Inequality, institutions and cooperation

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Abstract

We examine whether the relationship between economic inequality and voluntary cooperation is influenced by the quality of local institutions, as proxied by corruption. We use representative data from a large-scale lab-in-the-field public goods experiment with over 1,300 participants across rural Vietnam. Our results show that inequality adversely affects aggregate contributions due to high endowment individuals contributing a significantly smaller share than those with low endowments. This negative effect of inequality on cooperation is stronger in high corruption environments. We find that corruption is associated with pessimistic beliefs about others' contributions in heterogeneous groups, highlighting the indirect costs of corruption that are understudied in the literature. These findings have implications for public policies aimed at resolving local collective action problems.

Keywords: Inequality, institutions, corruption, public goods, lab-in-field experiment

JEL classification codes: H41, D73, D90, O12

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1 Introduction

With the increased dispersion of income and wealth in many countries, the effects of economic inequality are a growing concern.[1] Many cross-country studies find that the consequences of excessive inequality span from slower economic growth and development to the rise of political discontent (e.g., Banerjee and Duflo, 2003; Wilkinson and Pickett, 2009).

We examine the effects of inequality on a crucial aspect of social capital, namely, cooperation. While there is extensive research on the impact of inequality on cooperation and public goods provision (e.g., Anderson et al., 2008; Buckley and Croson, 2006; Cherry et al., 2005; Chan et al., 1996), this study takes a step forward by examining how the relationship between inequality and cooperation varies with the quality of the local institutions. The conjecture is that low quality institutions – in particular, corruption – is associated with pessimistic expectations about cooperation, and that the effect of such pessimism on cooperation is higher in more unequal societies.[2] We theoretically expect pessimistic beliefs to play a larger role in unequal than in equal societies because uncertainty about the cooperation behavior of others is strongest in unequal places.

To investigate these issues empirically, we conduct a large-scale lab-in-the-field experiment in 56 communes (spread across 22 provinces) in rural Vietnam, including a sample of over 1,300 members of the local population. We run public goods games in areas characterized by varying levels of corruption (our measure of institutional quality), and exogenously vary the distribution of initial endowments. The lab-in-the-field approach is used because the lab experiment allows us to exogenously vary inequality, while the field setting provides us with variation in beliefs among the local population, which may affect behavior in the lab, and

[1] See Milanovic (2016), Piketty (2014) and Gradin et al. (2021).

[2] A number of experimental studies find that expectations about behavior may be affected by people's experiences outside the laboratory (e.g., Barr and Serra, 2010; Bigoni et al., 2018; Cameron et al., 2009; Gangadharan et al., 2016).

the potential sources of such beliefs, e.g., corruption.[3]

The key results are as follows. Aggregate contributions to the public good are significantly lower in groups characterized by inequality. However, in terms of share contributed, there is no difference between groups with equal and unequal endowments. Within unequal groups, low endowment individuals contribute a higher share to the public good than high endowment individuals (this explains why the absolute amount contributed is lower in unequal than in equal groups, even though the average shares contributed are similar). Both low and high endowment types contribute smaller shares in communes characterized by higher corruption.

We find that individuals' own contributions are positively correlated with beliefs about average contributions of others in their group. In communes with high corruption, both high and low endowment individuals have more pessimistic expectations about their fellow group members' contributions than those in low-corruption areas, in line with our theoretical framework. Overall, the results are consistent with the view that rising inequality harms collective action in rural areas of developing countries, and that this relationship is intensified by pessimistic expectations about cooperation, which may in turn be generated by high levels of corruption.

Vietnam is a particularly informative context for conducting this study. First, collective action issues are widely recognized as being important in rural Vietnam. A large share of agriculture is irrigation-based and therefore requires collective action to build and maintain irrigation infrastructure (World Bank, 2016). Our experiment is implemented in areas where irrigation is prevalent. Also, due to population pressure, common property resources such as forestry, fishery and water resources are scarce.[4] Second, while income dispersion has

[3]In general, there is significant value in conducting experiments in settings other than the standard university lab where most experimental participants are 'WEIRD' i.e., from Western, Educated, Industrialized, Rich and Democratic societies (Henrich et al., 2010).

[4]The Vietnamese government plays an important part in providing irrigation infrastructure (Markussen

increased less in Vietnam than in China and other post-socialist countries, there have been marked increases in inequality in rural areas in recent years (Benjamin et al., 2017). Third, corruption is a significant issue in Vietnam (Bai et al., 2019; Sharma et al., 2021). To illustrate, in 2017, Vietnam was ranked 107 out of 180 countries on Transparency International's index of perceived corruption in the public sector. Petty corruption remains rampant.

Our study brings together three research strands. The first is the literature on the effects of economic inequality on voluntary cooperation. Income and wealth inequalities reduce identification and solidarity across social groups, and undermine the institutional framework underpinning cooperation (e.g., Bardhan et al., 2007; Dayton-Johnson and Bardhan, 2002). When it comes to cooperation, many people arguably have reciprocity preferences such that they are willing to contribute to the public good as long as others reciprocate fairly (Fischbacher et al., 2001).[5] From this perspective, inequality makes cooperation harder as it is more difficult to determine what constitutes a 'fair' contribution in an unequal group. In unequal groups, people may view equal absolute contributions or equal contribution shares or contributions that equalize ex-post income or utility as 'fair' (Reuben and Riedl, 2013). This ambiguity renders coordination on socially optimal equilibria more difficult, as highlighted in the theoretical framework in Section 2.

The experimental evidence on the effects of endowment inequality on cooperation is inconclusive. While Anderson et al. (2008), Buckley and Croson (2006), Cherry et al. (2005) and Hargreaves-Heap et al. (2016) find that inequality reduces public good contributions, others find evidence that inequality increases contributions (e.g., Chan et al., 1996; Visser and Burns, 2015). However, meta-analyses show that, on average, heterogeneous endowments

et al., 2011), regulating resource use and many other local-level issues (e.g., World Bank, 2016). However, self-organized collective action remains important and small-scale infrastructure is deemed villagers' responsibility (Carlsson et al., 2015). Also, perhaps the most important and difficult collective action problem in a non-democratic single-party setting, such as Vietnam, is to keep the local government accountable.

[5]Other reasons for contributions noted in the literature are altruism, warm glow and inequality aversion (e.g., Buckley and Croson, 2006; Chaudhuri, 2011).

negatively affect contributions (Zelmer, 2003). The present study also adds to the very small number of studies of this type conducted in the field in a developing country (Visser and Burns, 2015).

Second, our work relates to the literature on corruption. Corruption is pervasive in developing countries and mainly benefits relatively well-off members of society including public officials (Olken and Pande, 2012). Corruption decreases the efficiency of public goods provision on account of rent extraction (e.g., Beekman et al., 2014; Reinikka and Svensson, 2004) and also by dampening citizens' motivation to contribute (Cagala et al., 2019). The reduced motivation can be due to betrayal aversion (Bohnet and Zeckhauser, 2004; Cubitt et al., 2017), self-serving beliefs (Di Tella et al., 2015) and reciprocity (Sugden, 1984). Exposure to corruption has also been shown to affect dishonest behavior, willingness to bribe, and propensity to punish corrupt behavior (Ajzenman, 2021; Barr and Serra, 2010; Cameron et al., 2009).

Third, the present contribution broadly relates to the literature on the effect of institutions on individual preferences and beliefs. Preferences related to cooperation, trust, and redistribution have been shown to be influenced by historical institutions (Bigoni et al., 2018; Putnam, 2000), exposure to conflict (Bauer et al., 2016), identity of leaders (Gangadharan et al., 2016), property rights (Di Tella et al., 2007), and market conditions (Khadjavi et al., 2021). Gächter and Renner (2018) find that institutions have multiplier effects whereby bad examples such as corruption and unethical behavior shape citizens' behavior and beliefs about how others will react. We investigate whether such bad examples outside the lab (i.e., experience of corruption) affect behavior inside it.

We proceed as follows. Section 2 presents a theoretical framework. Section 3 provides details of the study design and procedures. Section 4 describes the sample and the empirical specification. Section 5 presents the results while Section 6 concludes.

2 Theoretical framework

This section presents a theoretical framework of the relationship between inequality, corruption and beliefs about contributions to public goods. Consider a situation where a group of individuals (indexed by i) with endowments E_i choose contributions, c_i, to a public good. Assume that people have reciprocity preferences i.e., that they value 'fairness' when choosing contributions (e.g., Rabin, 1993; Fehr and Gächter, 2000).

Everyone has one of two principles of fairness (PoF), cf. Reuben and Riedl (2013):[6]

$$\text{Absolute PoF:} \quad c_i = c_j \quad \text{for all} \quad i, j$$

$$\text{Relative PoF:} \quad \frac{c_i}{E_i} = \frac{c_j}{E_j} \quad \text{for all} \quad i, j$$

So, people are 'conditional co-operators' (Fischbacher et al., 2001; Fischbacher and Gächter, 2010), but condition their contributions on the contributions of others according to different principles. Contributions to public goods are made simultaneously. This, combined with the valuation of fairness, means that beliefs about the contributions of others are essential determinants of one's own contribution. The following focuses on the role of these beliefs.

For simplicity, we assume that there are two groups, the poor and the rich, with endowments E_p and E_r, respectively. Consider the beliefs of the poor about the contributions of the rich denoted by b_{pr}. Depending on the PoF of a rich individual, this person's contribution falls within a certain interval. This interval is bounded by zero and a maximum value denoted by b_{pr}^{max}.

If a rich person has an absolute PoF, then the maximum contribution is E_p, which is the

[6] A third potential PoF, namely that fair contributions entail equal *ex-post* earnings, is ignored. This principle implies that the rich contribute a larger share of their endowment than the poor. This is rarely observed in experimental data (e.g., Cherry et al., 2005; Buckley and Croson, 2006; Hargreaves-Heap et al., 2016; Martinangeli and Martinsson, 2020).

highest contribution the poor could possibly match. If the rich individual has a relative PoF, the maximum contribution is E_r, corresponding to the belief that everyone else contributes 100 percent of their endowment.

Denote the share of the poor who believe the rich to have a relative PoF by ϕ. The average value of b_{pr}^{max} across the population of the poor then equals $\phi E_r + (1-\phi)E_p$. Within the interval of possible contributions established by PoF, $[0,b_{pr}^{max}]$, which contributions do the rich actually choose? Assume that the poor on average expect the rich to contribute some fraction, λ, of b_{pr}^{max}. We then have that:

$$b_{pr} = \lambda(\phi E_r + (1-\phi)E_p) \tag{1}$$

Now consider how beliefs (i.e., λ and ϕ) depend on the local environment. In particular, assume that beliefs are more pessimistic in a more corrupt environment, i.e., $\frac{\partial \phi}{\partial K} < 0$ and $\frac{\partial \lambda}{\partial K} < 0$, where K denotes the degree of corruption. This assumption is reasonable because corruption is essentially a 'reverse public goods game': the corrupt extract from a pool of public resources to the detriment of others. Hence, experience of corruption is equivalent to experience with low contributions in public goods games (cf. Cagala et al., 2019).[7]

The effect of corruption on beliefs can be seen by differentiating (1) wrt. K:

$$\frac{\partial b_{pr}}{\partial K} = \frac{\partial \lambda}{\partial K}(\phi(E_r - E_p) + E_p)) + \lambda \frac{\partial \phi}{\partial K}(E_r - E_p) < 0 \tag{2}$$

The absolute value of this expression is increasing in $(E_r - E_p)$, i.e., in the difference between

[7]In particular, beliefs about principles of fairness are expected to be more pessimistic in a high-corruption environment for the following reason. It is plausible that there is some amount of 'self-serving bias' in the adoption of fairness principles i.e., given the availability of several reasonable principles, individuals are biased in favor of the one that serves their own material interests (Blaufus et al., 2015; Deffains et al., 2016). For example, it serves the material interests of a rich individual to adopt an absolute principle of fairness, since this implies a lower obligation to contribute than a relative principle of fairness (for any non-zero contribution by the poor). We may further assume that such bias is stronger in places where self-serving behavior by high-status individuals is common, as in places with high corruption in government.

the rich and the poor. This is the main hypothesis of the paper:

Hypothesis 1: *Inequality has a stronger, negative effect on cooperation in a more corrupt society.*

In particular, in an equal society ($E_r = E_p = E$), the expressions above reduce to: $b_{pr} = \lambda E$ and $\frac{\partial b_{pr}}{\partial K} = \frac{\partial \lambda}{\partial K} E$, respectively. In words, beliefs about principles of fairness (ϕ) do not matter in an equal society. A numerical example is provided in online Appendix A.

The framework so far considers the beliefs of the poor about the rich.[8] The reason is that the beliefs of the rich about the contributions of the poor (b_{rp}) are not affected by beliefs about the PoFs of the poor in the same way as in the opposite case. In particular, the feasible range of contributions by the poor is $[0, E_p]$ regardless of whether the poor have a relative or an absolute PoF.

When there is more than one rich individual in a group, as in our experiment, the beliefs of the rich about *other* rich individuals also matter. As long as both rich and poor individuals exist in every group, these beliefs are analogous to the beliefs of the poor about the rich, and therefore affected by inequality in the same way.[9,10]

Note that the framework is relevant in a setting where individuals carry beliefs from one environment (their local community) into another (the lab), where they play a public goods game with individuals from the first environment. The setting of our experiment is of this

[8]Naturally, the contributions of the poor depend both on their beliefs about the rich and on their own PoFs. The key point is that regardless of own PoF, more pessimistic beliefs always (weakly) lead to lower contributions.

[9]This assumes that the rich do not have more information about the PoFs of the other rich than the poor do, i.e., for example that PoFs are not correlated across individuals within an income class in a given group (such that knowledge of own PoF allows one to guess the other person's). While this is plausible in some real-life contexts, our assumption is reasonable in the experiment presented below, where assignment to group and income class is random.

[10]Similarly, when are multiple poor individuals in a group, the beliefs of the poor about the contributions of the other poor individuals will not matter as once again the feasible range of contributions is independent of the PoFs of the poor.

nature.

To sum up, the model shows that uncertainty about the public goods contributions of others is higher in more unequal societies than elsewhere, because uncertainty about principles of fairness plays a larger role in such places. Because uncertainty is higher, pessimistic beliefs matter more. Corruption is likely to be a source of pessimistic expectations about cooperation and therefore inequality has a stronger, negative effect on cooperation in a more corrupt society.

3 Study design and procedures

3.1 Study design

The study was divided into two parts: the first part was a series of experimental tasks and the second a post-experiment survey. The experimental part consisted of three tasks conducted sequentially, with no feedback being provided between tasks. The first task varied across sessions in terms of endowments while the second and third tasks were uniform across all sessions.

The first task was a standard linear one-shot public goods game.[11] All subjects were randomly and anonymously divided into groups of four and did not know the identity of others in their group. Each group member received an initial endowment and had to indicate the amount of money they wanted to allocate to the group account, with the remainder automatically accruing to their private account. The total amount allocated to the group account by all four members was doubled and then distributed equally among them. The total earnings

[11]The second task was a trust game, using the strategy method, where all subjects played the role of sender and receiver. The third task was a game to measure honest behavior. Experimental instructions are provided in online Appendix C.

per subject, therefore, was the sum of earnings from the group account and the money in the private account. The payoff function is as follows: $\pi_i = E_i - c_i + 0.5 \sum_{j=1}^{4} c_i$, where π_i, E_i, and c_i are the total earnings, initial endowment, and public good contribution of individual i, respectively. The marginal per capita return (MPCR) is 0.5. This implies a social dilemma where for a self-interested and rational individual, the dominant strategy is to free-ride and contribute nothing, while the social optimum for a group is achieved if all members contribute the full endowment to the group account.

As our interest is in understanding the effect of inequality on contribution to public goods, we had two treatments of the public goods game. In the first treatment (equal), all subjects had an initial endowment of VND 60,000.[12] In the second treatment (unequal), we induced inequality such that half the subjects in each group had endowments of VND 30,000 (low) while the other half had VND 90,000 (high). In both treatments, the total initial group endowments were fixed at VND 240,000. We used a between-subjects design, i.e., each subject only played in one treatment of the game.

Upon completion of the first part of the task, there was an incentivized belief elicitation component wherein subjects were asked to estimate the average of the remaining group members' contributions (as in Thöni et al., 2012). They were presented with possible ranges of allocations to the group account and were asked to indicate the range they believed the other three group members had on average allocated to the group account. Based on ex-post calculations of contributions, if the participants' beliefs were accurate, they received VND 30,000 and 0 otherwise in the equal treatment. In the unequal treatment, subjects had to indicate how much they believed the other group members with low and high endowments allocated on average to the group account separately. They received VND 30,000 for each accurate guess, and 0 otherwise.

[12] At the time of the study, the exchange rate was 1 USD = 22,500 Vietnamese Dong (VND).

Upon completion of the experimental tasks, one of the three tasks was randomly selected for payment based on a dice roll and was announced to the subjects. However, they were informed of their individual earnings only after the completion of a post-experiment questionnaire.[13] Enumerators conducted individual face-to-face interviews with all subjects to complete the questionnaire. This collected information on background characteristics and responses to non-incentivized questions on willingness to take risk, trust and helpfulness etc.

As part of the post-experiment questionnaire, subjects were presented with statements to elicit individual experiences and beliefs about corruption in the public sector with specific reference to bribery to obtain land titles, to get a government job, to receive medical treatment etc. Subjects were asked how much they agreed with each of the six presented statements on a 4-point scale where 1 meant 'agree completely', 2 meant 'somewhat agree', 3 meant 'disagree' and 4 meant 'disagree completely'. These statements were taken from a summary indicator of the quality of governance titled 'Vietnam Provincial Governance and Public Administration Performance Index' (hereafter, PAPI).[14] To create a commune-level corruption measure, for each statement, subjects indicating agreement (i.e., agree completely or somewhat agree) are coded as 1, and those expressing disagreement are coded as 0, such that the sum of responses for each subject lies between 0 and 6. We then construct the commune-level index as an average of the individual responses. Finally, we construct a binary variable 'High corruption' that takes a value 1 for communes with a commune-level index above the sample median, and 0 for communes below the sample median. In Section 5.1, we show that our results are robust to different ways of constructing the corruption index.

After subjects completed the post-experiment questionnaire, they received their individual

[13]We announced the chosen task, upon completion of the experimental tasks but *before* the questionnaire so that subjects were free to leave once their questionnaire was completed.

[14]PAPI is a survey that has been conducted annually since 2009 across Vietnam, to measure the performance of central and local governments in governance and public service delivery.

earnings in sealed envelopes. The average duration of a session was between 2 and 2.5 hours. The average amount earned was approximately VND 142,000 (about 6.5 USD) which was inclusive of a participation fee of VND 50,000. This compares favorably with the average daily wage of VND 166,700 in rural Vietnam in 2016.

Overall, we conducted 112 sessions across 56 communes such that in each commune, one session of each treatment of the public goods game (equal and unequal endowments) was organized. Finally, we also conducted a brief commune-level survey, administered face-to-face to a senior knowledgeable official in the commune. This elicited information about the commune demographics and availability of infrastructure etc.

3.2 Study procedures

The study was conducted in May-June 2017 in 56 rural communes across 22 provinces in the Red River Delta (north) and Mekong River Delta (south) of Vietnam (Figure B1 in the online Appendix). We focused on the north and south of Vietnam as recent work finds that different historical trajectories have led to cultural and economic differences (e.g., Ho et al., 2019).

Two sessions with 12 subjects each were organized in each commune, leading to a sample of 1,344 subjects. Sessions were conducted in spaces provided by the commune headquarters, and were organized in the morning and in the afternoon.[15]

We obtained listings of households in the communes, and the study team contacted the households to advertise the study and to encourage participation. The study was advertised as trying to understand social change in rural Vietnam, and individuals were informed that they would earn a fixed participation fee of VND 50,000 along with a chance to earn more. If

[15]We randomized the sequence of equal and unequal endowment sessions across communes.

more than 12 individuals showed up at a given time, then 12 of them were randomly picked to participate. The remaining individuals were paid the show-up fee and asked to leave. We excluded the participation of commune officials and individuals under the age of 18 in our study.

Experiments were conducted in Vietnamese, and using pen and paper. Experimenters read out aloud the instructions for each task one at a time. To ensure comprehension, examples were presented and practice quizzes were administered to ensure that subjects understood the payoff implications of their decisions. A photograph of an experiment session is in Figure B2 in the online Appendix.

4 Data and empirical strategy

4.1 Sample description

Table B1 reports the summary statistics for the individual characteristics used in our analysis. We do not find much difference between the observed characteristics of individuals assigned to the equal or unequal treatment (except for the share of married individuals), indicating that the randomization of individuals was successful. Further, we are also unable to reject the null that the pre-determined individual characteristics are jointly different across the two treatments (F-test $p - value = 0.48$).

Moreover, the study subjects are broadly representative of the rural population of these provinces (Table B2 in the online Appendix). Comparing the experiment subjects with the rural population of the 22 provinces sampled in the Vietnam Household and Living Standards Survey (VHLSS) 2016, we find that the two samples are quite similar but the experiment subjects are more educated. Positive selection based on education into participation in such

artefactual field experiments has also been shown previously (e.g., Frijters et al., 2015).

The corruption statements are summarized in Table B3 in the online Appendix. Approximately 33 and 37 percent of subjects respectively agree that bribes are important for receiving medical treatment and to get a government job. Twenty-eight percent agree that bribes are needed to get land titles while 26 percent agree that bribes have to be paid to teachers to better attend to one's children. Approximately 20 and 16 percent respectively believe that public officials receive kickbacks for granting construction permits and that officials divert state funds for private gains.

As a validation check for our corruption data, we use data from PAPI reports, available at the province level and check its correlation with our own survey data also aggregated to the province level. These six statements are a subset of the 'control of corruption' sub-index from PAPI. We find that the average responses from our survey are fairly strongly and significantly correlated with the PAPI 'control of corruption' sub-index for 2017 ($Spearman's\, rank\, correlation = 0.5, p - value = 0.02$).[16]

4.2 Empirical specification

We first use OLS regressions to estimate the effect of inequality on cooperation using the following equation:

$$C_{isj} = \alpha_0 + \alpha_1 Unequal_{sj} + \sum_{l=2}^{K} \alpha_l X_{isj} + \upsilon_j + \epsilon_{isj} \tag{3}$$

[16]Since the corruption statements were asked after the experiments, a concern may be that exposure to randomly generated inequality in the public goods game may affect responses on corruption questions. We do not find any significant differences in reported corruption based on exposure to the inequality treatment ($p - value = 0.64$). Table B4 in the online Appendix shows in a regression framework that the corruption index is not affected by the experimental treatment.

where the outcome variable, C_{isj}, is the contribution to the public good (measured either as amount or share contributed) by participant i in session s in commune j; $Unequal_{sj}$ is a dummy variable that indicates a session s with unequal endowments in commune j. The coefficient α_1 captures the effect of inequality in endowments on contributions to the group account. X_{isj} includes individual-level controls discussed in Table B1, i.e., age, gender (takes a value 1 for female), education (takes a value 1 for those who have completed high school), marital status (takes a value 1 if married), ethnicity (takes a value 1 for the ethnic majority Kinh), poverty status (takes a value 1 for those classified as poor by the government), and household's asset ownership. In addition, we include commune fixed effects (υ_j) to account for common factors that affect all individuals within a commune. Standard errors are clustered at the session level as there may be correlation in the error terms between individuals in the same session.

To examine the differences in responses by low and high endowment participants, we modify equation 3 as follows:

$$C_{isj} = \beta_0 + \beta_1 LowEndw_{isj} + \beta_2 HighEndw_{isj} + \sum_{l=3}^{K} \beta_l X_{isj} + \upsilon_j + \epsilon_{isj} \tag{4}$$

where $LowEndw_{isj}$ and $HighEndw_{isj}$ are dummy variables for participants with low and high endowments in a session with unequal endowments, respectively. The coefficients β_1 and β_2 capture how the contributions by low and high endowment participants differ from those in sessions with equal endowments, respectively. We also test if $\beta_1 = \beta_2$ to check whether contributions by low and high endowment participants differ significantly.

Finally, we interact the endowment terms with the indicator variable for high corruption to

understand the joint effect on cooperation in the following manner:

$$C_{isj} = \gamma_0 + \gamma_1 LowEndw_{isj} + \gamma_2 HighEndw_{isj} + \gamma_3 LowEndw_{isj} * HighCorruption_j \quad (5)$$
$$+ \gamma_4 HighEndw_{isj} * HighCorruption_j + \sum_{l=5}^{K} \gamma_l X_{isj} + \upsilon_j + \epsilon_{isj}$$

Note that we cannot include the corruption indicator separately as it is collinear with commune fixed effects (υ_j). Our coefficients of interest are γ_3 and γ_4. If $\gamma_3 < 0$ ($\gamma_4 < 0$), it implies that low (high) endowment participants in high corruption communes contribute less than low (high) endowment participants in low corruption communes. Further, $\gamma_1 + \gamma_3$ and $\gamma_2 + \gamma_4$ capture the marginal effect of low and high endowment respectively in a high corruption commune, relative to having equal endowments. If $(\gamma_1+\gamma_3)$ - $(\gamma_2+\gamma_4) > 0$, contributions by low endowment participants are greater than those by high endowment participants in the presence of high corruption. Standard errors are clustered at the commune level.

5 Results

5.1 Cooperation

The average amount contributed to public goods is 31,186 VND and the average share contributed is approximately 55 percent. The number of free riders is low, only 30 out of 1,344 subjects. On the other hand, approximately 20 percent contributed the full amount. These numbers are in line with findings from other one-shot public goods games where 40-60 percent contributions are typically observed (e.g., review in Chaudhuri, 2011) and previous evidence from Vietnam (e.g., Parks and Vu, 1994; Carpenter et al., 2004; Carlsson et al.,

2015).[17]

As seen in Figure 1, the average amount contributed is significantly larger in the equal treatment ($p - value \leq 0.001$). Figure 2 also shows that, at the group-level, the size of the public good created is significantly smaller in groups with heterogeneous endowments (Kolmogorov-Smirnov test $p - value = 0.001$). Within unequal groups, as seen in Panel (a) of Figure 1, high endowment individuals contribute significantly greater amounts than those with low endowments ($p - value \leq 0.001$). Panel (b) of Figure 1 shows that the share contributed does not vary significantly between equal and unequal treatments. However, the share contributed by the low endowment subjects is significantly greater than the share contributed by high endowment individuals ($p - value \leq 0.001$).

The pooled data may mask heterogeneous effects of inequality across different institutional environments. In Table 1, we examine within-commune differences in high corruption communes (Panel B) and low corruption communes (Panel C). The amounts and shares contributed in equal and unequal treatment sessions are statistically similar in low corruption communes. However, the amounts and shares contributed in equal treatment sessions are significantly higher than in unequal sessions in the high corruption communes (Wilcoxon paired signed-rank test $p - value \leq 0.001$ and $p - value = 0.035$ respectively). Further, the beliefs about others' contributions are also significantly different between unequal and unequal sessions only in the high corruption communes ($p - value = 0.001$).[18] These results are consistent with Hypothesis 1, which states that the negative effect of inequality is higher in a more corrupt environment.

Next, we estimate equations (3) and (4) to examine the relationship between contribution to the public good and inequality at the individual level in a regression framework. In

[17] We also do not find any significant differences in behavior in the amounts and share contributed between the Red River Delta and Mekong River Delta regions ($p - value = 0.64$ and $p - value = 0.38$ respectively).

[18] The unmatched differences across communes are in Table B5 in the online Appendix.

Table 2, the outcome variable is amount contributed in columns 1-4 and share of one's endowment allocated to the public good in columns 5-8. Column 1 shows that subjects in unequal groups contribute significantly lower amounts than those in equal groups. We split the subjects in the unequal endowment group into low and high with the equal group being the omitted category. Column 3 shows that those with low endowments contribute a significantly smaller amount than those in equal groups, while those with high endowments contribute a significantly larger amount.

In terms of share contributed, there is no significant difference between equal and unequal groups (column 5). When considering the share allocated in column 7, we find that low endowment subjects contribute a larger share than those in equal groups while high endowment subjects contribute a smaller share. Further, the share contributed by high endowment subjects is also significantly smaller than that contributed by low endowment subjects. Finally, consistent with the effect of inequality in column 1, the joint effect of low and high endowment is not significantly different from zero ($p - value = 0.28$).

These results are robust to the addition of control variables (columns 2, 4, 6, and 8). We observe a significant positive effect of age on cooperation. This could either be a life cycle effect such that people become more cooperative as they grow older, or a cohort effect implying that collective action might be weakening over time in rural Vietnam.[19]

Next, we examine how the relationship between inequality and cooperation differs across communes with varying levels of corruption. We examine this in a regression framework as defined in equation (5). Our coefficients of interest are the interaction of the high corruption indicator with inequality. Columns 1 and 2 in Table 3 show that those in unequal groups contribute significantly smaller shares to public goods in more corrupt communes. Further,

[19]Results for amount and share contributed are robust to using Tobit regressions (Table B6 in the online Appendix) and to including controls for incentivized trust (i.e., share sent by sender in the trust game) and non-incentivized willingness to take risk (Table B7 in the online Appendix).

in columns 3 and 4, it is evident that both high and low endowment subjects contribute significantly smaller shares in communes with high corruption.[20] As can be seen in the bottom panel of Table 3, while contributions fall in high corruption communes, we find that the low endowment subjects continue to contribute significantly higher shares compared to high endowment subjects. Together, these results suggest that corruption is associated with stronger, negative effect of inequality on cooperation, consistent with Hypothesis 1.

We also examine the robustness of our results to different ways of measuring commune-level corruption. The first is a continuous commune-level index, based on the average of individual responses, that lies between 0 and 6. In a second check, we utilize the degree of agreement with the corruption statements. For each individual we construct a continuous measure of corruption by coding responses to range from 1 to 4 such that the individual score ranges from 1-24 (with higher scores indicating more agreement). We then construct an indicator of high corruption based on whether the commune average falls above the sample median. The third is where the sample is restricted to communes where the corruption index is either high or low to account for the fact that communes close to the median may be quite similar in terms of corruption. We construct a high corruption indicator that takes value 1 if the corruption index is above the 70th percentile and 0 if the corruption index is below the 30th percentile. The fourth corruption measure is based on forming the high corruption indicator by excluding the first statement in the corruption inventory ("in my commune/ward, officials divert funds from the state budget for their personal benefit") as it may be the case that the first statement captures beliefs more than experiences. Tables B9-B12 of the online appendix show that our main results in Table 3 are robust to these changes.

[20]The results are similar with amount contributed as the outcome variable (Table B8 in the online Appendix).

5.2 Beliefs

In this section, we start by showing, in accordance with our theoretical framework and with the literature on conditional cooperation (e.g., Fischbacher et al., 2001; Fischbacher and Gächter, 2010; Gächter and Renner, 2018; Thöni et al., 2012), that in our sample, subjects base their own contribution decisions on how much they believe others contribute to the public good. More importantly, we examine the effect of inequality on beliefs, and whether these beliefs are even more pessimistic in the presence of corruption.

Figure B3 shows that one's belief about average shares contributed by one's group members is positively correlated with one's own contribution. This relationship between one's contribution and beliefs regarding contributions by others in the group is explored in a regression framework in Table 4. In both the pooled sample and when limiting the sample to the equal endowment groups, we find that there is a positive and significant correlation between average beliefs and own contributions (columns 1 and 2). However, within the unequal groups in column 3, we find that beliefs about contributions of high endowment subjects are significantly more important than those of low endowment subjects in determining one's contribution to the public good ($p - value = 0.09$). Further, when analyzing this relationship based on individuals' own endowment, we find that for high endowment subjects, their own contribution is dependent on their beliefs about contributions of other similar high endowment members than on their beliefs of low endowment group members ($p - value \leq 0.001$). On the other hand, column 4 shows that low endowment subjects' contributions are conditioned similarly based on beliefs about other high and low endowment group members ($p - value = 0.56$).

The theoretical framework presented in Section 2 states that the interaction between inequality and corruption, which is documented above, is driven by beliefs. We therefore go on to exploring interactions between inequality and corruption in a model for beliefs. Regressions

presented in Table 5 show that inequality negatively affects beliefs regarding contributions by others in the group and that this effect is stronger in communes with high corruption ($p - value = 0.103$) (column 1). In column 2, we find that low endowment subjects in high corruption communes report significantly lower beliefs than low endowment subjects in communes with low corruption. Overall, both low and high endowment subjects report lower beliefs regarding the contributions of others under high corruption, and those reductions are not significantly different from each other ($p - value = 0.67$).

We note that an alternative explanation for the systematic positive correlation between beliefs and contributions could be the 'false consensus effect' whereby people believe that others behave in the same way as they do (Ross et al., 1977; Engelmann and Strobel, 2000). This implies that actions shape beliefs rather than beliefs shaping actions. While we are unable to test this, results from other studies suggest that even if this effect exists, it may not be responsible for all of the correlation between contributions and beliefs (Frey and Meier, 2004; Fischbacher et al., 2001; Fischbacher and Gächter, 2010).[21]

To summarize, we find evidence that beliefs play a role in explaining our results. Furthermore, we find that inequality worsens beliefs, and that the negative effect of inequality on beliefs is strongest in high-corruption communes.[22] These findings are in line with the framework presented in Section 2.

[21]If differences in institutions affect beliefs, we would expect at least some of the variance in beliefs to be driven by across- rather than within-commune differences. On the other hand, the false consensus effect would mainly manifest itself in within-commune variation. To investigate this, we decompose the standard deviation of beliefs into parts coming from within communes and across communes, respectively. We find that the beliefs of free riders exhibit relatively small differences within communes and larger differences across communes. The beliefs of the full contributors exhibit more volatility within communes, similar to the amount of variation across communes. While the results of this analysis do not rule out the false consensus interpretation, they are also consistent with the view that beliefs drive contributions and that at least some of the variation in beliefs stems from variation in institutions across communes.

[22]In Table B13 in the online Appendix, we also show that corruption is associated with more adverse beliefs about the pro-sociality of one's fellow citizens more generally.

5.3 Heterogeneity by real-life wealth

In this section, we leverage the rich background information collected on the participants to check if the behavior in the laboratory depends on the real-life wealth status. Real-world wealth has been found to shape social preferences and beliefs (e.g., Cardenas, 2003; Sands and de Kadt, 2020). Using the wealth status of the participants, we construct an individual-level 'low asset' indicator which takes a value 1 if the number of assets owned is below the commune-specific median, and 0 otherwise, and re-estimate the main results presented in Tables 3 and 5 separately for individuals classified as those with low/high assets. As can be seen in Tables B14 and B15 in the online appendix, the coefficient on the interaction between inequality and high corruption is much more negative for individuals classed as 'low asset'. This indicates that the poor (low asset) respond more strongly to inequality in the presence of high corruption. This is arguably consistent with the theoretical framework in Section 2, which assumes that corruption leads to pessimistic beliefs: it is plausible that such beliefs are primarily formed among those who are most vulnerable to corruption, which are typically the poor.

6 Conclusion

We conducted a large-scale lab-in-the-field public goods experiment with over 1,300 participants across 56 communes in rural Vietnam to examine the effects of inequality on cooperation. Moreover, we wanted to investigate whether this effect varies with features of the local environment, in particular corruption in local governments. Our results show that aggregate contributions to the public good are significantly lower in unequal groups. However, there are no significant differences between equal and unequal groups in terms of share contributed. Within unequal groups, low endowment individuals contribute a higher share to

the public good than high endowment individuals. Further, both low- and high endowment types contribute smaller shares in communes characterized by higher corruption levels. In line with previous studies, we also find evidence supporting conditional cooperation such that individuals' own contributions are positively and significantly correlated with their beliefs about others' average contributions. Both high- and low endowment individuals believe others contribute smaller shares in areas with high corruption.

These results are consistent with our theoretical framework, which shows how corruption could increase the effect of inequality by generating pessimistic beliefs. Empirically, it is difficult to rule out completely that the corruption variable picks up other aspects of the local environment. Low quality institutions and low levels of social capital tend to reinforce each other and the effects of each element on beliefs and behavior are not easily disentangled (e.g., Putnam, 2000; Nannicini et al., 2013). While it is plausible that corruption is indeed a cause of pessimistic beliefs, the more general lesson is that aspects of the local environment, which stimulate such beliefs, strengthen the negative effects of inequality.

Ostrom (1990) and a number of other scholars have argued that government intervention is often not the optimal solution to local-level collective action problems, and that communities have significant capacity to solve such problems on their own. However, the result that poor individuals contribute a larger share of their endowment to public goods production than rich individuals is now emerging as a stylized fact (e.g., Buckley and Croson, 2006; Cherry et al., 2005, Hargreaves-Heap et al., 2016; Martinangeli and Martinsson, 2020). This has important implications for the distributional impacts of projects based on voluntary contributions. If we imagine, hypothetically, that public goods production in our experiment had been financed by a compulsory, proportional wealth tax equal to the average share contributed in the experiment, then ex-post inequality would have been lower than what we observe in our data. Proportionality is arguably the most common principle in taxation (for income taxes,

wealth taxes or value added tax), whereas this does not appear to be the case for voluntary contributions to joint projects. Hence, tax-based systems may be more egalitarian than systems based on voluntary commitment. In some respects then, government intervention may be superior to community-based solutions.

Finally, our results are consistent with the view that the voluntary contribution mechanism works least well in environments of high corruption. These are also the environments where tax-based systems tend to perform poorly. In this regard, our results support the conclusion that strengthening of local institutions is an essential prerequisite both for facilitating public goods production and for reducing inequality. Increasing the accountability of local governments, for example through competitive elections or transparency initiatives, is one important avenue for building stronger institutions.

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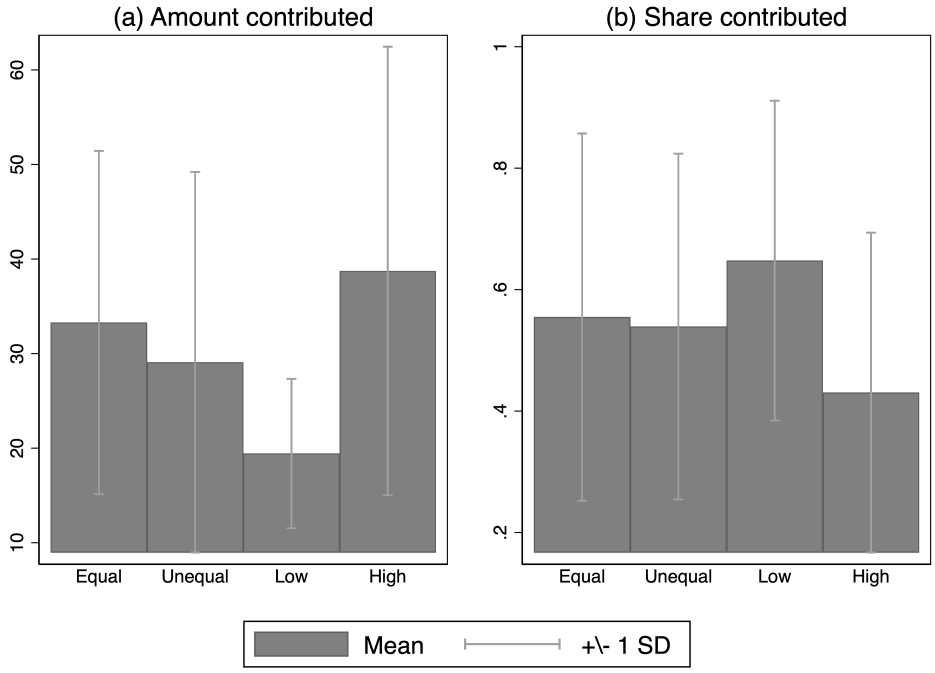
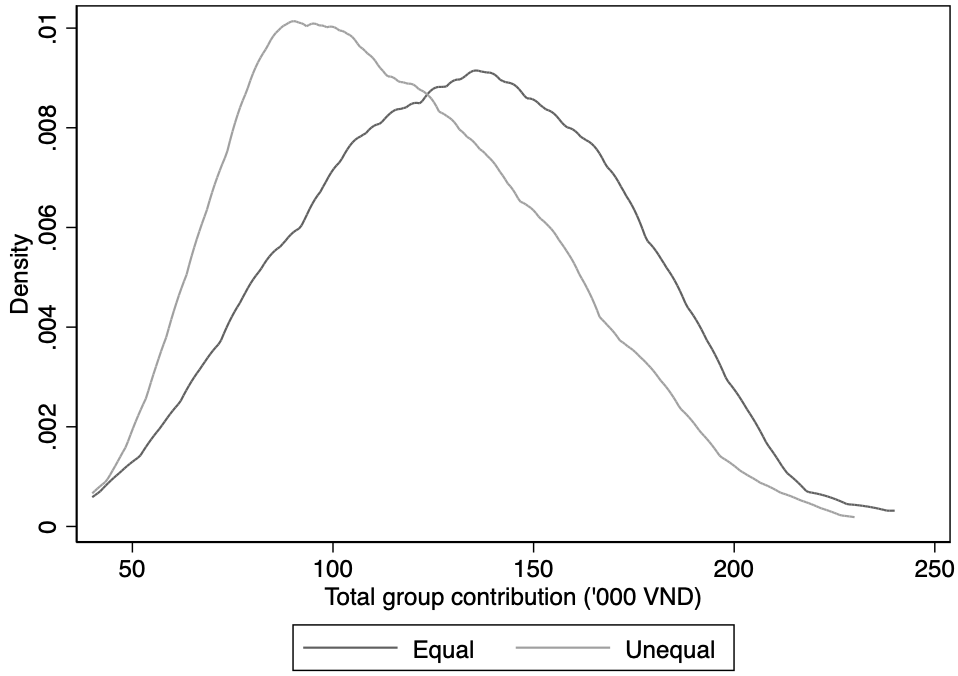
Figures and Tables

Figure 1: Public good contributions and endowment heterogeneity



Note: Authors' illustration based on experimental data. Amount contributed is in '000 VND.

Figure 2: Aggregate contributions to public good



Source: Authors' illustration based on experimental data.

Table 1: Matched differences in public good contributions

	Equal Endowments	Unequal Endowments	Wilcoxon paired signed-rank test (p-value)
	(1)	(2)	(3)
Panel A: Full sample			
Amt. contributed	33.284	29.089	0.001
Share contributed	0.555	0.539	0.374
Beliefs: av. share contributed	0.544	0.470	0.000
Panel B: High corruption communes			
Amt. contributed	35.565	28.007	0.000
Share contributed	0.593	0.526	0.035
Beliefs: av. share contributed	0.561	0.458	0.001
Panel C: Low corruption communes			
Amt. contributed	31.003	30.169	0.362
Share contributed	0.517	0.552	0.387
Beliefs: av. share contributed	0.528	0.482	0.142

Notes: Amount contributed reported in '000 VND.

Table 2: Amount and share contributed to public good

	Amount contributed				Share contributed			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unequal endowment	-4.196***	-3.937***			-0.016	-0.012		
	(0.886)	(0.886)			(0.014)	(0.014)		
Low endowment			-13.850***	-13.559***			0.093***	0.098***
			(0.878)	(0.882)			(0.017)	(0.017)
High endowment			5.458***	5.638***			-0.124***	-0.121***
			(1.299)	(1.296)			(0.017)	(0.017)
Female		-2.110*		-1.962*		-0.027		-0.029*
		(1.144)		(1.048)		(0.017)		(0.016)
Age		0.238***		0.226***		0.004***		0.004***
		(0.071)		(0.067)		(0.001)		(0.001)
High school education		-0.556		-0.371		-0.005		-0.007
		(1.314)		(1.169)		(0.019)		(0.019)
Married		-1.307		-0.756		0.007		0.001
		(1.803)		(1.588)		(0.025)		(0.025)
Kinh		-1.201		-0.146		0.006		-0.006
		(2.471)		(2.265)		(0.037)		(0.036)
Assets		0.328		0.288		0.002		0.003
		(0.272)		(0.255)		(0.004)		(0.004)
Poor household		1.540		0.859		-0.002		0.006
		(2.115)		(2.095)		(0.035)		(0.033)
Constant	33.284***	24.429***	33.284***	23.710***	0.555***	0.399***	0.555***	0.407***
	(0.627)	(4.033)	(0.627)	(3.701)	(0.010)	(0.063)	(0.010)	(0.060)
Wald test p-value:								
$\beta(Low) = \beta(High)$			0.00	0.00			0.00	0.00
Commune FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1344	1343	1344	1343	1344	1343	1344	1343
R-squared	0.067	0.084	0.19	0.21	0.068	0.085	0.14	0.15

Notes: Amount contributed reported in '000 VND. Poor household is an indicator variable for respondent's household being classified as poor by the government. Standard errors clustered at the session level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table 3: Share contributed and corruption

	(1)	(2)	(3)	(4)
Unequal endowment	0.035	0.038		
	(0.027)	(0.028)		
Unequal*High Corruption	-0.102***	-0.099**		
	(0.038)	(0.038)		
Low endowment			0.134***	0.139***
			(0.028)	(0.027)
High endowment			-0.063*	-0.064*
			(0.033)	(0.034)
Low Endw*High Corruption			-0.082*	-0.082*
			(0.043)	(0.042)
High Endw*High Corruption			-0.122***	-0.114***
			(0.041)	(0.043)
Constant	0.555***	0.396***	0.555***	0.406***
	(0.009)	(0.063)	(0.009)	(0.058)
Wald test p-value:				
$\gamma(Low) + \gamma(Low * HighCorr) = \gamma(High) + \gamma(High * HighCorr)$			0.00	0.00
Controls	No	Yes	No	Yes
Commune FE	Yes	Yes	Yes	Yes
N	1344	1343	1344	1343
R-squared	0.075	0.092	0.14	0.16

Notes: Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table 4: Share contributed and beliefs

	Full sample	Equal	Unequal	Unequal	
				Low	High
	(1)	(2)	(3)	(4)	(5)
Beliefs: av. share contributed	0.592***				
	(0.039)				
Beliefs: share contributed		0.590***			
		(0.056)			
Beliefs: share contributed by Low			0.217***	0.359***	0.061
			(0.071)	(0.076)	(0.075)
Beliefs: share contributed by High			0.413***	0.276***	0.556***
			(0.052)	(0.069)	(0.077)
Constant	0.148**	0.144*	0.158*	0.269**	0.069
	(0.057)	(0.084)	(0.084)	(0.110)	(0.104)
Wald test p-value:					
$\beta(BeliefLow) = \beta(BeliefHigh)$			0.084	0.521	0.000
Controls	Yes	Yes	Yes	Yes	Yes
Commune FE	Yes	Yes	Yes	Yes	Yes
N	1343	672	671	335	336
R-squared	0.27	0.37	0.29	0.42	0.39

Notes: Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Standard errors clustered at the session level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table 5: Beliefs, inequality and corruption

	Beliefs: av. share contributed	
	(1)	(2)
Unequal endowment	-0.044*	
	(0.024)	
Unequal*High Corruption	-0.057	
	(0.034)	
Low endowment		-0.031
		(0.024)
High endowment		-0.058*
		(0.029)
Low Endw*High Corruption		-0.067*
		(0.035)
High Endw*High Corruption		-0.047
		(0.039)
Constant	0.452***	0.452***
	(0.048)	(0.048)
Wald test p-value:		
$\gamma(Low) + \gamma(Low * HighCorr) = \gamma(High) + \gamma(High * HighCorr)$		0.67
Controls	Yes	Yes
Commune FE	Yes	Yes
N	1343	1343
R-squared	0.12	0.12

Notes: Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Online Appendix: Inequality, institutions and cooperation

Not for publication

Markussen, Sharma, Singhal, Tarp

Appendix A: Theoretical framework - Example

This section presents a numerical example of the framework laid out in Section 2. Assume that there is a low corruption and a high corruption society. In a low corruption society (denoted by l), $\phi = 0.5$, $\lambda = 0.5$. In a high corruption society (h), $\phi = 0.25$, $\lambda = 0.25$. Endowments are as in the experiment: $E = 60$, $E_p = 30$, $E_r = 90$.

Then in a low corruption society, we have:

$$b_{pr}^{equal,l} = 0.5 * 60 = 30$$

$$b_{pr}^{unequal,l} = 0.5(0.5 * 90 + 0.5 * 30) = 30$$

$$\Delta b_{pr}^{l} = 30 - 30 = 0$$

In a high corruption society, we have:

$$b_{pr}^{equal,h} = 0.25 * 60 = 15$$

$$b_{pr}^{unequal,h} = 0.25 * (0.25 * 90 + 0.75 * 30) = 11.25$$

$$\Delta b_{pr}^{h} = 11.25 - 15 = -3.75$$

So, the change in beliefs due to inequality is higher in a corrupt society.

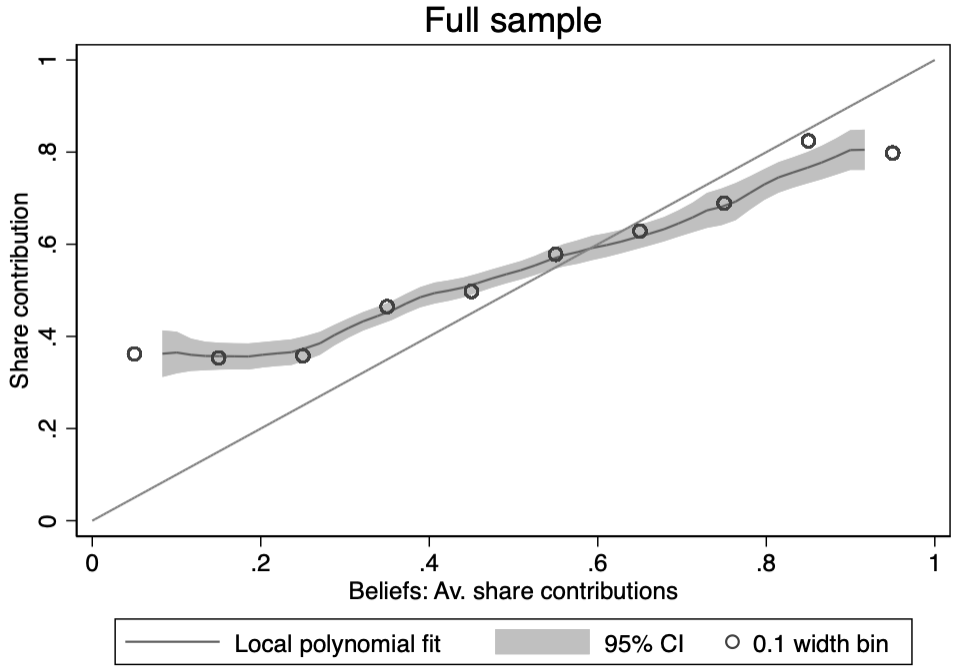
Appendix B: Supplementary figures and tables

Figure B1: Map of study provinces

Source: Authors' illustration.

Figure B2: An experimental session

Figure B3: Contributions and beliefs



Source: Authors' illustration based on experimental data.

Table B1: Summary Statistics

Variable	Full sample (1)	Equal Endowments (2)	Unequal Endowments (3)	Difference (4)
Female	0.52	0.51	0.53	0.02
	(0.50)	(0.50)	(0.50)	
Age	38.76	39.13	38.39	-0.74
	(10.58)	(10.57)	(10.58)	
High school education	0.54	0.53	0.56	0.03
	(0.50)	(0.50)	(0.50)	
Married	0.81	0.83	0.79	-0.04*
	(0.39)	(0.38)	(0.41)	
Kinh	0.93	0.92	0.93	0.01
	(0.26)	(0.27)	(0.25)	
Assets	9.04	9.11	8.97	-0.14
	(2.59)	(2.59)	(2.58)	
Poor household	0.08	0.08	0.08	0.00
	(0.27)	(0.27)	(0.27)	
F-test joint significance				0.93
F-test p-value				0.48
Number of sessions	112	56	56	
Observations	1344	672	672	1344

Notes: The table shows the balance in the key characteristics of participants in the experimental session. Poor household is an indicator variable for respondent's household being classified as poor by the government. Differences in column 4 are tested using two-sided proportions test (for dichotomous variables only) or t-test (all other variables). * significant at 10%,** significant at 5%,*** significant at 1%.

Table B2: Comparison of study sample with the VHLSS

Variable	Sample (1)	VHLSS 2016 (2)
Female	0.52	0.52
Age	38.76	42.43
High school education	0.54	0.27
Married	0.81	0.78
Kinh	0.93	0.95
Poor household	0.08	0.08
Observations	1344	6438

Notes: This table compares the sample characteristics with those in the 2016 Vietnam Household and Living Standards Survey (VHLSS 2016). The VHLSS 2016 figures are based on information collected from respondents of rural communes in the same 22 provinces as the experimental sample. The VHLSS did not collect information on the same assets reported in Table B1. Poor household is an indicator variable for respondent's household being classified as poor by the government.

Table B3: Corruption statements

	Statement	Mean (1)	SD (2)
1	In my commune/ward, officials divert funds from the state budget for their personal benefit.	0.16	0.37
2	People have to pay bribes in order to obtain a land title.	0.28	0.45
3	People like me have to bribe to receive medical treatment in the district's hospitals.	0.33	0.47
4	Parents have to pay bribes to teachers for their children to be better attended at the primary school nearest to my house.	0.26	0.44
5	In my commune/ward, officials receive kickbacks in exchange for approval of construction permits.	0.20	0.40
6	In order to get a job in the government, people have to pay a bribe.	0.37	0.48

Notes: This table reports the share of participants who agree with the given statements in the post-experiment survey.

Table B4: Robustness check: determinants of corruption

	(1)	(2)	(3)	(4)
Unequal endowment	-0.045	-0.050		
	(0.059)	(0.060)		
Low endowment			-0.065	-0.073
			(0.089)	(0.090)
High endowment			-0.024	-0.028
			(0.089)	(0.092)
Constant	1.616***	2.559***	1.616***	2.558***
	(0.042)	(0.360)	(0.042)	(0.359)
Controls	No	Yes	No	Yes
Commune FE	Yes	Yes	Yes	Yes
N	1344	1343	1344	1343
R-squared	0.16	0.18	0.16	0.18

Notes: The outcome variable in all regressions is the individual level corruption index, which takes values from 0-6. Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Standard errors clustered at the session level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B5: Differences in public good contributions

	All communes (1)	High corruption communes (2)	Low corruption communes (3)
Panel A: Amount contributed			
Equal	33.28	35.56	31.00
	(30)	(30)	(30)
	[18.14]	[17.96]	[18.06]
Unequal	29.09	28.01	30.17
	(24)	(20)	(30)
	[20.13]	[19.31]	[20.88]
Unequal-Low	19.43	19.35	19.52
	(20)	(20)	(20)
	[7.89]	[8.09]	[7.72]
Unequal-High	38.74	36.67	40.82
	(30)	(30)	(30)
	[23.71]	[23.06]	[24.23]
Panel B: Share contributed			
Equal	0.555	0.592	0.517
	(0.5)	(0.5)	(0.5)
	[0.302]	[0.299]	[0.3]
Unequal	0.539	0.526	0.552
	(0.5)	(0.5)	(0.5)
	[0.285]	[0.288]	[0.281]
Unequal-Low	0.648	0.645	0.65
	(0.67)	(0.67)	(0.67)
	[0.263]	[0.27]	[0.26]
Unequal-High	0.43	0.407	0.453
	(0.33)	(0.33)	(0.33)
	[0.263]	[0.256]	[0.27]
Panel C: Beliefs			
Equal	0.544	0.56	0.528
	(0.583)	(0.583)	(0.5)
	[0.25]	[0.244]	[0.255]
Unequal	0.47	0.458	0.482
	(0.44)	(0.44)	(0.44)
	[0.19]	[0.182]	[0.2]
Unequal-Low	0.478	0.461	0.494
	(0.44)	(0.44)	(0.5)
	[0.192]	[0.183]	[0.2]
Unequal-High	0.462	0.454	0.469
	(0.44)	(0.44)	(0.44)
	[0.191]	[0.181]	[0.201]

Notes: This table reports means, median in parentheses and standard deviation in square brackets. Amount contributed in reported in '000 VND. Beliefs are for the average share contributed.

Table B6: Amount and share contributed to public good: Tobit regressions

	Amount contributed		Share contributed	
	(1)	(2)	(3)	(4)
Unequal endowment	-3.818***		-0.013	
	(0.890)		(0.018)	
Low endowment		-13.530***		0.119***
		(0.887)		(0.023)
High endowment		5.796***		-0.138***
		(1.283)		(0.021)
Constant	29.165***	28.519***	0.532***	0.542***
	(5.233)	(4.882)	(0.099)	(0.095)
Controls	Yes	Yes	Yes	Yes
Commune FE	Yes	Yes	Yes	Yes
N	1343	1343	1343	1343

Notes: Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Standard errors clustered at the session level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B7: Amount and share contributed to public good: controlling for trust and risk preferences

	Amount contributed		Share contributed	
	(1)	(2)	(3)	(4)
Unequal endowment	-3.915***		-0.011	
	(0.847)		(0.014)	
Low endowment		-13.886***		0.093***
		(0.884)		(0.017)
High endowment		6.020***		-0.115***
		(1.293)		(0.018)
Willingness to take risk	0.497**	0.478**	0.007**	0.008***
	(0.196)	(0.188)	(0.003)	(0.003)
Trust	16.262***	17.630***	0.307***	0.293***
	(2.105)	(2.014)	(0.035)	(0.034)
Constant	12.351***	10.941***	0.183***	0.197***
	(3.932)	(3.708)	(0.064)	(0.060)
Wald test p-value:				
$\beta(Low) = \beta(High)$		0.00		0.00
Controls	Yes	Yes	Yes	Yes
Commune FE	Yes	Yes	Yes	Yes
N	1343	1343	1343	1343
R-squared	0.14	0.28	0.17	0.24

Notes: Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Trust is measured by the proportion of endowment sent by the sender in the investment game. Willingness to take risk takes values from 1-10. Standard errors clustered at the session level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B8: Amount contributed, inequality and corruption

	(1)	(2)
Unequal endowment	-0.697	
	(1.781)	
Unequal*High Corruption	-6.478***	
	(2.342)	
Low endowment		-11.170***
		(1.312)
High endowment		9.763***
		(2.561)
Low Endw*High Corruption		-4.777**
		(1.983)
High Endw*High Corruption		-8.246**
		(3.235)
Constant	24.268***	23.713***
	(3.619)	(3.500)
Wald test p-value:		
$\gamma(Low) + \gamma(Low * HighCorr) = \gamma(High) + \gamma(High * HighCorr)$		0.00
Controls	Yes	Yes
Commune FE	Yes	Yes
N	1343	1343
R-squared	0.091	0.22

Notes: The outcome variable is the amount contributed in the public goods game. Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B9: Share contributed to public good: using continuous corruption measure

	(1)	(2)	(3)	(4)
Unequal endowment	0.090**	0.086*		
	(0.044)	(0.045)		
Unequal*Corruption Index	-0.066**	-0.062**		
	(0.026)	(0.027)		
Low endowment			0.189***	0.188***
			(0.048)	(0.048)
High endowment			-0.009	-0.015
			(0.050)	(0.052)
Low endw*Corruption Index			-0.060*	-0.057*
			(0.030)	(0.031)
High endw*Corruption Index			-0.072**	-0.067**
			(0.028)	(0.030)
Constant	0.555***	0.397***	0.555***	0.405***
	(0.009)	(0.063)	(0.009)	(0.058)
Wald test p-value:				
$\gamma(Low) + \gamma(Low * HighCorr) = \gamma(High) + \gamma(High * HighCorr)$			0.00	0.00
Controls	No	Yes	No	Yes
Commune FE	Yes	Yes	Yes	Yes
N	1344	1343	1344	1343
R-squared	0.074	0.091	0.14	0.16

Notes: The outcome variable is the share contributed in the public goods game. Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. The Corruption Index takes values from 0-6. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B10: Share contributed to public good: using degree of agreement with corruption statements

	(1)	(2)	(3)	(4)
Unequal endowment	0.035	0.040		
	(0.028)	(0.028)		
Unequal*High corruption	-0.102***	-0.104***		
	(0.038)	(0.038)		
Low endowment			0.132***	0.140***
			(0.028)	(0.027)
High endowment			-0.061*	-0.059*
			(0.033)	(0.034)
Low endw*High corruption			-0.077*	-0.084*
			(0.043)	(0.042)
High endw*High corruption			-0.127***	-0.123***
			(0.041)	(0.043)
Constant	0.555***	0.389***	0.555***	0.399***
	(0.009)	(0.062)	(0.009)	(0.058)
Wald test p-value:				
$\gamma(Low) + \gamma(Low * HighCorr) = \gamma(High) + \gamma(High * HighCorr)$			0.00	0.00
Controls	No	Yes	No	Yes
Commune FE	Yes	Yes	Yes	Yes
N	1344	1343	1344	1343
R-squared	0.075	0.093	0.14	0.16

Notes: The outcome variable is the share contributed in the public goods game. Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. High Corruption is a dummy variable that takes value 1 if the underlying corruption index that takes values from 1-24 is above the sample median. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B11: Share contributed to public good: dropping $30^{th} - 70^{th}$ percentile of corruption index

	(1)	(2)	(3)	(4)
Unequal endowment	0.043	0.043		
	(0.030)	(0.030)		
Unequal*High corruption	-0.136***	-0.130**		
	(0.048)	(0.049)		
Low endowment			0.142***	0.143***
			(0.032)	(0.031)
High endowment			-0.055	-0.055
			(0.037)	(0.037)
Low endw*High corruption			-0.128**	-0.119**
			(0.055)	(0.055)
High endw*High corruption			-0.145***	-0.141**
			(0.052)	(0.053)
Constant	0.568***	0.403***	0.568***	0.390***
	(0.012)	(0.078)	(0.012)	(0.074)
Wald test p-value:				
$\gamma(Low) + \gamma(Low * HighCorr) = \gamma(High) + \gamma(High * HighCorr)$			0.00	0.00
Controls	No	Yes	No	Yes
Commune FE	Yes	Yes	Yes	Yes
N	816	816	816	816
R-squared	0.079	0.10	0.14	0.16

Notes: The outcome variable is the share contributed in the public goods game. The sample is restricted to communes where the corruption index is either below the 30th percentile or above the 70th percentile. High corruption is a dummy variable that takes value 1 if the corruption index is above the 70th percentile, and 0 if corruption index is below 30th percentile. Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B12: Share contributed to public good: using 5 corruption statements

	(1)	(2)	(3)	(4)
Unequal endowment	0.038	0.040		
	(0.027)	(0.028)		
Unequal*High Corruption	-0.107***	-0.103***		
	(0.037)	(0.038)		
Low endowment			0.135***	0.140***
			(0.028)	(0.027)
High endowment			-0.059*	-0.060*
			(0.033)	(0.034)
Low Endw*High Corruption			-0.083*	-0.084*
			(0.043)	(0.042)
High Endw*High Corruption			-0.131***	-0.121***
			(0.041)	(0.043)
Constant	0.555***	0.393***	0.555***	0.404***
	(0.009)	(0.063)	(0.009)	(0.059)
Controls	No	Yes	No	Yes
Commune FE	Yes	Yes	Yes	Yes
N	1344	1343	1344	1343
R-squared	0.076	0.093	0.15	0.16

Notes: The outcome variable is the share contributed in the public goods game. High Corruption dummy variable is formed by excluding the first statement in the corruption inventory (see Table B3 for the list of statements). Controls include age, gender, education, ethnicity, marital status, household assets, and household poverty status. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B13: Corruption and generalized beliefs

	Trust Game		Most people can be trusted=1	Most people are helpful=1	People are fair
	Share sent by Sender	Av. proportion returned			
	(1)	(2)	(3)	(4)	(5)
High corruption	0.032	-0.065***	-0.083***	-0.086***	-0.190
	(0.024)	(0.017)	(0.028)	(0.032)	(0.140)
Female	-0.008	-0.034**	-0.119***	0.032	-0.280**
	(0.016)	(0.015)	(0.025)	(0.022)	(0.125)
Age	0.003***	0.003***	0.010***	0.008***	0.040***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.007)
High school education	0.016	0.018	-0.018	-0.042	-0.201
	(0.018)	(0.015)	(0.029)	(0.030)	(0.126)
Married	0.040**	-0.005	-0.009	0.103**	0.104
	(0.017)	(0.017)	(0.035)	(0.046)	(0.175)
Kinh	0.011	0.044**	-0.063	-0.021	-0.258
	(0.043)	(0.020)	(0.069)	(0.076)	(0.245)
Assets	0.001	0.005	-0.005	-0.013**	-0.008
	(0.004)	(0.003)	(0.007)	(0.006)	(0.033)
Poor household	-0.053*	-0.030	-0.004	-0.008	-0.151
	(0.031)	(0.024)	(0.050)	(0.052)	(0.257)
Red River Delta	-0.014	0.026	0.087**	-0.035	0.371**
	(0.027)	(0.020)	(0.038)	(0.041)	(0.145)
Constant	0.543***	0.422***	0.184	0.438***	5.454***
	(0.070)	(0.061)	(0.120)	(0.114)	(0.519)
Commune controls	Yes	Yes	Yes	Yes	Yes
Control mean	0.63	0.57	0.49	0.70	6.77
N	1343	1343	1343	1343	1343
R-squared	0.023	0.056	0.083	0.087	0.070

Notes: Commune level controls include population, share of poor households, share of ethnic majority (Kinh) households, distance to main road, and distance to district centre. People are fair takes values from 1-10. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B14: Share contributed to public good: using asset ownership

	Low Assets		High Assets	
	(1)	(2)	(3)	(4)
Unequal endowment	0.112***		-0.012	
	(0.041)		(0.031)	
Unequal*High Corruption	-0.156***		-0.050	
	(0.056)		(0.045)	
Low endowment		0.216***		0.075**
		(0.043)		(0.034)
High endowment		0.001		-0.093**
		(0.047)		(0.038)
Low Endw*High Corruption		-0.123*		-0.039
		(0.063)		(0.050)
High Endw*High Corruption		-0.196***		-0.068
		(0.063)		(0.051)
Constant	0.431***	0.445***	0.410***	0.433***
	(0.075)	(0.080)	(0.087)	(0.083)
Wald test p-value:				
$\gamma(Low) + \gamma(Low * HighCorr) = \gamma(High) + \gamma(High * HighCorr)$		0.00		0.00
Controls	Yes	Yes	Yes	Yes
Commune FE	Yes	Yes	Yes	Yes
N	548	548	795	795
R-squared	0.18	0.26	0.11	0.16

Notes: The outcome variable is the share contributed in the public goods game. Controls include age, gender, education, ethnicity, marital status, and household poverty status. Low (High) Assets is a dummy variable for households that have less than (more than or equal to) the median number of assets in the commune. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Table B15: Beliefs regarding shares contributed to public good: using asset ownership

	Low Assets		High Assets	
	(1)	(2)	(3)	(4)
Unequal endowment	-0.012		-0.054*	
	(0.033)		(0.028)	
Unequal*High Corruption	-0.098**		-0.046	
	(0.046)		(0.039)	
Low endowment		-0.007		-0.041
		(0.033)		(0.030)
High endowment		-0.017		-0.067*
		(0.038)		(0.035)
Low Endw*High Corruption		-0.088*		-0.061
		(0.046)		(0.042)
High Endw*High Corruption		-0.109**		-0.032
		(0.054)		(0.046)
Constant	0.547***	0.548***	0.484***	0.484***
	(0.063)	(0.064)	(0.063)	(0.063)
Wald test p-value:				
$\gamma(Low) + \gamma(Low * HighCorr) = \gamma(High) + \gamma(High * HighCorr)$		0.31		0.91
Controls	Yes	Yes	Yes	Yes
Commune FE	Yes	Yes	Yes	Yes
N	548	548	795	795
R-squared	0.14	0.14	0.16	0.16

Notes: The outcome variable is the belief about share contributed in the public goods game. Controls include age, gender, education, ethnicity, marital status, and household poverty status. Low (High) Assets is a dummy variable for households that have less than (more than or equal to) the median number of assets in the commune. Standard errors clustered at the commune level are reported in parentheses. * significant at 10%,** significant at 5%,*** significant at 1%.

Appendix C: Experimental Instructions

[The following is the script for the unequal endowment sessions. The script for the equal endowment sessions was similar]

General Introduction

[Once all participants arrive and are seated, start reading the welcome and consent statement]

Welcome everyone! Thank you very much for being here today. I would like to introduce myself. I am *[insert your name]* coming from CIEM, MPI. Our team is here today to conduct a survey to learn more about communities in this area. We appreciate the time you have provided us to conduct this study.

This study will be conducted in two parts:

- In the first part, you will be asked to perform three tasks which we will explain to you in detail shortly.
- In the second part, we will ask each of you some simple questions about yourself.

After the session, each of you will receive **50,000 VND as a fee for your participation, and an additional amount of money that you earn depending on your choices and that of others in this room from one of three randomly chosen tasks in the first part**.

For your privacy, **your answers will be confidential**. You will be given an ID number and no one outside the study team will have access to the information that you provide.

In total, the study is expected to last up to two and a half hours.

Do you have any questions at this point? Please raise your hand if you do.

[Go to those who have questions, and answer them personally.]

If you agree to participate in this study, please pick up a chit with your ID number. We then request you to sit down on the desk and chair marked with your ID number.

[Ask participants to pick out chits with ID numbers from a common bag, then guide them to sit on the chair with their ID number marked]

Now, please sign this sheet. Once this is signed, we will begin the study.

[Wait for all participants to sign the sheet]

Thank you for agreeing to take part. We will now proceed. During our study, we would like **to ask you to keep quiet and do not talk to each other. Also, please do not use your mobile during this time**. In particular, we ask you to listen carefully to the instructions during the study.

Instructions for Task 1

I will now explain the instructions for the first task that you have to perform. Please pay attention and listen carefully. After I have explained the instructions, and provided some examples using charts, we will do a short exercise to ensure that the steps are clear to all of you.

In this task, all participants are randomly divided into groups of four. This means that you are in a group with three other participants in this room. You will never know the identity of the other participants in your group, and they will not know your identity.

In each group, **two members** will have endowments of **30,000 VND** each and the other **two members** will have endowments of **90,000 VND** each.

You will soon learn whether your endowment is 30,000 VND or 90,000.

[Pointing to Chart 1 for Task 1]

This is the decision you have to make:
You and the three others in your group simultaneously decide how to use the endowment. There are two possibilities:

1. **You can allocate money to a group account.**

2. **You can allocate money to a private account.**

You will be asked to indicate the amount of money you want to allocate to the group account. The remaining money will be automatically allocated to your private account. You can choose any amount to allocate to the group account from 0 through the size of your endowment.

This is how your earnings will be calculated:
When all of you have made your decisions:

1. We will add up all the money allocated to the group account by all four people in your group and then double it.

2. This doubled amount will be divided equally among all four participants in your group. Each person receives an equal share of the group account regardless of their allocation to the group account.

3. Your earnings will be calculated as the total of the amount of money from the group account and the money left in your private account.

This means that:

1. Your earnings from your private account are equal to the amount of money you allocate to it. For example, your earnings from the private account equal 1,000 VND if you allocate 1,000 VND to it. The money you allocate to your private account does not affect the earnings of the others in your group.
2. Your allocation to the group account affects your earnings and the earnings of all your group members. For example, if you allocate 1,000 VND to the group account, it is doubled to 2,000 VND and split

equally among all 4 group members. This means that you get 500 VND but your other group members also get 500 VND each.

No money will be given at this point. All actual payments will be made at the end of the experiment if this task is chosen as the one that you will be paid for.

I will now provide two examples. Please pay attention to the chart here.

[Display Chart #2 so that it is visible to everyone in the room]

Example 1: As shown here *[Point]*, there are four members in the group. Two members have endowments of 30,000 VND each while the other two members have an endowment of 90,000 VND each. Suppose you are member 1. Suppose, in your group, you and group member 2 have endowments of 30,000 VND each while members 3 and 4 have 90,000 VND each. Suppose you allocate 20,000 VND to the group account. This means 10,000 VND automatically goes into your private account. Everyone else in your group also allocates 20,000 VND. The total in the group account is 20,000*4 equal to 80,000 VND. This money is now doubled by us. So now the total is 160,000 VND which is shared equally among the group members such that each person in the group gets 160,000 divided by 4 equals to 40,000 from the group account.

Finally, your total earnings from this task is: 10,000 which is money left in your private account plus 40,000 which is money from the group account. This totals to 50,000 VND. Group member 2 also earns 50,000 VND, that is 10,000 plus 40,000, while group members 3 and 4 each earn 110,000 VND, that is 70,000 plus 40,000.

Let us go through one more example.

[Display Chart #3 so that it is visible to everyone in the room]

Example 2: As shown here *[Point]*, there are four members in the group. Two members have endowments of 30,000 VND each while the other two members have an endowment of 90,000 VND each. Suppose you are member 1. Suppose, in your group, you and group member 2 have endowments of 90,000 VND each while members 3 and 4 have 30,000 VND each. Suppose you allocate 15,000 VND to the group account. This means 75,000 VND automatically goes into your private account. Group member 2 allocates 90,000 VND, group member 3 allocates 0 while group member allocates 15,000 VND.

The total in the group account is therefore 120,000 VND. This money is now doubled by us. So now the total is 240,000 VND which is shared equally among the group members such that each person in the group gets 240,000 divided by 4 equals to 60,000 from the group account.

Finally, your total earnings from this task is: 75,000 which is money left in your private account plus 60,000 which is money from the group account. This totals to 135,000 VND. Group member 2 earns 60,000 VND, that is 0 plus 60,000. Group member 3 earns 90,000 VND, that is 30,000 plus 60,000. Finally, group member 4 earns 75,000, that is 15,000 from private account plus 60,000 from the group account.

Note that these are only examples. The actual decisions are up to you.

Are there any questions?

Now, we will ask each of you to do a short exercise on your own to ensure that the rules are clear.

[Distribute Test Sheet Task 1 to all participants]

[Hold up a sample Test Sheet Task 1 to show it to participants]

In this sheet titled "Test Sheet Task 1" that you have in front of you, you will see two questions with blank spaces provided for answers. Please answer those in the next few minutes.

[After 5 minutes, ask if everyone has completed the test.]

Have you all completed the test? Please raise your hands in case you have not.

[Experimenters assist those who say they have not completed the test.]

I will now announce the answers for the test questions.
The correct answer for question 1 is 1,000 VND
The correct answer for part 1 of question 2 is 1000 VND
The correct answer for part 2 of question 2 is 2000 VND
The correct answer for parts 3-6 of question 2 is 500 VND each for all group members.

Now, we will collect back these sheets.

[One person collects the test sheets while the other distributes the Decision Sheet for Task 1.]

[Remove the charts from the display]

Now, each of you has been handed a decision sheet for Task 1.

[Hold up a Decision Sheet for Task 1]

Please fill in here *[Point to the space they must write their decision]* how much you want to allocate to the group account. The remaining money will be automatically allocated to your private account. Remember that you will be paid actual money for your decisions if this task is selected.

[Wait for 5 minutes for everyone to finish making their decisions]

Now, we will collect back these sheets.

[Take back the decision sheets]

[Hand out Decision Sheet for Task 1, Part 2]

[Hold up a Decision Sheet for Task 1, Part 2]

Now, we ask you to indicate how much you think the other members in your group allocated to the group account *on average*, depending on their endowment.

[Hold up a Decision Sheet for Task 1, Part 2, and point to the columns in which they must indicate their choice]

Presented in this decision sheet are possible ranges of average allocations to the group account by those with endowments of 30,000 VND and 90,000 VND respectively.

Please mark the range you think the other group members' average allocation lies in if their endowment is 30,000 VND or 90,000 VND. If the range you select is the actual range of their allocation, you will earn 30,000 VND for each correctly selected range. Therefore, if you get one answer correct, you will earn 30,000 VND, and if you get both answers correct, you will earn 60,000 VND. **Please tick only one answer in each table.** Remember that you will be paid actual money for your decisions if this task is selected.

[Give them 5 minutes to fill in the decision sheet]

[Take back decision sheet]

Task 1 is now over. We will now begin Task 2.

Instructions for Task 2

I will now explain the instructions for the second task that you have to perform. Please pay attention and listen carefully. After I have explained the instructions, and provided some examples using charts, we will do a short exercise to ensure that the steps are clear to all of you.

This task will be performed in pairs. You will be randomly allocated a partner, who is one of the individuals in this room. You will not know the identity of your partner and your partner will also not know your identity. Your partner was **not** a member of your group in Task 1.

In each pair in this task, there is a Sender and a Receiver. Both the Senders and the Receivers are given 60,000 VND. You will be asked to make a decision both as a Sender and as a Receiver. One of your roles will be randomly picked for payment such that if you are a Sender, your partner is a Receiver. On the other hand, if you are a Receiver, then your partner is a Sender. Your decision and the decision of your randomly allocated partner will determine your earnings.

The decision to be made by the Sender:
First, you will make a decision as a Sender. Out of the initial 60,000 VND, the Sender can choose to send 0 VND, 10,000 VND, 20,000 VND, 30,000 VND, 40,000 VND, 50,000 VND, or 60,000 VND to the Receiver. Any amount sent will be tripled by us. The Sender keeps any amount of money not sent to the Receiver.

The decision to be made by the Receiver:
Next, you will make decisions as a Receiver. The Receiver can send back to the Sender any amount up to the total amount received, that is, the amount the Sender sent multiplied by 3. Note that the amount sent back **cannot** be more than the amount received from the Sender.

A Receiver will not know how much a Sender has sent to them at the time of making the decision. Thus, a Receiver will need to decide how much to send back to the Sender for every possible amount he/she could receive. Note that this time the money sent back will **not** be tripled again.

No money will be given at this point. All actual payments will be made at the end of the experiment if this task is chosen as the one that you will be paid for.

Please look at this chart where I explain how earnings will be determined.

[Display Chart #4 so that it is visible to everyone in the room]

[Point to the lowest box in Chart #4]

The Sender's earnings are the initial 60,000 VND **less** the amount sent to Receiver **plus** money Receiver sent back.

The Receiver's earnings are the initial 60,000 VND **plus** the tripled amount the Receiver received from Sender **less** the money Receiver chose to give back to Sender.

This table shows how much Receivers will receive for each possible decision made by the Sender.

[Pointing to the first table in Chart #4]

The highest amount Senders can send is 60,000 VND and the lowest is 0.

[Pointing to column 2 of the first table] If the Sender sends 0, the Receiver gets 0
[Pointing to column 3 of the first table] If the Sender sends 10,000, the Receiver gets 30,000
[Pointing to column 4 of the first table] If the Sender sends 20,000, the Receiver gets 60,000
[Pointing to column 5 of the first table] If the Sender sends 30,000, the Receiver gets 90,000
[Pointing to column 6 of the first table] If the Sender sends 40,000, the Receiver gets 120,000
[Pointing to column 7 of the first table] If the Sender sends 50,000, the Receiver gets 150,000
[Pointing to column 8 of the first table] If the Sender sends 60,000, the Receiver gets 180,000

This table gives the possible choices for the Receiver.

[Pointing to the second table Chart #4]

[Pointing to column 2 of the second table] Sender sends 0, which is tripled to 0, and Receiver gets 0. The Receiver can send back 0.

[Pointing to column 3 of the second table] Sender sends 10,000 VND, which is tripled, and Receiver gets 30,000 VND. The Receiver can send back between 0-30,000.

[Pointing to column 4 of the second table] Sender sends 20,000 VND, which is tripled, and Receiver gets 60,000 VND. The Receiver can send back between 0-60,000.

[Pointing to column 5 of the second table] Sender sends 30,000 VND, which is tripled, and Receiver gets 90,000 VND. The Receiver can send back between 0-90,000.

[Pointing to column 6 of the second table] Sender sends 40,000 VND, which is tripled, and Receiver gets 120,000 VND. The Receiver can send back between 0-120,000.

[Pointing to column 7 of the second table] Sender sends 50,000 VND, which is tripled, and Receiver gets 150,000 VND. The Receiver can send back between 0-150,000.

[Pointing to column 8 of the second table] Sender sends 60,000 VND, which is tripled, and Receiver gets 180,000 VND. The Receiver can send back between 0-180,000.

When deciding, the Receiver must fill a response for every possible amount that could be received from the Sender.

I will now provide two examples. Please pay attention to the chart here.

[Display Chart #5 so that it is visible to everyone in the room]

Example 1: Both Senders and Receivers are given 60,000 VND *[Point]*. Suppose, the Sender sends 20,000 VND. The amount given is then tripled to 60,000 VND. The Receiver chooses to send back 25,000 VND when he/she is sent 60,000 VND.

The Sender's earnings will be 60,000 – 20,000 + 25,000 = 65,000 VND

The Receiver received 60,000 VND and chose to return 25,000 VND.

The Receiver's earnings will be 60,000 + 60,000 – 25,000 = 95,000 VND

Let us go through one more example.

[Display Chart #6 so that it is visible to everyone in the room]

Example 2: Both Senders and Receivers are given 60,000 VND *[Point]*. Suppose the Sender decides to send 50,000 VND. The amount given is then tripled by the experimenter to 150,000 VND. The Receiver decided to send back 100,000 VND when he/she received 150,000 VND.

The Sender's earnings will be 60,000 – 50,000 + 100,000 = 110,000 VND

The Receiver's earnings will be 60,000 + 150,000 – 100,000 = 110,000 VND

Note that these are only examples. The actual decisions are up to you.

Are there any questions?

Now, we will ask each of you to do a short exercise on your own to ensure that the rules are clear.

[Distribute Test Sheet Task 2 to all participants]

[Hold up a sample Test Sheet Task 2 to show it to participants]

In this sheet titled "Test Sheet Task 2" that you have in front of you, you will see four questions with spaces provided for answers. Please answer those in the next few minutes.

[After 5 minutes, ask if everyone has completed the test]

Have you all completed the test? Please raise your hands in case you have not.

[Experimenters assist those who say they have not completed the test.]

I will now announce the answers for the test questions.
The correct answer for question 1 is 60,000 VND
The correct answer for question 2 is 0 VND
The correct answer for question 3 is 30,000 VND
The correct answer for question 4, part 1 is 60,000 VND
The correct answer for question 4, part 2 is 0 VND

Now, we will collect back these sheets.

[One person collects the test sheets, while the other distributes the Decision sheet for Sender.]

[Remove the charts from the display]

Now, each of you has been handed a Decision sheet for Sender.

[Hold up a Decision sheet for Sender]

Please mark the amount that you would like to send to the Receiver, and **please mark only one choice** *[point to the table on which they should mark their choice]*. Remember that you will be paid actual money for your decisions if this task is selected.

[Give 5 minutes for them to fill in this sheet]

Now, we will collect back these sheets.

[Take back the Decision sheet for Sender]

[Distribute Decision Sheet for Receiver]

Now, each of you has been handed a Decision sheet for Receiver.

[Hold up a Decision Sheet for Receiver]

In the table *[Point to the table they have to fill]*, please write a response for every possible amount that could be received from the Sender. Remember that you will be paid actual money for your decisions if this task is selected.

[Give 5 minutes for them to fill in this sheet]

Now, we will collect back these sheets.

[Take back the Decision sheet for Receiver]

Task 2 is now over. We will move on to the final task, that is Task 3.

Instructions for Task 3

Now, we will ask each of you to go one-by-one into the next room to perform the next task. The others must remain seated quietly during this time. We will ask you to throw a dice in private. *[Hold up a dice]* The dice is marked with numbers 1 and 2. On the decision sheet, please report the number outcome on the top of the dice after it lands. We will ask you to do this 20 times, and write the outcome each time. No one, including any of us from the study team, will be observing you while you roll the dice and record the outcome.

This is how your earnings will be calculated:
You will receive **5,000 VND** for every time the dice lands on **2**. When the dice lands on 1, you will earn zero. This means that you can earn between 0 and 100,000 VND.

[Distribute Decision Sheet for Task 3]

[Hold up the Decision Sheet for Task 3 for participants]

In this table in the decision sheet, write down the number that you rolled and return the sheet to us once you are done.

[Ask participants to go one by one into the adjacent room/space where they can play this privately. As they come back, collect their decision sheets.]

Experiment Ends – Payment and Survey

You have now completed all the tasks. We will now ask a participant to roll a dice in front of everyone to determine which task you will be paid for. If the dice roll results in number 1 or 4, then task 1 will be chosen for payment. If the dice roll lands on 2 or 5, then task 2 will be chosen for payment. If the dice roll lands on 3 or 6, then task 3 will be chosen for payment.

[Call any participant from the room to roll a dice in front of everyone]

The result is _____ and so you will be paid your earnings from task _____.

[If task 2 is chosen]:
Task 2 was chosen for payment. We will now ask a participant to roll the dice one more time to determine if you will be paid for your Sender decision or Receiver decision. If the dice roll results in an even number -2, 4, or 6 – then all even IDs will be paid for their Sender decisions and all odd IDs will be paid for their Receiver decisions. If the dice roll results in an odd number -1, 3, or 5 – then all odd IDs will be paid for their Sender decisions and all even IDS will be paid for their Receiver decisions.

[Ask the participant to roll a dice in front of everyone]

The result is _____ and so all even IDs will be paid for _____ decisions and all odd IDs will be paid for ____ decisions.

Before we commence payment, we would like you to answer some questions about yourself. You will be placed with one enumerator who will go through a short survey with you. Please take your time and answer honestly and as accurately as possible. You will not be identified and the enumerator will not disclose any information about you. Your survey answers will only be used for this study and will only be used by the researcher(s) involved in this project.

Decision Sheets for the tasks

1. Decision sheet for low endowment participants in public goods game

Decision sheet for Task 1

You have an endowment of **30,000 VND**. One other member of your group also has an endowment of 30,000 VND. The remaining two group members have endowments of **90,000** VND each.

Out of 30,000 VND, how much do you want to allocate to the group account? The remaining money will be automatically allocated to your private account.

Amount allocated to group account: _____ VND

2. Decision sheet for high endowment participants in public goods game

Decision sheet for Task 1

You have an endowment of **90,000** VND. One other member of your group also has an endowment of 90,000 VND. The remaining two group members have endowments of **30,000** VND each.

Out of 90,000 VND, how much do you want to allocate to the group account? The remaining money will be automatically allocated to your private account.

Amount allocated to group account: _____ VND

3. Decision sheet for beliefs in unequal endowment public goods game

Decision sheet for Task 1, Part 2

Please indicate how much you think the other members in your group allocated to the group account **on average**, depending on their endowment.

Presented here are possible ranges of average allocation to the group account by those with endowments of 30,000 VND and 90,000 VND respectively. Please mark the range you think the other group members' average allocation lies in if their endowment is 30,000 VND or 90,000 VND. If the range you select is the actual range of their allocation, you will earn 30,000 VND for each correctly selected range. Therefore, if you get one answer correct, you will earn 30,000 VND, and if you get both answers correct, you will earn 60,000 VND.

On average, how much do you think the group member/members with 30,000 VND allocated to the group account?	Please ✓ only one box	On average, how much do you think the group member/members with 90,000 VND allocated to the group account?	Please ✓ only one box
0-10,000 VND		0-10,000 VND	
10,001-20,000 VND		10,001-20,000 VND	
20,001-30,000 VND		20,001-30,000 VND	
		30,001-40,000 VND	
		40,001-50,000 VND	
		50,001-60,000 VND	
		60,001-70,000 VND	
		70,001-80,000 VND	
		80,001-90,000 VND	

4. **Decision sheet for sender in trust game**

Task 2

Decision sheet for Sender

You have a starting amount of 60,000 VND. The lowest amount Sender can send to Receiver is 0 and the highest is 60,000 VND. The amount you decide to send will be tripled by us.

Please mark the amount that you would like to send to the Receiver (please ✓ only one choice):

0	10,000	20,000	30,000	40,000	50,000	60,000

5. Decision sheet for receiver in trust game

Task 2

Decision sheet for Receiver

As a Receiver, please fill a response for every possible amount that could be received from the Sender.

	Amount sent	Amount received from Sender (tripled)	Amount you wish to send back to sender
1	0 VND	0 VND	_____ VND
2	10,000 VND	30,000 VND	_____ VND
3	20,000 VND	60,000 VND	_____ VND
4	30,000 VND	90,000 VND	_____ VND
5	40,000 VND	120,000 VND	_____ VND
6	50,000 VND	150,000 VND	_____ VND
7	60,000 VND	180,000 VND	_____ VND

6. Decision sheet for dice game

Decision sheet for Task 3

Roll the die 20 times. Please report the number outcome on the top of the die when it lands after every roll. You will receive 5,000 VND for every time the die lands on 2. When the die lands on 1, you will earn zero.

Roll Number	Outcome (1 or 2)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Roll Number	Outcome (1 or 2)
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	