Friend or Foe?

How reciprocity and trust between friends and strangers differ in a corrupt relationship.

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February 2010

Content

List of Figures

1. Introduction

Actors involved in corrupt transactions face several difficulties. Due to secrecy and the risk of opportunistic behavior on the part of their business partner, corrupt actors are obliged to enforce their contracts without any legal support and to implement other enforcement mechanisms. The transaction costs arising from the enforcement problem can only be circumvented by personally knowing the corrupt partner. In case partners are socially embedded, like relatives and colleagues, they are tied to each other in a certain way. Their misbehavior can lead to future consequences for their relationship and their reputation. Therefore, an interaction between partners who know each other does not necessarily end with the exchange of services. It outlives the contract and has ex post effects on the future. But does social embeddedness or trust between parties who know each other foster corrupt transactions?

This paper describes an experimental bribery game which was designed and conducted within the seminar "Experimental Economics". The idea of the experiment is to examine the relationship of friends in comparison to strangers in a potentially corrupt scenario. Theory would predict that economic agents always behave self-interested and maximize their payoff. However, various studies (Berg et al. (1995), Abbink (2002)) have been conducted on reciprocity between subjects that were randomly matched. Some of them still reciprocated positively even without knowing their counterpart. The question now is whether a corrupt result - which always requires a certain willingness to take a risk - is reached more often between friends than between randomly paired strangers. A conclusion could be drawn concerning the importance of "social embeddedness" (Lambsdorff (2007)) in corrupt relationships and the difference in the behavior within groups of friends and groups of strangers. Is trust and a certain level of familiarity between corrupt partners a major determinant in the emergence of corrupt deals?

2. Empirical Evidence

The following experiment is based on Behavioral Game Theory, in particular a trust game. Game Theory would predict that the behavior of economic agents is determined by selfishness and payoff maximization. But there have been several studies on reciprocity relationships, some of them covering corrupt situations. Berg, Dickhaut and McCabe (1995) conducted one of the first investment games where the first moving player can pass money to the second mover; the experimenter then triples the amount, and the second mover can voluntarily return money to reward trust. Their results clearly refute the hypothesis that individuals are motivated only by their own monetary gain and behave according to sub game perfect rationality. Mc Cabe et al. (1996) and Dickhaut et al. (1997) conducted single plays of trust games that were defined by the condition that no future punishment is possible due to the one-shot condition. Their results deliver further evidence for the reciprocity hypothesis: up to 50 % of the subjects attempted to achieve a cooperative outcome. So far, there have been numerous studies that all found a strong impact of trust and reciprocity even in one-shot situations in which completely anonymous players meet for playing the game only once. However, there is no record of experimental studies that compare the relationships of friends and strangers playing a corrupt game.

The following experiment is based on Abbink's (2002) pure reciprocity treatment. Abbink's game is a simple sequential game. One player, representing the potential briber, can transfer money to a second player, the public official. The second mover has the possibility of reciprocating the transferred money, which was tripled by the experimenter, but at a cost to himself. Abbink's results confirm the strong impact of reciprocity and he observed an increasing frequency of reciprocated moves the higher the amount transferred by the first mover was.

In contrast to Abbink's experiment, the following game is constructed as a simple one-shot investment game. It is designed to examine the possibly differential behavior of friends and strangers participating in a modeled corruption scenario. Due to the lack of a history condition, players cannot build up any expectations or beliefs about the behavior of their opponent. One player, acting as the briber, can invest a certain sum into the promotion of player two, representing the public official, in order to induce a decision advantageous to him

(awarding of a contract). This feature offers the possibility of studying the impact of trust and reciprocity in this situation separately.

3. Design and Procedure

3.1 Experimental Model and Instructions

The game tree in fig. 1 illustrates the decision situation.

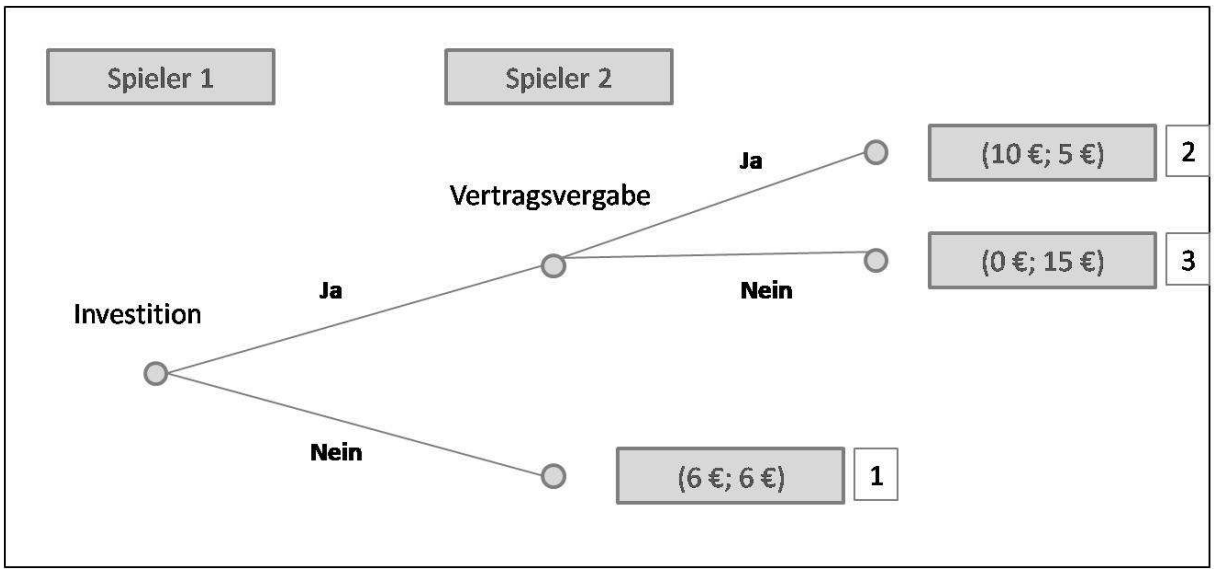

Fig. 1: Game Tree

In the first stage of the experiment player 1, representing the proposer, decides on whether or not to invest a sum of 6 € into the promotion of player 2. In the event of player 1 choosing not to invest, the result is payoff box 1 with (6€/ 6€) for (player 1/ player 2) respectively. If however player 1 decides in favor of the investment, player 2, representing the responder, has to make a binary decision between two alternatives in the second stage. Option 1 is to award a contract to player 1; option 2 is not to award it. The first option is more favorable to the first mover and represents the huge advantage due to possibly successful manipulation of player 2. This cooperative choice would yield an outcome of (10€/ 5€). The second option is more favorable to player 2 as it represents the more self-interested alternative for him/ her. Player 2

– as the public official – has no monetary advantage in awarding the contract to player 1 because he would end up with 5 € instead of 15 €. This emphasizes the cost that player 2 has to bear in the event of a corrupt transaction. He has to justify manipulative decisions to his superior or he has to bear the cost of obfuscating his decision. The second option would lead to an outcome of (0€/ 15€) – payoff box 3.

Based on the principle of dominance and backward induction, the standard game theoretic solution would predict non-cooperative behavior in any game played once. The sub game perfect equilibrium can easily be reached applying backward induction. In the second stage of the game, player 2 has no reason to award the contract to player 1 because he would not maximize his profit. Player 1 can anticipate this and would always choose not to invest in the first stage. Hence the game theoretic prediction would be result no. 1 – "no investment" with 6 € profit for each player and no cooperation. More detailed instructions and the procedure of the game is shown in Appendix 1.

3.2 Experimental Procedure

The pretests of the experiment took place on 11th January 2010 within the group of participants of the seminar "Experimental Economics". Minor changes had to be done concerning the design of the experiment and additional instructions for the second player. The experiment itself was conducted in January 2010 at the University of Passau. For this purpose the students were separated in different groups to organize the sessions. The author formed group no. 1 together with Marcus Giamattei and Michael Huber. Four sessions took place on 13th, 15th, 18th and 19th January 2010 in the PC-Pools at the University of Passau (WIWI 031 and JUR 058) and via the Internet in the evenings from the 13th until the 19th January. The three experiments were conducted in a row so each session lasted about 25 to 30 minutes – including the introductory talk (see below).

The subjects were recruited with flyers on the campus, "advertisement" in different courses and via social networks like studivz.net and facebook.com. The subject pool consisted of students of the University of Passau only. 72 subjects participated in the game. Since there was no contact between the participants of different sessions, every single pair can be considered as a statistically independent observation. Thus, 36 observations in pairs were gathered. The students come from different disciplines. The biggest groups comprise

economics (16.7 %), business administration (27.8%) and international business and culture studies (22.2 %) students.

The experiment was computerized with the software zTree - Zurich Toolbox for Readymade Economic Experiments by Urs Fischbacher. One experimenter was in charge of controlling the server for the PCs while the other two experimenters acted as instructors. The sessions began with the seating of the subjects. Upon arrival, each participant was asked whether he came alone or with a friend. Friends were placed separately but they got oral and written instructions that they were going to play the first game together. Strangers were seated and paired randomly. To ensure anonymous and randomized pairs of subjects in experiment 2 (by Marcus Giamattei) and experiment 3 (by Michael Huber), the subjects were re-matched after experiment 1. Each session began with an introductory talk (three games in a row, no monetary payoffs, remain silent until completion…). Additional written instructions could be found on the black board ("Bitte sprechen Sie während dem Experiment nicht und konzentrieren Sie sich auf Ihren Bildschirm. Bei technischen Problemen wenden Sie sich bitte mit Handzeichen an die Spielleiter.") After the instructions, the game started immediately. At the end of the session, the experimenters thanked the subjects for their participation and handed out feedback ("Fragen, Kritik, Anregungen") papers as well as email address lists for those interested in the results of the experiments.

To minimize possible side effects such as presentation effects and framing, the subjects in the experiment were named player 1 and 2 and the instructions were given without connecting the game to a bribe situation. The transfer of money was not called bribe, but "Investition" to promote the second player. The intention of a neutral presentation instead of loaded instructions was to avoid the uncontrollable effects of connotations arising from hypothetical scenarios. Numerous studies found a significant impact of wording in the prisoner's dilemma on the likelihood of corruption, but Abbink (2002) could not identify a significant difference between neutral and loaded instructions. However, the instructions of the experiment were kept neutral to exclude a possible presentation effect in principle. To avoid a deceptive experiment due to the risk of losing credibility with subjects and the risk of contaminating the subject pool, the subjects were matched randomly by lots.

The exact procedure/ computerized instructions for the subjects of the experiment and all collected data are listed in Appendix 1 and 3.

4. Hypotheses

The treatment of the experiment allows for testing several hypotheses by comparison of the results. In addition, the subjects were asked to fill in a questionnaire to test the hypotheses that are put forward in the paper.

It would be natural to start with formulating the hypothesis of equilibrium play with subjects motivated by their own payoffs only. However, the literature on reciprocity games already suggests that exchange of benefits is observable even if it does not maximize the individual player's own payoffs. In this experiment the subjects differ in a significant way: about half of them played the game with their friend, the other half of the subjects were strangers. The main question concerning this composition of subjects is: do friends behave differently in a corrupt experiment than strangers, who do not know with whom they are playing and who do not have any information about their counterparts?

Hypothesis 1: Friends are willing to choose a risky strategy.

The frequency of friends choosing to invest will exceed that of the strangers. Thus, friends in this protocol are more likely to signal their willingness to take a risk than strangers.

Hypothesis 1.1: Friends choose a risky strategy more often to get a higher outcome for both players.

Based on their long-standing relationship, friends intent to reach a higher outcome/ social optimum for both players

Hypothesis 1.2: Strangers are more risk-averse than friends.

The choice not to invest will be more prominent in the group of strangers. There will be an overwhelming support for the sub game theoretic outcome (6€/ 6€) due to proposers who are not willing to take a risk.

Hypothesis 2: Friends act more reciprocally than strangers.

Conditional on the choice of investment by player 1, the same qualitative results expressed in Hypothesis 1 will also apply to the frequency of awarding the contract (trustworthiness as presented by the choice of awarding the contract by the responders – players 2).

Hypothesis 2.1: Friends choose an altruistic motivated result more often instead of choosing a self-interested result.
The prominent motivation for friends to act reciprocally is altruism instead of selfishness.

Hypothesis 2.2: Strangers act more self-interested.
Responders in the group of strangers will act more self-interested by choosing option 2 – not awarding the contract to player 1.

5. Experimental Results and Analysis

In the following section, the experimental results will be analyzed with respect to the two main hypotheses and the four sub hypotheses. The overall choices of player 1 and 2 with the respective frequencies are shown in the decision tree in fig. 2.

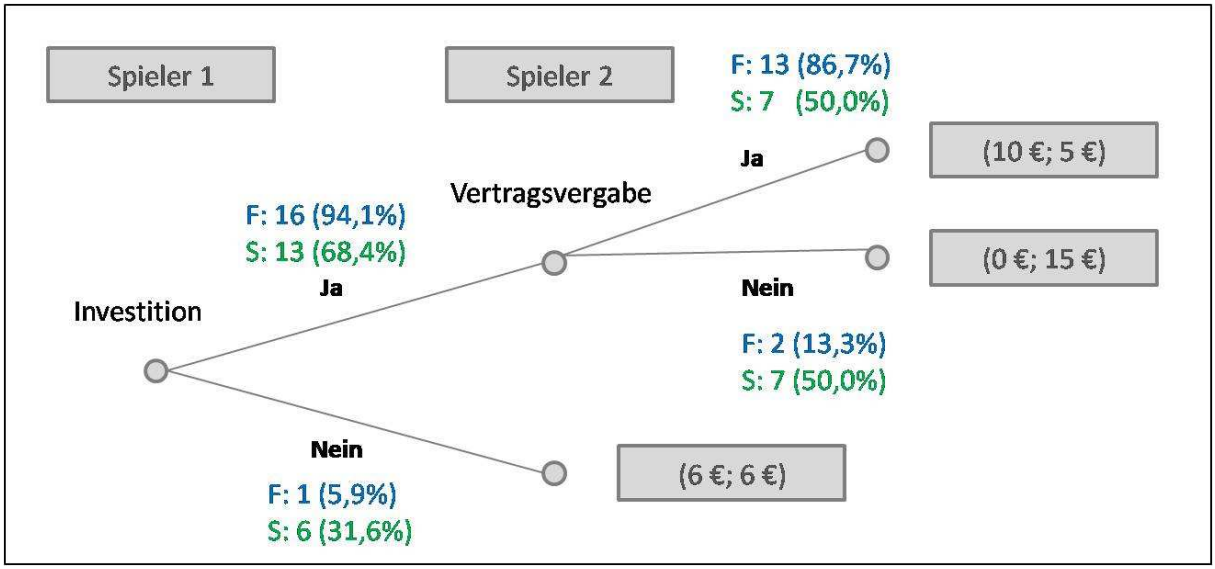

Fig. 2: Game Tree with Frequencies

36 out of 72 subjects were randomly chosen as proposers, hence 36 subjects acted as responders. 17 out of 36 proposers were friend, of which 94.1 % decided to invest into player 2 and 5.9 % did not invest. Within the group of strangers (19), 68.4 % decided to invest and

31.6 % did not invest. Due to the choice of no investment, seven pairs of subjects had a payoff of 6 € each.

Accordingly, only 29 players in the second stage had to act as responders and make a decision. Concerning the group of friends, 86.7 % responded to their counterpart with awarding the contract to player 1, while 13.3 % decided to keep the maximum payoff for themselves. On the other hand, 50 % of the strangers decided to award the contract and 50 % kept the maximum payoff. To achieve a more detailed analysis of the results and to separate the effects of trust and reciprocity, the strategy of proposers in stage 1 (section 5.1) and the strategy of responders in stage 2 (section 5.2) will be treated separately.

5.1 Strategy of the Proposers in Stage 1

The strategy choices of the proposers are illustrated in fig. 3. There is obviously a difference between the choice of friends and the choice of strangers; the question that remains is whether this difference is significant.

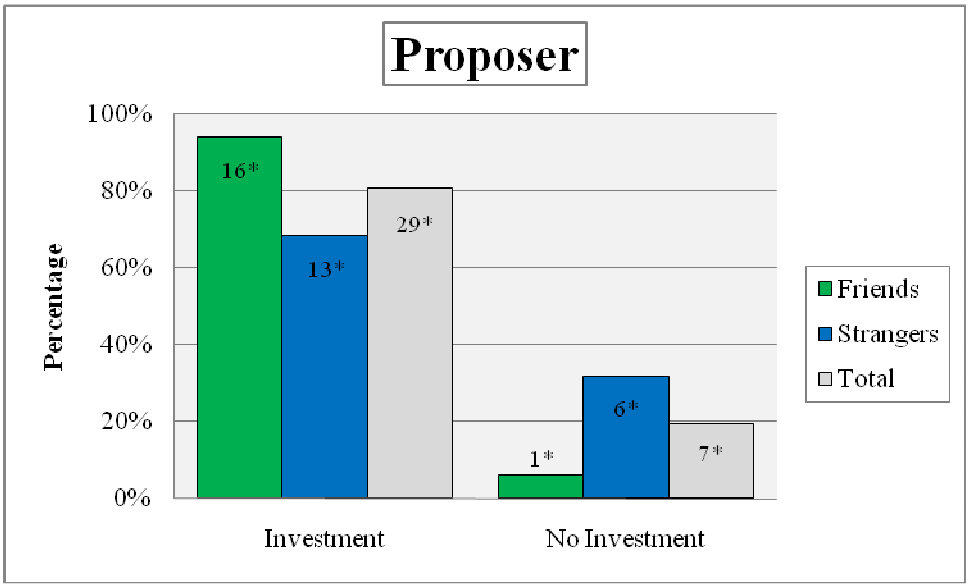

Fig. 3: Frequencies among Proposers (* = absolute frequencies)

A non parametric statistical test was chosen to test hypothesis 1. The χ^2-test resulted in a level of significance of p=0.052. That means that with a probability of 94.8 % the difference between the strategy choice of friends and the choice of strangers is not random and therefore the variables ("proposal" and "friend/ stranger") are not independent. Hence, the null

alternative can be rejected in favor of hypothesis 1. The frequency of friends (94.1 %) choosing the risky strategy exceeds that of strangers (68.4 %). In order to see which causes these decisions might have and to interpret this result, the sub hypotheses 1.1 and 1.2 were sat up. The data is drawn from the questionnaire (for a detailed overview see Appendix 3) in which players were asked about their intentions. It is hardly possible to analyze the subjects' intentions without a tool like a questionnaire because the design of the trust game can only illustrate trust and reciprocity, but not the real motivation of the players. The evaluation of the questionnaire resulted in two most frequent motivations: 13 out of 16 friends who chose to invest stated that they did this to reach a social optimum, 12 expected player 2 to reciprocate positively to the investment. These results give strong support hypothesis 1.1. Friends are willing to choose the risky strategy in order to obtain a higher payoff for both players but they also have certain expectations concerning the move of player 2.

Concerning the motivation of strangers, the experiment yields interesting results. 68.4 % of the strangers (in comparison to 94.1 % of the friends) decided to choose the risky way; their stated motivation was to achieve a social optimum for both players and they expected positive reciprocity (12 out of 13). This leads to the question whether strangers are risk averse at all or maybe just as willing to take a risk as friends are.

In this game, the optimal choice for player 1 is the following: Strangers chose in exactly 50 % of the time to award a contract in the second stage of the game. Thus, the correctly anticipated expectations value (for a stranger proposer) would be E= 5 (0.5*10+ 0.5*0). The expectations value, or rather the sure profit of choosing not to invest, is E= 6. Hence the best answer for the strangers would be not to invest (E=6 >E= 5). Despite this result, 68.4% of the strangers still chose to invest. Maybe strangers are capable of evaluating the risk of choosing to invest correctly and they are probably as willing to take a risk as friends. However they do not know their opponent, so they anticipate correctly that they only have a 50 % chance of being awarded the contract in the second stage if they choose to invest. If friends, on the other hand, anticipate the actual frequencies correctly, they have an expectations value of E= 9.41 (0.941*10+ 0.059*0) for the second branch. Their best answer is the choice of "investment". Due to the discrepancy of the best answer of friends and strangers under the presumption that the expectations where formed over the actual frequencies/ probabilities, an analysis of the risk aversion is not coherent. If strangers and friends had the same expectations value for the second stage (higher than E= 6) and there would still be more strangers choosing "no investment", it would be justified to suggest that they are more risk averse than friends.

Without further comparable treatments with the same best answer for friends and strangers, however, this comparison is not practical. Hypothesis 1.2 can therefore be rejected.

5.2 Strategy of the Responder in Stage 2

The frequencies of choices of the responders are illustrated in fig. 4. 86.7% of the friends, but only 50% of the strangers awarded the contract to their counterpart and therefore acted reciprocally.

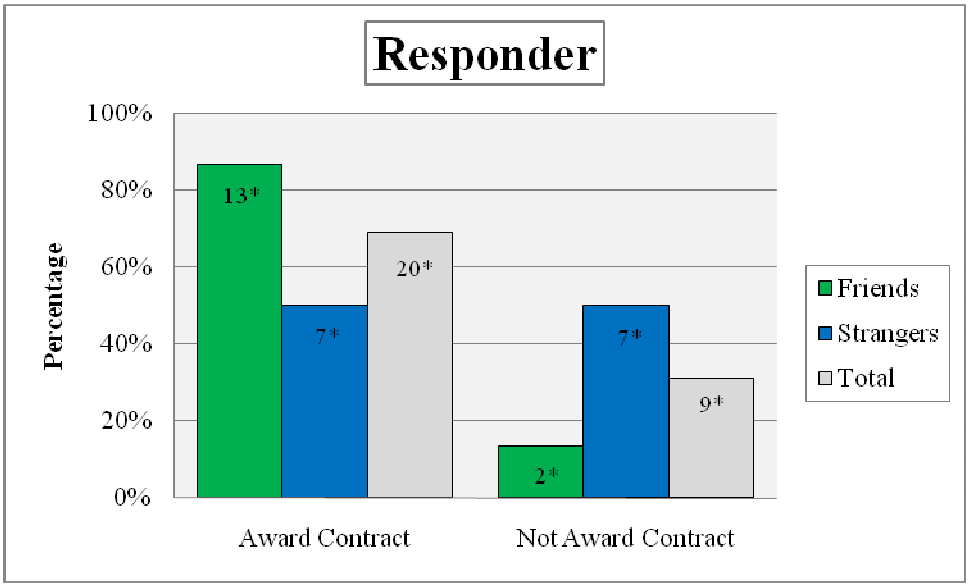

Fig. 4: Frequencies among Responders (* = absolute frequencies)

Once again, the difference between friends and stranger was statistically tested. The χ^2-test resulted in a highly significant value of p=0.033. According to this, the difference between the decision of a player responding to his/ her friend and the decision of a stranger responder is not random with a probability of 96.7 %. This demonstrates that friends act differently than strangers, which gives strong support for hypothesis 2. To evaluate the players' motivation, hypothesis 2.1 and 2.2 were set up. The data was once more drawn from the questionnaire (see Appendix 3).

10 out of 13 friends awarded the contract out of reciprocity and 92.3% of the responder that awarded the contract did this due to their expectation of ex post payoff sharing. This is in line with hypothesis 2.1, as 86.7% of the friends chose to award the contract instead of going for the self-interested option 2. Nevertheless there is a limitation to this result. As stated above,

friends do expect their friends to share the payoff ex post. This clearly demonstrates a major difference between friends and strangers: due to their relationship friends do not act one-shot in this game. It is only a link in a chain of actions between them. By awarding the contract they do not only act reciprocally due to altruism, but they also expect ex post effects. This is shown by the answers to question 11: only 38.5% of the responders stated altruism as a motivation for the awarding of the contract. This is the reason why a clear distinction has to be made between friends and strangers. The latter only play one-shot and therefore cannot expect any ex post effects.

The main motivation for the strangers who did not award the contract was payoff maximization (7 out of 7). The strangers who awarded the contract (7 out of 7), on the other hand, did so due to reciprocity. Within the group of strangers, it is hard to say whether they overall act self-interested. In case they awarded the contract, they definitely acted reciprocally and maybe altruistic because they could not expect any ex post effects. However, when compared to the friends' behavior, hypothesis 2.2 cannot be rejected because only half of the strangers reciprocated positively and the other half kept the payoff for themselves.

6. Limitation

While the experiment delivers conclusive results, there are some limitations to it. First of all, the experiment was conducted within a university seminar. The experimenters were students, which is the reason why no monetary payoffs could be offered. Consequently, the results could be distorted because the only incentive to play the game was to learn something.

Secondly, the subject pool only consisted of students of the University of Passau. Therefore, the question has to be asked whether the behavior of students is representative for the population. Fehr et al. (2002) conducted an experiment with several demographic variables affecting a game, but even if these affected how the game was played, the general pattern observed in another experiment with students only did not change.

A final potential source of distortion could be learning effects because the experiment was conducted with two other games in a row. However, the experiment was the first of the three games, so the danger of learning effects can be neglected.

7. Conclusion

As stated in Lamdsdorff (2007), trust is a crucial element in corrupt contracting. Corrupt actors negotiating a contract with an unknown partner face a considerable risk of denunciation. They do not only have to advertise their corrupt interest, but also negotiate and enforce a contract with a great risk of opportunistic behavior on the part of their new found partner. This process raises transaction costs and forces corrupt relationships to be built on trust. Parties that are familiar with each other tend to engage in bribery/ corruption way more often than anonymous partners. This is underlined by the results of the experiment. Friends tend to invest most of the time due to their trust and familiarity with their counterpart. They do not only trust their partner and are therefore willing to take a risk, but they also expect their counterpart to act reciprocally. The ex post effects between friends are underlined by the motivation of "friendly" responders that awarded the contract to their counterpart These ex post effects are a major indicator for the design of anticorruption rules. Lamdsdorff (2007) stated that conflicts of interest arise especially where relationships such as long-term business contacts pre-exist and serve as a basis for enforcing corrupt deals. Therefore regulation and supervision must be adjusted to this fact because the friendship of a public official with one of his clients may not only tempt him to privileged treatment of his partner, but also allows camouflaging a bribe as a gift. A special treatment could also be reciprocated years later. To prevent corruption or at least to complicate the process of establishing a stable corrupt relationship, it has to be kept in mind that friends never play one-shot in a game or in real life. Strangers, on the other hand, do this constantly. This leads to the conclusion that colleagues or partners in a professional environment who are socially embedded in a certain relationship or network should never be given the possibility to act (for example negotiate a new contract) alone.

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