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Inefficiency is worse for cooperation than corruption: Experimental evidence

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Abstract

The choice individuals make between the public good and their own self-interest lies at the heart of many societal problems. This trade-off has been found to depend on the quality of the institutional context in which cooperation takes place. The effect of institutions on cooperation, however, has been difficult to determine due to cultural and historical confounds, as well as reverse causality. We overcome these hurdles by modelling institutional quality using behavioural games. We develop novel experimental designs expanding on the embezzlement game, allowing us to observe the causal effect of administrative embezzlement and inefficiency on cooperation. We field two large-scale lab-like experiments: in Germany, where corruption and inefficiencies are not the norm, and Romania, where they may be considered common. We find that individuals are very sensitive to systemic waste or leakages: when exposed to inefficiencies, individuals contribute much less to the public good than when exposed to corruption.

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1 Introduction

There is a general belief that in the presence of dysfunctional political institutions, for example suffering from corruption and inefficiencies, individuals stop trusting each other (Rothstein and Eek, 2009), stop trusting the government (Harring, 2016), and tend to focus on their own benefits rather than collective well-being (Persson et al., 2013a). Indeed, when people's contributions to the system (e.g., taxes that should finance public service provision) get stolen, they have little reason to believe that others would contribute and little motivation to contribute themselves: On the one hand, the unethical nature of theft may harm individuals' morale; on the other, the subtraction of resources from the public coffers is analogous to an inefficiency in which the money is lost in a system that does not deliver. In this paper, we aim to disentangle these two motivations by asking whether corruption has a smaller, equal, or larger detrimental effect on cooperation and people's willingness to contribute to collectively beneficial outcomes than systemic inefficiencies.

This question is non-trivial. In purely economic terms, corruption and inefficiencies are similar because in both cases, individuals experience an economic loss in the form of lower returns to their contributions to the public good. That is, because people get a lower return in public good value than what they would expect, both institutional shortcomings should have the same effect on people's cooperative behaviour. At the same time, we argue, their perceptions of these two shortcomings may be different and thus lead to different behavioural reactions. In the case of corruption, people face unfairness as their contributions get deliberately misappropriated (stolen) by a dishonest individual. In the case of inefficiencies, people know that money will instead be wasted due to faulty institutional design or myopic allocations, which are not necessarily deliberate choices. We expect that the presence of corrupt practices in a political system is more detrimental than the presence of inefficiencies for people's willingness to cooperate.

After theorizing the different impacts of corruption and inefficiency, we test this expectation using large-scale lab-like experiments in two different political contexts: In Germany, where corruption and inefficiencies are not expected to be the norm, and Romania, where corruption and inefficiencies are likely to be considered common. We develop novel experimental games building on the classic public good game to model corruption and inefficiencies. This setup allows us to draw reliable causal inferences on the effect of these two important aspects of institutional quality on cooperation.

We contribute to the literature in three important ways. First, we theorize about the differing effect of inefficiencies and corruption on people's willingness to cooperate. Second, we provide empirical evidence for how these two dysfunctionalities shape cooperation using a unique experimental data collection. Third, we suggest a novel experimental design modelling institutional corruption and inefficiencies available for replication by scholars researching the effect of institutional quality on people's cooperation.

2 Previous research

Growing evidence shows that people trade-off prosocial and self-regarding behaviour differently in institutional settings of different quality (e.g., Herrmann et al., 2008; Gächter and Herrmann, 2009; Engl et al., 2021). However, we know little about how different aspects of institutional quality shape these choices. Moreover, most of our understanding of people's behaviour and attitudes under different institutional quality comes from cross-country comparisons (Steinmo and D'Attoma, 2022, e.g.,), suffering from confounding factors of historical, cultural, and institutional nature. Experimental research, while helpful to limit the impact of confounds, remains scant.

One important factor influencing people's cooperative choices is corruption: its effect on trust among individuals (e.g., Rothstein and Eek, 2009; Dinesen, 2012; Martinangeli et al., 2024) and on trust in the institutions individuals interact with (Rothstein, 2011) ultimately erodes cooperation (e.g., Campos-Vazquez and Mejia, 2016; Muthukrishna et al., 2017). Embezzlement, or misuse of public funds, the form of corruption this article focuses on, while under-investigated, has also been found to reduce trust and cooperation (Attanasi et al., 2019; Martinangeli et al., 2024).

Another under-researched factor influencing cooperative choices is institutional inefficiency. Experimental studies documented that a positive probability of incurring into losses due to inefficiencies results in a reduced support for income redistribution (Tepe et al., 2021). Similarly, "uncertainty about the outcome" (about others' contributions, about payoffs, or about the likelihood that a collective goal will be reached), was found to reduce cooperation (Van Dijk et al., 2004), especially if individuals believe their contribution to be critical to attain the collectively beneficial outcome (Chen et al., 1996).

In all, laboratory-controlled research on institutional quality is limited due to its relative recency. Identification of the effects of institutional quality on behaviours or attitudes has instead primarily relied on cross-country strategies, limiting causal inference. Therefore, we have no evidence on how people react to different institutional quality environments and which behavioural reactions embezzlement and inefficiencies evoke, despite the fact that these two institutional shortcomings have similar welfare impacts. This article addresses this research gap.

3 Theory

Corruption is broadly defined as "misuse of entrusted power for private gain" (Transparency International, 2025). It encompasses a variety of practices, including bribery (exchange of money for favours, goods or services), embezzlement (theft of public funds), and more systemic forms such as patronage or state capture. By contrast, institutional efficiency refers to the relationship between inputs and outputs in public administration. Governments are considered efficient when they are able to convert resources into public goods effectively and with minimal 'waste' (Tanzi and Davoodi, 1998; Rajkumar and Swaroop, 2008). We argue that while both corruption and inefficiency can result in lower returns from public good contributions, they differ fundamentally in their under-

lying mechanisms and normative implications and should thus have a different impact on people's cooperative behaviour.

In purely economic terms, the two phenomena create similar incentives - individuals contributing to a public good receive less in return than they reasonably expect. Thus, whether public resources are stolen by corrupt officials or lost due to inefficiencies, the material outcome for citizens is a reduction in the effectiveness of their contributions. From a rational choice perspective, this reduction should weaken incentives to contribute to the public good because the expected payoff from cooperation decreases regardless of the underlying cause to the economic loss. However, we argue that there are several reasons to believe corruption and inefficiency should influence behaviour differently, even if the experienced economic losses are similar.

First, an important difference between corruption and inefficiency concerns the attribution of responsibility. Corruption involves intentional wrongdoing, often by identifiable actors who deliberately misuse public resources for private gain. Because the behaviour is purposeful, citizens can attribute blame to specific individuals or groups within the political and administrative system. Inefficiency, by contrast, is perceived as the result of systemic complexity, bureaucratic inertia, or organizational shortcomings rather than deliberate exploitation. Responsibility is therefore more diffuse and difficult to assign to a particular actor.

Research on blame attribution suggests that people respond more negatively to losses caused by intentional wrongdoing than to similar losses resulting from structural or accidental processes (Shaver, 1985; Alicke, 2000). Intentional violations trigger stronger moral emotions such as anger and indignation, whereas unintentional inefficiencies are more likely to produce frustration or disappointment. For this reason, we should expect that corruption provokes stronger behavioural responses, including withdrawal from cooperative arrangements that rely on trust in others' good intentions. At the same time, the ability to attribute responsibility may also influence perceptions of accountability and control (Braccioli et al., 2025). When corruption is present, individuals may believe that the problem is rooted in actors who could, at least in principle, be removed or punished. In contrast, inefficiency often reflects structural characteristics of institutions that appear more difficult to reform.

The second important distinction concerns the types of norms that corruption and inefficiency violate. Political philosophers and social theorists distinguish between moral norms and social norms (Brennan et al., 2013). Moral norms refer to fundamental principles about right and wrong that individuals perceive as intrinsically binding. Violating a moral norm typically triggers strong moral condemnation and social sanction. Social norms, by contrast, describe commonly accepted patterns of behaviour within a society or organization. They regulate behaviour but are often more flexible and context dependent.

Corruption directly violates a moral norm. Public officials are entrusted the authority to act in the public's interest, and the misuse of this authority for private gain constitutes a clear breach of that moral entrustment. Because moral norms have an "either–or" character, their violation tends to generate strong and lasting reputational

consequences. After experiencing corruption, trust in the perpetrator is fundamentally damaged, and the legitimacy of the institution they represent may also be called into question. Corruption signals that actors entrusted with authority are willing to violate fundamental principles for personal benefit, which can have detrimental effects on people's cooperative behaviour, because it undermines citizens' broader normative expectations about behaviour within the system.

Efficiency, in contrast, relates more closely to a social norm concerning performance. While citizens probably expect public institutions to operate efficiently, inefficiency is rarely interpreted as a categorical moral failure. Rather, it tends to be evaluated along a continuum. Governments may perform better or worse in delivering services, and some level of inefficiency is often considered unavoidable in complex bureaucratic systems. As a result, violations of efficiency norms are likely to generate weaker normative reactions than violations of moral norms such as corruption.

In addition, when individuals encounter corruption, they likely infer that the broader social environment is characterized by opportunistic behaviour and weak moral constraints. Reasonably such inferences can erode both *institutional trust* and, in prolongation, also interpersonal trust (Rothstein, 2013). If citizens believe that others are likely to exploit the system for personal gain, they may become less willing to contribute to collective endeavours themselves.

Recent research demonstrates that exposure to corrupt environments can have such spillover effects. Institutions that leave room for corruption can reduce individuals' willingness to trust others in unrelated social interactions (Martinangeli et al., 2024). In this sense, corruption may have a demoralizing effect that extends beyond the institutional setting in which it occurs. Instead of merely reducing the material returns to cooperation, it also weakens the normative expectations that sustain cooperative behaviour in the first place.

Inefficiency, by contrast, does not necessarily convey the same social signal. Reasonably, when resources are lost due to administrative shortcomings, individuals interpret this negative outcome as a failure of organizational capacity rather than a deliberate attempt to exploit the system. Although inefficiency can reduce satisfaction with government performance and lower trust in institutions, it does not necessarily imply that other individuals are acting opportunistically. Consequently, the negative spillover effects on interpersonal trust and thus also cooperative behaviour, should be weaker.

Another perspective through which the two phenomena differ is the distinction between *procedural* and *distributive* fairness. Distributive fairness concerns the perceived fairness of outcomes, while procedural fairness relates to the perceived fairness of the processes via which outcomes are generated (Grimes, 2006; Akbaş et al., 2019; Spadaro et al., 2023).

Arguably, both corruption and inefficiency can contribute equally to distributive unfairness. However, corruption additionally undermines procedural fairness because the rules governing the allocation of public resources have been *deliberately* violated. Citizens may therefore perceive not only that the outcomes are unfair, but also that the procedures themselves are fundamentally illegitimate.

Perceptions of procedural unfairness are known to have particularly strong effects on cooperation and compliance (Sun et al., 2022). When individuals believe that decision-making processes are unfair or manipulated, they may withdraw their support for collective institutions altogether. Inefficiency, in contrast, primarily affects distributive fairness without necessarily undermining the legitimacy of the procedures themselves. Citizens may be disappointed with outcomes but still view the institutional rules as legitimate.

Taken together, these theoretical considerations all suggest that corruption should have stronger negative effects on cooperative behaviour than inefficiency. Although both phenomena have the same negative material consequences on returns from contributing to the public good, corruption additionally signals intentional wrongdoing, violates fundamental moral norms, and undermines procedural fairness. For these reasons, corruption is likely to produce stronger demoralizing effect and more pronounced declines in cooperation than presence of inefficiencies. We therefore hypothesize that:

H1: Institutional corruption damages cooperation among individuals more than institutional inefficiencies.

While the mechanisms described above should hold in general, it is easy to see that their strength may depend on the broader institutional context in which individuals operate. Citizens develop expectations about how the institutions typically function based on their everyday experiences within a particular political system. These experiences shape beliefs about the prevalence of corruption, the effectiveness of public administration, and the trustworthiness of others.

In contexts where corruption is rare and institutions function relatively efficiently, corruption may represent a particularly strong violation of expectations. Individuals socialized in such environments are likely to view corruption as highly abnormal and morally unacceptable behaviour. Thus, when confronted with corrupt practices, they will react strongly because the experience contradicts their expectations about how institutions should operate.

In contrast, in contexts where corruption and administrative inefficiencies are more prevalent, individuals can be assumed to develop different expectations about institutional functioning. As we see it, repeated exposure to corrupt practices should normalize such behaviour and lead individuals to view it as a common feature of the political system, rather than as an exceptional violation. Although corruption may still be normatively condemned, its behavioural consequences may be attenuated because individuals have adapted their expectations accordingly.

This logic is consistent with research on institutional socialization and norm adaptation (Fisman and Miguel, 2007; Barr and Serra, 2010; Persson et al., 2013b). Individuals who repeatedly encounter certain patterns of behaviour within the institutions may gradually adjust their expectations and strategies. In environments with high corruption, citizens may come to anticipate opportunistic behaviour and incorporate this expectation into their decision-making. As a result, the marginal effect of additional exposure to corruption on cooperative behaviour may be smaller.

The same logic applies to inefficiencies. In environments where administrative inefficiency is relatively common, individuals may already expect some degree of institutional waste. Because such inefficiencies are already incorporated into their expectations, additional exposure may have limited behavioural consequences.

This reasoning leads us to the expectation that the behavioural difference between corruption and inefficiency will vary across institutional contexts:

H2: The negative effect of corruption (relative to inefficiency) on cooperation will be stronger in high institutional quality settings than in low institutional quality settings.

4 Research design

4.1 Experimental design

This article focuses on the causal effect of institutional contexts leaving room for administrative embezzlement of public funds and institutional inefficiencies, two aspects of institutional quality that are directly comparable in terms of their effects, on individual choices to cooperate. We test our hypotheses using an experimental design which builds and expands on the embezzlement game designed by Martinangeli et al. (2024). The game introduces an institution mimicking the context in which administrative embezzlement and its consequences on individual and collective wellbeing take place in the real world. The standard version of the public good game stylises the raising of funds for public good provision (e.g. public schools, roads, and green spaces). Participants in groups of size n all choose how much to contribute to a collective good out of a personal endowment E. Each group member receives in return a fraction of their and others' contribution to the public good, but keeps the amount they have not contributed for themselves. In particular, the final payoff π_i of each individual $i \in G$, where G denotes the group, follow the rule

$$\pi_i = E - c_i + \alpha \sum_{j \in G} c_j,$$

with $1/n < \alpha < 1$. This restriction on α models the tension between self- and collective interest faced by the individuals contributing to a public good. In particular, one Euro contributed by i increases i's payoff by an amount $\alpha < 1$. The other group members, however, also receive α as a result of i's contribution. The whole group thus benefits from the public each individual's contribution because the sum of each individuals' gains amounts to $n \cdot \alpha > n \cdot 1/n = 1$. Society (the group) benefits therefore most if everyone contributes the maximum possible amount to the common good, although each individual's self-interest is to keep his or her own endowment, let others contribute, and free ride on others' contributions.

The embezzlement game (Martinangeli et al., 2024) introduces an agent acting as an administrator of public money, thus mimicking real-world scenarios in which public administrators have access to and administer public funds that should be used to provide public goods. The Administrator is a part of the group. The Administrator is mandated

to collect each of the group members' contributions to the public good, including their own, and to redistribute them according to the standard public good rule. This task is normally automated in experimental implementations of the game. Crucially, mimicking the real world, the Administrator has the opportunity to embezzle any fraction of the collected amount.

Embezzlement and inefficiencies are equivalent in terms of their payoff implications for the individual Group Members (GMs): the only difference lies in the fact that embezzlement is less inefficient from a social perspective, because the resources subtracted by the Administrator, while privately appropriated, are not lost and thus contribute to the group's earnings. For this reason, embezzlement can be seen as a form of inefficiency in the use of public money. To see this, denote $C = \sum_{j \in G} c_j$ the group's total contributions to the public good and $R < C$ an amount of those total contributions which are "lost" due to inefficiencies. Because R is subtracted from C before redistribution occurs, each individual misses out on an amount $IL = \alpha R$ due to unrealised earnings from full redistribution. The total loss in group earnings due to inefficiency is thus $SWL = n\alpha R$. Compare this scenario with one in which instead of being inefficiently lost R is embezzled by the administrator. For each individual, the individual loss remains $IL = \alpha R$, save for the administrator who while losing αR from redistribution, gains R from embezzlement. In this case, losses in group earnings are computed as $S\bar{W}L = (n-1)\alpha R + \alpha R - R = n\alpha R - R < SWL$. The term to the right of the equal sign shows that losses in group earnings in the case of embezzlement can be considered, from a purely mathematical perspective, lower in size than in the case of inefficiencies. This result reflects the fact that in this case, while not redistributed, R remains within the economy, though in the hands of one individual instead of being redistributed. Crucially, while at societal level the aggregate loss differs between inefficiencies and embezzlement, individual payoff consequences are identical and fixed at $IL = \alpha R$.[1]

Our experiment exploits precisely the payoff similarity between these two phenomena for individual non-administrator group members. The experiment randomises the type of institutional environment within which individuals contribute to the public good, ensuring expected payoff and behavioural equivalence across conditions that represent different aspects of institutional quality. Our experimental conditions model these different aspects of institutional quality: i. leave unconstrained room for administrative embezzlement, ii. "force" embezzlement, iii. introduce an inefficiency, and iv. perfectly constrain the Administrators' behaviours.

Our experiment thus consists of three experimental conditions plus a baseline:

Baseline The group plays the baseline version of our modified public good game with administrator. The latter here has no possibility to embezzle, such that $R = 0$ by definition.

[1] Appendix A shows that introducing inefficiencies or embezzlement as R does not change the Nash equilibrium predictions of the public good game.

Unconstrained The administrator can steal. By redistributing only a fraction of the public budget the administrator can increase her payoff at the expense of the group. In order to fix participants' beliefs about theft, we provide information about the embezzlement rates observed by Martinangeli et al. (2024) in an analogous design. Here $0 < R < C$. Embezzled amounts are not disclosed to the GMs.

Involuntary money allocation to the administrator The administrator is forced to redistribute the entire amount C, though the amount actually redistributed is randomly determined by the software. Practically, the software redistributes a lower fraction of the public budget, independent of the Administrator's will. We ensure that expected redistribution and (involuntary) theft rates match those observed in Martinangeli et al. (2024), and moreover we fix theft beliefs about embezzlement and redistribution by providing the players with the information about said rates. This way, we ensure comparability with Condition *Unconstrained* , such that the administrator's intention to steal is the one-step deviation between the two conditions. Involuntarily embezzled amounts are not disclosed to the GMs.

Inefficiency The Administrator cannot do differently than redistributing the whole budget, but the software introduces inefficiencies by making money "disappear" ahead of the redistribution process. The lost money is effectively *lost*, and is commonly known not to be given to the Administrator. In order to ensure comparability with Condition *Unconstrained* and Condition *Involuntary* , we ensure the software "loses" money at the same expected rate in which theft is observed in Martinangeli et al. (2024) and we again fix beliefs by providing information about said rates. Lost amounts are not disclosed to the GMs.

To ensure comparability of individuals' actions across conditions and behavioural and payoff equivalence, we fix expectations about the incidence and size of embezzlement or inefficiency across experimental conditions. We do so by providing information about the size of embezzlement relative to the size of the public budget to the participants in the *Unconstrained* and *Baseline* conditions, recorded in Martinangeli et al. (2024). Martinangeli et al. (2024) used in fact a similar design, different from the implementation of this study only in that the experimental variation consisted of the probability with which the administrator's declaration would be audited. In Condition *Unconstrained* we thus write that "in a previous similar study the Administrators would on average distribute 70% of the group contributions and keep 30% for themselves". In Condition *Involuntary* and Condition *Inefficiency* where the amounts of money "embezzled" or lost are selected by the software, we ensure these amounts match those observed in Martinangeli et al. (2024). We then tell the participants in these conditions that "the software will on average distribute 70% of the group contributions and leave 30% to the administrator [30% will be lost]", respectively. Different from Martinangeli et al. (2024), we measure the size of embezzlement relative to the size of the public budget. This strategy enables us to provide identical information to participants in different experimental conditions

and to construct our game as fully simultaneous, though asynchronous, allowing us to collect data on a large survey sample.[2]

We are interested in the components of embezzlement and not in the fact of embezzlement per se. We therefore inform the participants about the expected size of the theft (relative to the size of the public budget), but do not provide feedback on individual contributions, nor on the occurrence or size of embezzlement. Instead, we elicit incentivised beliefs about others' contributions and about the administrators' embezzlement behaviour. We elicit beliefs about others' cooperative behaviour by incentivising the group members' expectations about the other group member's contribution.[3] We further elicit the GMs beliefs about the Administrator's embezzlement behaviour as a proportion of endowment they will redistribute. The entire modified public good game is played as a one-shot interaction among anonymous strangers.

Below is the stepwise breakdown of the participants' progression through the experiment:

1. Explanation of the standard public good game mechanics
2. Explanation of the role of the Administrator
3. Explanation of the experimental condition relevant to the participant
4. Public good contribution decision
5. Only Administrators: embezzlement/redistribution decision
6. Belief elicitation: other GM's cooperation, administrator's behaviour

The experiment was conducted using the online experimentation software oTree (Chen et al., 2016). We adapted the instructions for them to be delivered online, in a simplified and intuitive way. We opted for short animated videos, generated via PowerPoint animations to illustrate the mechanics of the game. Appendix B provides an English transcription of the survey and links to the videos delivering the instructions to the participants. Appendix D details the preregistered protocol for asynchronous participant matching.[4]

[2]Compared to a laboratory environment, the simultaneity of an experimental group's choices cannot be ensured. For this reason the structure of the experiment must allow for the implementation of the simultaneous game in its extensive form, and ensure simultaneity via information sets over the co-players' moves.

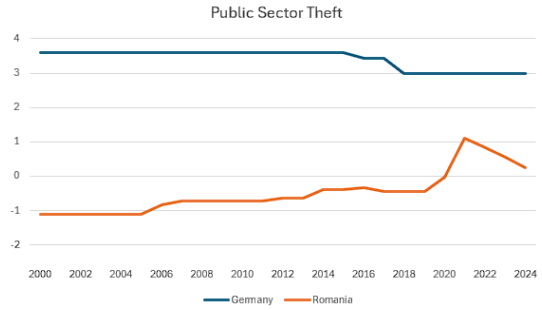
[3]Because the administrators have embezzlement in their strategy set, eliciting beliefs about their contribution would not convey any meaningful information.

[4]The experiment included additional steps, all included after the public good game and announced only after its conclusion. These steps were intended to measure, in random order, individuals' social trust, norm perceptions (trust, trustworthiness, and cooperation), and risk aversion. These follow-up elicitations did not produce interesting variation capable of illuminating on the mechanisms behind the results obtained in the public good game. For this reason, and in the interest of space, results from these sections of the experiment are not reported, and all materials will be made available upon request and can be found in public access data repositories. Transcripts of these sections of the survey are reported in Appendix C.

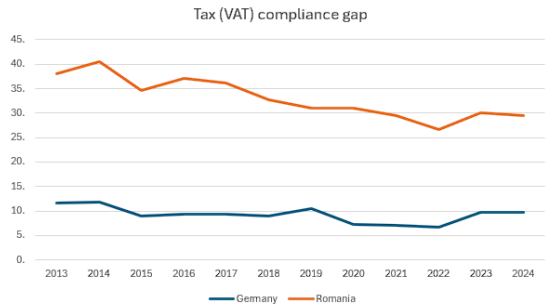
4.2 Case selection and data collection

When evaluating the effects of various aspects of institutional quality - in our case the possibility of embezzlement and inefficiencies in the system - on individual behaviour, we deem it important to take into account individual exposure to real-life institutional conditions, as it may affect people's perception of treatments that aim to represent institutional quality. External validity of experiments evaluating the effect of institutional quality from single country studies may be limited and we opted for comparing experimental results from different country contexts that vary in the level of corruption (and embezzlement more specifically) and the level of inefficiencies.

We chose two countries in the European Union that provide two contrasting institutional contexts along these dimensions - Germany, which is widely characterized by relatively high levels of government efficiency and low levels of corruption, and Romania, which has historically had high levels of corruption and lower administrative efficiency. We illustrate the differences in the level of embezzlement in Figure 1, using the Varieties of Democracy Public Sector Theft Index, which captures the extent to which public sector employees grant favours in exchange for material goods, and how often they "steal, embezzle, or misappropriate public funds or other state resources for personal or family use." Higher score on the index implies public administration free from embezzlement practices. To illustrate the levels of inefficiencies, we consult European Union's tax compliance report, which shows the difference between actual tax revenues and the revenues that would have been collected if all taxpayers paid their taxes according to the prescribed rules (European Commission, 2025)



Source: (Varieties of Democracy (V-Dem) Institute, 2025)



Source: European Commission (2025)

Figure 1: Public sector theft 2000-2024 (left) and Tax compliance gap 2013-2024 (right).

The figure illustrates that Germany has had a public administration nearly free from embezzlement practices. In contrast, Romania has scored much lower on the index, with an improvement only in recent years. As for the tax compliance gap, the tax gap in Germany is currently at 9%, which is a European average, while the tax gap in Romania is the highest in the EU and reaches 30% in unpaid taxes. The figures illustrate that there are large differences in the level of embezzlement in public sector and the level of

inefficiencies in tax collections between Germany and Romania.

These differences imply that citizens in the two countries may enter experimental situations with different baseline expectations about what is a norm in institutional quality. According to expectations set out in Hypothesis 2, participants in Germany may react particularly strongly to corruption treatments because they represent a clear violation of institutional integrity that is normally expected. Participants in Romania, by contrast, may be more accustomed to such practices and therefore exhibit a weaker behavioural response to corruption relative to inefficiency.

We collected data using online surveys coded with oTree (Chen et al., 2016). Such implementation made a lab-like experiment possible on a large representative sample. Previous studies comparing laboratory experiments to such lab-like online survey experiments find few differences in the results, implying that the results from both are comparable (Buso et al., 2021; Clifford and Jerit, 2014).

In both Romania and Germany we used Respondi/Bilendi survey company for sampling and survey data collection. In Germany, we collected data from 4812 respondents. In Romania, our sample consists of 3007 respondents.

5 Results

First, we compare how individuals' beliefs about the contributions of others and administrator's honesty differ between the experimental conditions. We can thus gain a sense of whether the experimental conditions had the desired effect on individuals' expectations about the behaviour of others, that is, whether institutions differing in their control over administrators' behaviours change beliefs about the behaviour of others. Due to the nature of this comparison, we set Baseline treatment condition as a reference category.

	(1)	(2)	(3)	(4)
	Beliefs about:			
	Group Member's contribution		Admininistrator's honesty	
VARIABLES	Germany	Romania	Germany	Romania
Cond. Inefficiency	-0.036	-0.004	-4.361***	0.926
	(0.021)	(0.134)	(1.342)	(1.274)
Cond. Involuntary	-0.024	-0.259	-4.649***	-1.608
	(0.021)	(0.211)	(0.874)	(1.570)
Cond. Unconstrained	-0.050**	-0.323	-6.020***	-6.414***
	(0.019)	(0.171)	(0.907)	(1.659)
Constant	0.836***	5.233*	62.703***	58.017***
	(0.116)	(2.462)	(7.199)	(9.803)
Observations	3,210	1,998	3,210	1,998
R-squared	0.035	0.030	0.127	0.083

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 1: Beliefs about group members' and administrators behaviour in Germany and Romania in different experimental conditions

Table 1 shows that when interacting within an institution that leaves room for embezzlement of public funds (Condition Unconstrained), individuals indeed believe that administrators will make larger attempts at theft. The difference between the Unconstrained and Baseline conditions is large and statistically significant and this effect true in both Romania and Germany, highlighting that our treatment worked as expected. In fact, in all treatments where there is a possibility of losses, participants in Germany are more distrustful of the administrator's behaviour compared to the treatment with no possibility of losses, even when theft or losses are forced by design. As for the beliefs about the contributions of others, the effects are different in Germany and Romania. In Germany, after exposure to a possibility of embezzlement, individuals believe other group members will contribute less than after exposure to no possibility of losses. In Romania, there is no such difference in the beliefs about other group members' behaviour between the conditions.

We continue by testing H1, postulating that exposure to corruption generates less cooperation than exposure to inefficiencies. As the hypothesis calls for comparing cooperation in condition Unconstrained, which aims to capture the possibility of embezzlement (a form of corruption), and condition Inefficiency, the results become easier to interpret if we set one of these conditions as a reference category when presenting differences in cooperation between conditions in the tables. We chose to use Condition Unconstrained as a reference when comparing cooperation levels, measured in our experiment with the degree of monetary contributions to a common pool in a public good game. Tables 2

and 3 present the results for experiments in Germany and Romania respectively.

VARIABLES	(1) Contribution	(2) Contribution	(3) Contribution	(4) Contribution
Cond. Baseline	0.048	0.015	-0.008	-0.009
	(0.028)	(0.022)	(0.024)	(0.021)
Cond. Inefficiency	-0.066**	-0.075***	-0.081***	-0.081***
	(0.023)	(0.023)	(0.024)	(0.025)
Cond. Involuntary	0.032	0.015	0.019	0.011
	(0.026)	(0.021)	(0.023)	(0.021)
Belief GM coop.		0.657***		0.589***
		(0.016)		(0.014)
Belief Admin honesty			0.009***	0.005***
			(0.001)	(0.000)
Constant	0.841***	0.325***	0.314*	0.121
	(0.166)	(0.103)	(0.167)	(0.106)
Observations	3,210	3,210	3,210	3,210
R-squared	0.042	0.382	0.168	0.408

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Extent of contributions to the common pool in different experimental conditions in Germany

VARIABLES	(1) Contribution	(2) Contribution	(3) Contribution	(4) Contribution
Cond. Baseline	0.115	-0.122	-0.136	-0.179
	(0.199)	(0.149)	(0.193)	(0.147)
Cond. Inefficiency	0.024	-0.210	-0.263	-0.276*
	(0.160)	(0.149)	(0.164)	(0.143)
Cond. Involuntary	-0.103	-0.150	-0.291	-0.198
	(0.176)	(0.190)	(0.154)	(0.189)
Belief GM coop.		0.731***		0.705***
		(0.014)		(0.014)
Belief Admin honesty			0.039***	0.010***
			(0.003)	(0.003)
Constant	5.167	1.577	3.150	1.181
	(2.906)	(1.023)	(2.531)	(0.979)
Observations	1,998	1,998	1,998	1,998
R-squared	0.029	0.506	0.115	0.511

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Extent of contributions to the common pool in different experimental conditions in Romania

In the German sample, participants contributed significantly less under the Inefficiency condition than under the Unconstrained (corruption) condition. This finding

rejects H1 and instead indicates the opposite: exposure to a possibility of inefficiencies reduced cooperation more than exposure to a possibility of corruption. This result is robust when controlling for participants' beliefs about the behaviour of other group members and of the administrator (see Table 1). The difference in contribution levels between the Unconstrained condition and the Baseline condition is insignificant, suggesting that participants are more sensitive to waste than to embezzlement.

In Romania, the results are much weaker, but still consistent with the ones obtained in Germany: Participants contribute less under the Inefficiency condition compared to the Unconstrained condition. This effect is only significant at 10% and only after controlling for beliefs about the behaviour of other group members and the administrator. The difference in the contribution levels between other conditions and the Unconstrained condition are statistically insignificant. While the results in Romania are weak, given that the participants are likely to have been exposed to some level of corruption and inefficiencies in the real world, it is surprising that we find the negative effect of inefficiencies at all. In practice, it means that enough people contribute less when experiencing a possibility of losses in the system due to inefficiencies than due to a possibility of corruption to generate a statistically significant result. Another issue could be the statistical power, as in Germany, our sample size is 40% larger than in Romania.

6 Discussion

Following the arguments outlined in the theory section and our hypothesis, we expected that individual propensity to cooperate is lower in the Condition *Unconstrained* than in the Condition *Inefficiency* due to a number of reasons, including the ease of attributing responsibility and a demoralizing effect of corruption, where encountering a possibility of corruption has a spillover effect on trust in others.

Contrary to our expectations, we found that experiencing inefficiencies in the system has a negative effect on cooperation compared to experiencing corruption. This might be due to a mechanism that individuals get frustrated by the fact that they cannot "put a face" on the problem, and it is beyond their abilities to change "the system".

The results also differ in the different country contexts under investigation - the negative effect of inefficiencies is pronounced in Germany and is less pronounced in Romania. We believe that this may be due to the fact that Romania and Germany have a different status quo in institutional quality or the initial level of corruption and inefficiencies experienced by participants in the real world are different.

In the high-corruption and high-inefficiency settings (Romania), the group that receives the Baseline treatment condition has likely experienced an improvement from the status quo. In the Baseline condition, there is no room for the administrator to steal and no room for the money getting lost, everything gets redistributed to the group members, and it is likely not the status quo in Romania. If in the real-world the participants have already experienced the demoralizing effect of corruption that we theorize, it is unsurprising that the level of cooperation (the level of contributions) is not different from that observed in other conditions that resemble the status quo. It is, however, surprising that

we observe a negative effect from inefficiencies, even if weak.

In the low-corruption and low-inefficiency settings (Germany), conditions outlined in Baseline treatment are 'business as usual' and people are more sensitive to an introduction of any "imperfections" in the system. However, what stands out is that people seem to react more strongly to inefficiencies than to corruption.

7 Conclusions

Taken together, the results of our study highlight that institutional inefficiencies can be more damaging to cooperation than corruption itself, especially in societies where efficiency and integrity are the norm, for instance, Germany. In contexts where corruption and inefficiency are more common, as in the case of Romania, studying the effects of corruption and inefficiency in laboratory settings is much more challenging, as individuals appear to be relatively desensitized to exposure to both of these conditions.

Based solely on the results of our study, we cannot conclude with certainty that inefficiencies are more important than corruption in shaping cooperation between individuals, as the results did not hold in different country contexts. However, our results give important food for thought.

The cross-country contrast suggests that individual reactions to stylized models of institutional quality are somewhat shaped by prior institutional experience that mediate how individuals react to experimental interventions. Future studies of the effect of institutions should take this into account and always compare individual reactions to models of institutional conditions in different institutional settings.

We also invite future research to further investigate why people react so strongly to inefficiencies in the system compared to corruption, including the psychological reactions that exposure to these institutional conditions triggers. For example, one of such mechanisms could be individuals placing a different value on procedural compared to distributional fairness. These mechanisms can be tested using our suggested behavioural game design, which we invite scholars to utilize when studying behavioural consequences of institutional quality in experimental settings.

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Appendix

A Equilibrium in a modified game with embezzlement by an intermediary agent

We denoted total group contributions as

$$C = \sum_{i \in G} c_i$$

The Administrator, k, is a member of G, and collects the group's contributions and redistributes them as standard in the public good game. We allow k to embezzle any fraction of C. The embezzled amount is R, with $0 \leq R \leq C$. If $R = 0$, all contributions are redistributed. If $R = Y$, the whole amount is embezzled. The payoffs of player $i \neq k$ are then given by

$$\pi_i = E - c_i + \alpha(Y - R).$$

Further k's payoffs are given by

$$\pi_k = E - c_k + \alpha(Y - R) + R.$$

Clearly, k maximises their payoff by setting $R = Y$. The Nash equilibrium remains that of zero contributions on behalf of player $i \neq k$ as in the standard public good game. The very same logic applies if R is lost due to inefficiencies instead of embezzled.

B The survey

The study was programmed on oTree (Chen et al., 2016) and fielded in the local languages (German and Romanian). Below is a full transcription, in English, of the survey the participants went through. The instructions were delivered to the participants in two ways. First Youtube videos, created with powerpoint animations, were embedded within the survey environment to explain the structure of the survey, the games, the payment schemes and the matching protocol, and screenout procedures for low quality answers. Clickable hyperlinks to the (English version) of the videos are embedded within the survey transcription.

All videos could be replayed by the participants at specific checkpoints within the survey (these are marked within the survey transcription). Second, at the checkpoints, the participants could click through stills of the videos in png format, at their own pace.

The authors' commentary for the reader (not visualised by the participants) is marked in [*italics within square brackets*]. Clickable elements of the survey are transcribed as bulleted lists.

B.1 Introduction

[Informed consent was included with the introduction video, detailing the anonymity of the data, the possibility for the participant to withdraw consent at any moment by quitting the survey, and that the participant could earn an additional compensation as part of the behavioural incentivisation scheme (in addition to the remuneration already offered by the survey company) by completing the survey. The participants were also warned that no compensation would accrue to those who would not complete the survey. The survey consisted of four incentivised games, only one of which was randomly selected to be paid to the participants, who were informed of this payment scheme right from start.]

Introduction video: `https://youtu.be/GFW0AWRkHK8`

- No, I want to leave the survey
- Continue

[New page]

Please answer the following questions.

What is your age?

- 18–29
- 30–39
- 40–49
- 50–59
- 60–69
- 70+

What is your gender?

- Male
- Female
- Other

What is your German State of residence?

- List of German/Romanian States/regions

What is the size of your household?

- *[Free numerical field]*

[New page]

[Should the survey hit the quota limits for representativity (geography, age, gender), the participant would be screened out with this page.]

Thank you for participating. The session is already full.

Please wait while we redirect you to the panel website.

B.2 Public good game explanation

[New page]
Public goods game explanation: `https://youtu.be/2bsomSHwRUk`

- Continue

[New page]
[The administrators' role was explained on this page.]
Administrator explanation`https://youtu.be/STx6QTOLYP0`

- Continue

[New page]
[The participants were randomised into one of the experimental conditions at this stage. Each participant was randomised into one condition only, and hence only watched one of the following videos]
Experimental condition – baseline: `https://youtu.be/mGz9dUmbIo4`
Experimental condition – involuntary: `https://youtu.be/DEfTAm3_0A0`
Experimental condition – inefficiency: `https://youtu.be/rPoQAiR-UI8`
Experimental condition – unconstrained: `https://youtu.be/yvNI2jjDm9w`

- Continue

[New page]

[This is a checkpoint page, where the participants could re-watch the videos they had been shown (and only those), or click through the video stills]

On this page you can re-watch the videos you saw earlier, or click on "Continue" to proceed.

- Continue

- Re-watchable video 1

- Re-watchable video 2
- Re-watchable condition-specific video
- Video stills

[New page]

Control questions

[On this page, we included control questions to gauge the respondents' understanding of the public good game payoff computations. Because our interest was in ensuring understanding rather than capturing the respondents' degree of understanding, we included a clickable button to display solutions. We nevertheless included a counter of the number of times a participant would submit the page with incorrect answers, and cap the number of attempts at 10. After 10 incorrect attempts at submitting the form, the participant was screened out (this occurred only once).]

Before we proceed:

It is **important** that the calculation of earnings is clear to you.
Please answer the following questions to check your understanding. Use your calculator if needed.
Click on "Solve" to display the solutions.

Here is a reminder of the calculation:

Your earnings = your 2 euros − your contribution + the **double of the group's total contribution**, **equally distributed** among all 3 group members

Your earnings = your 2 euros − your contribution + ((your contribution + the contribution of the others) × 2) / 3

Be careful! The arrow keys on your keyboard can change your entries!

Question 1

Imagine that everyone, including you, contributes **nothing** to the project:

How much does **each individual** group member earn?

Answer options (shown in randomized order):

- Higher than that of the other group members and equal to 2€
- Higher than that of the other group members and equal to 4€
- The same as that of the other group members and equal to 2€
- Lower than that of the other group members and equal to 2€

- Lower than that of the other group members and equal to 0€
- The same as that of the other group members and equal to 4€
- Solve Question 1

  [Only displayed if "Solve" is clicked] Solution: Everyone keeps their own **2 euros**.

Question 2

Imagine that everyone, including you, contributes **their entire endowment** to the project.

How much does **each individual** group member earn?

Answer options (shown in randomized order):

- Higher than that of the other group members and equal to 2€
- Higher than that of the other group members and equal to 4€
- The same as that of the other group members and equal to 4€
- Lower than that of the other group members and equal to 2€
- Lower than that of the other group members and equal to 0€
- The same as that of the other group members and equal to 2€
- Solve Question 2

  [Only displayed if "Solve" is clicked] Solution: Everyone contributes 2€. There are 6€ in the project, which doubled become 12 euros. They are divided equally. Therefore, each person in the group receives $\mathbf{2 - 2 + ((2 + 2 + 2) \times 2) \,/\, 3 = 12/3 = 4}$ **euros**.

Question 3

Imagine that the **other two group members** together contribute 2€ to the project.

a. How much will **you** earn if **you add 0€** to the 2€?

Answer options (shown in randomized order):

- Higher than that of the other group members
- Lower than that of the other group members
- The same as that of the other group members

- Solve Question 3a

  [Only displayed if "Solve" is clicked] Solution: There are 2€ in the project, which doubled become 4€. You receive 1/3 of that in addition to the 2€ you kept, so you earn: **2 − 0 + (2 × 2) / 3 = 2 + 4 / 3 = 2 + 1.3 = 3.3€**.

b. How much will **you** earn if **you add 2€** to the 2€?

Answer options (shown in randomized order):

- Higher than that of the other group members
- Lower than that of the other group members
- The same as that of the other group members

- Solve Question 3b

  [Only displayed if "Solve" is clicked] Solution: There are 4€ in the project, which doubled become 8€. You receive 1/3 of that in addition to the 0€ you kept, so you earn **2 − 2 + ((2 + 2) × 2) / 3 = 0 + (4 × 2) / 3 = 0 + 8 / 3 = 0 + 2.6€**.

Question 4
Imagine that **you** contribute 1€ to the project.

a. How much will **you** earn if **the others together add 0€** to the 1€?

Answer options (shown in randomized order):

- Higher than that of the other group members
- Lower than that of the other group members
- The same as that of the other group members

- Solve Question 4a

  [Only displayed if "Solve" is clicked] Solution: There is 1€ in the project, which doubled becomes 2€. You receive 1/3 of that in addition to the 1€ you kept, so you earn **1 + 2 / 3 = 1 + 0.6 = 1.6 euros**.

b. How much will **you** earn if **the others together add 2€** to the 1€?

Answer options (shown in randomized order):

- Higher than that of the other group members

- Lower than that of the other group members
- The same as that of the other group members
- Solve Question 4b

  [Only displayed if "Solve" is clicked] Solution: There are 3€ in the project, which doubled become 6€. You receive 1/3 of that in addition to the 1€ you kept, so you earn **2 − 1 + ((1 + 2) × 2) / 3 = 1 + (3 × 2) / 3 = 1 + 6/3 = 1 + 2 = 3€**.

- Continue

[New page]

Contribute
[The participants could submit their contribution to the public good from 0 to 2€ in steps of 1€cent. They could do so by moving an initially invisible cursor on a slider bar. Real time computations would display both the amount contributed by the participant and what they would keep for themself.]

How much will you contribute to the project (from 0 to 200)?

- Continue

[New page]

Redistribute
[This page is only displayed to the administrators.]

You were selected to collect the contributions. How much of them will you declare (from 0% to 100%)?

Click on the blue bars to display the sliders, and move them to select your answer.

- Continue

[New page]

Redistribute (correction page)
[Conditions Baseline, Involuntary and Inefficiency require the Administrator to redistribute the full amount contributed by the group. Should they attempt at embezzling any fraction of the contributions, they would land on this page, where they were asked to correct their answer.]

You did not redistribute the full amount collected by the group. Please revise your entry.

You were selected to collect the contributions. How much of them will you declare (from 0% to 100%)?

Click on the blue bars to display the sliders, and move them to select your answer.

- Continue

[New page]

Belief elicitation for non-administrator, contribution question shown first

[The next two pages display the belief elicitation questions for non-administrator group members – about the contribution behaviour of the other group member, and about the administrator's embezzlement behaviour – displayed in random order.]

Please answer the following questions.
We pay you an **additional amount** if you guess correctly.
The closer your estimate is to the true value, the more you receive, up to 0.5€ per estimate.

How much do you think the other group member (not the administrator) contributed?

Click on the blue bars to display the sliders, and move them to select your answer.

- Continue

[New page]

Please answer the following questions.
We pay you an **additional amount** if you guess correctly.
The closer your estimate is to the true value, the more you receive, up to 0.5€ per estimate.

How much of the group contributions do you think the administrator declared for redistribution (from 0% to 100%)?

Click on the blue bars to display the sliders, and move them to select your answer.

- Continue

[New page]

Belief elicitation for administrator

[The next questions are only displayed to Administrators to elicit their beliefs about the group's contribution behaviour.]

Please answer the following questions.
We pay you an **additional amount** if you guess correctly.
The closer your estimate is to the true value, the more you receive, up to 5 points per estimate.

How much do you think the other group members contributed on average (rounded to the nearest 0.1 euro)?

Click on the blue bars to display the sliders, and move them to select your answer.

- Continue

B.3 Additional games

[Follow three further sets of behavioural games in random order: trust game, risk elicitation, and an incentivised opinion matching norm elicitation strategy. These were intended to more deeply investigate the mechanisms uncovered with the public good game, which was always played first. These games were not disclosed to the participants before the end of the public good game section of the study. Because the data collected from these games does not return any informative insight we postpone their description and transcription to Appendix C, and omit their discussion in the interest of space.]

B.4 Further demographics and corruption questions

[New page]

How many people live in your household (including yourself)?

How many children (under 18 years old) live in your household?

What was your household's **monthly net income** last year? By this we mean the total amount resulting from wages, salaries, income from self-employment, retirement pensions, public benefits, income from rent and leasing, housing benefits, child benefits, and other income, **after deduction of taxes and social security contributions**.

- <500€
- 500€–1500€
- 1501€–2000€
- 2001€–2500€
- 2501€–4499€
- 4500€ +

What is your highest educational qualification (general or vocational)?

- No school-leaving qualification
- Lower secondary, intermediate secondary, or comparable qualification
- Abitur / Fachabitur or comparable qualification
- Completed university or university of applied sciences degree (Bachelor, Master, etc.)
- PhD

What is your current employment status?

- Employed full-time
- Employed part-time
- Self-employed or business owner
- I am unemployed and looking for work
- I am a pupil / student / trainee / apprentice / retraining participant
- Retired
- I am currently not employed and not looking for work

How often do you take part in surveys?

- Never
- Sometimes
- Often
- Very often

How many surveys, including this one, have you completed today?

- Continue

[New page]

[This page collected perceptions and experience of corruption. Question 3 was conditionally required: it had to be left blank if the participant answered "No" to Question 2, and had to be answered if the participant answered "Yes".]

1. How often do you believe employees in the public sector in your region embezzle public funds or other state resources for personal or family purposes?

- OFTEN. Public sector employees are responsible custodians of selected public funds, but treat the rest like personal property.
- ABOUT HALF THE TIME. The probability that public sector employees handle selected public funds responsibly is about equal to the probability that they treat them like personal property.
- OCCASIONALLY. Public sector employees handle most public resources responsibly, but treat selected others like personal property.
- NEVER OR ALMOST NEVER. Public sector employees almost always handle public funds responsibly and keep them separate from personal or family property.

2. Have you ever had direct experience with corruption in your region?

- Yes
- No

3. How often would you say you have had direct experiences with corruption in your region in the last 5 years?

- Sometimes
- Often
- Very often

- Continue

[New page]

Thank you for your participation. The survey is now finished.

You **MUST click the "Finish" button**, otherwise your participation will be marked as **incomplete** and you will **not be paid**.

After data collection is complete, you will receive information about your result and your payment.

Your answers will be matched with those of randomly selected other participants and evaluated according to the procedures explained earlier.

It is possible that we may not be able to match all responses.

If this happens, unmatched participants will be matched with the average responses of the other study participants and paid accordingly.

- Finish

C Additional games

[The following three games were presented after the respondent concluded the public good game phase and before the elicitation of additional demographic and corruption experience questions. The public good phase was always played first, and each additional game was only revealed and described upon its start. Therefore, neither the public good game, nor each additional game, could be influenced by knowledge of what would come next.]

C.1 Trust game

[The participants played the trust game, once as sender and once as receiver. The order of the two roles was randomised across participants. Only one, randomly selected matching order per pair of participants (see matching protocols in Appendix D), would be valid for payment of the trust game section. All participants were informed of this payment scheme. Moreover, the receiver's choice incentivisation followed the strategy method: a sent back amount would be specified for each possible choice of the sender. The implemented send-back would be the one corresponding to the actual choice of the sender with whom the participant was paired. This payment scheme was transparently disclosed to the participants.]

Trust game explanation: `https://youtu.be/_1Oy9cTq66k`

- Continue

[New page]

[This is a checkpoint page, where participants could re-watch the video, click through the slide deck, or continue.]

You can watch the video again, click through the slides, or continue the survey by clicking the "Continue" button.

- Continue

- Re-watchable video
- Video stills / slide deck

[New page]

Sender decision

You will now take on the role of the **Sender**.

Please indicate how much of your 2€, in steps of 0.2€, you would like to send to the other person, if any.

- Continue

[New page]

Receiver contingent decisions

You are now in the role of the **Receiver**.

Please indicate how much of your 2€ plus the amount you received you would like to send back to the Sender.

Please enter a number in steps of 0.2€.

The choice that applies is the one corresponding to the actual amount sent by the Sender.

If the Sender **sent 0€**, you received 0€. **How much of the 2€ you now have will you send back?**

If the Sender **sent 0.2€**, you received 0.4€. **How much of the 2.4€ you now have will you send back?**

If the Sender **sent 0.4€**, you received 0.8€. **How much of the 2.8€ you now have will you send back?**

If the Sender **sent 0.6€**, you received 1.2€. **How much of the 3.2€ you now have will you send back?**

If the Sender **sent 0.8€**, you received 1.6€. **How much of the 3.6€ you now have will you send back?**

If the Sender **sent 1€**, you received 2€. **How much of the 4€ you now have will you send back?**

If the Sender **sent 1.2€**, you received 2.4€. **How much of the 4.4€ you now have will you send back?**

If the Sender **sent 1.4€**, you received 2.8€. **How much of the 4.8€ you now have will you send back?**

If the Sender **sent 1.6€**, you received 3.2€. **How much of the 5.2€ you now have will you send back?**

If the Sender **sent 1.8€**, you received 3.6€. **How much of the 5.6€ you now have will you send back?**

If the Sender **sent 2€**, you received 4€. **How much of the 6€ you now have will you send back?**

- Continue

C.2 Norm elicitation

[New page]

Norm elicitation explanation – part 1: `https://youtu.be/5ezYxd1zf8k`

- Continue

[New page]

[This is a checkpoint page, where participants could re-watch the video, click through the slide deck, or continue.]

You can watch the video again, click through the slides, or continue the survey by clicking the "Continue" button.

- Continue

- Re-watchable video
- Video stills / slide deck

[New page]

On the following pages, you will find three statements.
Please indicate how strongly you **agree** or **disagree** with each of them.

- Continue

[New page]

Statement 1: Everyone should cooperate with others in the general interest.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

- Continue

[New page]

Statement 2: Everyone should trust others.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

- Continue

[New page]

Statement 3: No one should betray the trust that others place in them.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

- Continue

[New page]
Norm elicitation explanation – part 2: `https://youtu.be/5dFPPmF1CBI`

- Continue

[New page]

[This is a checkpoint page, where participants could re-watch the video, click through the slide deck, or continue.]

You can watch the video again, click through the slides, or continue the survey by clicking the "Continue" button.

- Continue

- Re-watchable video
- Video stills / slide deck

[New page]

Statement 1: Everyone should cooperate with others in the general interest.

Which answer will be chosen **most frequently** by the **other participants** in this study?

- "Strongly disagree" was chosen by most participants
- "Disagree" was chosen by most participants
- "Agree" was chosen by most participants
- "Strongly agree" was chosen by most participants

- Continue

If you guess correctly, you will receive 60 cents.

[New page]

Statement 2: Everyone should trust others.

Which answer will be chosen **most frequently** by the **other participants** in this study?

- "Strongly disagree" was chosen by most participants
- "Disagree" was chosen by most participants
- "Agree" was chosen by most participants
- "Strongly agree" was chosen by most participants

- Continue

If you guess correctly, you will receive 60 cents.

[New page]

Statement 3: No one should betray the trust that others place in them.

Which answer will be chosen **most frequently** by the **other participants** in this study?

- "Strongly disagree" was chosen by most participants
- "Disagree" was chosen by most participants
- "Agree" was chosen by most participants
- "Strongly agree" was chosen by most participants

- Continue

If you guess correctly, you will receive 60 cents.

C.3 Bomb risk elicitation task (Crosetto and Filippin, 2013)

[New page]

Bomb risk elicitation task explanation: `https://youtu.be/u0nzcQ8A5BI`

- Continue

[New page]

[This is a checkpoint page, where participants could re-watch the video, click through the slide deck, or continue.]

You can watch the video again, click through the slides, or continue the survey by clicking the "Continue" button.

- Continue

- Re-watchable video
- Video stills / slide deck

[New page]

Your decision

[This page displayed the bomb risk elicitation task itself. the task was dynamic: after clicking "Start", one box per second was collected automatically at random. The participant could stop the process at any time. Feedback was enabled, so after stopping, participants could click "Solve" to reveal whether the bomb had been collected. No separate results page was displayed in this app.]

Number of boxes collected

Number of boxes remaining

- Start
- Stop
- Solve

- Continue

[New page]

[Part marker shown before the next stage of the study. Depending on prior randomization, participants saw either Part 3, Part 4, or a blank page.]

D Asynchronous matching protocol

Public good game groups We maximise the chances of collecting complete responses and minimise procedural complexity by running the experiment asynchronously, i.e. each participant acts as part of a group of 3, but their actions do not require the simultaneous presence of the other group members online, though preserving their strategic and payoff interdependence.

To do so, we assign a sequence number to each participant at the moment in which the experimental conditions are assigned (immediately following the illustration of the basic game). This means that independent of the moment in which the participant will click on the link to reach the survey they received from the panel company, they will be assigned a sequence number the moment they will have learned of the basic procedures of the game and just before being assigned to one of the four experimental conditions.

Three sequentially contiguous participants will be assigned to one of the four experimental conditions. For example, the first three participants to reach the condition assignment stage will be assigned to condition 1; the second three participants will be assigned to condition 2; and so on.

After completing the data collection, we group participants in groups of 3 by assigning each individual a random number q without duplicates. Individual i, non-administrator in experimental condition c, will be assigned to group g as follows:

g = roundup(number of non-administrators in condition c whose q is smaller than or equal to i's, divided by 2).

For administrators in condition c:

g = roundup(number of administrators in condition c whose q is smaller or equal to theirs).

An analogous strategy was followed for role and pair assignment in the trust game, as described below. See preregistration document for a complete description of the procedure.

Administrator selection One of the three group members will be assigned the role of Administrator. This will also be assigned based on the participants' sequence number: as we will match the participants in groups of three with one administrator each, every third participant reaching the condition assignment stage will be assigned the role of Administrator.

Incomplete groups Asynchronous implementation leaves the possibility for the existence of residual participants who cannot be assigned to complete groups within a given experimental condition. This possibility is accounted for in our setting by, at the very end of the study, informing the participants that should it be impossible to assign some participants to complete groups, the behaviours of these participants would be remunerated against the average behaviour of the other participants in the study. This procedure was actually implemented, ensuring that in such case, the average behaviour was computed over the choices made under the same experimental condition that the members of the incomplete groups participated in.

Trust game pairs After completing the data collection, we assign each individual a second random number q without duplicates. Trust-game matching is implemented within experimental condition and separately by public good game role (Group Members and Administrators).

For non-administrators in experimental condition c:

$pair$ = roundup(number of non-administrators in condition c whose q is smaller than or equal to theirs, divided by 2).

For administrators in condition c:

$pair$ = roundup(number of administrators in condition c whose q is smaller than or equal to theirs, divided by 2).

This implies that, within each experimental condition, non-administrators are matched only with non-administrators and administrators only with administrators, pairing them sequentially two by two according to the ordering induced by q. It also implies that trust-game matching is independent of the public good game group assignment itself: public good game groups are constructed using a distinct random number, r, whereas trust-game pairs are constructed using q.