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„Using Social Disapproval to Deter Corrupt Behavior"

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1. Introduction

What is corruption? According to Transparency International corruption is defined as the abuse of entrusted power for private gain.[1] This is a concept commonly used and accepted in the academic world. Since, it is a broad definition that includes all types of corruption, from using personal influence to speed up a process, to paying a bribe to get a "juicy" contract.

There are authors like Tanzi (1998) that differentiates corruption by types, like "petty" corruption or "grand" corruption; nevertheless for this study it is not relevant to make this distinction.

The secretive nature of corrupt transactions makes it extremely difficult to measure this phenomenon. As pointed out by Dimant (2013) there are three important and internationally recognized corruption measures: The Corruption Perception Index (CPI) developed by Transparency International, the Control of Corruption Index (CCI) reported by the World Bank, and the Corruption Index (CI) from Political Risk Services Group.

All three indexes are based on surveys and the opinions of experts in the field and measure a perception of corruption instead of real corruption. Consequently, these types of indexes are biased measure of real corruption.

Nevertheless, without entering in the discussion of the validity of the indexes, it is not refutable that corruption exists in every country or society. Even countries that are on top of the CPI do reach a perfect score.

This raises the question of the causes of corruption that can explain the difference in the corruption level between countries.

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[1] Transparency International 2014-archive.transparency.org/news_room/faq/corruption_faq

It is difficult to determine the causes of corruption, since many of them could also be considered consequences. Efforts have been made to isolate causal factors of corruption that reduce de incidence of corruption like size of public sector, quality of regulation, structure of the government, among others (J. G. Lambsdorff 2006).

Rose-Ackerman (1999) states that corruption affects investments and growth and leads to ineffective government, this is consistent with empirical evidence that shows that corruption and development is strongly correlated.

Figure 1: Log GDP per Capita vs. CPI
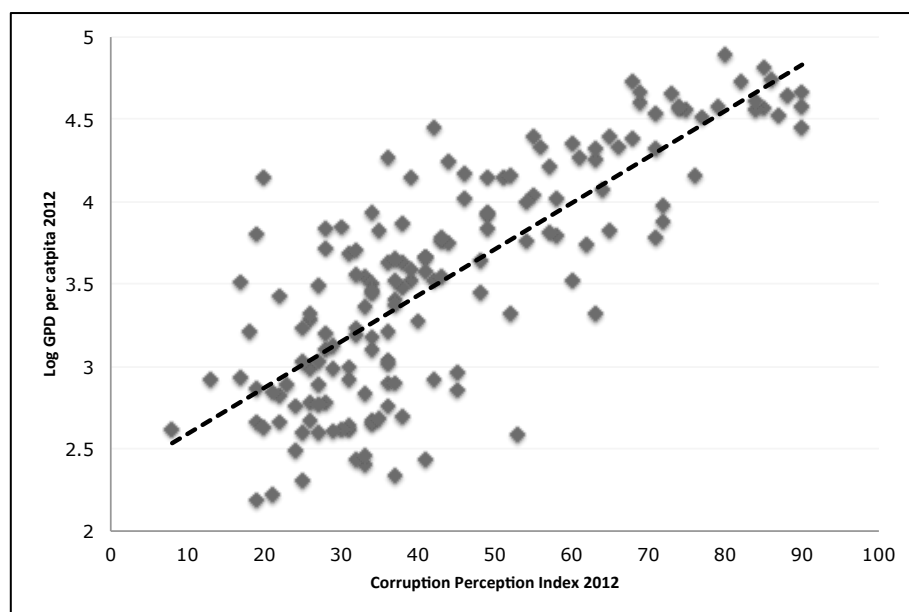
Source: Transparency International (2012) & World Development Indicators (2012).

In 2012, existed positive correlation of 0.80^{2} between GDP per Capita and the Corruption Perception Index. It is clear in Figure 1 that less developed countries score low in the CPI. Considering GDP per capita a proxy to the level of development and the CPI a proxy of the level of corruption of a country.

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[2] Sources: GDP per Capita - World Development Indicators http://databank.worldbank.org; CPI 2012 – Transparency International.

Furthermore, there are multiple effects of corruption: Abolishment of social values and norms; increased income disparity; deterioration of business and investment climates; reduced public investment quality; inequality and poverty, among others (Dimant 2013, p.39). These effects represent major costs for society.

Calculating the exact costs of corruption is difficult because it materializes in a "black" market. However, renowned organizations often give gross estimations of the costs of corruption that can give an idea of the magnitude.

In example, Huguette Labelle chair of the board of directors of Transparency International, in a public speech said, "This inevitability of social destabilization is backed up by the numbers. Globally bribery alone, according to the World Bank, costs more than $1 trillion a year. Corruption in government procurement adds another $1.5 trillion in costs. Add to this the devastating effects of the economic crisis of the past two years – 64 million people kept mired in poverty worldwide because of it – a crisis that we now recognize was fuelled by greed and a lack of transparency." (Transparency International 2011).

As a result, anti-corruption policies and the study of corruption have been moved upwards on the agenda of the world leaders. Especially for developing countries and international cooperation agencies.

In the last two decades, different approaches have been used to fight corruption in the world.

A framework for analysis of public policy towards corruption was implemented in the 90's, described as follows.

First, screen and select agents considering their honesty; second, give rewards to honest agents and penalize corrupt ones; third, improve information systems to increase the probability to detect corruption; fourth, reduce discretionary power

from public officers and increase accountability; and fifth, change the attitude of the society about corruption (Klitgaard 1988).

However, realities in each country are different and it is not possible to apply the same framework to every country, even less to every sector.

Nowadays, literature directed to policymakers focus on the study of specific cases. In example, Spector et al. (2005) summarizes experiences and strategies implemented in different cases for multiple countries and sectors. From this experiences policymakers can withdraw conclusions and apply similar policies adapting them to the reality of their own countries.

With these two approaches to fight corruption, only small changes in the perception of corruption have occurred. Which are evident when the results from the CPI for 2003[3] and 2013[4] are compared.

The CPI scores go from 0 to 100; the highest score shows less perception of corruption in the country. In 2003, approximately 71% out of 133 countries that where consider for the CPI scored less than 50 (median of the score scale). In 2013, about 69% out of 177 countries that participated scored less than 50.

Considering only the 129 countries that are present in the CPI for 2003 and 2013, 70% and 67% of the countries scored bellow 50, respectively for each year. Only 7 countries improved their corruption perception to score above 50.

Following this, 81 countries maintained or improved their score, while 48 reduced their score. The ten countries that improve the most in the last decade are Georgia, Poland, Macedonia, Turkey, Uruguay, United Arab Emirates, Latvia, Romania, Bangladesh and Ecuador. The ten countries that reduced the most their

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[3] Source: http://archive.transparency.org/policy_research/surveys_indices/cpi/2003
[4] Source: http://cpi.transparency.org/cpi2013/in_detail/

score in the last decade are Iceland, Syria, Oman, Belarus, Bahrain, United Kingdom, Austria, Spain, Kuwait and Italy.

It could be interesting to analyze what happened in these countries in the last decade, to learn from their successes and mistakes. Nevertheless, this document focuses in corruption from an economic and behavioral perspective.

The new approach to study corruption comes from the field of experimental and behavioral economics. This approach has helped researchers to avoid measurement and endogeneity issues of perception indexes.

Since early 2000, the literature using laboratory and field experiments has increased. The use of experimental technics allows researchers to measure the response of an individual to monetary and non-monetary incentives, as well as to determine motivations for corrupt behavior, responses to social norms, gender, culture (Abbink, Armantier, et al. 2012).

The ultimate goal of this type of research is to understand corruption in order to determine how to deter corrupt behavior.

Initially the research focused on the response of the subjects to monetary incentives, which replicate government policies like increasing penalties or the risk of detection. With the expansion on the research in the topic, new and interesting ways to deter corrupt behavior have been explored.

In example, Lambsdorff (2010) presents an alternative way to reduce bribery by lowering the inceptives of the public officer to reciprocate favors once he has received a bribe. Are there any other alternative ways to deter corrupt behavior?

Following the later, this study proposes an alternative way to fight corruption, considering non-monetary incentives to deter corrupt behavior.

The accepted behavior in a society or the social norm leans toward the rejection of corrupt behavior, since it is considered abuse of power. If corrupt behavior breaks the social norm, it is logical to think that society will judge or disapprove the individuals that engage in this type of behavior.

Furthermore, individuals might change their behavior for fear of any retaliation of the society for breaking the social norms.

Following this line of thought, the first research question of this study: Is social disapproval effective to deter corrupt behavior?

Nevertheless, a particular behavior is consider a social norm if the majority of the society abides it. Hence, if corrupt behavior is a common practice in a society (like in a case of highly corrupt country) social disapproval might not have the same impact in corrupt behavior.

Leading to the second research question: Is social disapproval more effective to deter corrupt behavior in less corrupt environments?

2. Literature review

The study of social disapproval as a mean to deter behavior is not new. Researchers in criminal law and criminology have developed empirical studies to determine if social disapproval inhibits illegal behavior.

In that line of research, Grasmick and Green (1980) concluded that the threat social disapproval is one of the factors that inhibit criminal activities, together with moral commitment and the threat of legal punishment.

The authors use a survey where respondents receive a list of eight crimes (mixed minor and major offences). They have to answer which of the offences they had committed or if they think they will commit them in the future. Then they are asked who are the 5 people they cared about the most. Immediately, they have

to answer, if they think their loved ones had committed or will commit any of the crimes in the list.

The less crimes the respondents believe that their loved ones are likely to commit the more threat of social disapproval they have. At the end it is analyzed the relation between the personal answers of the respondents and their threat of social disapproval. Concluding that social disapproval, together with other factors, inhibits illegal behavior.

Nonetheless, the literature reviewed for this study suggests that in the field of corruption and experimental economics the research about the effects of social disapproval is recent.

In this regard, the first publication founded is Salmon and Serra (2013) who studied the effects of social observability and social non-monetary judgment in rule braking behavior.

Their research uses three different rule-braking scenarios -theft, bribery and embezzlement- with absence of formal enforcement mechanisms. They created three games to mimic each scenario and run three treatments with three different levels of social observability. By excluding formal enforcement mechanisms they could test the effects of social observability.

In the first treatment -hidden action- subjects were informed that victims would not know that exists a possibility of anti-social behavior in the game or that they had monetary losses.

The second treatment -victim knows- subjects knew that victims would be informed of their actions and monetary losses.

Finally, in the last treatment -social judgment- subjects knew that victims would be informed of their actions and they had the possibility to send a message to the potential rule breaker in the form of a happy, indifferent or sad face.

Furthermore, authors were also interested on testing the behavior of people of different cultural backgrounds toward social observability. They were able to have a representation from 52 countries in their sample.

The results of this experiment suggest that rule breaking behavior is lower in the treatment with social judgment than the hidden action treatment for subjects with a cultural background from a country with high rule of law. This result is less robust for subjects from low rule of law countries. The victim knows treatment is only effective to reduce rule breaking for high rule of law countries.

In order to test for the effects of social disapproval in an experiment, a key issue is how to make it evident to the participants. Following this, a valid way for a society expresses social approval or disapproval towards a specific topic is to vote[5].

There are several academic publications that study voting procedures and its effects. For this study it is particularly interesting the ones that use voting as a tool to activate social norms, since we intend to activate social disapproval towards corrupt behavior.

Following this line of thought, Feld and Tyran (2002) study how fines implemented by voting, impact on tax compliance. The authors use a one-shot public good game to test the effect of endogenously determined (voted) versus exogenously determined fines on tax evasion.

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[5] "Vote: a usually formal expression of opinion or will in response to a proposed decision; especially: one given as an indication of approval or disapproval of a proposal, motion, or candidate for office" Source: http://www.merriam-webster.com/dictionary/vote

In this case, for their experiment they run three treatments. In the first one, they do not apply a fine. For the second treatment, subjects vote on the punishment to by applied. And in the last one, the punishment is exogenously established.

When a fine does not exist, the rational behavior will be not to pay any taxes. However, there are participants that decide to pay the taxes, because exists a respect for social norms, social capital or intrinsic motivation towards honesty (further literature about intrinsic motivations could be find in Frank and Schulze (2003), and J. G. Lambsdorff (2008)).

The incentives in the experiment are constructed in a way that non-compliance is the dominant strategy in all treatments. Hence, the change in the behavior is explained by the presence of a fine not its magnitude.

The most important result of this research is that fines established by voting increase tax compliance. In a way it stimulates intrinsic motivations of the individuals towards honest behavior by activating a social norm through voting.

Expanding in this topic, Tyran and Feld (2006) studied how to achieve compliance with non-deterrent[6] laws by norm activation. In this case they also use voting as a tool for norm activation.

The experiment considers three scenarios. First one is called "no law," where there are no legal sanctions for free riders. Second is called "mild law," where the sanctions are non-deterrent. And the last one called "severe law", where the sanctions are strong enough to shift rational choice against free ridding.

Following this, all three scenarios are run under endogenously chosen and exogenously impose law. In the endogenously chosen treatment, subjects must

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[6] The authors refer as non-deterrent laws to the ones that their sanctions are not high enough to shift the rational behavior.

vote over the implementation of the punishment. On the other hand, when punishment is exogenously imposed, the experimenter arbitrarily sets it.

The main results of this research are that endogenously chosen is more effective than exogenously imposed mild law, and that individuals tend to increase compliance when they expect others comply as well.

Tax evasion and corruption have a lot of similarities. For instance: both take places in an illegal black market; there is a low probability of detection; and, are considered criminal behavior.

There is experimental research that links tax evasion and corruption. In example, Bilotkach (2006) uses a tax evasion framing to study a bribery behavior between a businessman and a tax official.

This study contributes to existent literature experimental literature about corruption. It presents a link between social disapproval and corruption using a tax evasion framing. Additionally, study the difference in behavior under scenarios with different levels of corruption.

3. Experiment Design

3.1. Social disapproval on different levels of perceived corruption

The study focuses on deterrence through social disapproval with different levels of perceived corruption. To this end, the experiment design uses a one-shot tax evasion public goods game similarly to Tyran and Feld (2006), and additionally incorporates two different scenarios (implicit and explicit corruption). In one of them presents a corrupt transaction without explicitly mention corruption and in the other corruption is framed as a common practice. Each scenario has two different treatments, where social disapproval is enhanced and tested.

The trigger to enhance social disapproval is a voting procedure. Subjects have to vote on the punishment to be imposed on corrupt behavior.

<u>Figure 2: Expression of Disapproval</u>

Source: Experimental Design

As previously stated, the vote is an expression of approval or disapproval towards a specific topic. Hence, majority vote for a high punishment could be consider high social disapproval towards corruption.

Even if the possibility of two punishment is included, for the analysis is relevant the behavior when high punishment is voted by the majority, since it represents social disapproval (Figure 1). The two punishments where included as a tool to implement the voting procedure.

The treatment where social disapproval is active (endogenously chosen punishment) is tested against a treatment where social disapproval is not activated (exogenously imposed punishment).

The basic following basic design is followed in all sessions. Hence, every session has the same monetary incentives.

At the beginning of each session the subjects are randomly assign to groups of three. All subjects are in the role of a citizen with the same initial endowment. They face the decision to pay their taxes or to keep the money for themselves.

Every participant receives the same information, and it is not possible to communicate between subjects.

If they pay their taxes, the money goes to a common group account; all the money collected in the account is equally divided among the members of the group. This is consistent with a public good game.

On the other hand if they keep the money, there is a small probability that they are detected.

In the case they are not detected, they keep the money from their taxes plus they get the share from the contributions from their group account, and have to pay a minor cost to "hide the money." If they are detected the tax contribution is deducted their payoff, in addition to a monetary punishment.

The cost of hiding the money differentiates this experiment from a regular tax evasion game. In this case, a corrupt transaction is incorporated into the experiment framing. Therefore, when the subject choses to evade taxes, is choosing to act corruptly at the same time.

In the first session, the ground base is established. The session does not include social disapproval. Hence, punishment is exogenously imposed by a third party, in this experiment is called "the government."

The subjects are not informed about the magnitude of the punishment that has been set until the end of the experiment. Permitting the application of an experimental technique called "strategy method"[7] (Selten 1967), where is possible to get information about the behavior of the subjects to every outcome even if it does not happen.

Following this method, the subjects are asked to make the decision in the case that the punishment is high and in the case is low.

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[7] Employed by Tyran and Feld (2006)

On the other hand, the second session includes social disapproval. The punishment is endogenously chosen by the votes of the subjects.

The session develops in two stages. In a first stage, the subjects must vote over the magnitude the punishment to be set from to options high and low.

Being consistent with the strategy method from the first session, the subjects do not know the outcome of the voting until the end of the session. Hence, they are asked to make the decision in case of high and low punishment.

Even though for this study is particularly interesting the behavior of the participants when the punishment is high. Since, it sends the message of social disapproval. The presence of low punishment also provides valuable information on the behavior of the participants.

As pointed out earlier, the sessions with and without social disapproval are applied in the two different scenarios, with implicit and explicit corruption. In order to test for a framing effect, that allows reflecting the behavior of the participants under different levels of corruption. As stated by Abbink and Hennig-Schmidt (2006) "A framing effect is said to be present if the presentation of the task leads decision makers to change behavior, even though the underlying information and decision options remain essentially the same."

Table 1: Experimental Design

		Scenario:	
		Implicit Corruption	Explicit Corruption
Presence of Social Disapproval:	Yes	*SDisImpCorr*	*SDisExpCorr*
	No	*ImpCorr*	*ExpCorr*

Following this, two dimensions determine the sessions and the decisions to be implemented in the experiment: presence of social disapproval and the corruption scenario (See Table 1).

In the first scenario, with implicit corruption, there is no explicit mention of corruption. The participants are informed in neutral way that they have the option to pay the tax or keep the money for them, and that they have to pay a "cost of hiding the money" if they decide to keep it.

Meanwhile, for the second scenario corruption is explicit. Instead of paying a "cost of hiding the money", they have to pay a "bribe," and is explicitly mentioned that paying the bribe is a common practice.

Furthermore, to obtain more information that allow expanding the analysis, participants are asked about their beliefs on the behavior of all other subjects in each session and for two possible magnitudes of punishment.

Also, the experiment includes control questions like age, gender, and risk aversion. In addition a Big Five Inventory personality test (Rammstedt and Oliver 2007) is included as well.

The language used in the sets of instructions (0) is clear and neutral, as usual in economic experiments.

3.2. Procedures and parameters

The procedures and parameters used in this game are similar to the ones presented by Tyran and Feld (2006). The main differences are the type of variable used for the decision to pay the tax and the inclusion of a cost when the subject decides to keep the money. The authors use a continuous variable for the decision of how much to spend in the public good and how much to keep for their own. Since, they are interested on testing how much tax compliance increases.

In this experiment, the decision to pay the tax has been simplified to a discrete decision where the subjects have to choose between paying the tax and keeping the money. Additionally, introduces to the design two scenarios with different levels of corruption.

Following this, the basic setting for this experiment is a public good game. All monetary values are presented in "tokens" and converted to euros at the end of the experiment with an exchange rate of 100 tokens = 6.5 Euros.

The total number of subjects is (N) each subject receives and endowment $(W = 200)$ and is randomly assign into a group (j) of $(n = 3)$ subjects each.

The subjects have to decide if they want to pay a tax $(t_j = 100)$ or to keep the money for themselves. If the subject decides to pay the tax, the contribution goes to a group account with the contribution from the other members of the group $(\Sigma_j t_j)$. The contributions in the group account are equally divided among all members of the group.

Following this, the profit (π^h) for an honest subject that decides to pay the tax is the initial endowment, minus the tax, plus the share of the group account.

$$\pi^h = W - t_j + {}^{\Sigma_j t_j}\!/_n \tag{1}$$

On the other hand, if the subjects are corrupt and decide to keep the money, they have to pay a cost $(c = 20)$ for hiding the money. Hence, their profit (π^c_{nc}) is the initial endowment, minus the cost of hiding the money, plus the share of the group account.

$$\pi_{nc}^{c} = W - c + {}^{\Sigma_j t_j}\!/_n \tag{2}$$

However, there is a probability (q = 0.1) of getting caught. If caught the profit (π_c^c) from the subject is affected, reducing the tax contribution and an extra punishment that could be high ($p^h = 80$) or low ($p^l = 40$).

$$\pi_c^c = W - c + {}^{\Sigma_j t_j}\!/_n - t - p^h \tag{3}$$

$$\pi_c^c = W - c + {}^{\Sigma_j t_j}\!/_n - t - p^l \tag{4}$$

The magnitude of the punishment is not high enough to change the incentive structure. Hence, the expected profit of keeping the money is higher than the profit for paying tax.

$$E(\pi^c) = q * \pi_{nc}^c + (1 - q) * \pi_c^c \tag{5}$$

$$E(\pi^c) > \pi^h \tag{6}$$

It is possible for the subjects to increase their earnings, by expressing their beliefs on the behavior of the other subjects in the experiment. They have to guess how many, out of 10 randomly selected subjects, keep the money. If they guess correctly, they earn extra 20 tokens.

Finally, it is important to mention that it is not possible for the subjects to obtain any information about the actions of the other subjects. Preventing this way a change on their behavior, by fear of non-monetary retaliation like shaming.

Table 2: Overview of parameters

	Honest Subjects	Corrupt Subjects Not Caught	Corrupt Subjects Caught	
Members per group (n)	3	3	3	
Initial endowment (W)	200	200	200	
Tax Contribution (t_j)	100	-	100	
Share of Group Account:				
If 3 Sub. Pay	100	-	-	
If 2 Sub. Pay	67	67	67	
If 1 Sub. Pay	33	33	33	
If 0 Sub. Pay	-	0	0	
Cost of hiding the money (c)	-	20	20	
			High	Low
Punishment (p)	-	-	80	40
Profit				
If 3 Sub. Pay	200	-	-	-
If 2 Sub. Pay	167	247	67	107
If 1 Sub. Pay	133	213	33	73
If 0 Sub. Pay	-	180	0	40

3.3. Game-theoretic predictions

The predictions are based on the assumption that the subjects participating act in a completely self-interested and rational way.

It is noteworthy that monetary incentives remain the same (see Table 2) throughout all treatments, because the experiment focuses on non-monetary incentives (social disapproval and scenarios with different levels of corruption). Therefore, the same predictions apply to all treatments.

The use of a one-shot game allows for clear rational predictions that are not influenced learning procedures like repetition.

Table 3: Expected Profit for High and Low Punishment

	Honest Subjects	Corrupt Subjects High Punish.	Corrupt Subjects Low Punish.
Expected Profit:			
If 3 Sub. Pay	200	-	-
If 2 Sub. Pay	167	229	233
If 1 Sub. Pay	133	195	199
If 0 Sub. Pay	-	162	166

Considering the probability of getting caught of 10% used in the game it is possible to calculate the expected profit of keeping the money (see Table 3) for the two different magnitudes of punishment, depending on how many members of the group decided to pay the tax.

Following this, it is easy to construct and solve a 3x3 normal form game that could be solved by iterated elimination of strictly dominated strategies.

Table 4: 3x3 Game for high punishment

		Player 3			
		Keep		Pay	
		Player 2		Player 2	
		Keep	Pay	Keep	Pay
Player 1	Keep	162,162,162	195,133,<u>195</u>	195,195,133	229,167,167
	Pay	133,<u>195</u>,<u>195</u>	167,167,<u>229</u>	167,229,167	200,200,200

Table 5: 3x3 Game for low punishment

		Player 3			
		Keep		Pay	
		Player 2		Player 2	
		Keep	Pay	Keep	Pay
Player 1	Keep	166,166,166	199,133,<u>199</u>	199,199,133	233,167,167
	Pay	133,<u>199</u>,<u>199</u>	167,167,<u>233</u>	167,233,167	200,200,200

In both cases it is clear that exists a unique Nash equilibrium in dominant strategies (Table 4 and Table 5), where all players keep the money. Hence, the predicted theoretical result of this game is that all subjects decide to keep the money.

Consequently, the theoretical prediction for the voting stage on the endogenous punishment treatment is that all players vote for a high punishment. Since, the punishment negatively affects their profit and $(p^h > p^l)$, high punishment is strictly dominated by low punishment.

3.4. Hypotheses

The main goal of this study is to test the effectiveness of social disapproval as a non-monetary incentive to deter corrupt behavior. Hence, the first hypothesis is as follows:

Hypothesis 1 *The number of subjects that decide to engage corrupt behavior should be lower with the presence of social disapproval, in example:*

  Mean of Keep the Money (ImpCorr) > Mean of Keep the Money (SDisImpCorr)

  Mean of Keep the Money (ExpCorr) > Mean of Keep the Money (SDisExpCorr)

The empirical evidence presented in section 2 supports this hypothesis. In particular, it bases on the idea that exists an intrinsic motivation towards honesty that deviates the subjects' behavior from a completely rational prediction. Hence, it suggests that social disapproval is a non-monetary stimulus that enhances this intrinsic motivation.

In addition, is proposed that the effectiveness of social disapproval is different if the subjects face environments with different levels of corruption. Hence, the second hypothesis is:

Hypothesis 2 *The average reduction of corrupt behavior due to social disapproval is smaller in more corrupt environments, in example:*

  Mean of KtM (ImpCorr - SDisImpCorr) > Mean of KtM (Expcorr - SDisExpCorr)

Consequently, the idea behind this hypothesis is based on existent literature that links cultural background to corrupt behavior (i.e., Salmon and Serra (2013)). More importantly, the approach of this study is to test if the effectiveness of social disapproval changes when the level of corruption is different, regardless of

the subjects' cultural background. As the famous quote says "if you were in Rome, live in the Roman way; if you are elsewhere, live as they do there. [8]"

3.5. Implementation

The experiment was conducted at the Vienna Center for Experimental Economics (VCEE), with the use of z-Tree Software (Fischbacher 2007).

A total of 96 subjects participated in the experiment, in four sessions with 24 participants each. The participants registered through the VCEE web page, and the only requirement was that they were fluent in English, since all instructions where presented in that language.

Table 6: Summary of experiment design

Session	Number of Sessions	Number of Subjects
ImpCorr	1	24
SDisImpCorr	1	24
ExpCorr	1	24
SDisExpCorr	1	24
Total	**4**	**96**

Before the beginning of every session, all subjects received a clear a concise set of instructions according to the session they were participating on.

The instruction sets include all possible payoffs, according to their decisions and the possible decisions from the participants in their group.

The sessions 2 and 4 that included endogenous punishment where conducted in two stages. In the first one subjects had to vote on the magnitude of the punishment, and then continue to the decision stage.

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[8] Attributed to Saint Ambrose.

At the end of each treatment, the subjects have to respond the control questions and a personality test, before they receive their earning.

4. Findings

4.1. Summary Measures

4.1.1. Characteristics of the Subjects

A total of 96 subjects took part on the experiment. The gender structure of the total sample was 48% male and 52% female. Exists a significant difference (ztest p-value 0.0205) between the gender structure of the subjects in the second and third session. However, the differences are not significant between the other treatments.

The youngest subject in the experiment was 19 and the oldest 49 years old. Average age in the experiment was 26.8 years. There is not a significant difference in the average age between sessions.

Table 7: Subjects Summary

Session	1	2	3	4	
Corruption Scenario	Implicit	Implicit	Explicit	Explicit	Total
Social Disapproval	No	Yes	No	Yes	
Number of Subjects	24	24	24	24	96
Male	12	15	7	12	46
Female	12	9	17	12	50
Average Age (Years)	26.58	28.08	25.79	26.75	26.80
Average Risk Aversion[*]	5.79	5.75	5.29	5.83	5.67
Average Extraversion[+]	6.71	6.71	6.67	7.04	6.78
Average Agreeableness[+]	6.33	6.83	6.50	7.17	6.71
Average Conscientiousness[+]	7.33	6.50	6.58	7.25	6.92
Average Neuroticism[+]	5.63	5.67	5.83	5.21	5.58
Average Openness[+]	7.25	7.50	7.67	6.79	7.30

(*) Risk Aversion Self-assessment (1=Avoid taking risks, 10=Fully prepared to take risks)
(+) Big Five Inventory (BFI-10) Personality test. 10 Maximum Score. Ramstedt and Oliver (2007)
Source: Experiment Output

The experiment also included a risk aversion self-evaluation, and a Big Five Inventory personality test.

In the risk aversion self-evaluation, a score of one represent "avoid taking risks" and 10 "fully prepared to take risks". The participants score an average of 5.67.

Table 8: Risk Aversion Analysis

Test: ttest, two samples, unpaired				
Ho: Risk Session i = Risk Session j				
(p-value)	1	2	3	4
1	-	0.0469	0.5070	0.0456
2	-	-	0.4659	0.0901
3	-	-	-	0.5263

Source: Experiment Output

Testing the difference between the average risk aversions in each session, it is not possible to reject the null hypothesis that average risk aversion is similar between the first, second and fourth session, with a minimum confidence interval of 90%.

Also, when the average risk aversion in the second session is compared to any other session the null hypothesis must be rejected. However, there is not enough evidence to support any alternative hypothesis that supports a difference with the other treatments.

The Big Five Inventory (Rammstedt and Oliver 2007) measures personality with an ascending scale from one to ten, in five dimensions extraversion, agreeableness, conscientiousness, neuroticism and openness.

On average, from the highest to the lowest the subjects score in openness (7.30), conscientiousness (6.92), extraversion (6.78), agreeableness (6.71) and neuroticism (5.58).

4.1.2. Behavioral Effects of Changing the Punishment

The experimental data obtained (Figure 3) shows that subjects respond to the increase on punishment, despite that the increase does not the change the incentive structure. Since, with both punishments it is still rationally correct to keep the money.

Figure 3: Number of Subjects that decide to keep the money by session
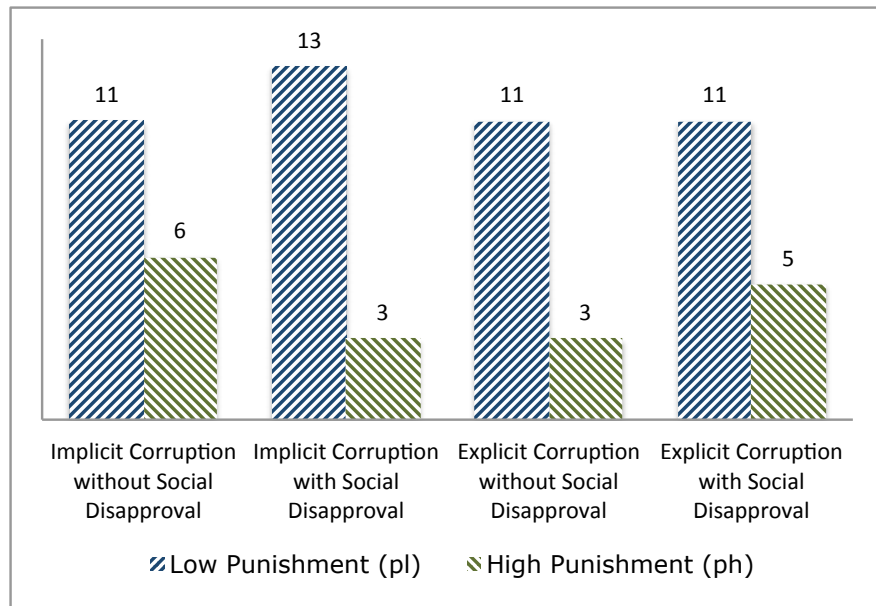
Source: Experiment Output

Table 9: Difference between low and high punishment

Session	Corruption Scenario	Social Disapproval	Low Punishment (pl)	High Punishment (ph)	Difference (pl - ph)	McNemar Test (p-value)
1	Implicit	No	11	6	5	0.0625
2	Implicit	Yes	13	3	10	0.0020
3	Explicit	No	11	3	8	0.0078
4	Explicit	Yes	11	5	6	0.0703

Source: Experiment Output

In the case of low punishment the average number of subjects that decide to keep the money is 11.5. The highest occurred in the session with implicit corruption scenario and the presence of social disapproval, where 13 subjects decided to keep the money. In all other sessions 11 subjects decided to keep the

money. When the punishment increases, the average of subjects that keep the money reduces to 4.25.

There is a reduction on the number of subjects that keep the money in all scenarios. The reduction is significant at a 90% level of confidence in session 1 and 4, while in session 2 and 3 the significance level is 99%. The biggest reduction occurred under the implicit corruption scenario with social disapproval.

Figure 4: Average beliefs over the percentage of subjects that keep the money
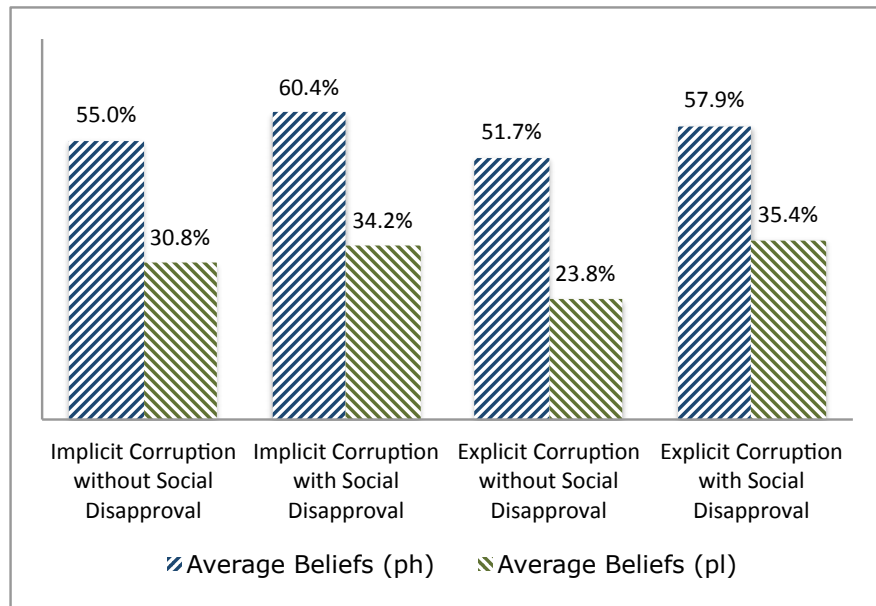
Source: Experiment Output

Table 10: Difference between beliefs with low and high punishment

Session	Corruption Scenario	Social Disapproval	Average Beliefs (pl)	Average Beliefs (ph)	Difference	t-test (p-value)
1	Implicit	No	30.8%	55.0%	24.2%	0.0000
2	Implicit	Yes	34.2%	60.4%	26.3%	0.0006
3	Explicit	No	23.8%	51.7%	27.9%	0.0000
4	Explicit	Yes	35.4%	57.9%	22.5%	0.0025

Source: Experiment Output

The subjects' beliefs (Figure 4) follow the same logic as the decision to keep the money. In the case of low punishment the average beliefs over the percentage of subjects that keep the money, is higher when the punishment is low.

The decrease on the beliefs is significant in all cases at a 99% confidence interval.

4.1.3. Insights from the Voting Behavior

The two corruption scenarios show different behavior in the voting decision. The rational prediction is that all subjects vote for a low punishment under both scenarios.

Figure 5: Voting Outcomes
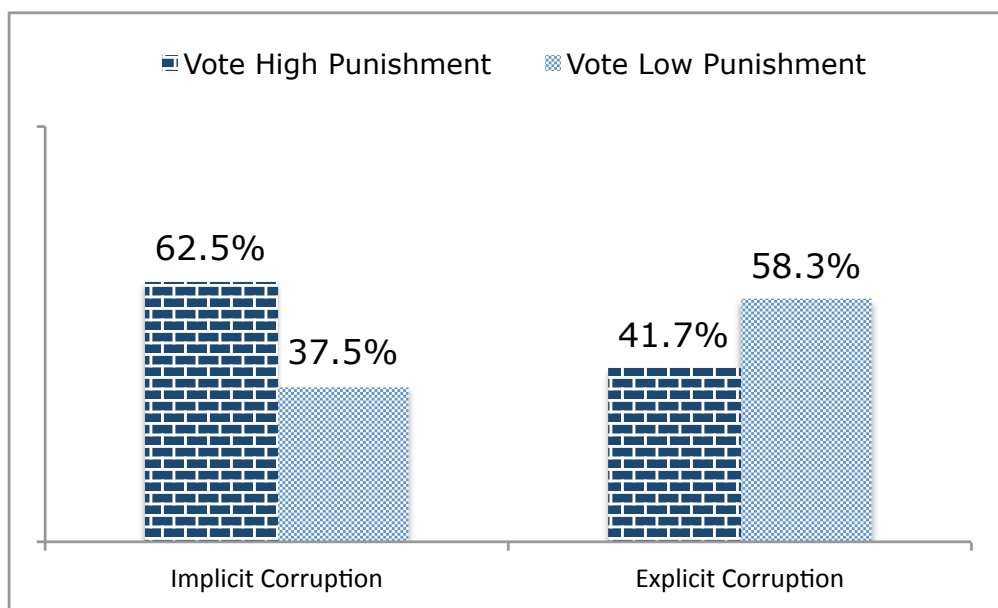
Source: Experiment Output

Table 11: Differences on Voting Behavior

Session	Corruption Scenario	Social Disapproval	Vote Low Punishment	Vote High Punishment
2	Implicit	Yes	37.5%	62.5%
4	Explicit	Yes	58.3%	41.7%
		Difference	20.8%	20.8%
		z-test (p-value)	0.0743	0.0743

Source: Experiment Output

Under the implicit corruption scenario 62.5% of the subjects voted in favor of a high punishment. Contrary to the explicit corruption where the majority voted for a low punishment, and only 41.6% voted for a high punishment.

As shown in Table 11, the difference on the voting between scenarios is significant at a 90% confidence level.

The difference in the voting results could be interpreted like the subjects are more permissive of corruption when the corrupt environment is explicit.

4.2. Analysis of Social Disapproval and Corruption Scenarios

Establishing social disapproval by voting has different effects depending on the level of punishment. If the punishment is low it might be interpreted as permission or less disapproval toward corrupt actions, while in the case of high punishment in fact sends the message of high disapproval.

Figure 6: Number of subjects that decide to keep the money with low punishment
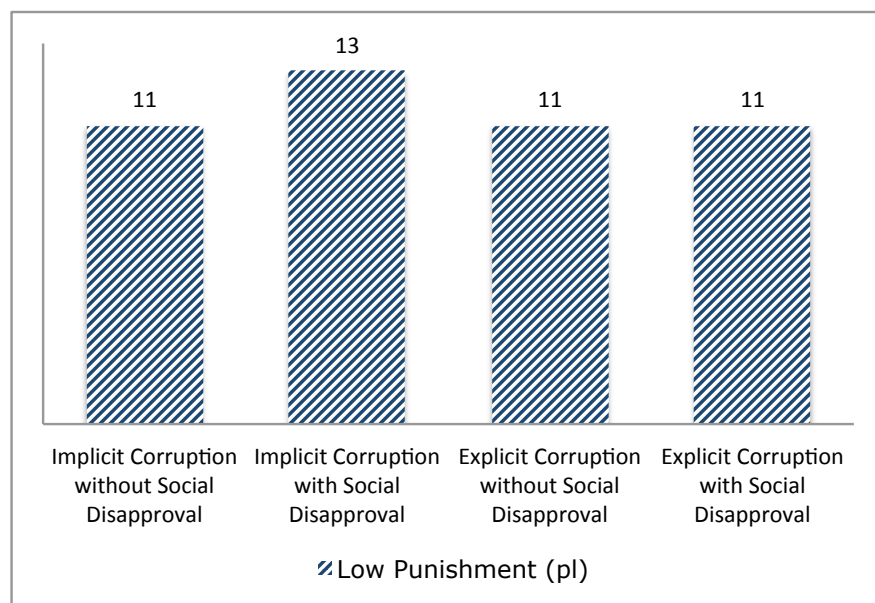
Source: Experiment Output

In the case of low punishment, existed an increase on the number of subjects that chose to keep the money from 11 without social disapproval to 13 with social disapproval, in the implicit corruption scenario. Nevertheless, the difference in the average behavior is not significant at a statistically relevant confidence level.

The explicit corruption scenario did not show a change the behavior of the subjects between the treatments with and without social disapproval, with 11 subjects keeping the money in each case.

However, for this study is relevant to analyze the behavior when the behavior when the punishment is high.

Result 1: *Social disapproval lowered the number of subjects that showed corrupt behavior under an implicit corruption scenario. The results obtained are not significant at a relevant confidence level higher than 90%. Hence, the hypothesis 1 is rejected.*

Figure 7: Number of subjects that decide to keep the money with low punishment
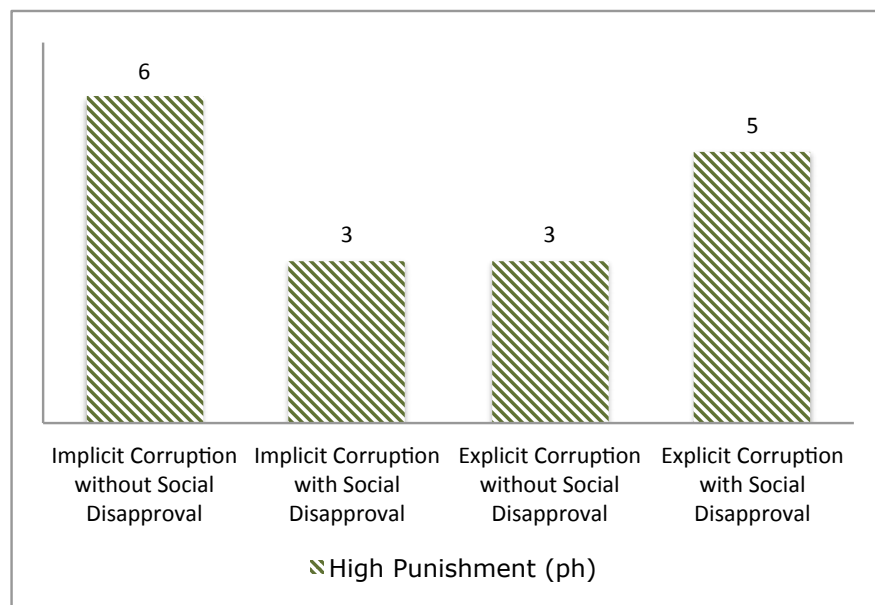
Source: Experiment Output

The number of subjects that decide to keep the money with social disapproval reduces from 6 to 3 in the implicit corruption scenario. Nevertheless, the reduction is not statistically relevant (ztest, p-value 0.1336).

In the case of the explicit corruption scenario with social disapproval, there was an increase in the number of subjects that decided to keep the money from 3 to 5. Even though the increase is not statistically significant as well (ztest, p-value

27

0.2193), this odd behavior might be explained by the lower risk aversion from the subjects in the third session compared to the other sessions (see Table 8).

Result 2: *The beliefs that other people will act corruptly and risk tolerance of the subject, increases the probability that subjects choose to act corruptly (keep the money).*

Table 12: Logit Keep the money or Pay the tax

	Logit: Keep or Pay
Explicit Corruption	0.090 (0.654)
Social Disapproval	-0.294 (0.614)
Beliefs (ph)	0.186* (0.100)
Risk aversion	0.345** (0.133)
Agreeableness	-0.429*** (0.143)
Neuroticism	-0.290** (0.128)

Robust Std. Err. in parentheses
***p<0.01, **p<0.05, *p<0.10
Source: Experiment Output

The binary logit regression model in Table 12, shows that the level of corruption (explicit corruption) and social disapproval do not increase or decrease (respectively) the probability that the subject engages in corrupt behavior at a statistically significant level.

Nevertheless, the beliefs over the behavior of other subjects, increases the probability of engaging in corrupt behavior with a 90% significance level. Furthermore, the higher is the risk tolerance of the subjects it is more likely that they engage in corrupt behavior

Result 3: *The difference of the behavior with and without social disapproval is higher in the scenario were corruption is implicit. The results obtained are not*

significant at a relevant confidence level higher than 90%. Hence, the hypothesis

2 is rejected.

In the scenario with implicit corruption, the reduction with social disapproval was 3. Meanwhile, in the explicit corruption scenario, existed an increase in the corruption so the difference between treatments is -2. However, the difference between the two scenarios is not statistically significant (ztest, p-value 0.1022).

5. Conclusions

Corruption is a relevant topic because of its implications in development of the world, especially for low-income countries. The particularities of this problem, like its secretive nature, makes of corruption an especially interesting topic to be studied in the laboratory from an experimental economics perspective.

Since 2000, important insight has been obtained from lab experiments about corruption and the way people respond to it. This study contributes to the academic debate proposing social disapproval as an alternative way to deter corrupt behavior.

Although, the results obtained from the experiment are not significant at a statistically relevant level, there is still some insight that can be obtained from the results.

The increase of the punishment has a good response to deter corrupt behavior of individuals, even if the punishment is not strong enough to change the incentive structure.

From a policy maker perspective, this might useful when punishments for corruption are being determined. If there is a credible threat of detecting and punishing corrupt behavior, it makes sense to set high punishments even if the

probabilities of detection are low, because exists a deterrent effect only by the presence of a high punishment.

Even when incentives are structured in a way that completely favors corrupt behavior, an intrinsic motivation towards honesty still exists. It could be easily check in the voting behavior of the experiment.

Despite that the strictly dominant strategy was to vote for a low punishment. The majority of subjects voted for a high punishment in the implicit corruption session, and an important percentage voted for high punishment in the explicit corruption session.

Furthermore, the significant difference between the votes for high punishment in the implicit and explicit corruption session could be evidence that the intrinsic motivation towards honesty lowers in highly corrupt scenarios.

Risk adverse individuals are less likely to engage in corrupt behavior. To improve the results obtained in this experiment might be need to increase the number of sessions and participants, allowing control of factors like risk aversion of the subjects.

Traditional approaches have not significantly reduced corruption in the world. Therefore, to continue the study of alternative ways to fight corruption might one day lead to the development of public policies that allows controlling and reducing corruption in the world.

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Appendix A - Instructions Sets

Instructions First Session - Implicit Corruption without Social Disapproval

<u>First Page</u>

General Instructions

Welcome to the Vienna Center for Experimental Economics!

You are now taking part in an economics experiment. Please read the following instructions carefully. You can in this experiment – depending on your decisions – earn money. This experiment consists of two parts.

During the experiment, we do not speak of Euros but of Tokens. Therefore, your total income will be first calculated in Tokens. The total number of Tokens earned by you in the experiment is then converted to Euros at the end, with an exchange rate of:

100 Tokens = 6.50 Euros

In this experiment, the participants will be randomly divided into groups of 3 members.

All the decisions that you make in this experiment will remain private. No other participant will know the decisions that you make.

Every participant receives the same instructions. Thus, all members of your group have the same information as you.

During the experiment it is not permitted to speak with other participants, failure to observe this rule will disqualify you from the experiment and from all payments.

If you have any questions please raise your hand and one of the experiment conductors will help you.

On the following pages we will describe the exact process of the first part of the experiment.

Second Page

Part 1

For the decision you have to make:

Each participant will receive an initial income of 200 Tokens. You are asked to pay a tax contribution to the government of 100 Tokens. Your task is to make a decision. Your options are:

1. **PAY THE TAX**

2. **KEEP THE MONEY**

In case you decide to **PAY THE TAX**, the money goes to a GOVERNMENT ACCOUNT, together with the contributions from the participants of your group. All the money collected is distributed equally among your group including yourself.

In case you decide to **KEEP THE MONEY, you have to pay BRIBE of 20 Tokens to a tax officer to avoid paying the tax. This is a COMMON PRACTICE, so there is no risk that the tax officer reports you, but exists a 10% chance that both of you get caught by the government.**

If you **KEEP THE MONEY AND DO NOT GET CAUGHT**, you will get your initial income, minus the cost of hiding the money, plus your share of any contributions to the government account.

If you **KEEP THE MONEY AND GET CAUGHT**, the government will deduct from your account the tax contribution, and an additional punishment in Tokens.

The government sets the punishment arbitrarily. You will be asked to make a decision twice. When the government sets the punishment Low (40 Tokens) and when the government sets the punishment High (80 Tokens).

At the end of the experiment, we will randomly one of the punishment conditions to calculate your payment.

The payments you can receive, depending on your decisions and the decisions of the other two participants in your group are explained in detail on the next page.

Profit Tables

Your income depends on your decisions and the number of participants in your group that decide to pay the tax.

If you decide to **PAY THE TAX**:

Number of Participants that Pay the Tax	(+) Initial Income	(-) Tax	(+) Share of Government Account	Total Income
3	200	100	100	200
2	200	100	67	167
1	200	100	33	133

If you decide to **KEEP THE MONEY AND YOU DO NOT GET CAUGHT**:

Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Government Account	(-) Cost of Bribing the tax officer	Total Income
2	200	67	20	247
1	200	33	20	213
0	200	0	20	180

If you decide to **KEEP THE MONEY, GET CAUGHT AND THE PUNISHMENT IS LOW**:

Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Gov. Account	(-) Cost of Bribing the tax officer	(-) Tax	(-) Punish.	Total Income
2	200	67	20	100	40	107
1	200	33	20	100	40	73
0	200	0	20	100	40	40

If you decide to **KEEP THE MONEY, GET CAUGHT AND THE PUNISHMENT IS HIGH**:

Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Gov. Account	(-) Cost of Bribing the tax officer	(-) Tax	(-) Punish.	Total Income
2	200	67	20	100	80	67
1	200	33	20	100	80	33
0	200	0	20	100	80	0

Once you understood how your decisions affect your payments, please click "Continue" and make your decisions.

Instructions Second Session - Implicit Corruption with Social Disapproval

<u>First Page</u>

General Instructions

Welcome to the Vienna Center for Experimental Economics!

You are now taking part in an economics experiment. Please read the following instructions carefully. You can in this experiment – depending on your decisions – earn money. This experiment consists of two parts.

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In this experiment, the participants will be randomly divided into groups of 3 members.

All the decisions that you make in this experiment will remain private. No other participant will know the decisions that you make.

Every participant receives the same instructions. Thus, all members of your group have the same information as you.

During the experiment it is not permitted to speak with other participants, failure to observe this rule will disqualify you from the experiment and from all payments.

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On the following pages we will describe the exact process of the first part of the experiment.

Part 1

For the decision you have to make:

Each participant will receive an initial income of 200 Tokens. You are asked to pay a tax contribution to the government of 100 Tokens. Your task is to make a decision. Your options are:

1. **PAY THE TAX**

2. **KEEP THE MONEY**

In case you decide to **PAY THE TAX**, the money goes to a GOVERNMENT ACCOUNT, together with the contributions from the participants of your group. All the money collected is distributed equally among your group including yourself.

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If you **KEEP THE MONEY AND DO NOT GET CAUGHT**, you will get your initial income, minus the cost of hiding the money, plus your share of any contributions to the government account.

If you **KEEP THE MONEY AND GET CAUGHT**, the government will deduct from your account the tax contribution, and an additional punishment in Tokens.

All participants including you will vote on the magnitude of the punishment, either low (40 Tokens) or high (80 Tokens). The punishment chosen by the majority will be used to calculate your earnings.

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1	200	33	20	213
0	200	0	20	180

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Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Gov. Account	(-) Cost of Bribing the tax officer	(-) Tax	(-) Punish.	Total Income
2	200	67	20	100	40	107
1	200	33	20	100	40	73
0	200	0	20	100	40	40

If you decide to **KEEP THE MONEY, GET CAUGHT AND THE PUNISHMENT IS HIGH**:

Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Gov. Account	(-) Cost of Bribing the tax officer	(-) Tax	(-) Punish.	Total Income
2	200	67	20	100	80	67
1	200	33	20	100	80	33
0	200	0	20	100	80	0

Once you understood how your decisions affect your payments, please click "Continue" and make your decisions.

<u>First Page</u>

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In case you decide to **KEEP THE MONEY**, you have to pay **20 Tokens to hide it**. There is also a **10% chance that you get caught**.

If you **KEEP THE MONEY AND DO NOT GET CAUGHT**, you will get your initial income, minus the cost of hiding the money, plus your share of any contributions to the government account.

If you **KEEP THE MONEY AND GET CAUGHT**, the government will deduct from your account the tax contribution, and an additional punishment in Tokens.

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2	200	67	20	100	40	107
1	200	33	20	100	40	73
0	200	0	20	100	40	40

If you decide to **KEEP THE MONEY, GET CAUGHT AND THE PUNISHMENT IS HIGH**:

Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Gov. Account	(-) Cost of Hiding the Money	(-) Tax	(-) Punish.	Total Income
2	200	67	20	100	80	67
1	200	33	20	100	80	33
0	200	0	20	100	80	0

Once you understood how your decisions affect your payments, please click "Continue" and make your decisions.

Instructions Fourth Session - Explicit Corruption with Social Disapproval

<u>First Page</u>

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3	200	100	100	200
2	200	100	67	167
1	200	100	33	133

If you decide to **KEEP THE MONEY AND YOU DO NOT GET CAUGHT**:

Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Government Account	(-) Cost of Hiding the Money	Total Income
2	200	67	20	247
1	200	33	20	213
0	200	0	20	180

If you decide to **KEEP THE MONEY, GET CAUGHT AND THE PUNISHMENT IS LOW**:

Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Gov. Account	(-) Cost of Hiding the Money	(-) Tax	(-) Punish.	Total Income
2	200	67	20	100	40	107
1	200	33	20	100	40	73
0	200	0	20	100	40	40

If you decide to **KEEP THE MONEY, GET CAUGHT AND THE PUNISHMENT IS HIGH**:

Number of Participants that Pay the Tax	(+) Initial Income	(+) Share of Gov. Account	(-) Cost of Hiding the Money	(-) Tax	(-) Punish.	Total Income
2	200	67	20	100	80	67
1	200	33	20	100	80	33
0	200	0	20	100	80	0

Once you understood how your decisions affect your payments, please click "Continue" and make your decisions.

Appendix B - Experiment Screens

First and Third Session - Implicit and Explicit Corruption without Social Disapproval

Welcome to the Vienna Center for Experimental Economics.

Please read the "General Instructions"

Before you press "Continue"

I have read and understood the printed instructions. ☑

Continue

The government ARBITRARILY decides the magnitude of the punishment.

In case the government ARBITRARILY decides to set a LOW PUNISHMENT of 40 Tokens.

Will you PAY THE TAX or KEEP THE MONEY to yourself?

PAY THE TAX

KEEP THE MONEY

The government ARBITRARILY decides the magnitude of the punishment.

In case the government **ARBITRARILY** decides to set a **HIGH PUNISHMENT** of 80 Tokens.

Will you **PAY THE TAX** or **KEEP THE MONEY** to yourself?

PAY THE TAX

KEEP THE MONEY

In the second part of the experiment we want to learn about your beliefs.

We will randomly select 10 participants. Your task is to **GUESS** how many participants decided to KEEP THE MONEY.

You have to GUESS in case LOW PUNISHMENT (40 Tokens) was arbitrarily decided by the government and in case HIGH PUNISHMENT (80 Tokens) was arbitrarily decided by the government.

Each time your GUESS is correct you will receive a BONUS of 20 Tokens.

If you have any questions, please rise your hand.

I have read and understood these instructions. ☐

Continue

From the 10 participants randomly selected.

How many do you think decided to **KEEP THE MONEY** when the **PUNISHMENT WAS LOW (40 Tokens)?**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

From the 10 participants randomly selected.

How many do you think decided to **KEEP THE MONEY** when the **PUNISHMENT WAS HIGH (80 Tokens)?**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

While we calculate your earnings please answer the following questions about yourself. Again, be assured that all your answers are treated anonymously and will only be used for this experiment!

What is your age?

What is your sex?

- ○ Male
- ○ Female

Which year did you enrol in University for the first time? (ex: 2003)

How do you see yourself:
Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?

Avoid taking risks ○ ○ ○ ○ ○ ○ ○ ○ ○ Fully prepared to take risks

Continue

I see myself as someone who...

... is reserved	Strongly disagree ⦿ ○ ○ ○ ○ Strongly agree	
... is generally trusting	Strongly disagree ○ ⦿ ○ ○ ○ Strongly agree	
...tends to be lazy	Strongly disagree ○ ○ ⦿ ○ ○ Strongly agree	
... is relaxed, handles stress well	Strongly disagree ○ ○ ○ ⦿ ○ Strongly agree	
... has few artistic interests	Strongly disagree ○ ○ ⦿ ○ ○ Strongly agree	
... is outgoing, sociable	Strongly disagree ○ ○ ⦿ ○ ○ Strongly agree	
... tends to find fault with others	Strongly disagree ○ ○ ○ ⦿ ○ Strongly agree	
... does a thorough job	Strongly disagree ○ ○ ⦿ ○ ○ Strongly agree	
... gets nervous easily	Strongly disagree ○ ⦿ ○ ○ ○ Strongly agree	
...has an active imagination	Strongly disagree ⦿ ○ ○ ○ ○ Strongly agree	

Continue

The computer has randomly selected for payment the decision made with a punishment of: 40 Tokens

Your Income is: 133 Tokens

Your Bonus Income is: 0 Tokens

Your Total Earnings is: 8.50 Euros

Thank you for your participation. Please gather your things (including your seating card) and proceed to the payment window at the front desk to collect your earnings.

Second and Fourth Session - Implicit and Explicit Corruption with Social Disapproval

Welcome to the Vienna Center for Experimental Economics.

Please read the "General Instructions"

Before you press "Continue"

I have read and understood the printed instructions. ☑

Continue

This is the Voting Stage.

The punishment chosen by the majority of participants will be used in the experiment.

Do you think the **PUNISHMENT** for the participants that decide to **KEEP THE MONEY** should be:

LOW PUNISHMENT (40 Tokens)

HIGH PUNISHMENT (80 Tokens)

The results of the voting will not be presented until the end of the experiment.

In case the **MAJORITY** of participants **VOTED** for a **LOW PUNISHMENT** of 40 Tokens.

Will you **PAY THE TAX** or **KEEP THE MONEY** to yourself?

PAY THE TAX

KEEP THE MONEY

In case the **MAJORITY** of participants **VOTED** for a **HIGH PUNISHMENT** of 80 Tokens.

Will you **PAY THE TAX** or **KEEP THE MONEY** to yourself?

PAY THE TAX

KEEP THE MONEY

In the second part of the experiment we want to learn about your beliefs.

We will randomly select 10 participants. Your task is to **GUESS** how many participants decide to KEEP THE MONEY.

You have to GUESS in case LOW PUNISHMENT (40 Tokens) was voted by the majority and in case HIGH PUNISHMENT (80 Tokens) was voted by the majority.

Each time your GUESS is correct you will receive a BONUS of 20 Tokens.

If you have any questions, please rise your hand.

I have read and understood these instructions. ☑

[Continue]

From the 10 participants randomly selected.

How many do you think decided to **KEEP THE MONEY** when the **PUNISHMENT WAS LOW (40 Tokens)?**

| 0 |
| 1 |
| 2 |
| 3 |
| 4 |
| 5 |
| 6 |
| 7 |
| 8 |
| 9 |
| 10 |

From the 10 participants randomly selected.

How many do you think decided to **KEEP THE MONEY** when the **PUNISHMENT WAS HIGH (80 Tokens)?**

| 0 |
| 1 |
| 2 |
| 3 |
| 4 |
| 5 |
| 6 |
| 7 |
| 8 |
| 9 |
| 10 |

While we calculate your earnings please answer the following questions about yourself. Again, be assured that all your answers are treated anonymously and will only be used for this experiment!

What is your age?

What is your sex?

○ Male
○ Female

Which year did you enrol in University for the first time? (ex: 2003)

How do you see yourself:
Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?

Avoid taking risks   ○ ○ ○ ○ ○ ○ ○ ○ ○ ○   Fully prepared to take risks

Continue

I see myself as someone who...

... is reserved	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
... is generally trusting	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
...tends to be lazy	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
... is relaxed, handles stress well	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
... has few artistic interests	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
... is outgoing, sociable	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
... tends to find fault with others	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
... does a thorough job	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
... gets nervous easily	Strongly disagree ○ ○ ○ ○ ○ Strongly agree
...has an active imagination	Strongly disagree ○ ○ ○ ○ ○ Strongly agree

Continue

The majority of participants voted for a punishment of: 80 Tokens

Your Income is: 133 Tokens

Your Bonus Income is: 0 Tokens

Your Total Earnings is: 8.50 Euros

Thank you for your participation. Please gather your things (including your seating card) and proceed to the payment window at the front desk to collect your earnings.

Appendix C - Experiment Results per Session

Results First Session - Implicit Corruption without Social Disapproval

| ImpCorrPLK	ImpCorrPHK	ICPLBelief	ICPHBelief	Age	Male	Risk	Vote PH	bfextra	bfagree	bfconsc	bfneuro	bfopen
0	0	3	1	24	0	4		8	7	7	4	6
0	0	6	3	32	0	2		4	8	7	6	7
0	0	6	6	26	1	3		7	6	6	4	7
1	1	7	5	26	1	5		5	4	9	5	4
0	0	6	9	21	0	4		7	4	10	7	5
0	0	4	0	29	0	4		4	5	7	6	10
0	0	4	2	24	0	10		7	9	10	4	10
0	0	4	2	20	0	4		8	6	8	7	6
1	1	8	6	27	1	6		9	3	10	5	10
1	1	4	2	39	0	9		6	8	6	6	6
0	0	4	2	25	1	4		7	6	7	5	8
0	0	3	0	24	0	3		7	8	8	8	10
0	0	4	2	25	1	3		5	5	6	7	6
1	0	7	3	40	1	7		8	6	7	5	9
0	0	4	1	20	0	8		7	6	7	3	10
1	0	10	0	23	0	6		8	7	4	10	5
0	0	7	5	28	1	10		4	8	9	5	6
1	1	7	5	26	1	9		6	3	6	4	6
1	0	9	10	23	0	8		9	9	7	5	8
1	0	7	3	23	0	3		7	4	6	7	5
0	0	2	0	31	1	7		7	8	9	5	9
1	0	3	1	32	1	5		8	10	7	6	6
1	1	7	2	27	1	8		5	4	6	5	5
1	1	6	4	23	1	5		8	8	7	6	10

Results Second Session - Implicit Corruption with Social Disapproval

SDisImpCorrPLK	SDisImpCorrPHK	SDICPLBelief	SDICPHBelief	Age	Male	Risk	Vote PH	bfextra	bfagree	bfconsc	bfneuro	bfopen
0	0	4	9	27	0	3	1	5	8	8	7	6
1	0	9	2	32	1	5	0	5	5	6	6	8
0	0	4	2	26	1	8	1	6	8	4	8	8
1	1	7	4	22	1	8	1	7	8	6	2	10
0	0	5	2	42	1	2	0	8	6	6	5	8
0	0	4	2	19	1	4	0	5	6	5	5	4
1	1	7	3	22	0	6	0	9	7	9	6	10
1	0	7	3	29	1	2	1	5	8	7	7	7
0	0	5	3	23	1	7	1	8	7	7	6	7
1	0	7	3	25	1	8	0	9	6	6	4	10
0	0	7	2	33	1	2	1	7	8	5	4	7
0	0	5	8	22	1	1	1	5	7	7	6	6
1	0	4	0	24	0	6	1	8	7	5	7	6
0	0	5	3	36	0	6	1	10	4	8	10	6
0	0	4	2	26	1	8	1	8	9	7	4	8
0	0	4	3	40	0	7	1	5	8	4	5	8
0	0	3	9	28	1	7	1	6	6	9	6	10
1	0	7	3	22	0	8	1	8	5	8	9	7
1	0	7	4	24	0	6	1	4	6	6	3	8
1	0	7	2	24	0	2	0	6	7	5	8	5
1	0	9	2	26	1	8	1	5	10	9	6	9
1	1	7	3	44	1	8	0	2	3	8	2	7
1	0	8	3	26	0	8	0	10	9	4	7	8
1	0	9	5	32	1	8	0	10	6	7	3	7

Results Third Session - Explicit Corruption without Social Disapproval

ExpCorrPLK	ExpCorrPHK	ECPLBelief	ECPHBelief	Age	Male	Risk	Vote PH	bfextra	bfagree	bfconsc	bfneuro	bfopen
1	0	7	3	23	0	7		9	7	4	6	9
1	1	3	3	28	0	7		4	7	10	5	9
0	0	5	2	28	1	7		6	5	9	5	10
1	0	5	3	24	1	8		6	3	6	3	8
0	0	5	3	22	0	4		5	5	10	5	8
0	0	4	1	25	0	4		8	6	9	7	8
0	0	4	2	22	0	2		8	4	4	6	6
1	0	6	2	29	0	7		6	10	5	5	4
0	0	6	3	37	1	8		8	6	4	6	9
1	0	8	4	25	1	10		8	8	5	7	6
0	0	0	0	29	0	2		4	5	6	7	5
1	0	6	3	20	1	9		6	6	4	7	7
0	0	6	4	24	0	1		7	9	9	6	8
0	0	5	2	49	0	2		8	6	9	7	10
1	1	6	4	24	0	3		6	5	4	7	10
0	0	6	3	27	1	3		6	8	9	2	6
0	0	3	2	21	0	4		8	6	9	5	10
0	0	3	2	20	0	5		9	8	8	5	10
1	0	8	4	19	0	4		7	9	5	8	5
1	1	6	2	26	0	8		6	7	7	5	8
0	0	2	0	22	0	4		8	8	7	4	7
0	0	8	0	27	0	3		5	5	6	8	6
1	0	7	2	23	1	7		5	6	5	6	8
1	0	5	3	25	0	8		7	7	4	8	7

Results Fourth Session - Explicit Corruption with Social Disapproval

SDisExpCorrPLK	SDisExpCorrPHK	SDECPLBelief	SDECPHBelief	Age	Male	Risk	Vote PH	bfextra	bfagree	bfconsc	bfneuro	bfopen
0	1	4	6	27	0	8	0	9	7	6	4	6
0	0	8	4	24	0	6	0	9	8	6	6	6
0	0	6	4	23	0	2	1	7	8	10	6	5
1	0	6	10	27	0	6	0	8	6	6	6	6
0	0	5	1	28	1	6	1	7	10	7	5	9
0	0	6	4	21	0	6	1	10	9	10	5	7
1	0	0	4	24	0	7	0	8	6	7	7	10
1	0	5	2	35	1	6	1	5	6	8	6	8
0	0	4	1	26	1	3	0	4	7	9	8	4
0	0	4	3	27	1	4	0	6	4	6	3	8
0	0	7	3	24	0	3	1	7	7	5	6	5
1	1	4	4	23	1	10	0	6	7	6	5	10
1	0	8	2	32	1	10	0	6	10	10	2	6
1	1	8	6	27	1	8	0	8	6	9	3	8
0	0	4	2	29	1	1	1	7	10	9	6	7
1	1	7	3	26	1	9	0	4	4	7	5	6
0	0	5	2	30	0	1	0	6	9	7	4	7
1	1	8	5	21	0	4	0	9	6	5	6	10
1	0	7	3	23	1	8	1	8	6	8	5	5
0	0	5	3	24	0	6	1	8	8	7	6	7
1	0	9	2	26	0	5	0	9	8	7	2	5
1	0	9	0	28	0	9	0	5	8	7	5	5
0	0	7	4	28	1	6	1	7	6	6	8	7
0	0	3	7	39	1	6	1	6	6	6	6	6

Appendix D - Statistical Tests and Logit Regressions

- McNemar's Exact Test was used to test for difference in the behavior of the subjects between low and high punishment in the same sample.

```
. mcc impcorrplk impcorrphk

                    Controls
Cases          Exposed   Unexposed          Total

     Exposed       6          5               11
   Unexposed       0         13               13

       Total       6         18               24

McNemar's chi2(1) =       5.00    Prob > chi2 = 0.0253
Exact McNemar significance probability      = 0.0625

Proportion with factor
        Cases        .4583333
        Controls          .25     [95% Conf. Interval]

        difference   .2083333     .0041892    .4124774
        ratio        1.833333     1.068946    3.144322
        rel. diff.   .2777778     .0708609    .4846947

        odds ratio          .     .9163559          .   (exact)
```

```
. mcc sdisimpcorrplk sdisimpcorrphk

                    Controls
Cases          Exposed   Unexposed          Total

     Exposed       3         10               13
   Unexposed       0         11               11

       Total       3         21               24

McNemar's chi2(1) =      10.00    Prob > chi2 = 0.0016
Exact McNemar significance probability      = 0.0020

Proportion with factor
        Cases        .5416667
        Controls         .125     [95% Conf. Interval]

        difference   .4166667     .1777599    .6555734
        ratio        4.333333     1.606199    11.69081
        rel. diff.   .4761905     .2625835    .6897975

        odds ratio          .     2.241521          .   (exact)
```

```
. mcc expcorrplk expcorrphk

                  Controls
Cases            Exposed    Unexposed        Total

      Exposed       3           8             11
    Unexposed       0          13             13

        Total       3          21             24

McNemar's chi2(1) =       8.00    Prob > chi2 = 0.0047
Exact McNemar significance probability      = 0.0078

Proportion with factor
        Cases      .4583333
        Controls      .125     [95% Conf. Interval]
                   ────────    ─────────────────────
        difference .3333333      .103069   .5635976
        ratio      3.666667     1.396911    9.62441
        rel. diff. .3809524     .1732527   .5886521

        odds ratio       .      1.706971          .  (exact)
```

- Z-test, used to test differences in the behavior due to social disapproval for different samples with low punishment.

```
. prtest impcorrplk== sdisimpcorrplk

Two-sample test of proportion          impcorrplk: Number of obs =        24
                                       sdisimpcorrp: Number of obs =       24

    Variable │     Mean    Std. Err.     z     P>|z|     [95% Conf. Interval]
─────────────┼──────────────────────────────────────────────────────────────
  impcorrplk │  .4583333   .1017071                       .2589911   .6576755
 sdisimpcorrp│  .5416667   .1017071                       .3423245   .7410089
─────────────┼──────────────────────────────────────────────────────────────
        diff │ -.0833333   .1438355                      -.3652458   .1985791
             │  under Ho:   .1443376    -0.58   0.564
─────────────┴──────────────────────────────────────────────────────────────
        diff = prop(impcorrplk) - prop(sdisimpcorrp)            z =   -0.5774
   Ho: diff = 0

  Ha: diff < 0                Ha: diff != 0                  Ha: diff > 0
Pr(Z < z) = 0.2819      Pr(|Z| < |z|) = 0.5637          Pr(Z > z) = 0.7181
```

```
. prtest expcorrplk==sdisexpcorrplk

Two-sample test of proportion              expcorrplk: Number of obs =        24
                                           sdisexpcorrp: Number of obs =       24
─────────────────────────────────────────────────────────────────────────────
   Variable │      Mean    Std. Err.      z     P>|z|     [95% Conf. Interval]
────────────┼────────────────────────────────────────────────────────────────
 expcorrplk │   .4583333    .1017071                       .2589911    .6576755
sdisexpcorrp│   .4583333    .1017071                       .2589911    .6576755
────────────┼────────────────────────────────────────────────────────────────
       diff │          0    .1438355                      -.2819124    .2819124
            │ under Ho:    .1438355     0.00   1.000
─────────────────────────────────────────────────────────────────────────────
        diff = prop(expcorrplk) - prop(sdisexpcorrp)                 z =    0.0000
    Ho: diff = 0

    Ha: diff < 0                  Ha: diff != 0                   Ha: diff > 0
 Pr(Z < z) = 0.5000        Pr(|Z| < |z|) = 1.0000          Pr(Z > z) = 0.5000
```

- Z-test, used to test differences in the behavior due to social disapproval for different samples with high punishment.

```
. prtest impcorrphk== sdisimpcorrphk

Two-sample test of proportion              impcorrphk: Number of obs =        24
                                           sdisimpcorrp: Number of obs =       24
─────────────────────────────────────────────────────────────────────────────
   Variable │      Mean    Std. Err.      z     P>|z|     [95% Conf. Interval]
────────────┼────────────────────────────────────────────────────────────────
 impcorrphk │        .25    .0883883                        .076762     .423238
sdisimpcorrp│       .125    .0675077                      -.0073127    .2573127
────────────┼────────────────────────────────────────────────────────────────
       diff │       .125    .1112196                      -.0929863    .3429863
            │ under Ho:    .1126735     1.11   0.267
─────────────────────────────────────────────────────────────────────────────
        diff = prop(impcorrphk) - prop(sdisimpcorrp)                 z =    1.1094
    Ho: diff = 0

    Ha: diff < 0                  Ha: diff != 0                   Ha: diff > 0
 Pr(Z < z) = 0.8664        Pr(|Z| < |z|) = 0.2673          Pr(Z > z) = 0.1336
```

```
. prtest expcorrphk== sdisexpcorrphk

Two-sample test of proportion              expcorrphk: Number of obs =        24
                                           sdisexpcorrp: Number of obs =       24
─────────────────────────────────────────────────────────────────────────────
   Variable │      Mean    Std. Err.      z     P>|z|     [95% Conf. Interval]
────────────┼────────────────────────────────────────────────────────────────
 expcorrphk │       .125    .0675077                      -.0073127    .2573127
sdisexpcorrp│   .2083333    .0828982                       .0458559    .3708108
────────────┼────────────────────────────────────────────────────────────────
       diff │  -.0833333    .1069084                      -.2928699    .1262032
            │ under Ho:    .1075829    -0.77   0.439
─────────────────────────────────────────────────────────────────────────────
        diff = prop(expcorrphk) - prop(sdisexpcorrp)                 z =   -0.7746
    Ho: diff = 0

    Ha: diff < 0                  Ha: diff != 0                   Ha: diff > 0
 Pr(Z < z) = 0.2193        Pr(|Z| < |z|) = 0.4386          Pr(Z > z) = 0.7807
```

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- T-test, used to test differences due to corruption scenarios.

```
. ttest diffimpcorrphk== diffexpcorrphk, unpaired

Two-sample t test with equal variances
```

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
diffim~k	24	.125	.1095528	.5366968	-.1016272	.3516272
diffex~k	24	-.0833333	.1191252	.5835921	-.3297627	.163096
combined	48	.0208333	.0814844	.5645402	-.1430921	.1847587
diff		.2083333	.1618414		-.1174365	.5341031

```
    diff = mean(diffimpcorrphk) - mean(diffexpcorrphk)          t =   1.2873
Ho: diff = 0                                        degrees of freedom =       46

    Ha: diff < 0               Ha: diff != 0                Ha: diff > 0
 Pr(T < t) = 0.8978        Pr(|T| > |t|) = 0.2044         Pr(T > t) = 0.1022

.
```

- Logit Regressions

. **logit phk expcorr sdis phbelief age male risk bfextra bfagree bfconsc bfneuro bfopen, nocon robust**

```
Iteration 0:   log pseudolikelihood = -66.542129
Iteration 1:   log pseudolikelihood =  -34.44799
Iteration 2:   log pseudolikelihood = -33.237901
Iteration 3:   log pseudolikelihood = -33.209645
Iteration 4:   log pseudolikelihood = -33.209619
Iteration 5:   log pseudolikelihood = -33.209619
```

Logistic regression

Log pseudolikelihood = **-33.209619**

			Number of obs	=	**96**	
			Wald chi2(**11**)	=	**49.19**	
			Prob > chi2	=	**0.0000**	

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
expcorr	.0735934	.6593436	0.11	0.911	-1.218696	1.365883
sdis	-.1426898	.6918867	-0.21	0.837	-1.498763	1.213383
phbelief	.2360262	.1226502	1.92	0.054	-.0043638	.4764163
age	-.011033	.0546444	-0.20	0.840	-.118134	.096068
male	-.6489743	.8468042	-0.77	0.443	-2.30868	1.010731
risk	.367984	.1683326	2.19	0.029	.0380581	.6979099
bfextra	-.1725408	.1633113	-1.06	0.291	-.4926251	.1475435
bfagree	-.4849995	.1955006	-2.48	0.013	-.8681737	-.1018253
bfconsc	-.0231439	.1614953	-0.14	0.886	-.3396689	.2933812
bfneuro	-.2987099	.1588786	-1.88	0.060	-.6101063	.0126866
bfopen	.2537956	.2034791	1.25	0.212	-.1450161	.6526072

. **logit phk expcorr sdis phbelief age male risk bfextra bfagree bfneuro bfopen, nocon robust**

```
Iteration 0:   log pseudolikelihood = -66.542129
Iteration 1:   log pseudolikelihood = -34.444161
Iteration 2:   log pseudolikelihood = -33.240297
Iteration 3:   log pseudolikelihood = -33.219394
Iteration 4:   log pseudolikelihood =  -33.21938
Iteration 5:   log pseudolikelihood =  -33.21938
```

Logistic regression

Log pseudolikelihood = **-33.21938**

			Number of obs	=	**96**	
			Wald chi2(**10**)	=	**48.02**	
			Prob > chi2	=	**0.0000**	

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
expcorr	.0779531	.6625884	0.12	0.906	-1.220696	1.376602
sdis	-.1289147	.6810452	-0.19	0.850	-1.463739	1.205909
phbelief	.2309514	.1170214	1.97	0.048	.0015937	.460309
age	-.0130931	.0532648	-0.25	0.806	-.1174902	.091304
male	-.6502869	.850489	-0.76	0.445	-2.317215	1.016641
risk	.3662683	.1701121	2.15	0.031	.0328548	.6996818
bfextra	-.1726447	.1623494	-1.06	0.288	-.4908436	.1455543
bfagree	-.4882798	.1910073	-2.56	0.011	-.8626472	-.1139124
bfneuro	-.2996601	.1584364	-1.89	0.059	-.6101897	.0108694
bfopen	.2464015	.1912755	1.29	0.198	-.1284915	.6212946

```
. logit phk expcorr sdis phbelief male risk bfextra bfagree bfneuro bfopen, nocon robust

Iteration 0:    log pseudolikelihood = -66.542129
Iteration 1:    log pseudolikelihood = -34.479909
Iteration 2:    log pseudolikelihood =  -33.27221
Iteration 3:    log pseudolikelihood = -33.251312
Iteration 4:    log pseudolikelihood = -33.251297
Iteration 5:    log pseudolikelihood = -33.251297
```

Logistic regression

Log pseudolikelihood = **-33.251297**

Number of obs   =   96
Wald chi2(9)   =   47.95
Prob > chi2   =   0.0000

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
expcorr	.0804475	.6615424	0.12	0.903	-1.216152	1.377047
sdis	-.1491385	.6606508	-0.23	0.821	-1.44399	1.145713
phbelief	.2292372	.1149331	1.99	0.046	.0039726	.4545019
male	-.7118356	.7510021	-0.95	0.343	-2.183773	.7601015
risk	.3593395	.184294	1.95	0.051	-.0018701	.720549
bfextra	-.1721002	.1615728	-1.07	0.287	-.4887771	.1445767
bfagree	-.4996143	.1846907	-2.71	0.007	-.8616014	-.1376271
bfneuro	-.3192434	.1554509	-2.05	0.040	-.6239216	-.0145651
bfopen	.2357363	.1645718	1.43	0.152	-.0868185	.5582911

```
. logit phk expcorr sdis phbelief male risk bfagree bfneuro bfopen, nocon robust

Iteration 0:    log pseudolikelihood = -66.542129
Iteration 1:    log pseudolikelihood = -35.070928
Iteration 2:    log pseudolikelihood = -33.707303
Iteration 3:    log pseudolikelihood = -33.672932
Iteration 4:    log pseudolikelihood = -33.672898
Iteration 5:    log pseudolikelihood = -33.672898
```

Logistic regression

Log pseudolikelihood = **-33.672898**

Number of obs   =   96
Wald chi2(8)   =   48.76
Prob > chi2   =   0.0000

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
expcorr	.0523122	.6573605	0.08	0.937	-1.236091	1.340715
sdis	-.2032843	.6541265	-0.31	0.756	-1.485349	1.07878
phbelief	.1886162	.1048603	1.80	0.072	-.0169063	.3941386
male	-.7160551	.744661	-0.96	0.336	-2.175564	.7434537
risk	.3595158	.1900151	1.89	0.058	-.012907	.7319386
bfagree	-.554074	.1802117	-3.07	0.002	-.9072825	-.2008655
bfneuro	-.3632823	.1424009	-2.55	0.011	-.642383	-.0841817
bfopen	.184592	.1568333	1.18	0.239	-.1227955	.4919796

```
. logit phk expcorr sdis phbelief risk bfagree bfneuro bfopen, nocon robust

Iteration 0:   log pseudolikelihood = -66.542129
Iteration 1:   log pseudolikelihood = -35.352286
Iteration 2:   log pseudolikelihood = -34.245386
Iteration 3:   log pseudolikelihood = -34.225729
Iteration 4:   log pseudolikelihood = -34.225694
Iteration 5:   log pseudolikelihood = -34.225694

Logistic regression                             Number of obs   =         96
                                                Wald chi2(7)    =      41.99
Log pseudolikelihood = -34.225694               Prob > chi2     =     0.0000
```

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
expcorr	.0732188	.6641703	0.11	0.912	-1.228531	1.374969
sdis	-.3046369	.6296749	-0.48	0.629	-1.538777	.9295031
phbelief	.1768482	.1034486	1.71	0.087	-.0259074	.3796038
risk	.2887347	.1605187	1.80	0.072	-.0258761	.6033455
bfagree	-.5027647	.1607444	-3.13	0.002	-.8178178	-.1877115
bfneuro	-.3507545	.13676	-2.56	0.010	-.6187992	-.0827097
bfopen	.1594059	.156979	1.02	0.310	-.1482673	.467079

• The mode presented in the thesis

```
. logit phk expcorr sdis phbelief risk bfagree bfneuro, nocon robust

Iteration 0:   log pseudolikelihood = -66.542129
Iteration 1:   log pseudolikelihood = -35.839956
Iteration 2:   log pseudolikelihood = -34.863328
Iteration 3:   log pseudolikelihood = -34.849674
Iteration 4:   log pseudolikelihood = -34.849661
Iteration 5:   log pseudolikelihood = -34.849661

Logistic regression                             Number of obs   =         96
                                                Wald chi2(6)    =      31.66
Log pseudolikelihood = -34.849661               Prob > chi2     =     0.0000
```

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
expcorr	.0897298	.6539807	0.14	0.891	-1.192049	1.371508
sdis	-.2942438	.6138008	-0.48	0.632	-1.497271	.9087837
phbelief	.1857432	.0997153	1.86	0.062	-.0096953	.3811817
risk	.3454654	.1334072	2.59	0.010	.083992	.6069387
bfagree	-.4294589	.1426287	-3.01	0.003	-.7090061	-.1499117
bfneuro	-.2900556	.1284543	-2.26	0.024	-.5418215	-.0382897

• The gender variable (male) was included again in the model to check if it showed any difference, since the gender is not balanced in some of the sessions.

```
. logit phk expcorr sdis male phbelief risk bfagree bfneuro, nocon robust

Iteration 0:   log pseudolikelihood = -66.542129
Iteration 1:   log pseudolikelihood = -35.741287
Iteration 2:   log pseudolikelihood = -34.522541
Iteration 3:   log pseudolikelihood = -34.489145
Iteration 4:   log pseudolikelihood =  -34.48914
Iteration 5:   log pseudolikelihood =  -34.48914

Logistic regression                             Number of obs   =         96
                                                Wald chi2(7)    =      32.76
Log pseudolikelihood =  -34.48914               Prob > chi2     =     0.0000
```

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
expcorr	.0849287	.6515179	0.13	0.896	-1.192023	1.36188
sdis	-.2217319	.6288982	-0.35	0.724	-1.45435	1.010886
male	-.5629846	.6917371	-0.81	0.416	-1.918764	.7927951
phbelief	.1966607	.1032381	1.90	0.057	-.0056823	.3990037
risk	.4093505	.1661256	2.46	0.014	.0837503	.7349506
bfagree	-.461571	.1654713	-2.79	0.005	-.7858888	-.1372532
bfneuro	-.2929207	.1291461	-2.27	0.023	-.5460423	-.039799

- In the same line models with interactions between genders were estimated. Nevertheless, social disapproval and the corruption scenarios still do not have significant impact on the probability to act corruptly.

```
. logit phk excomale sdismale phbelief risk bfagree bfneuro, nocon robust

Iteration 0:   log pseudolikelihood = -66.542129
Iteration 1:   log pseudolikelihood =  -35.21862
Iteration 2:   log pseudolikelihood = -33.854502
Iteration 3:   log pseudolikelihood = -33.828282
Iteration 4:   log pseudolikelihood = -33.828279

Logistic regression                             Number of obs   =         96
                                                Wald chi2(6)    =      38.56
Log pseudolikelihood = -33.828279               Prob > chi2     =     0.0000
```

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
excomale	-1.090822	.7312513	-1.49	0.136	-2.524049	.3424038
sdismale	-.2081158	.6262743	-0.33	0.740	-1.435591	1.019359
phbelief	.169687	.1012599	1.68	0.094	-.0287787	.3681527
risk	.4326076	.141457	3.06	0.002	.155357	.7098581
bfagree	-.4841328	.1346387	-3.60	0.000	-.7480198	-.2202458
bfneuro	-.2877315	.127999	-2.25	0.025	-.538605	-.0368581

```
. logit phk excofemale sdisfemale phbelief risk bfagree bfneuro, nocon robust

Iteration 0:   log pseudolikelihood = -66.542129
Iteration 1:   log pseudolikelihood = -35.116317
Iteration 2:   log pseudolikelihood = -33.636348
Iteration 3:   log pseudolikelihood = -33.596885
Iteration 4:   log pseudolikelihood = -33.596825
Iteration 5:   log pseudolikelihood = -33.596825

Logistic regression                              Number of obs   =        96
                                                 Wald chi2(6)    =     25.44
Log pseudolikelihood = -33.596825                Prob > chi2     =    0.0003
```

phk	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
excofemale	1.3273	.9641544	1.38	0.169	-.5624075	3.217008
sdisfemale	-.282066	1.001986	-0.28	0.778	-2.245923	1.681791
phbelief	.1879169	.1149295	1.64	0.102	-.0373407	.4131745
risk	.4205971	.1611532	2.61	0.009	.1047426	.7364517
bfagree	-.5426198	.1856143	-2.92	0.003	-.9064172	-.1788225
bfneuro	-.3342143	.1395575	-2.39	0.017	-.6077421	-.0606866

<u>Appendix E - Abstract</u>

Abstract

Corruption is a relevant topic in the academic and political world, due to major costs it generates to society. Nevertheless, traditional anti-corruption approaches have not managed to change the world's corruption scenario. This thesis aims to test social disapproval as an alternative way to deter corrupt behavior. It uses a voting mechanism to activate social disapproval in a controlled laboratory experiment, which also considers scenarios with different levels of corruption. Despite that results are not statistically significant, it provides valuable insights about subjects' behavior towards social disapproval. Furthermore, it sets a base to develop future research in the topic.

Zusammenfassung

Korruption ist von zentraler akademischer sowie politischer Bedeutung, da sie mit großen gesellschaftlichen Kosten verbunden ist. Dennoch haben traditionelle Antikorruptionsbemühungen keine deutlichen Veränderungen des globalen Korruptionsszenarios herbeiführen können. Diese Arbeit hat es zum Ziel, soziale Missbilligung als Alternative zur Verhinderung von korruptem Verhalten zu testen. In einem kontrollierten Laborexperiment wird ein Abstimmungsmechanismus verwendet, um soziale Missbilligung zu aktivieren. Dabei werden in mehreren Szenarios verschiedene Grade der Korruption in Anbetracht gezogen. Obwohl keine statistisch signifikanten Resultate erzielt wurden, können wertvolle Schlüsse über das Verhalten der Subjekte gegenüber sozialer Missbilligung gezogen werden. Darüberhinaus stellt das Experiment eine Basis für zukünftige Forschung zu diesem Thema dar.

<u>Appendix F - Resumé</u>

Santiago Córdova

Personal Information

E-mail: cordova.santiago@gmail.com   **Date of Birth:** 10-Jun-1981
Gender: Male   **Nationality:** Ecuadorian

Profile

Master in Economics. Over four years of professional experience in project design, management and monitoring. Worked for multiple international cooperation agencies as member of a private consultant firm. As a public officer, designed and coordinated the implementation of national projects. Strong inter-personal and communication skills with first hand experience dealing with high-ranking officials.

Education

October 2011 – April 2014: Master in Economics, University of Vienna (UNIVIE)

September 2000 – July 2005: Economist, Pontifical Catholic University of Ecuador (PUCE)

August 1999 – June 2000: International Baccalaureate – Timberlake High School – Oklahoma, USA.

October 1993 – July 1999: "San Gabriel" High School – High School Diploma with a specialization in Physics and Mathematics

Skills

Languages: English (fully proficient), Spanish (native language), German (Basic)

Computer skills: Microsoft Office (Excel, Word, Power Point), Stata (Statistics Software), Adobe Indesign (Publishing Software)

Work Experience

February 2011 – August 2011: National Secretariat of Transparency (SNTG) of Ecuador, *General Planning Coordinator*

The SNTG was a government institution in charge of developing public policies to achieve transparency. The General Planning Coordinator is responsible for the designing, coordinating the implementation and monitoring the institutional projects. As part of my duties, I designed, submitted and achieved approval of the 2012 – 2014 Projects. Monitored and coordinated the completion of the activities of 2011 projects, according to the approved budget. Elaborated the 2012 budget estimate and presented it for approval of the Finance Ministry and National Secretariat of Planning. Furthermore, I implemented and trained the personnel of the Secretariat in the "Government by Results Software". This was part of a public initiative to implement a planning and monitoring system for

every central government institution. This work experience helped me to develop skills as a team leader.

In 2013, the SNTG was fusion with the National Secretariat of Public as part of a government restructuring.

February 2010 – July 2010: Special Implementation Unit for the National Plan of Citizen Security (Interior Ministry), *Adviser to the Unit Director*.

The Special Implementation Unit was a temporary institution created to implement the National Plan of Citizen Security (NPCS), which depended of the Ministry of Interior. In its first stage the goals of the NPCS were in one hand to provide the National Police of all assets needed to fight against criminal activities, from bulletproof vests to telecommunication networks, and to carry on activities to increase security perception in the society. The budget of this plan was above USD. 100 million.

I joined an ongoing project that required to be restructured to achieve its goals. I re-designed the investment projects that supported the NPCS, presented them to the Finance Ministry and National Secretariat of Planning and achieved approval. Re-structured the 2010 budget. Coordinated and monitored the activities of the seven area directors in the unit.

In 2011, the Unit became part of the organic structure of the Ministry of Interior.

June 2007 – February 2010: Hexagon Consultant Firm, *Project Design, Implementation and Evaluation Manager*.

Hexagon is a Consultant Firm with operations in Ecuador and Chile. It specializes in research, analysis, economic and public policy assessment. In June 2007, I joined as an external consultant. In September 2007 I was offered a staff position. My main duties were to structure proposals for clients, assemble teams of consultants, and carry on the accepted proposals as team leader. Among our clients were International Cooperation Agencies (Belgian Development Agency, World Bank, Inter-American Development Bank, United Nations Development Programme, among others), Public Institutions (Multiple ministries, local governments), and several private firms.

Hexagon consultants had the support of several professionals from different fields. This allowed us to support our clients in the design and monitoring of projects from a variety of areas, from energy sector to justice. They were divided in social, environmental and economic projects. For a detailed list of the projects please refer to the section Consulting Projects Developed.

December 2006 – August 2007: Metraproyectos Architectonic Studio, *Project Manager*.

In 2006, I associated with the Architects Nestor Llorca and Veronica Rosero and created Metraproyectos. My duties included the negotiation with our clients of financial proposals. Once the projects were accepted, I was in charge of preparing and presenting to clients weekly financial reports regarding project improvements. Furthermore, I was responsible of all administrative management in the company.

August 2006 – November 2006: Provicapital Partners Investment Banking, *Financial Analyst*.

As a financial analyst, I was in charge of developing discounted cash flow models for company valuation prior fusion and acquisition deals. This work experience helped me to develop my ability to work under pressure and to improve my computer skills, especially in the use of Excel and Power Point.

Specialized Courses

April 2010: National Polytechnic School of Ecuador, Basic SPSS

July 2004 - April 2005: International Certificate on Project Design, Implementation and Evaluation, Inter-American Development Bank – National Polytechnic School of Ecuador

- Analysis of Stakeholders
- Logical Framework Matrix
- Technical and Commercial Viability
- Financial Analysis
- Economic Analysis
- Environmental Viability
- Gender Analysis
- Basic Course of Negotiation
- Project Implementation Course