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Finding the Stronger Impact among Bribery, Financial Reward, and Religious Attitude: The Insights of Experiment on Environmental Tax Compliance in Indonesia

Deden Dinar Iskandar¹, Tobias Wuenscher²

Abstract

The degradation of environmental quality has been one of the main concerns in Indonesia. The government has mentioned the environmental tax as the instrument of environmental management; however, the primary potential problem will be the issue of compliance. Inspired by the situation in Indonesia, this study is expected to contribute on environmental regulation and tax compliance literatures by examining and comparing the impact of bribery, financial reward, and religious attitude on compliance in a developing country where the bribery prevails. The study employs laboratory experiment approach. The results indicate that bribery has the strongest impact; the presence of bribery significantly worsens the compliance. Financial reward enhances the compliance only if the bribery is curbed, while religious attitude has no significant impact.

Keywords

Environmental tax, compliance, laboratory experiment

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1. INTRODUCTION

The cost of environmental degradation in Indonesia has been highlighted in the Country Environmental Analysis by World Bank (2009). According to the analysis, environmental degradation resulted from the problem of water and sanitation deficiency projected to lead to significant health problem and other welfare costs. World Bank analyzes that environmental degradation cost will grow in the future at the same annual growth rate. In order to mitigate the adverse impact of pollution on environmental, the application of environmental tax levied on polluting companies has been mainstreamed since 2008 by Ministry of Finance (MoF).

However, there are potential problems that should be taken into consideration for the success of environmental tax. First, taxes obviously increase the cost for companies. Since monitoring mechanism to enforce the compliance is costly, compliance behavior of companies is not fully observed to MoF agency. In this case, companies may tend to evade tax liability. Martowardojo, the current Finance Minister of Indonesia, mentions that the level of compliance with corporate tax is still low (Koran Jakarta, 2011). There are only 3.6% of corporations compliantly pay the corporate taxes. This fact indicates the high degree of tax evasion in Indonesia. Tax evasion is an illegal action designed to lessen tax liability, particularly by underreporting the tax objects. In the case of environmental tax, evasion could be translated into underreporting the actual level of emission and consequently lessening the environmental tax obligation. Another problem that could hinder the success of environmental tax is the presence of bribery practice in taxation office. The survey of Transparency International Indonesia in 2010 places taxation office in the top list of corrupting governmental agencies in Indonesia.

Corruption has been long considered in the existing literature environmental performance as one of the major sources of environmental damage. O'Connor (1994) in a survey of environmental regulations suggests that the problem of imperfect monitoring is complicated by the weak enforcement in the developing countries within the coverage of his survey. He explains that when the violators of environmental regulation are found, they can be exempted from the penalty because of the financial influence they may utilize through bribery. Desai (1998) concludes from his comparative study of ten countries that corruption leads to environmental degradation. He states that corruption by mid and low-level of officials is endemic in industrializing countries, and violation on environmental regulations is commonplace in that situation. Corruption may refer to the act of offering the bribe to the politicians who legalize the policies or the administering officials who execute the regulations, in an attempt to avoid the consequence of environmental regulation (Wilson and Damania, 2005).

The study of bribery in environmental perspective is important for the policy purpose; however, the problem of bribery is scarcely examined in the literature of environmental compliance. In this study, the compliance behavior of polluting companies in the presence of bribery is approached using the laboratory experiment. While the procedures of laboratory experiment are simpler than the realistic activities, the processes are real in the sense that real people are participating for real profits and following the real regulations (Plott, 1982).

This study aims to examine the effect of different environmental tax schemes on the compliance behavior under different bribery settings. In this study, the tax scheme is defined as a combination of tax rate, sanction rate, financial reward rate, cost of bribe,

and auditing probability. In addition to bribery and environmental tax scheme, this study also brings in religious attitude as a determinant of compliance. The religious concern is believed to provide moral encouragement for its believer to comply with their obligation and responsibility and prevent them from defiant behavior.

This study is expected to contribute on the literature of environmental tax compliance by examining the financial reward as the determinant variable in the presence of bribery. Furthermore, this study tries to include the effect of the bribe cost and religious attitude on the compliance. To the author's knowledge, the effect of financial reward on compliance under the influence of bribery has been scarcely investigated in the existing experimental literature; neither are the effect of bribe cost and religious attitude.

The rest of the paper is ordered as follows. The next session following the introduction part will present the brief review of experimental literature on tax compliance, followed by the description of the experiment method. The following session will present and discuss the results of the experiment, and concluded by the session of conclusion and policy recommendation.

2. LITERATURE REVIEW

With the exception of its unique objective to prevent the degradation of environmental quality, the environmental taxes are comparable to the other taxes designed by the government. Allingham and Sandmo (1972) apply the economics of crime approach as pioneered by Becker (1968) to investigate the tax compliance. Their study assumes that the taxpayers are weighing the potential costs of noncompliance against the potential benefits. The model presents the insight that tax evasion is negatively correlated with tax rate, detection probability and severity of punishment. Reinganum and Wilde (1985) also consider the detection probability and sanction rate in their analytical model. The impact of detection probability and noncompliance penalty are found to be positive, and they conclude that some combination of these variables will provide an optimal tax policy. However, they do not formulate the proper combination in their paper.

The first experimental research on tax compliance by Friedland, Maital, and Rutenberg (1978) examine the determinants of tax evasion. They conclude that the tax rate is the most important determining factor of tax evasion. The experimental result also suggests that the compliance is influenced stronger by the magnitude of fine than by audit probabilities. The latter result is supported by Park and Hyun (2003) who find that the magnitude of fine affects the compliance stronger than the probability of audit. However, Friedland (1982) reports that audit intensity affect compliance more than the severity of fine.

Beck, Davis, and Jung (1991) investigate the effects of variations in determinant variables, including tax rate, penalty rate, and audit probability on reported taxable income. The results support their hypothesis that the taxpayers will increase their compliant behavior as the detection probability and penalty rate increase. However, different with the finding of Freidland, Maital, and Rutenberg (1978), the tax rate is not found to influence the compliance behavior of taxpayers. The insignificance of the tax rate is also found in the experiment by Baldry (1987) and Porcano (1988), both study the self-reported compliance behavior.

Alm, Jackson, and McKee (1992a) conduct the experiment with declared income as the dependent variable. The independent variables employed in their experiment are income, tax rate, fine rate, audit rate, and a public good. The results show that a higher tax rates significantly lessen the tax compliance. The fine is also found to deter the evasion, although the impact is virtually zero. Alm, Sanchez, and De Juan (1995) show that fines are only effective in combination with high audit frequency. Their experiment suggests that the interaction of both variables is more important than their separate effects.

A Meta Study by Blackwell (2007) based on twenty experimental studies examines the impacts of traditional economic determinants of tax compliance: the tax rate, the penalty rate, and the probability of audit. In addition, it also examines the effect of the public good return to taxes payment. The study finds strong evidence that increasing the penalty rate, audit probability, and marginal-percapita return to the public good positively affect the tax compliance, but finds no statistically significant effect of the tax rate on compliance.

The effect of rewards has not been investigated extensively in the experimental study on tax compliance. The study of Alm, Jackson, and McKee (1992b); Torgler (2003); Bazart and Pickhardt (2009); and Kastlunger et.al (2010) are among a few of experimental studies that examine the effect of financial reward. Alm, Jackson, and McKee (1992b) observe the effects of financial reward on compliance behavior with multiple periods experiment. Compared with a control condition, tax compliance is higher when the reward is available. Torgler (2003) conducts a one-shot experiment with professionals from Costa Rica. Tax compliance in this experiment is higher when financial rewards are offered for an accurate report. Bazart and Pickhardt (2009) conduct the experiments in which the rewards are given in the form of a lottery for audited and completely honest reports. The results show that the financial reward has a positive impact on compliance. However, Kastlunger et.al (2010) find from their experiment that providing the reward to honest taxpayers does not generally increase the tax revenue.

With regard to the issue of tax compliance and corruption, the analytical research of Chander and Wilde (1992) suggests that the expected government revenue may be lower in the presence of corrupted officials. Moreover, when bribing is allowed and tax evaders are willing to pay the bribe, the increase in fines and tax rates may lower the tax returns. The experiment by Bilotkach (2006) examines the issue of tax evasion by companies through underreporting activity. He develops the game in which a businessman can hide part of his profit and offer bribe to the official. The results reveal that once it becomes known that supervising officials agree to accept bribes, participants offer bribes more aggressively and the magnitude of underreporting increases.

Few studies have investigated the influence of religiosity over tax evasion. Empirical research by Grasmick et.al (1991) finds that both church attendance and personal religious convictions have a significantly negative impact on tax evasion. Pack and Kposowa (2006) use the data from 36 countries in their cross country research to study the impact of religiosity on tax fraud acceptability. The results indicate that the tax fraud acceptability is decreasing when the level of religiosity is higher. Richardson (2008) studies the relationship between culture and tax evasion across countries using ordinary least squares (OLS) technique. Based on the data from 47 countries, he finds that the lower level of religiosity, the higher is the level of tax

evasion across countries. However, the study of Uadiale et.al (2010) on tax compliance in Nigeria fails to establish a significant relationship between religious variables and tax evasion.

3. METHOD

This study use laboratory experiment for several reasons. First, laboratory experiment enables to control the behavior of subjects in the way that is typically impossible in the field. It prevents external influencing factors and restricts confounding external factors. Second, laboratory experiment allows manipulating the circumstances and the corresponding behavior, and hence enables to address the issue of causality. Third, testing alternatives institutional arrangement and policies in laboratory setting is obviously less costly than in the real life.

Experimental study employs scientifically designed experiment under laboratory setting in order to generate reliable empirical results. It is directed to address decision-making in an economically relevant designed situation of economic agents acting in their own best interest. Experimental study is operationalized by developing the circumstances, institutional arrangement and policies in a laboratory setting, placing experimental subjects into laboratory setting, and finally observing the behavior of those subjects in the laboratory setting. Subjects can earn and lose money by making those decisions. Real and significant financial reward, where subjects are paid according to their success in decision making, is an important element in the experimental study.

The experiment is conducted in Indonesia with university students as participants. Baldry (1987) states that the responses of students are comparable to the behavior of other subjects under the same laboratory setting. The reason for this would be that the cognitive processes in the experiment are the same between subject pools (Alm, 1998). Students have been employed in previous experiments to investigate the firms' behavior. Fehr et al. (1993) in the first experimental study on the existence of wage exchanges employs students in their research to imitate the interaction between firms and workers. Other researches on wage contracts (Fehr and Gächter, 2000; Fehr and Falk, 2003; and Brandts and Charness, 2004) also use students to assume the role of firms. Students are also recruited as the subjects in the experiments on firms behavior in the oligopolistic setting (Le Coq and Orzen, 2006; Morgen et al., 2006; and Orzen, 2007).

3.1 The determinant variables

The laboratory setting uses traditional treatments' variables of the tax compliance scheme such as tax rate, sanction rate, and probability of audit. Contributing to the existing tax compliance literature, this research includes the financial reward as the additional parameter to existing enforcement factors. Since existing literatures (see Torgler, 2002) suggest that not only economic instruments but also institutional setting could influence the compliance behavior, this research includes the bribery in the experiment setting.

The religious attitude is included as the determinant of compliance. The common measures for religious attitude in the literature are mostly the level of attendance in the church and the intensity of personal religious practices (such as daily praying).

However, in the case of Indonesia, most of people attend the service in the mosque (or church) on weekly basis and most Moslem in Indonesia regularly offers the prayer five times a day. Therefore, those measures cannot be used to distinguish the depth of religious concern among the experiment participants. As an alternative, the religious attitude in the experiment is approached using the involvement of participants in religious based organizations. It is assumed that the participant who are actively involved in religious organizations have a profound religious understanding and sincerer religious attitudes.

The risk attitude of participants is controlled to distinguish whether the compliance behavior is driven by changing fiscal parameters or merely due to the risk attitude of participants. The risk attitude is measured by assessment on the perception of participants on the certain statement. The assessment basically refers to the risk characteristic appraisal applied by financial investment institutions.

3.2 Design of the experiment

The design of an experiment should be simple enough to conduct, without losing the basic features of the calibrated real situation. Therefore, for the sake of simplicity, this experiment uses the assumption that the income received by polluting companies is linearly corresponding with the emitted pollutant.

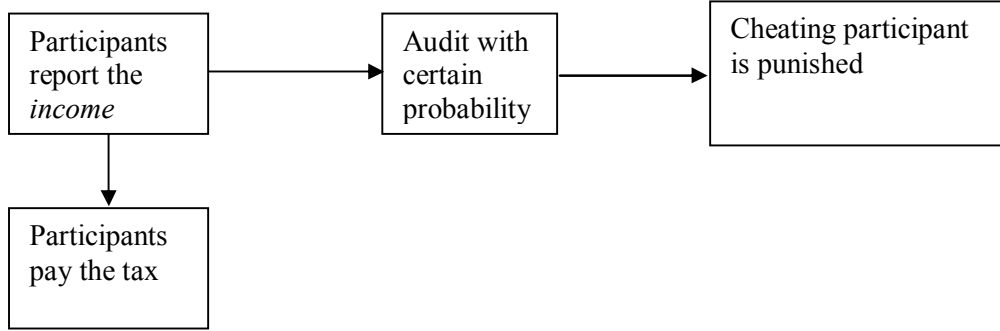
The experiment is divided into four different treatments. Treatment 1 is the basic experiment. It simulates the taxation condition when the reward for the accurate report is not offered and bribery is kept out. Participants receive the income, and they have to decide the amount of income that they are willing to report voluntary. Their reported income will be a basis for tax payment that will be deducted from their income. Participants face the probability of audit, and the cheating-participants will be charged by the sanction. Three determinant variables determined by the experimenter in this treatment are tax rate, probability of audit, and sanction rate.

$$\psi = \pi - (t.r + \rho.(S)) \quad (1)$$

Where $S = s.t.(e - r)$

The payoff of participants gained from the game (ψ) is the income (π) less the tax payment ($t.r$), where t is a tax rate and r is the amount of voluntarily reported income. The probability of getting audited is indicated by ρ . If they are audited and found cheating, their income will be further reduced by the sanction (S) proportional to the size of the unpaid tax. The unpaid tax is represented by $t.(e-r)$, where e denotes the actual income. The amount of sanction is given by $s.t.(e-r)$, where s is the sanction rate.

Figure 1.
Sequence of actions in treatment 1



The sequence of actions in treatment 1 is illustrated in Figure 1. First, participants decide the amount of received income that they are willing to report, given different values of treatment variables. Obviously, at the same time they also make a simultaneous decision regarding whether they will comply or cheat. Reporting the true amount of income means complying, while reporting less than the received money is considered cheating. After participants submit the reported income, their income will be deducted by the amount of tax proportional to their reported income. The report will be audited with certain probability. Participants who are found cheating will be punished by deducting their income with the amount of sanction.

Financial reward is introduced in treatment 2, while bribery is still excluded from the experiment setting. Treatment 2 represents the situation where the financial reward is awarded in return of true report after auditing process is completed. Participants are not only punished for cheating, but they are also encouraged to report accurately by providing them the reward for doing so. The determinant variables determined by the experimenter are tax rate, probability of audit, sanction rate, and reward rate.

$$\psi = \pi - (t.r + \rho.(\alpha.(S) - (1 - \alpha).(I)))$$

(2)

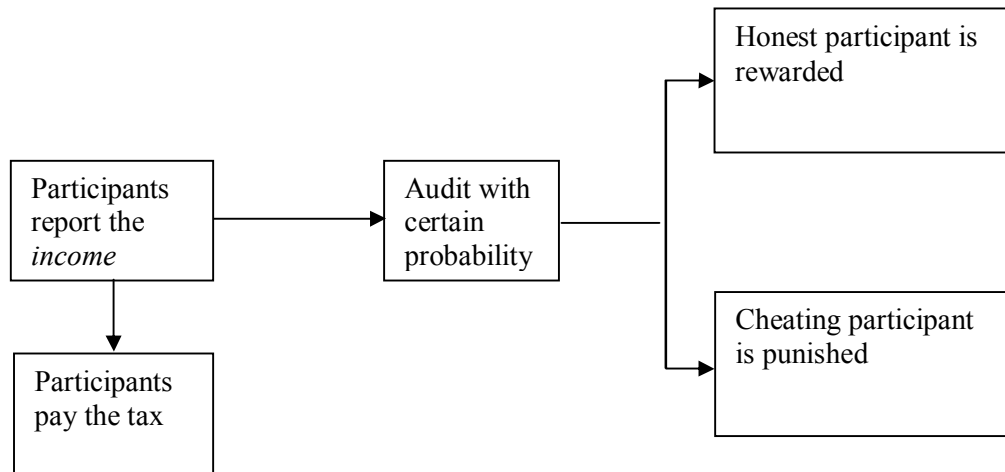
Where $S = st.(e - r)$ and $I = i.t.e$

The payoff obtained by the participants is the income less the tax payment. Their income will be deducted further by a certain amount of sanction if they are detected cheating. However, if they are found to submit the true amount of income, they will be given a financial reward, I . I is defined by $i.t.e$, where i is the reward rate. The amount of reward is proportional to the amount of reported income. α is a choice parameter where the value is 1 if the participants choose to cheat and 0 if they decide to report the true income.

Given the values of determinant variables, participants decide their reported amount. Next, the participants who are audited will have two alternative outcomes. Their income will be reduced by the certain amount of sanction if they send an understated

report, or their income will be increased by a certain amount of reward if they submit a true report. The sequence of actions in treatment 2 is illustrated in Figure 2.

Figure 2.
Sequence of actions in treatment 2



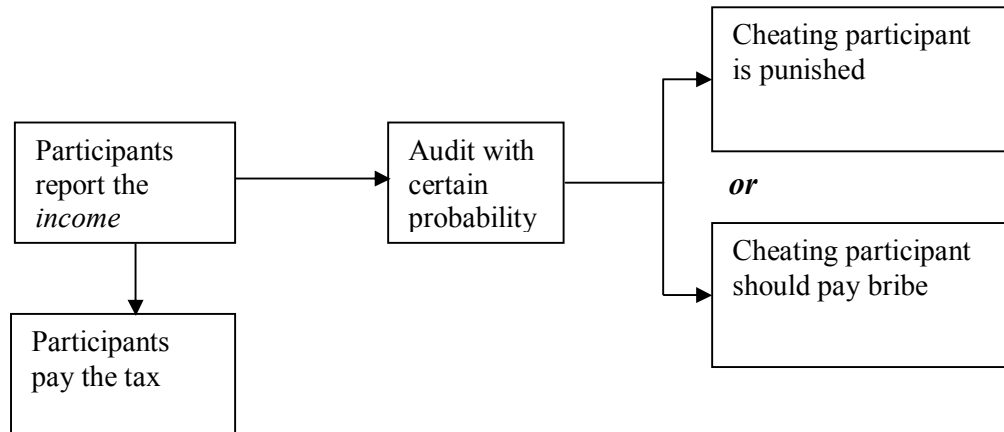
Treatment 3 calibrates the situation where the bribery is practiced while the reward for fully reporting the income is not implemented. This treatment closely illustrates the current situation in Indonesia, where the taxation office is afflicted with bribery practice and government has not yet provided the financial reward for the accurate reports. Bribery is translated into the option for sanctioned participants in this experiment to choose between paying the penalty and paying bribe to avoid the sanction. Bribe rate is introduced in this treatment to indicate the bribing cost that has to be paid by the participants. Bribe is designed to be lower than the sanction, matching the real-life situation. The determinant variables determined by the experimenter in this treatment are tax rate, probability of audit, sanction rate, and bribe rate.

$$\psi = \pi - (t.r + \rho.(\alpha.S + (1 - \alpha).(B))) \quad (3)$$

Where $S = (s.t.(e - r))$ and $B = b.s.t.(e - r)$

The payoff gained by participants closely similar with the treatment 1. However, now the cheating participants who are caught during auditing process are offered to pay the bribe in exchange of the sanction. The bribe is proportional to the amount of sanction, defined by $b.s.t.(e - r)$ where b is the bribe rate as a percentage of the sanction. In the equation (3), α is a choice parameter where the value is 1 if the participants decide to pay the sanction and 0 if they choose to bribe. The controlled parameters in this treatment are tax rate, sanction rate, bribe rate, and probability of audit. The sequence of actions in treatment 3 is illustrated in Figure 3.

Figure 3.
Sequence of actions in treatment 3



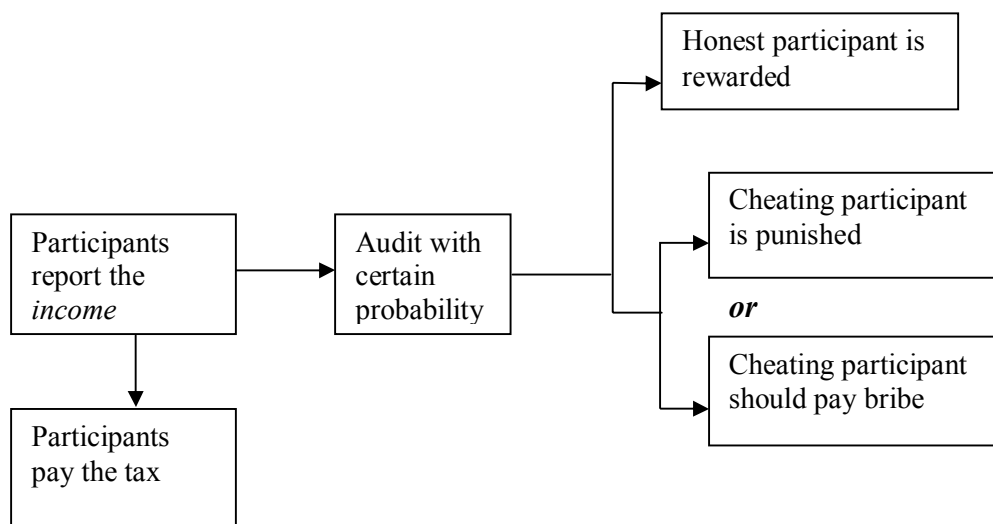
Treatment 4 is the most complex treatment, in which all determinant variable used in the previous three treatments are employed. Aside of the traditional parameter such as tax rate, probability of audit, and sanction rate; reward rate and bribe rate are also included in the treatment. This treatment is calibrated to represent the taxation game under the presence of bribery, while the reward for reporting truthfully is offered. The payoff is described by equation (4).

$$\psi = \pi - (t.r + \rho.(\alpha.(\beta.S + (1 - \beta).B) + (1 - \alpha).(I))) \quad (4)$$

Where $S = (s.t.(e - r))$, $B = b.s.t.(e - r)$, and $I = i.t.e$

α and β in equation (4) are the choice parameters. The value of α is 1 if the participants decide to underreport the received income and it is 0 if they report truthfully. β indicates the decision of cheating participants who are getting audited. The value of β is 1 if the cheating participants prefer to pay the sanction, and it is 0 if they rather pay the bribe.

Figure 4.
Sequence of actions in treatment 4



The sequence of actions is presented in Figure 4. The design is similar with treatment 3. However, in this treatment participants will get the reward in return of submitting the true report after auditing process is concluded. On the other hand, the participants who are caught cheating will be compelled to pay the cost of cheating (in term of sanction *or* bribing cost) after their report is checked.

The game in all treatment groups consists of 24 rounds, in which the values of controlled parameters are randomly picked up so that different combination of values occurs for each round in all treatments. The gap between each value is set distinctly wide so that the difference is noticeable to participants.

3.3 Data analysis

Standard econometric techniques are used to analyze the data of the experiments. The proxies of compliance are regressed on determinant variables using panel data regression. The repetition of games in each treatment provides the panel dataset, where the participants' decision responding to the changing values of determinant variables are observed over time. Panel data allows controlling variables that change over time but not across participants (the parameters of which the values are determined by the experimenter); and variable that is different across participants but does not change over time (risk and religious attitudes of the participants).

Random effect model is chosen to analyze the panel dataset from the experiment. The variation across participants is assumed to be random and uncorrelated with the value of determinant variables included in the model. This assumption is justified since the value of determinant variables over time is selected randomly by experimenter, independent of the characteristics of the participants. Random effect is also preferable if the characteristics of participants (risk and religious attitudes) are assumed to influence their decision. The random effect model assumes that the error term of cross-sectional unit in the model is not correlated with the independent variables, therefore, allowing the time-invariant variables to be used as explanatory variables.

However, the choice of the random effect model should be justified by statistical procedures. Therefore, following standard procedure on panel data regression, the analysis on panel data is started with the Hausman test to select between random effect and the alternative model (fixed effect model).

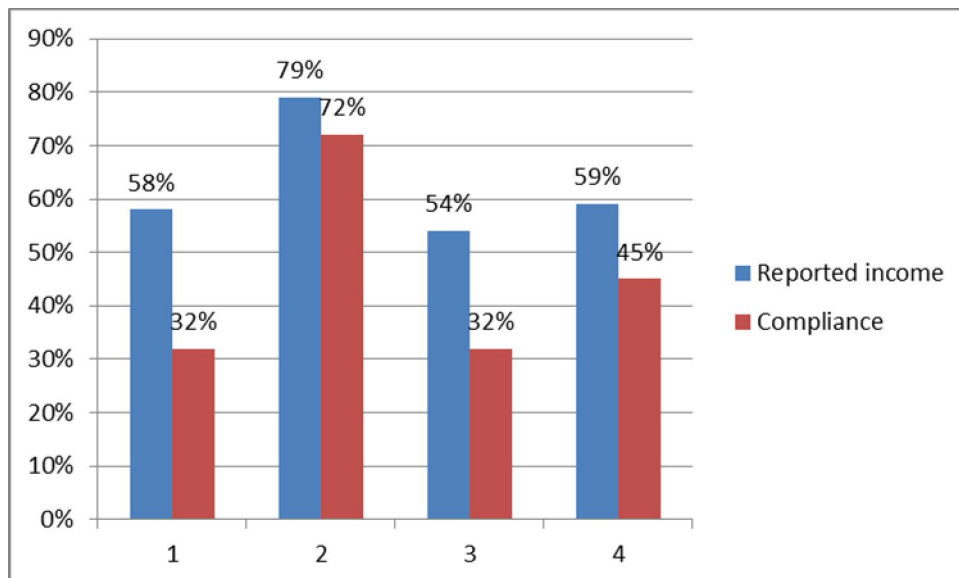
4. RESULTS

4.1 Compliance behavior of participants

The compliance is approached using two proxies. The first proxy of compliance is the reported income. The reported income is expected to give the information regarding the degree of compliance, implying that the more amount of income reported by participants, the higher their tendency to comply. The second proxy of compliance in this experiment is the complying decision. Complying in this research is interpreted as the action where the participants report the actual received income. It can provide the information regarding absolute compliance, which is consisted of only two dichotomous values; cheating or complying. Participants are only considered compliant if they report the full amount of received income.

Compliance behavior is measured with the mean of reported income as the percentage of received income and the percentage of complying decision during the experiment. In the group under treatment 1, where there are no reward and bribery, the mean of reported income is 58%. It indicates that in the average, participants only report 58% of their real income. The occurrence of complying decision is 32%, meaning that only 32% of participants are reporting the complete amount of their received income during the experiment. When the reward is introduced in the treatment 2, the mean of the reported income increases to 80% and the compliance increases to 72%. Under the circumstance where bribery does not exist, the introduction of reward clearly increases the complying decision.

Figure 5.
Compliance behavior of participants



Treatment 3 and 4 are set to simulate the situation where bribery is practiced and bribe rate is added as a determinant variable. In general, the complying decision of participants under treatment 3 (where there was no offer of reward for compliance and participants are given the choice to bribe instead of paying the sanction) is slightly lower than the compliance behavior of participants under treatment 1 with the same treatments but excluding the presence of bribery. The mean of reported income is lower (54%) while the occurrence of compliance is equal (32%). When the reward is introduced in the treatment 4, the mean reported income increase to 59% and the compliance increase to 45%. It indicates that under bribery setting, the introduction of reward only vaguely increase the reported income. However, the reward is able to increase the complying decision in a more considerable magnitude, although it is still lower than the compliance due to the availability of financial reward when bribery is fully prevented (treatment 2).

Comparing the compliance behavior under the absence and the presence of bribery reveals the fact that when a financial reward is not available, the complying decision of participants is similar. The availability of financial reward affects differently the behavior of participants under different bribery settings. The reward increases the level of compliance of participants when bribery is absent; however, the positive impact of financial reward is decreased when the cheating participants are allowed to bribe.

At this stage, it is still unknown whether the difference of complying decision among different treatments is indeed significant, or it is simply due to the random chance. Therefore, it is necessary to conduct the mean difference t-test. The t-test examines the probability that the difference between the two means is caused by chance. If the difference is statistically significant, it is safe to say that the difference across groups is not caused by random chance. Student's t-test was conducted to test the mean difference of the paired groups with equal variances; otherwise, Welch's t-test was run.

Table 1.

Reported income		Complying decision	
	t-test		t-test
1 and 2	-10.13** (0.00)	1 and 2	-15.73** (0.00)
1 and 3	0.51 (0.13)	1 and 3	0.23 (0.81)
2 and 4	9.43** (0.00)	2 and 4	10.30** (0.00)
3 and 4	-1.94 (0.06)	3 and 4	-5.19** (0.00)

Note: * significant at 5% significance level , ** significant at 1% significance level
Value in the bracket is P-value

Table 1 shows the difference of the mean of reported income and the complying decision among all treatment groups. The difference of reported income between treatment 1 and 2 is significant, so is the difference between treatment 2 and 4. On the contrary, the difference of reported income between treatment 1 and 3 is not significant, and neither is the difference between the treatment 3 and 4.

The complying decision of participants in the absence and the presence of bribery are not significantly different when financial reward is not offered (treatment 1 against 3). However, the difference of complying decision due to the implementation of financial reward is significant, under both the absence and the presence of bribery practice (treatment 1 against 2; treatment 3 against 4). The complying decision when the reward is available is also significantly different before and after the inclusion of bribery (treatment 2 against 4).

4.2 Determinants of compliance behavior

This study modeled the compliance behavior as a function of treatment variables such as tax rate, sanction rate, reward rate, bribe rate, probability of audit, religious and risk attitudes. Firstly, the reported income as the first proxy of compliance is regressed on determinant variables using Panel Data Regression approach. The first step in the analysis is applying Hausman test to check whether the unique errors are correlated with the independent variables. Hausman test on the regression models reveals that the null hypothesis of uncorrelated errors is not rejected. Therefore, the random effect is more preferable than the alternative fixed effect model. The regression results of the reported income are presented below.

Table 2.
Determinants of reported income

Determinant of reported income	Treatment 1	Treatment 2	Treatment 3	Treatment 4
Tax rate	0.03 (0.47)	0.03 (0.47)	-0.37** (0.00)	-0.15** (0.00)
Sanction rate	0.09* (0.03)	0.02 (0.69)	0.10* (0.02)	0.11** (0.01)
Financial reward rate	n.a	-0.04 (0.39)	n.a	0.07 (0.12)
Bribe rate	n.a	n.a	0.15** (0.00)	0.10* (0.03)
Audit probability	0.51** (0.00)	0.41** (0.00)	0.37** (0.00)	0.53** (0.00)
Religious attitude	-0.16 (0.08)	0.04 (0.78)	-0.03 (0.74)	0.00 (0.98)
Risk	-0.04 (0.53)	0.00 (0.99)	-0.02 (0.77)	-0.04 (0.41)

Note: * significant at 5% significance level, ** significant at 1% significance level
The value in the bracket is P-value

The coefficients in the table represent the percentage of change in reported income as one unit change in determinant variables. During all treatments, the risk characteristic and the religious attitude of participants do not have a significant impact on their decision in deciding the amount of reported income.

In the treatment 1, the determinant variables that significantly affect the reported income during the experiment are sanction rate and audit probability. Those variables are significant at 5% and 1% significance level respectively. The results show that audit probability has a greater impact on reported income. On the other hand, the tax

rate is not affecting the decision of participants in reporting their income. The only significant determinant in treatment 2 is audit probability (significant at 1% significance level), while the rest of the determinant variables are not significantly affecting the decision of participants. Financial reward rate, the additional instrument to augment the compliance of the represented tax payers, is also insignificant.

The impact of the tax rate in treatment 3 and 4, where the bribery practice is introduced into the experiment, is significant at 1% level of significance. The increase of tax rate will lead to the decrease of reported income. When the financial reward is introduced in treatment 4, the size of reduction due to one unit increase in the tax rate is smaller. Sanction rate and audit probability show the significant influence on the decision of participants in treatment 3 and 4. Both are showing a positive impact of reported income and significant at 1% significance level. Bribe rate, the additional determinant variable of compliance under the presence of bribery, also shows a significantly negative impact on reported income at 1% and 5% level of significance in treatment 3 and 4 respectively. Following one unit increase in the bribe rate, the decrease of reported income in the treatment 4 is lower than the decrease of reported income in the treatment 3.

So far, the regression results indicate that financial reward has no significant influence on the reported income. Since the impact of financial reward is the one of the main concern of this research, it is necessary to ensure whether the introduction of financial reward will make a different in the reported income. Therefore, financial reward is translated into the dummy variable consisted of binary values. Zero value represents the condition without the financial reward, and 1 if the financial reward is offered. Financial reward dummy is regressed on reported income, together with other controlled variables.

Table 3.

Determinants of reported income with financial reward dummy

Determinant of reported income	Treatment without bribery	Treatment with bribery
Tax rate	0.02 (0.33)	-0.25** (0.00)
Sanction rate	0.07** (0.00)	0.12** (0.00)
Bribe rate	n.a	0.13** (0.00)
Probability of audit	0.46** (0.00)	0.44** (0.00)
Religious attitude	-0.09 (0.24)	-0.01 (0.89)
Risk attitude	-0.01 (0.72)	-0.03 (0.37)
Reward dummy	0.21** (0.00)	0.04 (0.50)

Note: * significant at 5% significance level, ** significant at 1% significance level
The value in the bracket is P-value

The results presented in Table 3 show that financial reward dummy is statistically significant in influencing the reported income when bribery is kept out. The availability of financial reward increases the reported income under the absence of bribery. The significance of financial reward dummy may explain why financial reward rate does not affect the reported income in the treatment 2. The main motivation that drives the participants to be more compliant is not the amount of financial reward, but the availability of the reward itself. Participants are more motivated by the presence of financial reward instead of the size of the reward. As long as the reward is provided, they will be more compliant regardless of the amount of the reward. However, when the bribery practice is introduced, financial reward becomes insignificant. It clearly indicates that the introduction of financial reward for compliance is only effective in affecting the reported income in the absence of bribery.

In the second regression analysis, the complying decision as the second proxy of compliance is regressed on determinant variables using Panel Logistic Regression approach. The regression results are presented in the Table 4 below.

Table 4.
Determinants of complying decision

Determinant of complying	Treatment 1	Treatment 2	Treatment 3	Treatment 4
Tax rate	0.96 (0.91)	1.47 (0.37)	0.05** (0.00)	0.26** (0.00)
Sanction rate	2.59** (0.01)	1.26 (0.63)	3.73** (0.00)	2.72** (0.00)
Reward rate	n.a	0.79 (0.62)	n.a	1.66 (0.13)
Bribe rate	n.a	n.a	6.39** (0.00)	1.96* (0.05)
Probability of audit	19.56** (0.00)	42.38** (0.00)	20.48** (0.00)	27.41** (0.00)
Religious attitude	0.69 (0.67)	4.65 (0.29)	1.12 (0.89)	0.98 (0.98)
Risk attitude	0.83 (0.72)	1.33 (0.56)	1.32 (0.63)	0.75 (0.44)

Note: * significant at 5% significance level, ** significant at 1% significance level
The value in the bracket is P-value

The values in Table 4 are the odds ratio, indicating the odds that participants are compliant due to one unit increase in explanatory variables. In general, the results almost similar with the regression that used reported income as the proxy of compliance. In the treatment 1, two determinants are significantly affect the compliant behavior or participants. Sanction rate and probability of audit, both are significant at 1% significance level, present the positive impact on the odd that participant will report the true amount of income. The increase in sanction rate and probability of audit increase the odds that participants are being compliant. The impact of probability of audit is stringer than the impact of sanction rate.

The only significant determinant in the treatment 2 is the probability of audit, which is significant at 1% level of significance. The increase in probability of audit enhances the odds of participants to comply. In the treatment 3, sanction rate, probability of audit, and bribe rate significantly increase the odds of participants to submit the true report; while on the other hand, the tax rate is found to have the opposite impact. All of those variables are significant at 1% significance level.

Similar results to treatment 3 are found in the treatment 4. The increase in sanction rate, bribe rate, and probability of audit enhances the odds of participants to be compliant. On the other hand, the increase in the tax rate is more likely to urge the tendency to cheat. The rest of determinant variables are not significantly affecting the odds of the participants to comply.

Since the values of financial reward rate is found to be insignificant in affecting the tendency of participants to be compliant, it is in the interest of this study to see whether the introduction of financial reward is (or is not) significantly influence the compliance behavior. Therefore, financial reward was translated into the dummy variable, with 0 represents the condition without the financial reward and 1 if the financial reward was available. Financial reward dummy is regressed on compliance decision, together with other controlled variables. The results are presented below.

Table 5.
Determinants of reported income with financial reward dummy

Determinants of compliance	Treatment without bribery	Treatment with bribery
Tax rate	1.03 (0.89)	0.12** (0.00)
Sanction rate	1.92** (0.01)	3.67** (0.00)
Bribe rate	n.a	3.22** (0.00)
Probability of audit	29.02** (0.00)	22.66** (0.00)
Religious attitude	1.21 (0.79)	1.13 (0.82)
Risk	1.07 (0.84)	0.90 (0.73)
Reward dummy	24.36** (0.00)	2.67* (0.05)

Note: * significant at 5% significance level, ** significant at 1% significance level
The value in the bracket is P-value

The results confirm the previous finding of regression on reported income. Financial reward dummy is significantly affecting the odds of compliance. Under the absence of bribery, the offer of financial reward increases the odds that participants will submit the true report. When the compliance is approached using the complying decision, the reward is still able to significantly increase the odd of compliance even under the influence of bribery. However, in the presence of bribery, the odds of participants submitting the true report due to the availability of the reward is lesser.

4.3 Discussion

In the absence of bribery, the amount of reported income and the incident of the compliant decision (where the participants report the income truthfully) increase after the financial reward is introduced. The test of mean-difference confirms that the difference before and after the application of reward is significant. It implies that the introduction of reward can increase the compliance, by both increasing the reported amount and the complying decisions. However, reported income does not become higher after the application of financial reward in the presence of bribery, while the compliance occurrences only slightly increase. This demonstrates that the positive impact of financial reward is crowded out by the presence of bribery.

In the absence of financial reward, behavior of participants is not different before and after the inclusion of bribery setting in the treatment. This result is in contrast with the study of Chander and Wilde (1992) and Bilotkach (2006), which find that underreporting increases in the presence of a corrupted tax official. The reason for this might be that participants are constantly driven by economic motive to minimize the loss of income by reducing the tax payment, whether the bribery is practiced or not. It could also indicate that in general the people in Indonesia are still lack of compliance with regulation.

The impact of tax rate is not statistically significant in influencing the compliance when bribery is excluded from the experiment setting. However, the tax rate shows a significantly negative impact on compliance under the presence of bribery. The last finding confirms the study of Aïm, Jackson, and McKee (1992) that a higher tax rates significantly lessen the tax compliance. The argument for this ambiguity could be that participants are more aggressively underreporting the income under the presence of bribery. Participants find that the cost of the sanction could be evaded all the time by paying the bribe, which is inferior to the amount of sanction. When the tax rate increases, participants directly respond to it by decreasing their report.

The regression results show that the effect of audit probability on compliance is more considerable than the effect of sanction rate. The values of coefficients indicate that the impact of audit probability is greater than the impact of sanction rate in all treatments. This result is in line with the finding of Friedland (1982) that audit intensity affects the compliance stronger than the severity of fine.

The offer of financial reward on compliance is indeed significant in increasing the compliance when the bribery is fully prevented. It should be noted from the experiment that the size of financial reward is not significant; what is most important to encourage the compliance is the availability of the reward itself regardless the amount of the reward. However, when bribery is practiced, the availability of financial reward only significantly induces the tendency to comply but does not increase the reported income in general. Moreover, the tendency to comply due to financial reward is lower. It indicates that only participants who are inclined toward compliance will be encouraged to submit the true report by the presence of the reward. On the other hand, the rest of the participants who are more motivated to gain the economic benefit will not be affected by the reward if the gain of cheating is more profitable. Since the bribery provides them with a lower cost of evasion, they will continue to underreport the income. Therefore, the application of financial reward is not able to augment the reported income in the presence of bribery.

The effect of religious attitude, which is approached as the involvement of participants in the religious based organization, does not significantly induce the compliance in all treatments. This result is in line with the study of Uadiale et.al (2010) on tax compliance in Nigeria, which fails to establish a significant relationship between religious variables and tax evasion. The rationale behind this result could be simply that the all participants are motivated to gain the economic benefit, regardless their religious attitude. Another reason would be that the religious participants do not find the tax evasion as an unethical attitude. The survey of McGee et.al (2011) in Turkey, which is Moslem majority country, finds that the opposition to tax evasion is weak in the cases where the government is perceived as being corrupt and the system is unfair. The same reason could be applied in the case of Indonesia, where the government is still heavily afflicted with the corruption issues and unfairness.

Incorporating the bribe rate as a determinant variable of tax compliance is proven to be a correct choice. The bribe rate significantly affects the compliance of participants. Participants perceived bribe rate as the price of evading the punishment. The lower bribe rate indicates that the price for evading the punishment of cheating decreases; thus, participants are encouraged to lower their compliance. Accordingly, the increase in bribe rate tends to increase the tax compliance.

5. CONCLUSION AND POLICY RECOMMENDATION

The study finds that the presence of bribery does not much reduce the compliance. Although the bribery is fully prevented, the compliance behavior is not much different. However, this finding does not imply that bribery does not possess bad influence on compliance; instead, it confirms the fact that the nature of tax compliance behavior in Indonesia is still low.

The bribery is indeed harmful to the compliance in the way that it disrupts the effectiveness of environmental tax scheme and enforcement policies. Bribery practice augments the negative consequence of tax on compliance, by encouraging aggressive tax evasion as tax rate increases. Bribery also curbs the positive impact of financial reward on compliance, which is able to significantly enhance the compliance (regardless the value of the reward) before bribery takes place. On the other hand, the introduction of financial reward may be able encourage the tendency to comply under the presence of bribery, although the impact is not as great as that without bribery. The study also finds that the religious attitude is not able to induce the compliance with tax.

Based on the findings in this study, the proposed environmental tax scheme under the presence of bribery and costly monitoring would be a combination of moderate tax rate, moderate financial reward on compliance, accompanied by a high sanction for tax evasion. Since the bribe rate also has a significant impact on compliance decision, the enforcement policies directed toward corrupting tax officer that eventually lead to the increase in the cost of the bribe is recommended. Another insight from this experiment is that the government may forget the moral campaign to encourage the compliance, as long as the problems of corruption still exist.

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