Do coercive and reputational institutions build up interpersonal trust? Experimental evidence from informal traders in Bolivia

Mauricio Chumacero[1]

Lorena Heller[2]

Matías Iriarte[♦]

Joaquin Morales[3]

Soraya Román[4]

Fabiana Zenteno[⁑]

[1] Senior Researcher. Universidad Privada Boliviana. Email: mauriciochumacero@upb.edu
[2] Senior Researcher. Universidad Privada Boliviana. Email: lorenaheller@upb.edu
[♦] Research assistant. Universidad Privada Boliviana. Email: matiasiriarte@upb.edu
[3] Senior Researcher. Universidad Privada Boliviana. Email: joaquinmorales@upb.edu
[4] Senior Researcher. Universidad Privada Boliviana. Email: sorayaroman@upb.edu
[⁑] Research assistant. Universidad Privada Boliviana. Email: fabianazenteno@upb.edu

Abstract[5]

We conduct a laboratory experiment measuring interpersonal trust among informal merchants in the cities of El Alto and La Paz, Bolivia. Our design builds upon a repeated version of Berg's "Trust Game" (1995). We divide participants into groups of investors and entrepreneurs: investors can send money to the entrepreneurs and generate profits, and entrepreneurs must decide how much of these gains they will repay to the investors. Hence, the investment made is a measure of interpersonal trust.

Our experiment tests the trust-building potential of four institutional innovations: (i) certain sanctions for entrepreneurs who reimburse less than the received investments; (ii) probabilistic sanctions for entrepreneurs who reimburse less than the received investments; (iii) the delivery of information concerning the repayment history of the entrepreneur; and (iv) the delivery of information concerning the repayment actions of the group of entrepreneurs.

We frame treatments (i) and (ii) as formal institutions, and (iii) and (iv) as informal institutions. Our results show that treatment (i) increases the levels of investment, and therefore trust, by 23-28%, showing the positive incidence of effective formal institutions in interpersonal trust. The other institutional arrangements increase investment by about half of the effect of treatment (i), without statistically significant difference between them, showing that informal institutions can act as substitutes for weak formal institutions.

JEL Classification: C90, O17, D02

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1. Introduction

Interpersonal and institutional trust can be regarded as assets that require investment, nurturing and maintenance (Knack and Zak, 2003). Trust facilitates trade by reducing transactional costs; simultaneously, it permits political reform and improves the overall quality of life (Salehi et al., 2015; Berlinski et al., 2021). As for any asset, building up trust is costly: it requires compromise, communication and patience. In the developing world, particularly in Latin America and the Caribbean, measures of interpersonal and institutional trust are low to the point that they can constitute a real impediment for economic development (Francois and Zabojnik, 2005; Dearmon and Grier, 2009). Indeed, transactions that lag in time, specific investments, or unsupervised work require trust in that one of the parts of the agreement will not exploit the vulnerabilities emerging from asymmetric information (James Jr, 2002; Rousseau et al., 1998).

The microeconomic solution to these problems, generally second-best, depends on the optimal design of contracts and the enforceability of such agreements (Hart & Holmstrom., 1986). Indeed, interpersonal trust can flourish if the parties uphold the guarantees provided by the contract: a breach of trust is costly as it results in invoking the resolutory clauses of the contract and subsequent sanctions by a coercive authority for the negligent part. Therefore, if formal institutions are trustworthy and effective, the rule of law is a vehicle to promote interpersonal trust, at least in what respects to economic transactions. However, in many circumstances, this mechanism is weak: in developing economies, most agents distrust judicial courts and other official authority instances; moreover, a sizable fraction of the population belongs to the informal sector, outside of any regulatory framework. To illustrate this claim, the Latinobarómetro 2021 reports that on average, only 25% of Latin Americans trust judicial authorities (20% in Bolivia); likewise, Medina and Schneider (2018) estimate that the shadow economy represents 38% of GDP in Latin America, and up to 62.9% of GDP in Bolivia.

Without the enforceability of contracts, the informal economy would be reduced to simple, on-the-spot transactions, such as street food vendors; markets would be marred by low-quality products resulting from adverse selection, such as bootleg items of clothing; and employment should be characterized by observable effort only, such as drivers of ramshackle minibuses. These images are undoubtedly characteristic of informal markets in developing economies and display a much too narrow view of the sector. A growing body of literature, originating first in anthropology

(Hart, 1973) and now present in many fields (Neuwirth, 2012; Tassi et al., 2013; Kraemer-Mbula and Wunch-Vincent; 2016; Clay and Phillips, 2016; Chen and Carré, 2020; Morales and Salinas, 2019) studies the complexity of the informal sector in developing and developed economies. This literature finds that organization, intertemporal transactions, high-quality technological products, and the delegation of unobservable tasks are standard in informal markets. For example, informal merchants in Latin America and Africa often import the latest smartphones, television sets and videogame consoles from Asian industry; specific investments are made, such as the elaboration of expensive and customized garments for patronal festivities; and there is delegation of unmonitored, such as the transport of thousands of dollars' worth of merchandise to remote destinations by lorry (Tassi and al., 2013).

How can these informationally asymmetric operations subsist without enforceable contracts? How can transactional trust emerge without the backing of a coercive authority? In this paper, we claim that in the informal economy, informal institutions enable the formation of interpersonal trust by acting as substitutes for formal and coercive authorities, in particular when formal authorities are defective or have low effectiveness and capacity. We focus on two informal arrangements: reputation-building and conforming to a social norm. We theorize, first, that trust-building is achievable when personal information on an individual (gossip) permits agents to build a reputation as trustworthy partners in business. Second, we posit that when information concerning the aggregate behavior of members of a community is public, this establishes a reputation for the group, enabling the possibility of building a social norm of trustworthiness.

We test these claims in a laboratory setting. By recruiting informal merchants in El Alto and La Paz, Bolivia, we measured the levels of interpersonal trust in a game based on Joyce Berg's "Investment Game" (1995). In the experiment, we divided subjects into two groups, a group of investors and a group of entrepreneurs: we asked investors to 'send' some money to a randomly matched entrepreneur, and upon sending it, this sum was immediately multiplied by three. Then, the entrepreneur could decide how much of the obtained money she would send back to the investor. Given that the investor should have only invested in the enterprise if she trusted the entrepreneur to repay at least as much money as was invested, the amount invested is a commonly used measure of the levels of interpersonal trust. The game was repeated during twelve rounds. From round four on, we introduced four different treatments as institutional innovations. In the first treatment, we introduced a formal authority rule, in which any repayment by an entrepreneur

which was less than the invested amount (any scam) was detected and punished by removing all gains from the entrepreneur except the show-up fee. We call this the perfect formal institution treatment because any misbehavior was sanctioned. Likewise, we introduced a similar treatment, but in which there was a substantial probability that the authority figure would not sanction a scam. We call this the imperfect formal institution treatment due to the possibility for an entrepreneur getting away with scamming an investor. The third treatment introduced an informal institution, which we call the personal reputation treatment: investors were informed of the repayment history of the matched entrepreneur at each round, allowing her to build a favorable reputation. In an informal setting, we can think of this mechanism as a replacement for gossip. Lastly, the social norm treatment informed the investors of the repayments made by the group of entrepreneurs in the previous round. Here, reputation was not personalized, but entrepreneurs could work, without communication, towards building a reputation of trustworthiness of the group by conforming to a social norm of adequate repayments.

Our findings show that these institutional innovations indeed promoted the building-up of trust. As expected, the perfect formal institution is the best in fostering trust-building, but, as we hypothesize, when the formal institution is deficient, informal institutions such as reputation-building and social norms can act as substitutes to support trust-building. These laboratory findings are consistent with qualitative interviews conducted on the field with merchants and leaders of merchants' associations in La Paz and El Alto.

The rest of this paper contains, in order: a brief literature review; our experimental design; the econometric specification; the results of our estimations; a discussion of our results contrasted with our qualitative fieldwork; and our conclusions.

2. Literature review

The new institutionalist view has assigned a central role to interpersonal trust as a precondition for a functioning market economy (Greif, 1989; North, 1990; Platteau, 2015). Indeed, information asymmetries and the unenforceability of contracts characterize the division of labor, relation-specific investments and the hold-up problem (Rogerson, 1992), debt and credit, intertemporal and long-distance trade and investment in general (Hart & Holmstrom., 1986). By placing either or both parts of the transaction in a situation of vulnerability, mutual exchange will not be feasible

unless there is a reasonable expectation from one agent that the other part can be trusted not to exploit it (James Jr, 2002). Building trust becomes a transactional cost, which can be cheapened by setting up adequate institutional arrangements (Camussi, 2019; Cai, 2021).

In traditional societies, mechanisms established to enforce mutual trust usually rely on social norms, personalized relationships, and repeated interactions (Platteau, 2015). Tightly interconnected communities' benefit from fluent and sufficiently accurate information concerning the beliefs and actions of others. The community punishes the betrayers of trust, either by giving them a despicable reputation, by public shame, by ostracization, or even by the threat of divine retribution. In this setting, gossip and reputation become multilateral and evolve into a powerful incentive to behave and be trustworthy (Milgrom, North, & Weingast, 1990). As trade expands beyond the community, substitute arrangements must build up trust relationships without relying on gossip but instead are built upon political alliances, such as arranged marriages, the exchange of gifts, or sending out commissaries and ambassadors.

We can arguably interpret the modern State as a collection of formal institutions destined to replace reputation mechanisms and enforce contracts as commercial transactions become increasingly complex. North (1990) argues that the growth of economies depends on "the institutional framework of well-developed coercive polities". Laws and official norms, courts and judges, and a police force sustain the protection of private property and the enforcement of agreements necessary for the advent of the market economy. Indirectly, if legitimate, such coercive institutions can foster an environment of trust and cooperation toward the State and its constituents (Gangl, Pfabigan, Lamm, Kirchler, & Hofmann, 2017).

More recently, Basu (2018) argued that the Law operates mainly as a coordination device and will only be adhered to by citizens, officers, and judges if the equilibrium resulting from the beliefs signaled by the Law can be sustained. Therefore, if trust emanates from the Law, it is because agents benefit individually from trusting each other but require a reliable mechanism permitting them to credibly believe that they can trust each other, for example, the belief that the authorities will punish a betrayal of trust. When the State cannot sustain these beliefs because its constituents perceive it as untrustworthy or incompetent, respect for the Law dwindles, and interpersonal trust vanishes.

In developing economies, a substantial proportion of the population works in the informal economy (for up-to-date numbers, see Medina & Schneider, (2018)). By definition, the informal

economy operates outside of legal arrangements. It is often tolerated by authorities in the generalized belief, in line with Basu's argument, that the enforcement of the Law is separated from a sustainable, credible, and mutually beneficial equilibrium. Surprisingly, however, it is possible to encounter economic complexity, intricate contracts and intertemporal transactions in the shadow economy (Neuwirth, 2012; Chen, 2020). The import of up-to-date technology such as smartphones and computers from Asia in most informal markets in the developing world is one example of modern, impersonal and unregulated markets. We cannot trace back the levels of interpersonal trust required for such arrangements to the Rule of Law since these contracts are unlikely to be upheld in court. Instead, the olden mechanisms of social reputation, gossip, kin alliances, many of them inherited from rural migrants to the cities (Buggle, JC, & Durante, 2021), are likely candidates to subsist in the shadow economy as promoters of trust as long as the formal mechanisms are deficient.

In this paper, we intend to emulate formal and informal institutional arrangements in an experimental setting to test whether reputation and social norms are substitutes for coercive rules as promoters of interpersonal trust. The use of experiments to emulate institutional arrangements dates back to Hoffman & Spitzer (1985) in experimental Law and economics. Versions of the trust game by Berg have been implemented by testing the effects of social norms (Berg, Dickhaut, & McCabe, 1995; Hill, Maruyama, & Viceisza, 2012), reputation (Boero, Bravo, Castellani, & Squazzoni, 2009; Keser, 2003), contracts (Rigdon, 2009), and by varying institutional arrangements (Bohnet & Baytelman., 2007). Our contribution to this literature combines the comparative evaluation of informal and formal arrangements tested on a population taking part in the shadow economy.

3. Experimental design and hypothesis

Between August and September of 2021, we collected data for 468 participants in 52 laboratory sessions, based on a repeated version of the standard Trust game (Berg et al., 1995). The target population was moderate- to low-income merchants from La Paz and El Alto, Bolivia, recruited mainly on their places of work, including markets and small shops. Each session contained between 3 and 5 pairs of participants. As in Berg et al. (1995), the participants were divided evenly and randomly into two groups: we framed the first group as investors and the second group as a

group of entrepreneurs. Subjects were not allowed to communicate with each other. For the experiment, we provided each agent with an electronic tablet, a set of printed instructions, and pen and paper. We carefully implemented all sanitary precautions, considering the risks posed by the pandemic.

The game had fifteen rounds, including three initial practice rounds. At each round, all players in both groups were (digitally) allocated an initial endowment of bs40 (Bolivian bolivianos, 5.80 US dollars)[6]. We randomly matched each investor with an entrepreneur from the other group. Investors could invest a part, none, or all of their endowment in multiples of bs5 by sending them to her matched entrepreneur. The investor kept all non-invested sums. Upon receiving it, the investment became automatically multiplied by a factor of three in the hands of the entrepreneur, who could therefore receive up to bs120 (additionally to her initial endowment of bs40). The entrepreneur could then decide whether to reimburse any amount of the available sum to her investor, which could be less, equal, or more than the original investment. The round ended once the entrepreneur had decided on the amount to send back to the investor. The procedure was repeated for all remaining turns. Given that there is no obligation to reimburse in this game, investors should, in equilibrium, be reluctant to invest any amount unless they trust that the matched entrepreneur will not exploit this vulnerability and share part of the gains. At the end of the session, we randomly chose the payoffs of one of the played rounds using a twelve-sided die.

We designed the game using google sheets to provide a user-friendly interface compatible with cloud computing and any portable devices. Portable devices facilitate tabulation, accelerate procedures, and avoid paper exchanges between players during the pandemic. Screen captures of the interfaces are located in the appendix. We organized sessions at two universities in La Paz and El Alto. As previously noted, we recruited merchants in markets and small shops in different neighborhoods of those cities and by direct invitation.

We implemented a between-subject design, assigning participants to one treatment only. However, we exploit within-subject variation by using the first three non-practice rounds in the game to establish a baseline of interpersonal trust. In these rounds, we did not introduce any innovation. From round four on, we set in motion four treatments in the form of an institutional

[6] We provide both groups with the same initial endowment to avoid unintended effects related with aversion to inequality (Calabuig, Fatas, Olcina, & Rodriguez-Lara, 2016)

arrangement to explore if it is conducive to increased levels of trust and, therefore, investment[7]. The four treatments are:

(T1: SN) Social Norm - taken as an informal institution, participants were informed of how many entrepreneurs reimbursed less than the investment in the previous round. This information allows players to know how their peers behave and might create incentives to behave and conform to a social norm (the social norm may become non-cooperation).

(T2: PR) Personal reputation - taken as an informal institution, investors were informed of the history of repayments by the entrepreneur with whom they were matched at each round, emulating gossip and providing an opportunity for the entrepreneur to build up a favorable reputation.

(T3: II) Imperfect institution- taken as a formal institution (albeit a dysfunctional one), all treated participants were told that if entrepreneurs reimburse less than the investment in any previous round, examiners might punish them with a probability of five per cent. If punished, they would only receive the show-up fee at the end of the game. The likelihood of being punished is raised by five percent increments at each round in which the reimbursement was lower than the investment. The institution is imperfect in the sense that uncooperative behavior (reimbursing less than the investment) is likely to remain unpunished.

(T4: PI) Perfect institution - taken as a formal institution, participants were told that if an entrepreneur reimburses less than what was invested in at least one round, the examiners would punish her by only paying the show-up fee at the end of the game. The institution is perfect in the sense that uncooperative behavior is always punished.

After the experiment, we asked participants to fulfill a post-experimental survey that included the following topics: trust among institutions, interpersonal trust, and individual socio-demographic characteristics. We also collected information about participants' risk aversion using Binswanger's (1981) lottery game. The instructions of experimental sessions and the complete questionnaire are available in the Appendix.

We will test the following hypotheses with our collected data:

Any institution vs. none

[7] The initial experimental design considered four pre-treatment rounds. However, treatment was announced during the fourth round, leading to anticipation effects.

HA: The introduction of any institution (formal or informal) increases interpersonal trust.

By setting up the rules of the game, institutions reduce the cost of building up trust, either by attenuating informational asymmetries or by facilitating coordination through the (potential) punishment of misbehavior. Hence, it should always be the case that interpersonal trust increases in the presence of any institution rather than none.

Formal perfect institution vs. other institutions

HP1: The perfect formal institution generates more interpersonal trust than the imperfect formal institution

In our configuration, the presence of a perfect formal institution provides certainty regarding coercion by authorities. Investors know that if entrepreneurs reimburse less than the investment amount, the examiners will punish them. Compliance with this rule implies that investors cannot lose money by investing; therefore, building trust is costless. However, when the institution is imperfect, there is an incentive for risk-prone entrepreneurs to scam the investor, as there is a decent chance to get away unpunished. Repeated offenses are ultimately more likely to be punished, but still, considerable room remains for cheating. Conversely, risk aversion should be conducive to better repayments and more trust-building.

HP2: The perfect institution generates more interpersonal trust than the social norm arrangement.

The social norm treatment, in which we inform players of how many entrepreneurs reimbursed less than the obtained investment in the previous round, should impact how social norms form. The standard is created endogenously, i.e., it is contingent on the personal characteristics that make up the group. On the contrary, the perfect institution establishes the norm externally, regardless of the features of the group.

Allowing norms to be defined endogenously might have an ambiguous effect: it could lead to free-riding behavior, in which agents hope that others will work toward improving the group's reputation, ultimately dissolving interpersonal trust. On the other hand, conforming to the norm

and imitating the behavior of others could lead to multiple equilibria: one in which no one contributes and trust cannot emerge, and another one in which imitation leads to high repayment rates and significant investments.

Deviations from pre-existing norms can engender widespread social change (Granovetter, 1979; Young, 1998). Thus, deviations from the social norm (going against the convention) can cause negative or positive social change (Hill, Maruyama, & Viceisza, 2012). In our configuration, these social changes can arise depending on two factors: the number of rounds and the average behavior of the group before the treatment rounds[8] (i.e., the amount entrepreneurs which was reimbursed in the first few rounds can determine the social norm from the get-go). One of the limitations of our study is that our game is finite, leading to a reduced possibility of reaching convergence. Besides, the characteristics of the group could also affect their behavior, creating a rich but involved dynamic. We do not have this type of ambiguity with a perfect formal institution, which leads us to believe this institution will more likely generate higher levels of interpersonal trust than a social norm.

HP3: The perfect institution generates more interpersonal trust than the reputational arrangement.

In the reputational arrangement, punishments for misbehaving depend on investors and entrepreneurs' interaction rather than a third party, opposed to the treatments setting up a formal institution. Entrepreneurs can be susceptible to their reputational status. They may be inclined to send at least the investment amount in every round because their expected benefits may increase depending on the signal they send to the investor (Boero, Bravo, Castellani, & Squazzoni, 2009). However, our game is finite, so sending back less money is also profitable for entrepreneurs, especially in the final rounds of the game. This reduction in interpersonal trust should not happen in the perfect institution arrangement because a third party -an authority figure- fixes punishments

[8] Another possible mechanism that can cause social changes is the size of the group. A widely discussed example of this phenomenon is petty crime. For example, Glaeser et al. (1996) show in their model that an individual who commits a crime is positively influenced by the number of people around him who also engage in criminal behavior. We decided to focus on effects related to the number of rounds and the group's starting point, excluding the groups' size effect. Our groups in the study are homogeneous (they range from 3 to 5 people in one room).

and enforces them. Therefore, we expect this formal institution to generate higher levels of interpersonal trust than an institution based on personal reputation.

Imperfect formal institution vs. informal institutions

HI1: The imperfect institution generates as much interpersonal trust as the social norm and reputational arrangements.

HI2: The imperfect institution generates less interpersonal trust than the social norm and reputational arrangements.

The imperfect but formal institution by which punishments are faultily enforced introduces additional uncertainty into the game, diminishing the effectiveness of the authority figure and, thus, the interpersonal gains of trust facilitated by having an institution. We have also stated that social norms and personal reputation treatments (informal institutions) should also improve interpersonal trust. However, it is not clear *a priori* if norms imperfectly enforced by formal institutions should dominate or not trust-building compared to informal reputation-building or social norms. In principle, formality should be an advantage in societies that rely on official institutions, such as in developed economies. At the same time, informal arrangements should dominate societies mistrusting formal authority, such as in developing economies.

When comparing these institutions, the context of the experiment and the characteristics of the participating group are relevant. By targeting informal merchants from La Paz and El Alto, we expect that day-to-day reliance on reputational devices and conformity to the social norm, as reported in the anthropological literature, should be conducive to higher or comparable levels of trust compared to that generated by error-prone formal institutions. Effectively, this test is valuable in discussing whether informal merchants use informal arrangements inherited from rules predating modern bureaucracies as a substitute for ineffectual state administration.

4. Econometric analysis

The primary outcome variable of our analysis is the amount of money sent by the investors during our game sessions. This amount is a proxy for interpersonal trust, as investors trust that the

entrepreneur will not exploit their vulnerability. We will assess the impact of the treatments using Tobit regressions as follows:

$$Y_{ir}^{a} = \alpha + \beta_1 T_i \times S_r + \mu_i + \varepsilon_{ir} \quad (1)$$

in which Y_{ir}^{a} is the outcome variable for player i of room A in round r. We use Tobit estimators due to the censoring resulting from participants having to choose amounts from a bounded set. T_i is a factor variable that takes four different possible values: (1) the social norm treatment, (2) the individual reputation treatment, (3) the imperfect institution treatment, and (4) the perfect institution treatment. S_r is a dummy variable that equals one if the participant is in treatment rounds, and zero otherwise. We will control for a session fixed effect, μ_i. We do this because we foresee heterogeneity in the session group's average pre-treatment trust, potentially correlating with treatment effects. We will present standard errors for all our estimates clustered at individual and session levels (See the appendix). Our first specification has the intention to check for hypothesis HA. We expect the vector β_1 to have positive components since β_1 reports the effect of how much is invested with an institution vs. without an institution.

In order to estimate differences between treatments, we will verify all the other hypotheses using an alternative version of equation (1). To do this, one of the previous categories in T_i will be omitted to be used as a base depending on the hypotheses we are testing. For hypotheses HP1, HP2, and HP3, we will run specification (2) using treatment four (the perfect formal institution) as the base category.

$$Y_{ir}^{a} = \alpha + \beta_1 S_r + \beta_2 T_i \times S_r + \mu_i + \varepsilon_{ir} \quad (2)$$

The coefficient β_2 is the difference estimator and will be our coefficient of interest. We expect this coefficient to be negative in all cases, since we hypothesize that the perfect institution has the largest effect in building up trust.

Following this analysis, we use treatment three as the base category to verify the remaining hypothesis (HI1 and HI2) and focus on the coefficients related to treatments 1 and 2. As stated above, we are uncertain about the direction of the effect (whether it will be positive or negative). All effects should be interpreted in Bolivian bolivianos, the local currency.

Furthermore, we would like to check whether treatments affect trustworthiness (player B decisions). To estimate this, we run similar regressions than above:

$$Y_{ir}^{b} = \alpha + \beta_1 T_i \times S_r + \mu_i + \varepsilon_{ir} \quad (3)$$

$$Y_{ir}^{b} = \alpha + \beta_1 S_r + \beta_2 T_i \times S_r + \mu_i + \varepsilon_{ir} \quad (4)$$

where Y_{ir}^{b} is the amount reimbursed by the entrepreneur, player B. We expect all coefficients to show the same directions and significance that in the models for trust, as trust and trustworthiness should be highly correlated. In fact, the magnitude of the effects on trustworthiness should be larger than in the models measuring trust, as the rules of the institutions apply directly to the trustees, while trustors require to anticipate good behavior by backwards induction. We expect therefore that treatments build a virtuous cycle of trust and trustworthiness, as trustees benefit now from an institutional structure that allows them to build towards a credible high investments-high repayments equilibrium.

Finally, we explore some heterogeneities estimating dynamic models, quartile treatment effects and Tobit and OLS models of interactions between treatments and relevant socioeconomic characteristics, such as risk aversion and pre-treatment group behavior. Robustness checks are available in the appendix.

5. Results

We first verify for pre-treatment balance in the characteristics of the sample. Table 1 does not find systematic differences in any pre-treatment characteristics at the commonly accepted significance levels, reassuring us in the correct randomization of the treatments. The average participant was around 30 years old, most likely a woman (characteristic of informal merchants). Interestingly, she had about 15 years of education, a complete primary and secondary education, typical in contemporary urban Bolivia. The monthly reported income averages bs2,723, which is 25% more than the minimum wage; however, a standard deviation of bs6,889 shows a very unequal and skewed distribution of incomes. Participants self-identified as 81% mestizo and 11% indigenous. On a scale from 1 to 6, where one is most risk-loving, and six is most risk-averse, subjects averaged

a score of 3.83. Before treatment, investors invested more than half of their endowment, investing on average bs24.97 out of their allowance of bs40. The results reassure us that using control questions, around 92% of the investors understood well how much money the entrepreneur received, 83% of the investors understood their net balance after investment and repayment. Still, we should note that only 57% of the investors were able to assess the net balance of the entrepreneur correctly.

The group of entrepreneurs displays similar characteristics to the group of investors (see Table 2), as they should, given that their role in the game was randomized before starting each session. There is some unbalance in two characteristics by treatment among the entrepreneurs: the group treated with the social norm treatment was more feminine and less risk-averse. These differences might arise from the reduced sample size. Because we implemented the questionnaire after the sessions, treatments might have impacted attitudes toward risk. We control for these characteristics in our estimations.

Table 1. Investors' Average Characteristics by Treatment

	T4	T1 vs T4	T2 vs T4	T3 vs T4	F-test
Male	0.40	-0.04	-0.06	-0.02	0.93
	(0.49)	(0.08)	(0.12)	(0.09)	
Age	30.70	-0.25	0.20	1.56	0.88
	(12.57)	(3.26)	(3.21)	(2.83)	
Education (years)	15.51	-1.05	-0.70	-0.75	0.54
	(3.26)	(0.74)	(0.72)	(0.67)	
Monthly income (bs)	2723.08	-1293.60	-1199.60	-466.98	0.03
	(6888.98)	(870.62)	(877.42)	(890.48)	
Indigenous	0.11	-0.01	0.01	0.05	0.70
	(0.32)	(0.05)	(0.08)	(0.06)	
Mestizo	0.81	-0.09	-0.10	-0.07	0.50
	(0.39)	(0.07)	(0.08)	(0.07)	
Risk aversion	3.83	-0.18	-0.46	0.17	0.32
	(1.57)	(0.25)	(0.31)	(0.31)	
Pre-treatment investment	24.97	-2.15	-1.95	-0.24	0.46
	(8.46)	(1.56)	(1.70)	(2.12)	
Game understanding:					
Amount entrepreneur received	0.92	0.04	-0.03	-0.04	0.16
	(0.27)	(0.05)	(0.05)	(0.06)	
Own net balance	0.83	-0.03	-0.04	-0.07	0.92
	(0.38)	(0.07)	(0.08)	(0.10)	
Entrepreneur's net balance	0.57	-0.06	0.06	-0.02	0.68
	(0.50)	(0.09)	(0.12)	(0.11)	
Observations	53	138	101	95	228

Note: First column shows the average and standard deviation in parenthesis.

T4: Perfect institution, T3: Imperfect institution, T2: Personal reputation, T1 : Social norms

In following columns, clustered standard errors in parenthesis. * 10% significance ** 5% significance

*** 1% significance. Clusters are at session level

Source: Own

The pre-treatment reimbursement averaged bs24.53, which is smaller than the average investment of bs24.97. Hence, trusting was, on average, a losing strategy before treatment. Concerning the comprehension of the game, 87% understood how much money they would receive after the investment, and 74% correctly calculated the investor's net balance. However, only 57% were able to precisely assess their net gains, which is a limitation of this study; the initial endowment provided to entrepreneurs might have been a source of confusion.

Table 2. Entrepreneurs' Average Characteristics by Treatment

	T4	T1 vs T4	T2 vs T4	T3 vs T4	F-test
Male	0.38	-0.12*	-0.10	-0.00	0.24
	(0.49)	(0.06)	(0.07)	(0.09)	
Age	29.79	2.41	4.02	3.18	0.49
	(12.56)	(2.51)	(2.67)	(3.22)	
Education (years)	14.68	-0.64	0.02	-0.20	0.88
	(4.05)	(1.03)	(0.96)	(1.07)	
Monthly income (bs)	1619.50	388.89	172.24	318.71	0.84
	(1864.56)	(475.18)	(347.55)	(482.20)	
Indigenous	0.19	0.03	0.11	0.04	0.76
	(0.39)	(0.08)	(0.10)	(0.10)	
Mestizo	0.74	-0.06	-0.14	-0.04	0.62
	(0.45)	(0.09)	(0.11)	(0.12)	
Risk aversion	4.04	-0.53***	-0.46*	-0.31	0.07
	(1.40)	(0.20)	(0.24)	(0.37)	
Pre-treatment reimbursement	24.53	-3.78	-1.62	-1.47	0.57
	(14.01)	(2.68)	(2.72)	(3.99)	
Game understanding:					
Amount received	0.87	-0.02	0.00	-0.09	0.62
	(0.34)	(0.06)	(0.06)	(0.08)	
Investor's net balance	0.74	-0.16**	-0.08	-0.19*	0.18
	(0.45)	(0.08)	(0.10)	(0.11)	
Own net balance	0.57	0.03	0.07	0.11	0.79
	(0.50)	(0.08)	(0.10)	(0.12)	
Observations	53	137	100	93	224

Note: First column shows the average and standard deviation in parenthesis.

T4: Perfect institution, T3: Imperfect institution, T2: Personal reputation, T1 : Social norms

In following columns, clustered standard errors in parenthesis. * 10% significance ** 5% significance

*** 1% significance. Clusters are at session level

Source: Own

As previously mentioned, we implemented a post-experiment questionnaire to survey the opinions of our sample concerning trust in several different institutions and beliefs on interpersonal trust. We display descriptive data and balance tests in Table 3. Because treatments might influence players' perceptions, we find some correlations between treatments and opinions. Among

investors, it is noteworthy that private entrepreneurs and public schools and hospitals were ranked among the most trustworthy on a scale from 1 to 10.

The experiment influenced the perception of trust in institutions, particularly in the imperfect institution treatment. Consistently, investors from this treatment reported less trust in institutions related to politics and justice than investors from other treatments. The treatment does not influence interpersonal trust and confidence in other institutions (schools, hospitals). Concerning interpersonal trust among investors, family members scored as the most trustworthy, and foreigners and police officers as the less dependable. The less reliable institutions were the Congress, the Judicial authority, and politicians.

Table 3. Investors Trust Perceptions by Treatment

	T4	T1 vs T4	T2 vs T4	T3 vs T4	F-test
Institutions:					
Policemen	4.28	-0.02	0.36	-0.21	0.73
	(1.87)	(0.29)	(0.46)	(0.37)	
Public schools	5.06	0.16	0.65	-0.32	0.06
	(2.45)	(0.51)	(0.50)	(0.51)	
Public hospitals	4.55	0.28	0.39	-0.26	0.43
	(2.12)	(0.34)	(0.45)	(0.38)	
Businessmen	6.66	-0.41	-0.06	-0.33	0.70
	(2.03)	(0.40)	(0.50)	(0.38)	
Congress	3.49	0.13	0.18	-0.40	0.27
	(2.28)	(0.32)	(0.39)	(0.33)	
Politicians	2.94	-0.21	0.35	-0.78**	0.04
	(2.21)	(0.39)	(0.50)	(0.39)	
Judges	3.45	-0.22	-0.41	-0.93**	0.05
	(2.38)	(0.34)	(0.36)	(0.36)	
Civil servants	4.96	-0.16	-0.23	-1.32***	0.00
	(2.25)	(0.38)	(0.50)	(0.34)	
Interpersonal:					
Foreigners	4.40	0.13	0.46	0.15	0.87
	(2.48)	(0.46)	(0.57)	(0.58)	
Family	8.70	-0.12	-0.82	0.04	0.37
	(1.55)	(0.32)	(0.50)	(0.33)	
Teachers	6.21	0.04	0.44	0.51	0.55
	(2.76)	(0.46)	(0.54)	(0.53)	
Doctors	6.32	0.27	0.60	0.13	0.76
	(2.27)	(0.43)	(0.59)	(0.47)	
Police officers	3.77	0.23	0.87	0.23	0.49
	(2.30)	(0.39)	(0.58)	(0.46)	
Observations	53	138	101	95	228

Note: First column shows the average and standard deviation in parenthesis.

T4: Perfect institution, T3: Imperfect institution, T2: Personal reputation, T1 : Social norms

In following columns, clustered standard errors in parenthesis. * 10% significance

** 5% significance *** 1% significance. Clusters are at session level

Source: Own

Among entrepreneurs, interpersonal and institutional trust opinions displayed similar results (see Table 4). Interestingly, the personal reputation treatment negatively affected the perceptions of entrepreneurs towards the police, public hospitals, and congress. The question of how being scrutinized on one's personal history impacts agents' behavior is out of the scope of this study. Still, it might provide a clue on the limitations of such types of disciplining institutions.

Figure 1 shows a histogram of the trustors' investments, separated by treatment. Note that the range is bounded between zero and forty and that the distributions are skewed to the right. The mode for all treatments is at 40, the maximum amount investable.

Table 4. Entrepreneurs Trust Perceptions by Treatment

	T4	T1 vs T4	T2 vs T4	T3 vs T4	F-test
Institutions:					
Policemen	4.70	-0.72**	-1.17***	-0.62	0.02
	(2.44)	(0.32)	(0.36)	(0.42)	
Public schools	5.58	-0.00	-0.33	-0.31	0.81
	(2.32)	(0.43)	(0.45)	(0.54)	
Public hospitals	4.83	-0.13	-0.89**	-0.23	0.19
	(2.26)	(0.43)	(0.44)	(0.43)	
Businessmen	6.40	-0.43	0.18	0.38	0.14
	(1.82)	(0.38)	(0.43)	(0.40)	
Congress	3.43	-0.16	-0.75*	-0.83*	0.13
	(2.13)	(0.40)	(0.39)	(0.48)	
Politicians	2.34	-0.04	-0.21	0.06	0.87
	(1.52)	(0.35)	(0.34)	(0.39)	
Judges	3.09	-0.07	-0.52	-0.32	0.52
	(1.87)	(0.35)	(0.44)	(0.41)	
Civil servants	4.85	-0.08	-0.57	-0.37	0.45
	(2.25)	(0.31)	(0.38)	(0.46)	
Interpersonal:					
Foreigners	4.49	-0.40	-0.26	-0.77*	0.21
	(2.10)	(0.47)	(0.54)	(0.40)	
Family	8.58	-0.11	0.44	-0.06	0.21
	(1.63)	(0.31)	(0.33)	(0.35)	
Teachers	6.62	-0.60	-0.15	-0.80	0.29
	(1.84)	(0.43)	(0.39)	(0.49)	
Doctors	6.51	-0.28	-0.02	-0.48	0.68
	(2.33)	(0.49)	(0.56)	(0.50)	
Police officers	3.51	-0.20	0.11	-0.03	0.91
	(2.08)	(0.39)	(0.52)	(0.46)	
Observations	53	137	100	93	224

Note: First column shows the average and standard deviation in parenthesis.

T4: Perfect institution, T3: Imperfect institution, T2: Personal reputation, T1 : Social norms

In following columns, clustered standard errors in parenthesis. * 10% significance

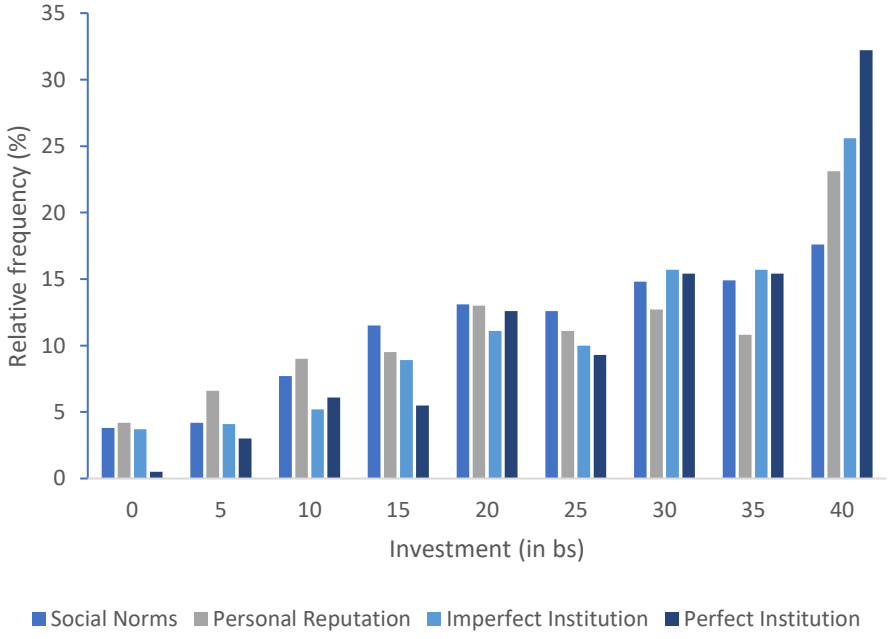
** 5% significance *** 1% significance. Clusters are at session level

Source: Own

In Figure 1, the perfect institution treatment skews the distribution of investments most, with more than 30% of the investments made at the maximum bound, while the other treatments cause milder effects. Figure 2 displays the histogram of repayments, also broken down by treatment. Repayments are skewed to the left for the social norm and the reputational mechanism. The formal institutions have a mode around the repayment of bs35-40.

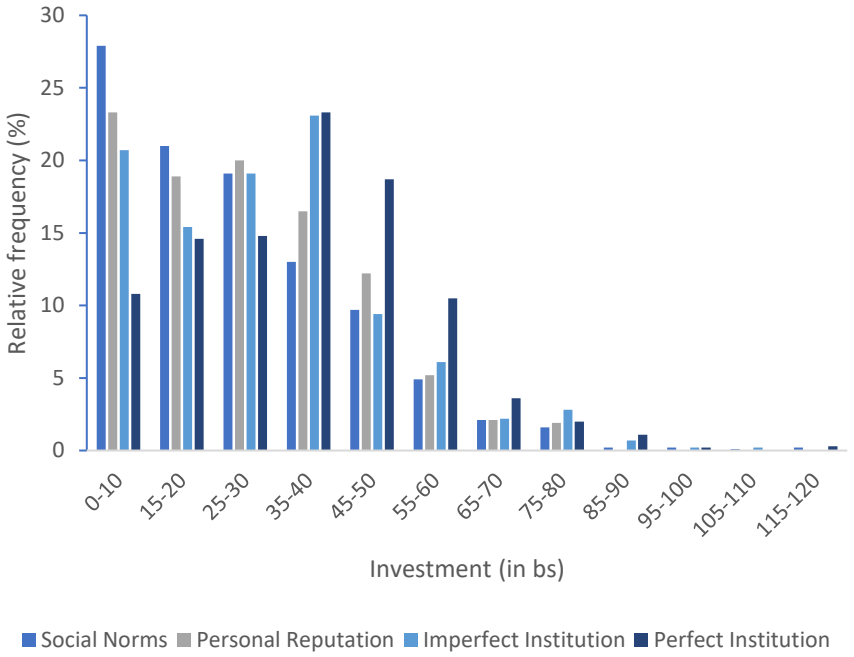
Due to the censored nature of our data, we study the effects of our interventions relying on Tobit estimators (Ordinary Least Square estimates with different clustering methods are available in Tables A1 to A4 in the appendix). Notice that we apply punishments and reputational devices to the entrepreneurs. Still, investors know of the set-up of such disciplining devices, and from this information can infer that the entrepreneurs have incentives to behave adequately and are trustworthy. Hence, we expect investors to react indirectly to the disciplining mechanisms imposed upon the entrepreneurs.

Figure 1. Histogram of Investment by Treatment



Source: Own

Figure 2. Histogram of Reimbursement by Treatment



Source: Own

In Table 5, the first and second columns estimate the average treatment effects compared to the control baseline set in pre-treatment rounds for the group of investors based on equation (1) of section 4. At the baseline, the average investment was bs24.97. Let us look first at the informal institutions. Without fixed effects at the session level, the social norm treatment increased investment by bs2.61 (a 10.4% increase, significant at the 5% level). The personal reputation treatment increased investment by a similar amount, bs2.60, although the difference is not statistically different from zero. Looking now at the formal institutions, the imperfect institution increased investments by bs5.71 (22.8%, $P < 0.01$), and the perfect institution, as predicted, has the most significant effect with an increase of bs9.83 (39.36%, $P < 0.01$). When we introduce fixed effects by sessions to control for heterogeneity between groups, we find a reinforced effect of the social norm treatment, increasing investment by bs3.82 (15.3%, $P <0.01$) and of the reputation treatment, becoming significant at the 10% level. Conversely, with session fixed-effects, the coefficients of the formal institution-treatments diminish but maintain their significance levels. Overall, we confirm hypothesis HA that any institutional arrangement is better than none to foster interpersonal trust, although the effects of the personal reputation treatment are somewhat inconclusive.

Table 5. Treatment Effects on Trust -Tobit Model

	(1)	(2)	(3)	(4)	(5)	(6)
Social norms	2.61**	3.82***	-4.50**	-4.40**	-0.76	-0.67
	(1.04)	(0.98)	(1.77)	(1.78)	(1.90)	(1.90)
Personal reputation	2.60	3.22*	-5.03**	-5.00**	-1.29	-1.27
	(1.68)	(1.69)	(2.27)	(2.26)	(2.37)	(2.36)
Imperfect institution	5.71***	4.51***	-3.74*	-3.73*		
	(1.49)	(1.63)	(2.20)	(2.21)		
Perfect institution	9.83***	8.22***			3.74*	3.73*
	(1.46)	(1.49)			(2.20)	(2.21)
Observations	2808	2808	2808	2808	2808	2808
Session FE	No	Yes	No	Yes	No	Yes
Round FE	No	No	No	Yes	No	Yes

Note: Dependent variable, trust, is the amount sent by the investors (in local currency – bs)
Clustered standard errors in parenthesis. * 10% significance ** 5% significance
*** 1% significance. Clusters are at individual level. Columns 3 and 4 use Perfect Institution as base category. Columns 5 and 6 use Imperfect Institution as base category
Source: Own

Columns 3 and 4 in Table 5 report the differences in average treatment effects with respect to the perfect formal institution and estimate equation (2). The model is estimated with and without Session and Round fixed effects. This ideal institution, which always punishes any breach of trust, has, as expected, the most significant impact in fostering trust. All other institutional arrangements provide an investment that is bs3.73 to bs5.03 lower than the ideal institution ($P < 0.10$), which is about 37% to 61% less money that is trusted to the entrepreneur with informal and imperfect formal institutions compared to the perfect institution. We conclude that hypotheses HP1 to HP3 are confirmed.

Finally, we compare in columns 5 to 6 of Table 5 the imperfect formal institution treatment to the other institutional innovations. Recall that the flawed formal institution is a coercive authority that can punish a breach of trust by the entrepreneur but will do so with a probability of five percent, plus a five percent increment in the likelihood of punishment for each repeated offense. Therefore, it is likely that the formal institution will not sanction some misbehavior. Our estimation does not find any statistical difference between the imperfect formal institution treatment and the two informal institution treatments. Therefore, we cannot reject hypothesis HI1 that the imperfect institution generates as much trust as the informal institutions, but we reject HI2 that it causes less trust. In our configuration, we cannot state, therefore, that informal institutions dominate low-quality formal institutions. However, they can act as substitutes for them.

We turn now to the average treatment effects for the group of entrepreneurs, estimated by equations (3) and (4) in Table 6. As expected, all the coefficients have the same sign as for the investors, and both magnitude and statistical significance increase. This parallelism is due to the fact that trust and trustworthiness are strongly correlated. Likewise, because we apply the treatment directly to the group of entrepreneurs, the magnitude of the effects is larger. From a baseline reimbursement of bs24.53, in the model without session fixed-effects, the four institutional arrangements have increased reimbursement amounts by bs5.18 (21.1%, social norm), bs7.11 (29%, personal reputation), bs10.41 (42,5%, imperfect formal institution) and bs18.81 (76.7%, perfect formal institution). All increments are statistically significant at the 1% level, including the personal reputation treatment. Including session-fixed effects has no impact on the main interpretations. When comparing the perfect formal institution to all other arrangements (columns (3) and (4)), we obtain the expected negative and significant difference in which less is reimbursed compared to the idealized institution. In columns (5) and (6), we do not find statistically significant differences among the other three treatments: the imperfect formal institution, the social norm, and the building-up of personal reputation.

Table 6. Treatment Effects on Trustworthiness – Tobit Model

	(1)	(2)	(3)	(4)	(5)	(6)
Social norms	5.18***	6.66***	-10.18***	-10.15***	-3.16	-3.18
	(1.48)	(1.41)	(2.27)	(2.25)	(3.01)	(3.00)
Personal reputation	7.11***	7.14***	-9.75***	-9.66***	-2.73	-2.70
	(1.49)	(1.90)	(2.60)	(2.59)	(3.26)	(3.26)
Imperfect institution	10.41***	9.84***	-7.02**	-6.97**		
	(2.05)	(2.65)	(3.18)	(3.18)		
Perfect institution	18.81***	16.80***			7.02**	6.97**
	(1.57)	(1.76)			(3.18)	(3.18)
Observations	2808	2808	2808	2808	2808	2808
Session FE	No	Yes	No	Yes	No	Yes
Round FE	No	No	No	Yes	No	Yes

Note: Dependent variable, trustworthiness, is the amount reimbursed by the entrepreneurs (in local currency – bs). Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance. Clusters are at individual level. Columns 3 and 4 use Perfect Institution as base category. Columns 5 and 6 use Imperfect institution as base category

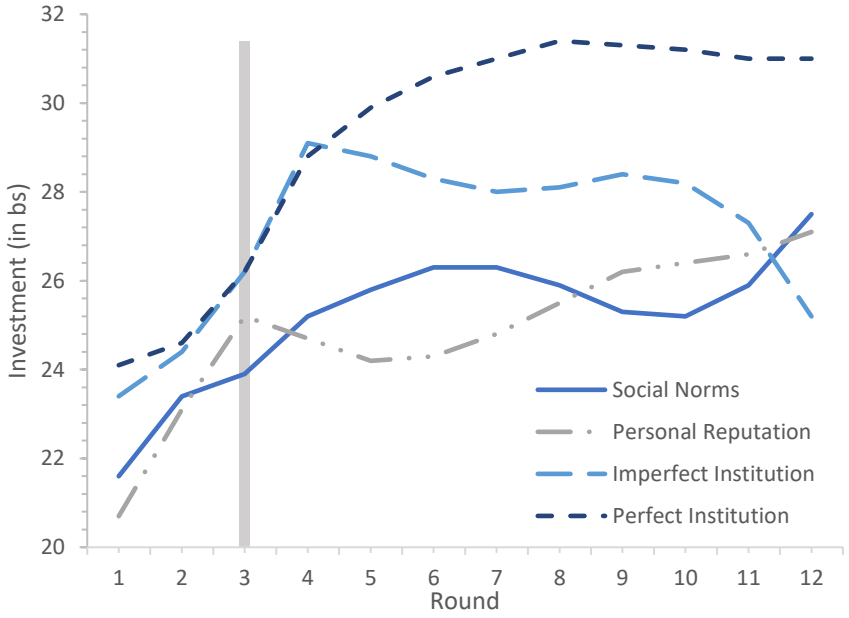
Source: Own

Figures 2 and 3 explore the dynamics of these trust-building mechanisms. The three first rounds are control rounds. The first graph shows a widening gap in investment levels between the four different treatments starting immediately after round three. The perfect institution treatment builds up trust and plateaus at around bs31. The imperfect institution initially increases investment,

which afterward declines rapidly, most likely due to participants anticipating the end of the session. The social norm and the personal reputation treatments make the levels of investment tend slightly upwards in an oscillating manner.

After round three, there is an increase in repayment levels for all treatments that rapidly stagnate at higher equilibrium repayment levels than the pre-treatment repayments. As expected, the effects are more pronounced on measurements of trustworthiness. As in our previous estimates, the perfect institution forces more trustworthiness than the imperfect institution, which induces more reliability than the social norm and the reputation-building mechanism. We display the magnitude of the effects and their statistical significance in Tables A5 and A6 of the appendix.

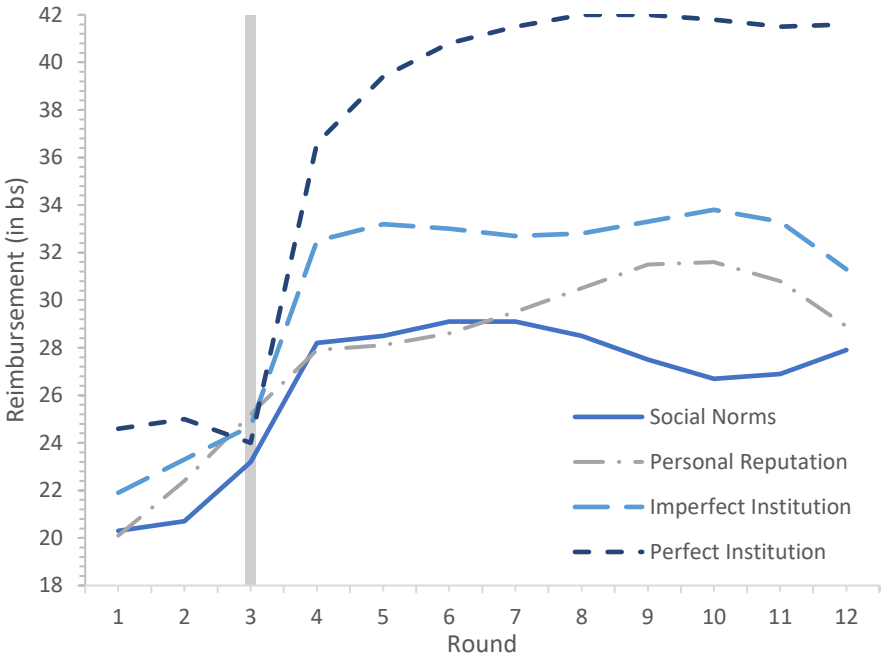
Figure 3. Average Investment by Treatment and Round



Note: Each line is the smoothed polynomial of the average value of investment per round.

Source: Own

Figure 4. Average Reimbursement by Treatment and Round



Note: Each line is the smoothed polynomial of the average value of reimbursement per round.

Source: Own

In addition to data censoring, Figures 1 and 2 show that the distributions of investments and repayments are multimodal likely because the design of the experiment required participants to choose values among multiples of bs5. Hence, finite sample inference properties of traditional estimators may not apply to our case, leading to biases in the estimation of treatment effects and wrongful conclusions. To address this issue, we rely on non-parametric tests. Using Mann-Whitney U and Wilcoxon's sign-rank tests, we verify whether the distribution of investment (and reimbursement) systematically differs between treatments and whether it changes before and after the treatments. Results confirm these hypotheses, reinforcing the conclusions from Tobit models (See Tables A7 and A8 in the appendix).

Further, we estimate unconditional quartile treatment effects, which are particularly appropriate for this setting, to improve our understanding of the differences in our outcome variables' distribution. Specifically, we use a non-parametric estimation following Firpo (2007), in which standard errors are robust to heteroscedasticity and are estimated using Powel's (1986) analytical variance. The following tables contain the results. Table 7 displays quartile treatments effects for investments. Compared to the pre-treatment rounds, all treatments increase the levels of trust for all quartiles except the social norm treatment in the third quartile, as seen in columns

(1), (4), and (7). It appears that the treatments perform better at the median of the distribution, where it is easier to conform to a social norm, to switch from a bad to a good reputation, and to switch from low chances of punishment to high probabilities of punishment. The perfect institution increases the levels of trust more than all other treatments in quartiles one and two, and in the third quartile, the perfect institution performs only better than the social norm (Columns (2), (5), (8)). Finally, the imperfect formal institution does better than the personal reputation mechanism in the first quartile, and performs better than the social norm in the third quartile.

Table 7. Quartile Treatment Effects on Trust

	First Quartile			Second Quartile			Third Quartile		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Social norms	5.00***	-5.00***	0.00	10.00***	-5.00***	-0.00	0.00	-5.00***	-5.00***
	(1.23)	(1.90)	(1.51)	(0.95)	(1.14)	(1.13)	(1.00)	(0.60)	(0.66)
Personal reputation	5.00*	-10.00***	-5.00***	10.00***	-5.00***	0.00	5.00***	0.00	0.00
	(2.68)	(1.85)	(1.64)	(1.36)	(1.28)	(1.32)	(1.29)	(0.55)	(0.64)
Imperfect institution	5.00***	-5.00***		10.00***	-5.00***		5.00***	0.00	
	(1.74)	(1.88)		(1.30)	(1.12)		(1.14)	(0.52)	
Perfect institution	10.00***		5.00***	15.00***		5.00***	5.00***		0.00
	(1.76)		(1.88)	(1.09)		(1.12)	(1.08)		(0.50)

Note: Dependent variable, trust, is the amount sent by the investors (in local currency – bs). Robust standard errors in parenthesis.

* 10% significance ** 5% significance *** 1% significance. Columns 1, 4 and 7 compare pre and post treatment quartiles. Columns 2, 5 and 8 compare Perfect institution quartiles against those of the other treatments for all post-treatment rounds. Columns 3, 6 and 9 compare Imperfect institution quartiles against those of the other treatments for all post-treatment rounds.

Source: Own

Consistently, the estimation for quartile treatment effects on the groups of entrepreneurs produces higher and more significant coefficients. However, it is noteworthy that the imperfect institution dominates the social norm and the personal reputation mechanism in quartiles one and two only. In our interpretation, informal institutions can act as substitutes for the ineffective formal institution, but only at the top of the distribution.

Table 5. Quartile Treatment Effects on Trustworthiness

	First Quartile			Second Quartile			Third Quartile		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Social norms	5.00***	-20.00***	-10.00***	15.00***	-15.00***	-10.00***	10.00***	-10.00***	0.00
	(1.06)	(1.46)	(1.57)	(1.20)	(1.24)	(1.34)	(1.19)	(1.43)	(1.29)
Personal reputation	10.00***	-15.00***	-5.00***	20.00***	-10.00***	-5.00***	10.00***	-10.00***	0.00
	(1.58)	(1.78)	(1.88)	(1.53)	(1.38)	(1.48)	(1.55)	(1.54)	(1.43)
Imperfect institution	15.00***	-10.00***		25.00***	-5.00***		10.00***	-10.00***	
	(1.58)	(1.78)		(1.41)	(1.18)		(1.51)	(1.30)	
Perfect institution	20.00***		10.00***	25.00***		5.00***	20.00***		10.00***
	(1.60)		(1.78)	(1.36)		(1.20)	(1.33)		(1.30)

Note: Dependent variable, trustworthiness, is the amount reimbursed by the entrepreneurs (in local currency – bs). Robust standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance. Columns 1, 4 and 7 compare pre and post treatment quartiles. Columns 2, 5 and 8 compare Perfect institution quartiles against those of the other treatments for all post-treatment rounds. Columns 3, 6 and 9 compare Imperfect institution quartiles against those of the other treatments for all post-treatment rounds.

Source: Own

We conclude that average and quartile treatment effects confirm our hypotheses, except for hypothesis HI2. Namely:

1. the introduction of any institution (formal or informal) increases interpersonal trust (HA);
2. the perfect formal institution generates more interpersonal trust than the imperfect formal institution, the social norm arrangement, and the reputational mechanism (HP1, HP2, HP3); and
3. the imperfect institution generates as much interpersonal trust as the social norm and reputational arrangements (HI1), but not less (we reject HI2).

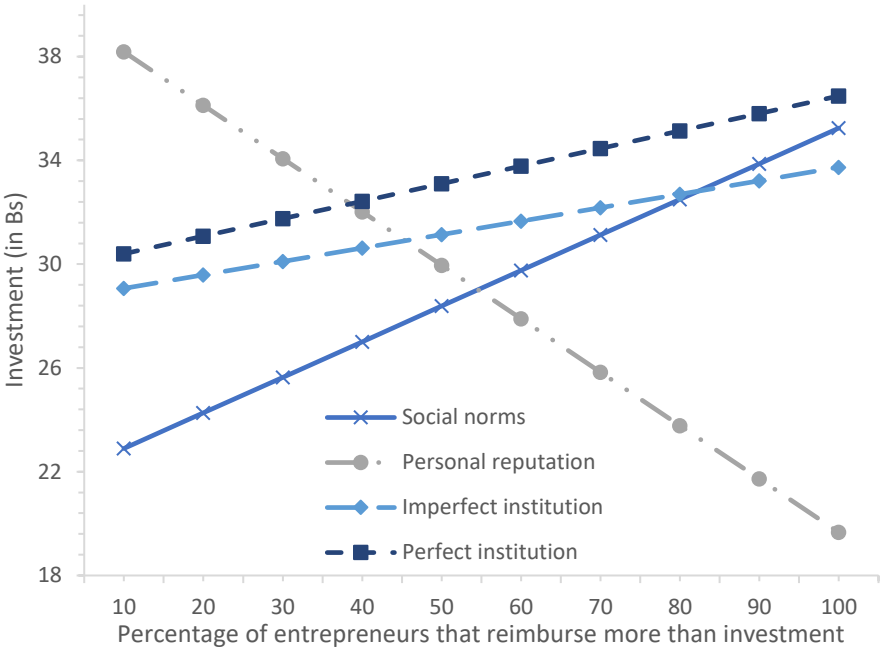
These results guided us toward expanding our analysis further into exploring heterogeneous treatment effects. We do so by studying two meaningful correlations between the outcome variables and pre-treatment characteristics. First, we look at the relationship between trust and trustworthiness, and the 'quality' of the group of entrepreneurs. We associate the quality of the group with the pre-treatment rate of repayments which are larger than the corresponding investment. In other words, it is the percentage of reimbursements that are not a scam. Our objective is to reveal the possibility of path dependency, particularly in the social norm treatment. However, it is also interesting to analyze if groups of good quality comply more with rules or if bad quality groups take the most advantage of the credible commitment mechanisms offered to

them. Second, we investigate the correlation between predicted outcomes and each entrepreneur's degree of risk aversion. We expect that participants who display higher risk aversion tend to comply more with coercive mechanisms, particularly the probabilistic sanctions imposed by the imperfect formal institution. The personal reputation mechanism, which provides more control to entrepreneurs over their own image, should be less sensitive to changes in the levels of risk aversion. Under the social norm treatment, there is uncertainty associated with the lack of control over the actions of others, but also comfort in observing the formation of a social norm. Our estimates rely on a Tobit specification which interacts treatments with pre-treatment characteristics, for which we display the coefficients and their significance in Tables A9 to A12 of the appendix.

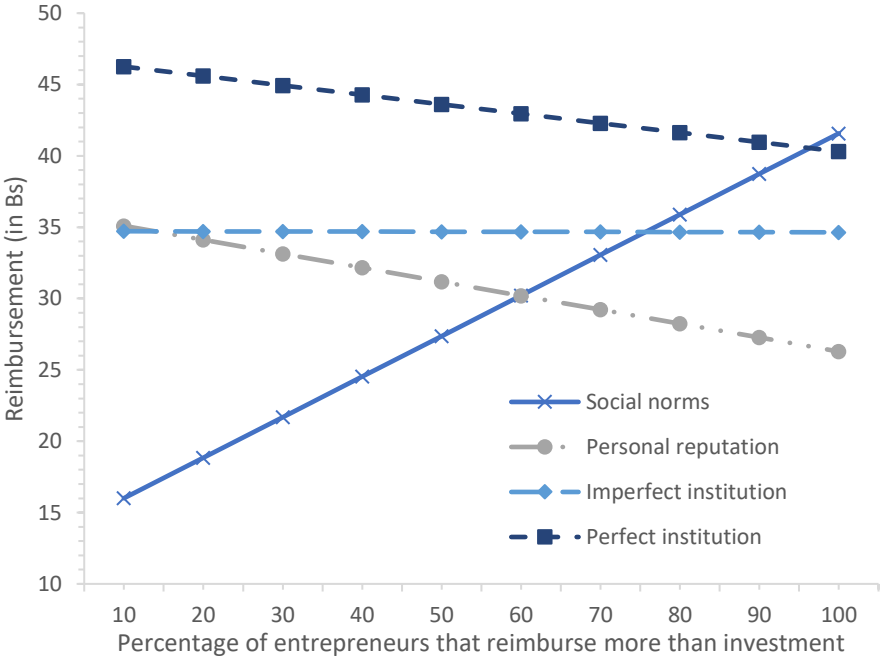
Figure 5 displays, in panel (a), the predicted level of investment as a function of the quality of the group. We observe that the formal institutions increase their trust-building effectiveness as the quality of the group improves. Interestingly, the slope of the level of investment as a function of the quality of the group is the steepest for the social norm treatment, implying some form of path dependency. A group with a good initial reputation is likely to sustain high levels of trust and cooperation, perhaps even more than an imperfect formal institution. More surprisingly, under the personal reputation mechanism, the correlation between interpersonal trust and the quality of the group becomes negative. Under this treatment, entrepreneurs have control over their own reputation, which to the eyes of entrepreneurs might provide the correct incentives to exert an effort and differentiate themselves from bad quality peers. In good quality groups, however, trust breaks down in the pursuit of building up an individualized reputation and under the scrutiny of the personal history of repayments.

In panel (b) of Figure 5, the formal institutions tend to slightly reduce trustworthiness as a function of the quality of the group. Consistently with the levels of investment, the levels of repayment improve with the quality of the group in the social norm treatment, reaffirming the idea of path dependency. Finally, the personal reputation treatment seems to erode trustworthiness among good quality groups.

Figure 5. Predicted outcomes by treatment and entrepreneurs' pre-treatment session characteristics



(a) Investment



(b) Reimbursement

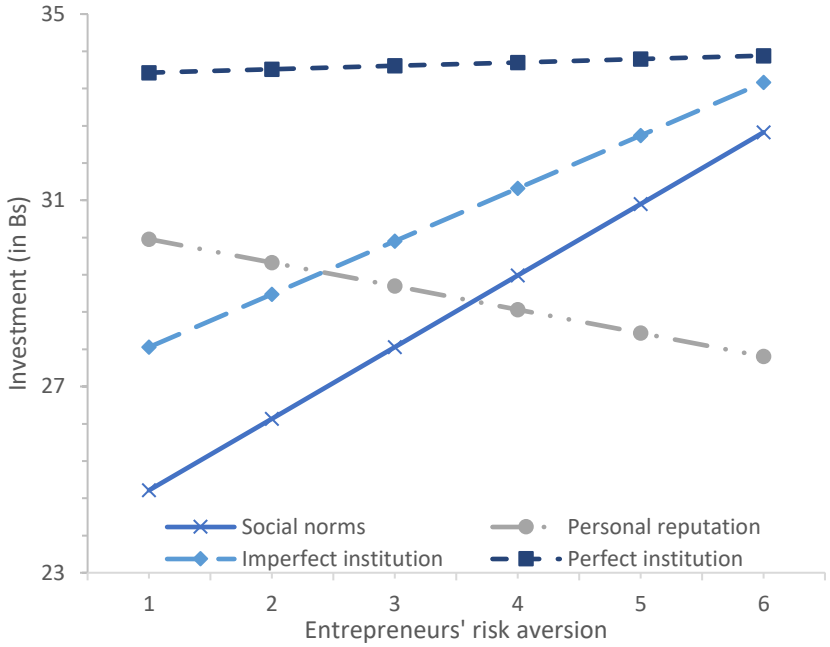
Note: Figures show the predicted value of the outcome of interest per the average percentage of entrepreneurs that reimburse more than the investment in a session. The estimates are based on the Tobit models detailed in Tables A9 and A10.

Source: Own

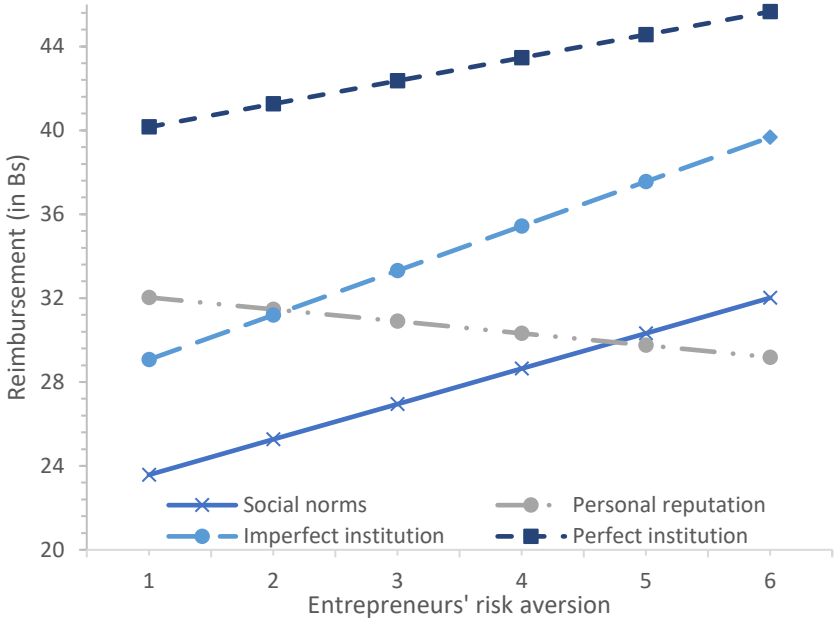
Figure 6 displays in panel (a) the correlation between predicted investments and risk aversion, and in panel (b) the correlation between reimbursements and risk aversion. Formal institutions become more effective in building trust among more risk-averse participants; in particular, the slope is steeper for the imperfect formal institution. The social norm is also more effective at building up trust when entrepreneurs are more risk-averse: even though there is uncertainty on how other entrepreneurs in the group behave, there is also comfort in observing peers' behavior. Counterintuitively, the personal reputation mechanism loses effectiveness with risk aversion. Despite having more control over one's image, the exposure associated with this treatment might provoke a discomforting effect on the participants.

We should mention some caveats regarding the results displayed in Figures 5 and 6. First, the predictions are extrapolated to the whole range of pre-treatment characteristics and should therefore be interpreted with caution regarding the values near the limits. Second, we took the measure of risk aversion post-treatment; therefore, endogeneity is an issue. The results should be interpreted as correlations to be further studied in specifically designed experiments. Nonetheless, they help establish a discussion on the events unfolding outside of the laboratory.

Figure 6. Predicted outcomes by treatment and entrepreneurs' risk aversion



(a) Investment



(b) Reimbursement

Note: Figures show the predicted value of the outcome of interest per measured level of risk aversion of the entrepreneurs. The estimates are based on the Tobit models of Tables A11 and A12.

Source: Own

6. Discussion and experiences from the field

For the design of the experiment carried out in this research, we documented the experiences of informal merchants of the cities of La Paz and El Alto through a series of lengthy qualitative interviews. We interviewed five leaders of merchant associations and ten vendors in popular markets. Recent studies now acknowledge that the informal sector in developing economies is heterogeneous in activities and incomes, from street vendors to large importers of sophisticated hardware (Tassi, Medeiros, Rodríguez-Carmona, & Ferrufino, 2013; Neuwirth, 2012; Morales & Salinas, 2019). Our interviewees included importers of cellphones, videogame consoles, washing machines, refrigerators, cooking gear, textiles, etc. The volumes of merchandise traded by this sector are often valued on the tens of thousands of American dollars, and the profit margins can also be substantial in some of these trades. Due to informational asymmetries, time lags in exchange, and some forms of collusion between merchants (Morales & Salinas, 2019), such commercial activities require a certain degree of contractual sophistication. Now, because merchants operate mainly in the informal sector, it is unlikely that contracts might be enforced by official and formal institutions such as the police or courts of justice. Moreover, when institutional quality is low, subjects might be reluctant to use official institutions to enforce contracts due to the fear, often justified, of lengthy, expensive, and ineffective procedures (Morales & Pando, 2019), as was reported by our interviewees.

The question of enforceability of contracts requires then another explanation. Bolivia has a long tradition of unionized labor inherited from its mining history and the unionized agrarian structures set up by the National Revolution of 1952 (Campero Prudencio, 1999). Even though most informal merchants in Bolivia are self-employed, many are unionized or belong to merchant associations to bargain collectively with official authorities on matters of public thoroughfare or exemptions to market regulations. Some of these associations date as far back as the 1940s, when rural-urban migrants formed them. These organizations often have a hierarchical structure, written statutes, and a democratically elected directorate. They collect union dues and impose fines while controlling market entrance and exit. A priori, the merchant unions and associations are likely candidates for the enforcement of contracts due to their controlling nature. For example, some of the merchants that we interviewed and the literature make mention of *Tribunals of Honor* set up by associations to regulate disputes (Tassi, Medeiros, Rodríguez-Carmona, & Ferrufino, 2013).

However, neither the leaders of the associations that we interviewed acknowledged the existence of such tribunals nor the written statutes of these organizations make mention of these tribunals (it is worth noting, however, that we were denied access to some of these written statutes). The leaders of the associations we interviewed claimed that these organizations seldom intervene and resolve disputes among their affiliates.

We questioned then the interviewees directly on the issue of the enforcement of contracts. How can disputes be resolved if there is no intervention by either the state or the merchant's association? The answer was that disputes are resolved only between the parts involved. Hence, a great deal of interpersonal trust is required for these markets to function. As in agricultural and pre-capitalist communities, a dense social network of urban merchants facilitates credible reputation-building, strengthens the threat of ostracization, and establishes a visible social norm of behavior. In the Bolivian context, merchants build interconnected urban communities thanks to the geographical clustering of commercial endeavors and accumulate social capital by investing in shared cultural activities, such as patronal festivities and folkloric dances (Morales & Salinas, 2019).

These considerations led us to design our experiment to test whether reputational mechanisms and social norms are substitutes for the enforcement of contracts and building up trust when institutions are of poor quality. Our results show that a perfectly designed formal institution can effectively build up interpersonal confidence. However, this institution is idealized. Realistically speaking, social norms, and to a lesser extent, reputation building, appear as adequate substitutes for formal institutions of poor quality. According to our results, this is particularly true if social cohesion within the group is inherited, for instance, from a common rural origin or by sharing cultural values and norms. For outsiders or groups of little cohesion, personal reputation and gossip can help build up mutual trust relations.

Policy-wise, improving the quality of formal institutions should be an absolute priority. However, policies can harness the qualities of dense and interconnected urban communities to promote positive role models and enhance social cohesion, which builds trust, fostering investment, development, and formality.

7. Conclusions

Interpersonal trust is an essential requirement for the functioning of a market economy, which necessitates the upholding of contracts and agreements. In societies with robust and efficient institutions, official authorities enforce contracts when they are breached. Indirectly, the upholding of contracts by trustworthy authorities reassures the signatory parts that breaches are costly for the offender. Thus, signatories can be trusted not to renege on the agreement despite temptations. In weak institutional contexts, if authorities are ineffective in upholding contracts or if parts operate outside of the official regulatory framework, there is no enforcer of the contract. The building-up of trust should be unattainable. However, even in informal settings with weak institutions, we see complex agreements on costly transactions, such as the import of modern technologies or fashionable clothing from Asia to other markets in the developing world, which are certainly not enforceable by authorities.

We posit that the levels of trust required for these costly transactions to occur are based on informal institutions, such as social norms and reputation-building, which require tightly interconnected urban communities. Moreover, we theorize that these informal reputational arrangements substitute formal institutions when formal institutional quality is too low.

We test this theory by setting up a laboratory experiment based upon Berg's investment game (1995). The experiment targets the population of informal merchants in the cities of La Paz and El Alto. In a repeated game, we assigned the role of investors in an economic endeavor to a group of individuals. We gave another group the role of entrepreneurs who should reimburse their investors part of the economic gains made, ideally more than what was invested. If they do, progressively trust from the investors towards the entrepreneurs should build up, manifested by increasing investment. At each round, we randomly match an investor with an entrepreneur.

We introduce then four institutional innovations: an informal social norm in which we inform all players of the behavior of the group of entrepreneurs in the previous rounds (social norm treatment); an informal norm in which we notify each investor of the repayment history of the matched entrepreneur (reputation treatment); a formal institution under which the entrepreneur is punished if only once she reimburses less than what was invested (perfect institution treatment); and an imperfect formal institution which an entrepreneur is punished if she returns less than what was invested, but with a small probability (imperfect institution treatment).

Our results show that the perfect institution treatment is the most conducive to increased trust, as we expected. The social norm and imperfect formal institution increase interpersonal trust levels compared to a no-institution baseline. We conclude that social norms can reduce the cost of building up trust and substitute for poor institutional quality.

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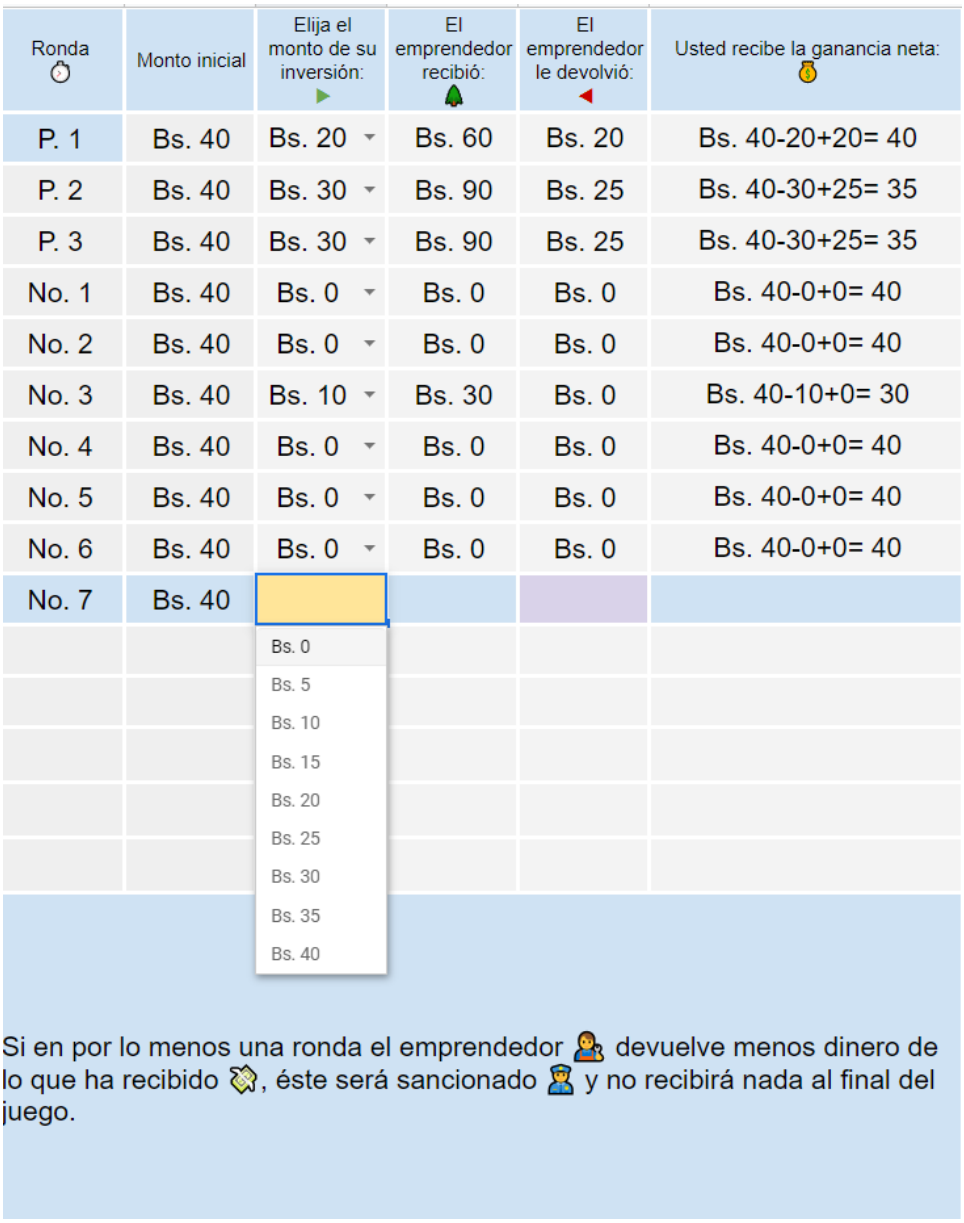
Appendix

1. Material of experimental sessions

The following figures show the screen that participants used during the experiment. Notice that participants can see the other player's moves and net profits per round. In addition, they have a reminder of the treatment they are assigned to at the bottom of the game's sheet.

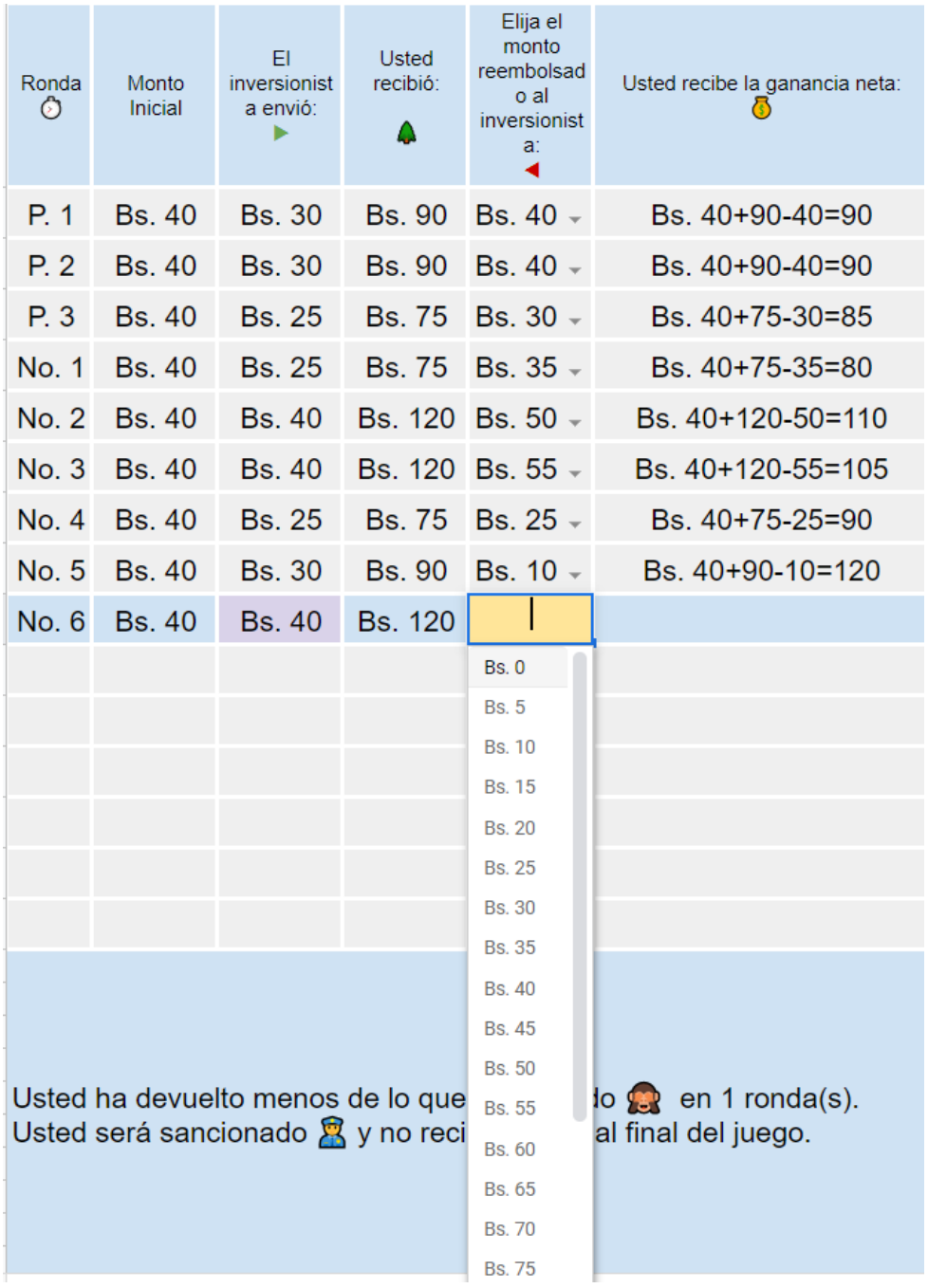
Figure A1. Screen capture of the investor's interface



Ronda	Monto inicial	Elija el monto de su inversión:	El emprendedor recibió:	El emprendedor le devolvió:	Usted recibe la ganancia neta:
P. 1	Bs. 40	Bs. 20	Bs. 60	Bs. 20	Bs. 40-20+20= 40
P. 2	Bs. 40	Bs. 30	Bs. 90	Bs. 25	Bs. 40-30+25= 35
P. 3	Bs. 40	Bs. 30	Bs. 90	Bs. 25	Bs. 40-30+25= 35
No. 1	Bs. 40	Bs. 0	Bs. 0	Bs. 0	Bs. 40-0+0= 40
No. 2	Bs. 40	Bs. 0	Bs. 0	Bs. 0	Bs. 40-0+0= 40
No. 3	Bs. 40	Bs. 10	Bs. 30	Bs. 0	Bs. 40-10+0= 30
No. 4	Bs. 40	Bs. 0	Bs. 0	Bs. 0	Bs. 40-0+0= 40
No. 5	Bs. 40	Bs. 0	Bs. 0	Bs. 0	Bs. 40-0+0= 40
No. 6	Bs. 40	Bs. 0	Bs. 0	Bs. 0	Bs. 40-0+0= 40
No. 7	Bs. 40				

Source: Own

Figure A2. Screen capture of the entrepreneur's interface



Source: Own

Instruction sheets

In the following paragraphs, we present the instruction sheets translated to English. The participants had a printed copy of these instructions in their seats.

Room A

This exercise aims to study the decision-making of individuals. For participating in this activity, you will be rewarded with money; the amount will depend on your decisions and the decisions of others. If in the exercise for your choices and others', you receive less than Bs 40, you will still get a reward of Bs 40 for your participation.

Please do not talk to the other participants in your room or ask aloud. If you break any of these rules, you will be removed from the room and not receive your payment.

There are two types of participants in this exercise: INVESTORS and ENTREPRENEURS. The participants in this room have been assigned the role of INVESTORS. In contrast, the participants in the other room have been given the part of ENTREPRENEURS. Throughout the exercise, you will remain in the same role.

The exercise consists of several rounds. You will be RANDOMLY MATCHED with different entrepreneurs from the other room at the start of each round. At no time will you know who your match is, nor will the person in the other room know who you are.

At the beginning of each period, both the investors (participants in your room) and the entrepreneurs (participants in the other room) will receive Bs 40. As an INVESTOR, you can send part of these Bs 40 to the entrepreneur that is your match. You can select not to send anything (Bs 0) or send an amount from Bs 5 to Bs 40 (send everything) in amounts of Bs. 5. The amount sent will triple, so the entrepreneur will receive what you sent times three.

When you have decided, the entrepreneur will be informed of the amount sent and will receive the amount tripled. If you sent an amount greater than 0, the entrepreneur will have the opportunity to return everything (which is the tripled amount that you sent), a portion, or nothing of what he received in amounts of Bs 5.

THE PROFIT YOU can receive at the end of each round is equal to the initial amount of Bs 40 minus the amount you sent to the entrepreneur (in the other room) plus the amount the entrepreneur decided to return.

THE PROFIT THAT THE ENTREPRENEUR can receive at the end of each round is equal to the initial amount of Bs 40 plus the amount received, which is the tripled amount that you sent, minus the amount he chooses to return.

This procedure repeats for all the rounds that the exercise lasts.

Your FINAL PAYOUT will be the profit from one of the rounds chosen at random, so pay close attention to all rounds as one will define your payout.

At the end of the experiment, you will be asked to fill out a QUESTIONNAIRE with questions related to this exercise. Once all your doubts are cleared up, the exercise can begin.

Thank you for your participation!

Room B

This exercise aims to study the decision-making of individuals. For participating in this activity, you will be rewarded with money; the amount will depend on your decisions and the decisions of others. If in the exercise for your choices and others', you receive less than Bs 40, you will still get a reward of Bs 40 for your participation.

Please do not talk to the other participants in your room or ask aloud. If you break any of these rules, you will be removed from the room and not receive your payment.

There are two types of participants in this exercise: INVESTORS and ENTREPRENEURS. The participants in this room have been assigned the role of ENTREPRENEURS. In contrast, the participants in the other room have been given the part of INVESTORS. Throughout the exercise, you will remain in the same role.

The exercise consists of several rounds. You will be RANDOMLY MATCHED with different entrepreneurs from the other room at the start of each round. At no time will you know who your match is, nor will the person in the other room know who you are.

At the beginning of each period, both the entrepreneurs (participants in your room) and the investors (participants in the other room) will receive Bs 40. The investor that is your match can send you part of her Bs 40. She will be able to choose not to send anything (Bs 0) or to send an amount from Bs 5 to Bs 40 (send it all) in amounts of Bs. 5. The amount sent will triple, so you will receive what the investor decides to send times three.

When the investor has decided, you will be informed of the amount sent and will receive the amount tripled. If you receive an amount greater than 0, you will have the opportunity to return

to the INVESTOR all (which is the tripled amount sent), a portion, or nothing of what you received in amounts of Bs 5.

THE PROFIT YOU can receive at the end of each round is equal to the initial amount of Bs 40 plus the amount of money received, which is the tripled amount that the investor decided to send, minus the amount you choose to return.

THE PROFIT THAT THE INVESTOR can receive at the end of each round is equal to the initial amount of Bs 40 minus the amount sent to the entrepreneurs (in this room) plus the amount that the entrepreneurs decided to return.

This procedure repeats for all the rounds that the exercise lasts.

Your FINAL PAYOUT will be the profit from one of the rounds chosen at random, so pay close attention to all rounds as one will define your payout.

At the end of the experiment, you will be asked to fill out a QUESTIONNAIRE with questions related to this exercise. Once all your doubts are cleared up, the exercise can begin.

Thank you for your participation!

Post-experiment questionnaires

Next, we detail the questionnaires that participants answered after the experiment's sessions. The questionnaire is divided into two sections. The first section asks comprehension questions about the mechanics of the experiment and perceptions about the treatments. This section's questions vary by room and treatment. The second section is devoted to questions about trust in institutions, interpersonal trust and sociodemographic characteristics.

SECTION 0-I GENERAL AND GAME-SPECIFIC QUESTIONS

Write the number of your ID

Write the code that is on your table

Room A

Please answer the following questions as if they were part of the game

T1. If you send 15 bs, how much will your partner in the other room receive?

T2. If your partner returns 10 bs, how much do you keep? Remember that you had 40 bs, and you already sent 15 bs.

T3. And how much does your partner get? Remember that he had 40 bs, that you sent him 15 bs, and he returned 10 bs

T4. Remember the exercise, how much money do YOU think you should have sent?

T5. Remember the exercise; how much do you think THE ENTREPRENEUR SHOULD have given YOU back in each round?

T6. Do you think YOU were FAIR in the amount of money you sent to the entrepreneurs in the exercise?

T7. Do you think they were FAIR with you in the amount of money they gave you back?

T8 – Imperfect institution treatment

In the exercise, each time an ENTREPRENEUR RETURNS LESS than what was sent to him, the PROBABILITY of being sanctioned and NOT RECEIVING ANYTHING at the end of the exercise increases by 5%. Did this rule help you MAKE BETTER DECISIONS in the exercise?

T8 – Perfect Institution treatment

In the exercise, we told you that if an ENTREPRENEUR RETURNS YOU LESS than what they sent, he will be sanctioned and WILL NOT RECEIVE ANYTHING at the end of the exercise. Did this rule help you MAKE BETTER DECISIONS in the exercise?

T8- Social Norms treatment

In the exercise, we informed you HOW MANY entrepreneurs RETURNED LESS than what they sent to Room A. Did this information help you MAKE BETTER DECISIONS in the exercise?

T8 – Reputation treatment

In the exercise, we inform you EVERY TIME that your partner sent you LESS money than you sent. Was this information useful for you?

T9. What other INFORMATION would you have liked to share with INVESTORS so that they are ENCOURAGED TO SEND YOU MORE MONEY?

Room B

Please answer the following questions as if they were part of the game

T1. If your partner in the other room sends you 15 bs, how much money will you receive?

T2. If you return 10 bs, how much does your partner keep? Remember that your partner had 40 bs and sent you 15 bs

T3. And how much do you keep? Remember you had 40 bs, your partner sent you 15 bs, and you returned 10 bs.

T4. Remember the exercise, how much money do you think THE INVESTOR should have sent in each round?

T5. Remember the exercise; how much do you think you should have returned to the INVESTOR in each round?

T6. Do you think THE INVESTORS were FAIR in the amount of money they sent YOU in the exercise?

Mark a number from 1 to 3, where 1 means that it was NEVER fair and 3 that it was ALWAYS fair.

T7. Do you think YOU were FAIR in the amount of money you returned to investors?

T8 – imperfect institution treatment

In the exercise, every time YOU RETURN LESS than what you received, the PROBABILITY that you will be sanctioned and RECEIVE NOTHING at the end of the exercise increases by 5%. Did this rule motivate you to CHANGE YOUR DECISIONS in the exercise?

T8 – Perfect institution treatment

In the exercise, we told you that if YOU RETURN LESS than what was sent to you, you will be penalized and RECEIVE NOTHING at the end of the exercise. Did this rule motivate you to CHANGE YOUR DECISIONS in the exercise?

T8 – Social norms treatment

We told investors HOW MANY entrepreneurs RETURNED LESS than they received in the exercise. Did this information motivate you to CHANGE YOUR DECISIONS in the exercise?

T8 – Reputation treatment

In the exercise, we inform INVESTORS EVERY TIME that you returned LESS money than they sent you. Did this information motivate you to change your decisions?

Mark a number from 1 to 3, where 1 means that they were NEVER fair and 3 that they were ALWAYS fair.

SECTION II TRUST AND SOCIODEMOGRAPHIC QUESTIONS

Thank you for participating in this survey which is part of an international study!

Please read all questions carefully and take your time to answer.

You will be asked to express your opinions on several topics and to provide information about yourself. In addition, we remind you that your participation in this study will be confidential, and your responses will not be disclosed in any way that would allow you to be identified.

It is unnecessary to have specific information about the topic to participate; answer honestly.

II.1. Now we are going to ask you some questions about trust in institutions.

In the following questions, you will indicate your answers on a scale of 1 to 10.

1 means NOTHING.

10 means A LOT.

CI1. How much trust do you have in the Police?

CI2. How much trust do you have in public schools?

CI3. How much trust do you have in public hospitals?

CI4. How much trust do you have in public employees?

CI5. How much trust do you have in Congress/Parliament?

CI6. How much trust do you have in judges?

CI7. How much trust do you have in entrepreneurs?

CI8. How much trust do you have in politicians?

II.1.1 Next, we are interested in knowing if you think it is common for public institutions to care about you and the interests of people like you. Please read the alternatives and mark only one answer for each item.

1 means NOTHING COMMON.

10 means VERY COMMON.

CI9. Do you think it is common that the Police can prevent crime?

CI10. Do you think it is common for public schools to offer a quality education?

CI11. Do you think it is common for public hospitals to offer quality services?

CI12. Suppose you complained about the poor quality of public service. Do you think that the public employee could effectively solve the problem?

CI13. Do you think it is common for legislators to keep what they promise?

CI14. Do you think it is common for judges to make fair decisions?

CI15. Do you think it is common for companies to offer quality products at fair prices?

CI16. Do you think it is common for the Armed Forces to contribute to public security?

CI17. Do you think it is common for politicians to think of you and the interests of people like you?

CI18. The last time you had to go to a hospital, did you go to a public or private hospital?

- Public
- Private

- I have never had to go to a hospital

CI19. If you currently have children enrolled in school, have you enrolled them in a public or private school? If you have children in public and private schools, check both options.

- Public
- Private
- I don't have a child at school

CI20. Does your home have any private security, such as an alarm service, camera monitoring, or a guard?

II.2. Now we are going to ask you some questions about interpersonal trust.

In the following questions, you will indicate your answers on a scale of one to ten.

1 means NOTHING.

10 means A LOT.

PC1. How much trust do you have in foreigners currently living in your community (or neighborhood)?

PC2. How much trust do you have in your family?

PC3. How much trust do you have in the teachers at your child's school or at your own school?

PC4. How much trust do you have in the doctors at the last hospital you visited?

PC5. How much confidence do you have in the Police in your neighborhood?

II.3.

CG1. Generally speaking, to what extent would you say most people can be trusted?

Here, the meaning of the extremes of the scale is as follows: (1) "One has to be very careful when dealing with others" and (7) "Most people can be trusted"

CG2. "I guess people have only the best intentions." To what extent do you agree or disagree with this statement?

1 means "strongly disagree", 7 means "strongly agree"

Now we are going to ask you about some groups of people and if you think it is very common, somewhat common, rare, or not at all common that they deliver what they promise.

1. CG3. politicians in general
2. CG4. public officials
3. CG5. Businessmen

4. CG6. Your family members
5. CG7. The police officer
6. CG8. judges and prosecutors

And thinking about these same groups of people, do you think it is very common, somewhat common, rare, or not at all common that they comply with the laws and regulations of the country.

1. CG9. politicians in general
2. CG10. public officials
3. CG11. Businessmen
4. CG12. Your family members
5. CG13. The police officer
6. CG14. judges and prosecutors

II.4. In this last section, we will ask you some questions about yourself.

Please fill in the following information:

PS1. What is your nationality?

PS2. How old are you?

PS3. Please indicate your gender:

- Man
- Woman

PS4. Could you tell what your monthly income is?

PS5. What was the last year of education you completed or passed?

- 0 years – None
- 1 year - 1st year of primary school
- 2 years - 2nd year of primary school
- 3 years - 3rd year of primary school
- 4 years - 4th grade of primary school
- 5 years - 5th grade of primary school
- 6 years - 6th grade of primary / 1st intermediate
- 7 years - 1st year of high school / 2nd intermediate
- 8 years - 2nd year of high school / 3rd intermediate
- 9 years old - 3rd year of secondary school/1st middle school

- 10 years - 4th year of secondary school / 2nd middle school
- 11 years old - 5th year of secondary school / 3rd middle school
- 12 years old - 6th year of secondary school / 4th middle school (bachelor's degree)
- 13 years old - 1st year of university/higher non-university
- 14 years - 2nd year of university/higher non-university
- 15 years - 3rd year of university/higher non-university
- 16 years old - 4th year of university/superior non-university
- 17 years old - 5th year of university
- 18 years or older - 6th year of university or more (Postgraduate)

PS6. In the last 5 years, have you lived in any other country?

PS6P. If you answered "Yes" to the previous question, which countries have you lived in during the last 5 years?

PS7. In general, how satisfied are you with your life? Would you say that you are?

- very satisfied
- somewhat satisfied
- little satisfied
- Not at all satisfied

PS8. What race do you consider yourself to be?

2. Additional results

Tables A1 and A2 reproduce our estimations using Ordinary Least Squares, while adding control variables and clustering standard errors at the individual level. In a few sessions, we could not recruit an even set of players, thus a research assistant played as a "fictitious" player: our main estimations control for the presence of these players using a dummy variable. All coefficients remain robust to these specifications.

Table A1. Treatment Effects on Trust

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Social norms	3.12***	3.12***	-2.82**	-2.82**	-2.82**	-0.82	-0.83	-0.83
	(0.80)	(0.80)	(1.37)	(1.38)	(1.38)	(1.61)	(1.62)	(1.62)
Personal reputation	2.44*	2.44*	-3.50**	-3.50**	-3.50**	-1.50	-1.51	-1.51
	(1.34)	(1.34)	(1.75)	(1.75)	(1.75)	(1.94)	(1.94)	(1.95)
Imperfect institution	3.94***	3.96***	-2.00	-1.98	-1.98			
	(1.40)	(1.40)	(1.80)	(1.80)	(1.80)			
Perfect institution	5.94***	5.94***				2.00	1.98	1.98
	(1.12)	(1.12)				(1.80)	(1.80)	(1.80)
Observations	2664	2664	2664	2664	2664	2664	2664	2664
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Round FE	No	No	No	No	Yes	No	No	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fictitious player	No	Yes	No	Yes	Yes	No	Yes	Yes

Note: Dependent variable, trust, is the amount sent by the investors (in local currency – Bs).

Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance.

Clusters are at individual level. Columns 3 to 5 use Perfect Institution as base category. Columns 6 to 8 use Imperfect institution as base category. Control variables are sex, age, education, income, race, risk aversion, understanding of the game, not part of target population and perception of interpersonal trust.

Source: Own

Table A2. Treatment Effects on Trustworthiness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Social norms	6.14***	6.14***	-10.23***	-10.23***	-10.23***	-4.71	-4.65	-4.65
	(1.26)	(1.27)	(2.14)	(2.15)	(2.15)	(3.05)	(3.04)	(3.05)
Personal reputation	7.32***	7.32***	-9.05***	-9.05***	-9.05***	-3.53	-3.47	-3.47
	(1.96)	(1.96)	(2.62)	(2.62)	(2.62)	(3.40)	(3.39)	(3.40)
Imperfect institution	10.85***	10.79***	-5.52*	-5.57*	-5.58*	0.00	0.00	
	(2.77)	(2.77)	(3.27)	(3.27)	(3.27)	(.)	(.)	
Perfect institution	16.37***	16.37***	0.00	0.00	0.00	5.52*	5.57*	5.58*
	(1.73)	(1.73)	(.)	(.)	(.)	(3.27)	(3.27)	(3.27)
Observations	2616	2616	2616	2616	2616	2616	2616	2616
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Round FE	No	No	No	No	Yes	No	No	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fictitious player	No	Yes	No	Yes	Yes	No	Yes	Yes

Note: Dependent variable, trustworthiness, is the amount reimbursed by the entrepreneurs (in local currency – Bs).

Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance.

Clusters are at individual level. Columns 3 to 5 use Perfect Institution as base category. Columns 6 to 8 use Imperfect institution as base category. Control variables are sex, age, education, income, race, risk aversion, understanding of the game, not part of target population and perception of interpersonal trust.

Source: Own

Tables A3 and A4 estimate the same models clustering errors at the session level.

Table A3. Treatment Effects on Trust

	(1)	(2)	(3)	(4)	(5)	(6)
Social norms	2.10*	3.12***	-2.91*	-2.82*	-0.46	-0.83
	(1.09)	(0.93)	(1.73)	(1.68)	(1.91)	(1.99)
Personal reputation	1.70	2.44*	-3.38*	-3.50*	-0.93	-1.51
	(1.14)	(1.27)	(1.91)	(1.89)	(2.08)	(2.17)
Imperfect institution	4.31***	3.96**	-2.45	-1.98		
	(1.32)	(1.75)	(2.18)	(2.24)		
Perfect institution	7.03***	5.94***			2.45	1.98
	(1.06)	(1.39)			(2.18)	(2.24)
Observations	2808	2664	2808	2664	2808	2664
Session FE	No	Yes	Yes	Yes	Yes	Yes
Round FE	No	No	No	Yes	No	Yes
Controls	No	Yes	No	Yes	No	Yes
Fictitious player	No	Yes	No	Yes	No	Yes

Note: Dependent variable, trust, is the amount sent by the investors (in local currency – Bs). Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance. Clusters are at session level. Columns 3 to 4 use Perfect Institution as base category. Columns 5 to 6 use Imperfect institution as base category. Control variables are sex, age, education, income, race, risk aversion, understanding of the game, not part of target population and perception of interpersonal trust.

Source: Own

Table A4. Treatment Effects on Trustworthiness

	(1)	(2)	(3)	(4)	(5)	(6)
Social norms	5.25**	6.14***	-9.93***	-10.23***	-3.26	-4.65
	(2.02)	(1.34)	(2.26)	(2.18)	(3.38)	(3.20)
Personal reputation	7.14***	7.32***	-9.19***	-9.05***	-2.51	-3.47
	(2.06)	(2.59)	(2.97)	(3.12)	(3.89)	(3.90)
Imperfect institution	10.38***	10.79***	-6.68*	-5.58		
	(2.43)	(2.90)	(3.45)	(3.38)		
Perfect institution	18.29***	16.37***			6.68*	5.58
	(1.75)	(1.72)			(3.45)	(3.38)
Observations	2808	2616	2808	2616	2808	2616
Session FE	No	Yes	Yes	Yes	Yes	Yes
Round FE	No	No	No	Yes	No	Yes
Controls	No	Yes	No	Yes	No	Yes
Fictitious player	No	Yes	No	Yes	No	Yes

Note: Dependent variable, trustworthiness, is the amount reimbursed by the entrepreneurs (in local currency – Bs). Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance. Clusters are at session level. Columns 3 to 4 use Perfect Institution as base category. Columns 5 to 6 use Imperfect institution as base category. Control variables are sex, age, education, income, race, risk aversion, understanding of the game, not part of target population and perception of interpersonal trust.

Source: Own

In Tables A5 and A6, we identify whether the change in levels of trust is permanent, based on the two-way fixed effect model. To accomplish this, we introduce a set of time dummies (a set of pre-treatment dummies, and another set of after-treatment dummies) and interact them with the treatments. The pre-treatment time dummies – rounds 1 to 3 - help us to analyze if there are differences before treatment per round; that is, trends in behavior prior to treatment. After-treatment time dummies – round 4 onward - help us study the dynamics of the effects, identifying in which period there are greater differences between treatments. Tobit estimates of column (1) come from the following specification:

$$Y_{ir}^{x} = \alpha + \sum_{s=2}^{6} \beta_s T_i \times D_r^s + \mu_i + \varepsilon_{ir} \quad (5)$$

where Y_{ir}^{x} is the investment or reimbursement of player i of type $x = \{a, b\}$ in round r, and $\{D_r^s\}$ is a set of dummies for rounds 2-3, 4-6, 7-8, 9-10 and 11-12. Round $r = 1$ is the base category. This equation estimates specific time trends per treatment, showing the changes in investment or reimbursement respect to their initial values. The graphic parallel was presented in Figures 3 and 4.

Tobit estimates of columns (2) and (3) are the result of:

$$Y_{ir}^{x} = \alpha + \sum_{s=2}^{6} \beta_s T_i \times D_r^s + \mu_i + \delta_r + \varepsilon_{ir} \quad (5)$$

where we isolate the common time trend of the dependent variable by introducing round fixed effect, δ_r, and use one of the treatments as base category to study the differences in the dynamics between treatments as in a difference in difference model. The dynamics are similar for both outcomes: investment and reimbursement. By examining the coefficients of the interaction of Rounds 2-3 with each treatment, we can conclude there is no systematic difference between pre-treatments trends. In the post-treatment rounds, we observe that the difference in the performance of the perfect formal institution treatment and the other treatments widens, reaching its peak in rounds 9 and 10. However, most coefficients are not statistically significant, possibly due to a lack of power.

Table A5. Dynamic Treatment Effects on Trust – Tobit Model

	(1)	(2)	(3)
Social norms*Rounds 2-3	2.14**	0.33	-0.34
	(1.04)	(1.66)	(2.04)
Social norms*Rounds 4-6	4.90***	-3.00	-2.10
	(1.27)	(2.08)	(2.37)
Social norms*Rounds 7-8	6.58***	-2.73	1.08
	(1.59)	(2.57)	(2.86)
Social norms*Rounds 9-10	3.71**	-8.37***	-3.97
	(1.82)	(2.77)	(2.89)
Social norms*Rounds 11-12	5.95***	-3.33	1.96
	(1.71)	(2.89)	(3.24)
Personal reputation*Rounds 2-3	4.04**	2.23	1.55
	(1.79)	(2.21)	(2.50)
Personal reputation*Rounds 4-6	3.84*	-4.07	-3.17
	(2.08)	(2.65)	(2.89)
Personal reputation*Rounds 7-8	6.03**	-3.28	0.53
	(2.67)	(3.35)	(3.58)
Personal reputation*Rounds 9-10	7.01***	-5.07	-0.67
	(2.33)	(3.14)	(3.24)
Personal reputation*Rounds 11-12	7.86***	-1.43	3.86
	(2.70)	(3.57)	(3.86)
Imperfect institution*Rounds 2-3	2.49	0.67	
	(1.75)	(2.18)	
Imperfect institution*Rounds 4-6	7.01***	-0.90	
	(1.99)	(2.59)	
Imperfect institution*Rounds 7-8	5.50**	-3.81	
	(2.37)	(3.12)	
Imperfect institution*Rounds 9-10	7.68***	-4.40	
	(2.24)	(3.08)	
Imperfect institution*Rounds 11-12	4.00	-5.29	
	(2.74)	(3.61)	
Perfect institution*Rounds 2-3	1.82		-0.67
	(1.29)		(2.18)
Perfect institution*Rounds 4-6	7.90***		0.90
	(1.64)		(2.59)
Perfect institution*Rounds 7-8	9.31***		3.81
	(2.01)		(3.12)
Perfect institution*Rounds 9-10	12.09***		4.40
	(2.09)		(3.08)
Perfect institution*Rounds 11-12	9.30***		5.29
	(2.33)		(3.61)
Observations	2808	2808	2808
Session FE	Yes	Yes	Yes
Round FE	No	Yes	Yes

Note: Dependent variable, trust, is the amount sent by the investors (in local currency – Bs). Clustered standard errors in parenthesis.

* 10% significance ** 5% significance *** 1% significance. Clusters are at individual level. Column 2 uses Perfect Institution as base category. Column 3 uses Imperfect institution as base category.

Source: Own

Table A6. Dynamic Treatment Effects on Trustworthiness – Tobit Model

	(1)	(2)	(3)
Social norms*Rounds 2-3	1.12	1.58	-0.45
	(1.48)	(2.67)	(2.33)
Social norms*Rounds 4-6	8.17***	-7.03**	-3.24
	(1.95)	(3.08)	(3.10)
Social norms*Rounds 7-8	9.91***	-6.55**	0.49
	(1.97)	(3.05)	(3.35)
Social norms*Rounds 9-10	4.91**	-14.28***	-7.33*
	(2.06)	(3.44)	(3.89)
Social norms*Rounds 11-12	6.20***	-9.59***	-3.99
	(2.34)	(3.34)	(4.31)
Personal reputation*Rounds 2-3	3.78	4.23	2.20
	(2.63)	(3.45)	(3.19)
Personal reputation*Rounds 4-6	7.78***	-7.43**	-3.63
	(2.33)	(3.33)	(3.35)
Personal reputation*Rounds 7-8	9.79***	-6.67*	0.36
	(3.10)	(3.87)	(4.11)
Personal reputation*Rounds 9-10	11.80***	-7.39*	-0.44
	(2.74)	(3.88)	(4.29)
Personal reputation*Rounds 11-12	10.18***	-5.60	-0.00
	(2.76)	(3.65)	(4.55)
Imperfect institution*Rounds 2-3	1.58	2.03	
	(1.80)	(2.86)	
Imperfect institution*Rounds 4-6	11.41***	-3.80	
	(2.41)	(3.38)	
Imperfect institution*Rounds 7-8	9.43***	-7.04**	
	(2.70)	(3.56)	
Imperfect institution*Rounds 9-10	12.24***	-6.95	
	(3.30)	(4.30)	
Imperfect institution*Rounds 11-12	10.19***	-5.60	
	(3.62)	(4.34)	
Perfect institution*Rounds 2-3	-0.45		-2.03
	(2.22)		(2.86)
Perfect institution*Rounds 4-6	15.21***		3.80
	(2.38)		(3.38)
Perfect institution*Rounds 7-8	16.46***		7.04**
	(2.32)		(3.56)
Perfect institution*Rounds 9-10	19.19***		6.95
	(2.76)		(4.30)
Perfect institution*Rounds 11-12	15.79***		5.60
	(2.39)		(4.34)
Observations	2808	2808	2808
Session FE	Yes	Yes	Yes
Round FE	No	Yes	Yes

Note: Dependent variable, trustworthiness, is the amount reimbursed by the entrepreneurs (in local currency – Bs). Clustered standard errors in parenthesis.
* 10% significance ** 5% significance *** 1% significance. Clusters are at individual level. Column 2 uses Perfect Institution as base category. Column 3 uses Imperfect institution as base category.

Source: Own

In tables A7 and A8 we show the results of non-parametric tests to identify treatment effects. Wilcoxon's sign-rank test compares the differences of matched pairs of dependent samples centered at the median. We use this test for before-after treatment comparisons of investment and reimbursement. The null hypothesis is that differences between pairs are not systematically asymmetric above or below the median (zero). The null hypotheses are rejected for all treatments, in line with our regression model results (Tobit, quartile regressions and OLS models).

The hypothesis that the perfect institution induces more trust than the other institutions is confirmed using Mann-Whitney U-test, based on the U-statistic which measures the probability of the treatment distribution being systematically different to the control distribution.

Table A7. Investment Statistics and Non-parametric Tests

	Mean	Quartile 1	Median	Quartile 3	Wilcoxon	Mann-Whitney (1)	Mann-Whitney (2)
Before treatment							
Social Norms	23	15	20	30	.	0.05	0.10
Personal Reputation	23	15	25	30	.	0.14	0.00
Imperfect Institution	25	15	25	35	.	0.92	.
Perfect Institution	25	20	25	35	.	.	.
After treatment							
Social Norms	26	20	30	35	0.00	0.00	0.20
Personal Reputation	25	15	28	40	0.00	0.00	0.00
Imperfect Institution	28	20	30	40	0.00	0.00	.
Perfect Institution	31	25	35	40	0.00	.	.

Note: Investment statistics are in local currency (Bs). Column Wilcoxon reports the p-value of Wilcoxon sign-rank two-sided test that compares the average investment after and before treatment. Column Mann-Whitney (1) reports the p-value of Mann-Whitney U two-sided test, comparing Perfect Institution treatment against the other treatments. Column Mann-Whitney (2) reports the p-value of Mann-Whitney U two-sided test, comparing Imperfect Institution treatment against Social Norms and Personal Reputation treatments.

Source: Own

Table A8. Reimbursement Statistics and Non-parametric Tests

	Mean	Quartile 1	Median	Quartile 3	Wilcoxon	Mann-Whitney (1)	Mann-Whitney (2)
Before treatment							
Social Norms	21	10	20	30	.	0.05	0.77
Personal Reputation	23	10	18	30	.	0.14	0.00
Imperfect Institution	23	10	15	35	.	0.14	.
Perfect Institution	25	10	20	35	.	.	.
After treatment							
Social Norms	28	10	25	40	0.00	0.00	0.95
Personal Reputation	30	15	30	40	0.00	0.00	0.02
Imperfect Institution	33	20	35	40	0.00	0.00	.
Perfect Institution	41	30	40	50	0.00	.	.

Note: Reimbursement statistics are in local currency (Bs). Column Wilcoxon reports the p-value of Wilcoxon sign-rank two-sided test that compares the average investment after and before treatment. Column Mann-Whitney (1) reports the p-value of Mann-Whitney U two-sided test, comparing Perfect Institution treatment against the other treatments. Column Mann-Whitney (2) reports the p-value of Mann-Whitney U two-sided test, comparing Imperfect Institution treatment against Social Norms and Personal Reputation treatments.

Source: Own

Tables A9 and A10 present correlations between treatment effects and the pre-treatment quality of the group of entrepreneurs to build Figure 5.

Table A9. Treatment Effects on Trust and Entrepreneurs' Pre-treatment Session Characteristics – Tobit Model

	(1)	(2)	(3)
Social norms*Reimbursement higher than investment	6.96		
	(6.32)		
Personal reputation*Reimbursement higher than investment	-27.34**		
	(11.71)		
Imperfect institution*Reimbursement higher than investment	-1.57		
	(7.51)		
Social norms*Average reimbursement		0.25	
		(0.24)	
Personal reputation*Average reimbursement		-0.52*	
		(0.31)	
Imperfect institution*Average reimbursement		-0.06	
		(0.24)	
Social norms*Median reimbursement			0.25
			(0.24)
Personal reputation*Median reimbursement			-0.52*
			(0.31)
Imperfect institution*Median reimbursement			-0.06
			(0.24)
Social norms	-8.20**	-9.87	-9.87
	(4.16)	(6.12)	(6.12)
Personal reputation	10.52	6.75	6.75
	(7.10)	(7.59)	(7.59)
Imperfect institution	-1.18	-1.26	-1.26
	(4.48)	(6.31)	(6.31)
Reimbursement higher than investment	6.76		
	(5.49)		
Average reimbursement		0.15	
		(0.22)	
Median reimbursement			0.15
			(0.22)
Pre-treatment investment	0.60***	0.54***	0.54***
	(0.08)	(0.08)	(0.08)
N	1998	1998	1998
Round FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes

Note: Dependent variable, trust, is the amount sent by the investors (in local currency – Bs). Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance. Clusters are at individual level. Perfect Institution is the base category. Control variables are sex, age, education, income, race, risk aversion, understanding of the game, not part of target population, perception of interpersonal trust and fictitious player.

Source: Own

Table A10. Treatment Effects on Trustworthiness and Entrepreneurs' Pre-treatment Session Characteristics – Tobit Model

	(1)	(2)	(3)
Social norms*Reimbursement higher than investment	35.02***		
	(6.87)		
Personal reputation*Reimbursement higher than investment	-3.18		
	(10.39)		
Imperfect institution*Reimbursement higher than investment	6.52		
	(10.30)		
Social norms*Average reimbursement		1.15***	
		(0.28)	
Personal reputation*Average reimbursement		0.16	
		(0.32)	
Imperfect institution*Average reimbursement		0.35	
		(0.30)	
Social norms*Median reimbursement			1.15***
			(0.28)
Personal reputation*Median reimbursement			0.16
			(0.32)
Imperfect institution*Median reimbursement			0.35
			(0.30)
Social norms	-33.75***	-39.58***	-39.58***
	(4.44)	(6.80)	(6.80)
Personal reputation	-10.84*	-16.29**	-16.29**
	(6.34)	(7.91)	(7.91)
Imperfect institution	-12.19**	-16.51**	-16.51**
	(5.37)	(7.28)	(7.28)
Reimbursement higher than investment	-6.61		
	(5.74)		
Average reimbursement		-0.16	
		(0.27)	
Median reimbursement			-0.16
			(0.27)
Pre-treatment reimbursement	0.28***	0.21***	0.21***
	(0.06)	(0.06)	(0.06)
N	1962	1962	1962
Round FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes

Note: Dependent variable, trustworthiness, is the amount reimbursed by the entrepreneurs (in local currency – Bs). Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance. Clusters are at individual level. Perfect Institution is the base category. Control variables are sex, age, education, income, race, risk aversion, understanding of the game, not part of target population, perception of interpersonal trust and fictitious player.

Source: Own

Tables A11 and A12 present correlations between treatment effects and the risk-aversion measures of entrepreneurs to build Figure 6.

Table A11. Treatment Effects on Trust and Risk Aversion – Tobit Model

	(1)	(2)
Social norms*Entrepreneur's risk aversion	1.46**	
	(0.67)	
Personal reputation*Entrepreneur's risk aversion	-0.58	
	(0.73)	
Imperfect institution*Entrepreneur's risk aversion	1.06	
	(0.92)	
Social norms*Investor's risk aversion		0.18
		(1.06)
Personal reputation*Investor's risk aversion		-1.24
		(1.23)
Imperfect institution*Investor's risk aversion		-1.27
		(1.22)
Social norms	-10.43***	-5.82
	(2.95)	(4.39)
Personal reputation	-3.00	-0.93
	(3.26)	(5.32)
Imperfect institution	-6.96	2.28
	(4.27)	(5.15)
Entrepreneur's risk aversion	0.07	
	(0.54)	
Investor's risk aversion	0.03	0.45
	(0.40)	(0.88)
Pre-treatment investment	0.57***	0.57***
	(0.08)	(0.08)
N	1938	1998
Round FE	Yes	Yes
Controls	Yes	Yes

Note: Dependent variable, trust, is the amount sent by the investors (in local currency – Bs). Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance. Clusters are at individual level. Perfect Institution is the base category. Control variables are sex, age, education, income, race, understanding of the game, not part of target population, perception of interpersonal trust and fictitious player.

Source: Own

Table A12. Treatment Effects on Trustworthiness and Risk Aversion – Tobit Model

	(1)	(2)
Social norms*Entrepreneur's risk aversion	0.59	
	(1.30)	
Personal reputation*Entrepreneur's risk aversion	-1.67	
	(1.12)	
Imperfect institution*Entrepreneur's risk aversion	1.02	
	(1.34)	
Social norms*Investor's risk aversion		-0.04
		(1.00)
Personal reputation*Investor's risk aversion		-1.88*
		(1.09)
Imperfect institution*Investor's risk aversion		1.10
		(1.43)
Social norms	-17.17***	-14.94***
	(5.05)	(4.21)
Personal reputation	-6.45	-6.10
	(4.75)	(4.68)
Imperfect institution	-12.10**	-12.96*
	(6.10)	(6.69)
Entrepreneur's risk aversion	1.10	1.32***
	(0.83)	(0.50)
Investor's risk aversion		-0.40
		(0.79)
Pre-treatment reimbursement	0.38***	0.38***
	(0.06)	(0.06)
N	1962	1936
Round FE	Yes	Yes
Controls	Yes	Yes

Note: Dependent variable, trustworthiness, is the amount reimbursed by the entrepreneurs (in local currency – Bs). Clustered standard errors in parenthesis. * 10% significance ** 5% significance *** 1% significance. Clusters are at individual level. Perfect Institution is the base category. Control variables are sex, age, education, income, race, understanding of the game, not part of target population, perception of interpersonal trust and fictitious player.

Source: Own