suggest that these may be important challenges for the populations targeted by CCT programs to make investments whose returns are far in the future, such as investments in their children's human capital. By providing relatively immediate returns for such investments, CCT programs are likely to have a significant impact. Although these results do not preclude the possibility that parents in such populations are relatively unlikely to invest in their children's human capital, because either they do not understand or do not value improved education and health outcomes, we show that preference primitives may be part of the story. Note that, during our study, the degree of impatience that we observed also suggests that funds from CCT programs ought to be dispersed quickly after the corresponding conditions have been met. The low estimate of α highlights the importance of the predictability of the CCT flows, and implies that there may be significant reductions in compliance in response to the delays or uncertainty regarding the timing of payment that occur in practice.

The finding that $\beta > 1$ implies that a participant would prefer to postpone monetary payments until a future time. This result is puzzling, as we also observe relatively low levels of patience, as measured by $\hat{\delta}$. One possible explanation, which we find compelling, is that the unitary model of household decision making may not be appropriate for our participants. In particular, if there is disagreement within the household regarding how to allocate funds, then a monetary windfall may be a precursor to conflict that the participant would, all else being equal, prefer to postpone. That is, the estimated future biasedness may be a conflict mitigation strategy. Furthermore, the presence of such disagreements within the household may be correlated with α and δ. If the presence of conflict affects preference for smoothing consumption, discounting or present biasedness, it may affect investment decisions in human capital. Although our experimental

[32]Note that the estimates reported here are consistent with the previously discussed reduced form analysis reported in Table 8.

design does not allow us to establish a causal relationship between household conflict and preferences, investigating such a link is of interest to policymakers who seek to encourage investments in human capital. Are women in households with intra-household conflict different in terms of utility curvature and discounting than their peers?

It is with this question in mind that we turn our attention to the second set of specifications in Table 11, which again reports average parameter estimates, but clusters the data with regards to whether the participant expressed a positive willingness to forgo funds to ensure they are disbursed in her name (subindex 1) or not (subindex 0). In addition, this table also reports tests of equality across clusters. We find that women who demand intra-household control have lower estimates of α and β, and have a higher δ. That is, they seem to have a stronger preference to smooth consumption and show a higher degree of impatience. However, the differences for β and δ are not statistically significant at conventional levels. The difference for utility curvature (α) is only significant under one specification (2b). Surprisingly, it is women with no demand for intra-household control who seem to be future-biased in that $\hat{\beta}_0 \geq 1.12$. This estimate is statistically significantly greater than one ($p < 0.01$). Women with demand for control are not future biased; $\hat{\beta}_1 = 1.05$, and this estimate is not significantly different than one but, as previously mentioned, β is not statistically significantly different between groups.

4.4. Individual parameter estimates

We also attempt to explore individual level estimates and separate those between groups. Table 12 presents summary statistics of individual level parameter estimates by using non-linear least squares (excluding the show-up fee for all participants).[33] For each parameter, summary statistics are presented for two groups, depending on whether individuals expressed demand for intra-household control or not. In addition, p-values are reported for a two-sided test for equal means and for a Pearson's χ^2 test of

Table 12. Individual level parameter estimates and statistical tests.

	Curvature: α			Present bias: β			Discount factor: δ		
	Demand for IHHC			Demand for IHHC			Demand for IHHC		
Statistic	No	Yes	p-value	No	Yes	p-value	No	Yes	p-value
Mean	0.678	0.639	0.497	7.227	1.785	0.166	1.006	1.021	0.084
Median	0.877	0.828	0.205	1.152	1.082	0.526	1.00	0.999	0.526
10-pctile	0.000	0.000		0.469	0.021		0.988	0.977	
25-pctile	0.517	0.429		0.841	0.722		0.993	0.993	
75-pctile	0.924	0.91		1.645	1.557		1.008	1.019	
90-pctile	0.945	0.94		3.034	2.998		1.026	1.131	

Note: Individual level joint estimates of parameters α, β, and δ, using non-linear least squares (NLS) excluding the show-up payment as the background consumption parameter for all participants. For means, the p-value shows the corresponding value for two-sided t-test of equality of means, assuming unequal variance. For medians, the reported p-value corresponds to that for a Pearson's chi-squared test for equality of medians.

[33]We present results for these estimates because they show parameters that seem most sensible (in terms of fewer implausibly extreme values). However, Table 13 presents results for alternative parametrization of the background consumption for non-linear least square estimates, as well as estimates using the interval censored Tobit and ordinary least squares.

Table 13. Individual level parameter estimates and statistical tests.

	Curvature: α			Present bias: β			Discount factor: δ		
	Demand for IHHC			Demand for IHHC			Demand for IHHC		
Statistic	No	Yes	*p*-value	No	Yes	*p*-value	No	Yes	*p*-value
Panel I: NLS estimate (b)									
Mean	0.429	0.374	0.311	1.131	1.134	0.966	0.433	0.416	0.813
Median	0.423	0.480	0.526	1.108	1.081	0.341	0.204	0.169	0.751
25-pctile	0.000	0.000		0.908	0.814		0.022	0.009	
75-pctile	0.765	0.670		1.397	1.515		1.000	1.000	
Panel II: NLS estimate (a)									
Mean	0.306	0.307	0.983	5.4e+27	2.6e+20	0.320	53.140	1045.900	0.134
Median	0.026	0.120	0.751	1.108	0.973	0.057	0.212	0.169	0.567
25-pctile	0.000	0.000		0.857	0.582		0.022	0.006	
75-pctile	0.678	0.599		1.373	1.339		2.728	8.494	
Panel III: OLS estimate									
Mean	1.115	0.264	0.524	1.4e+75	2.1e+58	0.32	1.476	6.4e+10	0.321
Median	0.456	0.311	0.205	1.009	0.486	0.341	1.158	1.102	0.526
25-pctile	0.056	0.226		0.114	0.009		0.850	0.849	
75-pctile	0.631	0.620		16.814	99.345		1.525	1.583	
Panel IV: ICT estimate									
Mean	0.329	0.294	0.528	3.983e+19	3.844e+17	0.324	111.516	1.3e+199	NA
Median	0.053	0.085	0.751	0.947	0.924	0.678	0.009	0.008	NA
25-pctile	0.000	0.000		0.692	0.605		0.001	0.001	
75-pctile	0.707	0.601		1.251	1.194		0.095	0.113	

Note: Individual level joint estimates of parameters α, β, and δ, using alternative methods and parametrization. Panel I (NLS b) shows non-linear least squares estimation, and only includes the show-up payment for the participants who explicitly included the payment, as shown in the Tables. Panel II (NLS a) presents non-linear least squares estimates that include the split show-up payment (GTQ25 in the early payment and GTQ25 in the late payment) as the background consumption parameter for all participants. Panels III and IV present ordinary least squares and interval censored Tobit estimates, both including the split show-up payment (GTQ25 in the early payment and GTQ25 in the late payment) as the background consumption parameter for all participants. For means, the *p* -value shows the corresponding value for two-sided *t*-test of equality of means, assuming unequal variance. For medians, the *p*-value is for Pearson's χ^2 test for medians.

equality of medians. For α, we find no statistically significant difference either in tests of equality of means or medians ($p > 0.205$). The results are robust as evidenced by other estimates reported in Table 13. For β and δ we also fail to find any significant differences (whether in means or medians). Again, this result is robust to alternative parametrization of background consumption with respect to NLS estimates or to alternative estimates.

The finding that α, β, and δ are not significantly different between women with and without demand for intra-household control suggests that providing CCT funds to women ensures that outcomes are not likely to be affected by the presence of intra-household conflict within the home via time preferences. However, they may still be affected directly by preferences over different goods to be allocated in the same time period.

5. Conclusions

This paper investigates the demand for intra-household control, as well as time-preference parameters of female recipients of a CCT program in Guatemala. To measure demand for intra-household control, we employ a novel method to assess willingness to forgo funds to ensure that a monetary windfall will be dispersed directly to the participant. This experimental measure allows us to distinguish whether a willingness to forgo funds for intra-household control is driven by conflicting preferences regarding *what*, rather than *when*, goods and services ought to be purchased. We jointly estimate time-preference parameters using the CTB introduced by Andreoni and Sprenger (2012).

Of interest is variation in preference primitives with regards to the presence of intra-household conflict. This question is important as time preferences will affect investment decisions. Our results are also of interest to policymakers, since CCT programs are designed to incentivize investments in human capital for children within the household.

Although we see heterogeneity in time preferences, we find no statistical differences in time preference parameters among those participants who exhibit positive willingness to forgo funds for intra-household control of finances. This suggests that the investment behavior of women who face intra-household conflict is not likely to differ dramatically from women who do not. Notwithstanding, our results do not rule out the possibility that other members of the household are able to influence these investment decisions via an intra-household bargaining process.

We also find that participants exhibit stronger preferences for consumption smoothing (i.e., greater utility concavity) than so-called WEIRD participants; see, for example, Andreoni and Sprenger (2012) and Andreoni et al. (2015).[34] The exhibited strong preferences for consumption smoothing together with the discount factor suggest that recipient preferences are such that high levels of illiquid investment with returns far in the future, such as human capital, may be relatively unlikely in the absence of the CCT program. Thus, given the poverty levels of CCT recipients and their vulnerability to income shocks, one might expect that marginal income will be allocated to investments

[34]Henrich, Heine, and Norenzayan (2010) coined the acronym WEIRD to refer to samples of participants drawn from Western, Educated, Industrialized, Rich, and Democratic societies.

that can be easily liquidated to cope with shocks and smooth consumption. An unconditional cash transfer is less likely to be invested in an illiquid asset such as health or education. Alternatively, in the absence of a CCT, a likely mechanism to smooth consumption will be to reduce investments in human capital (e.g., pulling the children out of school and putting them to work). Jensen (2000) finds that investments in children suffer drastically in the presence of adverse agricultural shocks and Beegle, Dehejia, and Gatti (2003) find that credit-constrained households actively use child labor to smooth their income.

This interpretation also suggests that preference primitives play a role as one of the drivers of the observed increased investments in human capital under CCTs relative to unconditional or weakly conditional transfers (i.e., with no enforcement or monitoring). For instance, in terms of education, Baird, Ferreira, Ozler, and Woolcock (2013) find that explicitly conditional programs that monitor compliance and penalize non-compliance have substantively larger effects (60% improvement in the probability of enrollment). Our findings also suggest that improved understanding of the preferences of CCT recipients may help improve program design. For instance, given the strong preferences for consumption smoothing by recipients, a transfer mechanism that retains the conditionality but allows for adjustment to shocks might improve program outcomes. Considerable resources are being expended on such programs in developing countries and there is evidence of room for improvement in their design (Attanasio et al., 2012; Barrera-Osorio et al., 2011; Janvry & Sadoulet, 2004). Thus, further research into the preferences and household environments of recipients may offer guidance in how to design them to maximize their effects.

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Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Diego Aycinena received his PhD from George Mason University and is currently an associate professor at Universidad del Rosario.

Szabolcs Blazsek received his PhD from Universidad Carlos III de Madrid and is currently a professor at Universidad Francisco Marroquin.

Lucas Rentschler received his PhD from Texas A&M University and is currently an assistant professor at Utah State University.

Betzy Sandoval received her master's degree from Chapman University and is currently a professor at Universidad Francisco Marroquin.

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