

The effect of knowing how tax money is spent and the distance with tax revenue's potential beneficiaries on tax compliance

El efecto de conocer cómo se invierten los impuestos y la distancia geográfica con los potenciales beneficiarios sobre el cumplimiento tributario

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RESUMEN

El presente estudio busca responder las siguientes preguntas: ¿un sentido de distancia no geográfica con los posibles beneficiarios de los ingresos fiscales resultaría eficaz para reducir la evasión fiscal?; ¿el grado de conocimiento que tienen los contribuyentes en lo referente al uso de los impuestos marcaría una diferencia en la disposición a cumplir con los impuestos?; El conocimiento sobre el uso de impuestos y la distancia geográfica influyen el cumplimiento tributario de manera indirecta a través del gusto sobre en que se invierten los impuestos. ¿El conocimiento del uso de impuestos y la distancia geográfica moderan el efecto de un incremento de la tasa impositiva sobre el cumplimiento tributario? Esta investigación presenta resultados de dos diseños experimentales. El primero fue un experimento aleatorio sin restricciones con 175 profesionales matriculados en un Programa de Maestría en Administración de Empresas. Se les situó en el escenario de un trabajador profesional, quien debía tomar una decisión relacionada con su disposición a cumplir con los impuestos. Un segundo experimento se realizó con 168 estudiantes de pregrado matriculados en diferentes programas de licenciatura en ingenierías y en administración de empresas. Los resultados indican que el conocimiento del uso de los impuestos y la distancia no geográfica influyen indirectamente en el cumplimiento de los impuestos.

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ABSTRACT

The research questions this study addresses are: Would the knowledge taxpayers have about tax money use make a difference in their willingness to comply with taxes? Would a sense of non-geographical distance with tax revenue's potential beneficiaries be effective in reducing tax evasion?; Do tax usage knowledge and geographical distance influence tax compliance indirectly through having a preference for the way the taxes are invested?; Do tax usage knowledge and geographic distance moderate the effect of a tax rate increment on tax compliance? This study reports on the results of two experimental designs. The first one was a random unrestricted experiment with 175 professionals enrolled in a Business Management Mastering Program. They were situated in a white-collar worker's scenario, where they had to make one decision related to their willingness to comply with taxes. A second experimental game was carried out, with 168 undergraduate students enrolled in different engineering and business management bachelor programs. The results indicate that tax usage knowledge and non-geographical distance influence tax compliance indirectly.

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INTRODUCTION

Successful tax compliance is one of the objectives of tax administrations (Walsh, 2012). It is frequently suggested that the solution for evasion is to charge taxpayers sizable punishments; however, empirical research has shown that the imposition of a penalty is not necessarily an effective mechanism (Fischer, Wartick and Mark, 1992; Andreoni, Erard and Feinstein, 1998). Research on tax compliance has received notable attention, since the 1970s, by governments and academics (Richardson and Sawyer, 2001). Literature reviews have shown that tax compliance is a complex issue (Andreoni et al., 1998; Richardson and Sawyer, 2001) influenced by multiple variables (Richardson and Sawyer, 2001; Alm, 2019). Although authors such as Torgler (2005) have studied citizens' attitudes toward paying taxes defined as tax morale (Alm and Torgler, 2006; Frey and Torgler, 2007; Luttmer and Singhal, 2014), no broad explanatory theory has come about this tax domain (Richardson and Sawyer, 2001).

Regarding the latter, as Alm (2019) asserts, a single theory is not practically feasible in large part for the limits placed upon assumptions in theory when trying to explain the phenomenon. Consequently, he suggests to "choose wisely" among the myriad approaches as an ability to contribute to public policy discussion (Alm, 2019, p. 23).

Based on the above, Alm et al. (2012) discusses recent paradigms related to the analysis of tax compliance behavior. Hence, they posit that the decision for a

taxpayer to comply is not just a decision based upon risk but merely a benefit-cost calculus when considering economic variables such as fines, probabilities of audit, tax rates; but to others. They conclude that "there are "more actors in the field" whose separate behaviors, different motivations, and dynamics interactions must all be considered as a way of explaining compliance" (Alm et al., 2012, p.34).

Two of these paradigms consider tax compliance as a social contribution dilemma in which willingness to cooperate is a crucial issue and a psychological contract between taxpayers, tax authorities, and government where social norms of behavior are the main issue (Alm et al., 2012). In line with these paradigms, the use of tax revenue is one of the key concerns to address in this study. Institutional trust has been identified as a driver of cooperation (Alm et al., 2012). Moreover, knowledge related to how the benefits of the tax system are distributed (Hofmann, Hoelzl, and Kirchler, 2008; Fochmann, 2016; Alm, Jackson, McKeen, 1993) can promote tax compliance. Furthermore, according to Hofmann et al. (2008), it has been found that perceived fairness of taxation, as the balance distinguished between taxes paid and public goods received, has a strong covariance with compliance. Recently, Doerrenberg (2015), in an exploratory-experimental design, found that the type of recipient of tax revenue is a kind of pro-social behavior that affects compliance, despite the differences between recipients who were not statistically significant in his research. Despite

this statistic shortcoming, he requests future lab experiments to assess the extent to which the type of tax revenue recipient could impact tax compliance (Doerrenberg, 2015, p.33).

Still, on social norms, another variable that has been linked to tax compliance is social distance. The latter is defined as the real or perceptual separation between groups of people according to the locality, social class, culture, race, nationality, sex, and so on (Ein-Gar and Levontin, 2013). Based on Social Interactions Theory, Alm (2019) indicates that literature has shown evidence that an individual's behavior is influenced by the functioning of the group to which he/she identifies. Henceforth, fairness, altruism, reciprocity, empathy, sympathy, and morality could motivate individuals' decisions (p. 18). However, to the best of our knowledge, we have not found evidence regarding the interaction among locality (a kind of social distance) and the type of recipient of tax revenue to explain tax compliance.

Finally, another issue to explore in this study is the interaction among tax rate, the type of recipient of tax revenue and locality.

Some findings in literature have found that fairness (Moser et al., 1995, cited by Richardson and Sawyer, 2001, p.201-202) and horizontal equity (Jimenez and Iver, 2016) are correlated with the tax rate. The link among these variables has pointed out as an essential line of research (Richardson and Sawyer, 2001),

According to the above, the following research questions arise:

- a) Would the knowledge taxpayers have about tax money use make a difference in their willingness to comply with taxes?
- b) Would a sense of non-geographical distance with tax revenue's potential beneficiaries be effective in reducing tax evasion?
- c) Do tax usage knowledge and geographical distance influence tax compliance indirectly through liking the way the taxes are invested?
- d) Do tax usage knowledge and geographic distance moderate the effect of a tax rate increment on tax compliance?

Thus, this study aims to shed light on the direct and indirect effects of the knowledge about tax usage and geographical distance of the place where the taxes are invested in tax compliance. To achieve this goal,

we conducted two experiments. The first experiment was designed to analyze the direct and indirect effect of tax usage knowledge and geographical distance on tax compliance. Experimental subjects were students enrolled in Business Administration and Engineering Mastering programs. The second experiment was designed to analyze the effect of tax usage, geographical distance, and their interaction with tax rate increment on tax compliance. Experimental subjects were students enrolled in Business Administration and Engineering bachelor's programs. In both experiments, students came from the same state-owned technological university.

This research contributes to the literature in several ways. The study expands the recent Doerrenberg's findings, in the sense of continuing with the analysis of the type of recipient or beneficiary, but incorporating the effect of locality affinity in the study of tax evasion. Besides, the study also looks upon the effect of their interaction on tax compliance, as well as the interaction of tax rate with these variables on tax compliance. The above broadens the understanding of the behavior related to individuals' tax decisions considering the social context. Secondly, it contributes to the call from the literature considering interaction effects in tax evasion (Richardson and Sawyer, 2001; Richardson, 2006). Thirdly, experimental research on tax compliance has been scarce in Latin American countries, and especially in developing contexts, such as Costa Rica, where only one study by Torgler (2003) was found. His experimental study consisted of a static problem (a single decision); however, the issue of evasion rather than being static is dynamic as this research considers by the second experiment in repeated decision rounds.

The paper is organized into four sections. The first section is devoted to deriving the hypothesis based on the literature review. The next section describes two experimental designs. The third section summarizes and analyzes the results of each of the two experiments, and the final section presents the discussion of the main findings and future research lines.

LITERATURE REVIEW

Tax usage knowledge and tax compliance

Alm et al. (2019) posit, "individuals are influenced by the social context, and the process by which

decisions are made" hence, group considerations matter (p.18 and 22). Hallsworth (2014), on the one hand, showed that compliance depends on the salience of tax revenue. In this regard, one variable that can promote tax compliance is knowledge related to how the tax system benefits are distributed (Alm et al., 1993; Fochmann, 2016; Hofmann, Hoelzl, and Kirchler, 2008).

Some studies have shown that caritative donations increase when individuals receive more detailed information about the beneficiary of the donation (Kogut and Ritov, 2005a, Rooney and Frederick, 2007; Cryder, Loewenstein and Scheines, 2013). Details facilitate to visualize how the money will be used and the possible impact it will have. For this reason, the donators may have an insight into the impact of their contribution, generating emotional satisfaction (Dunn, Aknin and Norton, 2008). Knowing the recipient of tax revenues may have a similar effect on tax compliance. According to Holler (2010), the knowledge about the use of their taxes increases the willingness to cooperate; thus, taxpayers with higher knowledge about the topic are expected to be more acquiescent than taxpayers with lower knowledge. Dorrenberg (2015) found that compliance was lower when tax revenue was transferred to the country's general budget rather than when it was spent on specific purposes as research and charity purposes. However, this result was not statically significant due to the small sample size used in the study. Fochmann (2016) analyzed whether the knowledge about the tax recipient increases compliance. In that research, some participants were allowed to select different recipients where their taxes will be devoted, while other participants were not able to. The results showed that tax compliance decreases substantially in the latter kind of taxpayers.

Under all those mentioned above, the following hypothesis emerges:

H1: The knowledge an individual has regarding the usage of taxes influences tax compliance.

Geographical distance and tax compliance

Another variable that has been linked to tax compliance is social distance. It is defined as the real or perceptual separation between groups of people by locality, social class, culture, race, nationality, sex, etc. (Ein-Gar and Levontin, 2013). In this study, the social distance will be addressed considering the

geographical distance of the taxpayer with respect to the community or place that will mainly benefit from the tax. Donations and the altruistic behavior increase as the beneficiary or the cause are known to be closer (Small, 2011). Moreover, Meer (2014) and DellaVigna, List and Malmendier's (2012) findings suggest that people are more willing to donate to less distant recipients. According to Fjeldstad, Schulz-Herzenberg and Sjursen (2012), "citizens' evaluations of their obligations to the state, including tax compliance, were largely conditioned by feelings of closeness or affinity towards other groups included in the state's definition of the national political community."

In their experimental research, Jones and Rachlin (2006, p. 283) showed that social discounting and time discounting are related. Social discounting is defined as the ability to make consistent choices that are congruent with those of a larger social group, with which they share common ground. Time discounting is defined as the ability to make choices congruent with their interests in the future. Their experimental results showed that subjects were willing to spend a more considerable amount of money, the closer they were to the recipients; therefore, asserting that discounting is a meaningful concept. Likewise, Casal, Kogler, Mittone and Kircher (2016) showed that tax compliance depends on the tax framing and the government's public expenditure. On the bases of the preceding considerations, we hypothesize the following:

H2: The geographical distance of the taxpayer concerning the community or place that will mainly benefit from the tax influences negatively the tax compliance

The indirect effect of tax usage knowledge and geographical distance on tax compliance

The knowledge about tax usage and the geographical distance could promote the preference about tax usage because it generates positive attitudes and perceptions towards taxes (Ali, Odd-Hedge y Hoem Sjursen, 2014; Hofmann et al., 2008; Kirchler, 2007). Abbiati, Antinyan and Corazzini (2014) state that one reason taxpayers can exhibit dissatisfaction with taxation is the lack of knowledge of how the government uses their taxes, what is financed with these funds, and in what proportions; leading to perceive taxes as an exogenous deadweight loss (p.2). Similarly, Ali, Odd-Hedge y Hoem Sjursen

(2014) demonstrated how the attitude towards tax compliance is negatively correlated with the perception that the government does not appropriately treat the individual's nearest social group.

Knowing that the purpose of a tax usage has an affinity with the interests of the taxpayer increases tax compliance. Empirical evidence reveals it in studies where subjects have been able to choose where they would like their tax to go (Alm et al., 1992; Fochmann, 2016; Casal et al., 2016). On the bases of the preceding considerations, we hypothesize the following:

H3: The knowledge about tax usage and the tax recipient's geographical distance influence the tax compliance indirectly through the preference for tax revenue's recipient.

Interactions between tax usage knowledge, geographical distance and tax rate

Among variables commonly associated with tax compliance, tax rate has received considerable attention in research, but its impact remains unclear due to mixed results (Richardson and Sawyer, 2001; Kirchler, Hoelzl and Wahl, 2008). As Jackson and Milliron (1986) pointed out, in their literary review published in the middle of the 1980's, analytical studies generally found a positive relationship between tax rates and tax compliance. However, when using methods like surveys, experiments, and regression models, studies showed either a negative relationship or no significant effect (Richardson and Sawyer, 2001, p.200). It is important to point out that in the surveys done during this last period, experiments and regression models showed a positive relationship (Richardson and Sawyer, 2001). These results suggest that the increase in the payment of taxes does not generate an effect on tax compliance under certain conditions.

The knowledge taxpayers have about tax money use and the geographical distance could be determinants of these conditions since they generate positive reactions towards the taxes that mitigate tax evasion. These conditions include the perceived fairness of taxation (Hofmann et al., 2008), the awareness of the tax benefits (Alm et al., 1992; Lamberton, Kabatereine, Oguttu, Fenwick and Webster, 2014), perception of effectiveness and efficiency of the government (Li, Eckel, Grossman and Brown, 2011), perception of taxes utility (Kirchler et al., 2007), perception of a fair

exchange of resources, benefits and costs (Hofmann et al., 2008). The literature on tax labeling and tax assignment suggests that providing information on how tax revenue is used significantly influences tax perception and tax acceptance (Fochmann and Kroll, 2016). Sussman and Olivola (2011) showed that when people are aware of the positive use that can be derived from their taxes, negative attitudes diminish.

Thus, the following hypothesis emerges:

H4: Tax usage knowledge moderates the effect of a tax rate increment on tax compliance.

H5: Geographical distance moderates the effect of a tax rate increment on tax compliance.

H6: Tax usage knowledge and geographical distance moderate the effect of a tax rate increment on tax compliance.

METHOD

Experiment 1

A first experiment was designed to analyze up whether the tax usage knowledge and geographical distance influence directly and indirectly the tax compliance. A random unrestricted design with four treatments was performed. The participants were situated in a white-collar worker's scenario in which they had to make a decision related to their willingness to comply with taxes. The method is described in the following section.

Participants

Professionals that were enrolled in a Business Management Mastering Program at the Costa Rica Institute of Technology were selected to take part in the experiment. This Program is focused on fields related to Business studies (e.g., Leadership, Business Intelligence, Innovation). The number of subjects that got involved in the experiment was 175, of which 39% were women, and 61% were men, with an average age of 33 years.

Treatment Design

A random unrestricted design with four treatments was implemented. A total of 42 participants were

assigned to a control group, 45 participants were assigned to the first treatment, 43 to the second treatment, and 45 to the third treatment. The explanation of what constitutes the control and treatment groups will be cleared further on.

Participants read a document that presents a scenario based on Holler et al. (2008). Participants are put in a hypothetical situation they want to buy a property. Additionally, it is indicated that they have received an additional income of \$10 000 from a job they did. This money will help them to purchase the house. A tax must be paid equivalent to 25% of the total amount to receive this additional income. The participant must decide how likely it is for them to declare all the extra income received to pay the entire tax, in a range of 0% to 100%, considering there is a 15% probability that they will be audited and charged a fine, equal to the amount evaded and the tax recipient. The information about tax revenue usage changes between treatment.

In the control group, participants know that the tax will be sent to the general government budget, but no information was indicated regarding how the government will spend the money collected by taxes (unknown tax usage). In the second treatment, participants were informed that the tax revenue would be invested in road construction (tax usage know, but

not precisely) because of a policy established by the government. In the third treatment, participants were notified that, because of a policy established by the government, the tax revenue would be invested in the construction of a road that will help the route between San José, San Pedro and Curridabat to be more fluid. This route is part of the main commute to the capital of Costa Rica, and all participants had to travel through this route to arrive at the location where they received their Mastering Program courses (tax usage and non-geographic distance are known). In the fourth treatment, participants were informed that the tax collected will be invested in the construction of a road that will help to provide more fluidity between Atenas, San Mateo, and Orotina counties (tax usage and geographic distance are known) because of a policy established by the government. This route is in a rural area far from the capital. Table 1 summarizes the different treatments mentioned above. Participants were randomly assigned to each treatment to control the comparability between treatments and the spurious effect of external variables (Haslam and McGarty, 2004).

Participants were asked about age, gender, tax recipient’s likeness, and frequency traveling through the routes mentioned in the second and third treatments.

Table 1. Treatments of experiment design

Treatment	Tax Usage	Localty Beneficiary Social Distance
T0 (Control group)	General budget	Government: Any beneficiary (tax usage unknown)
T1	Road construction: Any route	Road construction Government program: Any beneficiary (tax usage known but not specifically)
T2	San José-San Pedro-Curridabat route	Citizens of these towns and any driver that travel by this specific route (for instance, Business Management Mastering Program at the Costa Rica Institute of Technology) (tax usage known- non-geographic distance)
T3	Atenas-San Mateo-Orotina route	Citizens of these towns and any driver that travel by this specific route (tax usage known- geographic distance)

Source: own elaboration.

Experiment 2

A second study was designed to analyze the influence of tax usage, geographical distance, and the interaction of tax rate increment, tax usage knowledge, and geographical distance on tax compliance. It was performed at the Laboratory of Experimental Economics in the Costa Rica Institute of Technology

(LEX-TEC). The experimental subjects were students enrolled in Business Management and Engineering Bachelor Programs at the Main Campus in Cartago city. Payments were associated with the decisions taken by those subjects. We analyze the direct and indirect effect of tax usage knowledge and non-geographical distance on tax compliance. Furthermore, we analyze

the influence of those two variables on tax compliance when the tax rate is incremented.

Participants

The experiment was carried out in the LEX-TEC at the Costa Rica Institute of Technology. The participants were 168 undergraduate students of various academic programs at the Main Campus located in Cartago city, of which 41% were women, and 59% were men, with an average age of 21.3 years. Recruitment was carried out using the SR 2.0 system, in which students interested in participating in experiments can register. It is important to mention that, before making the decision to register, students must accept the recruitment policies. The call for the experimental sessions was sent through the system to all registered students who had not participated in experiments related to taxation. A total of 10 experimental sessions were held in September 2018.

In the second experiment, undergraduate students were chosen instead of Master's because there are more potential available subjects with easy access to the Experimental Economics Laboratory, where the experiment would be developed through a computer game. Although in the first experiment, the subjects could have higher tax knowledge, since they mostly work, it is not presumed that the type of participant

can change the influence of experimental variables on tax compliance. Student and nonstudent subjects have shown similar behavior in the laboratory in different research related with economy outputs (i.e., Charness and Villeval 2009; Güth and Kirchkamp 2012; Güth, Schmidt, and Sutter, 2007) and even in tax compliance experiments (Alm, Bloomquist, and McKee, 2015). On the other hand, it is a common practice in Experimental Economy to use students as experimental subjects (Danielson and Holm, 2007).

Experimental Design

The experimental game consisted of 20 rounds. In each round, participants received a random income of between 2 500 and 3 000 ECU's, which they had to report for tax payment. The exchange rate for ECU's to Costa Rican Colones was 2:1. Subsequently, they had to decide how much income they would report being charged at a tax that is equivalent to 25% of what was reported. After round 10, the amount charged would become 40%. They were also informed that there was a probability of auditing and that if they were selected and had reported less income than what they received, the amount of unpaid taxes would be deducted, plus an equal amount in fines for under-reporting their income. The final income in each round was thus computed as:

$$\text{Final income} = \text{Initial income received} - \text{taxes paid} - \text{taxes not paid} - \text{fine} \quad (1)$$

At the end of the 20 rounds, the program randomly chose one of the rounds, taking the final income reported in that round to make the respective payment. The average tax payment was 4 300 colones per subject (equivalent to \$ 7.35). The average duration of the game was approximately 25 minutes, and the game was programmed in JAVA.

The experimental design was a 2 * 2 factorial design, which resulted in four treatments, as follows:

Tax usage knowledge. It had two levels. Without specification: participants were informed that money collected from their taxes would be allocated to a general departmental budget. With specification: participants were informed that tax revenues would be used to buy books to the University Library.

Geographical distance. It had two levels. Main Campus Cartago Principal Office: the subjects were informed that the tax collected will be sent to the Principal Office at the Main Campus of the university. This condition mimics non- geographical distance because the participants belong to this Campus. Santa Clara Campus' main office: subjects were notified that tax revenues would be sent to the main office at Santa Clara Campus, which is located to the Northside of the country, where they are not taking courses at the university. This Campus is located in a rural area.

Combining these factors gives rise to four versions of the game – that is, the four treatments (T1 to T4) shown in Table 2.

Table 2. Factorial Design 2*2

Factor: Tax usage knowledge	Factor: geographical distance	
	Without	With
With	T1	T3
Without	T2	T4

Source: own elaboration.

Participants were randomly assigned to either treatment to control the comparability between treatments and the spurious effect of external variables (Haslam and McGarty, 2004). They were distributed as follows: 41 subjects participated in T1, 43 in T2, 42 in T3, and 43 in T4. When participants finished the game, they were asked to answer how much they like the tax recipient of the taxes.

RESULTS

Experiment 1

Four multiple linear regression models were executed to analyze the results (see Table 3). First model explains the difference between treatments and the control group in the probability of paying all taxes.

Treatment 2 shows a favorable difference of 7% in the probability of paying the taxes concerning the control group. However, this difference is not statistically significant. Also, treatments 1 and 3 did not show a statistically significant difference. These results do not support hypotheses H1 and H2.

Table 3. Coefficients of the linear regression models of the probability to pay all extra income and the likely of tax recipient

Parameters	Model 1 Compliance	Model 2 Compliance	Model 3 Like
Intercept	0.74 (0.055)	0.55 (0.052)	4.12 (0.466)
like	-	0.04* (0.008)	-
T1	0.01 (0.076)	-	2.08* (0.648)
T2	0.07 (0.077)	-	2.70* (0.656)
T3	-0.02 (0.076)	-	1.75* (0.648)
R-square	0.001	0.104	0.098
n	175	175	175

Note. *p<0.05, ** p<0.10. Like: how much they like the tax recipient (measure in a range of 0 to 10, where 10 is the highest level)

Source: own elaboration.

Model 2 shows that liking the tax recipient has a significant effect. Lastly, Model 3 presents the difference in how liking the tax recipient differs between the treatments and the control group. The results show that subjects prefer tax revenues to

be directed to treatment 2 vs. the control group, whereas treatment 1 and treatment 3 show a more positive effect than the control group. The results of model 3 and 4 support the hypotheses H3.

Experiment 2 results

Several regression models were conducted to analyze the hypothesis. The first and second models show that geographical distance, tax usage knowledge, and the interaction between them do not influence tax compliance. Therefore, hypothesis H1 and H2 are not supported again.

The third model suggests that their liking of the tax recipient positively influences tax compliance. An

increment of one unit on the scale, described as the amount they liked the tax recipient, generates a 1.9 percentage point in the tax compliance. Model 4 demonstrates that tax usage knowledge exerts a positive influence on how much they like the tax recipient, as expected. However, concerning geographical distance, the model shows a contrary to what was expected. Therefore, the model third and fourth support partially the hypothesis H3.

Table 4. Coefficients of the linear regression models of tax compliance and how much they like the tax recipient

Coefficients	Model 1 Compliance	Model 2 Compliance	Model 3 Compliance	Model 4 Like
Intercept	0.77 (0.031)	0.76 (0.035)	0.63 (0.076)	8.58 (0.30)
Like			0.02* (0.008)	
Distance	-0.01 (0.034)	0.02 (0.049)		-0.72* (0.301)
T usage	0.03 (0.034)	0.05 (0.048)		0.62* (0.30)
Distance*T usage		-0.04 (0.067)		
R-square	0.006	0.013	0.04	0.06
n	169	169	169	169

Note. * $p < 0.05$, ** $p < 0.10$. Like: how much they like the tax recipient (measure in a range of 0 to 10, where 10 is the highest level), Distance= geographical distance (1=Without, 0=with), T usage=knowledge about tax recipient (1=with, 0=without)

Source: own elaboration.

Two additional models were executed to evaluate if the tax usage knowledge and geographical distance exert a positive effect on tax compliance when there is an increment in the rate of taxation (table 5). In this case, mixed regression models with a random constant were generated. A mixed model was processed because we used the information for each round. Hence, there were repeated measurements. There was a correlation between the residuals of the model that must be considered before estimating the standard errors of the coefficients. Ignoring this situation by estimating classic linear regressions would lead to the analysis of biased standard errors and erroneous conclusions about the significance of the coefficients (Snijders and Bosker, 1999).

Model 1 shows a significant interaction between tax usage knowledge and the variable that indicates if the round is higher than ten (when the tax rate increased from 25% to 40%). This interaction suggests that knowing the tax recipient reduces the negative effect on tax compliance when there is an increment in the tax rate, although the reduction is small. Model 2 demonstrates that the triple interaction between tax usage, geographical distance, and round 11 is not statistically significant. In summary, model 1 supports hypothesis H4 and does not support H5, while model 2 does not support hypothesis H6.

Table 5. Coefficients of mixed regression models of tax compliance

Coefficients	Model 1	Model 2
Fixed		
Intercept	0.80 (0.028)	0.77 (0.032)
T usage	-0.01 (0.032)	0.03 (0.045)
Distance	0.01 (0.032)	0.06 (0.045)
Round11	-0.03 (0.014)	-0.02 (0.016)
T usage: Round11	0.03* (0.016)	0.02 (0.022)
Distance: Round11	0.01 (0.016)	-0.01 (0.064)
T usage: Distance		-0.09 (0.022)
T usage: Distance: Round11		0.03 (0.032)
Random		
Intercept	0.2	0.2
R-squared	0.44	0.44
n	3 380	3 380

Note. * $p < 0.05$, ** $p < 0.10$. Distance: geographical distance (1 = without, 0 = with), T usage: knowledge about tax recipient (1 = with, 0 = without), Round11 (1 = round 11 or higher, 0 = Less than round 11).

Source: own elaboration.

CONCLUSION, DISCUSSION AND FUTURE LINES OF RESEARCH

This study conducted two experiments to analyze the direct and indirect effects of tax usage knowledge, geographical distance, and tax rate on tax compliance.

Firstly, concerning tax usage, we postulated the following research question: Would the knowledge taxpayers have about tax money use make a difference in their willingness to comply with taxes? Our results do not confirm that knowing the tax revenue usage in the form of an overall public expenditure or a more real public expenditure over the redistributive usage (money transferred to the government) increases the probability of tax compliance. The

result of our experiments mirrored those obtained by Doerrenberg's (2015), even though our sample size was a little larger than Doerrenberg's. An aspect that could have unfavored these results may be that the different options of tax usages are imposed in the experiment. That is contrary to a context where taxpayers could have a choice among expenditure alternatives, endogenously has been linked positively to tax compliance (Abbiati et al., 2014). However, this is an issue beyond the scope of this study, that cannot be proved in our experiments.

Secondly, we formulated this research question regarding geographical distance: Would a sense of non-geographical distance with the tax revenue's potential beneficiaries be effective in reducing tax evasion? Our results do not find evidence out to stay

that tax compliance depends on the geographical distance of the taxpayer concerning the community or place that could benefit from the public expenditure. Just being aware of that taxpayer is identified with a sense of beneficiaries' locality does not seem enough to explain tax compliance, and other variables could play a role throughout.

According to the above, a third research question was a focus of concern in this study: Does tax usage knowledge and geographical distance influence tax compliance indirectly through liking the way the taxes are invested? In this study, we found an indirect effect. That is, both variables correlate to the degree subjects liked the public expenditure. Likewise, the liking of public expenditure correlates with tax compliance. However, in experiments 1 and 2, our results were varied. In experiment 1, it was clear that overall and specific public expenditures were preferred over the redistribute expenditure -money sent to the government. However, in the particular case where public expenditure meant an improvement on vehicle traffic that stretches to the way near the university where they took their Mastering classes, it showed a larger magnitude. Hence, tax revenues to be directed to specific and close recipients. In this sense, reciprocity as a non-financial consideration may be a preference that could motivate to comply (Alm et al., 2012). Besides, liking was positively correlated to tax compliance. Moreover, results reinforce previous research findings in terms of geographical distance and perceived utility (Kirchler, 2007).

In experiment 2, this indirect effect was also present in terms of tax usage knowledge-liking-tax compliance. However, the effect of geographical distance has a negative sign, meaning that investing the tax revenue to the Main Campus at the university (closer geographically) was not preferred over investing to the Campus located to the North of the country, in a rural area. As expected, liking was positively correlated to tax compliance. We postulate that this result could be related to the incidence of perceived fairness and social justice (Alm, Jackson, McKeen, 1993; Hofmann et al, 2008; Fochmann, 2016; Jimenez and Iyer, 2016). Besides, a destination that already has enough resources does not positively influence tax compliance, as was the case in experiment 2.

Finally, the last research question was as follows Does tax usage knowledge and geographical distance moderate the effect of a tax rate increment on tax compliance? Both the results of the first and second experiment

showed a more significant impact on tax compliance, in line with past research, if the subject likes and knows the tax recipient (Fochmann and Kroll, 2016; Torgler, 2005). Furthermore, model 1, table 5 from experiment 2, shows that understanding the tax recipient reduces the tax non-compliance. This result may follow what Hofmann et al. (2008) have pointed out in their review of literature that internal variables play an essential role in shaping taxpayer's willingness to cooperate when authorities and taxpayers should perceive as collaborating and achieving similar community goals. In this case, not only enforcement matters but also group considerations (Alm, 2019); beyond external variables, such as tax rates, other actors in the filed along with their motivations and interactions matters in tax compliance (Alm et al., 2012).

To sum up, closing the gap between the taxpayer and the tax recipient may positively influence his compliance. At the same time, also combining the sense of justice and the tax recipient's knowledge increases tax compliance. Public policymakers could consider this for the sake of reinforcing the country's tax revenues. In future lines of research, and intending to deepen the findings gathered, it seems pertinent to incorporate new variables to continue analyzing the behavior of the taxpayers. That could be explained: according to regulative profiles, depending on the message emitted in fiscal campaigns and on the characteristics of the audits. Thus, manipulating these variables, together with the information given about the tax usage knowledge and affinity, tax policies could be designed, which could aid in a more efficient and effective collection of taxes.

Previous research calls for cross-cultural comparisons, to explore whether cultural differences may be present in the relationship between tax rates and compliance. (Alm, Sanchez and De Juan, 1995; Andrighetto, Zhang, Ottone, Ponzano, D'Attoma and Steinmo, 2016; Lewis, Carrera, Cullis and Jones, 2009; Pampel, Andrighetto and Steinmo, 2019). In this sense, Costa Rica - empirical site of this study - is characterized for being one of the most consolidated democracies of Latin America, marked by the milestone of the abolition of the army in the year 1948. Since then, commitments made in the Constitution have assumed policies, related to democracy, transparency, participation citizen, and efficiency (Güemes, 2016; Naser, Ramírez-Alujas and Rosales, 2017). It might be interesting to start collecting empirical data that allows us to explore the cultural differences to which the authors refer.

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