Propensities to Engage in and Punish Corrupt Behavior: Experimental Evidence from Australia, India, Indonesia and Singapore[*]

Lisa Cameron,[a] Ananish Chaudhuri,[b] Nisvan Erkal,[a] Lata Gangadharan[a]

[a] Department of Economics, University of Melbourne, VIC 3010, Australia.
(e-mail: {lcameron, latag, n.erkal}@unimelb.edu.au)

[b] Department of Economics, University of Auckland, Private Bag 92019, Auckland, New Zealand. (e-mail: a.chaudhuri@auckland.ac.nz)

September 2008

Abstract

This paper examines cultural differences in individual decision-making in an experimental corruption game. We define culture as an individual's accumulated experience, shaped by the social, institutional, and economic aspects of the environment in which the individual lives. Based on experiments run in Australia (Melbourne), India (Delhi), Indonesia (Jakarta) and Singapore, we find that there is a greater variation in the propensities to punish corrupt behaviour than in the propensities to engage in corrupt behaviour across cultures. Consistent with the existing corruption indices, the subjects in India exhibit a higher tolerance of corruption than the subjects in Australia. However, the subjects in Singapore have a relatively high tolerance and the subjects in Indonesia have very low tolerance of corruption. We conjecture that this is due to the nature of the recent institutional changes in these two countries. We also vary our experimental design to examine the impact of the perceived social cost of bribery.

JEL Classification: C91, D73, K42, O17, O57.
Keywords: Corruption; Experiments; Punishment; Cultural Analysis

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1. Introduction

Corruption is a pervasive phenomenon. Transparency International finds that of the 133 countries evaluated for its 2003 Corruption Perception Index (CPI), 70 percent score less than 5 out of a clean score of 10. Among the developing countries, 90 percent score less than 5 against a clean score of 10.[1] Corruption is a particularly troubling phenomenon in developing countries because of its negative impact on economic growth. It undermines development by weakening the institutional foundations on which economic growth depends and by reducing the incentives for public and private investment (Klitgaard, 1988; Bardhan, 1997; Mauro, 1995).

Given its large negative impact, much stands to be gained from understanding the causes of corruption and the ways in which it can be reduced.[2] The aim of this paper is to contribute to our understanding of corruption by comparing individual decision-making in a corruption experiment across four different cultures.[3] Individuals' attitudes towards corruption are shaped by their everyday experiences of corruption. These experiences are determined by the social, institutional (political and legal), and economic backgrounds of the countries in which they live. We refer to all the elements that shape individuals' attitudes as culture. One hypothesis that we test is whether higher levels of exposure to corruption in daily life promote a tolerance of corruption that is reflected in norms of behavior. A corrupt environment may make it easier to justify one's own corrupt behavior. Hence, corruption may gain more acceptance as it becomes

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[1] See http://www.transparency.org/surveys/index.html#cpi for information on the CPI. This Index ranks countries in terms of the degree to which corruption is perceived to exist among politicians and public officials. It reflects the views of analysts and business people around the world, including experts living in the countries evaluated.

[2] Previous studies have discussed, among other things, the importance of deregulation, civil service reform, inter-governmental competition, and an effective legal system in reducing corruption. See Rose-Ackerman (2006) for a comprehensive survey of the literature. Treisman (2000) for an assessment of the explanatory power of various theories of the causes of corruption, and Glaeser and Goldin (2004) for a discussion of the historical factors that may have helped reduce corruption in the United States.

[3] The fact that countries with similar degrees of development may have significantly different levels of corruption suggests that corruption may at least partially be a cultural phenomenon. For instance, Finland, with a 2002 per capita GDP of 26,495 USD, is ranked 1st in the 2003 edition of the CPI while Italy with a 2002 per capita GDP of 25,568 USD is ranked 35th. Portugal, with a 2002 per capita GDP of 18,434 USD is ranked 25th while Greece with a 2002 per capita GDP of 18,439 USD is ranked 50th.

more widespread and such acceptance of corruption may contribute to its further spread and sustenance (Dey, 1989).

Several papers in the theoretical literature on corruption focus on the cultural transmission of corruption (e.g., Andvig and Moene, 1990; Hauk and Saez-Marti, 2002; Lui, 1986; Sah, 1988; Tirole, 1996). However, empirical investigations of the impact of culture on corruption are harder to find. While existing studies rely on data that is aggregated at the country level (see, for example, Treisman, 2000 and Paldam, 2002), experimental methodology provides us with a unique opportunity to explore how *individual* behavior differs across cultures.

The set of actions that fall under the rubric of "corrupt acts" is large. In our paper, we interpret corruption as a situation where two people can act to increase their own payoff at the expense of a third person, the victim. The transaction that takes place between the two people is illegal, so the victim is allowed to punish them. However, such punishment is costly to the victim. Our experimental design allows us to differentiate between the incentive to engage in a corrupt act from which one reaps benefits and the willingness to incur a cost to punish a corrupt act which decreases one's payoff. This distinction enables us to examine whether individuals' behavior differs depending on whether they directly benefit from a corrupt act. The ability to examine punishment behavior is important because as suggested by Fehr and Gächter (2002) and Bowles and Gintis (2002), such "altruistic" punishment by *homo reciprocans,* humans who are willing to punish norm violators even when such punishment is costly to the punishers, may be the primary driving force behind sustaining cooperative norms in a variety of social settings.

We explore whether, in environments characterized by lower levels of corruption, there is both a lower propensity to engage in corrupt behavior and a higher propensity to punish corrupt behavior. We report findings from experiments conducted in four countries: Australia (Melbourne), India (Delhi), Indonesia (Jakarta), and Singapore. We have chosen to run our

experiments in two countries that are consistently ranked among the least corrupt countries in the world (Australia and Singapore, with scores of 8.8 and 9.4 out of 10 respectively) and two countries that are consistently ranked among the most corrupt (India and Indonesia, with scores of 2.8 and 1.9 respectively).

The results show that only the comparison of the behaviour in Australia and India supports the hypothesis that subjects in a country characterized by a low level of corruption tend to be less likely to engage in corruption and more likely to punish corrupt behaviour. We find a relatively high tolerance of corruption in Singapore (our other low corruption country) and very low tolerance of corruption amongst our Indonesian subjects. The results imply that cultural variation in attitudes towards corruption is more complex than we originally hypothesised. We conjecture that the relatively high tolerance of corruption in Singapore and the relatively low tolerance of corruption in Indonesia reflect the recent institutional histories of these two countries. It appears Singapore's strict top-down approach to eradication of corruption may not have been that effective in changing the hearts and minds of the population whereas Indonesia's recent grassroots rebellion against entrenched corruption coupled with our results suggests a possibly promising change in the underlying attitudes.[4]

In addition to examining cultural differences in behaviour, we varied our experimental treatment to examine the impact of the cost of corruption. We conducted one treatment with a welfare-enhancing bribe, where the total payoff gains from the bribe exceed the total payoff loss, and another treatment with a welfare-reducing bribe, where the reverse is true.

The rest of the paper is organized as follows. Section 2 describes the related experimental literature. Section 3 explains the experimental design and procedure. Section 4 states the research

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[4] As we discuss below, these results are also supported by a recent attitudinal survey conducted by Transparency International.

questions that motivate the analysis presented in Section 5. Section 6 discusses the implications of our results and concludes by suggesting avenues for future research.

2.   Previous Experimental Literature on Corruption and Punishment

The experimental literature examining corruption is scarce.[5] Abbink, Irlenbusch and Renner (2002) model corruption as a variant of the two-person trust and reciprocation game, where the participants play the role of a briber or a public official. They find that social welfare considerations have no impact on the level of bribery. However, the introduction of a threat of high penalties when discovered significantly reduces corruption. Abbink (2000) uses a similar design and finds that varying the relative salaries received by those who engage in corruption does not affect its prevalence. Barr, Lindelow and Serneels (2004) focus on the decision-making process of health workers and those appointed to monitor their performance. Using nursing students in Ethiopia as subjects, they find that corruption in the form of the embezzlement of public resources is less likely to take place when service providers have higher incomes and when the risk of being caught and sanctioned is high. Frank and Schulze (2000) focus on the individual determinants of corruptibility and find that economics students are significantly more corrupt than others. They show that this is due to a process of self-selection rather than indoctrination.

Two papers which have analysed corruption using field experiments are Bertrand et al. (2007) and Olken (2007). By studying the allocation of driving licenses in India, Bertrand et al. (2007) show that corruption does not merely reflect transfers from citizens to bureaucrats, but that it distorts allocation. Olken (2007) finds that increasing government audits was more effective in reducing corruption than encouraging local-level monitoring.

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[5] See Abbink (2006) for a comprehensive survey.

Our paper differs from these papers in two main ways. First, to the best of our knowledge, our study is the first to focus on behavioral differences across cultures in a corruption experiment. It thus contributes to a growing experimental literature on cross-cultural comparisons of behavior in other types of experiments.[6] Second, previous studies have modelled punishment as an exogenous lottery. In contrast, punishment is endogenous in our paper and takes place if the victim decides to incur the cost associated with punishment. We are thus able to examine both the incentives to engage in corruption and the incentives to punish corrupt behavior. Understanding punishment behavior is important since societal control of corruption often relies on an individual bringing the act to the attention of enforcement officers. A further advantage of our study is that it benefits from the increased power associated with a large sample of 569 observations, involving 1707 participants.

3. Experimental Methodology

3.1 Design

We have designed a three-person, sequential-move game that focuses on a common bribery problem. Figure 1 contains an extensive-form representation of the game, where all of the payoffs are denoted in experimental dollars. The first player acts as a firm which has the option of initiating a corrupt act by offering a bribe to a government official in order to increase its own payoff at the expense of society. We assume the firm can offer a bribe by choosing an amount $B \in [4,8]$. It costs the firm two experimental dollars to offer a bribe and the firm incurs this cost regardless of whether the bribe is accepted. If a bribe is offered, the second player, who we call the official, can either accept or reject the bribe. If the official accepts the bribe (which

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[6] See, for example, Carpenter and Cardenas (2004), Croson and Buchan (1999), Roth et al. (1991) and Henrich et al. (2004).

implies favorable treatment of the firm), then the payoffs of the firm and the official increase by 3B while the payoff of the citizen decreases by B.[7]

The third player is called the citizen and moves last after observing the choices made by the firm and the official. If a bribe has been offered and accepted, the citizen is given a chance to punish the firm and the official for the corrupt transaction by choosing an amount $P \in [2,12]$ [8] in punishment. Punishment is costly to the citizen and reduces the citizen's payoff by the amount of the punishment, P.[9] However, it imposes a monetary sanction on the firm and official by reducing their payoffs by 3P. Hence, the net benefit to the firm and the official from the corrupt transaction is 3B - 2 - 3P and 3B - 3P respectively.

We have chosen to conduct a one-shot game because in a one-shot game the punishment has no economic benefit to the citizen and so the decision to punish is not affected by the anticipation of possible future economic gains. Hence, with a one-shot game, a comparison of the citizens' willingness to punish corrupt acts across different cultures reveals the differences in the tolerance levels for corruption. The citizens who choose to punish in a one-shot game would have even more incentives to punish in a multi-period game since by doing so, they can deter corruption and decrease the harm they suffer.

The one-shot nature of the game also helps us avoid the issues associated with repeated games, such as signalling, reputation formation and serial correlation in decisions. Each subject

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[7] The payoff increase that the firm experiences may represent, for example, the benefit from avoiding a regulation. The official's payoff also increases by 3B even though the amount of bribe paid by the firm is B. This is due to a difference in the marginal utility of income. Since the income earned in the public service is likely to be lower than that earned in private firms, the same amount of money can be assumed to have a lower marginal utility value to the firm than to the official. Abbink, Irlenbusch and Renner (2002) make a similar assumption in their paper. As in their paper, this multiplier also has the additional advantage of helping us prevent negative total payoffs.

[8] These values were chosen to guarantee two things. First, we wanted to ensure that no one obtained a negative payoff. Second, we wanted to make sure that the payoffs were not unduly inequitable. Often, if the payoffs are excessively unequal, it leads to confounding changes in behavior.

[9] The cost of punishment can be interpreted as the effort the citizen has to put in to file a police report or pursue legal action. Alternatively, it can be interpreted as the amount of tax s/he is willing to pay in order to have such a legal enforcement scheme against bribery.

in our database participated in the experiment only once and played only one role.[10] The subjects playing the three roles were grouped anonymously in the experiment to avoid conscious or unconscious signalling.

We deliberately chose to use emotive terms such as "bribe" and "punishment" in the instructions. This is a deviation from the standard practice of using neutral language in economics experiments. However, since our aim was to simulate a real-life corrupt transaction, we used loaded language. As indicated in Harrison and List (2004), "it is not the case that abstract, context-free experiments provide more general findings if the context itself is relevant to the performance of subjects (p. 1022)."[11]

3.2   Treatments

We conducted the following two treatments. One is <u>welfare-enhancing (WE)</u>, in that the total payoff gains to the firm and the official *exceed* the payoff loss to the citizen. The other treatment is a <u>welfare-reducing</u> (WR) bribe game, where the combined gains to the firm and the official are *less* than the payoff loss to the citizen. Specifically, in the welfare-enhancing bribe game, each dollar offered as a bribe, if accepted, reduces the payoff to the citizen by $1 whereas in the welfare-reducing bribe game, it reduces the payoff to the citizen by $7. Figures 1 and 2 describe the associated payoffs to the three players in the welfare-enhancing bribe game and the welfare-reducing bribe game respectively.

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[10] One standard response in cases such as these is to have random re-matching of subjects. Kandori (1992) states that it is not clear whether random re-matchings do actually succeed in eliminating supergame effects. However, Duffy and Ochs (2005) consider an experiment with an indefinitely repeated 2-player prisoner's dilemma game and find that contrary to Kandori's theoretical conjecture, a cooperative norm does not emerge in the treatments where players are matched randomly. In the current paper we decided to adopt a conservative stance and have players participate in pure one-shot games to avoid any repeated game effects.

[11] Cooper and Kagel (2003) consider the role of loaded language in signaling games and suggest that the use of a meaningful context might better capture behavior in field settings than the use of neutral language. Abbink and Hennig-Schmidt (2002) however find that the use of words like "bribe" do not make a difference in the corruption game that they study.

The distinction between welfare-enhancing and welfare-reducing corruption is one that is frequently made in the literature (see, for example, Ali and Isse, 2003; Kaufman and Wei, 1999; Bardhan, 1997; Nas, Price and Weber, 1986; and Lui, 1986). As an example, consider the scenario where a firm would like to import certain goods, but it needs to obtain a license to do so. In order to acquire the license more quickly than might otherwise be the case, the firm has to bribe a government official. Here, although undoubtedly corrupt, the immediate social cost of this action is possibly not very high. In contrast, consider the case where the same firm manages to bribe its way out of complying with some environmental regulations and dumps toxic waste into the groundwater. Our goal in running the two treatments is to explore whether the tendency to engage in and punish corrupt behavior is different in the latter case, where the cost of bribery is potentially far greater.

A change in the cost of bribery may have the following effects on subject behavior. When the bribe is welfare-reducing, the subjects may think that it is less justified. Moreover, as the harm imposed on the citizen increases, the citizen may choose to punish due to feelings of negative reciprocity. Both of these effects would result in lower bribe amounts and higher punishment amounts being chosen when the bribe is welfare-reducing. Alternatively, if the harm imposed on the citizen is sufficiently large, the citizen may not want to punish and decrease his/her payoff by even more. As a result, punishment may occur less frequently, and if the firms and officials anticipate this, they may act more corruptly. The relative impoverishment of the citizen when a bribe is offered and accepted in the welfare-reducing treatment hence works in the opposite direction of the efficiency considerations. Thus, whether we observe higher levels of

bribery and punishment in the welfare-reducing treatment than in the welfare-enhancing treatment depends on the relative magnitude of these effects and cannot be stated a priori. [12]

3.3   Procedure

The experiments were run at the University of Melbourne, the Delhi School of Economics, the University of Indonesia, and the National University of Singapore using third year undergraduate or postgraduate students.[13] We recruited students from a variety of fields of study. In order to minimize the experimenter effects, we made sure that one of the authors (the same one) was present in all the countries where we ran the experiment.[14] All the sessions were run as non-computerized experiments. Across all four locations, a total of 1707 subjects participated once and only once as a firm, an official, or a citizen.

Each experiment lasted about an hour. At the beginning of each session subjects were asked to come to a large lecture theatre. Each session consisted of at least 30 subjects. These subjects, on entering the room, were randomly designated as either firms, officials or citizens. The subjects participating in the experiment under the same role (as firms, officials or citizens) were asked to sit together and in one section of the lecture theatre away from the subjects representing the other two roles. The subjects were matched anonymously with each other, so individual subjects were unaware of which three specific subjects constituted a particular firm-official-citizen trio.

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[12] We also conducted another treatment. The additional treatment was a welfare-enhancing game but was "low punishment" in that the range of the punishment was restricted to $P \in [2,8]$. Our goal in designing this treatment was to observe whether a less effective punishment system increases the incentives to engage in corrupt behavior and decreases the incentives to punish corrupt behavior. We found this to be the case (results available from the authors). This is consistent with Abbink, Irlenbusch and Renner (2002), and Barr, Lindelow and Serneels (2004) who find in a game with exogenous punishment that corruption is lower when the risk of penalty is higher.
[13] All four universities are comparable in the sense that they are ranked among the best in their respective countries.
[14] Roth et al. (1991) and Cardenas and Carpenter (2005) discuss the methodological issues arising in multi-site experiments.

At the beginning of each session, each subject received a copy of the game's instructions, which were then read out loud to them. They were also given a number of examples explaining how the payoffs would be calculated for specific bribe and punishment amounts. Then, the subjects playing the role of a firm were asked to decide whether or not to offer a bribe. If they chose to offer a bribe, they also had to choose an amount. The record sheets with the bribe amounts were then collected and distributed by the experimenter to the corresponding officials. After the officials made their decisions, the corresponding citizens were informed about whether a bribe was offered and whether it was accepted. The game ended after the citizens decided whether to punish by choosing a punishment amount. The decisions made by all of the subjects were entered into a spreadsheet which generated their payoffs. The subjects were paid at the end of each session after the payoffs were converted into cash using an appropriate conversion rate, taking into consideration purchasing power parity across the countries where the experiment was conducted.[15] Since the equilibrium payoffs were highly asymmetric across the different player types (firm, official, and citizen), we used different conversion rates for the different types.[16] These conversion rates were public information.

All the subjects filled out a demographic survey, which asked them a series of questions regarding their age, gender, field of study, work experience, income, ethnicity, exposure to

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[15] The conversion rate in each country was based on 1) the standard hourly wage paid for a student research assistant in each country, and 2) a typical basket of goods bought by students in each country. This is similar to the procedure used by other researchers who have conducted cross-cultural studies (e.g., Carpenter and Cardenas, 2004 and Cardenas and Carpenter, 2005).

[16] The treatments described in Section 3.2 are welfare-enhancing and welfare-reducing both before and after taking into account the relevant conversion rates. In Australia, the conversion rates were 3 experimental currency = 1 real currency for the firms, 2 experimental currency = 1 real currency for the officials, and 1.5 experimental currency = 1 real currency for the citizens. Each subject made on average AU$20. This amount is approximately equivalent to US$15. In India subjects were paid an average of US$11, in Singapore US$13, and in Indonesia US$9. Davis and Holt (1993) recommend that average payments in experiments should be high enough to compensate all participants for the opportunity cost of their time (pp. 24-26). Having different conversion rates for the different player types helped us achieve this outcome. Moreover, recruiting subjects for experiments can be very difficult if payoffs are not within the range announced for all subjects.

corruption, and time spent in other countries. Those in the role of the citizen were also asked to explain the motivation for their decisions.[17]

In addition to the 569 observations that we report on in the paper, we also collected data using a neutral language treatment. We eschewed words such as "bribe" or "punishment" and replaced them with words such as "transfer" and "forego money to reduce others' payoff" respectively.[18]

4.   Research Questions

In the subgame perfect equilibrium of the game outlined in Section 3.1, a payoff-maximizing citizen does not punish. Knowing this, the official accepts the bribe and the firm offers the bribe. Moreover, the firm offers the maximum amount of bribe it can since its payoff is increasing in the amount it offers.

Since there is ample evidence in the experimental literature that punishment takes place even in one-shot games, we expected the citizens' behavior to differ from the theoretical prediction. Hence, we designed our experiment with the following research questions in mind:

(i)   Do subjects in countries with higher levels of corruption offer and accept bribes more frequently, and punish bribery less frequently than subjects in countries with lower levels of corruption?

(ii)   Does increasing the cost of bribery on the victim, have an impact on the propensity to engage in and punish corrupt behavior?

5.   Results

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[17] The instruction, record and survey sheets are available from the authors upon request.
[18] The neutral language treatment was conducted in Australia. A total of 231 students at the University of Melbourne participated in this treatment, which resulted in 77 neutral language observations.

5.1   Overview of the results

Table 1 summarizes the data we collected in terms of the treatments we ran at each location and the number of subjects involved in each treatment. Figure 3 provides a broad overview of our findings, pooling across all locations and treatments. Overall 1707 subjects participated in 569 plays of the game across all treatments since three players (a firm, an official and a citizen) are required to generate one play of the game. As can be seen from Figure 3, in 480 out of 569 (84%) plays of the game a bribe was offered by the firm. The average amount of the bribe for those who chose to bribe was $7.58 (in a range of 4 to 8). 417 out of 480 (87%) officials who received a bribe chose to accept it. Both the firm's and official's behavior is more or less in accordance with the theoretical predictions. However, the citizens' behavior deviates sharply from the theoretical prediction. 203 out of 417 (49%) citizens who were harmed by the bribe chose to incur a pecuniary cost in order to punish the firm and the official for their actions.[19]

In the next two subsections, we present our findings in more detail. We first report the results on the cultural effects in Section 5.2. We then consider the treatment effects in Section 5.3.

5.2   Comparing Behavior in Australia, India, Indonesia and Singapore

5.2.1 Tests of Differences of Means

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[19] We conducted neutral language games in Australia. Behavior in the neutral-language treatment was closer to the subgame perfect equilibrium outcome. That is, the bribe and acceptance rates were significantly higher and the punishment rate was significantly lower. The bribe was offered in 97% of the cases (compared to 84% in the loaded language game). The bribe was then accepted in 95% of the cases (compared to 84% in the loaded language game). 37% of the citizens in the neutral language game who were in a position to punish did so (compared to 53% in the loaded language game).

Table 2 compares the means of behavior across the Australian, Indian, Indonesian and Singaporean subjects and reports p-values of t-tests of statistical significance.[20] Panel A tells a clear story. The point estimates for firm subjects, official subjects and citizen subjects indicate a consistent ranking of the countries in terms of their tolerance of corruption. The Indian subject were the most likely to offer bribes, the most likely to accept bribes and the least likely to punish corruption. Singaporeans were the next most tolerant of corruption, then Australians and then Indonesians.

The differences between India and the other countries is large and statistically significantly in each case, with the exception of acceptance behaviour in Singapore (92.5% of Singaporean officials accepted the bribe versus 92.8% in India). The magnitude of the differences across countries is quite large. For example, 92.5% of Indians accepted bribes versus 79% in Indonesia. For officials, 92.8% of Indians accepted the bribes, compared to 78% in Indonesia. Citizens punished corrupt behaviour only 28% of the time in India versus 66% in Indonesia.

While India is in most cases significantly different from the other countries, behaviour in the other three countries is more similar. Bribery rates are insignificantly different across Australia, Indonesia and Singapore. Singaporean and Indian acceptance rates are insignificantly different from one another but significantly higher than those in Indonesia and Australia (which are insignificantly different from one another). The most cross-country variation is apparent in the punishment rates where the Indonesian punishment rate is significantly lower than that in Australia. Australian and Singaporean punishment rates are insignificantly different from one another but the Indian rate is significantly higher than in all the other countries. The great

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[20] We also conducted non-parametric rank sum tests of differences in distribution. Unless noted in the text, the results were the same as the ones in the reported t-tests.

variation in punishment rates is also borne out by a comparison of the coefficient of variation of

the country means by subject type. The coefficients of variation for offering bribes and accepting

bribes are 0.067 and 0.082 respectively while for punishing corruption it is 0.319.

The amount bribed or punished conditional on bribing and punishing respectively does

not vary much across countries. Note that once one has decide to bribe, bribing $8 is a dominant

strategy and most firms (77%, 369 out of 480) take this strategy. Indians on average do choose

lower punishment amounts ($5.00 on average) than in other countries and statistically

significantly lower than in Singapore ($7.16) and Australia ($6.61).

5.2.2 Regression results

Table 3 presents the results from regression analysis. We estimated binary probit models for the

bribe, acceptance and punishment rates, and ordinary least square models for the bribe and

punishment amounts.[21] In addition to the regression coefficients, Table 3 presents the results of

pairwise tests of significant differences across countries.

The regression results use the information collected in the surveys to control for several

aspects of the subjects' backgrounds and also control for the treatment effect (which will be

discussed in detail in section 5.3). The demographic variables generally weren't strong

predictors of behaviour. Whether the subject was an economics major and gender were

significant in some specifications. Subjects who studied economics were on average 12

percentage points less likely to punish bribes than other subjects.[22] Men were 6.3 percentage

points more likely to offer a bribe and 9 percentage points less likely to punish corrupt behaviour.

Many of our Australian subjects were foreign students. We constructed a variable that equals the

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[21] We also estimated ordered probit models for positive bribe amounts. The results were very similar to the reported results. We could also have estimated tobit models but these confound the determinants of the choice of whether to bribe with the choice of how much to bribe. The results indicate that the determinants of the two decisions differ.
[22] This result is consistent with Frank and Schultz (2000).

% of the subject's life that was spent outside Australia. It was significant only in the bribery regressions. [23]

The regression results are largely consistent with the results of the t-tests. Indian subjects are on average 15 percentage points more likely to bribe than Australian subjects, 9.9 percentage points more likely than Indonesians, and 5.5 percentage points more likely than Singaporeans. All of these differences are statistically significant. Unlike in the t-tests, once we control for other variables Singaporeans are statistically significantly more likely to bribe than Australians (by 9.6 percentage points, p=0.06). [24]

For the acceptance rates, the regressions show, as before, that there is no significant difference between India and Singapore. Acceptance rates are higher in India than Australia (p=0.05) and significantly higher than in Indonesia (p=0.003).

Table 3 shows that Indian subjects are 21 percentage points less likely to punish than the Australian subjects. The punishment behavior in Indonesia also differs from that in Australia, but suggests a *lower* tolerance of corruption (as in Table 2) with subjects being on average 14 percentage points more likely to punish than in Australia. Punishment behaviour in Singapore is insignificantly different from that in Australia but significantly higher punishment rates are observed than in India (16.9 percentage points higher on average, p=0.02) and higher than in Indonesia (10.2 percentage points lower, p=0.03). The largest difference is found between the punishment behavior of the Indian and Indonesian subjects. The Indonesian subjects are 34 percentage points more likely to punish than the Indian subjects and this difference is strongly statistically significant (p = 0.00).

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[23] This variable and whether a subject majored in economics are only included in the regressions in which they were significant in Table 3.

[24] It is controlling for foreign students in the Australian subject pool that makes the difference between Australia and Singapore statistically significant.

In summary, when we compare behavior in the four locations, we find that, as expected, the Indian subjects are more tolerant of corruption than the Australian subjects. The Indonesian subjects however display a much lower tolerance of corruption than expected given the high level of corruption that exists in this country. In contrast, the Singaporean subjects appear to be more tolerant of corruption than expected. There is greater cross-country variation in the willingness to punish corruption than in the willingness to engage in it.

5.2.3 Exploring the Impact of Culture

One can think of "culture" as having two components – one that represents those customs and values that ethnic and religious groups transmit relatively unchanged from generation to generation and another that reflects the values embedded in the current institutions of the society the individual lives in.[25] Although it is difficult to differentiate between these two influences, our data allows us to explore this issue by controlling for ethnicity. Almost all the Singaporean sample in our data is ethnic Chinese. Indonesia has a Chinese minority who are over-represented in Jakarta. Of our Indonesian sample, 11.4% are ethnic Chinese. Table 4 presents regression results where we control for the Chinese ethnicity in Indonesia and test whether the behavior of the Chinese subjects in Indonesia resembles the behavior of ethnic Indonesians or Singaporean subjects. We find that there is no significant difference between the behaviour of Chinese-Indonesians and other Indonesians (the coefficient on the Chinese-Indonesian dummy is insignificant in all three regressions). The Chinese-Indonesian coefficient is however estimated very imprecisely in the bribery and acceptance regressions, and we are unable to reject the hypothesis that the behaviour of Singaporeans and Chinese-Indonesians are the same.[26] However, the punishment behaviour of Chinese-Indonesians is significantly different to that of their

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[25] The first of these two components is how culture is defined in Guiso, Sapienza and Zingales (2006). See Bisin and Verdier (2001) for a model where both family and society play a role in the transmission of preferences.
[26] This is particularly unsurprising for the bribery decision as Table 3 showed that there is no statistically significant difference between Indonesia and Singapore.

Singaporean counterparts. Table 4 shows that Chinese Indonesians were on average 42.6 percentage points more likely to punish than Singaporeans, p = 0.03).[27] These results tentatively imply that subjects' punishment behavior is affected by the values embedded in the institutions of the society in which they live rather than their ethnic background.[28]

To gain further insight into whether the subjects' reasons for punishing differ across the four locations, we examined the citizens' responses to the question about why they chose to punish/not to punish in the survey given to them after the experiment. Table 5 shows our categorization of their responses. We categorized the stated reasons for punishment into four groups: moral responsibility, reduction of corruption, fairness, and negative reciprocity. Similarly, the reasons for not punishing were categorized into three groups depending on whether the subject is profit maximizing, believes that it is difficult to change the system, and thinks that the bribe may be necessary. These categories were not mutually exclusive, so the same person may have been counted in more than one category. We chose to create non-exclusive categories because often it was not possible to determine one single reason for the citizens' behavior from the statements provided in the surveys.

The reasons given reflect both the current levels of corruption in the respective countries and the extent of concern over the problem. In general, in countries where we observed higher rates of punishment, the proportions of subjects who gave moral responsibility or reduction of corruption as their reasons for punishment were higher. This implies that the punishment rates we observed reflect the attitudes of the subjects towards corruption. For example, of the citizens who got a chance to punish, a greater proportion of citizens in Indonesia stated that they saw punishing as a moral responsibility (39% in Indonesia versus 13% in India, 20% in Singapore,

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[27] 0.105+0.283 – (- 0.038) = 0.426.

[28] These results are further borne out by results from unreported regressions which control for a number of different Indonesian ethnic groups and Indian and Malay ethnicity in Singapore. In each case the subjects acted in accordance with their country's participants rather than their ethnic group.

and 36% in Australia), or as a way to reduce corruption (20% in Indonesia versus 13% in India, 8% in Singapore, and 15% in Australia). Also, less of those who chose not to punish in Indonesia cited individual payoff maximisation as their reason (27% in Indonesia as compared to 58.3% in India, 48.5% in Singapore and 43% in Australia). More often, they stated a concern with the existing level of corruption in their country, and explained their behavior by arguing that it is necessary to bribe in the environment in which they operate or that it is difficult to change the corrupt system.

Although the majority of those who chose to punish in India did so to maximize their payoffs, many stated that they didn't punish because it is difficult to change the system (13%) or because a bribe may be necessary (8%). This indicates a relatively high acceptance of corruption as part of life.

Table 5 also shows that the citizen subjects in Singapore, when compared to those in Australia and Indonesia, were driven to a much greater extent by personal considerations rather than moral responsibility or an attempt to reduce corruption while choosing to punish. A relatively low proportion of those who punished in Singapore reported doing so for reasons of moral responsibility or to reduce corruption. They were more likely to give reasons of fairness or negative reciprocity.

The difference between the punishment rates in the neutral language and loaded language treatments further illustrates that the subjects' decisions were informed by their attitudes to real life corruption. Only 37% of the citizens in the neutral language game punished as compared to 53% in the loaded language game.

5.3 Welfare-Enhancing versus Welfare-Reducing Bribe Games

We now address whether behavior differs when the bribe is perceived as being harmful, i.e., when the payoff loss to the citizen exceeds the total payoff gain to the firm and the official. As discussed in Section 3.2, one would expect those subjects who are sensitive to the perceived cost of bribery to offer and accept bribes less frequently and to punish more frequently in when corruption is welfare-reducing.[29] On the other hand, those citizen subjects who feel impoverished and disempowered as a result of the high cost of bribery may choose to punish less and those firms and officials that expect this may offer and accept bribes more frequently.

The lowest panel of Table 2 presents p-values from t-tests of differences in behavior across the two treatments. It shows no significant differences in the propensities to engage in and punish corrupt behavior across the two treatments in India, Indonesia and Singapore. In contrast, there are substantial differences between subjects' behavior in the two treatments in Australia. The frequency with which a bribe was offered was higher in the welfare-reducing game (88% versus 79%, p=0.09), the frequency with which the bribe was accepted was also higher (89% versus 81%), although not statistically significantly different, and there was a significantly lower propensity to punish (42% versus 62%, p = 0.02). These differences across treatments show Australian citizen subjects responding to the changes in citizens' payoffs rather than changes in social welfare. Interestingly though, while fewer citizens punished in the welfare-reducing bribe game, those who did punish punished by considerably larger amounts ($7.74 versus $5.98, p = 0.06). This suggests that while the larger harm imposed on the citizen by the bribery discouraged some citizens from choosing to punish, those that did punish felt particularly affronted by the corrupt behavior.[30]

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[29] It was clear from the survey responses that we collected and the questions we received after the experiments that for some of the subjects the purpose of the bribe, i.e., whether it was for a "good" purpose, mattered.

[30] The coefficients on the welfare-reducing treatment dummy in Table 3 captures the average treatment effect across the four countries. Only the coefficients in the punishment regressions are significant. The different treatment effects in Australia detected by the t-tests suggest that it may be appropriate to interact the treatment variable with an

In summary, when we consider the impact of the cost of bribery on subject behavior, we find that the results are culture-specific. In India, Indonesia and Singapore, there were no significant differences in subject behavior across the two treatments. This result is consistent with that in Abbink, Irlenbusch and Renner (2002), who find that social welfare considerations have no impact on corrupt behavior. Citizens in Singapore, Indonesia and India may be reacting against the welfare-reducing nature of corruption but this may be being countered by the relative impoverishment of the citizen in the welfare-reducing treatment. The difference in behavior between the Australian subjects and those in the other two countries could be because subjects in Indonesia and Singapore have more immediate experiences of the negative impact of corruption and are, therefore, relatively more willing to condemn it in the welfare-reducing treatment even though citizen payoffs are very low.

6.   **Discussion**

We have analysed the propensity to engage in and to punish corrupt behavior in the context of a three-person sequential-move game in four different cultures. We find significant cross-cultural variation in behavior, particularly in the propensity to punish corrupt transactions.

While a comparison of behavior in India and Australia is in line with our *apriori* hypothesis that greater exposure to corruption in daily life builds a greater tolerance of corruption and hence a greater propensity to engage in it and a lower propensity to punish such behavior, the results for Singapore and particularly Indonesia reject the hypothesis. Indonesia is consistently ranked as having high levels of corruption, yet our subjects displayed a low

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Australian dummy variable. Doing so resulted in a less well-fitted model for the bribery and acceptance decisions and did not affect the qualitative results in the punishment regression.

tolerance for corrupt behavior. In contrast, Singapore is a relatively low corruption country but Singaporean subjects showed a willingness to engage in corruption and a reluctance to punish it.

Although we are not able to identify the causes of these results with certainty, we conjecture that the Indonesian result is due to the type of corruption that exists in Indonesia and the recent institutional changes that have occurred in this country. Corruption in Indonesia has traditionally been more centralized (controlled largely by the Suharto family, the military leaders, and the ethnic Chinese-run conglomerates) while corruption in India is more fragmented (Bardhan, 1997, p. 1325). The introduction of democracy in 1998 and the increased press freedom have resulted in this highly visible and identifiable type of corruption that exists in Indonesia receiving a lot of negative media attention – more than in the past and more than in India.[31,32] There have been several attempts (some successful) to prosecute high profile cronies of the previous government who were engaged in corruption to the scale of billions of dollars and the current president was elected largely on an anti-corruption platform. Although there is no doubt that corruption remains high in Indonesia, our results suggest that these institutional changes may have resulted in an increase in aversion to corruption in Indonesian society.[33] This finding is also supported by the findings of a recent Transparency International survey, which assesses people's attitudes to corruption. The results indicate that, among the 45 countries

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[31] That corruption receives more attention in Indonesia than in India is borne out by the percentage of newspaper articles that are devoted to the topic. In the time period April to June 2004, approximately 2 per cent of the total number of articles in *Times of India* relate to domestic corruption. In Indonesia nearly 9 percent of the articles in *The Jakarta Post* discussed corruption issues during this same time period..

[32] India is of course a functioning democracy with a free press, but the relatively smaller scale of high-level corruption in India has not galvanized society to forcefully oppose corruption. Further, corruption was not a major issue at the time when democracy was introduced in India. In contrast, corruption was one of the major causes of the downfall of President Suharto and the advent of democracy in Indonesia.

[33] Our conjecture is supported by Ferraz and Finan (2005) and Brunetti and Weder (2003). Based upon the results of Brazil's recent anti-corruption program, Ferraz and Finan (2005) show that the media can enable voters to hold corrupt politicians accountable and to reward non-corrupt politicians by reducing informational asymmetries. In a study that involves a large cross-section of countries, Brunetti and Weder (2003) find evidence of a significant negative relationship between press freedom and corruption. Gentzkow, Glaeser and Goldin (2004) also discuss how the rise of the informative press may have been one of the reasons why corruption declined in the US.

surveyed, Indonesians were the most optimistic about corruption falling in their country in the next 3 years.[34] Indonesia's corruption has also been improving since we conducted these experiments (as recently discussed in *the Economist*).

The relatively high propensity to engage in and a low propensity to punish corrupt behavior in Singapore suggest that attitudes towards corruption may take a long time to change. Half a century ago the level of corruption in Singapore was comparable to that in India and Indonesia. It has successfully eradicated corruption, but this has been achieved by the imposition of strict and heavily-enforced anti-corruption legislation.[35] A possible explanation for our results is that although the strict top-down approach in Singapore for the last few decades has made Singaporeans less tolerant of corruption (e.g., vis-à-vis Indians), the attitudinal change that accompanies such an approach occurs only slowly.

Finally, we find greater cross-cultural variation in the propensity to punish corrupt transactions, but little variation in the propensity to engage in them. This finding suggests that people may be more ready to sanction behaviour socially regarded as immoral when they see it in others or when they are victimized by it. It is in line with the arguments made in previous studies that the extent to which individuals care about other regarding preferences like fairness or morality may depend on whether they are predators or potential victims (Bolton and Ockenfels, 2000, and Fehr and Schmidt, 1999).

Our paper is a first attempt to study an extremely complex phenomenon. One possible response to our findings is that the cross-cultural variation in our results merely reflects the

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[34] See http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN016537.pdf. Indians were found to be among the most pessimistic.
[35] The strict top down approach of the Singaporean government may of course reflect the population's high propensity for corruption.

differing propensities to punish across cultures, rather than the attitudes to corruption.[36] While this is an issue worthy of additional research, for a number of reasons we believe that our results reflect attitudes to corruption rather than punishment per se. First, as discussed in Section 5.2 the reasons subjects give for punishing/not punishing reveal that the majority of subjects specifically consider the seriousness of corruption as a blight on society and often refer to the level of corruption in their country. More than 50% of all survey responses refer explicitly to real life corruption in their answers. Second, our results are consistent with a number of other data sources. As mentioned above, Transparency International finds Indonesia to be one of the most optimistic countries in regard to lowering corruption in the future. India is found to be one of the most pessimistic. The World Values Survey finds that more Singaporeans say that accepting a bribe could be justified under certain circumstances (than in the other countries in our study).[37] Third, evidence from other experimental work on Indonesia using the ultimatum game has not found that Indonesians have a higher inherent propensity to punish than other cultures (Cameron, 1999). Fourth, punishment rates in our subject pool are much higher in the loaded language treatment than in a neutral language treatment.

The results from Indonesia and Singapore suggest it would be worthwhile doing further research to understand more fully the role institutional change plays in changing attitudes towards corruption. One way to do this is to investigate how attitudes towards corruption change over time in a given location. Further experimental research involving other countries with different levels of corruption would also be valuable, particularly since our results suggest that the existing corruption indices might not fully capture how individuals behave in corrupt environments.

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[36] Even if this were the case, the results would still be relevant to anti-corruption policy making because a society's low propensity for punishment makes it vulnerable to corruption.

[37] See http://www.worldvaluessurvey.org/.

In general, the differences between our results and what one would expect to observe in these countries based on the existing corruption indices suggest that experiments can be used as an alternative methodology for eliciting attitudes towards corruption. Corruption is difficult to measure because it is illegal. The most frequently used measures of corruption, such as the Transparency International Corruption Index, measure people's perceptions of corruption in the recent past.[38] Policy makers value more forward-looking measures that assess individuals' propensity to support anti-corruption policies in the future. Our study suggests that experimental methodology can provide such information.

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[38] Several people have raised concerns about the reliability of these measures and there exists a small recent literature that attempt to measure corruption more objectively. See Olken (2005), Svensson (2003) and Hsieh and Moretti (2005).

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Figure 1: The Welfare-Enhancing Bribe Game

FIRM (F)

Don't offer bribe

Offer bribe (B)

F: 60
O: 30
C: 40

OFFICIAL (O)

Reject bribe

Accept bribe

F: 60 - 2
O: 30
C: 40

CITIZEN (C)

Don't punish

Punish (P)

F: 60 + 3B - 2
O: 30 + 3B
C: 40 - B

F: 60 - 2 + 3B - 3P
O: 30 + 3B - 3P
C: 40 - B - P
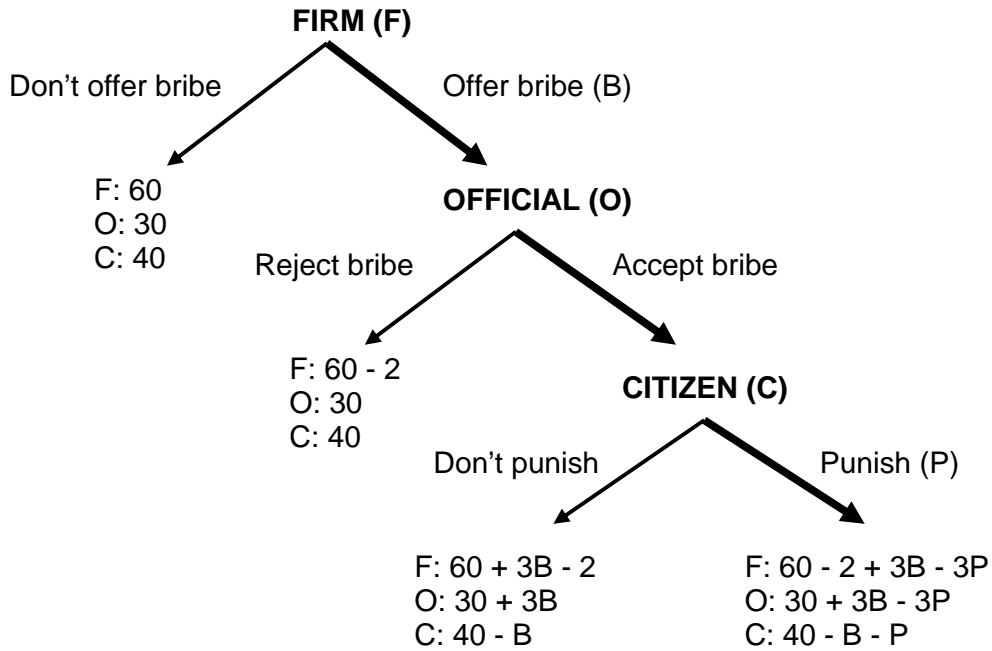
Figure 2: The Welfare-Reducing Bribe Game

FIRM (F)

Don't offer bribe

Offer bribe (B)

F: 60
O: 30
C: 80

OFFICIAL (O)

Reject bribe

Accept bribe

F: 60 - 2
O: 30
C: 80

CITIZEN (C)

Don't punish

Punish (P)

F: 60 + 3B - 2
O: 30 + 3B
C: 80 - 7B

F: 60 - 2 + 3B - 3P
O: 30 + 3B - 3P
C: 80 - 7B - P
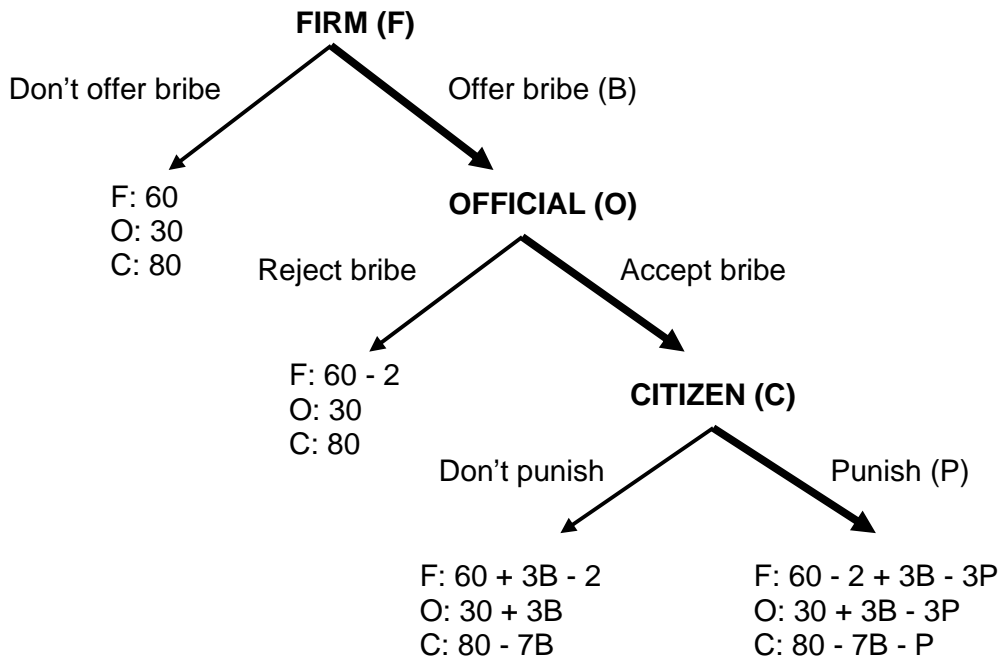
Figure 3: Overview of the Results

FIRM (F) [n = 569]

Don't offer bribe
[n = 89, 15.6%]

Offer bribe (B)
[n = 480, 84.4%]

OFFICIAL (O)

Reject bribe
[n = 63, 13.1%]

Accept bribe
[n = 417, 86.9%]

CITIZEN (C)

Don't punish
[n = 214, 51.3%]
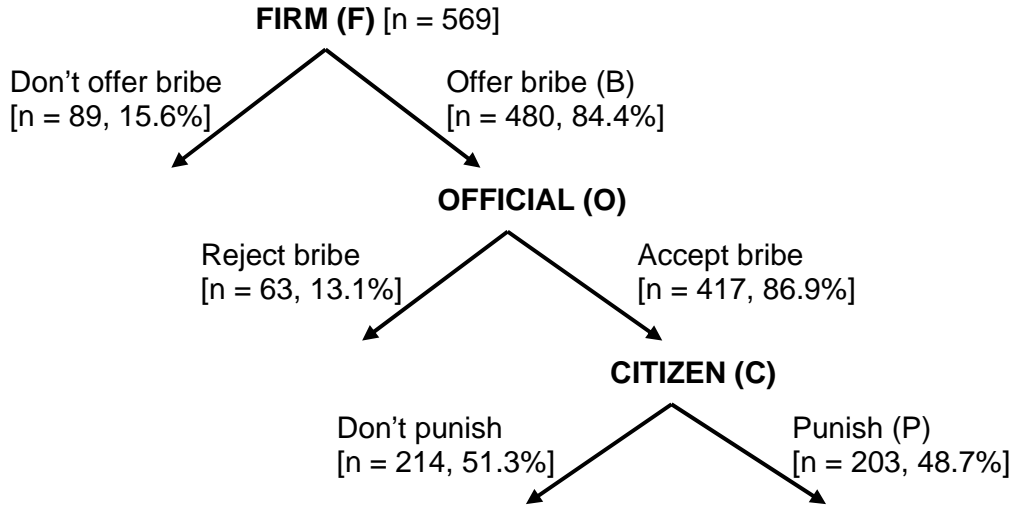
Punish (P)
[n = 203, 48.7%]

Table 1: Experimental Design

	High Punishment/ Efficiency-enhancing (Treatment 2)	High Punishment/ Efficiency-reducing (Treatment 3)
Australia (N = 609)	N = 363 Games = 121	N = 246 Games = 82
India (N = 360)	N=180 Games=60	N=180 Games=60
Indonesia (N = 360)	N = 180 Games = 60	N = 180 Games = 60
Singapore (N = 378)	N = 195 Games = 65	N = 183 Games = 61
Total (N = 1707)	N = 918 Games = 306	N = 789 Games = 263

Table 2: Differences in Means (t-tests) - Cultural and Treatment Effects

	India	Singapore	Australia	Indonesia		p-values (cultural effects)				
					Aust/ India	India/ Sing	India/ Indon	Aust/ Sing	Aust/ Indon	Indon/ Sing
A. BOTH TREATMENTS POOLED										
% of firms bribing (%)	92.5	84.9	82.3	79.2	0.01△	0.06#	0.002△	0.53	0.49	0.24
Bribe amount (if >0)	7.64	7.61	7.61	7.41	0.82	0.78	0.083	0.93	0.07#	0.15
% of officials accepting (%)	92.8	92.5	84.4	77.9	0.04*	0.94	0.002△	0.05*	0.19	0.003△
% of citizens punishing (%)	28.2	50.0	53.2	66.2	0.001△	0.001△	0.000△	0.68	0.07#	0.04*
Punishment amount (if >0)	5.00	7.16	6.61	6.38	0.05*	0.01△	0.15	0.46	0.77	0.38
B. WELFARE-ENHANCING TREATMENT										
% of firms bribing (%)	91.7	86.15	78.51	80.00	0.002△	0.20	0.03*	0.21	0.82	0.36
Bribe amount (if >0)	7.54	7.63	7.65	7.50	0.013*	0.007△	0.0002△	0.83	0.30	0.48
% of officials accepting (%)	92.7	89.29	81.05	77.08	0.011*	0.96	0.019*	0.18	0.58	0.10#
% of citizens punishing (%)	35.3	44.00	62.34	72.97	0.000△	0.077#	0.0005△	0.04*	0.27	0.01△
Punishment amount (if >0)	4.89	7.23	5.98	5.59	0.000△	0.264	0.582	0.21	0.69	0.19
C. WELFARE-REDUCING TREATMENT										
% of firms bribing (%)	93.3	83.61	87.80	78.33	0.264	0.10#	0.02*	0.48	0.13	0.46
Bribe amount (if >0)	7.73	7.59	7.57	7.32	0.061#	0.001△	0.000△	0.90	0.16	0.19
% of officials accepting (%)	92.9	96.08	88.89	78.72	0.364	0.94	0.017*	0.15	0.13	0.01△
% of citizens punishing (%)	21.2	57.14	42.19	59.46	0.062#	0.0004△	0.000△	0.12	0.10#	0.83
Punishment amount (if >0)	5.18	7.11	7.74	7.36	0.000△	0.270	0.521	0.58	0.76	0.84

p-values (treatment effects)	India	Singapore	Australia	Indonesia
% firms bribing	0.73	0.69	0.09#	0.82
Bribe Amount (if >0)	0.24	0.83	0.49	0.40
% officials accepting	0.98	0.19	0.17	0.85
% citizens punishing	0.11	0.19	0.02*	0.22
Punishment Amount (if >0)	0.80	0.92	0.06#	0.18

* (#, △) denotes statistical significance at the 5% (10%, 1%) level.

Table 3: Multivariate Regression Results - Cultural Effects

A. Australia vs. India vs. Indonesia vs. Singapore, All Treatments, Pooled Regression (Australia and Treatment 2 are the reference dummies.)

	Bribe (0/1)		Bribe Amount		Accept (0/1)		Punish (0/1)		Punishment Amount	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	M. Effect♣	p-value	Coeff	p-value	M. Effect♣	p-value	M. Effect♣	p-value	Coeff	p-value
Treatment - WR	0.019	0.54	-0.030	0.71	0.045	0.14	-0.096	0.06 #	1.000	0.08 #
India	0.150	0.00 △	-0.012	0.95	0.074	0.05 *	-0.205	0.00 △	-1.920	0.04 *
Indonesia	0.051	0.33	-0.211	0.24	-0.058	0.16	0.138	0.06 #	-0.429	0.56
Singapore	0.096	0.06 #	-0.008	0.96	0.073	0.05 *	-0.036	0.59	0.363	0.62
Male	0.063	0.04 *	0.069	0.39	0.012	0.70	-0.090	0.08 #	0.950	0.10 #
Econ major							-0.120	0.03 *	0.359	0.60
% life out of Australia	0.126	0.05 #	-0.013	0.95						
Bribe amount					0.002	0.91	-0.020	0.50	0.422	0.21
Const			7.60	0.00 △					2.650	0.31
Tests: India=Indon		0.00 △		0.06 #		0.003 △		0.00 △		0.12
India=Sing		0.09 #		0.87		0.990		0.02 *		0.02 *
Indon=Sing		0.20		0.10 #		0.003 △		0.03 *		0.33
R-squared	0.038		0.01		0.044		0.069		0.030	
N	569		480		480		417		203	

♣ We report marginal effects for the probits. * (#, △) denotes statistical significance at the 5% (10%, 1%) level.

Table 4: Multivariate Regression Results - Controlling for Chinese Ethnicity

	Bribe (0/1)		Accept (0/1)		Punish (0/1)	
	M. Effect	p-value	M. Effect	p-value	M. Effect	p-value
Treatment - WR	0.018	0.55	0.046	0.13	-0.103	0.04*
India	0.150	0.00 △	0.074	0.05*	-0.200	0.00 △
Indonesia	0.047	0.39	-0.069	0.11	0.105	0.17
Chinese Indonesian	0.048	0.60	0.081	0.32	0.283	0.14
Singapore	0.096	0.06#	0.073	0.05*	-0.038	0.57
Male	0.065	0.03*	0.010	0.75	-0.098	0.06#
Econ Major					-0.134	0.02*
Bribe amount			0.001	0.95	-0.021	0.47
% life out of Australia	0.126	0.05*				
Test: Indonesian + Chinese Indonesian= Singapore		0.95		0.71		0.03 *
R-squared	0.039		0.047		0.073	
N	569		480		417	

⁑ We report marginal effects for the probits. * (#, △) denotes statistical significance at the 5% (10%, 1%) level.

Table 5: Survey Responses: Reasons for Punishing/Not Punishing
(as a percentage of those who had a chance to punish)

A. Reasons for punishing

	Overall	Location			
		Australia	India	Indonesia	Singapore
Moral responsibility	26.9%	35.5%	12.6%	39.2%	20.2%
reduce corruption	13.7%	14.9%	12.6%	20.3%	8.1%
fairness	11.8%	10.6%	1.9%	23.0%	15.2%
Negative reciprocity	12.7%	9.9%	7.8%	21.6%	15.2%

B. Reasons for not punishing

profit maximizing	45.1%	42.6%	58.3%	27.0%	48.5%
difficult to change the system or ineffective punishment system	10.1%	5.7%	12.6%	16.2%	9.1%
bribe may be for a good purpose or may be necessary	3.6%	2.8%	7.8%	4.1%	0.0%
N	417	141	103	74	99