

Measuring Trust in Institutions*

Stefan P. Penczynski Maria Isabel Santana

August 7, 2015

Preliminary draft, please do not cite.

Trust is an important driver of economic interactions. We propose a new way of experimentally measuring trust in institutions which draws on the experimental method used to elicit time preferences. Our method allows to elicit levels of trust towards institutions in an incentivized way that is not identified by the participants as a measure of trust. In contrast to other measures of trust, it can easily be translated into the meaningful metric of subjective probability of completion of a payment. We measure trust towards two institutions, a Philippine microfinance institution (MFI) and local money lenders. We show that our trust measure is able to differentiate between treatments in the expected way, implying subjective probabilities of payment completion between 0.34 and 0.44 relative to the control treatment with payment securement. Unincentivized survey measures go in the same direction but suggest a much stronger difference.

*University of Mannheim, L7, 3-5, 68131 Mannheim, Germany. We thank participants of the ZEW/University of Mannheim Experimental Seminar, the European ESA Conference 2014 Prague, and the SEEDEC 2014 Bergen for helpful comments and discussions.

1. Introduction

Economic transactions are based on bilateral exchange of goods, services or money. The more the transacting parties trust each other, the easier it is to organize important sequential exchanges. Trust has a causal impact on economic development via channels on the financial, product and labor markets (Algan and Cahuc, 2013) and has positive consequences for behavior in the microfinance sector (Karlan, 2005). It is shown to be relevant for the demand for financial products when household financial literacy and legal protection are low (Cole, Gine, Tobacman, Topalova, Townsend, and Vickery, 2013).¹

In this study, we propose a novel measure of trust in institutions that is – like all experimental measures – based on the behavioral definition of trust put forward by Coleman (1990) and Fehr (2009). “An individual trusts if she voluntarily places resources at the disposal of another party without any legal commitment from the latter. In addition, the act of trust is associated with an expectation that the act will pay off in terms of [this individual]’s goals.” (Fehr, 2009, p. 238)

In particular, our trust elicitation is inspired by the literature on the quantification of time preferences (see Frederick, Loewenstein, and O’Donoghue, 2002, for a survey) and the documented challenge to obtain time preference measures for subjects that have complete trust in the experimenter and in the completion of the future payment (see, for example, Andreoni and Sprenger, 2012b, section IB). Here, we will observe changes in behavior between treatments in which different institutional settings govern the future payment. For example, looking at two random samples of the same population that differ in the institution responsible for the future payment allows us to attribute differences in elicited time preferences to a different level of trust in the institution. Furthermore, we establish a benchmark setting by providing payment securement in form of a post-dated check and can observe by institution the difference to the unsecured setting. Under assumptions about preferences, our data enables a quantification in terms of subjective probability of payment completion and thus trust in the institution.

Our measure of trust is related to other methods that have been used for that purpose. Experimental measures of trust are commonly based on the trust game by Berg, Dickhaut, and McCabe (1995) or the gift-exchange game by Fehr, Kirchsteiger, and Riedl (1993). The trust game has been used extensively in laboratory and field experiments as a way to measure trust both in developed and in developing countries (Karlan, 2005; Glaeser, Laibson, Scheinkman, and Soutter, 2000; Barr, 2003; Tu and Bulte, 2010; Buck and Alwang, 2011). Other frequently used measures of trust are hypothetical questions in surveys. For example, the question “Generally speaking, would you say that most people can be trusted or that you can’t be too careful when dealing with others?” is used in the European and General Social Survey, the World Value Survey etc. Measures of trust in institutions are elicited for example by the German Socio-Economic Panel by asking “How much trust do you have in ...?” A combination of the survey and experimental methods is proposed by Naef and Schupp (2009) who elicit responses to three statements which correlate with experimentally measured trust in strangers.

Like survey questions, our trust elicitation is equipped to measure trust in an institution because – in contrast to the standard trust games – there is a clearly defined, known trustee:

¹Generally, trust has been shown to be positively related to GDP (Porta, Lopez-De-Silanes, Shleifer, and Vishny, 1997; Knack and Keefer, 1997; Zak and Knack, 2001), trade (Guiso, Sapienza, and Zingales, 2009), and to stock purchases (Guiso, Sapienza, and Zingales, 2004, 2008).

the institution that is responsible for the future payment. In addition, an advantage of the experimental nature of the games and our method is that they lead to the observation of incentivized, not hypothetical behavior. Furthermore, coming in the guise of a measure of time preferences, trust is elicited without the subjects ever suspecting a trust measurement or hearing the word “trust”. In contrast to both survey and experimental measures, our data allows us to quantify the trust in an institution in terms of the subjective probability of following through on a promise.

In this study we implemented our trust elicitation method alongside a trust game and survey questions on trust in the context of a field study in the Philippines. The two institutions that are responsible for delivery are on the one side a regional microfinance institution called Negros Women for Tomorrow (NWTF) and on the other side local money lenders (ML). In addition to this variation, we further vary whether the future payment is secured for the subjects by a check or not and the distance in time until the future payment.

We observe significant differences in trust in the expected direction and quantify the subjective probability of payment completion to be between 0.34 and 0.44 relative to payments with securement by check. The results from a subsequently played trust game are not significantly different across treatments. The survey measures of trust are differing between the two institutions to a much stronger degree. Although they cannot be translated into a meaningful metric, it seems that the question for trust invokes further elements beyond trust like fairness or preference that is distinct from the definition of trust as presented above.

2. Theoretical Background

In order to get an intuition for the exact nature of our trust measure, consider a time separable CRRA utility function

$$U(c_t, c_{t+k}) = \frac{1}{\alpha} c_t^\alpha + \delta^k \beta P_I c_{t+d}^\alpha, \quad (1)$$

where δ is the standard time discount factor, β is the present bias discount factor and α is the curvature parameter. c_t and c_{t+k} correspond to the experimentally chosen amounts of money allocated to time t and time $t+d$. P_I is the probability of receiving the money by the institution at time $t+d$ and is what we call the level of trust in institution I .

Maximizing the utility subject to the future valued budget constraint

$$m = c_t(1+r) + c_{t+d}, \quad (2)$$

the optimal consumption allocation is characterized by:

$$\frac{c_t}{c_{t+d}} = \left[(1+r) P_I \delta^d \beta \right]^{\frac{1}{\alpha-1}}. \quad (3)$$

Taking logs of equation 3, we get an estimable equation:

$$\ln \left(\frac{c_t}{c_{t+d}} \right) = \left(\frac{1}{\alpha-1} \right) \cdot \ln(1+r) + \left(\frac{\ln P_I}{\alpha-1} \right) \cdot \mathbf{1}_I + \left(\frac{\ln \beta}{\alpha-1} \right) + \left(\frac{\ln \delta}{\alpha-1} \right) \cdot d, \quad (4)$$

in which $\mathbf{1}_I$ is an indicator function that takes the value of 1 when c_{t+d} is received through institution I and 0 when received through another (benchmark) institution.

Variation of the interest rate $(1 + r)$ enable the identification of the curvature parameter, variation in delay lengths d allows for the identification of the discount factor δ and variation in institution responsible for the future payment allows for the identification of P_I , the level of trust in institution I .

3. Experimental Design

The data on levels of trust results from an experimental trust elicitation (TE) that is similar to a time preference elicitation as described in the following. The trust game (TG) and the implemented survey questions (SQ) complement the perspective on trust. We elicit risk preferences (RPE) in a way that is very similar to the trust elicitation. At the moment, their analysis and the combination with the results on trust are subject of future work.

3.1. Trust Elicitation

3.1.1. Design

Subjects are presented 36 decisions, in which they allocate payment amounts c_t and c_{t+d} . These decisions result from a (2x2) experimental design with two dates for the later payments $d = (7, 28)$ and a payment securement $S = (NC, C)$, depending on whether a securement in form of a check was offered (C) or not (NC). For each combination of c and t , subjects were presented with nine different interest rates ranging from 0 to 3900 percent over period d .

In each of the decisions, subjects had to choose a Philippine Pesos (PHP)² amount $c_t \in [a, 150]$ that determines the future amount to be $c_{t+d} = (150 - c_t) \cdot (1 + r)$. For interest rates ranging from 0 to 1.67, the smallest current amount is $a = 0$. For $r = (3, 7, 39)$, we set $a = (50, 100, 140)$ in order to limit the amount that can be invested and cap the amount c_{t+d} at 400. Table 1 presents the interest rates and the daily standardized interest rates for the 36 decisions.

3.1.2. Institutions

We measure trust in two financial institutions. One institution is a formal financial institution that offers loans at market interest rates, while the other is an informal financial institution offering credit at high interest rates and probably less highly regarded by clients and the community.

Negros Women For Tomorrow Foundation (NWTF) The Negros Women for Tomorrow Foundation is a nonprofit microfinance institution that operates in the Visayas Region of the Philippines. NWTF provides loans to poor women from rural communities to start or expand their own small businesses following the Grameen Bank credit methodology of group lending. Here, women form part of a lending group of 5 people where loans are made to individual participants within the group. There is, however, joint responsibility in the sense that if a member

²The exchange rate at the time of the experiment was 47 PHP for 1 EUR. Thus 150 PHP amount to 3.19 EUR.

Delay d	Securement c	Minimum amount a	Interest rate $(1 + r)$	Daily Rate r_{daily}
7	0	0	1	0.00
7	0	0	1.33	4.20
7	0	0	1.67	7.57
7	0	0	2	10.41
7	0	0	2.33	12.87
7	0	0	2.67	15.04
7	0	50	4	21.90
7	0	100	8	34.59
7	0	140	40	69.38
7	1	0	1	0
7	1	0	1.33	4.20
7	1	0	1.67	7.57
7	1	0	2	10.41
7	1	0	2.33	12.87
7	1	0	2.67	15.04
7	1	50	4	21.90
7	1	100	8	34.59
7	1	140	40	69.38
28	0	0	1	0
28	0	0	1.33	1.03
28	0	0	1.67	1.84
28	0	0	2	2.51
28	0	0	2.33	3.07
28	0	0	2.67	3.57
28	0	50	4	5.08
28	0	100	8	7.71
28	0	140	40	14.08
28	1	0	1	0
28	1	0	1.33	1.03
28	1	0	1.67	1.84
28	1	0	2	2.51
28	1	0	2.33	3.07
28	1	0	2.67	3.57
28	1	50	4	5.08
28	1	100	8	7.71
28	1	140	40	14.08

Table 1: Choice Sets.

defaults all members have to pay for her or else the entire group is excluded from future loans. Those five member groups meet every week to make their loan payments and savings in a center meeting, where usually other seven groups also carry out their payments. The loan program has a minimum loan of PHP 1,000 and a maximum of PHP 30,000 (between 21 and 638 US dollars, approximately).

Local Money Lenders (ML) Local Money Lenders are an informal financial institution in the Philippines also referred to as “5-6”. They lend money usually to poor people that might not have access to formal lending institutions. These type of lenders charge a nominal interest rate of 20 percent over a time period of usually two months. Thus, a person borrowing 500 PHP will have to pay 600 pesos at the end of the two months. Local money lenders do not require collateral or any documents from their borrowers. “5-6” Money lenders are widely known by the population and usually seen as a last resort for borrowing money. In general, this type of credit institution has a negative reputation among the population since it is perceived as

charging very high interest rates to the detriment of the borrower.³

3.1.3. Payment Procedures

Like in standard time preferences elicitation studies, our payment procedures are intended to equalize the transaction costs between the possible payment dates. Therefore, payments for $t = 0$ were paid at the end of the experiment session and later payments were delivered in cash to the subjects' home. However, since we are interested in eliciting levels of trust in the institution we did not generally implement measures that would change the confidence regarding the delivery of the future payment (see Andreoni and Sprenger (2012a); Harrison, Lau, and Williams (2002)).

Payment Securement Many experiments in the time preference literature use post-dated checks to increase the subjects' confidence in the realization of the later payment. From our perspective, adding a payment securement in the form of a check allows to exogenously vary this confidence and also test whether it indeed has an influence on the decision. We therefore implement checks, signed and post dated to the future date, for 18 of the 36 decisions. The remaining 18 decision have no payment securement. Subjects are familiar with this form of payment, since this is the method used by NWTF for loan disbursements. Checks were issued from Banco de Oro (BDO), the largest bank in the Philippines and had the stamp of the University of Mannheim. A sample check can be seen in Appendix A.1.3.

Subjects were informed about the payment securement before they made the 36 decisions during the game instructions. They were told for 18 decisions there will be a payment securement and for the remaining 18 there will not be a payment securement. Participants were also shown a sample check, signed and post-dated with the name of one of the participants as an example.

BDO branches are common in the city of Iloilo, but less common in rural areas. Subjects would have to incur transportation costs if the need to cash the check arises. Therefore we offered a second possibility to cash the checks within the communities. For this second option, NWTF allowed us to use their branches for cashing the checks. Each branch was provided with a cash box in order to cash the checks. Subjects were only disclosed the information of the local option upon payment.

In order to account for order effects, we randomized the order of the check. Thus, approximately half of the subjects first made 18 decisions that had no payment securement and the following 18 decisions included a payment securement (NC/C treatment) and the remaining half had the first 18 decision with a payment securement and the following 18 without a payment securement (C/NC treatment).

Later Payments At the end of the session, subjects were reminded of the results of the incentivized tasks. Subject's "later" payments and a receipt were placed in an envelope with the double checked subject's address and phone number and were sealed in front on the participant to make sure they saw the funds go into the envelope.

³The lucrative and risky business attracts many Indians and has a long history in the Philippines (Times of India, 2013).

Each subject was given at the time of payment a secret code, which they had to provide upon the later payment. The secret code allowed us to verify that the subject had indeed received the payment.

After the experimental session, the envelopes were brought to the respective institutions to be kept until the later payment dates. Later payments were delivered by research assistants representing the two different institutions. Out of our 1,253 subjects, 667 had later payments and only 2 did not receive them because both were not at home at the time of the delivery and could not be tracked afterwards.⁴

3.2. Trust Game

The trust game was played in a way similar to the original game by Berg, Dickhaut, and McCabe (1995) and did not differ across treatments. Participants were randomly assigned to the role of investor or investee. Investors were given an initial endowment of PHP 50. Investors had then to choose an amount ranging from 0 to PHP 50 to send to the investee. This amount was tripled by the experimenter. The investee had to choose how much to send back from the tripled amount. Participants were not aware which participant had been matched with her as in the opposite role.

3.3. Trust Survey Questions

In the questionnaire after the games, we elicit general trust attitudes and trust in institutions with standard survey questions. In particular, we use General Social Survey (GSS) questions on trust: “Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?”, fairness: “Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair” and helpfulness: “Would you say that most of the time people try to be helpful or that they are mostly just looking out for themselves?”. The particular trust question, however, has raised concerns since it could not only be drawing on people’s belief about others’ trustworthiness, but also on their own preferences towards risks. (Fehr, 2009; Miller and Mitamura, 2003). Thus, we also include a direct trust question “Do you think that most people can be trusted?” with answer categories on a 7-point Likert scale ranging from “not at all” (1) to “completely trusted” (7) as in Miller and Mitamura (2003).

We also adapt these questions to the institutions we are interested in. The trust, fairness and helpfulness questions as in the GSS are adapted for NWTF and the local money lender. The same for the direct trust question. All questions are asked in detail for NWTF when the NWTF and the control treatments are implemented and for the local money lender when the local money lender treatment is implemented. We also ask the direct trust question for NWTF when the money lender treatment is implemented, and vice versa. The direct trust question is also asked for other institutions, family, center members, group members and the loan officer.

⁴Both subjects were contacted repeatedly, one was not interested in receiving the amount (only 20 PHP) and the second one could not be reached.

3.4. Experimental Protocol

The experiments were conducted in the Philippine provinces of Guimaras, Capiz and Iloilo during the months of March, April and May 2015. They were implemented on android supported tablet computers with Open Data Kit (ODK), an open source survey program. Instructions and explanations were provided by research assistants.

A session begins with a pre-questionnaire administrated by a research assistant which is followed by the general instructions in the plenary. Subsequently, subjects go through the trust and risk preference elicitation tasks as well as the trust game, each starting with its respective instructions. The one decision out of TE and RPE to be paid out is chosen by a draw of the subject. Then participants answer a second questionnaire. Finally, subjects collect their payments.

For the incentivized tasks, posters with screenshots illustrate in detail the steps of the decisions in order to help the understanding of the subjects. After the instructions of the TE and RPE, participants do a trial round in which they go over the decisions. Subjects are at all times accompanied by a research assistant, who explain the context again step by step if needed. One research assistant usually attends to 2 subjects. Appendices A.1.1 and A.1.2 present the instructions and screenshots of the TE.

Each of the TE decisions involves three steps. First, subjects decide non-incentivized between two PHP allocations (c_t, c_{t+d}) and indicate a preference between $(150, 0)$ and $(0, 150 \cdot (1 + r))$ (see figure 3 in appendix A.1.2). This first question resembles a single question from a multiple price list without a convex budget set. After getting familiar with the key parameters of the decision, subjects are able to choose any amount $c_t \in [a, 150]$ in steps of 10 and see at the same time the remaining amount $c_{t+d} = (150 - c_t) * (1 + r)$ (see figure 4). Finally, subjects have the option to refine their choice to the unit level in a dropdown menu (see figure 5). For $a = 140$, the third step is dropped since the second step was in steps of 1 already.

The 36 decisions were divided in 4 blocks of 9 questions with different interest rates. In the first and third blocks, subjects made their choices for $d = 7$ and in the second and fourth blocks for $d = 28$. Once a block was finished, subjects could not rush ahead. They had to wait for the research assistant to enter a code and remind them of the features of the new block. Depending on the order of NC and C , a payment securement was offered in the two first or last blocks. Between the first and last two blocks, the instructor would remind subjects of the upcoming decisions and the provision (or not) of the payment securement.

3.5. Randomization and Recruiting

Subjects participating in our study are clients of NWTF⁵ and were randomly selected from the pool of clients belonging to three different branches in the provinces of Iloilo, Guimaras and Capiz. Individuals were randomly assigned to four treatment groups, following a (2×2) design where the institutions and the two order of the payment securement were randomly assigned. Prior to randomization, we divided our sample into 60 bins, each of which contained on average 90 clients. The bins were composed of clients in different locations, and the criteria to form a

⁵Out of the 1253 subjects, 77 were not NWTF members, but community members of villages with NWTF clients.

bin was minimum distance between villages within the bin and number of clients.

The bins were randomly assigned to one of the four treatments, and subjects were randomly chosen within each bin using an optimally designed mechanism that guaranteed similarity across the four groups in terms of financial characteristics (loan size and amount of savings), village size and distance from the village to the municipality center.⁶

In order to recruit the participants we first got permission from the Municipality Major and subsequently from the Village head, locally known as Barangay Captain. Barangay Captains would additionally authorize the use of the village facilities, usually the Barangay Hall, where we would hold the experiment sessions. Subjects were invited to participate in the experiment via an invitation letter delivered to their houses.

4. Data and Empirical Strategy

Table 2 reports summary statistics for the full sample and the equality of means test between the order treatments (NC/C and C/NC) and the institution treatments (NWTF and ML). Panel A presents data gathered during the pre-questionnaire and panel B presents data collected during the post-questionnaire, that is to say after the experiments.

Given that the treatments are randomly assigned, we expect individuals in the NWTF treatment to be similar to individuals in the ML treatment, and individuals in the NC/C treatment to be similar to individuals in the C/NC treatment. The table shows that our expectation holds in general. The number of significant differences are within the bounds expected to occur by chance. Individuals assigned to the NWTF treatment are more likely to have a formal source of non-drinking water than individuals in the ML treatment and less likely to have larger households. They also report higher trust levels in NWTF. As noted before, the trust level data was gathered in the post-questionnaire after the games were played in order to avoid the subjects deliberate their trust in the institutions before the experiments. Thus, the difference in levels of trust between the NWTF and the ML treatments might be due to an effect of the games.

Individuals assigned to the NC/C treatment are less likely to use a shared toilet in the household than individuals assigned to the C/NC treatment and have a slightly lower number of rooms used for sleeping in the household. All other covariates are not statistically different between treatment groups.

The table shows that subjects are on average 43 years old with approximately 13 years of education. They have an average household size of 6 members and earn on average 1,422 PHP on a monthly basis. The subjects earned income is relatively low, taking into account that the daily minimum wage for their region ranges from 256.50 to 298.50 PHP (DOLE, 2015). However, only approximately half of the subjects have an income source either as full or part time employees or as self employed. The average level of trust for all subjects in NWTF is 6.3, based on a 7 point Likert scale, while for local money lender it is 3.8.

⁶This procedure minimizes the Mahalanobis distance of the covariates to its cluster average weighted by the covariance matrix (see Morgan and Rubin (2012)). The treatment assignment procedure is available upon request.

	(1) Full Sample	(2) ML	(3) NWTF	(4) ML- NWTF	(5) NC/C	(6) C/NC	(7) NC/C- C/NC
<i>Panel A</i>							
Age	42.78	43.02	42.55	0.470 (0.502)	43.04	42.54	0.504 (0.471)
HH source of non drinking water	4.01	4.11	3.91	0.204** (0.021)	3.94	4.07	-0.134 (0.129)
HH source of drinking water	5.54	5.59	5.49	0.0974 (0.468)	5.47	5.61	-0.138 (0.306)
Material of HH's roof	4.57	4.54	4.60	-0.0591 (0.445)	4.58	4.56	0.0168 (0.829)
Electricity in HH	0.88	0.89	0.87	0.0191 (0.337)	0.88	0.87	0.00279 (0.889)
HH shares toilet (yes, no)	0.13	0.12	0.13	-0.004 (0.824)	0.10	0.15	-0.046** (0.021)
Number of rooms used for sleeping	1.81	1.83	1.78	0.0491 (0.305)	1.76	1.84	-0.0796* (0.097)
HH/dwelling ownership	0.88	0.88	0.88	-0.000564 (0.977)	0.89	0.88	0.00571 (0.769)
Number of HH members	5.47	5.33	5.60	-0.276** (0.028)	5.49	5.45	0.0450 (0.722)
Material of HH's floor	2.32	2.34	2.29	0.0499 (0.290)	2.31	2.32	-0.0128 (0.786)
Material of HH's walls	2.74	2.74	2.75	-0.0114 (0.878)	2.72	2.76	-0.0446 (0.549)
Type of toilet in HH	1.21	1.20	1.23	-0.0261 (0.508)	1.20	1.22	-0.0205 (0.603)
Monthly income (PHP)	1421.93	1457.66	1387.79	69.87 (0.777)	1513.75	1339.67	174.1 (0.482)
Has regular income (yes, no)	0.56	0.57	0.56	0.0115 (0.702)	0.56	0.56	-0.000332 (0.991)
Employment Status	4.15	4.10	4.19	-0.0893 (0.466)	4.15	4.14	0.00954 (0.938)
Holds official position in village (yes, no)	0.07	0.08	0.06	0.0211 (0.176)	0.06	0.08	-0.0158 (0.310)
Years of education	12.85	12.70	12.99	-0.283 (0.354)	12.76	12.93	-0.175 (0.567)
<i>Panel B</i>							
Amount borrowed from MFI/Banks (latest loan)	5771.32	5925.00	5626.25	298.8 (0.141)	5826.63	5721.83	104.8 (0.606)
Total savings in MFI/rural bank	1419.84	1398.03	1439.44	-41.41 (0.913)	1179.47	1645.25	-465.8 (0.220)
Trust level in NWTF (1-7)	6.29	6.12	6.46	-0.337*** (0.000)	6.23	6.35	-0.117 (0.101)
Trust in local money lender (1-7)	3.81	3.82	3.79	0.0236 (0.847)	3.76	3.85	-0.0904 (0.460)
<i>N</i>	1,102	533	569	1,102	521	581	1,102

Notes: *p*-values in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Descriptive Statistics.

5. Results

5.1. Trust Elicitation

From the treatment variations in the trust elicitation method in terms of checks, institution, and delay d , we derive three hypotheses about differences in behavior.

First, the the payment securement in form of the check is expected to influence the subjective probability of receiving the later payment in a positive way. This increase in expected future payment should result in an increased “investment” and a reduced current consumption.

Hypothesis 1 *Ceteris paribus, choices with check provision result in lower current consumption than choices without check provision.*

Second, given the differences in the formality and reputation of the two financial institutions, we expect the subjects to exhibit more trust in the more formal institution of NWTF. Compared to the local money lender, the future payment is higher in expectation and should result in an increased “investment” and a reduced current consumption.

Hypothesis 2 *Ceteris paribus, choices with the responsible institution being NWTF result in lower current consumption than with the local money lender.*

Finally, due to standard exponential time discounting, a higher delay d makes the evaluation of an investment with a given interest rate less interesting. Therefore, since the later payment will be discounted more heavily, the smaller present value of the later payment should result in a higher current consumption under $d = 28$ than $d = 7$.

Hypothesis 3 *Ceteris paribus, the stronger discounting under the longer delay results in higher current consumption choices under $d = 28$ than under $d = 7$.*

For a first glance into the data, table 3 presents average differences over all decisions for the three hypotheses. The data suggests that the first two hypothesis are supported by the data while the hypothesis on time discounting is not.

	(1)	(2)	(3)
	No Check–Check	ML–NWTF	7–28 Days
Δc_t	16.21*** (0.000)	4.288*** (0.000)	0.243 (0.639)
N	45036	45036	45036

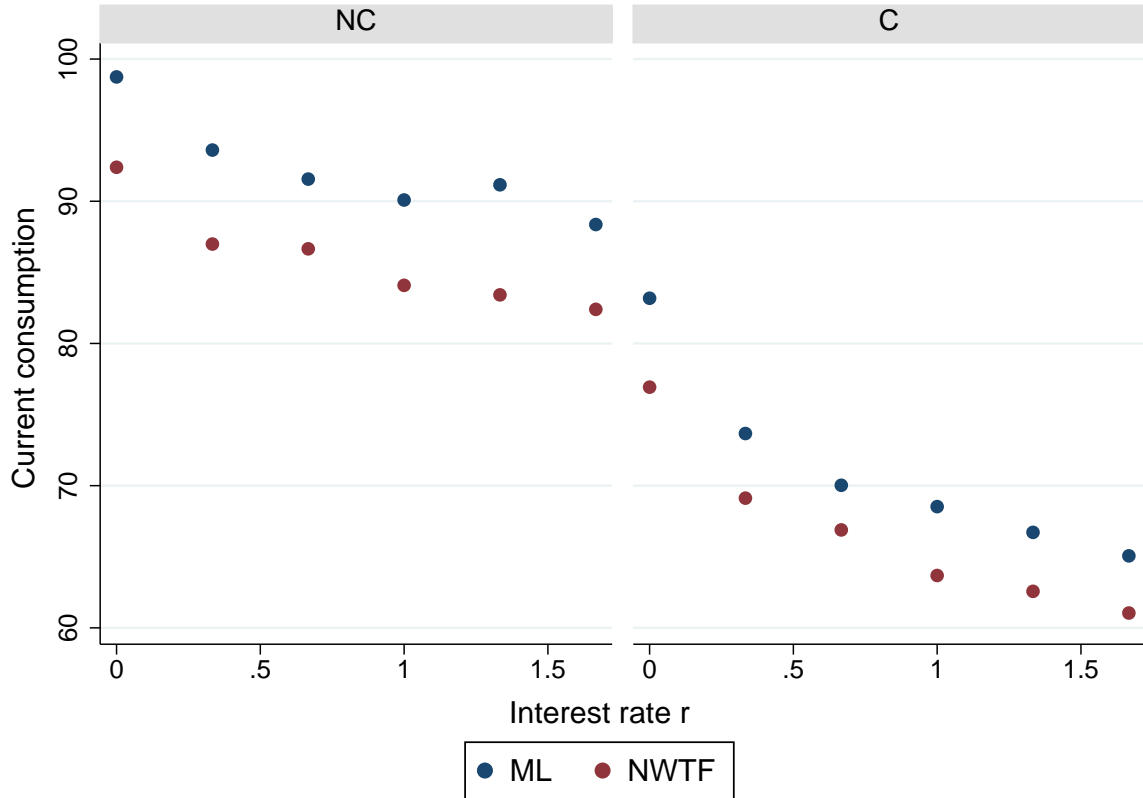
Notes: p -values in parentheses, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Equality of means test for c_t .

Column 1 shows that – as expected – without a payment securement in form of a check, current consumption is significantly higher by 16.21 PHP than with the securement of a check. Figure 1 illustrates the average decisions by interest rate. For both institutions, the left panel (NC) shows visibly higher current consumption levels than the right panel (C).

Column 2 of table 3 shows that the current consumption is significantly higher by 4.29 PHP in the ML treatment than in the NWTF treatment. This regularity is also visible in figure 1.

Figure 1: Current consumption by interest rate and institution: NC vs. C.



The significance of these differences is quantified in tables 4 and 5. Interestingly, without check securement, the difference in the current consumption between the two institutions is statistically significant at each interest rate level as shown in table 4. However, when the check is provided the difference in current consumption across the institution treatments is smaller and in several cases only marginally significantly different from zero as shown in table 5. This suggests that the “institution” of the check securement increases the subjective probability of receiving the future payment and reduces the relevance of the two responsible institutions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
r	0	0.33	0.67	1	1.33	1.67	3	7	39
Δc_t	6.352***	6.610***	4.905**	6.000**	7.738***	5.964**	5.381***	2.374***	0.429**
	(0.008)	(0.006)	(0.037)	(0.011)	(0.001)	(0.011)	(0.001)	(0.006)	(0.014)
N	2502	2502	2502	2502	2502	2502	2502	2502	2502

Notes: p -values in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Equality of means tests of c_t by interest rate in NC (ML–NWTF)

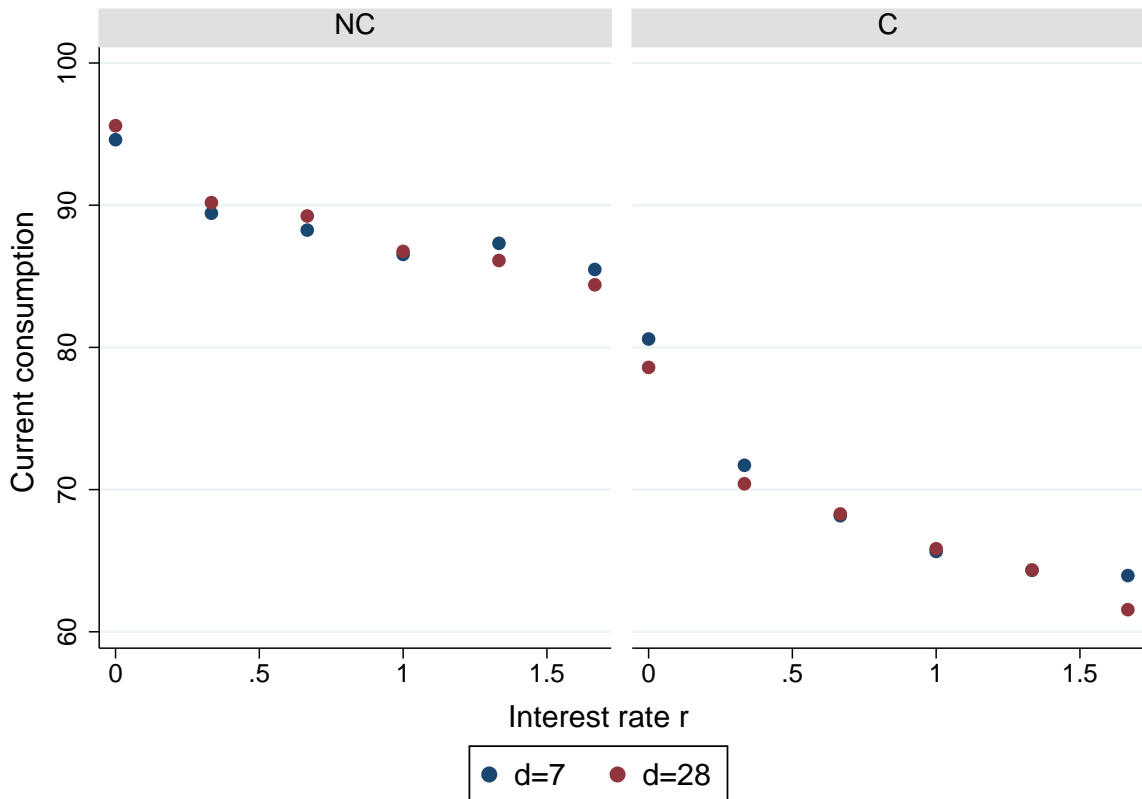
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
r	0	0.33	0.67	1	1.33	1.67	3	7	39
Δc_t	6.251** (0.012)	4.545* (0.057)	3.141 (0.184)	4.843** (0.036)	4.147* (0.068)	4.021* (0.075)	3.280** (0.030)	1.020 (0.146)	0.180 (0.207)
Observations	2502	2502	2502	2502	2502	2502	2502	2502	2502

Notes: p -values in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Equality of means tests of c_t by interest rate in C (ML–NWTF)

Finally, column 3 of table 3 suggests that there is no statistically significant difference in current consumption when varying the delay between $d = 7$ and $d = 27$ days. Figure 2 illustrates the differences by interest rate for both NC and C. Tables 6 and 7 show that there is no significant difference in current consumption between the two delays for any level of the interest rate. The results suggest that if there is any δ -discounting, it is very small.

Figure 2: Current Consumption by interest rate and days until future payment: C vs. NC.



	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
r	0	0.33	0.67	1	1.33	1.67	3	7	39
Δc_t	-0.985	-0.745	-0.993	-0.210	1.207	1.078	-0.962	-0.106	0.150
	(0.680)	(0.752)	(0.670)	(0.928)	(0.604)	(0.644)	(0.559)	(0.902)	(0.383)
N	2502	2502	2502	2502	2502	2502	2502	2502	2502

Notes: p -values in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Equality of means tests of c_t by interest rate in NC (7–28 days).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
r	0	0.33	0.67	1	1.33	1.67	3	7	39
Δc_t	1.998	1.303	-0.128	-0.192	-0.0240	2.398	0.352	0.184	0.0544
	(0.417)	(0.582)	(0.956)	(0.933)	(0.991)	(0.283)	(0.814)	(0.791)	(0.700)
N	2502	2502	2502	2502	2502	2502	2502	2502	2502

Notes: p -values in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Equality of means tests of c_t by interest rate in C (7–28 days).

For a structural estimation of preferences and trust levels, the utility function introduced in equation 4 can be adapted to our particular setup. In particular, the institutional environment is now defined by the responsible institutions I as well as the payment securements S .

$$\ln \left(\frac{c_t}{c_{t+d}} \right) = \left(\frac{\ln \beta}{\alpha - 1} \right) + \left(\frac{1}{\alpha - 1} \right) \cdot \ln(1 + r) + \left(\frac{\ln P_S}{\alpha - 1} \right) \cdot \mathbf{1}_S + \left(\frac{\ln P_I}{\alpha - 1} \right) \cdot \mathbf{1}_I + \left(\frac{\ln \delta}{\alpha - 1} \right) \cdot d,$$

Random assignment of treatments allows us to obtain unbiased estimates of our parameters by estimating

$$y = \gamma_0 + \gamma_1 \ln(1 + r) + \gamma_2 \cdot \mathbf{1}_S + \gamma_3 \cdot \mathbf{1}_I + \gamma_4 \cdot d, \quad (5)$$

where $y = \ln \left(\frac{c_t}{c_{t+d}} \right)$ is the log of the ratio of the current and future consumption and r is the interest rate. $\mathbf{1}_I$ is a dummy variable that takes the value of 1 when the institution corresponds to the local money lender and 0 when the institution is NWTF. $\mathbf{1}_S$ is an indicator function that takes the value of 1 if no payment securement is provided and 0 when a payment securement is provided. Finally, $d = (7, 28)$ indicates the delay in days until the later payment will be realized.

Rearrangements of the estimated coefficients γ allow us to calculate our parameters of interest: the curvature parameter $\hat{\alpha} = \frac{1}{\gamma_1} - 1$, the discount rate $\hat{\delta} = \exp\left(\frac{\gamma_4}{\gamma_1}\right)$, $\hat{P}_S = \exp\left(\frac{\gamma_2}{\gamma_1}\right)$, $\hat{P}_I = \exp\left(\frac{\gamma_3}{\gamma_1}\right)$, and the present bias $\hat{\beta} = \exp\left(\frac{\gamma_0}{\gamma_1}\right)$.

Table 8 presents two-limit Tobit Maximum Likelihood estimates for various specifications. Throughout all estimations, the estimated CRRA curvature $\hat{\alpha}$ is estimated around 0.77, a level in between estimates of Andreoni and Sprenger (2012b) and Andersen, Harrison, Lau, and Rutström (2008). The daily discount rate $\hat{\delta}$ is estimated to be close to 1, implying that there is no discounting occurring that depends on the distance of consumption in the future. Across the NWTF and ML treatment samples, these parameters are stable. It is therefore reasonable to jointly estimate parameters in the full sample (columns 1 and 4).

Removing the payment securement is estimated to significantly change the perceived probability of receiving the later payment. In the full sample, when the probability of receiving the payment with a check is normalized to 1, the probability of receiving the later payment is roughly 0.39 when no check is provided. This estimate differs between the two institution samples. This probability is 0.44 in the NWTF sample, higher than the 0.34 in the ML sample. Therefore, compared to a benchmark with a payment securement that is independent of the institution, the trust in a non-secured payment from NWTF is higher than for ML. This is recurring in the full sample estimations where the estimated probability of receiving the later payment – irrespective of the securement – from ML rather than NWTF is $\hat{P}_I = 0.956$, although it is not statistically different from 1. The previous difference is mitigated by the smaller difference between institutions when a securement is provided.

The inclusion of a present bias parameter $\hat{\beta}$ in columns 4-6 does not change the likelihood of the parameters much. It does, however, lead to a decreased estimate of \hat{P}_I and suggests rather unreasonable estimates of $\hat{\beta} > 1$.

	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	NWTF	ML	Full sample	NWTF	ML
CRRA Curvature $\hat{\alpha}$	0.775 (0.008)	0.770 (0.010)	0.781 (0.000)	0.771 (0.008)	0.766 (0.011)	0.779 (0.013)
Daily Discount Rate $\hat{\delta}$	1.002 (0.001)	1.004 (0.001)	1.000 (0.038)	1.002 (0.001)	1.003 (0.001)	1.000 (0.002)
\hat{P}_S	0.396 (0.015)	0.436 (0.020)	0.343 (0.019)	0.387 (0.016)	0.426 (0.021)	0.339 (0.024)
\hat{P}_I	0.956 (0.114)			0.742 (0.116)		
Present bias $\hat{\beta}$				1.315 (0.142)	1.219 (0.135)	1.080 (0.140)
LL	-65783.8	-38084.6	-27636.4	-65780.5	-38082.9	-27636.2
N	30096	17232	12792	30096	17232	12792
Uncensored	15598	9244	6354	15598	9244	6354

Notes: Two-limit Tobit Maximum Likelihood estimators. Standard errors in parenthesis calculated via the delta method.

Table 8: Utility and trust parameters.

Overall, compared to an independent benchmark with payment securement, we can see that the trust in the institution as expressed in the probability of receiving the later payment is relatively low. As we expected, the level of trust in NWTF is higher than the level of trust in ML. The differences in the levels between the two institutions are, however, gradual and probably less than expected.

5.2. Trust Game and Self-reported Trust

In the following, we compare the previous results on trust to the results from the trust game and the survey questions.

The top part of table 9 presents the amounts invested and received in the trust game. Out of 50 PHP, subjects on average invest 25.7 PHP and return 30.8 PHP. The levels of trust and

trustworthiness with a return on investment slightly higher than 1 are in line with other results in the literature (Berg, Dickhaut, and McCabe, 1995). Comparing the ML and NWTF samples, we see that there is a slight but insignificant difference between treatments. In ML, slightly higher amounts are invested and returned.

It has been discussed that the trust game is picking up general levels of trust as the players that are confronting each other anonymously are randomly drawn from a known general population. It would be rather surprising to find differences depending on the institution that is relied upon in the previous part of the experimental session.

The bottom part of the table reports average ratings on a 7 point Likert-scale for the question: “Do you think that NWTF/ML can be trusted?” Irrespective of the treatment, there is a stark difference in trust ratings between NWTF and ML. The differences between treatments are comparatively small. They are very small and insignificant for ML. For NWTF, the ratings are significantly higher in the NWTF treatment, probably as a result of the experiments that were done previously. Still, the difference is nowhere near the overall differences between institutions. While NWTF’s rating are on the top end of the scale, ML only gets middle ratings.

Although the Likert-ratings come without a metric, a comparison of the results suggests that the reported differences in trust differ from the trust measured in our elicitation task. It is possible that the self-reported levels include further aspects of these institutions, like general preference, fairness of their common terms, helpfulness, or other factors that might explain the strong differences in the self-reports, but which are not part of trust in the institution.

	Full Sample	ML	NWTF	ML–NWTF
Invested in TG	25.70	26.31	25.26	1.048 (0.688)
Returned in TG	30.82	31.67	30.19	1.480 (1.185)
Trust in NWTF (1-7)	6.29	6.12	6.46	-0.337*** (0.071)
Trust in ML (1-7)	3.81	3.82	3.79	0.024 (0.122)
<i>N</i>	1251	533	718	1251

Notes: The trust survey questions are based on a 7 point Likert scale: 1-strongly disagree, 7-strongly agree. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors of the equality of means test in parentheses.

Table 9: Trust game and survey questions.

6. Conclusion

We propose a new way of experimentally measuring trust in institutions which draws on the experimental method of eliciting time preferences. In particular, we are implementing a time preference elicitation with convex budget sets as proposed by Andreoni and Sprenger (2012b) and vary the institutional setting that describes the terms and responsibilities for the payment in the future. Our method allows to elicit levels of trust towards institutions in an incentivized way while at the same time it is not identified by the participants as a measure of trust. In

contrast to any other measure of trust, it can easily be translated into the meaningful metric of subjective probability of completion of a payment.

In a field study in the Philippines, we measure trust towards two institutions, a Philippine microfinance institution (MFI) and local money lenders. We show that our trust measure is able to differentiate between these institutions in the expected way, namely that the subjective probabilities of payment completion is higher for the MFI than the local money lenders. We contrast this measure with other ways of measuring trust, the trust game and non-incentivized survey questions. While the trust game – as expected – does not pick up differences between the institutional setting of a separate experimental task, the survey responses results in substantially larger differences in levels of trust than the incentivized measures.

Overall, the results show that time preference elicitation can be a useful method to get to a measure of trust in institutions that is incentivized, readily quantifiable, not recognized as such and not confounded with other factors such as fairness or preference. In that sense, it is a useful measure to quantify trust in or the perceived reliability of particular institutions. Furthermore, on a methodological level, our results confirm that the institutional setting is an important aspect of any time preference elicitation and can substantially change estimates of utility parameters.

References

- ALGAN, Y., AND P. CAHUC (2013): “Trust and growth,” *Annu. Rev. Econ.*, 5(1), 521–549.
- ANDERSEN, S., G. W. HARRISON, M. I. LAU, AND E. E. RUTSTRÖM (2008): “Eliciting Risk and Time Preferences,” *Econometrica*, 76(3), 583–618.
- ANDREONI, J., AND C. SPRENGER (2012a): “Estimating Time Preferences from Convex Budgets,” *American Economic Review*, 102(7), 3333–56.
- (2012b): “Risk Preferences Are Not Time Preferences,” *American Economic Review*, 102(7), 3357–76.
- BARR, A. (2003): “Trust and expected trustworthiness: experimental evidence from zimbabwean villages,” *Economic Journal*, 113(489), 614–630.
- BERG, J., J. DICKHAUT, AND K. MCCABE (1995): “Trust, Reciprocity, and Social History,” *Games and Economic Behavior*, 10(1), 122–142.
- BUCK, S., AND J. ALWANG (2011): “Agricultural extension, trust, and learning: results from economic experiments in Ecuador,” *Agricultural Economics*, 42(6), 685–699.
- COLE, S., X. GINE, J. TOBACMAN, P. TOPALOVA, R. TOWNSEND, AND J. VICKERY (2013): “Barriers to Household Risk Management: Evidence from India,” *American Economic Journal: Applied Economics*, 5(1), 104–35.
- COLEMAN, J. S. (1990): *Foundations of Social Theory*. Harvard University Press.
- DOLE (2015): “Department of Labor and Employment: Summary of Current Regional Daily Minimum Wage Rates,” http://www.nwpc.dole.gov.ph/pages/statistics/stat_current_regional.html, Accessed: 2015-08-01.
- FEHR, E. (2009): “On the economics and biology of trust,” *Journal of the European Economic Association*, 7(2-3), 235–266.
- FEHR, E., G. KIRCHSTEIGER, AND A. RIEDL (1993): “Does fairness prevent market clearing? An experimental investigation,” *The Quarterly Journal of Economics*, pp. 437–459.
- FREDERICK, S., G. LOEWENSTEIN, AND T. O’DONOGHUE (2002): “Time Discounting and Time Preference: A Critical Review,” *Journal of Economic Literature*, 40(2), pp. 351–401.
- GLAESER, E. L., D. LAIBSON, J. A. SCHEINKMAN, AND C. L. SOUTTER (2000): “Measuring trust,” *Quarterly Journal of Economics*, 115(3), 811–846.
- GUIO, L., P. SAPIENZA, AND L. ZINGALES (2004): “The Role of Social Capital in Financial Development,” *American Economic Review*, 94(3), 526–556.
- (2008): “Trusting the Stock Market,” *Journal of Finance*, 63(6), 2557–2600.
- (2009): “Cultural Biases in Economic Exchange?,” *The Quarterly Journal of Economics*, 124(3), 1095–1131.

- HARRISON, G. W., M. I. LAU, AND M. B. WILLIAMS (2002): “Estimating individual discount rates in Denmark: A field experiment,” *American economic review*, pp. 1606–1617.
- KARLAN, D. S. (2005): “Using Experimental Economics to Measure Social Capital and Predict Financial Decisions,” *American Economic Review*, 95(5), 1688–1699.
- KNACK, S., AND P. KEEFER (1997): “Does Social Capital Have an Economic Payoff? A Cross-Country Investigation,” *The Quarterly Journal of Economics*, 112(4), 1251–88.
- MILLER, A., AND T. MITAMURA (2003): “Are Surveys on Trust Trustworthy?,” *Social Psychology Quarterly*, 66(1), 62–70.
- MORGAN, K. L., AND D. B. RUBIN (2012): “Rerandomization to improve covariate balance in experiments,” *The Annals of Statistics*, 40(2), 1263–1282.
- NAEF, M., AND J. SCHUPP (2009): “Measuring Trust: Experiments and Surveys in Contrast and Combination,” SOEPpapers on Multidisciplinary Panel Data Research 167, DIW Berlin, The German Socio-Economic Panel (SOEP).
- PORTA, R. L., F. LOPEZ-DE-SILANE, A. SHLEIFER, AND R. W. VISHNY (1997): “Trust in Large Organizations,” *American Economic Review*, 87(2), 333–38.
- TIMES OF INDIA (2013): “Money-lending Punjabis at receiving end in Philippines,” <http://timesofindia.indiatimes.com/india/Money-lending-Punjabis-at-receiving-end-in-Philippines/articleshow/21793074.cms>, Accessed: 2015-08-01.
- TU, Q., AND E. BULTE (2010): “Trust, Market Participation and Economic Outcomes: Evidence from Rural China,” *World Development*, 38(8), 1179–1190.
- ZAK, P. J., AND S. KNACK (2001): “Trust and Growth,” *Economic Journal*, 111(470), 295–321.

A. Appendix

A.1. Experiment Materials

A.1.1. Instructions

Experiment Protocol

English version

Instructions

§1. Thank you all for taking the time to join us here today. My name is XXX and this is Maria Isabel Santana/Frederik Weber. I am a research assistant and Maria Isabel/Frederik is a researcher at the University of Mannheim, in Germany. The complete session will last approximately 3 hours. In this study we want to play some games for the purpose of economic research. Some decisions will involve actual money, and whatever you earn today will be paid to you in private at the end of the session and is yours to take home.

§2. The money you can earn today is not Maria Isabel's/Frederik's own money. The funds for this project are provided by the German Ministry of Science particularly for this research study. The study is carried out with similar games throughout Iloilo, Capiz and Guimaras.

§4. It is very important that you understand the games... If there is something you do not understand, you may always ask the assistants to explain the rules.

§5. Before the games you participated in the first part of a small survey. After the games, you will be asked to participate in the second part of the survey by answering some additional questions. Once the second part of the questionnaire is completed, you will receive your payment.

§6. There will be four parts of games played in this session [refer to agenda]. The first two parts are a money valuation game, the third one is a lottery game, and the fourth one is an investment game. We will explain you the rules for each game before each of the games are to be played. The games are to be played by each player individually, therefore we kindly ask you to remain silent during the games and to take decisions individually.

§7. After you have played the games and answered the questionnaire, Maria Isabel/Frederik will give you your payment and a receipt for you to sign.

Upcoming decisions

§9. Within the three first parts, you will take 54 decisions [show bag with balls]. You will be paid for only one decision. At the end of all games, you will randomly select one of 54 balls that indicates the number of the decision paid for you. All decisions are equally likely to be selected by you; therefore you should make each decision seriously as the one that would be paid out.

Money Valuation Game

§10. In this game you are asked to make decisions about how to allocate money between two dates, one date would be today and the other date will be later in time. The later date in which you will possibly receive your payment is either in 1 week, that is in 7 days from today or in 4 weeks, that is in 28 days from today. In parts 1 and 2, you will in each part make 18 decisions of the same kind.

§11(NWTF). If the decision to be paid to you has a payment to be paid today, then you will receive this payment today together with any other additional payments from the game played in part 4. If the decision to be paid to you has a payment in a later date, then this payment will be kept for storage at Negros Women for Tomorrow foundation (NWTF), which is the organization that runs Project Dungganon and delivered to you to your house at the according date, either in 7 days or in 28 days. §11(ML). If the decision to be paid to you has a payment to be paid today, then you will receive this payment today together with any other additional payments from the game played in part 4. If the decision to be paid to you has a payment in a later date, then this payment will be kept for storage at _____, a local moneylender from the municipality of _____, and delivered to you to your house at the according date, either in 7 days or in 28 days.

Part 1 [refer to agenda]

§14(No-Check/Check; NWTF). NWTF is responsible for payment at the later date and promises that the payment will be delivered to you, but we cannot provide you with any written legal note to secure this payment for the 18 questions in this part 1. Only for the later 18 questions in part 2 we will be able to – on top of the promise – offer to secure the payment with a signed check to your name which is dated for the due date of the payment and which you can take home with you.

§14(Check/No-Check; NWTF). NWTF is responsible for payment at the later date and promises that the payment will be delivered to you. On top of that promise and only for the coming 18 questions in this part 1, we will be able to offer to secure this payment with a signed check to your name which is dated for the due date of the payment and which you can take home with

you. [Show example check and pass around so participants can see it.] This is an example check made to be paid out in 7 days under the name of one of the participants.

You do not need to cash the check. It is only a securement of payment. When the later payment is delivered to you at your house, you have to return the check and receive your later payment. Of course, if the delivery does not happen you can cash the check and this way receive the promised later payment. The check can be cashed in a BDO branch. Alternatively, we have arranged for cashing methods within your local area which will be specified at the payment.

For the 18 questions coming later in part 2, we cannot provide you with any written legal note to secure the payment.

§14(No-Check/Check; Moneylender). The Moneylender ____ is responsible for payment at the later date and promises that the payment will be delivered to you, but we cannot provide you with any written legal note to secure this payment for the 18 questions in this part 1. Only for the later 18 questions in part 2 we will be able to – on top of the promise – offer to secure the payment with a signed check to your name which is dated for the due date of the payment and which you can take home with you.

§14(Check/No-Check; Moneylender). The Moneylender ____ is responsible for payment at the later date and promises that the payment will be delivered to you. On top of that promise and only for the coming 18 questions in this part 1, we will be able to offer to secure this payment with a signed check to your name which is dated for the due date of the payment and which you can take home with you. [Show example check and pass around so participants can see it.] This is an example check made to be paid out in 7 days under the name of one of the participants.

You do not need to cash the check. It is only a securement of payment. When the later payment is delivered to you at your house, you have to return the check and receive your later payment. Of course, if the delivery does not happen you can cash the check and this way receive the promised later payment. The check can be cashed in a BDO branch. Alternatively, we have arranged for cashing methods within your local area which will be specified at the payment.

For the 18 questions coming later in part 2, we cannot provide you with any written legal note to secure the payment.

§15. In the money evaluation game, we will present you with options of receiving money today or receiving money with interest at a later date. Your decision is reached in a two- to three-stage process. In a first stage[point to the first screenshot on the poster], you will decide between an option of getting 150 PHP today and 0 Pesos later and another option of receiving a higher amount in either 7 or 28 days and 0 or little today. You can view this as either using

money today or saving it for the future and earning interest. In a second stage [point to the second screenshot on the poster], you have these two options plus further options in which you get some of the 150 Pesos today and let only the remainder earn interest for later. Finally [point to the last screenshot on the poster], you get a confirmation of your choice and the option to define your choice to the Peso unit. Throughout the screens, amounts received today are shown in blue, amounts received in the later date are shown in orange.

§16. Let us now consider one of the interest rates as an example. Here, you are first asked whether you prefer getting 150 Pesos today and 0 later [point again to the first screenshot, now on the blue bar, RA associates real money to column (150-0)] or 0 pesos today and 300 pesos in 7 days. [point again to the first screenshot, now on the orange bar, associate money to (0-300)]. Take a moment to think which one you would prefer and click the bar when you are decided. You will then see the same two options and further options in between Note that towards the left columns the today payments gets higher, and towards the right the later payments get higher [point again to the second screenshot, RA associates real money to columns (150-0, 0-300, 50-200, 20-260, 80-140)]. Again, take a moment to consider which combination of payments today and later you prefer. Click the bar of the combination that you prefer. On the last screen you get a confirmation of your choice. If you want, you can also specify your choice to the Peso level in a drop-down menu.

Overall, you can allocate any amount between 0 and 150 today. The remaining amount will be multiplied and paid out later. You will see that the interest increases from low to very high, and it is shown at the top of the screen. That means that if you for example decide to keep 80 today in the first decision you get 70 in 7 days, but in subsequent decisions you get 93, 117, 140, 187 and even higher amounts in 7 days. The same with any other amount that you choose to keep between 0 and 150 for today. Whatever you save for later will increase in value throughout the decisions.

Please note that steps 2 and 3 are the ones that count. You can at any point go back to change your decision.

Please note that in decisions 1-9 you receive the amount saved for later in 7 days and in decisions 10-18 you make the same decision but receive the amount saved for later in 28 days.

Do you have any questions? It is important that you understand the options available to you. Before you take your decisions that count for your payment, we will go through a trial of the 9 decisions. If you do not understand the options available to you or the way you can choose the option that you would like to have paid to you, you may always ask the assistants for an explanation. Once everybody is finished and all questions are answered we will start the decisions that count. We now start the trial.

[SNACKS]

Part 2 [refer to agenda]

§24. Now, comes part 2. Here, you will again like in part 1 be asked to make 18 decisions about payment options on two dates, one date being today and the other date being in 7 or in 28 days. Remember that the upcoming 18 decisions are also part of the 54 decisions of which one will be randomly chosen and paid out to you.

§25(No-Check/Check; NWTF). Like before, NWTF is responsible for payment at the later date and promises that the payment will be delivered to you. On top of that promise and only for the coming 18 questions in this part 2, we will be able to offer to secure this payment with a signed check to your name which is dated for the due date of the payment and which you can take home with you. [Show example check and pass around so participants can see it.] This is an example check made to be paid out in 7 days under the name of one of the participants.

You do not need to cash the check. It is only a securement of payment. When the later payment is delivered to you at your house, you have to return the check and receive your later payment. Of course, if the delivery does not happen you can cash the check and this way receive the promised later payment. The check can be cashed in a BDO branch. Alternatively, we have arranged for cashing methods within your local area which will be specified at the payment.

§25(Check/No-Check; NWTF). Like before, NWTF is responsible for payment at the later date and promises that the payment will be delivered to you, but we cannot provide you with any written legal note to secure this payment for the 18 questions in this part 2.

§25(No-Check/Check; Moneylender). Like before, the Moneylender ____ is responsible for payment at the later date and promises that the payment will be delivered to you. On top of that promise and only for the coming 18 questions in this part 2, we will be able to offer to secure this payment with a signed check to your name which is dated for the due date of the payment and which you can take home with you. [Show example check and pass around so participants can see it.] This is an example check made to be paid out in 7 days under the name of one of the participants.

You do not need to cash the check. It is only a securement of payment. When the later payment is delivered to you at your house, you have to return the check and receive your later payment. Of course, if the delivery does not happen you can cash the check and this way receive the promised later payment. The check can be cashed in a BDO branch. Alternatively, we have arranged for cashing methods within your local area which will be specified at the payment.

§25(Check/No-Check; Moneylender). Like before, the Moneylender _____ is responsible for payment at the later date and promises that the payment will be delivered to you, but we cannot provide you with any written legal note to secure this payment for the 18 questions in this part 2.

Do you have any questions?

Lottery Game (Part 3) [refer to agenda]

§18. In this game you are asked to allocate money between a certain payment and a risky lottery. All payments from this game will be paid out today after the session. The upcoming 18 decisions are the last part of the 54 decisions of which one will be randomly chosen and paid out to you.

§19. In the lottery game, we will present you with options of receiving a payment for sure or playing a risky lottery that might lead to a larger payment or no payment. The result of the risky lottery depends on a random draw of yours of one of ten balls in this red bag.

§19a. You will win when an orange ball is drawn and lose when a white ball is drawn. The chance of winning depends on the number of orange balls in this bag of ten balls. The number of orange balls in the coming decision will be between 1 and 9. There is no decision without an orange ball, since then it would be sure that you lose. With 1 orange ball, out of 10 people drawing a ball, on average only 1 will win the lottery. [Prepare such a bag, maybe a transparent bag] With 2 orange balls, 2 out of 10 people on average will win the lottery, and so on. [Prepare such a bag] With 9 orange balls it is very certain to win since 9 out of 10 draws on average win the lottery. [Prepare such a bag] There is no decision with 10 orange balls since it would be sure that you win.

§20. In the first stage of the lottery game [point to the first screenshot on the poster], you will decide between an option of getting 150 PHP for sure and another option of receiving a higher amount when winning the lottery and 0 or little when losing. In a second stage [point to the second screenshot on the poster], you have these two options and further options in which you get some of the 150 Pesos for sure and put some money into the risky lottery. Finally [point to the last screenshot on the poster], you get a confirmation of your choice and the option to define your choice to the Peso level. Throughout the screens, amounts received for sure are shown in blue, amounts received when winning the lottery are shown in orange. The amount received from a lost lottery is always 0.

§21. Let us now consider an example. In this example, the chance that you win is 60%, that is, there are 6 orange balls and 4 white balls in the bag. [Prepare a bag with 6 orange balls and 4 white balls in front of the participants.] The chance that you win is always indicated at the top of the screen [point to the screenshot]. You are first asked whether you prefer getting 150 Pesos for sure [point again to the first screenshot, now on the blue bar, no money handling] or 300 pesos when you win the lottery and 0 otherwise. [point again to the first screenshot, now on the orange bar]. Take a moment to think which one you would prefer and click the bar when you are decided. You will then see the same two options as well as further options in between. Again, take a moment to consider which combination of a sure payment and a risky lottery you prefer. Click the bar of the combination that you prefer. On the last screen you get a confirmation of your choice. If you want, you can also specify your choice to the peso level in a drop-down menu. Overall, you can decide to get any amount between 0 and 150 for sure. The remaining amount will be multiplied and paid out when you win the lottery. Please note that steps 2 and 3 are the ones that count. You can at any point go back to change your decision.

Note that in each question, the number of orange balls will be different, that is, the chance that you win changes going from a low chance to a higher chance. Also, there are 9 decisions in which the lottery wins you up to 300 pesos and 9 decisions in which the lottery wins you up to 400 pesos while you still get at least 50 pesos for sure.

Do you have any questions? It is important that you understand the options available to you. Before you take your decisions that count for your payment, we will therefore go through all 9 decisions that you will take for a possible lottery gain of 300 pesos. Further, we will go through 2 decisions for a lottery gain of 400. If you do not understand the options available to you or the way you can choose the option that you would like to have paid to you, you may always ask the assistants for an explanation.

Once everybody is finished and all questions are answered we will start the decisions that count. We now start the trial.

Investment Game (Part 4) [refer to agenda]

§26. This game is played by pairs of individuals. Each pair is made up of an Investor and a Recipient. Half of you will be Investors, the other half of you will be Recipients. You will be notified on the screen which role you have. You will be playing with someone from this session, but none of you will know exactly with whom you are playing.

§27. If you are an Investor you will start with 50 PHP. You have to choose how much of the 50 PHP you would like to send to the Recipient. Whatever amount you choose will be tripled and then go to the Recipient.

§28. If you are a Recipient you will be informed about the amount available to you. You then indicate how much of the tripled amount you want to send back to the Investor. You can freely choose to return a part, everything or nothing. You simply keep what you do not return. Then the game is over.

§29. Whatever you hold as an Investor or Recipient, we will pay you in cash at the end of the meeting.

In summary, first the investor indicates the amount to be sent to the Recipient. It could be 0, 10, 23, 46. Any amount between 0 and 50 Pesos. Then, the amount sent is tripled and notified to the Recipient.

Once the Recipient knows the amount available, he decides how much to send back to the Investor and indicates it in the screen. Could be 0, 10, 50, 150, that is any amount between 0 and the full amount available to the Recipient.

Finally, the investor and recipient will be informed of the total earnings. The Investor earns the amount kept and the amount returned by the Recipient. And the Recipient earns the amount that was not returned from the available tripled amount.

The amounts earned will be paid out at the end of the session, after the games are played and the second part of the questionnaire is completed.

Do you have any questions? If there are no further questions, let's start the Investment Game.

Choice of Round to be Paid

Now, we will choose the round to be paid. To do this, we will insert 54 numbered balls in this big black bag, from where you will take one ball and the number in the ball will be the round paid out to you.

[2 RAs place numbered white balls in the big black bag clearly so participants have no doubt of numbers of balls in the bag]

Many thanks for your participation. We are almost done.

We will now ask you to please answer the second part of the questionnaire. Afterwards, you will collect your payment. One final comment regarding your payment. Your payment receipt will have a secret code enclosed in the envelope with the later payment. You will be given a copy of this code. Please keep this code with you. In order to get your payment, you need to present this code otherwise you will need to present an id. If you have received a check, you will need to hand in the check when you receive your payment in the later date.

A.1.2. Trust Elicitation Screen shots

Figure 3: Money Valuation Game: Sample Decision, step 1

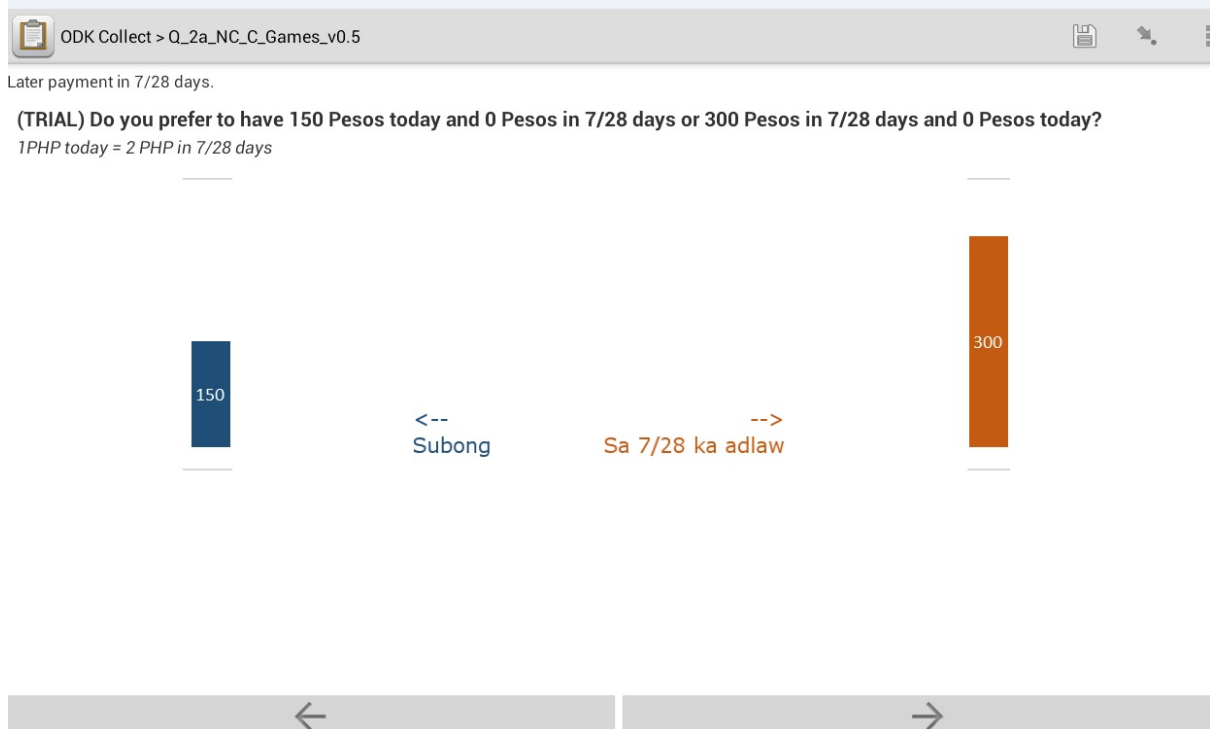


Figure 4: Money Valuation Game: Sample Decision, step 1

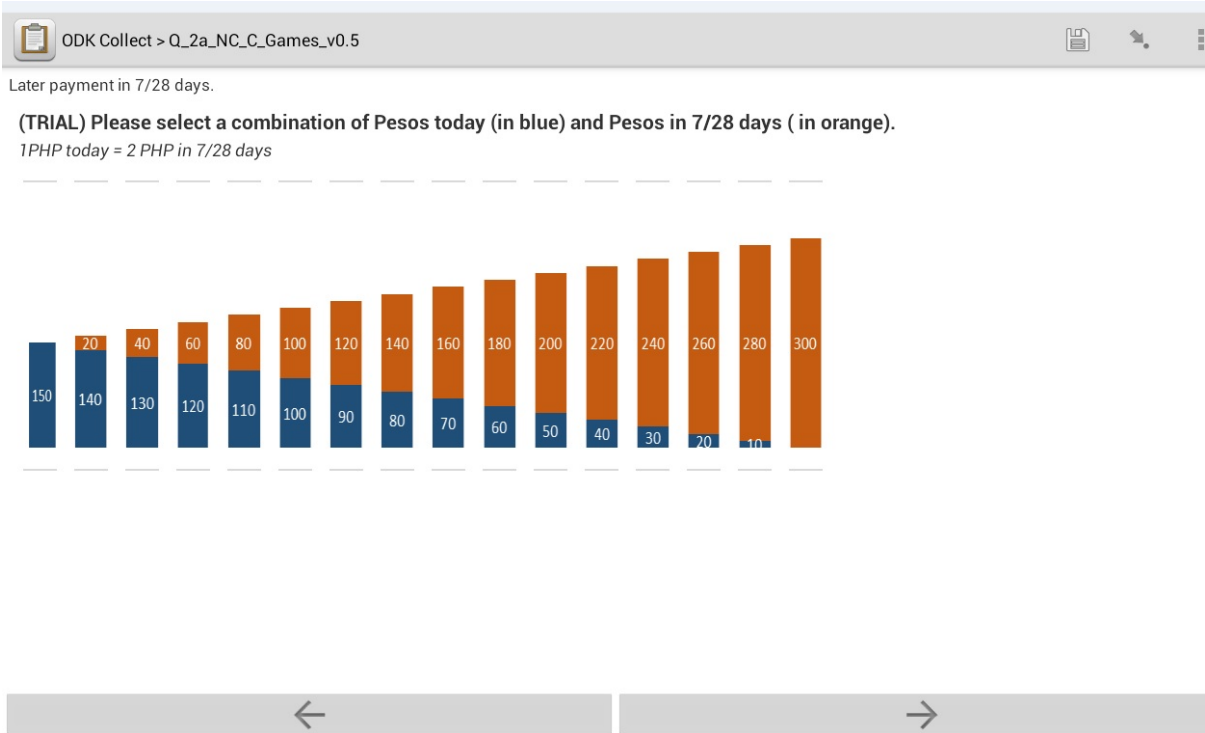
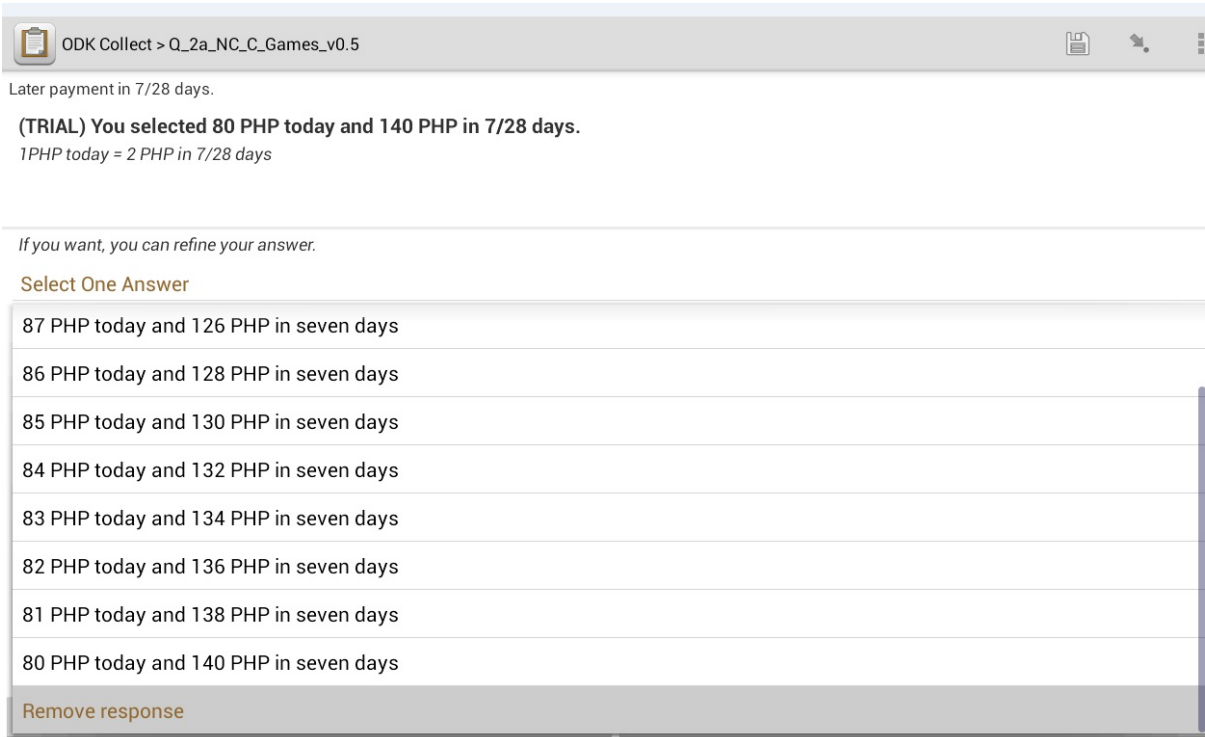
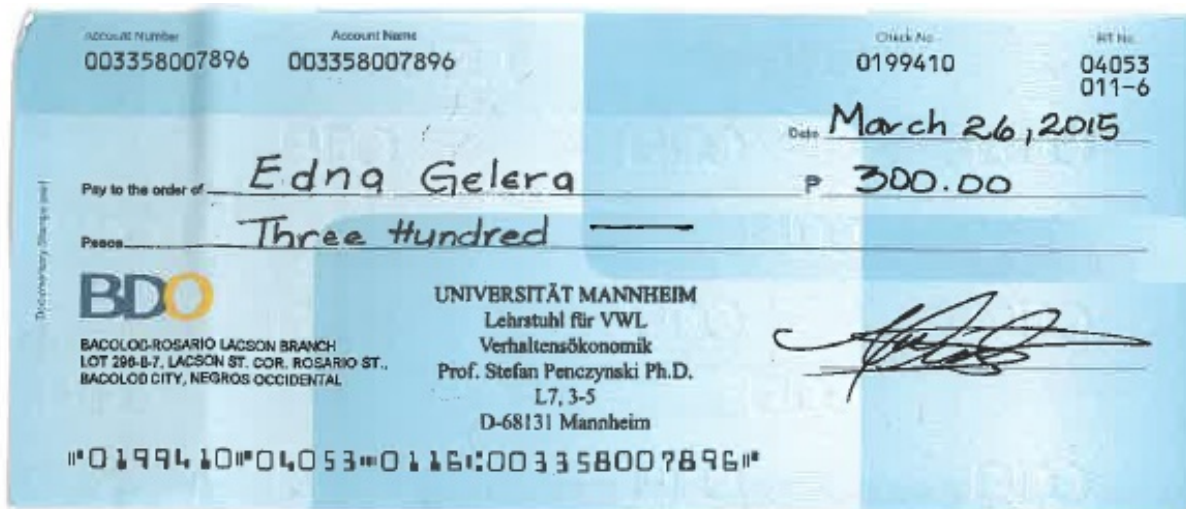


Figure 5: Money Valuation Game: Sample Decision, step 1



A.1.3. Payment Securement: Check

Figure 6: Sample Check



A.2. Tobit MLE output

	(1) Full sample	(2) NWTf	(3) ML
$\hat{\gamma}_1$	-4.447*** (0.000)	-4.354*** (0.000)	-4.556*** (0.000)
$\hat{\gamma}_2$	4.121*** (0.000)	3.615*** (0.000)	4.871*** (0.000)
$\hat{\gamma}_3$	0.202 (0.704)		
$\hat{\gamma}_4$	-0.0110** (0.023)	-0.0175*** (0.003)	-0.000659 (0.933)
LL	-65783.8	-38084.6	-27636.4
N	30024	17232	12792
Uncensored	15598	9244	6354

Notes: Two-limit Tobit Maximum Likelihood estimation of equation 5. p -values in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Tobit MLE Estimates without constant $\hat{\gamma}$.

	(1)	(2)	(3)
	Full sample	NWTF	ML
$\hat{\gamma}_1$	-4.373*** (0.000)	-4.273*** (0.000)	-4.518*** (0.000)
$\hat{\gamma}_2$	4.151*** (0.000)	3.647*** (0.000)	4.886*** (0.000)
$\hat{\gamma}_3$	1.303* (0.055)		
$\hat{\gamma}_4$	-0.00865* (0.077)	-0.0149** (0.014)	0.000531 (0.948)
$\hat{\gamma}_0$	-1.197*** (0.010)	-0.845* (0.067)	-0.347 (0.549)
LL	-65780.5	-38082.9	-27636.2
N	30024	17232	12792
Uncensored	15598	9244	6354

Notes: Two-limit Tobit Maximum Likelihood estimation of equation 5. p -values in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 11: Tobit MLE Estimates with constant $\hat{\gamma}$.