Measuring Trust in Institutions and its Causal Effect*

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We propose a novel way of measuring trust in institutions, which draws on the experimental method used to elicit time preferences. Our measure is provided in the meaningful metric of the subjective probability of trustworthiness of the trustee. In a lab-in-the-field setting in the Philippines, we measure trust in two different financial institutions. Additionally, we exploit exogenous variation in the eligibility for a future payment to examine whether a promise fulfilled by the institution increases trust and changes individual financial behavior. We find that eligible individuals significantly increase savings held with the institution.

JEL classification: C91, D81, D90, O10

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1. Introduction

While *trust in institutions* is an important economic factor,[1] neither a behavioral measure nor a method of exogenously varying trust have been established so far. Our study introduces methods to fill these gaps. We propose an experimental measure of trust in institutions based on the behavioral definition of trust put forward by Coleman (1990). "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)

The most commonly used measures of trust in institutions are hypothetical questions in surveys.[2] However, behavioral measures capture trust more accurately than reported measures (Fehr, 2009; Algan and Cahuc, 2014). After all, it is not clear whether individuals that verbally declare trusting an institution would actually behave in a cooperative way or be willing to transact with the institution.

Our trust measure is inspired by the time preference elicitation methods that use choices between smaller, sooner and larger, later payments. Instead of the experimenter, an institution is responsible for the future payment. We identify trust by providing a payment guarantee in form of a post-dated check and by examining the behavioral difference to the setting without such check. The uncertainty of future payment delivery by the institution in our trust elicitation is analogous to the situation described in the definition of trust. An additional risk elicitation informs us about individual risk preferences. We measure trust in two different financial institutions that invoke different levels of reported trust. Our results confirm the direction of the difference, yet with small magnitudes.

The second contribution of our paper follows from the fact that the experiment payment itself can provide exogenous, random variation of the level of trust in an institution. Specifically, a future payment that eventually is fulfilled as promised can affect trust positively and hence can change individual financial behavior. Our experiment features trust elicitation decisions which give rise to a future payment but also risk preference elicitation decisions that do not. A random draw determines the type of decision to be remunerated and thus whether a future payment poten-

[1] Generally, trust has been shown to be positively related to GDP (Putnam, Leonardi, and Nonetti, 1993; Porta, Lopez-De-Silane, Shleifer, and Vishny, 1997; Knack and Keefer, 1997; Zak and Knack, 2001; Algan and Cahuc, 2010; Tabellini, 2010), trade (Guiso, Sapienza, and Zingales, 2009), stock purchases (Guiso, Sapienza, and Zingales, 2004, 2008) and financial behaviour in developing countries (Karlan, 2005; Cole, Gine, Tobacman, Topalova, Townsend, and Vickery, 2013; Karlan, Ratan, and Zinman, 2014).

[2] Important relevant surveys are the World Value Survey (WVS), the General Social Survey (GSS) and the Financial Trust Index Survey (FTIS). Further data is regularly collected by Gallup, the Pew Research Center, Edelman Trust Barometer and others.

tially occurs. Using administrative data, we find that being paid a trust decision rather than a risk decision from an institution increases personal savings held at this institution by approximately 25% above baseline levels. Overall, we see this as first indicative evidence that the kept promise of the later payment causally increases savings via a higher level of trust in the institution.

To our knowledge this is the first instance of exogenously impacting trust in the field and using this random variation to show the effects of trust on economic outcomes. The laboratory study by Bartling, Fehr, Huffman, and Netzer (2018) is the only other study known to us that exogenously varies trust. Their study and our paper contribute different methods and insights. While they use different examples of game play histories to induce a trust variation, we use variation in the subjects' experience with the institution. They illuminate the mechanisms of how institutional arrangements interact with trust in the laboratory while we observe the effect of trust reflected in economic outcomes in the field.

The literature on trust measurement using laboratory experiments typically measures *general* trust, mostly using the trust game (Berg, Dickhaut, and McCabe, 1995) and the gift exchange game (Fehr, Kirchsteiger, and Riedl, 1993). We aim to measure directed trust, which features less prominently in the literature. Using the trust game, a number of studies investigate directed trust by installing as trustees either known members of a person's social network (Leider, Möbius, Rosenblat, and Do, 2009; Ligon and Schechter, 2012; Binzel and Fehr, 2013) or employees of various institutions for a measure of trust in institutions (Carlsson, Demeke, Martinsson, and Tesemma, 2019). Adding to this literature, we implement an experimental method with an institution as the clearly defined trustee that is responsible for the future payment. In contrast to both survey and common experimental measures, our data allows us to objectively quantify the trust in an institution in terms of the subjective probability of keeping a promise. For example, an estimated probability of payment completion of 0.5 would imply that in one out of two cases, the institution is expected to indeed complete the payment.

We implement our trust elicitation method alongside a trust game and survey questions on trust in a lab-in-the-field experiment in the Philippines. The two institutions that are responsible for the future payment are a formal and named microfinance institution called Negros Women for Tomorrow Foundation (NWTF) and local Money Lenders (ML), a well-known, informal group of anonymous individual lenders that has a long history in the Philippines.

Our three estimation methods estimate the trust in NWTF to be higher than in ML, albeit not significantly. They suggest a much less pronounced difference than the levels of trust reported in the survey. For example, one specification quantifies

the subjective probability of payment completion to be 0.573 for NWTF and 0.524 for the ML, relative to payments with guarantee by check. Further analyses suggest that the hypothetical question for trust invokes additional elements beyond trust, particularly for those experienced with the institution.

Since we employ methods of time preference elicitation, our study is related to the wide area of experimental work that measures intertemporal discounting. The survey by Frederick, Loewenstein, and O'Donoghue (2002) emphasizes that delayed rewards are subject to uncertainty, which could be a confounding factor in the measurement of time preferences. Since the delay of a payment comes with inherent uncertainty about its future enjoyment, the literature has always aimed to establish subjects' trust in the experimenter's full commitment to realize the payment. For that purpose, it is common practice to use notarized certificates, post-dated checks or equivalent financial instruments to assure the future payment (e.g. Coller and Williams, 1999; Benjamin, Choi, and Strickland, 2010). By varying the use of checks we contribute to the understanding of the role of such guarantees and observe that a post-dated check indeed influences subjects' decisions and hence the inferred time preferences.

The literature on experimental time preference elicitation features various elicitation methods. In order to account appropriately for utility function curvature, Andersen, Harrison, Lau, and Rutström (2008) use double multiple price lists (DMPL) of binary choices for the simultaneous elicitation of time and risk preferences. Andreoni and Sprenger (2012a,b) put forward a single elicitation that features a convex time budget (CTB) to identify both curvature and discounting. The latter method has been the subject of controversial debates (Harrison, Lau, and Rutström, 2013; Cheung, 2015; Andreoni and Sprenger, 2015; Andreoni, Kuhn, and Sprenger, 2015). Harrison, Lau, and Rutström (2013) suggest a latent index type estimation strategy as in Andersen, Harrison, Lau, and Rutström (2008) to be implemented on the CTB task data. Our experimental setup generates convex and binary budget data for both time and risk preference elicitations. This allows for the implementation of both the CTB and DPML estimation methods and for extending the DPML joint estimation approach to convex budget data. Our results are robust across approaches, including the latter hybrid one. However, advances and convergence in the literature of time preference elicitation would improve and facilitate trust measurements of the kind we propose.

2. Experimental design

In our experiment, we measure trust in institutions with a method that is similar to time preference elicitation. To identify trust, we vary within-subject whether the later payment is guaranteed by a post-dated check (C) or not (NC). Furthermore, we vary between-subject i) the institution that carries responsibility for the implementation of the later payment and ii) the order of C and NC.[3]

The main elements of the experimental design are the trust elicitation task (TE, 36 decisions), the risk preference elicitation task (RPE, 18 decisions) as well as the trust game. In this order, these elements are parts of each experimental session. Each element is introduced by verbal instructions to the plenary of all session participants. From TE and RPE, one out of 54 decisions is chosen randomly for payment via a ball draw by the subject. Additionally, all subjects are paid according to the outcome of the trust game.

2.1. Trust elicitation task

The main idea behind the trust elicitation task is that a subject places more resources in the hands of an institution the higher is her belief of getting back these resources, *absent any contractual commitment*, from the institution in the future. Adding a payment guarantee in the form of a check to the aforementioned procedure and observing resulting changes in behavior allow us to estimate the subjects' beliefs P of compliance by the institution. We call P the level of trust in institution I. The intertemporal utility of consumption at two points in time, depends on the probability P of obtaining the chosen future consumption c_{t+d} as follows,

$$DU(c_t, c_{t+d}) = u(c_t) + \delta^d \left[P \cdot u(c_{t+d}) + (1 - P) \cdot u_0\right], \tag{1}$$

where u_0 refers to the utility of not receiving any payment.

2.1.1. Decision

Subjects are presented 36 decisions which feature two delay lengths until the later payment, $d \in \{7, 28\}$ in days, and two payment guarantees $G \in \{NC, C\}$. For each combination of d and G, subjects are presented with nine different interest rates $1 + r$ ranging from 1 to 40. The variations in d, $1 + r$, and G will allow us to estimate time preferences, the curvature of the utility function and the trust in the institution, respectively.

[3] In the NC/C treatment, subjects first make 18 NC decisions and then 18 C decisions. Vice versa in the C/NC treatment.

Drawing on the CTB approach of Andreoni and Sprenger (2012a), in each of the decisions subjects choose an amount $c_t \in [a, 150]$ in Philippine Pesos (PHP) for current consumption. The interest rate $1+r$ determines the future consumption to be $c_{t+d} = (150 - c_t) \cdot (1 + r)$. For interest rates ranging from 1 to 2.67, the budget set begins at $a = 0$. For $1 + r \in \{4, 8, 40\}$, we set $a \in \{50, 100, 140\}$, respectively, and thus cap the future consumption c_{t+d} at a maximum of 400.[4] Figure 1 reprints the instructional poster and table 1 presents the parameters of the 36 decisions.

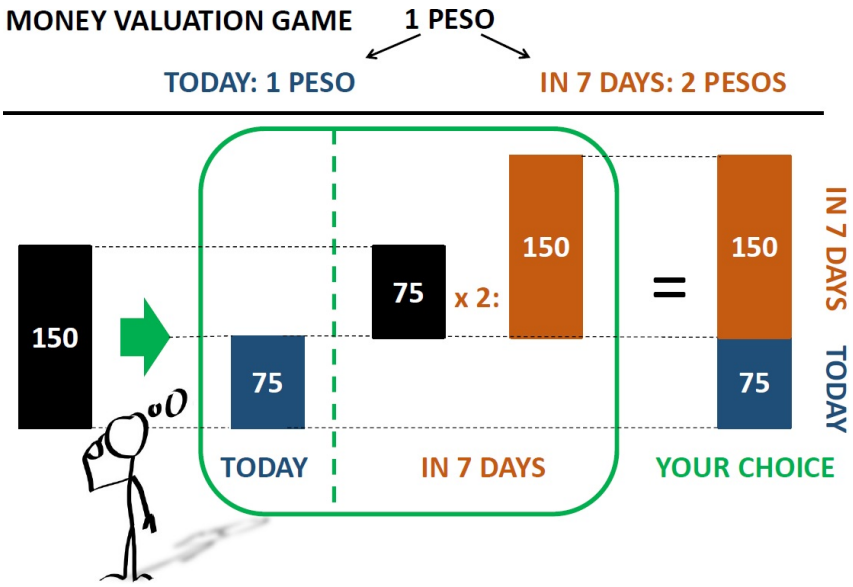


Figure 1: Instructional poster for the trust elicitation task (English translation).

2.1.2. Decision protocol

The decisions are divided into four blocks of nine decisions with different interest rates. In the first and third blocks, subjects make their choices for $d = 7$ and in the second and fourth blocks for $d = 28$. Depending on the order of NC and C, a payment guarantee is offered in the first two or last two blocks. Between the first and last two blocks, the instructor reminds subjects of the upcoming decisions and the change in provision of the payment guarantee.

From the start of the instructions, posters illustrate in detail the decisions. In each block, before they take the payoff-relevant decisions, participants do a trial round and go over all upcoming decisions. Tablet computers are used for simple

[4] We include high interest rates to provide incentives for eventual allocations to the future date because these inform our trust measure. The cap on the future amount is introduced due to budgetary reasons. For example, for $1 + r = 40$, a subject choosing $c_t = 0$ would otherwise generate a future consumption of PHP 16,000 which is approximately 359 USD.

Delay d	Guarantee G	Minimum amount a	Interest rate $1+r$	Daily rate (percent)
7	NC	0	1	0
7	NC	0	1.33	4.20
7	NC	0	1.67	7.57
7	NC	0	2	10.41
7	NC	0	2.33	12.87
7	NC	0	2.67	15.04
7	NC	50	4	21.90
7	NC	100	8	34.59
7	NC	140	40	69.38
28	NC	0	1	0
28	NC	0	1.33	1.03
28	NC	0	1.67	1.84
28	NC	0	2	2.51
28	NC	0	2.33	3.07
28	NC	0	2.67	3.57
28	NC	50	4	5.08
28	NC	100	8	7.71
28	NC	140	40	14.08
7	C	0	1	0
7	C	0	1.33	4.20
7	C	0	1.67	7.57
7	C	0	2	10.41
7	C	0	2.33	12.87
7	C	0	2.67	15.04
7	C	50	4	21.90
7	C	100	8	34.59
7	C	140	40	69.38
28	C	0	1	0
28	C	0	1.33	1.03
28	C	0	1.67	1.84
28	C	0	2	2.51
28	C	0	2.33	3.07
28	C	0	2.67	3.57
28	C	50	4	5.08
28	C	100	8	7.71
28	C	140	40	14.08

Table 1: Choice parameters in the trust elicitation task in the NC/C treatment.

and intuitive decision entry.[5] On average, about one research assistant per two subjects is available to explain the decision once more. Appendix B presents the instructions.

Each decision involves three steps. First, subjects make a binary choice between options $c_t = 150$ and $c_t = a$, similar to a multiple price list choice. After getting familiar with the key parameters of the current decision, subjects can choose any amount $c_t \in [a, 150]$ in steps of 10. Both c_t and the remaining amount $c_{t+d} =$

[5]We used Android^{TM} supported tablets and Open Data Kit (ODK), an open source survey program.

$(150 - c_t) \cdot (1 + r)$ are visualized. Finally, subjects can refine their choice to the unit level in a dropdown menu. Subjects are told that only steps 2 and 3 are payoff relevant. The screenshots of these steps are presented below in figure 2.

2.1.3. Payment procedures

Given our study's goal of measuring trust in institutions, the specific arrangements for the later payment – and the subject's understanding thereof – are important. While payments corresponding to the c_t choice are made at the end of the session, the payments corresponding to c_{t+d} are delivered in cash to the subjects' homes. The subjects are informed that the local institution, NWTF or ML, is responsible for storage and delivery of the money. Envelopes containing the money, contact information and a prepared receipt are handed over to the institution by the experimenters after the session.[6]

Regarding NC decisions, we tell subjects that we cannot provide any written legal note to secure the payment. With the C decisions, we establish a baseline level of trust in the payment by the additional provision of a post-dated check for the future payment. Checks are provided at the end of the session in case delivery of the later payment fails. Upon successful delivery, the checks are collected and voided. Many experiments measuring time preferences use similar procedures to increase the subjects' confidence in the realization of the later payment (Coller and Williams, 1999; Andersen, Harrison, Lau, and Rutström, 2008; Benjamin, Choi, and Strickland, 2010; Andreoni and Sprenger, 2012b). Although the payment guarantee is independent of the institution, differences between institutions are not ruled out in C decisions.

We instruct subjects that the checks are provided by us to guarantee their payment only for C decisions. During instruction, participants are shown a sample check, signed and post-dated with the name of one of the participants as an example (see appendix A.1). We place a stamp of the University of Mannheim on the check. This way, we associate ourselves, researchers from a European University, with the check payment and not with the unguaranteed payments. In contrast, subjects know that the non-guaranteed default procedure relies on the treatment institution, a procedure credibly deemed outside of the experimenter's control after the handing over of the money envelopes.

The checks are issued from Banco de Oro (BDO), the largest bank in the Philip-

[6]Local research assistants assisted the two institutions in the delivery of the later payments. The instructions were silent on such procedural aspects of the payment and said generally that "this payment will be kept for storage at [the institution] and delivered to you to your house at the according date." 551 subjects were to be paid in the future and only four did not receive their payment due to absence and non-traceability.

pines. Subjects are familiar with this form of payment.[7] While BDO branches are common in cities, they are less common in rural areas. To avoid large transportation costs for subjects when cashing the check, they are informed prior to the decisions that we offer a second possibility to locally cash the checks within the community. For this option, NWTF's local offices kindly assisted us and were available to cash checks out of our funds. This procedure is implemented in all sessions, but subjects are only disclosed NWTF's involvement in the local option during the payment procedure after the decisions have been made.[8]

Although our study's goals differ from standard time preferences elicitation studies, our payment procedures are symmetric between treatments. Additionally, delivery to homes is implemented in order to equalize the transaction costs between possible payment dates. This ensures a clean measure of time discounting and avoids any possible interaction of transaction costs with our treatments.

Other studies minimize the procedural difference between the current and the future payment and enable a present bias estimation by implementing a front end delay (Coller and Williams, 1999; Andersen, Harrison, Lau, and Rutström, 2008; Andreoni and Sprenger, 2012a). Our focus on the uncertain nature of the future payment guides us not to subject the front end payment to such uncertainty and to ensure that front end payment arrangements are always the same: paid at the end of the experiment.

We carefully designed our experiment to pick up differences in trust in institutions. With the random allocation of treatments and the constant parameters across the TE tasks we make sure that systematic differences in the valuation of later payments can be related to the different institutions and guarantees. It is possible, however, that subjects have preferences over elements of the later payment, such as the delivery mode, the provision of the information necessary to find subjects, the storage at the institution, or the check transaction, that might limit this clean attribution.

For instance, regarding the delivery, subjects might not want to have a representative of the institution come to their house, possibly due to pending loans. This could make subjects avoid contact entirely by avoiding any future payment at all ($\bar{c}_t = 150$), depending on the institution. However, there is no difference across treatments on the extensive margin of avoiding future payments in all decisions. 15

[7] All of our subjects are clients of NWTF and have loans with them. Their loans are disbursed through checks. 59 subjects report never cashing a check before. It could be that someone else cashed the check with their loan disbursement for them, but they would know how a check works.

[8] Out of 297 distributed checks, 5 were cashed (1 at a BDO branch) and therefore the later payment not handed in. 3 checks were not returned, 1 of them received the delivery and 2 could not be reached at home or by phone.

out of 560 subjects (2.7%) do this in NWTF, 11 out of 533 (2.1%) in ML. Thus, occurrences of such extremely front-loaded allocations probably result from particular time preferences that are equally present in both treatments, not from preferences regarding the later payment from a particular institution.

In C decisions, the payment guarantee via a check is established in addition to the delivery to the subject's home. Subjects may doubt the delivery of the payment. In this case, whether the check fully substitutes for the delivery depends on beliefs with respect to the funds of the check, the time necessary to cash it, the familiarity with cashing a check, etc. The C decisions consistently generate higher future allocations, which reassures us that the check is perceived as an overall valuable substitute for the delivery.

2.1.4. Institutions

We chose to work with two financial institutions $I \in \{\text{NWTF}, \text{ML}\}$, which gave rise to distinct reported trust levels in ex ante surveys.

Negros Women For Tomorrow Foundation (NWTF) The Negros Women for Tomorrow Foundation is a formal, nonprofit microfinance institution (MFI) that operates in the Visayas Region of the Philippines. NWTF provides loans at modest rates to poor women from rural communities to start or expand their own small businesses following the Grameen Bank credit methodology of group lending (Besley and Coate, 1995). The loan program has a minimum loan of PHP 1,000 and a maximum of PHP 30,000 (between 22 and 673 USD, approximately).

Local Money Lenders (ML) Local Money Lenders are an informal financial institution in the Philippines also referred to as "5-6" lenders, because commonly for every 5 PHP borrowed, 6 PHP are to be repaid after an agreed period of time of usually one or two months. They lend money usually to poor people that might not have access to formal lending institutions such as banks or MFIs. Local money lenders do not require collateral or any documents from their borrowers (Kondo, 2003). "5-6" lenders are widely known by the population and usually seen as an expensive and last resort for borrowing money.[9]

We aim to have institutions that are well known to all participants. However, having participants with similar levels of experience towards two different financial institutions was not possible. We thus opted for an institution with which our

[9]The lucrative and risky business attracts many Indian nationals and has a long history in the Philippines (Times of India, 2013). While well-known, only 7 out of 1093 participants report to have borrowed from money lenders, implying a markedly different level of experience with Money Lenders in the sample compared to NWTF.

sample had first hand experience (NWTF) to guarantee that participants were each equally aware of at least one institution. 100% of our sample (both NWTF and ML treatments) are drawn from NWTF's client base. On the other hand, Money Lenders are a well-known last-resort lending institution throughout the country. Due to security reasons, the exact identity of the ML could not be disclosed as we could only work with them under the condition of anonymity. This is in-line with our aim because people assigned to the ML treatment then draw on their own previous experiences and private information about local money lenders in general when making their choices. A priori and by design, we expect different levels of trust towards the two institutions, with a higher level towards NWTF. One of our aims is to see whether our measure discriminates between the two in the expected direction.

2.2. Risk preference elicitation task

In the experiment's second task, subjects allocate money between a safe and a risky lottery in 18 decisions, as illustrated in the instructional poster in figure 3. The parameters of the risk preference elicitation (RPE) task are chosen analogously to the TE task in that the safe lottery imitates the immediate payment and the risky lottery mimics the later payment's size and risk. Winning the risky lottery multiplies the allocated money by $1+r \in \{2, 4\}$, losing it reduces the payment to 0. The nine probabilities of winning the lottery are $p_w \in \{0.1, 0.2, \ldots, 0.9\}$. The safe lottery pays out for sure the amount allocated to it. Like before, subjects allocate an amount $l \in [a, 150]$ to the safe lottery and thus obtain a prize of $(1+r) \cdot (150-l)$ when winning the lottery. The amount of a is 0 and 50 for the two values of $1+r$, respectively, analoguous to TE. Each decision again involves three steps. First, subjects make a binary choice between $l_t = 150$ and $l_t = a$. In the second step, subjects can choose any amount $l_t \in [a, 150]$ in steps of 10. Subjects can clearly visualize the amount l_t assigned to the safe lottery and the amounts $(1+r) \cdot 150 - l_t$ or zero, relevant for the risky lottery. In the third step subjects can refine their l_t choice to the unit level in a dropdown menu. Steps 2 and 3 are analogue to the CTB approach used in TE. Table 2 presents the choice parameters and appendix A.2 presents the screenshots of the task.

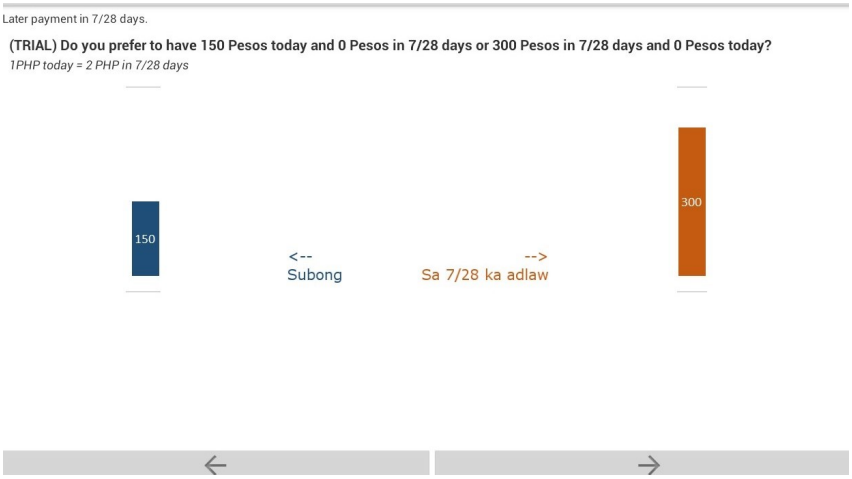
2.3. Trust game

In order to have a behavioral measure of general trust we implement the trust game. This game is played in a similar way to the original game by Berg, Dickhaut, and McCabe (1995) and does not differ across treatments. Participants are randomly

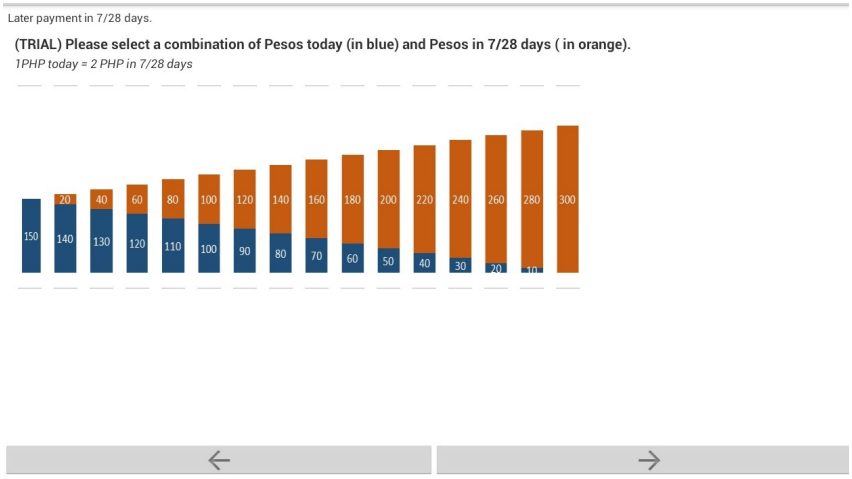
Interest rate $1+r$	Minimum Amount a	Probability p_w	EV of Δl PHP
2	0	0.1	0.2
2	0	0.2	0.4
2	0	0.3	0.6
2	0	0.4	0.8
2	0	0.5	1
2	0	0.6	1.2
2	0	0.7	1.4
2	0	0.8	1.6
2	0	0.9	1.8
4	50	0.1	0.4
4	50	0.2	0.8
4	50	0.3	1.2
4	50	0.4	1.6
4	50	0.5	2
4	50	0.6	2.4
4	50	0.7	2.8
4	50	0.8	3.2
4	50	0.9	3.6

Table 2: Choice parameters in risk preference elicitation task.

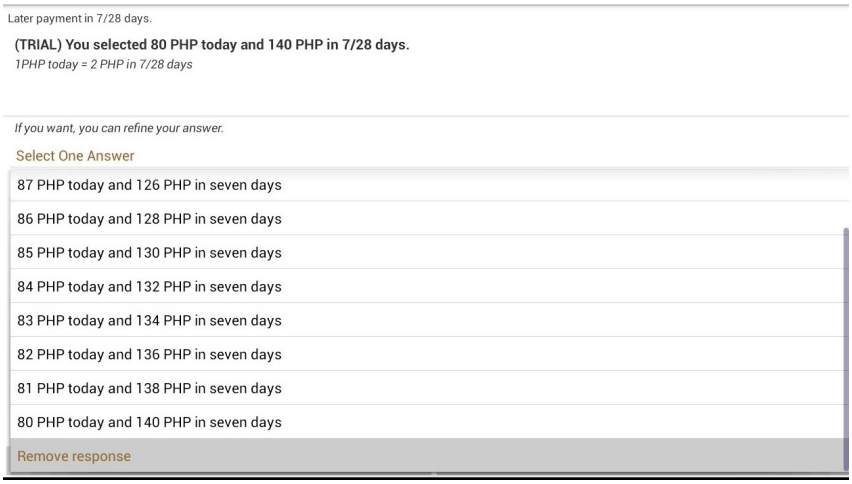
assigned to the role of either investor or investee. Investors are given an initial endowment of PHP 50. They then choose an amount ranging from 0 to PHP 50 to send to the investee. This amount is tripled and the investee chooses how much to send back from the tripled amount. Participants do not know which participant has been matched with them in the opposite role.



(a) Step 1, binary choice.
"Subong" meaning today and "Sa 7/28 ka adlaw" meaning in 7/28 days.



(b) Step 2, Convex Time Budget choice.



(c) Step 3, refined Convex Time Budget choice.

Notes: The screenshots correspond to the trial round that the subjects do before the decisions. The screenshots read "Later payment in 7/28 days". The expression "7/28" is only for illustrative purposes. Participants are always shown choices to be delivered in either 7 or 28 days.

Figure 2: Screenshots of the trust elicitation task in the trial round.

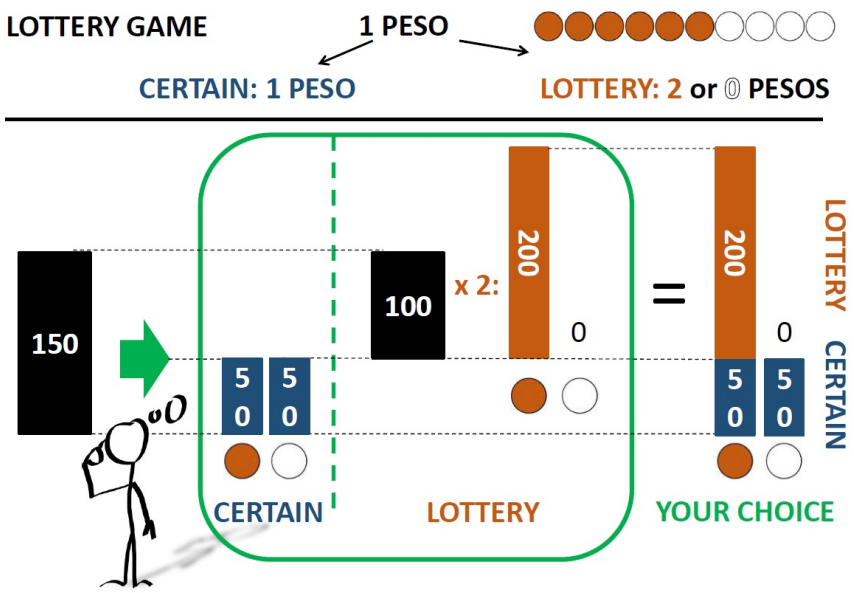


Figure 3: Instructional poster for risk preference elicitation task (English translation).

3. Theoretical background and statistical model

We assume an expected utility framework with exponential discounting, which leads to the discounted utility

$$DU(c_t, c_{t+d}) = u(c_t + \omega) + \delta^d P u(c_{t+d} + \omega) + \delta^d (1 - P) u(0 + \omega), \tag{2}$$

where $u(\cdot)$ is a separable and stationary over time utility function, c_t is the chosen consumption at time t, c_{t+d} is the consumption d periods into the future of t, ω is background consumption, and δ is the discount factor. Importantly, P is our parameter of interest, namely the probability that the subject attaches to receiving the future payment from institution I. With probability P the subject receives the future payment c_{t+d}, and with probability $1 - P$ the subject does not receive the future monetary outcome, in this case she gets 0.[10]

Other than P, we further estimate the discount factor δ and the curvature of the utility function. We implement two statistical specifications. Specification 1 uses only the TE data and is implemented with two different utility functions similar to Andreoni and Sprenger (2012a). Specification 2 makes use of the binary choices from the first decision stage in TE and RPE in an estimation similar to Andersen, Harrison, Lau, and Rutström (2008). Implementing the two specifications allows for comparisons across methods and robustness checks of the estimates. We furthermore implement a third specification which uses the CTB data for both TE and RPE (see appendix A.5).

3.1. Specification 1: theoretical and statistical model

Thanks to the CTB design, specification 1 delivers estimates of both discounting and curvature on the basis of the TE data alone. Our model follows the setup of Andreoni and Sprenger (2012a), using constant relative risk aversion (CRRA) and constant average risk aversion (CARA) utility functions.

3.1.1. CRRA utility

Consider a time separable CRRA utility function for current consumption c_t and future consumption c_{t+d},

$$DU(c_t, c_{t+d}) = \frac{1}{\alpha}(c_t + \omega)^\alpha + \frac{1}{\alpha}\delta^d P(c_{t+d} + \omega)^\alpha + \frac{1}{\alpha}\delta^d (1 - P)(0 + \omega)^\alpha. \tag{3}$$

[10] We assume that the institution is believed to deliver either the full promised amount or nothing in period $t + d$. We view the ex-ante belief that the institution provides only a fraction of the promised amount as very unlikely.

Maximizing the utility subject to the future-value budget constraint with endowment m,

$$m = c_t(1+r) + c_{t+d}, \tag{4}$$

the optimal consumption allocation for $\alpha < 1$ is characterized by

$$\frac{c_t + \omega}{c_{t+d} + \omega} = \left[(1+r)P\delta^d\right]^{\frac{1}{\alpha-1}}. \tag{5}$$

Taking logs of equation 5, we are able to estimate the equation

$$\ln\left(\frac{c_t+\omega}{c_{t+d}+\omega}\right) = \left(\frac{1}{\alpha-1}\right)\cdot\ln(1+r) + \left(\frac{\ln P_{NC}}{\alpha-1}\right)\cdot\mathbf{1}_{NC} + \left(\frac{\ln\delta}{\alpha-1}\right)\cdot d, \tag{6}$$

in which $\mathbf{1}_{NC}$ is an indicator function that takes the value of 1 when there is no payment guarantee (NC) and 0 when there is a payment guarantee (C). P_{NC} is the probability of receipt without payment guarantee and P_C is assumed to be 1.

Let there be N experimental subjects and J_1 TE decisions. Assume that each subject i makes her J_1 TE decisions $c_{t_{ij}}$, with $j = 1, 2, \ldots, J_1$, according to the log-linearized equation 6. These decisions are made with some additive mean-zero, potentially correlated error. Specifically,

$$\ln\left(\frac{c_t+\omega}{c_{t+d}+\omega}\right)_{ij} = \left(\frac{1}{\alpha-1}\right)\cdot\ln(1+r) + \left(\frac{\ln P_{NC}}{\alpha-1}\right)\cdot\mathbf{1}_{NC} + \left(\frac{\ln\delta}{\alpha-1}\right)\cdot d + \varepsilon_{ij}. \tag{7}$$

We assume that the terms ε_{ij} may be correlated within individuals but uncorrelated across individuals. The log consumption ratio is censored by corner solution responses,

$$\ln\left(\frac{c_t+\omega}{c_{t+d}+\omega}\right) \in \left[\ln\left(\frac{0+\omega}{c_{t+d}+\omega}\right), \ln\left(\frac{c_t+\omega}{0+\omega}\right)\right], \tag{8}$$

leading us to implement two-limit Tobit maximum likelihood regression techniques, following Andreoni and Sprenger (2012a).

The two-limit Tobit model can be represented as follows,

$$y^*_{ij} = \gamma_1 \ln(1+r) + \gamma_2 \cdot \mathbf{1}_{NC} + \gamma_3 \cdot d + \varepsilon_{ij}, \tag{9}$$

where y^*_{ij} is the latent variable. If the observed dependent variable is denoted by

y_{ij}, the model can be represented by

$$y_{ij} = \begin{cases} \ln\left(\frac{0+\omega}{c_{t+d}+\omega}\right) & \text{if } y^*_{ij} \leq \ln\left(\frac{0+\omega}{c_{t+d}+\omega}\right), \\ \ln\left(\frac{c_t+\omega}{0+\omega}\right) & \text{if } y^*_{ij} \geq \ln\left(\frac{c_t+\omega}{0+\omega}\right), \\ y^*_{ij} = \gamma_1 \ln(1+r) + \gamma_2 \cdot \mathbf{1}_{NC} + \gamma_3 \cdot d + \varepsilon_{ij} & \text{otherwise.} \end{cases} \tag{10}$$

With this specification, the parameters can be estimated by maximizing the corresponding likelihood function, which we implemented with Stata's two-limit Tobit programs.[11] We cluster standard errors at the session level, which is the randomization unit.

The random assignment of treatments allows us to obtain consistent estimates of our parameters by estimating equation 10. Rearrangements of the estimated coefficients $\hat{\gamma}$ allow us to calculate our parameters of interest, the curvature parameter $\hat{\alpha} = \frac{1}{\hat{\gamma}_1} + 1$, the discount rate $\hat{\delta} = \exp\left(\frac{\hat{\gamma}_3}{\hat{\gamma}_1}\right)$, and $\hat{P}_{NC} = \exp\left(\frac{\hat{\gamma}_2}{\hat{\gamma}_1}\right)$.

3.1.2. CARA utility

Consider now a time separable constant absolute risk aversion (CARA) utility function, specifically the exponential utility function

$$DU(c_t, c_{t+d}) = -\left[\exp(-\rho(c_t+\omega)) + \delta^d P \exp(-\rho(c_{t+d}+\omega)) + \delta^d (1-P)\exp(-\rho(0+\omega))\right], \tag{11}$$

where ρ is the coefficient of absolute risk aversion. Under this specification, the optimal consumption allocation is defined by the equation

$$\exp\left(-\rho(c_t - c_{t+d})\right) = (1+r)(\delta^k P).$$

Taking logs, we are able to estimate the equation independent of ω,

$$c_t - c_{t+d} = \left(\frac{1}{-\rho}\right) \cdot \ln(1+r) + \left(\frac{\ln P_{NC}}{-\rho}\right) \cdot \mathbf{1}_{NC} + \left(\frac{\ln \delta}{-\rho}\right) \cdot d,$$

whose rearrangement allows us to estimate the parameters of interest with a similar statistical model as for CRRA utility.

[11] Censor regression techniques are able to address the issue of corner solutions, but have disadvantages acknowledged by both Andreoni and Sprenger (2012a) and Harrison, Lau, and Rutström (2013). We address these in our hybrid specification 3 in appendix A.5, using CTB data with the statistical framework of specification 2.

3.2. Specification 2: theoretical model and statistical specification

Next, we use a simple stochastic specification that translates the discounted utility into choice probabilities, allowing us to specify likelihoods conditional on the model. This is the probabilistic approach based on binary choices used among others by Holt and Laury (2002) and Andersen, Harrison, Lau, and Rutström (2008). We implement a CRRA utility function for choices from both RPE and TE. For the latter, the specification is identical to equation 3.

3.2.1. Theoretical model for risk preference elicitation

Recall that subjects can allocate an amount $l \in \{a, 150\}$ to the safe lottery. The complementary amount $(150 - l)$ is allocated to the risky lottery, which turns into $(1 + r) \cdot (150 - l)$ with probability p_w when the lottery is won and 0 otherwise. The expected utility can be written as

$$\text{EU}(l) = \frac{1}{\alpha} p_w [(1 + r) \cdot (150 - l) + l + \omega]^\alpha + \frac{1}{\alpha}(1 - p_w) \cdot [0 + l + \omega]^\alpha. \tag{12}$$

3.2.2. Statistical specification

With the choice utilities $DU(c)$ or $EU(l)$, we define the indices

$$\nabla\text{DU} = \frac{\text{DU}(c)^{\frac{1}{\nu}}}{\text{DU}(a)^{\frac{1}{\nu}} + \text{DU}(150)^{\frac{1}{\nu}}}, \text{ and } \nabla\text{EU} = \frac{\text{EU}(l)^{\frac{1}{\mu}}}{\text{EU}(a)^{\frac{1}{\mu}} + \text{DU}(150)^{\frac{1}{\mu}}}. \tag{13}$$

These indices are used to specify a likelihood conditional on the model parameters and contain noise parameters ν and μ, respectively, to allow for some errors from the perspective of the deterministic model. The denominator reflects the feasible actions available to the subject, $z \in \{a, 150\}$. The log-likelihood of observing the J_1 decisions c_{ij} of individual i in the TE task is then

$$\ln L_i^{DU}(\alpha, \delta, P_{NC}, \mu, \nu; c, \omega) \;\; = \;\; \sum_{j=1}^{J_1} \ln \nabla\text{DU}.$$

The log-likelihood of observing the J_2 decisions l_{ij} of individual i in the RPE task is then

$$\ln L_i^{EU}(\alpha, \mu; l, \omega) \;\; = \;\; \sum_{j=1}^{J_2} \ln \nabla\text{EU}.$$

The joint sample likelihood of the TE and RPE decisions is the sum of these two likelihoods over all individual likelihoods

$$\ln L(\alpha, \delta, P_{NC}, \mu, \nu; c, l, \omega) = \sum_{j=1}^{J_1} \ln \nabla \text{DU} + \sum_{j=1}^{J_2} \ln \nabla \text{EU} \tag{14}$$

3.3. Discussion

The CTB method has been the subject of vivid discussions. On the basis of the Andreoni and Sprenger (2012a) data, Harrison, Lau, and Rutström (2013) expect the estimated utility function to be convex in order to explain the frequently occurring corner allocations (see specification 3 in appendix A.5). They deem such results implausible and a consequence of poor comprehension of subjects. We observe a smaller, but still substantial share of corner allocations. The distribution of choices over the interval $[0, 150]$ is shown in appendix A.6. At the same time, the method has been applied successfully to numerous studies in laboratory experiments, in developing countries and on children and teenagers (see Andreoni and Sprenger, 2015, for references). We deliberately implement a decision protocol that generates all the necessary information for estimating trust in various ways. This way, we obtain a comprehensive picture of our trust measure from multiple perspectives.

4. Data and sample statistics

The experiments were conducted in the Philippine provinces of Guimaras, Capiz and Iloilo during the months of March, April and May 2015. Overall, 1,093 subjects took part in the experiment. The experiment session took place during a morning or afternoon and lasted about 3 hours. On average, 22 subjects participated in a session. On average, subjects were paid PHP 290 (ca. 7 USD).

Subjects participating in our study are all clients of NWTF and are randomly selected from the pool of clients in the three provinces. Individuals are randomly assigned to four treatment groups, following the 2×2 between-subject design with two institutions and two orders of the payment guarantee. Subjects are invited to participate in the experiment via an invitation letter delivered to their houses. Details of the randomization procedure are provided in Appendix A.3.

An individually administered, two-part questionnaire is implemented, with a first part asked before the experimental elements ("pre-questionnaire") and a second part asked right before payment ("post-questionnaire"). Table 3 reports summary statistics for the full sample and the different treatments, as well as the equality of means t-test between the institution treatments (NWTF and ML) and the order

treatments (NC/C and C/NC). Table 3a contains pre-questionnaire data and table 3b contains post-questionnaire data.

Given that the treatments are randomly assigned, we expect individuals in the NWTF treatment to be similar to individuals in the ML treatment in terms of the pre-questionnaire responses. The same is expected for individuals in the NC/C and C/NC treatments. The table shows that our expectation holds in general. The number of significant differences are within the bounds of what is expected to occur by chance and joint F-tests are insignificant ($p = 0.422$ and $p = 0.200$, bank distance from post-questionnaire included).

Some differences are worth discussing. The distance to the bank is significantly different between subjects in the NWTF treatment and those in the ML treatment. This difference, however, is driven by remote outliers. When we exclude the top 1 percentile, the difference loses statistical significance. Further, we provide a local cashing option, which makes the distance to the bank less important for us. The fraction of subjects that "Ever cashed a check" turns out higher in ML, which, if at all relevant, should make it harder to observe a higher $\hat{P}_{NC}$ for NWTF.

Further, the question that asks whether the subject knows the institutions is answered differently. Our subjects are all clients of NWTF, therefore a large share reports to know the institution. However, only 18% of subjects in the ML treatment report to know the institution. As mentioned earlier, this is due to the fact that the exact identity of the money lender was not disclosed.

As a further balancing check, we implement a multivariate analysis of variance to test for differences between means across the four different treatment groups, on each of the variables presented in the summary statistics. The last column of Table 3 shows the p-values associated with the F-statistic based on Wilks' lambda. We do not reject the null hypothesis that the means across the groups are equal for all variables except being married, having a flush toilet and electricity in the household, bank distance and knowing the institution.

Finally, in a hypothetical question after the experimental tasks, we directly elicited participants' subjective probability of payment completion in order to obtain a self-reported measure of their beliefs of the institutions' trustworthiness. A priori, we would expect the informal institution ML to generate lower beliefs. Interestingly, both self-reported beliefs measures (*Trustworthiness beliefs I* and *II*) indicate very high levels of expected trustworthiness with very small, insignificant differences between NWTF and ML treatments. In contrast, reported measures of trust (*Trust level in NWTF* and *ML*) indicate large differences between the two institutions. Moreover, our estimated $\hat{P}_{NC}$ parameters presented in the Results section, indicate minor differences between NWTF and ML at intermediate levels.

In summary, it is possible that – when asked directly by our RAs – subjects are reluctant to reveal their true beliefs.

5. Results

In this section, we report basic patterns in simple statistics of the data, proceed to the trust results from the structural estimations and show results from the trust game and survey questions.

5.1. Descriptive statistics

Choice behavior is expected to respond to experimental variations in four dimensions: payment guarantee, institution, interest rate $1 + r$, and delay d. Table 4 presents average differences in c_t for the first three variations. Figure 4 illustrates current consumption c_t across the four variations. For ease of illustration and interpretation, we show results for uncapped decisions with interest rates $1 + r < 3$.[12]

First, the payment guarantee in the form of a 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" in the future and a reduced current consumption.

Indeed, row 1 shows that current consumption without guarantee is significantly higher by PHP 17.36 than with the guarantee. This number represents 11.6% of the endowment and indicates by how much the NC decisions would have to increase on average for a full trust result with $\hat{P}_{NC} = 1$. The remaining entries of that row indicate the differences between the two institutions to be rather small.

Second, we expect that the probability of payment is higher for NWTF than ML, leading to a lower current consumption. This should be driven by the decision without guarantee because the guarantee should reduce the relevance of the institution.

As expected, row 2 of table 4 shows that the current consumption is significantly higher by PHP 3.62 in the ML treatment than in the NWTF treatment (see figure 4a). The remaining difference between institutions in C imply that even when the check is provided, beliefs or preferences towards the institutions still matter.

Quantitatively, a difference-in-difference analysis shows no significant interaction between institutions and payment guarantee ($p = 0.889$), reiterating the point that the check does not entirely mute the differences due to institutions. If the C choices for ML were lower, the trust in ML would be estimated lower. In an "ideal"

[12] Appendix A.7 shows data for remaining interest rates. It also shows data by C/NC and NC/C treatments and discusses differences.

	(1) Full Sample	(2) ML	(3) NWTF	(4) ML− NWTF	(5) NC/C	(6) C/NC	(7) NC/C− C/NC	(8) Equality of Means (p)
Age	42.83	42.61	43.07	0.46	42.68	43.00	0.32	0.518
	(11.60)	(11.28)	(11.92)	(0.70)	(11.61)	(11.59)	(0.70)	
Years of education	8.80	8.81	8.80	-0.01	8.85	8.75	-0.10	0.507
	(2.89)	(3.00)	(2.77)	(0.18)	(2.89)	(2.89)	(0.18)	
Married	0.83	0.82	0.85	0.03	0.86	0.81	-0.05	0.027
	(0.37)	(0.39)	(0.36)	(0.02)	(0.35)	(0.39)	(0.02)	
Household size	5.46	5.59	5.33	-0.26	5.44	5.48	0.04	0.054
	(2.08)	(2.20)	(1.94)	(0.13)	(2.04)	(2.13)	(0.13)	
Employed	0.48	0.46	0.49	0.03	0.48	0.47	-0.00	0.772
	(0.50)	(0.50)	(0.50)	(0.03)	(0.50)	(0.50)	(0.03)	
Has regular income	0.57	0.57	0.57	0.00	0.57	0.57	-0.00	0.756
	(0.50)	(0.50)	(0.50)	(0.03)	(0.50)	(0.50)	(0.03)	
Monthly income (PHP)	1409.6	1329.9	1492.8	162.8	1345.5	1481.1	135.6	0.054
	(3057.1)	(2891.9)	(3223.6)	(246.1)	(2829.9)	(3295.9)	(246.5)	
Background cons. (PHP, weekly)	350.47	350.05	350.91	0.86	357.22	342.94	-14.29	0.734
	(366.09)	(372.38)	(359.71)	(22.17)	(379.93)	(350.21)	(22.20)	
HH background cons. (PHP, weekly)	1002.7	973.9	1033.0	59.08	973.9	1034.8	60.90	0.182
	(700.3)	(674.3)	(726.2)	(42.36)	(660.7)	(741.3)	(42.41)	
Village official position	0.07	0.06	0.08	0.02	0.08	0.07	-0.01	0.204
	(0.26)	(0.24)	(0.28)	(0.02)	(0.27)	(0.25)	(0.02)	
Dwelling								
Rooms for sleeping	1.81	1.78	1.84	0.05	1.84	1.77	-0.07	0.314
	(0.79)	(0.78)	(0.81)	(0.05)	(0.83)	(0.75)	(0.05)	
Cement floor	0.49	0.48	0.51	0.03	0.50	0.49	-0.01	0.576
	(0.50)	(0.50)	(0.50)	(0.03)	(0.50)	(0.50)	(0.03)	
Flush toilet	0.88	0.87	0.90	0.03	0.88	0.88	0.00	0.000
	(0.32)	(0.34)	(0.30)	(0.02)	(0.33)	(0.32)	(0.02)	
Electricity	0.88	0.87	0.88	0.02	0.87	0.88	0.00	0.001
	(0.33)	(0.34)	(0.32)	(0.02)	(0.33)	(0.33)	(0.02)	
Bottled drinking water	0.37	0.37	0.37	-0.01	0.37	0.37	-0.01	0.988
	(0.48)	(0.48)	(0.48)	(0.03)	(0.48)	(0.48)	(0.03)	
Owned	0.88	0.88	0.88	-0.00	0.88	0.89	0.01	0.981
	(0.32)	(0.32)	(0.32)	(0.02)	(0.33)	(0.32)	(0.02)	
N	1093	533	560	1093	517	576	1093	

Notes: Standard deviations and errors in parentheses. Column (8) shows p-values for multivariate equality of means test based on Wilks' lambda test statistics for the four treatment groups.

(a) Pre-questionnaire data collected before experimental games.

Table 3: Sample summary statistics.

	(1) Full Sample	(2) ML	(3) NWTF	(4) ML− NWTF	(5) NC/C	(6) C/NC	(7) NC/C− C/NC	(8) Equality of Means (p)
Am't borrowed MFI/ Banks (PHP)	5780.2	5635.1	5931.5	296.36	5747.1	5817.1	69.97	0.112
	(3169.1)	(2912.9)	(3412.2)	(203.8)	(3179.6)	(3160.4)	(204.32)	
Savings in MFI/rural bank (PHP)	1422.5	1426.2	1418.6	-7.51	1665.1	1159.1	-505.9	0.485
	(4498.9)	(5294.8)	(3442.1)	(381.9)	(6039.0)	(1596.6)	(381.31)	
Trust level in NWTF	6.30	6.49	6.11	-0.38	6.35	6.25	-0.10	0.000
	(1.18)	(0.94)	(1.36)	(0.07)	(1.14)	(1.22)	(0.07)	
Trust in ML[1]	3.81	3.79	3.82	0.03	3.86	3.75	-0.11	0.155
	(2.03)	(2.08)	(1.98)	(0.12)	(2.04)	(2.02)	(0.12)	
Risk preference[2]	3.71	3.68	3.74	0.06	3.78	3.64	-0.14	0.817
	(2.57)	(2.56)	(2.59)	(0.16)	(2.60)	(2.54)	(0.16)	
Betrayal aversion[3]	6.33	6.32	6.33	0.01	6.36	6.30	-0.06	0.653
	(1.50)	(1.53)	(1.48)	(0.09)	(1.48)	(1.53)	(0.09)	
Avoid being taken advantage of[3]	6.16	6.07	6.24	0.17	6.23	6.07	-0.16	0.129
	(1.69)	(1.78)	(1.59)	(0.10)	(1.63)	(1.75)	(0.10)	
Reciprocity[4]	1.57	1.58	1.56	-0.02	1.55	1.60	0.05	0.830
	(1.40)	(1.44)	(1.36)	(0.08)	(1.35)	(1.45)	(0.08)	
Sociability[5]	4.25	4.25	4.24	-0.01	4.29	4.20	-0.09	0.276
	(1.23)	(1.23)	(1.23)	(0.07)	(1.21)	(1.24)	(0.07)	
Bank distance (minutes)	32.55	29.95	35.28	5.33	32.52	32.58	0.05	0.030
	(35.67)	(28.71)	(41.60)	(2.15)	(29.03)	(41.87)	(2.16)	
Ever cashed a check	0.95	0.97	0.92	-0.04	0.94	0.95	0.01	0.009
	(0.23)	(0.18)	(0.27)	(0.01)	(0.24)	(0.21)	(0.01)	
Knows institution	0.54	0.87	0.18	-0.69	0.55	0.51	-0.04	0.000
	(0.50)	(0.33)	(0.38)	(0.02)	(0.50)	(0.50)	(0.03)	
Trustworthiness beliefs I[6]	5.80	5.78	5.83	0.04	5.81	5.80	-0.01	0.447
	(1.62)	(1.62)	(1.61)	(0.10)	(1.65)	(1.58)	(0.10)	
Trustworthiness beliefs II[7]	8.04	8.07	8.02	-0.05	8.04	8.05	0.02	0.529
	(2.59)	(2.51)	(2.68)	(0.16)	(2.61)	(2.58)	(0.16)	
N	1093	533	560	1093	517	576	1093	

Notes: Standard deviations and errors in parentheses. Column (8) shows p-values for multivariate equality of means test based on Wilks' lambda test statistics for the four treatment groups.

[1] 1–no trust, 7–complete trust,

[2] Avoid/prepared to take risks: 1–avoid, 7–fully prepared,

[3] Avoid being betrayed/taken advantage of: 1–completely avoid, 7–do not avoid,

[4] If offended, offend back?: 1–offend, 7–not offend,

[5] Meet friends, relatives, neighbor: 1–never, 2–seldom, 3–monthly, 4–weekly, 5–daily,

[6] How certain is payment in 28 days?: 1–surely not reach me, 7–absolutely certain,

[7] Imagine 10 people that are promised a payment in 28 days. Out of 10 people, how many people do you think will get the payment delivered in 28 days?

(b) Post-questionnaire data collected after experimental games.

Table 3: Sample summary statistics.

	All	*NWTF*	*ML*
(1) $\bar{c}_t^{NC} - \bar{c}_t^{C}$	17.36	17.62	17.10
	(0.550)	(0.770)	(0.786)
N	39348	20160	19188
	All	*C*	*NC*
(2) $\bar{c}_t^{ML} - \bar{c}_t^{NWTF}$	3.617	3.878	3.357
	(0.557)	(0.792)	(0.764)
N	39348	19674	19674
	All	*C*	*NC*
(3) $\bar{c}_t^{1+r=1} - \bar{c}_t^{1+r=2.67}$	13.28	17.06	9.503
	(1.280)	(1.783)	(1.785)
N	8744	4372	4372

Notes: Standard errors in parentheses.

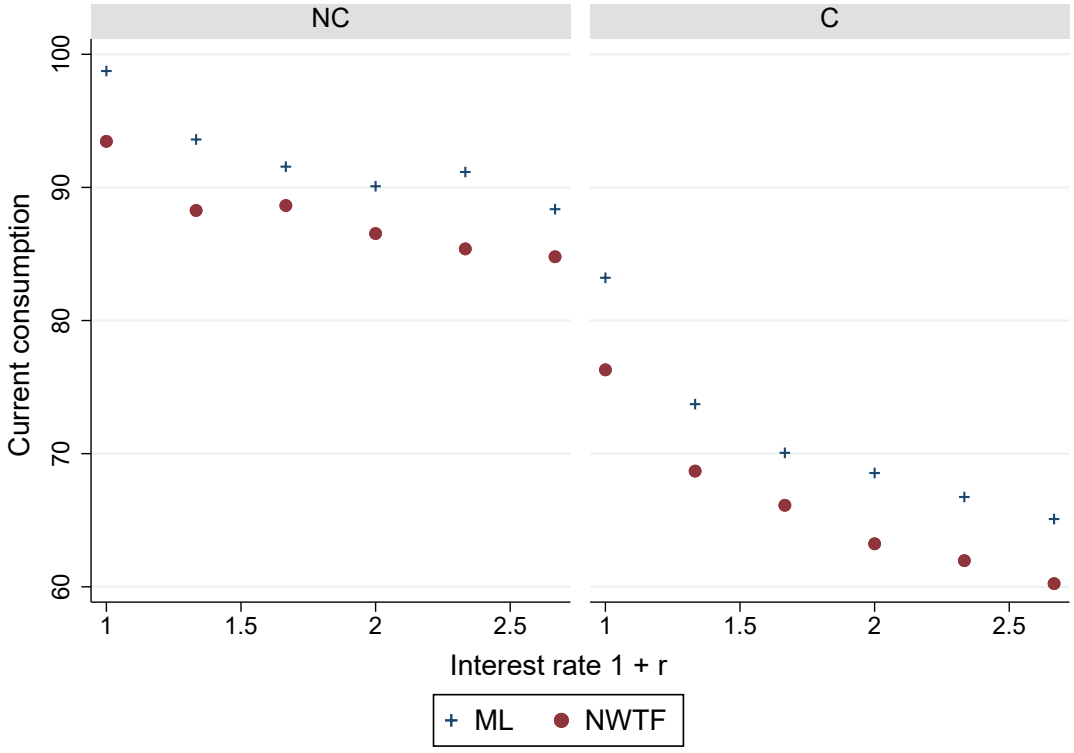
Table 4: Equality of means test for $c_t \in [0, 150]$.

C scenario, in which the institution is entirely irrelevant, the C choices would not differ between institution. If there was no difference between institutions in C, the difference in estimated trust between the institutions would be larger. We simulate such ideal scenarios and provide conceivable ranges of $\hat{P}_{NC}$ in section 5.4.

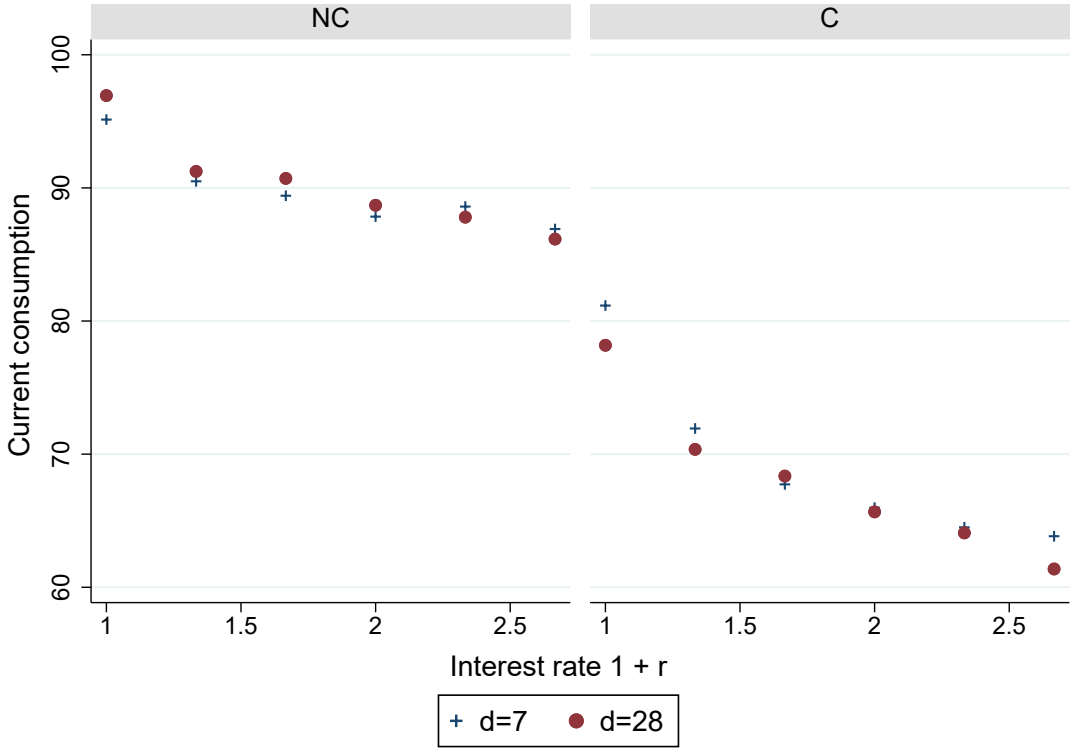
Third, a higher interest rate makes the investment more attractive and should result in lower current consumption. Row 3 shows that a move from $r = 1$ to $r = 2.67$ decreases current consumption by 13.28 PHP overall. Without a check guarantee, this decrease is about 9.5 PHP. Even at this very aggregate level of analysis, it is noteworthy that the change in the interest rate from 1 to 2.67 results only in about 55% of the effect of the payment guarantee on $\bar{c}_t$. In other words, the reduction in investment due to low levels of trust in the institution is much larger than the impact of a very significant reduction in the interest rate.

Finally, due to standard exponential time discounting, a higher delay d makes the investment with a given interest rate less attractive. We therefore expect a higher current consumption for $d = 28$ compared to $d = 7$. At 0.25 PHP, these differences turn out to be small and insignificant, suggesting basically no exponential time discounting (see figure 4b).[13]

[13]Indeed, at commonly observed discount rates, standard exponential discounting is probably not relevant for these specific time horizons. Even present bias might be less relevant for monetary decisions (Augenblick, Niederle, and Sprenger, 2015). Unfortunately, our data does not allow us to estimate present bias.



(a) By institution, pooled across delay lengths.



(b) By delay lengths, pooled across institutions.

Figure 4: Current consumption $c_t \in [0, 150]$ by interest rate and payment guarantee, NC vs. C.

5.2. Estimation

This section presents the estimation results of specifications 1 and 2.

5.2.1. Specification 1

Table 5 presents two-limit Tobit Maximum Likelihood estimates following the model of section 3.1.[14] In columns 1 and 2, removing the payment guarantee is estimated to significantly change the perceived probability of receiving the later payment. This probability is 0.393 in the NWTF sample, higher than the 0.324 in the ML sample. Therefore, compared to a benchmark with a payment guarantee, the trust in a non-guaranteed payment from NWTF is higher than for ML. The difference is statistically insignificant. In columns 3 and 4, we include background consumption of PHP 50.25, the average daily consumption in our sample. The probabilities $\hat{P}_{NC}$ of receiving the later payment are 0.500 for the NWTF sample and 0.442 for the ML sample. Finally, for the exponential CARA utility specification in columns 5 and 6, the probability attached to receiving the later payment by the institution, is 0.573 for NWTF and 0.524 for ML.

Overall, compared to an independent benchmark with payment guarantee, the trust in the institution as expressed by the probability of receiving the later payment is quite low in absolute terms. Only about one out of two payments are expected to take place. And while the level of trust in NWTF is consistently higher than the level of trust in ML, the differences between the two institutions are smaller than the reported trust level led us to expect and are not statistically significantly different.[15]

The estimated curvature parameters are in the range of results from previous estimations by Andreoni and Sprenger (2012a) and Andersen, Harrison, Lau, and Rutström (2008). The daily discount rate $\hat{\delta}$ is estimated to be close to 1 as expected from the descriptive statistics.

5.2.2. Specification 2

Table 6 presents the estimation results of specification 2 on the basis of the binary decisions. The curvature parameters imply stronger risk aversion than the estimates in specification 1. These results are in line with those of Andersen, Harrison, Lau,

[14] We restrict the analysis to uncapped choices with $a = 0$, i.e. $1 + r < 3$. Including choices for higher interest rates with $a \in \{50, 100, 140\}$ leads to qualitatively similar results. However, compared to the literature, the curvature estimates are less plausible. Generally, the cap makes it more difficult to draw insights from these observations.

[15] Alternatively, if we follow Andreoni and Sprenger (2012a) in clustering the standard errors at the individual level, the differences are marginally significant. See appendix A.4.

	(1) NWTF	(2) ML	(3) NWTF	(4) ML	(5) NWTF	(6) ML
Curvature $\hat{\alpha}$ (CRRA)	0.77	0.774	0.121	0.097		
	(0.0234)	(0.0246)	(0.0638)	(0.0695)		
Curvature $\hat{\rho}$ (CARA)					0.005	0.005
					(0.0003)	(0.0003)
Daily discount rate $\hat{\delta}$	1.005	1.000	1.003	0.9983	1.002	0.9986
	(0.003)	(0.005)	(0.0019)	(0.0036)	(0.0014)	(0.0027)
$\hat{P}_{NC}$	0.393	0.324	0.500	0.442	0.573	0.524
	(0.0558)	(0.0626)	(0.0465)	(0.058)	(0.0412)	(0.0537)
$\hat{P}_{NC}^{NWTF} = \hat{P}_{NC}^{ML}$	$p = 0.2129$		$p = 0.2354$		$p = 0.2359$	
Back. cons. ω	0.01	0.01	50.25	50.25		
Observations	13440	12792	13440	12792	13440	12792
LL	-33960	-31560	-21480	-20295	-56232	-51482
Uncensored	7077	6359	7077	6359	7077	6359
Clusters	30	29	30	29	30	29

Notes: Two-limit Tobit Maximum Likelihood estimates. Clustered standard errors at the session level in parenthesis calculated via the delta method. The reported p-values result from a simple linear hypothesis Wald test.

Table 5: CRRA and CARA parameters estimates, specification 1.

and Rutström (2008). The discount rate is estimated to be at or slightly above 1 throughout the different variations of specification 2.

We find that the levels of $\hat{P}_{NC}$ depend strongly on the background consumption and utility function, but the difference between the institutions and its direction persist. Again, the differences between institutions are insignificant. As in specification 1, this emphasizes the point that the differences between institutions in our experimental trust measure are smaller than expected. A closer look at the self-reported trust measures in the next section suggests an explanation.

5.3. General and Reported Trust

Our elicitation tasks, the trust game and the survey questions provide us with an array of data to investigate differences between elicited and reported measures of trust.

The amount invested in the trust game is commonly seen as a measure of general trust since players are confronted with a random, anonymous opponent from a known, general population.

The top part of table 7 presents the amounts invested and received in the trust game (see section 2.3). Out of PHP 50, subjects on average invest PHP 26.0 and return PHP 31.4. The levels of trust and trustworthiness with a return on investment

	(1) NWTF	(2) ML	(3) NWTF	(4) ML	(5) NWTF	(6) ML
Curvature $\hat{\alpha}$ (CRRA)	0.313	0.266	0.646	0.572		
	(0.026)	(0.019)	(0.033)	(0.028)		
Curvature $\hat{\rho}$ (CARA)					0.012	0.014
					(0.0011)	(0.0008)
Daily discount rate $\hat{\delta}$	1.009	1.002	1.019	1.004	1.010	1.003
	(0.003)	(0.004)	(0.007)	(0.008)	(0.003)	(0.003)
$\hat{P}_{NC}$	0.452	0.437	0.166	0.103	0.501	0.517
	(0.057)	(0.069)	(0.089)	(0.115)	(0.049)	(0.057)
$\hat{P}_{NC}^{NWTF} = \hat{P}_{NC}^{ML}$	$p = 0.7900$		$p = 0.4779$		$p = 0.8422$	
Back. cons. ω	0.01	0.01	50.25	50.25		
Observations	30240	28782	30780	28782	30240	28782
LL	-19719	-18935	-20172	-19381	-19878	-18699
Clusters	30	29	30	29	30	29

Notes: Maximum Likelihood estimates. Standard errors in parenthesis are clustered at the session level. The noise parameter μ is set to 1 to allow for noise and to avoid its estimation. The reported p-values result from a simple linear hypothesis Wald test.

Table 6: CRRA and CARA parameters estimates, specification 2.

slightly higher than 1 are in line with other results in the literature (see Camerer, 2003; Cardenas and Carpenter, 2008). Comparing the ML and NWTF samples, we only observe slight and insignificant differences. The same picture emerges for reported general trust in the lower part of the table, where we see that the institution responsible for delivery in the TE task does not play a role.

Between treatments we observe a small, significant difference in reported trust in NWTF, which shows that the level of trust reported after the experiment tasks is higher when NWTF is the treatment institution.

The last two lines of the table report markedly higher levels of reported trust in NWTF (6.3) than in ML (3.81). Given that our trust estimates $\hat{P}_{NC}$ differ less than expected between NWTF and ML, a look at these measures in a different sample can tell us more about these differences in reported trust levels.

In addition to our main sample that consists exclusively of NWTF clients, we have a separate sample from four villages that consists of 79 NWTF clients and 77 non-clients who were subject to the NWTF treatment.[16] Among NWTF clients, the self-reported trust levels in table 8 replicate the large difference in reported trust between institutions. Interestingly, however, this difference disappears entirely in the non-client sample. Given that the estimated trust levels are not very far apart

[16]For a separate project, these 156 subjects were randomly selected but all allocated to the NWTF treatment. Hence, they were not included in our main sample (See appendix A.3).

	Full Sample	NWTF treatment	ML treatment	ML-NWTF
	(1)	(2)	(3)	(4)
Behavioral trust				
Invested amount in TG	26.03	25.76	26.31	0.5412
	(8.80)	(8.58)	(9.03)	(0.744)
Returned amount in TG	31.35	30.99	31.67	0.674
	(14.78)	(14.25)	(15.34)	(1.282)
Fraction returned in TG	0.40	0.41	0.40	-0.001
	(0.14)	(0.14)	(0.14)	(0.012)
Observations (invest)	560	288	272	
Observations (return)	533	272	261	
Reported trust				
General trust level	4.33	4.34	4.32	-0.011
	(1.37)	(1.41)	(1.34)	(0.083)
Trust level in NWTF	6.30	6.49	6.11	-0.381
	(1.18)	(0.94)	(1.36)	(0.070)
Trust level in ML	3.81	3.79	3.82	0.031
	(2.03)	(2.08)	(1.98)	(0.123)
Observations	1,093	560	533	

Notes: The trust survey questions are based on a 7-point Likert scale: 1–no trust, 7–complete trust. In parenthesis is the standard deviation (columns 1-3) and standard errors of the equality of means test (column 4).

Table 7: Trust game and survey questions.

in our main sample, these numbers suggest that client status correlates strongly with reported trust levels for NWTF, but less with our experimental measure.

		NWTF clients	NWTF non-clients
Reported trust level	NWTF	6.10	3.96
	ML	4.05	3.94
Observations		79	77

Notes: The trust survey questions are based on a 7-point Likert scale: 1–no trust, 7–complete trust.

Table 8: Reported and estimated trust levels in NWTF for clients and non-clients.

5.4. Estimation results with adjusted c_t^C for Money Lenders

So far, our estimation results illustrate the relevance of the payment guarantee for the decisions, but section 5.1 also discussed the slight differences in current consumption between institutions in the benchmark (C) decisions. These are relevant

because we normalize the behavior in C to $P_C = 1$. In order to gauge the maximal influence of these slight differences on our trust estimations, we simulate alternative ML data in C decisions that feature similar current consumption averages as in the NWTF C data. Due to their lower level of c_t, we take NWTF C decisions as the choices closest to the $P_C = 1$ ideal. There are multiple ways to adjust the ML C data to lower averages, none of which we see as a superior way to approximate an inherently hypothetical behaviour. We chose to lower all ML subjects' c_t choices in C by the same amount until the average c_t at a given interest rate matches the corresponding average of the NWTF subjects. When some individuals' choices are reduced to the lower bound of 0 in this process, we continue adjusting other individuals' choices downwards. We report results only for specification 1 since the binary data for specification 2 cannot easily be adjusted in the same way.

The results in table 9 show that the $\hat{P}_{NC}$ estimates for the ML treatment are lower by about 0.03 compared to those in table 5. These numbers therefore give conservative lower bounds of what trust in ML measured by $\hat{P}_{NC}$ could be, if the c_t choices under guarantee in the ML treatment were as low as those in the NWTF treatment. On the adjusted data, the difference-in-difference analysis shows a stronger, yet still insignificant interaction between institutions and check provision ($p = 0.441$).

	Specification 1		
	(2)	(4)	(6)
Curvature $\hat{\alpha}$ (CRRA)	0.793	0.141	
Curvature $\hat{\rho}$ (CARA)			0.005
Daily discount rate $\hat{\delta}$	1.013	1.006	1.005
$\hat{P}_{NC}$	0.288	0.410	0.491
Back. cons. ω	0.01	50.25	
Observations	12792	12792	12792
LL	-33318	-20516	-57726
Uncensored	7560	7560	7560
Clusters	29	29	29

Notes: Two-limit Tobit Maximum Likelihood estimates.

Table 9: CRRA and CARA parameters estimates in ML for adjusted c_t^C.

5.5. Discussion

From our structural estimations, we obtain levels of trust $\hat{P}_{NC}$ between 0.10 and 0.57, which result from differences between C and NC clearly visible in the descriptive statistics. The variation of $\hat{P}_{NC}$ across estimations shows that the measure depends considerably on the exact forms of the utility function and the level of

background consumption. At this point, attaching a particular absolute level of trust to a single institution would require a firm stance on those parameters. At the same time, a relative comparison between institutions is readily available as it can be done for any given set of parameters. In any case, the trust measure would benefit from a convergence in the literature on the best method to identify time and risk preferences and from a set of agreed values for a valid calibration of the necessary parameters.

Nevertheless, all estimates are located in the lower two-thirds of the interval $[0, 1]$, in contrast to the trustworthiness beliefs in table 3b and reported trust levels in NWTF discussed later. This suggests a qualitative difference in the trust evaluation depending on it being behaviorally elicited or self-reported.

In this first implementation of the trust measure, we use the delayed delivery of money as the most basic object of an institution's legally non-binding promise to provide value to a voluntarily invested individual. Similar to other experimental measurements of beliefs and preferences, the elementary nature of a monetary payment makes the measure universal and thus applicable to institutions across the board. Of course, a good or service closer to an institution's day-to-day operations can be used if this substitute for the monetary payment is an equally well quantifiable and homogeneous carrier of value and if comparability with measures of trust in other domains is not essential. At the same time, it might be useful to place the promise of an institution in a different context than its core operations in order to maintain a level of uncertainty that calls for trust and not merely for confidence obtained through long prior interaction (Seligman, 1998).

6. Effect of the Promise on Savings

Lack of trust in financial institutions has been identified as one of the possible causes for low levels of savings with formal financial institutions in developing countries (Karlan, Ratan, and Zinman, 2014; Dupas, Green, Keats, and Robinson, 2014). If this is true, an exogenous variation that influences trust in the institution should also change the savings held at this institution.

In our experiment, the random selection of the decision to be paid generates such variation. Subjects make 54 decisions, 36 on the trust elicitation task and 18 on the risk preference elicitation task. The one decision to be paid is selected uniform randomly from these 54 decisions. Indeed, 34% of all subjects were paid for the RPE task and 66% were paid for a choice taken in the TE task (see appendix A.8).

Choices in the RPE task are paid fully at the end of the experiment, since RPE payoffs do not feature any time delay. In contrast, all choices in the TE task

potentially include a future payment in 7 or 28 days. This future payment, kept and delivered by the institution, constitutes a promise to the subject. Fulfillment of that promise could have a positive effect on the subject's trust towards the institution. We therefore consider the payment for a TE choice as a potential, exogenous variation of trust.[17]

In our analysis of savings, we use weekly financial data about NWTF clients. Our aim is to test whether the variation of trust has an effect on savings with NWTF after the experiment.

To examine our question we run the following panel data regression

$$\text{Sav}_{i,t+k} = \theta + \phi_1 \cdot T_i + \phi_2 Z_i + \phi_3 \cdot X_i + \varepsilon_{i,t+k},$$

where $\text{Sav}_{i,t+k}$ corresponds to the weekly savings level of subjects held at NWTF. We look at the effects in the 8 weeks after the experiment took place, $k \in \{1, \ldots, 8\}$.[18] The treatment indicator is $T_i = 1$ if the subject is paid on a TE task and $T_i = 0$ if the subject is paid for a RPE task. Table 17 in appendix A.9 shows descriptive statistics for the sample of interest. Covariates are balanced between subjects paid for a TE task and subjects paid for a RPE task.[19]

Since subjects' earnings in the experiment could have an effect on their savings level after the experiment, we control for the total amount earned in the experiment, Z_i. Finally, X_i is a vector of covariates which includes risk aversion estimates, covariates used for balancing during the sampling (baseline savings, loan amount, distance to municipality and urban indicator) and household characteristics (household size, age, electricity in the household's dwelling). Standard errors are clustered at the session level. Our estimates are robust to alternative specifications with random effects and with time fixed effects.

Column 1 in table 10 shows a positive and significant effect on savings of being eligible for receiving the later payment from NWTF. Savings significantly increase by PHP 66, representing 25% of baseline savings. If the trust mechanism is behind

[17] Note that a TE payment establishes the eligibility for a future payment and promise of delivery. The promise and delivery materialize unless the subject chose $c_t = 150$, which led to no future payment. Choices in which interest rates are low have a higher likelihood of $c_t = 150$. Out of the 1,093 subjects, 721 were randomly determined to be paid for a TE choice and and were thus eligible for a future payment. Of those, 551 decided for a *positive* future consumption ($c_t < 150$).

[18] Compared to the estimation analysis, the NWTF sample reduces over time since savings data is not available for those subjects whose loan has come to an end, limiting our ability to look at longer-term effects. The effect size and significance are robust for savings observations of 4, 6, and 10 weeks.

[19] The balance of covariates for subjects 8 weeks after the experiment is unchanged from the one presented in A.9. Electricity in the dwelling and banking distance are different across groups. We control for electricity in the dwelling in our analysis. We do not control for bank distance, given that a local option for cashing the check is provided.

this increase, a check guarantee should dampen this effect since the client is less exposed to the institution keeping its promise. Column 2 exhibits payment eligibilities separately for C and NC decision payments by including a dummy variable $\mathbf{1}_C$. The coefficient for T_i then derives exclusively from NC decision payments. The coefficient of $\mathbf{1}_C$ turns out to be insignificant, but the negative sign of the coefficient is in-line with the trust mechanism.

	$\text{Sav}_{i,t+k}$			
	NWTF treatment		ML treatment	
	(1)	(2)	(3)	(4)
Future payment eligibility	66.49	72.84	34.31	18.63
T_i	(28.24)	(36.25)	(28.86)	(27.36)
Check guarantee		-14.17		31.97
$\mathbf{1}_C$		(47.86)		(29.93)
Experiment earnings	-0.140	-0.134	-0.138	-0.148
Z_i	(0.113)	(0.119)	(0.110)	(0.110)
Constant	-151.4	-152.3	-119.0	-119.4
	(97.07)	(97.11)	(216.3)	(217.9)
Covariates X_i	Yes	Yes	Yes	Yes
R^2	.45	.45	.24	.24
N	3537	3537	3260	3260

Notes: Standard errors in parentheses, clustered at the session level.

Table 10: Effect of future payment eligibility on savings.

If the causal mechanism is indeed via an increased level of trust in NWTF, the ML treatment provides an interesting point of comparison because the causal mechanism from the kept promise in a ML treatment to savings with NWTF is, if at all existing, very different. Column 3 shows that savings increase for ML participants, but only by PHP 34.[20] More interestingly, in the ML treatment the payment guarantee positively contributes to the savings increase (column 4). This is likely due to the local cashing option. All subjects, including those in the ML treatment, learned about the NWTF involvement in that option at the end of the experiment.

Despite the experimental nature and the modest financial size of the manipulation, we find significant effects of the eligibility for a future payment. Even though we do not have direct evidence of higher levels of trust after the experiment, the savings consequences of the exogenous variation in the eligibility for a future payment are throughout consistent with the mentioned mechanism of an increased level of trust in NWTF. Thanks to the exogenous variation, this field exercise thus is first

[20] The difference is not statistically significant. Testing the T_i coefficient for NWTF in column (1) against the same for ML in column (3) leads to a p-value of 0.265. Testing column (2) against column (4) leads to a p-value of 0.147.

indicative evidence that trust influences savings levels even for existing clients of an institution in the context of a developing country. The results suggest that our method or elements of it are promising for future investigations of trust and its causal effects in the field.

7. Conclusion

This study proposes a novel way of measuring trust in institutions which draws on the experimental method of eliciting time preferences. It allows us 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 is provided in the meaningful metric of subjective probability of completion of a payment and seems less confounded with other factors such as social preferences.

The potential of an exogenous variation of trust resulting from the measure is documented to change subjects' savings behavior and opens up new paths of investigating the influence of trust on economic behavior and outcomes. For time preference elicitation, our results confirm that the payment arrangement is an important aspect and can substantially change money allocations over time.

A. Appendix

A.1. Payment guarantee: check

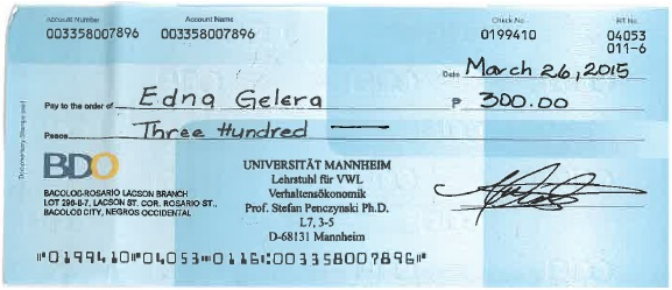
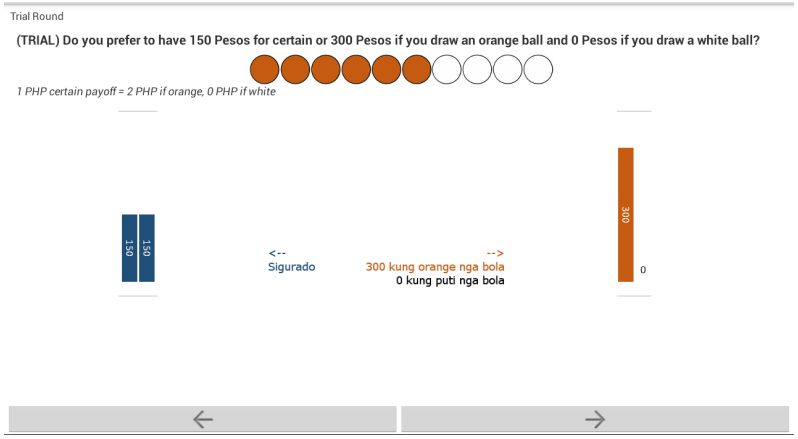
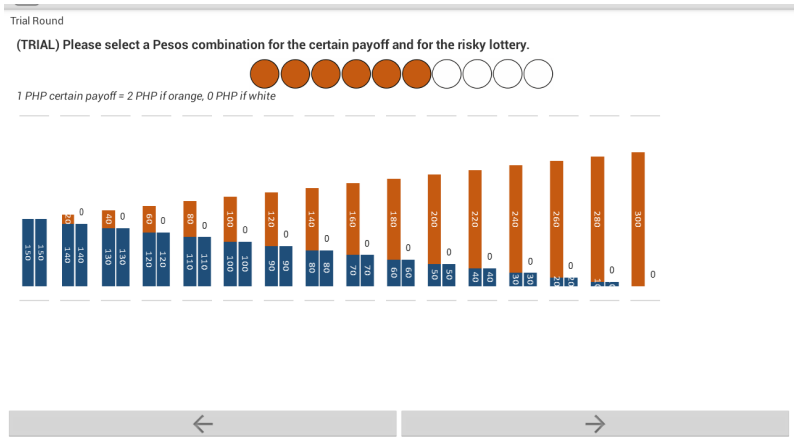


Figure 5: Sample check.

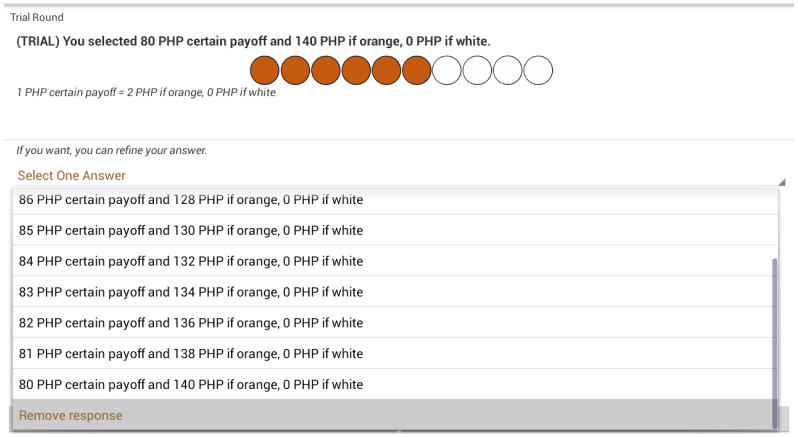
A.2. Risk preference elicitation screen shots



(a) Step 1.
"Sigurado" meaning certain and "300/0 kung orange/puti nga bola" meaning 300/0 if orange/white ball.



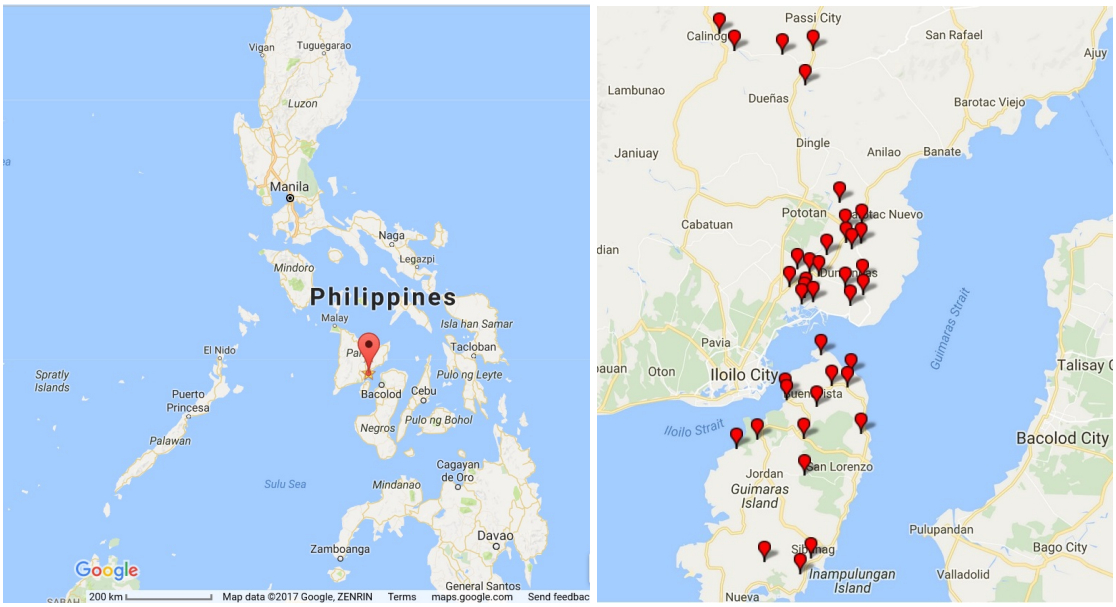
(b) Step 2.



(c) Step 3.

Figure 6: Screenshots of the risk elicitation task in trial round.

A.3. Randomization



(a) Philippines. (b) In detail.

Figure 7: Location of experimental sessions.

Subjects participating in the study are mostly clients of NWTF (Negros Women for Tomorrow Foundation). NWTF is organized into branches according to the Philippine provinces. Our study recruited participants from the three branches in Capiz, Iloilo and Guimaras. Figure 7 locates the experimental sessions within the Philippines (7a) and in detail around Iloilo City (7b). Clients in the three NWTF branches were distributed across 175 centers, located in 155 different villages, called "barangays".

The randomization procedure had two steps. In the first step, an average of three centers were grouped together in a bin, based on geographical proximity. The grouping made the recruitment and the logistics of the experimental sessions easier and more efficient. Safety concerns led us to exclude some barangays, particularly in the Capiz branch. Bins had on average 90 clients. Each of the 60 bins was then randomly allocated to one of four treatment arms, following the between-subject 2×2 design with two institutions and the two orders of the C and NC blocks. In a second step, 20-30 clients were randomly selected from each bin for the experimental session. Given this, we refer to the session as the randomization unit.

In order to have the information required for the randomization procedure, recruiters surveyed the barangays and collected data about the facilities and resources available. The survey, implemented with tablets, enabled the collection of geographical reference data of the barangays and municipalities as well as pictures of the

facilities. Recruiters also gathered information about the barangay head and the possibility to acquire permission to hold the sessions in the barangay. The selection of the barangay in which the session was to be held depended on the meeting hall facilities, the proximity to the municipality, and the accessibility.

In order to improve precision of our estimates, a rerandomization procedure based on a set of covariates was implemented, following Morgan and Rubin (2012). The procedure uses available data to check for covariate-balance across treatment groups. If a lack of balance is present, then rerandomization can help to ensure balance. This procedure used NWTF administrative data on loan size, savings and other funds balances, as well as an urban area indicator, the population size of the bins' barangays, and the average distance from the bin to the municipality.

To establish the rerandomization criteria, the Mahalanobis distance M was utilized:

$$M = (\bar{X}_T - \bar{X}_C) \left[cov(\bar{X}_T - \bar{X}_C)\right]^{-1} (\bar{X}_T - \bar{X}_C), \tag{15}$$

where $\bar{X}_T - \bar{X}_C$ is the k-dimensional vector of the difference in covariate means between the treatment groups and $cov(x)$ is the sample covariate matrix of x. A randomization is acceptable whenever M is below a certain threshold.

The additional sample referenced in section 5.3 results from a survey mapping of four villages to gather full network information on the inhabitants for another research project. In these villages, 77 participants were randomly selected from the village household list and 79 participants were randomly selected from the NWTF client pool. The entire mapping effort involved 156 participants, who were all allocated to the NWTF treatment.

A.4. Clustering at the individual level

When we estimate $\hat{P}_{NC}$ in section 5 we cluster the standard errors at the randomization unit level. In field experiments, the clustering commonly is done on the level of the randomization unit, which in our case is the session level. Here, alternatively, we cluster standard errors at the individual level, following Andreoni and Sprenger (2012a). Tables 11 and 12 report the results for these estimations. We find that the standard errors for $\hat{P}_{NC}$ are slightly lower and make the difference between $\hat{P}_{NC}^{NWTF}$ and $\hat{P}_{NC}^{ML}$ marginally significant.

	(1) NWTF	(2) ML	(3) NWTF	(4) ML	(5) NWTF	(6) ML
Curvature $\hat{\alpha}$ (CRRA)	0.773	0.774	0.121	0.097		
	(0.0209)	(0.0225)	(0.0551)	(0.0628)		
Curvature $\hat{\rho}$ (CARA)					0.005	0.005
					(0.0003)	(0.0003)
Daily discount rate $\hat{\delta}$	1.005	1.000	1.003	0.9995	1.002	0.9986
	(0.003)	(0.003)	(0.0019)	(0.063)	(0.0014)	(0.0016)
$\hat{P}_{NC}$	0.393	0.324	0.500	0.442	0.573	0.524
	(0.0430)	(0.0416)	(0.0345)	(0.036)	(0.0302)	(0.0323)
$\hat{P}_{NC}^{NWTF} = \hat{P}_{NC}^{ML}$	$p = 0.1063$		$p = 0.1098$		$p = 0.1042$	
Back. cons. ω	0.01	0.01	50.25	50.25		
Observations	13440	12792	13440	12792	13440	12792
LL	-33960	-31560	-21480	-20295	-56232	-51482
Uncensored	7077	6359	7077	6359	7077	6359
Clusters	560	533	560	533	560	533

Notes: Two-limit Tobit Maximum Likelihood estimates. Clustered standard errors at the individual level in parenthesis calculated via the delta method. The reported p-values result from a simple linear hypothesis Wald test.

Table 11: CRRA and CARA parameters estimates, specification 1.

	(1) NWTF	(2) ML	(3) NWTF	(4) ML	(5) NWTF	(6) ML
Curvature $\hat{\alpha}$ (CRRA)	0.313	0.266	0.646	0.572		
	(0.020)	(0.016)	(0.029)	(0.026)		
Curvature $\hat{\rho}$ (CARA)					0.012	0.014
					(0.0010)	(0.0007)
Daily discount rate $\hat{\delta}$	1.009	1.002	1.019	1.004	1.010	1.003
	(0.003)	(0.003)	(0.006)	(0.006)	(0.002)	(0.003)
$\hat{P}_{NC}$	0.452	0.437	0.166	0.103	0.510	0.517
	(0.035)	(0.041)	(0.057)	(0.074)	(0.031)	(0.034)
$\hat{P}_{NC}^{NWTF} = \hat{P}_{NC}^{ML}$	$p = 0.6664$		$p = 0.2657$		$p = 0.9545$	
Back. cons. ω	0.01	0.01	50.25	50.25		
Observations	30240	28782	30240	28782	30240	28782
LL	-19719	-18935	-20172	-19381	-19522	-18699
Clusters	560	533	560	533	560	533

Notes: Maximum Likelihood estimates. Standard errors in parenthesis are clustered at the subject level. The noise parameters μ and ν are set to 1 to allow for noise and to avoid their estimation. The reported p-values result from a simple linear hypothesis Wald test.

Table 12: CRRA and CARA parameters estimates, specification 2.

A.5. Specification 3

As an extension to the probabilistic approach of specification 2, specification 3 uses CTB data in a way that has been outlined by Harrison, Lau, and Rutström (2013) as an appropriate analogue. This approach deals with corner choices and the constrained action space in a natural way and allows for the incorporation of the RPE data.

The main difference lies in the translation of choices into probabilities. Here, due to the choice sets $c, l \in [a, 150]$, the indices become[21]

$$\nabla \text{DU} = \frac{\text{DU}(c)^{\frac{1}{\nu}}}{\sum_{\tilde{c}}^{150} \text{DU}(\tilde{c})^{\frac{1}{\nu}}}, \text{ and } \nabla \text{EU} = \frac{\text{EU}(l)^{\frac{1}{\mu}}}{\sum_{\tilde{l}}^{150} \text{EU}(\tilde{l})^{\frac{1}{\mu}}}. \tag{16}$$

Table 13 presents the results from specification 3 that are based on both the TE and the RPE decisions. Due to many corner allocations, the estimates are indeed such that the curvature implies risk-lovingness with $\alpha > 1$ and $\rho < 0$, respectively, as hypothesized by Harrison, Lau, and Rutström (2013).[22] The daily discount rate is now lower at values around 0.97. This difference to the earlier estimates results from the compensation of the now risk-loving attitude towards the risky future payment.

Across utility and background consumption specifications, the estimates of $\hat{P}_{NC}$ are in the range between 0.25 and 0.34, lower than in specification 1. The difference between institutions is now smaller and only marginally significant for the CRRA specifications at the 0.2 significance level and insignificant for the CARA specification.

Overall, little can be taken away from these results as the curvature $\hat{\alpha}$ in the range of risk-lovingness cannot be meaningfully identified.

A.6. Choice histogram

The CTB method by Andreoni and Sprenger (2012a) sparked many responses (see section 1), many of which deemed the econometric method inappropriate in the light of such a choice distribution. The consideration of specification 2 in section 3.2 and the following specification 3 is motivated by our desire to explore whether our results are robust across methods.

[21] For convex utility ($\alpha > 1$) – a likely outcome of this specification with a high frequency of corner choices (see later results and Harrison, Lau, and Rutström, 2013) – the parameters ν and μ are not separately identified from α. For us, robustness of the trust estimates for a given level of $\nu = \mu = 1$ is sufficient.

[22] The raw choice data is suggestive of the existence of two types of players, those with predominant corner allocations ($\alpha > 1$) and those with mostly interior allocations ($\alpha < 1$).

	(1) NWTF	(2) ML	(3) NWTF	(4) ML	(5) NWTF	(6) ML
Curvature $\hat{\alpha}$ (CRRA)	1.900	1.910	2.374	2.374		
	(0.052)	(0.052)	(0.075)	(0.075)		
Curvature $\hat{\rho}$ (CARA)					-0.007	-0.006
					(0.0004)	(0.0004)
Daily discount rate $\hat{\delta}$	0.983	0.974	0.983	0.974	0.987	0.980
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
$\hat{P}_{NC}$	0.275	0.271	0.264	0.258	0.270	0.282
	(0.021)	(0.022)	(0.023)	(0.024)	(0.026)	(0.023)
Back. cons. ω	0.01	0.01	50.25	50.25		
Observations	30240	28782	30240	28782	30240	28782
LL	-137858	-131317	-138170	-131662	-138426	-131864
Clusters	560	533	560	533	560	533

Notes: Maximum Likelihood estimates. Standard errors in parenthesis are clustered at the subject level.

Table 13: CRRA and CARA parameters estimates, specification 3.

	Interest rate $1+r$								
	1	1.3	1.7	2	2.3	2.7	4	8	40
Lower-bound corner	21.7	24.4	24.6	25.3	25.5	26.9	42.2	59.1	60.9
Upper-bound corner	33.5	25.0	23.1	20.3	19.6	18.3	17.4	16.3	14.9
Interior choices	44.9	50.6	52.3	54.3	55.0	54.8	40.4	24.6	24.2

Table 14: Proportion of corner and interior choices by interest rate.

A.7. Current consumption details

Figure 9 shows the current consumption by interest rate and check order for interest rates $1+r>3$, where c_t was constrained from below. The regularities discussed in section 5.1 and illustrated in figure 4 hold for these interest rates as well.

Figure 10 splits up the current consumption by institution and check order. Irrespective of the order, it can be seen that the current consumption in C is lower than in NC. Quite surprisingly, the difference in current consumption between institutions is higher in C/NC than in NC/C. While behavior in NC/C hardly distinguishes institutions, the difference in C/NC is much higher.

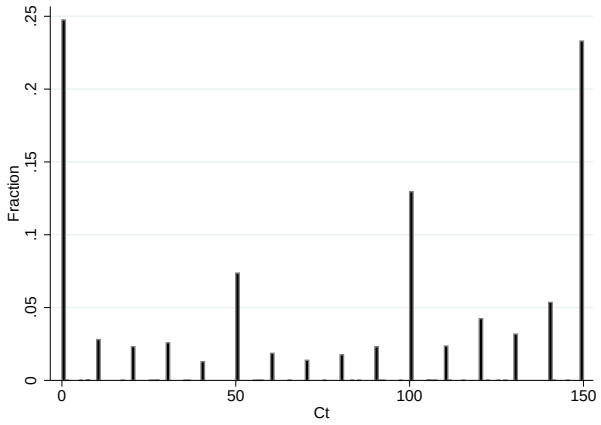
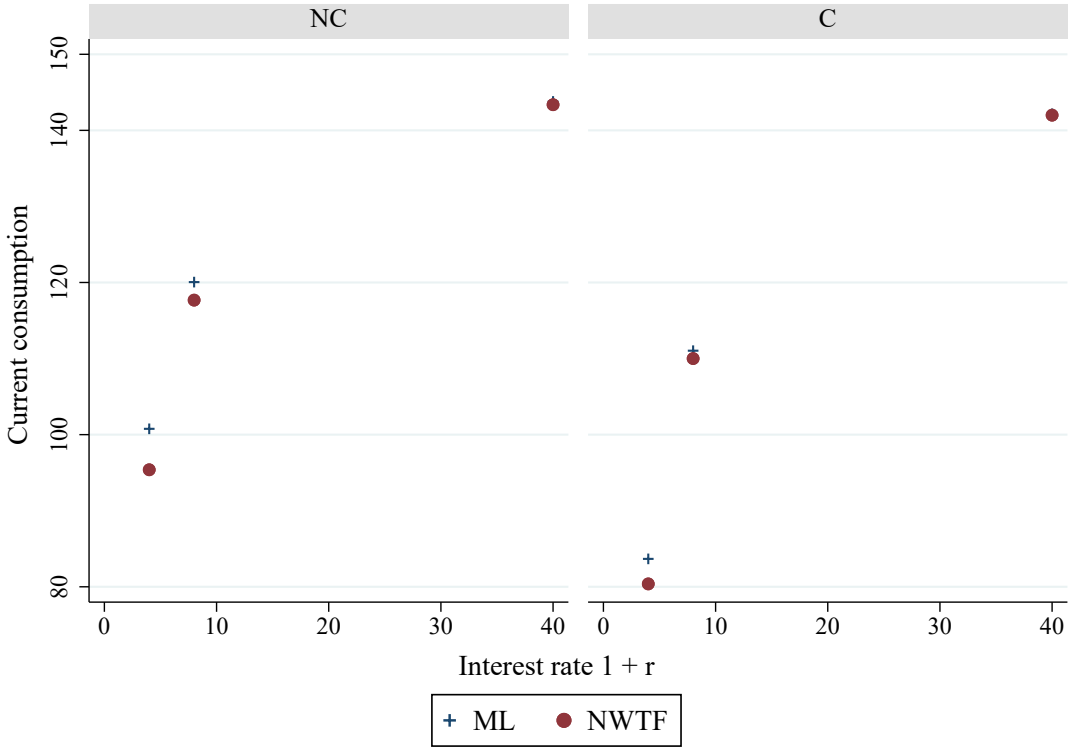
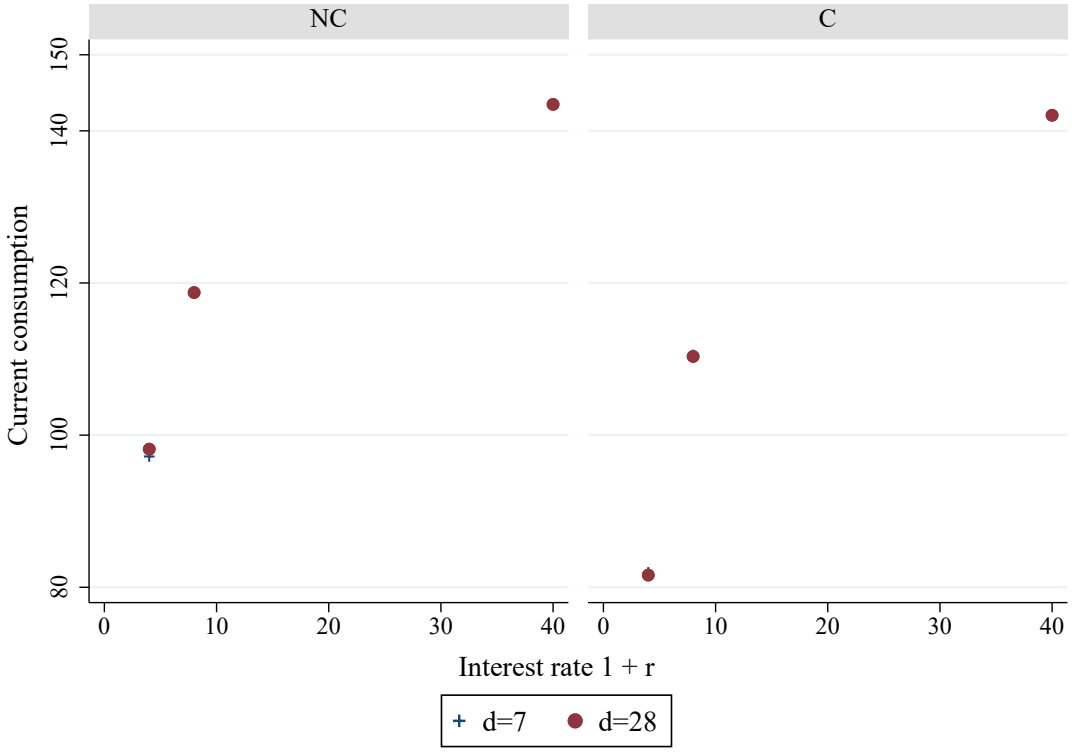


Figure 8: Choices for c_t in TE with $1 + r < 3$.

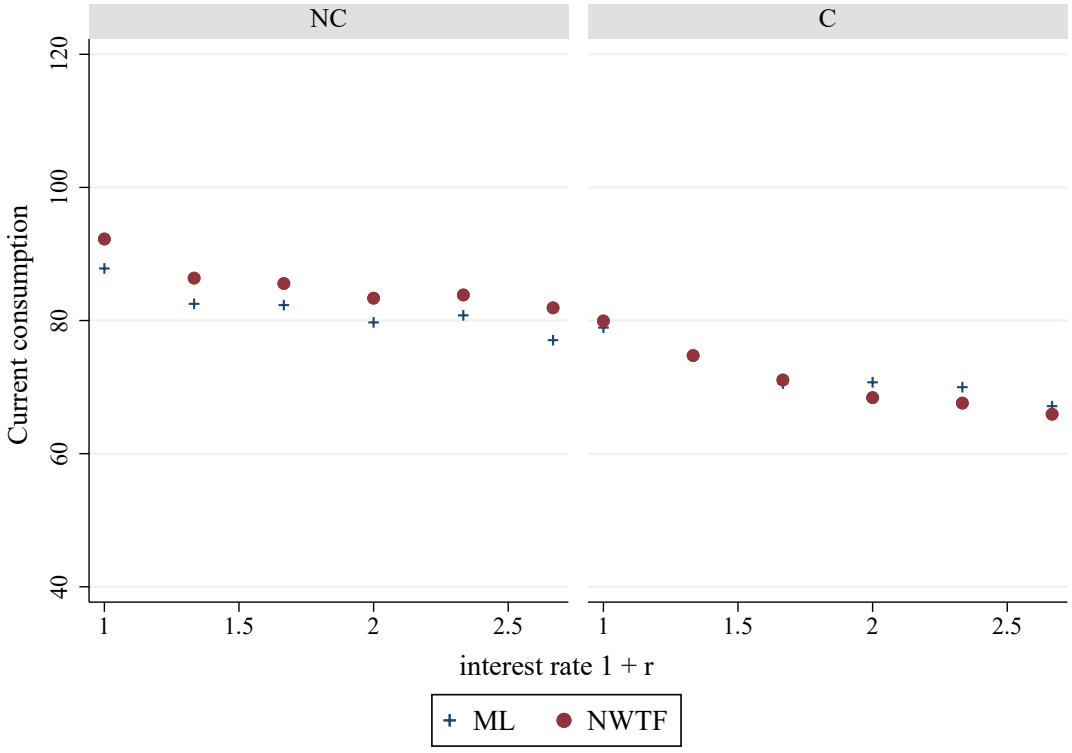


(a) By institution, pooled across delay lengths.

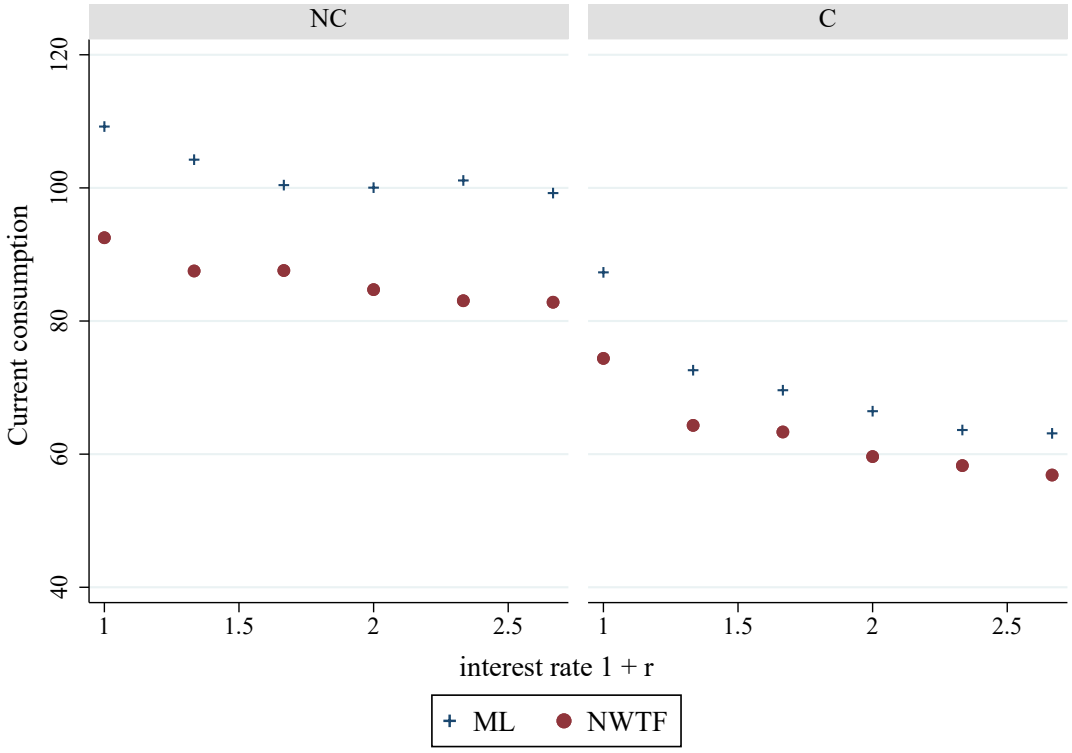


(b) By delay lengths, pooled across institutions .

Figure 9: Current consumption $c_t \in [0, 150]$ by interest rate and check order, NC vs. C.



(a) NC/C treatment.



(b) C/NC treatment.

Figure 10: Current consumption c_t by interest rate and institution.

	All	*NWTF*	*ML*
(1) $\bar{c}_t^{NC/C} - \bar{c}_t^{C/NC}$	-1.44	4.30	-7.68
	(0.558)	(0.782)	(0.794)
N	39348	20160	19188

Notes: Standard errors in parentheses.

Table 15: Equality of means test for $c_t \in [0, 150]$.

	(1)	(2)	(3)
C/NC	1.442	1.561	-4.304
	(2.810)	(2.823)	(3.411)
ML		3.668	-2.639
		(2.848)	(3.655)
C/NC × ML			11.98
			(5.449)
Constant	90.85	89.00	92.19
	(1.847)	(2.509)	(2.818)
N	39348	39348	39348
Clusters	59	59	59
R^2	0.00017	0.0013	0.0042

Notes: Clustered standard errors at the session level.

Table 16: Check order effects in current consumption c_t.

We find no overall effects of the check order on the full sample (column 1 in table 16), but we do find an effect when we interact the check order with the institution (column 3). It is not clear to us what drives this interaction between check order and ML. One possibility is a certain loss aversion with respect to the check guarantee, so that the removal of the check guarantee midway through the TE task in the ML treatment highlights risks of NC stronger than starting right without such guarantee.

A.8. Histogram of paid rounds

A.9. Descriptive statistics

	Future payment eligibility					
	$T_i = 0$		$T_i = 1$			
	Mean	SD	Mean	SD	Diff.	SE
Age	42.5	10.9	41.8	11.4	0.7	(1.0)
Years of education	8.6	3.2	9.0	2.9	-0.4	(0.3)
Married	0.8	0.4	0.8	0.4	0.0	(0.0)
Household size	5.7	2.2	5.5	2.0	0.2	(0.2)
Employed	0.5	0.5	0.4	0.5	0.0	(0.0)
Regular income	0.6	0.5	0.5	0.5	0.0	(0.0)
Background consumption	331.1	418.1	331.2	307.0	-0.1	(32.3)
Background consumption HH	1000.4	727.5	946.4	645.3	54.1	(61.9)
Official position in village	0.1	0.2	0.1	0.3	-0.0	(0.0)
Rooms in HH for sleeping	1.7	0.7	1.8	0.8	-0.1	(0.1)
Flush toilet at dwelling	0.8	0.4	0.9	0.3	-0.0	(0.0)
Electricity at dwelling	0.8	0.4	0.9	0.3	-0.1	(0.0)
Own dwelling	0.9	0.3	0.9	0.3	-0.0	(0.0)
Am't borrowed MFI/Banks	5492.4	2794.1	5638.0	2888.2	-145.7	(277.0)
Savings in MFI/rural bank	1224.8	2106.2	1564.5	6696.3	-339.7	(699.2)
Trust level in NWTF[1]	6.5	1.0	6.4	0.9	0.1	(0.1)
Trust in ML[1]	3.8	2.0	3.7	2.1	0.1	(0.2)
Risk preference[2]	4.3	2.6	4.3	2.5	0.0	(0.2)
Betrayal aversion[3]	1.7	1.6	1.7	1.5	0.1	(0.1)
Avoid being taken advantage of[3]	2.0	1.8	2.0	1.8	0.0	(0.2)
Revenge if suffer serious wrong[4]	6.5	1.5	6.4	1.5	0.0	(0.1)
Reciprocity[5]	6.4	1.5	6.5	1.4	-0.1	(0.1)
Sociability[6]	4.3	1.2	4.2	1.3	0.1	(0.1)
Bank distance (minutes)	27.5	21.1	32.7	33.5	-5.2	(2.7)
NWTF information (PHP)						
Savings	265.9	423.7	245.1	337.7	20.7	(34.2)
Loan amount	5402.6	2652.2	5531.3	3008.6	-128.7	(262.5)
Loan balance	3233.1	2861.7	3008.4	2453.8	224.8	(238.8)
Repayment	248.7	217.3	246.6	169.6	2.2	(17.3)
Emergency fund balance	766.2	879.1	786.7	814.3	-20.4	(77.0)
Loan cycle	4.3	2.2	4.3	2.1	-0.0	(0.2)
Principal amortization	222.3	175.5	222.0	123.2	0.3	(13.3)
Observations	195		313			

Notes: The last columns gives the standard errors of a t-test for a difference of 0.

[1] 1–no trust, 7–complete trust,

[2] Avoid/prepared to take risks: 1–avoid, 7–fully prepared,

[3] Avoid being betrayed/taken advantage of: 1–completely avoid, 7–do not avoid,

[4] If offended, offend back?: 1–offend, 7–not offend,

[5] Meet friends, relatives, neighbor: 1–never, 2–seldom, 3–monthly, 4–weekly, 5–daily,

[6] How certain is payment in 28 days?: 1–surely not reach me, 7–absolutely certain,

[7] Imagine 10 people that are promised a payment in 28 days. Out of 10 people, how many people do you think will get the payment delivered in 28 days?

Table 17: Descriptive statistics - Savings Analysis

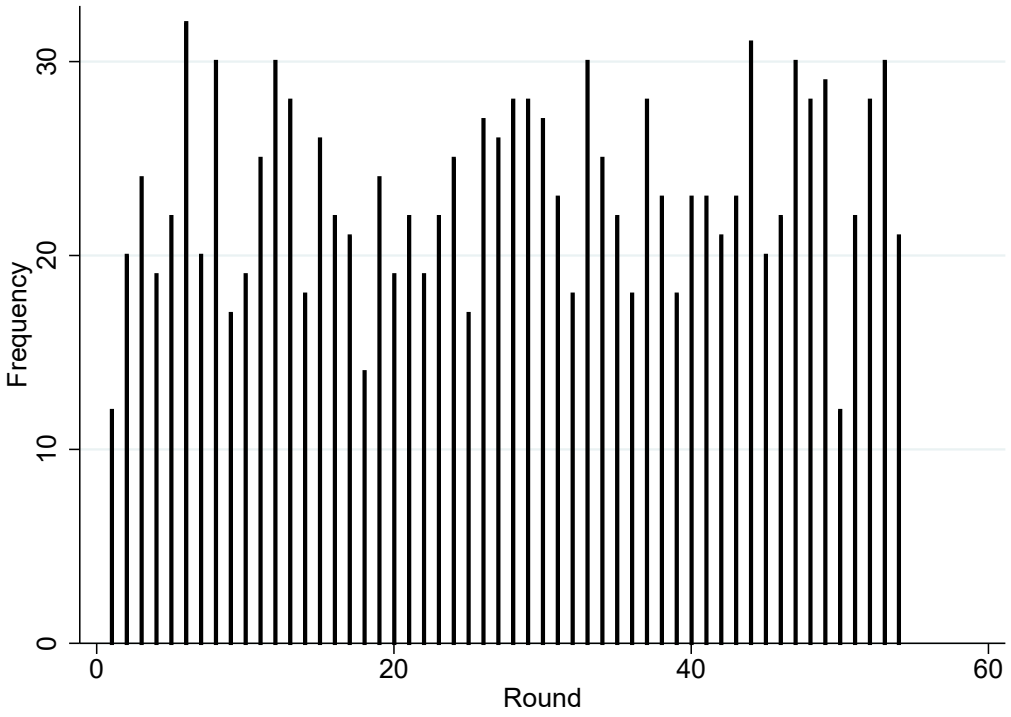


Figure 11: Distribution of decisions in rounds 1-54 randomly selected to be paid.

B. Experiment instructions

Please note that the instructions were written in the expectation that we can provide the names of the moneylenders. As described in section 2.1.4 this was not possible, so the indicated gaps for their name were left empty in the verbal 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.

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