

# **Institutional Quality, Culture, and Norms of Cooperation:**

## **Evidence from Behavioral Field Experiments**

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### **Abstract**

We design an experiment to examine the causal effect of legal institutional quality on informal norms of cooperation, and study the interaction of institutions and culture in sustaining economic exchange. 346 subjects in Italy and Kosovo play a market game under different and randomly allocated institutional treatments, which generate different incentives to behave honestly, preceded and followed by a non-contractible and non-enforceable trust game. Significant increases in individual trust and trustworthiness follow exposure to 'better' institutions. A reduction by one percentage point in the probability of facing a dishonest partner in the market game, which is induced by the quality of legal institutions, increases trust by 7 to 11%, and trustworthiness by 13 to 19%. This suggests that moral norms of cooperative behavior can follow improvements in formal institutional quality. Cultural origin, initial trust and trustworthiness influence opportunistic behavior in markets, but only in the absence of strong formal institutions.

Keywords: legal institutions, culture, trust, trustworthiness, markets, experimental methods

JEL classification: K40, O17, Z10

## 1. Introduction

How does the quality of institutions affect norms of good conduct, such as trust and trustworthiness? How do values and institutions interact to sustain economic exchange? While there is a consensus that both good formal institutions and high societal trust are beneficial for trade and development, how they interact and co-evolve is much less clear. On the one hand, the literature suggests a positive relationship. Theoretical models argue that well functioning and impartial enforcement of contracts enhances societal trust (Guiso, Sapienza and Zingales 2008a; Tabellini 2008). On the other hand, formal institutions, by reducing the marginal returns to being trustworthy, may crowd out trust and trustworthiness (Aghion et al. 2010). A scatter-plot of societal levels of trust against the quality of institutions in a cross-section of countries displayed in Figure 1 illustrates the complex nature of this relationship. While the correlation between trust and rule of law is positive, the correlation between trust and regulatory quality is nil or even slightly negative. Showing a causal link from institutions to trust with happenstance data is difficult because institutions and beliefs are co-determined (Piketty 1995)<sup>i</sup> and co-evolve under the influence of common historical events.<sup>ii,iii</sup>

In this study, we use the experimental method to introduce an exogenous variation in the quality of formal enforcement institutions and measure their effect on moral norms of cooperation. We address two main questions. First, we study the causal effect of formal enforcement on informal norms of trust and trustworthiness, through their influence on cooperative behavior in markets. Second, we shed light on how institutions and pre-existing social norms interact to sustain market efficiency and cooperation.

Our experiment consists of four parts: first, a trust game to measure pre-existing social norms of trust and trustworthiness. Second, ten rounds of a market game, in which subjects chose

whether to trade honestly, cheat or stay out, in the absence of any institution. Third, ten rounds of the market game under one of two formal enforcement institutional treatments: either a Partial Enforcement System (PES) treatment, which reproduces basic features of a closed network justice system, such as the Mafia, or an Impartial Enforcement System (IES), which captures key traits of an impartial justice system for which all agents are equal in front of the law. Finally, another trust game identical to the first one. The different institutional treatments in the market game generate sharply different incentives to deviate from non-cooperation (that is, cheating in the market game). More precisely, the Nash equilibrium is to: cooperate with probability 0 under no institutions, with probability 1 in the IES treatment, and with probability between 0 and 1 in the PES treatment (mixed strategy equilibrium). Allocation to the institutional treatment to experimental session is random. We rely on the initial and final one-shot non-contractible and non-enforceable investment games to measure trust and trustworthiness as moral norms, separate from the cooperative norms occurring in the market game. We do so in order to avoid the confounding effect of reputational concerns in repeated interactions or that of institutional incentives, which can influence the cost of cooperation. Playing a trust game before and after our exchange game is a key feature of our design and is motivated by our desire to study how pre-existing norms, or “culture”, affect behavior under different institutions, and how different institutions foster different dynamics in the evolution of trust and trustworthiness. Relying on within subject variation in trust also reinforces the validity of our causal estimates and overcomes any possible deviation from randomization in the allocation to treatment.

The experiments were conducted in the field with 169 subjects in Italy (both in the North and in the South) and 178 in Kosovo during the summer of 2011. Our results indicate that better formal enforcement (impartial adjudication of tort), has a positive effect on informal norms

of cooperation: trust and trustworthiness are, respectively, between 12% and 18% and between 20% and 31% higher under the impartial institutions treatment compared with the partial institutions treatment. Consistent with our design, the impartial treatment reduces the frequency of non-cooperative behavior in the market game. In turn, Wald estimates indicate that a reduction by 1 percentage point in the frequency of facing a non-cooperative partner (a cheater) in the trading game leads to a 7-11% increase in trust and a 13-19% increase in trustworthiness. Within Italy, the effect of impartial vs. partial institutions on trustworthiness is equivalent to three-fourths of the difference between Milan and Palermo. In Kosovo, it is about three-fourths of the difference between Pristina, the capital city, and Mitrovica, the scene of major tensions during the 1999 civil war. The effect is particularly robust in Kosovo and holds even in a first difference specification, which measures the variation in trust and trustworthiness within subjects, across treatments.

Pre-existing trust and trustworthiness are associated with less cheating and, more generally, cultural differences captured by participants' regional origins explain opportunistic behavior; but only for those that did not experience impartial institution in the market game. This suggests that trust may act as a substitute for formal institutions in supporting exchange, but only in the absence of strong formal institutions. Impartial formal institutions produce more cooperative behavior independently on pre-existing moral norms and culture.

This paper makes two contributions. First, it adds to the literature on the origin of trust. Theoretical models see legal enforcement as having either a positive or negative effect on trust (Guiso et al. 2008a; Tabellini 2008; Aghion et al. 2010). Empirically, recent papers have pointed to a positive relationship between institutional quality and trust, based on evidence that societal trust is higher today in regions that experienced good quality institutions in the past (Guiso et al. 2008b; Tabellini 2010; Grosjean 2011). A possible limitation to causal

identification in these studies is that historical institutions were themselves the outcome of societal trust, and both have persisted until today. By randomly allocating our subjects to different institutional environments, we are able to identify a positive causal effect of institutions. Our findings suggest that trust and trustworthiness can result as a by-product of better formal institutional quality.

Second, we contribute to the literature on the role of culture and its interaction with formal institutions in determining opportunistic behavior in markets and market efficiency. By running our experiment in regions with different levels of trust, we can observe how behavior under each exogenously imposed institution varies across cultures. Running experiments in the field and the selection of our experimental sites are both driven by a desire to capture substantial cultural differences and thereby enhance external validity of our findings. We ran sessions in the North of Italy, characterized by good formal institutions and high trust; Sicily, characterized in theory by the same formal institutions but in practice all too familiar with partial, closed network contract enforcement institutions and low trust; and Kosovo, characterized by weak formal institutions and relatively high trust.

The paper is organized as follows. Section 2 presents our main hypothesis in light of the empirical and theoretical literature on the co-evolution of social norms and institutions and their influence on economic exchange. Section 3 describes the experiment. Section 4 presents the data and descriptive statistics. Section 5 analyzes the effect of legal institutions on trust and trustworthiness. Section 6 addresses the role of pre-existing norms on market behavior and efficiency and their interaction with institutional quality. Section 7 concludes. Appendix A presents the theoretical solution to the trading game. Appendix B includes additional results and descriptive statistics. Appendix C contains the experimental instructions.

## 2. Background and Hypotheses

A fundamental proposition in economics is that markets achieve 100% efficiency, that is the maximization of possible benefits from trade for buyers and sellers. This, however, is based on the hypothesis of frictionless markets. On the contrary, actual markets face many trading frictions since contracts are not always perfectly or costlessly enforceable. In this case, the fear of dealing with a cheating partner might drive market opportunities and surplus down. Such “cheating frictions” present formidable obstacles not just in places where formal contract enforcement institutions are weak, as in markets of the ancient and medieval world (Greif 1993) and in many developing economies (Fafchamps 2004, 2006) but also in economically advanced countries with good enforcement institutions, since it is rarely possible to specify by contract all dimensions of an economic transaction.

Interpersonal networks based on kinship and reputation have been recognized as playing an important role in enforcing trade and promoting cooperation (Fafchamps and Minten 2001; Greif 2006).<sup>iv</sup> However, the very interpersonal nature of these institutions limits the scope of exchange and may reduce efficiency by diverting trade to better connected but less efficient traders (Fafchamps 2002, 2004, Kuran and Lustig 2012). Impartial institutions and the rule of law are deemed to become necessary to sustain large-scale impersonal trade (North 1991; Dixit 2004). Nevertheless, the observation that trade can flourish when contracts are not enforceable, either due to their incomplete nature or to the absence of institutions, has revived interest in the positive role of social norms and of trust and trustworthiness, in particular (Fafchamps 2006). Although there is a clear consensus in the literature that both good quality institutions and high trust promote trade, cooperation, and development,<sup>v</sup> the question of how institutions and social norms interact and co-evolve is much less clear.

The literature offers many definitions for trust, depending on the specific context and content of the study. Here we follow Gambetta (2000) and define trust as “the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action”. In our experimental context, trust is the expectation that another subject will return at least as much as he was given or more, sharing some of the gains. So when discussing trust and trustworthiness as moral norms, we refer to these non-contractible expectations and behaviors, distinguished from the ones that occur in contractible market environments. The literature has tried to distinguish among the two. In the theoretical model of Guiso et al. (2008a), trust is based on culturally transmitted beliefs about others’ trustworthiness and on real experiences of cooperation. Societies can be trapped in an “equilibrium of mistrust” if the net benefits from cooperation are not sufficiently high to induce people to experience cooperation and update the low priors they may hold on others’ trustworthiness. Institutions play a role by determining the net benefits from cooperation. Shocks to the quality of institutions, if capable of inducing significant increases in cooperation, may shift societies to a cooperative equilibrium, even when the shock is temporary.

Tabellini (2008) considers a model in which culturally transmitted values enhance the probability of cooperation. This model distinguishes between localized trust, which is based on interpersonal relationships, and generalized trust, which can sustain exchange with anonymous others. Only improvements in impartial enforcement are capable of crowding in generalized trust, while improvements in local enforcement have an opposite effect by reducing the relative return from trading with anonymous versus local partners. This suggests a complementarity between impartial contracting institutions and societal norms of generalized trust and trustworthiness.

The special role of impartial enforcement institutions has also been highlighted in the political science and sociology literature. Among the first, Rothstein and Stolle (2008) finds that the specific institutions that explain variation in societal trust across countries are the supposedly impartial enforcement institutions, such as the legal system and the police, rather than the more partisan political and representational institutions. Among sociological works, Hruschka (2010) shows that adherence to impartial norms of conduct is correlated with the quality and impartiality of legal enforcement institutions.<sup>vi</sup>

By contrast, the negative relationship in Tabellini (2008) between local, as opposed to impartial, enforcement and generalized trust is reminiscent of a possible negative effect of legal enforcement on trust, which has been discussed elsewhere in the literature. Crowding out may occur because better external enforcement weakens reputational incentives (McMillan and Woodruff 2000) and decreases the returns to being trustworthy (Bohnet, Frey and Huck 2001; Jackson 2011). Under perfect (or close enough) contract enforcement, behavior is entirely dictated by the perspective of monetary punishment, so that there is no return to honesty and trust may be crowded out.

In short, the theoretical literature discusses two countervailing effects of enforcement institutions on social norms, in which trust is either crowded in or out by better legal enforcement. Empirically, a number of papers find evidence that good quality historical institutions have a long lasting positive effect on trust (Guiso et al. 2008b; Tabellini 2010; Grosjean 2011). However, a possible limitation to causal identification in these studies is that historical institutions were themselves the outcome of societal trust, which has persisted until today. Another limitation emanates from recent evidence that good historical institutions can persist at a very local level. Identification in Guiso et al. (2008b), Tabellini (2010) and Grosjean (2011) is based on the assumption that formal institutions are constant in a given



country, so that variations in trust can be attributed to culturally transmitted social norms and not to contemporaneous institutional quality. However, recent evidence by Becker, Hainz and Woessman (2011) shows that there is less corruption in local courts and police in regions of a given country that were part of the Habsburg Empire. If both historical and contemporaneous local institutions are different, observed trust may not necessarily be reflective of cultural norms inherited from historical institutions but, rather, justified by higher institutional quality today.

Beyond exploring the effect of institutions on trust, we are also interested in how pre-existing trust, or more generally culture, affects the effectiveness of institutions. Fisman and Miguel (2007), in a study on parking violations committed by diplomats stationed in New York, finds that cultural origins matter in determining behavior in the absence of formal enforcement, but such an effect disappears very rapidly once enforcement is imposed. With immunity, diplomats from countries with high corruption committed more parking infractions than those from less corrupt countries, but infractions were reduced dramatically once immunity was removed.<sup>vii</sup>

To sum up, theoretical works and empirical evidence suggest two testable hypotheses that will be addressed in this paper. First, impartial institutions in a market environment have a positive effect on non-market moral norms such as trust and trustworthiness. Second, pre-existing culture may be important at intermediate levels of institutional development, but it ceases to play any role in cooperative behavior in markets once good impartial institutions are in place.

A challenge to laboratory studies on the evolution of trust consists in the velocity with which social norms change. The theoretical models reviewed above conceptualize trust as an inherited cultural variable that exhibits remarkable persistence over time. The inherited

component of trust and the implication that trust is slow to change has been supported by several empirical studies (Butler et al. 2012; Durante 2011; Grosjean 2011; Nunn and Wantchekon 2011). However, in certain contexts, rapid changes in trust and norms of good conduct are shown to occur. For example, variations in trust are observed as migrants adapt to their new environment (Algan and Cahuc 2010) or after experiencing violence during a civil war (Becchetti, Conzo and Romeo 2013, Cassar, Grosjean and Whitt 2013). Cialdini, Reno and Kallgren (1990) shows that an exogenous manipulation in perceived social norms about littering has an immediate effect on littering behavior. The “broken window theory” in sociology is based precisely on the idea, supported by empirical evidence (Holden 2008; Keizer, Lindenberg and Steg 2008), that pro (or anti)-social behavior can easily be triggered by small, local changes in disorder. Rand et al (2013)’s “social heuristics hypothesis” suggests, precisely, that intuition can trigger internalized norms of cooperation.

### **3. Experimental Design**

Each experimental session was comprised of four parts followed by a survey: an initial trust game (a.k.a. investment game) in which subjects played both the part of the trustor and the trustee (Part 1); 10 rounds (“days”) of trading in the market game under no institutions (Part 2); 10 rounds of trading under either partial enforcement system (PES) or impartial enforcement system (IES) (Part 4); a final trust game (Part 3), for a total of 24 decisions per subject.

#### *3.1. Trust Game*

To measure initial and final levels of trust and trustworthiness as moral social norms we use a modification of the standard protocol of the investment game of Berg, McCabe, and

Dickhaut (1995). In this game subjects have the ability to “invest” by sending money to an anonymous experimental partner. The amount of money sent is then multiplied by three before reaching the partner. It is then the partner’s turn to decide how much of the received amount to return to the original investor. By considering the amounts that subjects invest and then return, we can determine to what extent subjects trust others and how trustworthy they are. In our version, subjects played both the role of Sender and that of Receiver. We used the strategy method (for which Receivers have to decide how much to send back to the Sender under all possible amount that they could have received) to prevent players from knowing anything about trust and reciprocity of the fellow subjects, so as to limit the dependency between the specific trust experienced in the first game and the following exchange games. Senders could choose to invest any amount between 0 and 10 Euro while Receivers had to decide how much they would send back for each possible amount that they could receive, ranging from a minimum of 0 to a maximum of 30 Euro. The amount sent by Sender ( $X$ ) is considered a signal of trust because larger amounts  $X$  sent translate into larger pies that Receiver has to divide. By sending higher amounts, Sender’s best possible payoff from the game increases, but at the same time her worst-case payoff from the game decreases, relative to the scenario where she sends nothing at all. The amount sent back by Receiver is considered as a measure of trustworthiness or reciprocity. If one of these four decisions (as Sender or Receiver in either Part 1 or Part 4) was randomly drawn to be the one to be paid, the experimenter randomly matched subjects into pairs and computed their profits depending on the actual partners’ choices.

### *3.2. Market Game*

The central part of the experiment consists of playing in a market game under different institutional treatments: first 10 rounds of trading under no institutions (NoES), then 10 rounds of either partial (PES) or impartial institutions (IES) depending on the randomly selected treatment for that session.

No Institutions (NoES). The basic framework consists of a trading game in which 8-10 players decide whether or not to cheat an anonymous counterparty, or not to trade at all, for each one of 10 days for which trading partners change each day. In practice, cheating in markets happens when, for example, a buyer doesn't pay, a check bounces, or a seller deliver a lower quality or defective good. In the experiment players trade an abstract good, so we do not go into details and we simply ask them to either cheat, not cheat or stay out of trade. Matrix 1 displays the parameters chosen for the baseline game:

	No cheat	Cheat	Out
No Cheat	20, 20	0, 30	1, 1
Cheat	30, 0	10, 10	1, 1
Out	1, 1	1,1	1, 1

Matrix 1. NoES Payoff matrix, Cheating - No Institutions.

This treatment of the market game reproduces the features of a prisoner-dilemma game. Each individual has a private incentive to cheat. However, if everyone follows the same rationale, the exchange generates lower social welfare. Maximum social welfare and efficiency (40 total surplus, equally split between traders) are reachable only when both parties do not cheat. Given our payoffs, we find 2 equilibria: (Cheat, Cheat) and (Out, Out) which is payoff dominated by the first one. As long as the payoff from trading and cheating is higher than

the payoff from opting out, we expect everyone to participate in equilibrium and Cheat. In this case the equilibrium quantity would be 1 per couple of players and the total surplus would be 10 per player. Such an outcome is in stark contrast with the equilibrium that would be obtained under perfect and costless enforcement: as long as the payoff from trading is higher than the payoff from opting out, under perfect enforcement everyone would trade in equilibrium, with an equilibrium quantity of 1 per couple of players, and a total surplus of 20 per player per day.<sup>viii</sup>

Between the two benchmarks of perfectly running institutions or a complete lack of an enforcing system, we can investigate the effects of different institutions. An experiment is not expected to reflect all aspects of the real world, but just what one thinks are the most important features for understanding the issue of interest. In our case, we cannot model all the dimensions of a contract enforcement institution, but we want to generate substantial variation in deviations from cooperation while focusing on one aspect in particular that has been the focus of an important literature (see Section 2): partial vs. impartial administration of justice.

Partial Enforcement System (PES). In this treatment, subjects can ensure themselves against being cheated on by buying “protection” against a cheating counterpart. Purchasing protection costs 5, which has to be paid regardless of whether such protection is used or not later on. If a player buys protection and is cheated, the cheater not only loses all she has gained by cheating, but also gets punished. This payoff scheme is designed to mimic what happens when a partial, closed network institution, such as the mafia, is in charge of enforcing contracts. Typically in these settings, individuals who are determined to participate in economic activities may be induced to pay for protection regardless of whether they will require the services of the local boss or not, and in return are ensured against the claims,

rightful or not, of competitors and commercial partners. There is always the incentive, though, not to pay the “protection fee”, or to cheat hoping that the partner is not protected. This is reflected in the payoff matrix of the game (see Appendix A).

Every trading day, subjects have to decide whether or not they want to buy protection and whether they want to trade honestly, cheat or stay out, before knowing the choice of their trading partner for that day. During instructions, we explained to the subjects each possible decision, presenting all the following four possible scenarios (in addition to the staying out option): neither subject has protection, only the subject has protection, only the partner has protection, both have protection. When neither side purchases protection, the payoff structure is the same as in NoES. When both parties buy protection, the final result depends on whether none, one or both cheated. Traders who don't cheat earn 15 (20 from honest exchange, minus the 5 payment to purchase protection). If both traders cheat, then the “protection agency” makes sure that exchange does follow through and imposes an additional cost of 3 as punishment for cheating; therefore, both traders end up with a payoff of 12 (20 of a honest exchange, minus the 5 payment to purchase protection, minus 3 punishment for cheating). When both parties have protection and one cheats while the other doesn't, the one that doesn't can get the contract enforced anyway, so she still earns 15, while the cheating party, as before, gets 12. Last, the case in which only one trader buys protection. The trader that buys protection and doesn't cheat gets 15 no matter what the partner does (20 of a honest exchange, minus the 5 payment to purchase protection). The partner receives 20 if she doesn't cheat or -3 if caught cheating. If the trader cheats, she earns 25 (30 from cheating, minus 5 to purchase protection) no matter what the partner does, since the “protection agency” will protect her no matter what. The non-protected trader will instead earn 0 if he doesn't cheat or -3 if cheats. As in the previous cases, staying out of the market yields a profit

of 1. A payoff matrix and a full description of the solution to this game are provided in Appendix A.

The only pure strategies equilibrium of this game is for both players to stay out. However, the game has many equilibria in mixed strategies in which players can randomize between the different strategies, with the exception of [buying protection, stay out], which is a purely dominated strategy. This outcome is consistent with our desire to generate an equilibrium in which the probability of cheating is between 0 and 1. Also, in the presence of multiple equilibria, individual beliefs on the probability of being cheated will determine the specific strategy played by each subject. Therefore, we expect pre-existing levels of trust to influence the outcomes of the game in the field.

Impartial Enforcement System (IES). For this treatment, we model an impartial judicial system as an institution in which each subject has the option of taking a cheating partner to court. The court then enforces order: whoever cheats has to pay full price plus a fine and whoever is cheated receives full amount minus a court fee. This treatment aims at reproducing the trade-offs faced by citizens when deciding to use an impartial justice system: going to court is an option open to everyone, but still voluntary; it is moderately costly but, when used, it restores the outcomes of honest market exchanges.

Similarly to the PES treatment, subjects have to decide at the beginning of each trading day whether they want to have the option of taking a cheating partner to court or not and whether they want to trade honestly, cheat or stay out, before knowing the choice of their trading partner. Selecting this option is free. A small fee is required only when someone actually takes a cheater to court. We elicit this decision before the behavior of the counterparty is revealed for simplicity, much like in the strategy method. Pairs where neither side wants to take the counterpart to court face the same payoffs as in the no institution case

(NoES). On the contrary, when a subject decides to take a cheating trading partner to court, the court forces the cheating party to trade honestly and pay a fine of 5. Going to court costs 2, which are deducted from subjects' profit for the day only when courts are involved in solving the dispute. When neither party cheats, each trader still receives a payoff of 20. In case a trader that has been cheated has selected to go to court, she earns 18 if she didn't cheat (the honest exchange payoff of 20, minus 2 for taking the counterpart to court) or 13 if she also cheated (the honest exchange payoff of 20, minus 2 for taking the counterpart to court, minus a fine of 5 for having cheated as well). Lastly, when a subject decides not to go to court while her partner does, her payoff is still 20 if nobody cheated, 13 if she cheated or 0 if her partner cheated. Staying out of the market, either by opting out or by being matched with a subject that opted out, still yields 1. A full payoff matrix for this game is provided in Appendix A.

In this treatment, going to court and trading honestly for both partners is a Nash-Equilibrium in pure strategies. It is, however, not unique. The case where both players stay out is also a Nash equilibrium, payoff dominated by the first one. As in the NoES case, we expect individuals to play the payoff-dominant Nash equilibrium.

There are two crucial differences between the IES and the PES treatments. The first is impartiality of enforcement. The court system in the IES treatment is impartial: all the cheaters are punished in the court system, even if they themselves initiated the process by taking a cheater to court. Under PES, a cheater that has private protection can cheat and not only get away with it but also get her partner to pay without herself having to pay, if the partner does not have protection. The second difference between our institutional treatments lies in the level of cooperation that they induce. Subjects are expected to cheat with probability 1 in equilibrium under the NoES treatment, with probability 0 under the IES



treatment, and with probability between 0 and 1 under the PES treatment. The exogenous variation in the probability of cheating introduced within the experiment is crucial for our analysis of treatment effects on trust and trustworthiness.<sup>ix</sup>

### *3.3. Experimental Protocol*

The games were played with paper and pencil to be able to reach our targeted subject pool in the field. Each point was equivalent to 1 Euro in both sites<sup>x</sup>. After the experimenters read each part of the instructions aloud and explained the various possible scenarios, the subjects had to go through a set of comprehension questions before playing the actual games. Subjects were randomly and anonymously re-matched for each of the 24 decisions they had to take.<sup>xi</sup> It was stressed during instructions that each choice subjects had to make had the same probability of being selected for payment. On average, each session lasted about 2 hours.

Subjects were not given any information on the nature nor on the sequence of the tasks beforehand. They knew the total number of tasks, but no details were given until the instructions for the corresponding stage of the experiment were handed out. Trust game results in Part 1 were not revealed to the players, unless that first activity was the one actually selected for payment at the very end of the session. The fact that participants knew the total number of activities in the experiment implies that they were aware, at the time of playing the second trust game, that that was the final task of the session. This end-game feature stacks the deck against us finding a significant difference in the change of trust or trustworthiness following the different treatments. The fact that we still find significant differences means that our results are lower bounds.

Each session was randomly assigned only one of the two treatments (either IES or PES) in addition to the NoES treatment administered to everyone. In the market games, at the

beginning of each round, participants were given a sheet of paper, featuring one line for each of the ten trading days. Each line was divided in two parts: on the left side, subjects had to mark their choices (by checking the corresponding boxes) concerning eventual use of the court system or of the protection and their trading strategy; on the right side, similar boxes were used by the experimenter to report, at the end of each day, the decisions of the trading partner and the resulting profit. Partners were randomly and anonymously re-matched each day by the experimenter who also computed the profits on the basis of the relevant payoff matrix. Subjects were constantly reminded that, were one of these trading days be the one selected for payment, they would gain the profits they made for that day.

When all decision sheets were collected, the experimenter asked one of the subjects to draw a number from a hat. The numbers ranged from 1 to 24, equal to the total number of decisions made during the experiment. The number determined the decision to be implemented. While the assistants computed the payments, participants filled out a survey. The survey featured basic demographic and socio-economic questions, as well as questions on beliefs and behaviors related to the social preferences and behaviors elicited through the experiment. The survey included questions on trust in institutions and people, on experiences of economic exchanges, on borrowing, help-seeking in different situations, and on exposure to illicit activities.

## **4. Data and Descriptive Statistics**

### *4.1. Sample Size and Selection of Subjects*

We ran 37 experimental sessions: 19 in Italy (169 subjects) and 18 in Kosovo (178 subjects). The average number of participants in each session is 9.56 (min. 7, max 12).<sup>xii</sup> The majority of sessions has either 10 (58% of sessions) or 8 participants (25% of sessions).

In Italy, subjects were recruited through the help of producers' and workers' associations in 3 different regions, Lombardy, Liguria and Sicily. Each association sent to its members the invitation to participate in an economic study, specifying its duration and the range of possible gains. When enough people had volunteered, the time and place for the session was agreed upon. Sessions usually took place in the offices of the association. This choice of recruitment system answered two basic needs. The first was a need to overcome the logistical challenges of recruiting people for 2 hours sessions in the middle of the summer: associations had the network and capacity to bring together enough members to allow us to conduct our sessions. Second, one of the objectives of this study is to assess how the preferences and behavior we observe within the experiment generalize to economically relevant choices in the real world: workers and producers associations gave us access to a sample of business owners and employees from different sectors, who regularly have to make decisions in their jobs similar to the ones they faced in experiment.

In Kosovo, participants were recruited at random through paper invitations. Invitations were dropped off at every 5th doorway of both rural and urban areas of 10 different locations.

Both the survey instrument and experimental instructions were translated into local languages using the double translation procedure to ensure consistency across sites. Nevertheless, to account for the fact that recruitment procedures differed between the two countries, all specifications will include country fixed effects in the regression analysis.

#### *4.2. Descriptive Statistics*

Summary statistics on the socio-demographic and economic background of our subject pool are presented in Table 1. The objective of collecting such information is to investigate potential heterogeneous effects of experimental treatments but also to check the validity of

the randomized allocation procedure to the different experimental treatments. Apart from a higher proportion of students in the IES treatment (27% versus 14% in the PES treatment, t-stat of 3.1) and a larger average household size in the PES treatments (4.7 versus 4.2 in the IES treatment, t-stat of 1.9), covariates are well balanced across the experimental treatments.<sup>xiii</sup> Despite randomizing the assignment of treatments to sessions, initial trust and trustworthiness turned out to be significantly higher in the IES than in the PES treatment. Trust is measured as the amount sent and trustworthiness as the average amount returned as percentage of the amount sent, averaged over all the possible amounts sent (elicited with the strategy method). Subjects assigned to the PES and IES treatments sent on average 5.2 and 5.9 Euro (t-stat of 2.76), and returned on average 48% and 58% (t-stat of 4.56) respectively. Such differences are entirely driven by Kosovo (t-stats of 3.07 and 0.82 in Kosovo and Italy respectively). They certainly represent a concern for our identification strategy, which we address by controlling for initial trust and trustworthiness in all regressions shown below, and by presenting results in first differences.

Initial trust and trustworthiness differ across countries. Subjects in Kosovo and Italy sent on average 5.6 and 5.4 Euro and returned on average 55% and 50%, respectively. These differences are statistically significant.<sup>xiv</sup> Our small sample size makes it impossible to detect significant within-country differences. In particular, subjects from Southern Italy appear less trusting and more trustworthy than those from the North, but these differences are not statistically significant. For this reason, in what follows we show results disaggregated by country only.

Descriptive statistics of the outcome variables are presented in Figures 2 to 6. Panel (a) in Figure 2 displays the average amount sent, that is trust in the final trust game after each of the two different institutional treatments for the whole sample and for each country separately.

Figure 3 shows similar results for trustworthiness: on average, participants sent 6.5 and 5.4 Euro, and returned 60% and 45% of the amount received respectively in the games following the IES and PES treatments. The amounts sent and percentages returned in the second trust game are higher following the impartial enforcement system treatment compared with the partial enforcement one (t-stat of 3.87 and 5.31, respectively). The differences are particularly large in Kosovo. Panel (b) in Figure 2 presents the average individual increase in amounts sent between the two trust games, before and after the experimental institutional treatment. Similarly, Panel (b) in Figure 3 presents the average individual difference in the percentage returned between the two trust games. Taking first differences within individuals gets rid of any individual heterogeneity and of any departure from perfect randomization across treatments. Trust increases after both treatments but much more so in the IES treatment: the average difference in amount sent is 0.6 and 0.2 Euro after the IES and PES treatments respectively. According to a simple t-test, the difference is statistically significant (t-stat of 1.49). For trustworthiness, partial enforcement institutions actually lead to a decrease in average percentage returned of 3.8 percentage points, whereas impartial institutions lead to an increase of 2.2 percentage points, a difference that is statistically significant according to a simple t-test (t-stat of 2.39). As a result, trustworthiness is higher under the impartial enforcement treatment compared with the partial enforcement treatment, and the difference is statistically significant overall, in Italy and in Kosovo (t-stats of 5.31, 2.75 and 5.14, respectively).

The remaining figures display the measures of individual behavior and market efficiency in the market game: cheating behavior (Figure 4), market participation decisions (Figure 5), and traders' total individual profits (Figure 6) under the three different situations: no contract enforcement institutions (NoES), partial contract enforcement institutions (PES) and

impartial contract enforcement institutions (IES). Figures B1 to B3 in Appendix B display the evolution of cheating, opting out and trading profits throughout the game under the three institutional set-ups. Market participation and profits are highest and cheating is lowest under the IES treatment. On average, participants opt out of trade 1 trading day per round in the NoES treatment, 0.6 trading days in the PES treatment, and 0.4 trading days in the IES treatment. They cheat 3.61 times out of the 10 rounds in the absence of institutions, 3.65 times under partial institutions but only 2.20 under the impartial ones. Total profits over the 10 rounds are on average 131, 121 and 167 Euro in the NoES, PES and IES treatments respectively. A direct comparison of profit across treatments warrants caution: in the PES subjects have to pre-pay the 5 Euro fee for ensuring private protection and this further reduces profits. The quality of contract enforcement institutions seems to have a non-monotonic effect on cheating behavior and on market efficiency. In Kosovo, cheating is actually higher under PES than under NoES (4.3 and 3.6 times over the 10 rounds respectively). As a result, total surplus is not higher under PES than under NoES: total profits are on average 123 and 138 Euro in PES and NoES, respectively. On the contrary, in Italy cheating is lower under PES than under NoES (2.97 and 3.62 over the 10 rounds respectively), yet profits remain lower. The next section turns to regression analysis to test the statistical significance and robustness of these results.

## **5. The Causal Effect of Institutions on Trust**

We turn now to testing through regression analysis our first hypothesis: impartial contract enforcement institutions in markets lead to higher trust and trustworthiness as moral norms (in non contractible environments) compared with partial institutions, through their effect on cooperative behavior in markets. Descriptive evidence in the previous section indicates that

our institutional treatments were successful in generating the predicted changes. In this section, we first show the effect of our institutional treatments on trust and trustworthiness in a reduced form regression framework. Second, we quantify the effect of a reduction in the frequency of non-cooperation on trust and trustworthiness with a Wald estimate.

### 5.1. Empirical Specification

Since allocation to treatment is random, the causal effect of the institutional treatment on trust and trustworthiness is obtained by comparing across treatment groups the average amounts sent and returned, respectively, in the second trust game. We control for country fixed-effects in order to take into account any difference in the implementation of the experiment in the different countries. All regressions also control for behavior in the first trust game, in order to control for differences in initial trust and trustworthiness. For robustness, we present additional specifications to show that our results are robust to the inclusion of additional individual controls. We estimate the following regression:

$$T_{2i} = \alpha + \beta D + \gamma T_{1i} + \vartheta C + \delta X_i + \varepsilon_i \quad (1)$$

where  $T_{2i}$  and  $T_{1i}$  denote the behavior (either trust or trustworthiness) of individual  $i$  in the second and first trust game, respectively.  $D$  is a dummy variable capturing the institutional treatment and taking value 1 for the impartial contract enforcement institutional treatment (IES) and 0 for the partial contract enforcement institutional treatment (PES).  $C$  is a country dummy.  $X_i$  is a vector of individual controls, such as age, gender, marital status, education, individual income, employment status and an individual estimate of risk aversion measured by a survey question about a lottery choice between a safe and a risky option. We present results with and without this set of individual controls.

For robustness, we also estimate the model in first differences. The first difference model estimates the variation of trust and trustworthiness *within* individuals as a function of the experimental treatment. For this specification, we estimate the following model:

$$T_{2i} - T_{1i} = \alpha + \beta D + \varepsilon_i \quad (2)$$

$\beta$  is interpreted as the causal effect of the treatment: it estimates the differential variation within subjects, across treatments, in trust and trustworthiness levels between period 1, before the treatment is administered, and period 2, after the treatment is administered.<sup>xv</sup>

Throughout our tables of results, in the regressions using the full sample we report robust standard errors as well as robust standard errors clustered at the session level to take into account any potential correlation among individual errors of participants in the same session (37 clusters). Regressions ran on individual country or on treatment sub-samples use robust standard errors, given the lower number of clusters.

## 5.2. Reduced Form Results

Regression results are presented in Table 2. Columns 1 and 2 display results for the pooled sample when the dependent variable is the amount sent by the first player in the final trust game, that is, our measure of trust. Columns 6 and 7 display regression results for the percentage returned by the second player (averaged over all the possible amounts received elicited via the strategy method) in the final trust game, that is, our measure of trustworthiness. Columns 4, 5 and 9, 10 report the results of similar specifications using the country subsamples data for the same dependent variables. For each measure and in each sample, results are presented without and with individual controls.

As anticipated by the uncontrolled tests on means, impartial enforcement institutions (IES) have a positive, statistically significant and robust effect on both the amount sent and the



percentage returned in the final trust game, compared to partial enforcement institutions (PES). The effect of treatment on trustworthiness is further decomposed, to reveal that impartial enforcement positively affects both unconditional altruism, and reciprocity.<sup>xvi</sup> We also explore whether individuals' initial endowment of trust and trustworthiness are sources of heterogeneity in treatment effects, but it appears that the treatment influences equally individuals with high and low levels of initial trust and trustworthiness.<sup>xvii</sup> These effects are robust to the inclusion of additional controls for individual characteristics<sup>xviii</sup> and are also robust within Italy and within Kosovo. The effects both on trust and trustworthiness are robust and significant at the 1% level in Kosovo and at the 10% level in Italy. For each behavior in the second trust game, trust or trustworthiness specifications displayed here control only for the corresponding behavior in the first trust game. However, all results are robust to controlling both for trust and trustworthiness behavior in the first trust game. Results are not only robust but also statistically and economically more significant when country fixed effects are not included.<sup>xix</sup>

The effect of contract enforcement institutions on trust and trustworthiness is economically meaningful. Having traded under impartial contract enforcement institutions as opposed to partial enforcement institutions leads to 12% to 18% higher amounts sent and 20% to 31% higher percentages returned, depending on whether we control for individual characteristics and for behavior in the initial trust game. The effect of institutions far outweighs that of any individual characteristics, including the regional origin of our subject pool, as captured by our country dummy. Controlling for individual characteristics, the coefficient on the institutional treatment is 1.6 times higher than the coefficient on the country dummy for Kosovo for trust and 2.1 for trustworthiness. Within Italy, the effect of impartial vs. partial institutions on trustworthiness is equivalent to three fourths of the initial trust difference between Milan and

Palermo, in Sicily. In Kosovo, it is about three fourths of the difference between Pristina, the capital city, and Mitrovica, the scene of major tensions during the 1999 civil war.

Columns 3 and 8 present the results of first-difference specifications (2) for trust and trustworthiness, respectively. The coefficient associated with the impartial enforcement treatment is still positive. It is only marginally significant for within-subject differences in amount sent, but its significance reaches the 5% level for within-subject differences in percentage returned. Results for individual countries subsamples are similar to the ones discussed so far. Impartial institutions lead to positive and statistically significant individual increases in trust and trustworthiness in the Kosovo sub-sample and in trustworthiness only in the Italy subsample.<sup>xx</sup>

We also explore how long lasting the treatment effect may be by testing its sensitivity to cheating in the last round. Our analysis shows that the treatment effect on trustworthiness is insensitive to what happens in the last rounds of trading. Results of the empirical analysis are displayed in Table B5 in Appendix B. The variable “# cheated last 5 rounds” sums the number of times each respondent has been cheated by his/her partner in the last 5 rounds of treatment. On average, respondents have been cheated 2.24 times over the last 5 rounds. As expected, respondents in the PES treatment are cheated more often (2.68 times) than respondents in the IES treatment (1.69 times). Columns 1 to 3 of Table B5 reproduce Columns 7 to 9 of Table 2, in which trustworthiness is regressed on the treatment and on a number of control variables, to which the variable “# cheated last 5 rounds” is added. Results are unchanged. In other words, better quality institutions lead to higher trust and the effect is robust to the most recent experiences of non cooperation. Columns 4 to 7 take this test further by adding an interaction term between the treatment and how many times participants were cheated in the last 5 rounds. This enables to test whether the treatment has a differential

effect as a function of recent experiences of cheating. Again, the treatment effect is insensitive to the most recent experiences of cheating. This insensitivity of the treatment effect suggests that the treatment effect of being exposed to good institutions may be long lived.

Such a rapid change in trust observed after exposure to different institutions in an experimental setting is intriguing in light of the literature on the slow changing nature of culture which we reviewed in Section 2, and is more in line with the results of Cialdini et al. (1990). Kandori (1992) and Rand et al. (2013) suggest a compelling interpretation of our results. Kandori (1992) shows that when an agent can only observe her own history of trade, cooperation can only be sustained by an equilibrium in which an experience of dishonesty incites an individual to cheat all of her future partners, which unravels community trust. In this context, better enforcement institutions can protect community trust by preventing defection. Rand et al. (2013)'s social heuristics hypothesis illustrates how experiences in one context of interactions can spill over to another. Experiences of cooperation in the market game can shape subjects' intuition, pre-disposing them to cooperation in the trust game. In this interpretation, good quality institutions, by favoring cooperation over defection, foster cooperative social norms, which are internalized and predispose agents to cooperate in other environments, even when the institutional framework no longer has any bite.

It should also be noted that we obtain our results in the specific context of a very small economy comprised of only 8-10 players, each one expected to meet all the other players at least once throughout the market game. Such opportunities for trade enable individuals to update priors about others in a rapid way. Other studies have demonstrated how trade (Maystre et al. 2009) and information, measured by access to phones or television (Fisman and Khanna, 1999; Head and Mayer 2008) accelerate cultural change.

### *5.3. Quantifying the Effect of Non-cooperation*

Beyond the gross effect of our treatment, we are interested in the effect of experiences of non-cooperation (that is, cheating) in markets on trust and trustworthiness. This is indeed the main channel through which institutions are expected to affect moral norms of cooperation in theoretical models à la Guiso et al. (2008a) and Tabellini (2008). We use a Wald estimate to quantify the effect of non-cooperation on trust and trustworthiness. We first compute the subjective probability that any other trader in the game is a non-cooperator based on the individual frequency of having met a cheating partner in the trading game relative to the number of participants in the session.<sup>xxi</sup> We then regress the frequency of cheating in the trading game on the institutional treatment. Results are displayed in Table 3. Consistent with our experimental design and with the descriptive evidence provided above, the IES treatment reduces the frequency of cheating by 45% on average (significant at the 1% level).<sup>xxii</sup> Wald estimates of the effect of a reduction in the frequency of non-cooperation in the trading game on trust and trustworthiness are presented in Table 4.<sup>xxiii</sup> On average, a reduction by 1 percentage point in the probability of non-cooperation in the trading game increases amounts sent in the trust game by between 7% and 11%, depending on the specification. The corresponding increases in trustworthiness are between 13% and 19%. Again, all effects reported here are robust to controlling for trust and trustworthiness behavior in the first trust game; and are robust and statistically more significant when omitting all controls including country fixed effects.<sup>xxiv</sup>

These estimates can only be interpreted as instrumental variable estimates if the reduction in non-cooperation is the only mechanism through which the treatment affects trust and trustworthiness. Alternative mechanisms may work through the effect of treatment on the

frequency of exchange, on profits, and on subjects' own behavior. Variations in the volume of trade are not consistently associated with variations in trust or trustworthiness. Similarly, the higher level of profits accruing to subjects under impartial enforcement does not significantly correlate with final levels of trust and trustworthiness.<sup>xxv</sup> Since we estimate within subject variation in trust and trustworthiness, we can rule out that the observed effect is due to any individual idiosyncrasy, or due to individual's own behavior either in the first trust game or in the market game dictating behavior in the final trust game. Overall, we do not find any evidence that channels other than non-cooperation are at play, but we cannot entirely rule out that other channels, for example unintended and undetected framing in the experiment, could be at play.

## 6. The Interaction Between Culture and Enforcement Institutions

### 6.1. Empirical Specification

The second hypothesis we wish to empirically test deals with the relationship between pre-existing culture, particularly initial trust and trustworthiness, and behaviors in market under the different enforcement institutions. We estimate the following relationship:

$$MBehav_{it} = \alpha + \beta D + \delta T_{i1} + \vartheta C + \phi X_i + \gamma_i + \gamma_t + \varepsilon_{it} \quad (3)$$

where  $MBehav_{it}$  captures individual market behavioral outcomes for individual  $i$  (cheating, participation, as well as her trading profit) on day  $t=[1,10]$  of trading.  $D=\{NoES, PES, IES\}$  is the experimental treatment.  $C$  denotes country fixed effects.  $T_{i1}$  captures the behavior of agent  $i$  in the first trust game.  $\gamma_i$  is an individual effect and  $\gamma_t$  is a vector of dummy variables for each trading day (time fixed effect).  $\varepsilon_{it}$  is the error term. We estimate this model in the pooled sample as well as in the different treatments sub-samples in order to test whether trust or trustworthiness has a differential effect under different contract enforcement institutions.

Because the first trust game is played before the trading game, even before the trading game instructions are administered, we can use behavioral estimates of trust from the first trust game as measures of pre-existing culture without worrying about the reverse causal effect of trading behavior on trust. Nevertheless, we suspect the presence of an omitted variable bias due to unobservable individual characteristics that could influence both behavior in the trust game and behavior in the market game. In an attempt to control for such bias, we control for individual characteristics such as age, gender, education, income, employment status, and risk aversion in  $X_i$ .  $\delta$  should still only be interpreted as indicative of a correlation between trust and market behavior in the market game.

## *6.2. Results*

Results of the regressions investigating the role of pre-existing culture, namely initial trust and trustworthiness, on market behavior and market efficiency are displayed in Panels a and b of Table 5. All models are estimated with random effects.<sup>xxvi</sup> Columns 1, 5 and 9 in each Panel display the results for the pooled treatments when the dependent variables are, respectively, the number of times the individual cheats, stays out, and his or her total profit. Cheating behavior is strongly curtailed in the impartial enforcement institution treatment, while participation is increased. Cheating is lower and participation higher in the PES treatment as well, compared to the baseline of no institutions. In the pooled regressions, initial trust and trustworthiness are negatively associated with cheating (significant at the 1 % level), but not with participation decisions or profit. However, investigating the interplay between initial trust and trustworthiness and the different institutional treatments leads to a more contrasted picture.

Regressions displayed in columns 2 to 4, 6 to 8 and 10 to 12 estimate the effect of initial trust (Panel a) or initial trustworthiness (Panel b) on each dependent variable within each of the three institutional treatments. Trust and trustworthiness deter cheating, but only in the absence of impartial institutions. Under impartial institutions, neither trust nor trustworthiness has any influence on cheating behavior (Column 4 in both panels). The interpretation is that when contract enforcement institutions are present, economic incentives have a salient effect on cheating behavior, akin to Fisman and Miguel (2007), Bohnet et al. (2001), and McMillan and Woodruff (2000). Trust is not necessary and it does not affect market behavior. Similarly, neither trust nor trustworthiness is associated with market participation decision in the presence of impartial institutions (Column 8 in both panels). By contrast, initial trust and initial trustworthiness are both significantly and negatively associated with opportunistic behavior when either no institution or partial enforcement institutions only are present (Columns 2 and 3 in both panels). Initial trust is associated with more participation in the presence of partial institutions but with lower participation in the absence of institutions, although the latter effect is only marginally significant (Columns 6 and 7 in Panel b). There is no robust effect of individual trust on individual profits.

Elements of culture other than trust and trustworthiness may play a role. In Table 6, we provide results of specifications in which culture is proxied by participants' region of birth instead of initial behavior in the trust game. We reach similar conclusions. Culture is an important determinant of opportunistic behavior and of market participation decisions, but only in the absence of impartial institutions. Cheating and opting out of trading are more prevalent in absence of institutions (NoES) in the South of Italy. As a result, profits are much lower in Southern Italy under NoES and PES. Cheating and opting out of trading are more prevalent under partial institutions (PES) than under NoES or IES in Kosovo. However,

subjects display no significant differences in cheating behavior, opting out, or profits under IES regardless of the region they originate from.

## **7. Conclusion and Policy Implications**

We designed a framed field experiment to identify the causal effects of legal institutions on trust and trustworthiness and shed light on how formal institutional quality and cultural traits interact to sustain market exchange.<sup>xxvii</sup> We obtained several results. The quality of legal institutions has a positive causal effect on trust and trustworthiness, in a way that suggests that moral norms of cooperative behavior can result as a positive by-product of improvement in formal institutional quality. Better legal institutions enhance trust and trustworthiness by reducing the frequency with which subjects face opportunistic agents when trading. This reduction enables individuals to revise upwards their beliefs about other people generalized trustworthiness and it results in higher trust. Even more strikingly, agents not only trust more but also reciprocate by being more trustworthy. This is important because generalized norms of trust and trustworthiness play a crucial role in supporting exchange and cooperation when contracts are incomplete or not easily enforceable. This finding contributes to the literature that roots trust in the well functioning of impartial institutions, provides empirical support to models such as Guiso et al. (2008a) and Tabellini (2008), and complements existing non-experimental empirical evidence. Our controlled experiment not only establishes a causal link from formal institutions to culture by ruling out the feedback effect of culture on the design of institutions, but also opens the black box of institutions by focusing on one dimension of enforcement institutions: partiality vs. impartiality. Our empirical analysis quantifies the effect of impartial enforcement institutions on trust through their influence on cooperation in a contractible environment.



Another noteworthy finding is that pre-existing trust and trustworthiness, or more generally cultural origins, influence market participation and opportunistic behavior in the absence of formal enforcement, or when formal enforcement is based on personalized networks; but they cease to matter once strong and impartial formal institutions are in place. This echoes previous findings in non-experimental settings (Fisman and Miguel 2007, Grosjean forth) and suggests that cultural norms substitute formal enforcement when the latter is weak.

Our study offers practical contributions for the reform of governance institutions and, in particular, contributes to the debate over the contribution of informal institutions to public order and efficiency. Our study indicates, on an optimistic note, that formal institutions can work not only to sustain economic exchange but also to build trust, even in low trust environments such as the South of Italy or even if current formal institutions are poorly developed, as in Kosovo. However, in a real world environment, the problem is how to generate such positive institutional change. Some studies have shown how different modes of institutional transplants -whether such institutions are imposed or adopted in a democratic fashion- affect the likelihood of their success (Dal Bo, Foster and Putterman 2010). We aim to explore these issues in further work. This additional study would cast light on the issue of the endogenous evolution of institutions, as well as how culture and pre-existing norms may affect it.

## References

- Acemoglu, D., Johnson, S. and Robinson, J.A. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review*, 91(5): 1369-1401.
- Aghion, P., Algan, Y., Cahuc, P. and Shleifer, A. 2010. "Regulation and Distrust." *Quarterly Journal of Economics*, 125(3): 1015-1049.
- Alesina, A. and Angeletos, G-M. 2005. "Fairness and Redistribution." *American Economic Review*, 95: 960-980.

- Algan, Y. and Cahuc. P. 2010. "Inherited Trust and Growth." *American Economic Review*, 100(5): 2060–92.
- Becchetti, Leonardo, Pierluigi Conzo and Alessandro Romeo. 2013. Violence, trust, and trustworthiness: evidence from a Nairobi slum. Oxford Economic Papers, 2013, doi:10.1093/oeq/gpt008
- Becker, S.O., Boeckh, K., Hainz, C. and Woessmann, L. 2011. "The Empire Is Dead, Long Live the Empire! Long-Run Persistence of Trust and Corruption in the Bureaucracy." *IZA Discussion Paper No. 5584*.
- Berg, J., Dickhaut, J. and McCabe, K. 1995. "Trust, Reciprocity, and Social History." *Games and Economic Behavior*, Elsevier, 10(1): 122-142.
- Bohnet, I., Frey, B. and Huck, S. 2001. "More Order with Less Law: On Contract Enforcement, Trust and Crowding." *American Political Science Review*, 95(1): 131-144.
- Butler, J., Giuliano, P. and L. Guiso. 2012. Trust and Cheating. NBER Working Paper No. 18509.
- Cassar, A., Friedman, D. and Schneider P. 2009. "Cheating in Markets." *Journal of Economic Behavior and Organization*, 72(1): 240-259.
- Cassar, A., Grosjean, P. and Whitt, S. 2013. "Legacies of Violence: Trust and Market Development," *Journal of Economic Growth*, 18(3): 285-318
- Cialdini, R., Reno, R. Kallgren, C. 1990. "A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places." *Journal of Personality and Social Psychology*, 58(6): 1015-1026.
- Dal Bo, P., A. Foster and L. Putterman. 2010. "Institutions and Behavior: Experimental Evidence on the Effects of Democracy." *American Economic Review*, 100: 2205-2229.
- Dell, M. "The Persistent Effects of Peru's Mining Mita." *Econometrica*, 78(6): 1863-1903.
- Dixit, A. 2004. *Lawlessness and Economics. Alternative Modes of Economic Governance*. Princeton: Princeton University Press.
- Djankov, S., La Porta, R., Lopez-de-Silanes, F., and Shleifer, A. 2002. "The Regulation of Entry." *Quarterly Journal of Economics*, 117 : 1–37.
- Durante, R. 2011. "Risk, Cooperation and the Economic Origins of Social Trust: An Empirical Investigation." *Mimeo, Sciences-Po*.
- Engerman, S. and Sokoloff, K. 1997. "Factor endowments, institutions, and differential paths of growth among New World economies: a view from economic historians of the United States." in *How Latin America Fell Behind*, S. Harber ed., pp. 260–304, Stanford Univ. Press.
- Fafchamps, M. 2004. *Market Institutions in Sub-Saharan Africa*. Cambridge: MIT Press.
- Fafchamps, M. 2006. "Development and Social Capital." *Journal of Development Studies*, 42(7): 1180-98.
- Fafchamps, M. 2002. "Returns to social network capital among traders." *Oxford Economic Papers*, Oxford University Press, vol. 54(2): 173-206.
- Fafchamps, M. and B. Minten. 2001. "Social Capital and Agricultural Trade." *American Journal of Agricultural Economics*, 83(3): 680-685.
- Fisman, R. and Khanna, T. 1999. "Is Trust a Historical Residue? Information Flows and Trust Levels." *Journal of Economic Behavior and Organization*, 38(1): 79-92.
- Fisman, R. and Miguel, E. 2007. "Corruption, Norms, and Legal Enforcement: Evidence from Diplomatic Parking Tickets." *Journal of Political Economy*, 2007, 115(6): 1020-1048.
- Gambetta, D. 2000. "Can we Trust Trust?" in Gambetta D. (ed.) *Trust: Making and Breaking Cooperative Relations*, University of Oxford, 213-237.
- Grosjean, P. 2011. "The Weight of History on European Cultural Integration: a Gravity Approach." *American Economic Review Papers and Proceedings*, 101(3): 504-508.

- Grosjean, P. forth. "A History of Violence: The Culture of Honor and Homicide in the US South." *Journal of the European Economic Association*, forthcoming.
- Greif, Avner, 1993. "Contract Enforceability and Economic Institutions in Early Trade: the Maghribi Traders' Coalition." *American Economic Review*, 83(3): 525-48.
- Greif, A. 2006. "The Birth of Impersonal Exchange: The Community Responsibility System and Impartial Justice." *Journal of Economic Perspectives*, 20(2): 221-236.
- Guiso, L., P. Sapienza and L. Zingales. 2006. "Does Culture Affect Economic Outcomes?" *Journal of Economic Perspectives*, 20: 23-48.
- Guiso, L., P. Sapienza and L. Zingales. 2008a. "Social Capital as Good Culture." *Journal of the European Economic Association*, 6(2-3): 295-320.
- Guiso, L., Sapienza P. and Zingales, L. 2008b. "Long Term Persistence." *NBER Working Papers* 14278.
- Guiso, L., Sapienza P. and Zingales, L. 2009 "Cultural Biases in Economic Exchange?" *Quarterly Journal of Economics*, August 2009, 124(3): 1095-1131.
- Head, K. and Mayer, T. 2008. "Detection Of Local Interactions From The Spatial Pattern Of Names In France." *Journal of Regional Science*, 48(1): 67-95.
- Holden, C. 2008. "Study Shows How Degraded Surroundings Can Degrade Behavior." *Science* Vol. 322(5905): 1177.
- Hruschka, D. 2010. *Friendship: Development, Ecology, and Evolution of a Relationship*. University of California Press.
- Jackson, K. 2011. "Contract enforceability and the evolution of social capital." *Journal of Law, Economics, and Organization*, forthcoming
- Kandori, M. 1992. "Social Norms and Community Enforcement." *The Review of Economic Studies* Vol. 59(1), 63-80.
- Keizer, K., S. Lindenberg and L. Steg. 2008. "The Spreading of Disorder." *Science* Vol. 322 (5908): 1681-1685
- Kuran, T. and Lustig, S. 2012. "Islamic Justice and Its Compatibility with Modern Economic Life." *Journal of Law and Economics*, 55(3): 631-666
- La Porta, R., Lopez-de-Silanes, F., and Shleifer, A. 2008. "The Economic Consequences of Legal Origins." *Journal of Economic Literature*, 46: 285-332.
- Maystre, N., Olivier, J., Thoenig, M. and Verdier, T. 2009. "Product-based cultural change: is the village global?" (7438). *CEPR - Centre for Economic Policy Research*.
- McMillan, J., and Woodruff, C.M. 2000. "Private Order under Dysfunctional Public Order." *Michigan Law Review*, 98: 2421- 2458.
- North, D. C. 1991. "Institutions." *Journal of Economic Perspectives*, 5(1): 97-112.
- Nunn, N. and Wantchekon, L. 2011. "The Slave Trade and the Origins of Mistrust in Africa." *American Economic Review*, 101(7): 3221-52.
- Nunn, N. 2012. "Culture and the Historical Process." NBER working paper 17869.
- Piketty, T. 1995. "Social Mobility and Redistributive Politics." *Quarterly Journal of Economics*, 110: 551-584.
- Rand, DG, Peysakhovich A, Kraft-Todd GT, Newman GE, Wurzbacher O, Nowak MA, Greene JD. 2013. Intuitive cooperation and the Social Heuristics Hypothesis: Evidence from 15 time constraint studies. Available at SSRN: <http://ssrn.com/abstract=2222683>
- Rodrik, D., Subramanian, A. and Trebbi, F. 2002. "Institutions Rule: The Primacy of Institutions over Integration and Geography in Economic Development." *IMF Working Papers* 02/189, *International Monetary Fund*.

- Roth, A. E., "[The Economist as Engineer: Game Theory, Experimentation, and Computation as Tools for Design Economics](#)," Fisher-Schultz Lecture, *Econometrica*, 70,4, July 2002, 1341-1378.
- Rothstein, B. and Stolle, D. 2008. "An Institutional Theory of Social Capital." In *The Handbook of Social Capital*, eds. J. Van Deth & D. Castiglione. Oxford Univ. Press, pp. 273-302.
- Smith, V. L. 1994. "Economics in the Laboratory." *Journal of Economic Perspectives*, 8(1): 113-131.
- Tabellini, G. 2008. "The Scope of Cooperation: Norms and Incentives." *Quarterly Journal of Economics*, 123(3): 905-950.
- Tabellini, G. 2010. "Culture and Institutions: Economic Development in the Regions of Europe." *Journal of the European Economic Association*, 8(4): 677-716.
- Voigtländer, N. and J. Voth. 2012. "Persecution Perpetuated: Medieval Origins of Anti-Semitic Violence in Nazi Germany." *Quarterly Journal of Economics*, Vol. 127(3): 1339-1392.
- Williamson, C. and Kerekes, C. B. 2011. "Securing Private Property: Formal versus Informal Institutions." *Journal of Law and Economics*, 54(3): 537-572

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<sup>i</sup> For example, Alesina and Angeletos (2005) describe how beliefs about redistribution influence, and are influenced, by actual redistribution policies. In Aghion et al. (2010), low trust individuals demand more regulation as they cannot rely on trust to enforce contracts. Williamson and Kerekes (2011) discuss the strong empirical correlation between culture and formal institutions in a cross-section of countries.

<sup>ii</sup> On the persistence of historical events on formal institutions, see, among others: Engerman and Sokoloff (1997), Acemoglu, Johnson and Robinson (2001), Dell (2011). On the

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persistence of historical events on norms, attitudes and trust: Guiso et al. (2008a), Durante (2011), Grosjean (2011, forth), Nunn and Wantchekon (2011), Voigtländer and Voth (2012).

<sup>iii</sup> Most exogenous factors that influence formal institutions might also influence trust, and vice versa. For example, the exclusion restriction for one of the most popular instrument for institutions, legal origins (Djankov et al. 2002, La Porta, Lopez-de-Silanes, and Shleifer 2008), is violated if Europeans who transplanted legal traditions also transplanted aspects of beliefs or even regulatory traditions that may influence trust. For more details and examples on how institutions first established by European migrants were endogenous to their cultural beliefs, see Nunn (2012).

<sup>iv</sup> In support of this hypothesis, Cassar, Friedman and Schneider (2009) provide evidence based on laboratory markets experiments showing that reputation-based networks significantly reduce cheating and increase efficiency with respect to a baseline of completely anonymous interactions in the absence of legal enforcement institutions, but, even if in theory they could achieve 100% efficiency, in practice they always fail to do so.

<sup>v</sup> The literature is too large to be adequately reflected here. For the role of formal and informal institutions in supporting trade: Fafchamps (2006), Greif (2006), North (1991), Dixit (2004); for the role of formal institutions in promoting growth and development, see namely Rodrik, Subramanian and Trebbi (2002), Acemoglu, Johnson, Robinson (2001), Dell (2011); for the role of trust in promoting cooperation, development and growth: Guiso, Sapienza and Zingales (2006, 2008a, 2008b, 2009), Tabellini (2008, 2010); Algan and Cahuc (2010).

<sup>vi</sup> This is measured through answers to a survey question called ‘Passenger’s dilemma’, which asks for respondents’ willingness to lie to the police in order to save a friend from jail in an hypothetical situation.

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<sup>vii</sup> Similarly, Grosjean (2011b) finds that a culture of violence brought by Scots-Irish and Scottish Highlander settlers to the 18<sup>th</sup> century US only persisted where formal enforcement institutions were absent.

<sup>viii</sup> For example, the continuous double auction (CDA), which is usually run with the underlying assumption that contracts are perfectly and costlessly enforceable, always delivers 100% efficiency (Cassar, Friedman and Schneider 2009).

<sup>ix</sup> The partial/impartial enforcement mechanisms features an important distinction between up-front sunk costs and costs which can be made contingent upon being cheated. In our design choice, these are necessary features of the two enforcement systems. A partial enforcement system, as the Mafia type, runs on the premises that they can deliver “smooth transactions” upon the collection of an up-front payment (known as “il pizzo”). Protection is exclusionary, only for the people who pay up front. We do not think conceivable (or realistic) a Mafia-style system that would require payment ex-post: it is precisely their business to make sure that trades run smoothly, without cheating incidents. If they were to be paid ex-post, they (members of the organization) would have an interest in increasing the amount of “accidents”, so their business would be revenge/vendetta instead of enforcing a system in which contracts among paying members run smoothly (see Gambetta). On the contrary, in an impartial court system, nobody can be excluded from using the enforcement system. We cannot have discretionary sunk-cost as everyone has to be in, whether or not one pays (taxes). Additional individual costs are conditional upon using the system. Of course, a court system also comes with sunk costs, such as paying for judges, but given the fungibility of public funds, we don’t think that this type of costs would directly enter individual decision-making in the market game that we consider.

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Another way in which we can look at the differential effect of upfront vs. conditional payments is to see it not just in connection with partiality/impartiality of a system, but in its relation to individual risk preferences. Yet, we never find risk preferences to impact our results in a significant way. This provides comforting evidence that this distinction in risk may only play a minor role.

<sup>x</sup> Despite differences in GDP per capita, in order to recruit and incentivate subjects we needed to use the same payoffs in Kosovo as in Italy, given the Kosovo high cost of living.

<sup>xi</sup> A computer program displayed couples of random numbers reproducing participants' IDs, which were used to determine the random matching into pairs in this as well as in the other tasks of the experiment. The program was set so that repetition of the same pairs was kept to a minimum.

<sup>xii</sup> One session had 7 participants because 1 person left after the first trust game. The experimenter filled out the subject's decision sheet using random choices generated by the computer. Other participants in the session were aware of this.

<sup>xiii</sup> Separate data for Kosovo, Northern and Southern Italy are presented in Table B1 in Appendix B.

<sup>xiv</sup> The t-stats are 1.67 and 2.29, respectively.

<sup>xv</sup> This model gets rid of any potential unobserved heterogeneity at the individual level or any departure from perfect randomization across treatments.

<sup>xvi</sup> Following a suggestion by an anonymous referee, we explore the effect of treatment on trustworthiness by decomposing trustworthiness into unconditional altruism and reciprocity, in order to get a sense of whether the treatment enhances concern for others generally (e.g., altruism) or, instead, makes cooperation more conditional. Exploiting the fact that participants made their choices as Receiver in the trust game using the strategy method, we



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first regressed, for each individual, the amount returned in the first (second) trust game on the amount received. We then stored the parameters of these individual level regressions: the constant term is interpreted as a proxy of individual unconditional altruism, while the estimated coefficient on the amount received variable is interpreted as a proxy of individual reciprocity. Finally, we ran regression (1) in Table B2 replacing the average share returned in the first (second) trust game with our measures of altruism and reciprocity, to explore how our treatment affected these two components of Receivers' behavior in the trust game. Regression coefficients on our IES treatment indicator are positive in both regressions, suggesting that impartial enforcement has a positive effect both on unconditional altruism and on reciprocity. This effect is statistically significant only for reciprocity.

<sup>xvii</sup> In order to explore heterogeneous treatment effects based on subjects' initial endowment of trust and trustworthiness, we generate a variable equal to 1 if a subject's level of trust (trustworthiness) in the first trust game is greater than the median value of trust (trustworthiness) displayed by participants in the experiment. We then run regression (1), adding an interaction term between our treatment variable and the high trust (trustworthiness) indicator. We find that the treatment effect on trust and trustworthiness is not affected by individuals' endowment of trust and trustworthiness, respectively. The coefficient on the interaction term IES\*High trust (trustworthiness) is generally positive (although not for Kosovo) and insignificant. The results of these regressions are not displayed here for economy of space, but are available upon request.

<sup>xviii</sup> Table B3 in Appendix B shows results from regression analysis of the individual characteristics correlated with trust and trustworthiness in the initial trust game, for the whole and individual country samples. Our survey measure of risk-aversion, based on a non-

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incentivized, hypothetical choice between a safe and a risky lottery, is not significant except for trustworthiness in Kosovo.

<sup>xxix</sup> The results of these robustness specifications are not displayed here for economy of space, but are available upon request.

<sup>xxx</sup> Running the analysis by macro-regions (Northern Italy, Southern Italy and Kosovo), although extremely interesting, poses the challenge of statistical power. While our results are qualitatively robust to the geographical split, regression coefficients for the two Italian macro-regions generally lose significance due to the reduced number of observations. The results suggest a stronger effect of treatment in Northern than Southern Italy, but it is worth noting that this may be also due to the larger number of participants from the North than from the South. The results of these regressions are displayed in Appendix B.

<sup>xxxi</sup> This probability is computed as: (Number of cheating partners/(Number of participants\*Trading days in treatment round))\*100 for each individual  $i$ .

<sup>xxxii</sup> Results for individual country subsamples in Appendix B Table B6.

<sup>xxxiii</sup> The Wald estimators are:  $\hat{\beta}_{Wald} = \frac{\hat{E}(T | IES = 1) - \hat{E}(T | PES = 1)}{\hat{E}(Cheated | IES = 1) - \hat{E}(Cheated | PES = 1)}$  for  $T=Trust, Trustworthiness$ .

<sup>xxxiv</sup> Results for individual country subsamples in Appendix B Table B7.

<sup>xxxv</sup> The results of specifications supporting the discussion in this paragraph are not displayed for economy of space but are available upon request.

<sup>xxxvi</sup> A series of Hausman specification tests cannot reject the hypothesis that individual effects are adequately modeled by random effects. The value of the Hausman statistics for the basic specification in the pooled sample (Columns 1, 5 and 9) is 7.38, 1.12 and 0.05 when the dependent variable is, respectively, cheat, stay out of trading and profit.

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<sup>xxvii</sup> Ethical reasons would prevent a study of this kind to be implemented as a randomized control trial in the field. A long tradition in economics of analyzing the effects of different market institutions via controlled laboratory experiments provides support to the idea that subjects that are given real incentives and face real choices, as they are in the current setting, would exhibit a behavior indicative of the real behavior they would exhibit outside the lab (Smith 1994, Roth 2002).