CORRUPTION IN EXPERIMENTAL ECONOMICS

CONTRIBUTIONS AND STRATEGIES IN THE PREVENTION AND FIGHT AGAINST CORRUPTION

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ABSTRACT: This work is addressed to give a general overview of the main contributions in the field of corruption from an experimental economics perspective. In the first section we introduce the topic of corruption and we briefly explain some rules regarding the experimental economics methodology. In the second section we review the main works that give an understanding of the determinants of behavior when people face a bribery environment. In third section we explain the anticorruption policies that has been studied in the lab. Fourth section concludes.

KEYWORDS: corruption, experimental, economics.

RESUMEN: Este trabajo está dirigido a dar una visión general de las principales contribuciones en el campo de la corrupción desde una perspectiva económica experimental. En la primera sección presentamos el tema de la corrupción y explicamos brevemente algunas reglas sobre la metodología de la economía experimental. En la segunda sección se revisan los principales trabajos que permiten comprender los determinantes del comportamiento cuando las personas se enfrentan a un entorno de soborno. En la tercera sección se explican las políticas anticorrupción que se han estudiado en el laboratorio. La cuarta sección concluye.

PALABRAS CLAVE: corrupción, experimental, economía.

RESUM: Aquest treball està dirigit a donar una visió general de les principals contribucions en el camp de la corrupció des d'una perspectiva econòmica experimental. En la primera secció presentem el tema de la corrupció i expliquem breument algunes regles sobre la metodologia de l'economia experimental. En la segona secció es revisen els principals treballs que permeten comprendre els determinants del comportament quan les persones s'enfronten a un entorn de suborn. En la tercera secció s'expliquen les polítiques anticorrupció que s'han estudiat en el laboratori. La quarta secció conclou.

PARAULES CLAU: corrupció, experimental, econom

1. INTRODUCTION

The specific nature of corruption, illegal and secret, makes the analysis and the quantification of it a constant challenge for scholars. Since the eighties, the empirical works of corruption are based on surveys that measure the perception of corruption as a proxy of the level of corruption in a country[1]. For instance, PAOLO MAURO (1995) was the first to investigate the effect of corruption on economic growth through a cross-country analysis in which he included the perception level of corruption in a regression. Many others researchers followed him and started to use the same methodology. This methodology has been very successful in the last decades. However, using a corruption perception index as an accurate indicator of the level of corruption presents many bias problems (Olken, 2009).

The experimental methodology has been very useful for the progress of the study of corruption. Rather than using real or perceived data of the level of corruption in a country, the experiments are done to study how potential corrupt people react to different incentives (monetary and non- monetary) and which mechanisms might change the behavior of people. By gathering information of the participants in an experimental session, the researcher also analyzes the socioeconomic determinants of corruption.

This essay is addressed to review the main contributions made in the field of experimental economics to the literature of corruption.

2. WHAT IS EXPERIMENTAL ECONOMICS?

2.1. History

Let's start with a brief review of the history of experimental economics. The first experiment reported was in the fifties. EDWARD CHAMBERLIN (1948) ran classroom experiments during 10 years and tried to demonstrate that competitive equilibrium is not possible to be achieved in real life. However, VERNON SMITH (1962), who was awarded with Nobel Prize in 2002, improved Chamberlin's technique by introducing salient payment, repeated interactions, and

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[1] Transparency International is a non-governmental organization that fight against corruption and publishes the Corruption Perception Index (CPI) every year. CPI is based on surveys and gives a ranking of countries according to their level of corruption.

more realistic environment. VERNON SMITH inaugurated the first laboratory of experimental economic at Purdue University. This methodology gained also the interest of many game theorists such as JOHN NASH, MARTIN SHUBIK and LLOYD SHAPLEY. Some of them were awarded with the Nobel Prize for their theories. Other economists also became very interested in testing their theories in the laboratory with real people. The experiments started to grow in the sixties but the explosion and the consolidation of this field was in the seventies. It was during this decade that many researchers used the experimental methodology to study their topics of interest and the methodology ended up with an agreement among scholars for respecting some common rules.

Specific laboratories of experimental economics started to appear all over the world in the eighties. The most outstanding hint was the big increase of publications of experiments in classic economic journals. The final step so far is in the nineties when the scientific community accepted experimental economics as a formal methodology. In fact, in 1998 a journal specifically dedicated to this methodology was born: *Experimental Economics*.

Nowadays, many are the researchers using experimental economics in their research and the more and more PhD students choose this methodology in their dissertations.

2.2. Some ideas about this methodology

The main purpose of the experimental economics methodology is to create a controlled environment in which subjects take economical decisions. Experiments are done either in the lab or in the field. The main advantages are replicability and control, it permits to test the validity of existing theories and gives new results that are used to develop new models of human behavior (behavioral economics). In addition, the comparison between slightly different treatments provides straightforward results. In fact, this discipline has challenged the classic economic theory in which models seem too simple and are missing several features of human behavior.

A. Differences with psychology (extracted from "Economics Lab: An intensive course in experimental economics, DANIEL FRIEDMAN and ALESSANDRA CASSAR")

"The techniques of experimental economics have diverged from those of cognitive and social psychology. RALPH HERTWIG AND ANDREAS ORTMAN (2001) identify four principal methodological differences:

• Script versus open-ended. Economists (drawing on Siegel's tradition) almost

always include detailed formal written instructions for subjects defining their roles, interactions, and payoffs. Psychologists in recent decades seldom use written instructions and usually are quite casual about describing the task to the subjects.

• Repeated trials versus one-shot. Economists since Smith (1962) typically have subjects repeat the task or interactions several times, and focus on data from later repetitions when they are sure that the subjects are fully adjusted to the environment. Psychologists more commonly just give the subjects one shot at any particular task.

• Salient pay. Economists almost always pay subjects in cash based on performance. Psychologists seldom pay cash, and when they do, they usually pay a flat amount unrelated to performance.

• Deception. A large fraction of social psychology experiments attempt to mislead the subjects as to the true nature of the task. Deception of any kind is taboo among experimental economists. It seems to us that these differences in lab methods spring from differences in the nature of the disciplines:

• Role of theory. Economics has a core theory that assumes self-interest, rationality, and equilibrium. Theory in psychology is more descriptive and eclectic. Hence, psychologists are less concerned with salient rewards, repeated trials, etc. that give economic theory a better shot.

• Role of institutions. Personal preferences are the dominant influence in individual choice tasks but play a minor role for firms in strong institutions such as markets. Cognitive psychologists prefer to work at the weak institution end of the spectrum, while social psychologists study quite different social constraints."

 B. Lab versus Field experiments

In this section we briefly clarify the difference between field and laboratory data. This distinction may help to better understand the experimental methodology.

It is important to firstly distinguish between econometrics and experimental data. Econometrics uses happenstance data, or naturally occurring data and the processes are uncontrolled, as opposed to experimental data, which are controlled like in any experimental science. Now, let´s explain what field experiments are. According to JOHN A. LIST (2008)

there are three types of field experiments.

- Artefactual field experiments are like a lab experiment "but use a subject pool from the population of interest."

- Framed field experiments are done in the context of interest, hence subjects take decisions in a more natural framework. "Yet the subjects remain aware that they are part of an experimental study."

- Natural field experiment: "the analyst manipulates experimental conditions in a natural manner, whereby the experimental subjects are unaware that they are participating in an experiment. This approach combines the most attractive elements of the laboratory and of naturally occurring data: randomization and realism."

This introduction is needed to acquire some knowledge about the basic principles of experimental economics and therefore being able to understand the current experiments on corruption that can be found in the literature. It may also inspire people to develop new ideas and experiments for future researches.

In the next section we review the main works dealing with what we know about corruption in experimental economics. In the third section we explain the anti–corruption measures that have been tested in the experiments. Section four concludes this essay.

3. WHAT DO WE KNOW ABOUT CORRUPTION IN EXPERIMENTAL ECONOMICS?

3.1. How to implement experiments on corruption in the lab. Features appearing in the different experimental designs.

To start this section, we have to point out an important issue: corruption is a wide concept so it takes many forms. Corruption includes bribery, public embezzlement, nepotism or black mail for instance. As studying all the forms of corruption is beyond the scope of this survey, we will give more attention to bribery. Although bribery is considered as a money transfer in exchange for a favor, it may also appear in different environments: in public procurement auctions between public officials and firms, in the street between police officers and citizens, etc.

Therefore, corruption has been also modeled in different ways in experimental economics.

The most common way to represent corruption is the interaction between an agent who gives some money to a second agent in exchange of a favor. If the deal is executed, then a third agent is negatively affected by it. Scholars represent corruption according to their preferences or according to their research interest, though. The first experiments on corruption appeared around ten years ago; and we are still far from a deep understanding of this topic especially when the results for the same question are contradictory. Rather than considering this as weakness we prefer to see it as a remaining challenge for researchers.

We now review some of the main features that contain the main experiments on corruption.

3.1.1. Agents involved in the transaction

- Firm and Official: Several experimental designs imply in their instructions the interaction between a firm and a public official. This is the case of KLAUS ABBINK et al. (2002), ABBINK (2004), ABBINK and HEIKE HENNIG-SCHMIDT (2006), SHEHERYAR BANURI and CATHERINE C. ECKEL (2015), JOHANN GRAF LAMBSDORFF and BJORN FRANK (2010, 2011), YE-FENG CHEN et al. (2015). Others like VIVI ALATAS et al. (2009a,b), LISA CAMERON et al. (2009) also add a third player, a citizen victim of corruption who has the option to punish the others.

- Citizen and Official: ABIGAIL BARR and DANILA SERRA (2009, 2010) rather focus their design in what they call "petty corruption", that is the interaction between a citizen and a public official. The authors claim that this scenario is more realistic for students.

- Two firms and Official: Other experimental designs represent the competition between two firms in a public procurement auction and the interaction with a public official: SUSANNE BÜCHNER et al. (2008), TAREK JABER-LÓPEZ et al. (2014) are some examples.

We can also find other scenarios simulating other forms of corruption such as public embezzlement and elections (Omar Azfar and Robert Nelson, 2007), embezzlement and monitoring (Banerjee et al., 2015), tax evasion (Coricelli et al., 2010, 2014).

3.1.2. Time and type of Interaction

Depending on the involved parties and the scenario, the experimental design consists in a *repeated game*, i.e. repeated interaction between players in a certain number of periods or in a *one-shot game,* i.e. subjects interact only once.

Among repeated games we can distinguish two kind of matching protocols: *partners* or *strangers.* In a *Partners* matching, players interact with the same players in a repeated

number of periods. In the *Strangers* matching, the composition of the group changes randomly in every repetition. Hence, subjects play with different people in each interaction.

The election of these two features depends on the paradigm that the researcher wants to represent. For instance, a petty corruption scenario among the same police officer and citizen generally happens only once in real life. On the other hand, a public procurement scenario consists in a repeated interaction between firms and public officials, thus the partners matching protocol are more suitable. This is also important when the experimenter wants to include the effect of reputation and trust.

3.1.3. Lab or field?

The experiments on corruption have been run in the laboratory and in the field as well. The laboratory has the advantage of being a controlled environment, but the disadvantage of being criticized for lack of external validity. This means that the results obtained in the lab may be not generalized to real life situations. Field experiments may be more realistic and have not the problem of external validity but may suffer for lack of control.

3.2. Socioeconomic determinants of bribery

The experiments give us important information about the characteristics of the agents involved in a certain type of decision. For instance, we are able to distinguish whether either male or female have a higher propensity to engage on corruption, or whether the origin of the person matters. Generally, the experimenter collects socioeconomic variables about subjects before the session starts or at the end of it. Hence, by using aggregate data with sufficiently high samples, we are able to correlate decisions with the personal characteristics of people.

Several articles analyze the differences among gender on the propensity to engage on corruption[2]. VIVI ALATAS *et al.* (2009), replicate the same experimental design with students in four different countries: Australia, Singapore, India and Indonesia. Their design consists in a bribery scenario in which a firm may offer a bribe to a public official. In a second stage the public official can either accept or reject the bribe. If the bribe is accepted, payoffs for both players are increased. If the bribe is rejected, the game ends. If both parties are engaged on bribery, a third player in the role of the citizen is affected negatively. Finally, in a last stage the citizen can punish the other two agents at a cost, i.e. use his money to decrease

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[2] For a survey on that, see FRANK, B. *et al.* (2009).

others' money. This scenario represents a typical situation in developing countries where firms pay bribes to avoid complying with some regulations. The design represents a fundamental feature of corruption: the corrupt parties make benefits while the society suffers negative consequences. The authors compare the effect of gender in the four countries and found that men behave similarly in the four countries, by offering more frequently bribes and in a higher amount on average than women. On the other hand, women seem to have different behavior according to their country of origin suggesting that the role of women in the society is more context-dependent.

JOHANN GRAF LAMBSDORFF and BJÖRN FRANK (2011) find interesting gender differences. Their game starts with the public servant receiving a bribe and having the option to either report to authorities, reciprocate by delivering the contract to the briber or behave opportunistically. The business person decides afterwards whether they want to report the payment or do nothing. In their experiment, women are more willing to report bribes than men. Women are also behaving more opportunistically than men, which means that they accept the bribe but then they do not reciprocate with the businessperson. Men more often punish opportunistic public servants.

OLIVIER ARMANTIER and AMADOU BOLY (2011) run a natural field experiment in Burkina Faso. In their experiment, a grader for exams receives a bribe in exchange of a better grade. Subjects, as graders, had to grade 20 exams and the 11th one has a money bill and a message saying: *''Please, find few mistakes in my exam paper''*. Subjects were informed they were participating in an experiment just after the experiment finished. The experimenters also variate the amount of bribe, the wage paid to graders and the level of monitoring and punishment. Concerning socioeconomic determinants, the authors find that accepting bribe is negatively correlated with age and religiosity but there is no correlation with gender.

BJÖRN FRANK and GÜNTHER SCHULZE (2000) found that students of economics seem more prone to engage on corruption than students from other disciplines. The authors suggest that this is due to a self- selection issue rather than learning.

ABIGAIL BARR and DANILA SERRA (2010) study the correlation between the level of perception of corruption in the country of origin of the subject and the decisions made in the experiment. In a first series of experiments they found that a correlation exists for undergraduate students but not for graduate students. In 2007 they replicate the experiments and find that the time spent in UK was associated with a lower propensity to bribe. The

authors are cautious though by claiming that people must not be judged according to their country of origin.

3.3. Trust and Reciprocity in paying the favor back

The experimental and behavioral economics literature has paid much attention to motivations different from the pure monetary maximization. These are known as other-regarding preferences. Among these preferences we find an important one known as reciprocal behavior. Reciprocity and trust are two fundamental requirements for the corrupt agents. In fact, if trust and reciprocity are not fully settled between the two potential corrupt agents, it might yield to negative reciprocity behavior such as reporting, denounces or whistle-blowing.

KLAUS ABBINK *et al*. (2002) use an experimental design consisting in a variation of the standard trust game (Berg *et al*. 1995) as baseline. In their game, a firm can offer a bribe to a public official who can accept or reject the bribe and reciprocate by choosing a monetary favorable option for the firm. The results demonstrate that people needed to interact in a long term and repeated interaction in order to settle trust and reciprocity.

OLIVIER ARMANTIER and AMADOU BOLY (2011) in their field experiment demonstrate that higher bribe amounts increase the probability of acceptance, and consequently reciprocity by paying the favor back.

3.4. The awareness of the social cost of corruption

An important question is whether potentially corrupt agents have empathy towards the society. In other words, are they less willing to engage in corruption when they are aware of the negative consequences of their actions in the society? In economic terms, the effect produced by corruption is called an externality. Externality is a common concept used to define the cost (negative externality) or benefit (positive externality) that affects other parties not involved in a transaction. A classic example of negative externality is a manufacture that contaminates a river used by the inhabitants of a village.

KLAUS ABBINK *et al*. (2002), run what they call the "negative externality" treatment. The experimenters manipulate the payoff function of subjects: each time a pair official-firm engage on corruption, the rest of the participants in the session incur on losses. Furthermore, if all the pairs of the session engage on bribery the final earnings of all the subjects would be negative. Their results show that this manipulation has not any significant effect on reducing

bribery, compared to a baseline treatment without negative externality. It seems that people look for their own personal interest and do not care about the effect of their decisions on others. A possible limitation of this design is the fact that subjects may still bribing because they expect others to do the same, and not because they are not actually concern of their negative effect on others.

JOHANN GRAF LAMBSDORFF and BJÖRN FRANK (2010) avoid this problem by imposing the negative effect on an agent not participating in the experiment. This manipulation has an interesting advantage as it represents better a real scenario of corruption since *"bribers and officials do harm to people who will never get the chance to pay them out in their own coin"*. In their experiment, the agent suffering the externality is the Non-Governmental Organization, *Médecins Sans Frontières.*

Similarly, ABIGAIL BARR and DANILA SERRA (2009) chose a passive agent as victim of the externality, a group of passive players representing 'other members of the society'. The difference with the previous work is that these passive players participate in the experimental session. In their design they manipulate the level of the negative externality: High vs Low. Their results show that when the consequences of the externality are high, the potential corrupt agents seem less willing to engage on bribery.

GARCÍA-GALLEGO *et al*. (2016) study whether the lower bribery and increase of social awareness is due to the fact of being observed by the society or because potential corrupt agents really care about others' welfare. The authors run three treatments: 1-a baseline treatment without a negative externality, 2-a treatment in which passive players are just observing the decisions of firms and officials 3-a treatment in which passive players are observing and affected by firms and officials' decisions. Their results demonstrate that subjects bribe less in treatment 3. That is, officials and firms bribe less when they are aware that some passive players are observing them and affected by their decisions. These results are in line with the classic results of experimental economics literature that suggest that people have other-regarding preferences such as pro-sociality or inequity aversion.

Due to different experimental designs, some contradictions exist in the results. Despite that, it seems that the increase and development of awareness campaigns might be a successful tool to fight against corruption.

3.5. Framing effects and the way the instructions are written

An important issue concerning the experimental methodology is the way the instructions are written, also known as framing. AMOS TVERSKY and DANIEL KAHNEMAN (1981) study the effect of framing in different decisions concerning life and death for instance. Subjects were facing a situation in which 600 people are affected by a deadly disease and they have to choose between treatment A or treatment B.

Some of them participated in the positive framing: Treatment A "Saves 200 lives" or Treatment B "A 33% chance of saving all 600 people, 66% possibility of saving no one."

And some subjects participated in the negative framing: Treatment A "400 people will die" and Treatment B "A 33% chance that no people will die, 66% probability that all 600 will die."

The results of this experiment show a straightforward effect since 72% of subjects chose Treatment A when it was presented with positive framing while only 22% chose it when it was presented with negative framing.

There is hence a deep discussion in the experimental literature about the importance of framing. By framing we refer here to the way that instructions are written. For instance, in an experiment on corruption, a neutral frame uses terms such as player 1, player 2 and money transfer for instance. A loaded frame rather uses the terms firm, public official and bribe for instance. Corruption has a negative connotation thus subjects might refuse to bribe to give a good image of themselves in front of the experimenter, rather than for actual intrinsic preferences.

This feature has been firstly studied by ABBINK (2004) by comparing one treatment with neutral instructions vs. a treatment with loaded instructions. The results were not significantly different between the two treatments, therefore in his setting it seems that framing has not any effect.

On the other hand, BARR and SERRA (2009) obtain a significantly lower propensity to ask for and offer bribes when the instructions were loaded than when instructions were neutral. Therefore, framing has a significant effect in their setting. Interestingly, LAMBSDORFF and FRANK (2010) give subjects the option to choose two different framed scenarios, i.e. the bribe framing and the gift framing. The main result of their research is that those businesspeople chose the bribe framing were more willing to punish non-delivering public servants.

It seems that the way we refer to the same action might have some effects in people's behavior. In fact, it might be that some societies do not have such a negative perception of corruption as in others. We hence believe that policy makers with the help of media can play an important role in the way of stigmatizing bribery and corruption.

3.6. How the behavior of others affects our behavior

A common question around corruption is whether people become more dishonest when they observe others being also dishonest or it has the opposite effect. GINO *et al.* (2009) demonstrate that, in line with social norms theories, when the cheater belongs to the same group, subjects cheat more. However, if the cheater was an out-group member, subjects were less willing to cheat. Their results demonstrate that cheating does not correspond to a cost-benefit computation as suggested by economic theory but by a matter of social norms.

3.7. Physiological aspects

The current decade is observing a growth of interdisciplinary researches. Neuro-economics studies the process in peoples' brain while taking economical decisions. Physio-economics analyzes the physiological and emotional reactions of the body in the decision making process.

TAREK JABER-LOPEZ *et al.* (2014) use skin-conductance to measure the emotional response of subjects when playing the bribery game. Subjects play a bribery game in which their decisions are categorized as pro-social or self-interested. Pro-social means that the subject refuse a bribe that provides him higher earnings in order to increase all the group members' earnings. Self- interested means that the subject only care about his personal monetary earnings and hence accepts the highest bribe. Their main result shows that pro-social subjects suffer a higher emotional arousal than self-interested subjects. It seems that refusing a bribe and consequently deviating from the monetary interest provokes and internal conflict that makes them to suffer more tension. This result give us an interesting hint in terms of policy implications: affecting the emotional side of people may be an effective way to deter corruption.

4. ANTICORRUPTION POLICIES: IN THE LAB

The experimental economics methodology is a powerful tool for policy makers. It has many advantages in the study of anti-corruption policies that other methodologies does not have.

The laboratory is a controlled environment, so the experiments permit to study the reactions of subjects to different incentive schemes by controlling any slight change. It is also a low cost way tool to anticipate the effectiveness of anticorruption policies. A classic critique to running experiments of corruption is the fact that we rely on students as a representation of the whole society. Despite its limitations as any other methodology, an accurate experimental design might prevent governments and organizations from wasting money and effort.

In this section we review what we know so far from the literature in terms of mechanisms to reduce corruption: monetary and psychological ones.

4.1. Monetary mechanisms to reduce corruption

4.1.1. Sanctions

One of the most important issues is to analyze the effect produced by sanctions on bribery. Sanctions are considered direct costly punishment, reports with punishment, or exogenous probability of detection. Punishment for instance, has been extensively studied in infinite experiments. Generally, punishment is a costly action for the punisher but even more costly for the punished subject, that is a subject can burn his money in order to reduce others' money. The most important result is that despite that punishing is against the self-monetary interest, people are willing to punish in order to impose a social norm which yields to more cooperative behavior.

Let's see how the probability of being detected affects people's willingness to engage on bribery. ABBINK et al. (2002) use a design, which permits to study whether the threat of being sanctioned if caught bribing may decrease the levels of bribery. In every round, there is a very small probability (0.3%) of being discovered if the public official accepted a transfer. If a corrupt pair is discovered, both, the firm and public official are disqualified by losing all earnings and are not allowed to continue playing. Their results demonstrate that in this treatment people significantly engage much less in bribery, compare to a baseline treatment without sanctions. Hence the effect is huge, despite the low probability.

SCHULZE and FRANK (2003) based on the same experiment reported in FRANK and SCHULZE (2000) study the effect of the risk of an exogenous penalty. The authors conducted a treatment where people face a risk of being detected and one in which they do not. In their

design, the higher is the bribe, the more likely detection becomes. Their most interesting result is that once the detection probability is introduced the intrinsic motivation for being honest disappears. The policy implications of this result are important as monitoring crowds out the intrinsic motivation of people for honesty.

These two studies show contradictory results. In the first, the probability of detection decrease bribery while in the second there is no effect. A possible explanation of this may be the different experimental designs (Abbink, 2012).

4.1.2. Monitoring, reporting and whistle blowing

Other experiments rather than using an exogenous probability of being detected prefer to study the effect of being monitored by humans, i.e. other subjects in the session.

ARMANTIER and BOLY (2011) in their field experiment studied the effect of monitoring the exams' grading accuracy. They conducted two treatments with different levels of monitoring: 1) 'low monitoring' treatment in which graders were informed that 1 of the 20 papers would be randomly picked to check the accuracy of the graders' work. 2) 'high monitoring' treatment in which the probability of detection increased to 1 of 5 papers. The authors find that monitoring is effective to decrease corruption in the low monitoring treatment. However, people´s intrinsic motivation for honesty seem to suffer a crowding out as the level of corruption in the 'high monitoring' condition was the same than in the baseline.

ABBINK et al. (2014), use an interesting design with important policy implications. The authors study the possible consequences of giving immunity to bribe givers in order to encourage them to report public officials asking for bribes. ''Their results show that this manipulation reduces significantly bribery, however retaliation from bribe-takers and giving weak incentives (not refunding the bribe) to report may be insufficient to achieve the objectives.''

In the baseline treatment of GARCÍA-GALLEGO et al. (2016), the subjects participate in an environment representing a public auction in which two firms post their bids of quality and bribe to win the auction and an auctioneer after observing both offers decides on the wining firm. Subjects play 15 rounds of the baseline in which sanctions are not possible. Afterwards, subjects play in the inspection treatment in which losing firms have the option to call for an inspection if they suspect of a corrupt assignment. If the public assignment turns out to be corrupt, the involved parties lose all their current money. Their results show a

dramatic and significant decrease of bribe bids and acceptance when inspection is available. More interestingly, this decrease on bribery appears despite that the actual frequency of inspection is very low. It seems that is the threat of being sanctioned which represents an effective mechanism to reduce corruption rather than the actual level of sanctions.

4.1.3. Wages of public officials

It has been often conjectured that corruption in public officials is due to their low wages. This topic has been studied in different disciplines and thus experimental economics has a word to say.

ARMANTIER and BOLY (2011) vary the wage paid to the graders. The results show that higher wages decrease significantly the propensity to accept bribes.

OMAR AZFAR and WILLIAM ROBERT NELSON (2007) study experimentally the effect of transparency, different levels of wages and the separation of powers. Subjects take the role of either executive, attorney general or voter. The executive is determined by vote, the attorney general is either appointed by the executive or selected in a separate, simultaneous election. After rolling a die to see the amount of valuable tiles, the executive chooses how many valuable tiles he want to distribute to the votes and how many he wants to keep for himself. The attorney can expose the valuable tiles kept by the executive, to the voters. The most relevant result for this section is that when executives receive high wages they tend to be less corrupt.

SCHULZE and FRANK (2003) find that without risk of detection the different wages has not an effect on bribery, however once the risk is introduced, people perceive the cost of opportunity and bribery is lower.

4.1.4. Regulation and institutions

We examine below two articles that compare different institutional contexts that might be effective in the fight against corruption: the first experiment examines the effect of *staff rotation* and the second experimental study examines the *four-eye principle*.

ABBINK (2004) replicates the game of ABBINK *et al*. (2002) and compares two different matching protocols: partners vs strangers. The partners matching protocol means that subjects play with the same components in all the rounds of the experiment. The strangers matching protocol means that subjects play with different subjects in each round. In other words, in partners, the same firm plays with the same official while in strangers the same

firm plays with a different official in each round. Strangers represents hence a situation of staff rotation. In fact the German government applied this measure in the nineties in some areas. The idea behind that is that officials and firms should not be able to engage in long-term relationships and hence the likelihood of engaging on bribery would be more difficult.

The results of this study are straightforward as the staff rotation mechanism has a huge effect on bribery. The frequency of bribery decreases around two thirds compare to the partners matching. The author suggests that although this is a very simplistic way to represent the problem of corruption, this measure might be effective.

JAN THEODOR SCHIKORA (2011) tests the four-eye principle, which means that decisions in some areas of public service should be made by more than one official. This measure aims at deterring bribery as if two officials are needed to take a decision, one would monitor the other. If both officials are corrupt, either the briber should bribe both and consequently the cost of bribe would be higher or the officials would share the bribe and hence the benefit of corruption would be lower for them. His experimental design allows to understand which effect is dominant, the *bribe- splitting* or *group-decision* effect. The *bribe-splitting* effect should reduce bribery as corruption is less attractive in terms of money. The *group-decision* effect which can go in both directions: if the honest official is more persuasive bribery should decrease but it can also happen that both encourage each other to choose to bribe. Communication was possible between officials in some treatments. The main results found show a detrimental effect of the *four-eye* manipulation as bribery is higher in the group treatments. It seems that at the end, maximizing the benefit is the dominant strategy made by subjects. Although the results are interesting in terms of policy implications, the author suggest to be prudent with the conclusions as a single experiment is not sufficiently conclusive.

4.2. Psychological mechanisms to reduce corruption. Affecting intrinsic motivation

4.2.1. Transparency

Transparency is also an important element in the fight against corruption. We refer to transparency for instance to giving free Access to anyone interested in public information. The results of AZFAR and NELSON (2007) show that subjects rarely revote a politician exposed as corrupt.

GARCÍA-GALLEGO *et al*. (2016) also study the effect of transparency by manipulating the degree of information observed by passive players in the role of citizens. In the baseline

treatment, the citizen is just receiving a payoff in function of decisions of firms and public officials, i.e. the higher the bribery, the lower the payoffs for citizens. In the subsequent treatment the citizen observes the other subject while playing. In the last treatment, citizens observe subjects and their decisions, although they have no way to associate a decision with a concrete person. The results show that the more citizens are able to observe, the lower is the level of bribery. In other words, the higher the transparency, the lower the bribery.

LEONID PEISAKHIN and PAUL PINTO (2010) run a field experiment in India in which they test the effect of a law known as RTIA (Right to Information Act). *'The RTIA came into effect fully on 13 October 2005 and became the most advanced regulatory tool on India's statutory books that seeks to improve public policy outcomes via greater information disclosure.''* In India is known that civil servants usually ask for bribes to slum inhabitants in Exchange of providing public goods and services. The RTIA exists in order to ensure the provision of public goods and services without bribery. The authors study the length of time that elapses before the applicant is issued a ration card by comparing 3 conditions: *''1- the participants submitted an information request under the RTIA shortly after filing their ration card applications 2- presented a letter of support from a local non-governmental organization (NGO) with their application 3- paid a bribe to a local official via a middleman.''* Their results show that those paying a bribe had the lowest time on receiving the ration card, and then those using their right of RTIA with a small time difference between them. However, those in the other conditions waited mucho more time to receive their public good. The authors conclude that the RTIA is as effective as bribery.

4.2.2. Priming, a method to activate the ethical motivation of people

A method commonly used in psychology is known as priming and it consists in using a stimulus to subjects in order to provoke a specific reaction. ''The experimental use of priming in social psychology refers to a technique whereby the presentation of one stimulus passively and temporarily affects processing or response, often in a different domain (Bargh, Chen, & Burrows, 1996). Although it is not necessary that priming stimuli are perceived outside of awareness, it is a necessary characteristic of this form of priming that the individual is either unaware of the influence of the priming stimulus on its measured response, or that this influence is unintended.''

This technique is used to enhance the ethical motivation of subjects in the decision making process. In the experimental economics literature research use this method to study whether a reminder of ethical concerns might increase the propensity to take ethical decisions. An

expert in this field is DAN ARIELY who, in collaboration with his authors, publish a bunch of papers analyzing the determinants of (un)ethical behavior. For instance in NINA MAZAR *et al*. (2008), six experiments are run to study some determinants that may reduce the likelihood of cheating. Subjects are asked to write the Ten Commandments before giving them the option to cheat and found that people cheat less than in a control treatment in which they have to write the name of ten books. In another experiment, they are asked to sign the MIT's honor code finding again a less willingness to cheat. Hence, it seems that the moral motivation of subjects is activated and yielding to a lower level of cheating. The authors conclude that people want to keep a self- image of themselves.

5. CONCLUSIONS

This essay review some of the main experimental studies done on corruption. We first give some basic tips to help the reader to understand in what consists the experimental methodology. The second section gives an overview of the experiments on corruption and the main contributions done by researchers to understand how people behave when facing a corrupt paradigm. In the last section we explain the main experiments done concerning strategies to fight against corruption and their results.

As mentioned in the introduction, experimental economics is an interesting tool for any scholar interested in the understanding of corruption. We simulate a controlled environment representing the same paradigm than a real situation of corruption. It allows us to understand the real behavior of people with monetary incentives rather than surveys.

The reader may be disappointed with the contradiction in some of the results. We sometimes find opposed results for the same research question. We believe that this is due to the broad existence of forms of corruption which yields researchers to implement different experimental designs.

The study of corruption is a relatively recent trend in experimental economics. We are still far from a deep understanding of the topic. However, we believe that the contribution of researchers to this growing literature will help to acquire a deeper wisdom related to corruption and hence it will provide the correct tools to fight against corruption.

In fact, the experimental economics methodology represents an interesting way for anyone interested in studying the impact of policy tools before the real implementation. In some experiments we observe how a very slight change in the conditions yields to highly different

results. We are therefore convinced of the potential of experimental economics as a tool to find the optimum solutions in the fight against corruption.

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