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## DELAYED FEEDBACK, REGULATORY FIT AND GOAL FRAMING EFFECTS ON TAX COMPLIANCE: AN EXPLORATORY STUDY

## EFFECTOS DE LA RETROALIMENTACIÓN RETARDADA, EL AJUSTE REGULATORIO Y LA ORIENTACIÓN DEL MENSAJE SOBRE EL CUMPLIMIENTO TRIBUTARIO: UN ESTUDIO EXPLORATORIO

Ronald Mora-Esquivel<sup>1</sup>  
Paula Arzadun<sup>2</sup>  
Martín Solís<sup>3</sup>

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### ABSTRACT

This research shows the main effects of three variables on tax compliance. Specifically, a) the goal framing message (positive or negative message) about tax compliance importance addressed to taxpayers, b) the prevention and promotion orientation of the taxpayers and, c) the audit delayed feedback. We combine these variables at the laboratory experiment because they have been underestimated in the research of tax compliance decisions. In addition, this research analyzes whether the effect of the message framing on tax compliance changes according to the promotion or prevention orientation of the taxpayers, and the delayed feedback. A total of 186 undergraduate students from engineering and business administration programs took part in an experiment to explore those effects. Results show: a) that the negative frame has a positive significant effect on tax compliance; b) a significant effect of the interaction between negative frame and promotion focus. When there is a low promotion focus, the best option is not to apply a negative frame; c) that, as time goes by, the effect of delayed feedback increases.

*KEYWORDS:* TAXATION, EVASION, MESSAGE, PERSONALITY.

*JEL CLASSIFICATION:* H26, H41.

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- 1 Tecnológico de Costa Rica, Escuela de Administración de Empresas; Código Postal: 159-7050; Cartago, Costa Rica; [rmora@itcr.ac.cr](mailto:rmora@itcr.ac.cr)
  - 2 Tecnológico de Costa Rica, Escuela de Administración de Empresas; Código Postal: 159-7050; Cartago, Costa Rica; [parzadun@itcr.ac.cr](mailto:parzadun@itcr.ac.cr)
  - 3 Tecnológico de Costa Rica, Escuela de Administración de Empresas; Código Postal: 159-7050; Cartago, Costa Rica; [marsolis@itcr.ac.cr](mailto:marsolis@itcr.ac.cr)

## RESUMEN

Esta investigación muestra los principales efectos de tres variables sobre el cumplimiento tributario. Específicamente: a) la orientación del mensaje (mensaje positivo o negativo) dirigido a los contribuyentes sobre la importancia del cumplimiento tributario; b) la orientación a la prevención y promoción de los contribuyentes y finalmente c) la retroalimentación rezagada de la auditoría. Estas variables se plasmaron en un experimento de laboratorio porque han sido subestimadas en las investigaciones sobre las decisiones de cumplimiento tributario. Aunado a lo anterior, esta investigación analiza si el efecto de la orientación del mensaje sobre el cumplimiento tributario cambia según la orientación de promoción o prevención de los contribuyentes, y la retroalimentación retardada. Un total de 186 estudiantes de pregrado de carreras de ingeniería y administración de empresas participaron en un experimento para explorar esos efectos. Los resultados muestran que: a) el mensaje con orientación negativa tiene un efecto estadísticamente significativo y positivo sobre el cumplimiento tributario; b) un efecto significativo de la interacción entre la orientación negativa del mensaje y el enfoque de promoción. Cuando hay un enfoque de promoción bajo, la mejor opción es no aplicar un mensaje negativo; c) a medida que pasa el tiempo, aumenta el efecto de la retroalimentación rezagada.

*PALABRAS CLAVE:* IMPUESTOS, EVASIÓN, MENSAJE, PERSONALIDAD.

*CLASIFICACIÓN JEL:* H26, H41.

## I. INTRODUCTION

Tax compliance is a recurring concern among government authorities around the world, as is the understanding of variables that optimize it. In this regard, many experimental researches have been carried out. However, as far as we know, three variables have been underestimated in the research of tax compliance decisions: the goal framing message, the prevention and promotion orientation of the taxpayers, and the audit delayed feedback.

The concept of framing has been investigated in a wide variety of settings since a seminal research by Hovland et al. (1953). Afterwards, the discussion regarding message-framing direction emerged with the Prospect theory by Kahneman and Tversky (1979). Although there are several concepts of framing, we focus on the mind's internal cognitive processes, closely associated with social, cognitive and economic psychology (Druckman, 2001; Hasseldine & Hite, 2003).

Promotion focus and Prevention focus are two distinctions of self-regulatory principles of people's motivations (Higgins, 1997). Under promotion focus, people are strongly oriented towards winning and achieving potential gains. They attempt to bring their actual selves in alignment with their ideal selves. Under prevention focus, people are strongly oriented towards security needs, avoiding potential losses (Higgins, 2000).

Regarding audit delayed feedback, experiments on tax behavior that carried audits out immediately after-tax declaration has been questioned about their external validity, since they do not reflect what happens in reality. On the contrary, the effect of audit time lag feedback on tax compliance shows a direct effect of time-delayed in knowing the audit result with the percentage of compliance in the payment of taxes (Kogler et al., 2016; Muehlbacher et al., 2012).

In addition to identifying the underestimation of the variables described above, we also found that experimental research on tax compliance has been scarce in Latin American countries. Therefore, we carried it out in Costa Rica. Overall, this paper broadens the understanding of two experimental variables -goal framing and delayed feedback and one non-experimental variable -regulatory focus- in people's tax decisions.

The paper structures as follows. The first section reviews prior literature. The second one describes the experimental design of the study. The third one summarizes the empirical results of this research. Finally, the fourth section presents conclusions, limitations, and future research opportunities.

## II. LITERATURE REVIEW

The discussion regarding message-framing direction emerged with the Prospect theory by Kahneman and Tversky (1979). From this moment, mixed results have emerged regarding the impact of positive and negative message framing. A factor that can moderate the effect of message-framing is related to people's judgments (Levin et al., 1998). Kwang Seok (2018) concluded that for some people, a negative framing direction might be more persuasive than positive framing direction messages.

Some studies have confirmed the positive impact of the pertinent information and message-framing on tax compliance (Fochmann & Kroll, 2016; Gangl et al., 2016; Hofmann et al., 2008; Sussman & Olivola, 2011). Moreover, it has also been found that more significant effect can be reached if the message is correctly directed according to taxpayers' promotion and prevention focus (Holler et al., 2008).

Promotion focus and Prevention focus are two distinctions of self-regulatory principles of people's motivations (Higgins, 1997). Under promotion focus, people are oriented more strongly towards winning, growing and developing, and towards achieving potential gains. They attempt to bring their actual selves in alignment with their ideal selves. Besides, people try to succeed through eagerness -approach motivation- (Higgins, 2000). Under prevention focus, people are oriented more strongly towards security needs, avoiding potential losses. The congruency between framing of information and regulatory focus is called regulatory fit (Chia-Lin et al., 2017; Higgins, 2000; Schindler & Pfattheicher, 2017).

Holler et al. (2008) conducted two experiments and found that regulatory fit impact on tax compliance. Their findings suggest, for participants under promotion focus, that information highlighting the potential gains increased tax compliance; and, for participants under prevention focus, that details highlighting the potential losses increased tax compliance.

In this study, similar to Holler et al. (2008) we assess the fit between message-framing and promotion/prevention, but with a different methodology to examine other issues. Unlike Holler et al. (2008), where they pose a hypothetical scenario, and the participants responded if they would evade under those conditions; first, we carry out an experimental game where participants received money, according to the decisions taken during the game; adding an auditing process with a penalty associated with a probability, and a repeated rounds design. The latter two correspond to the possibility to integrate the timing audit feedback in this study, for reasons we present in the succeeding paragraphs. Second, Holler et al. (2008) evaluate, in one hand, the interaction of positive frame with promotion and, in the other hand, negative frame with prevention. On the contrary, we assess the interactions of positive frame and negative frame with both regulatory focus (promotion and prevention) to show if effectively positive frame only interacts with promotion and negative frame with prevention.

It should be noted that experiments on tax behavior that carries audits out immediately after-tax declaration wherein consequences of the process are given immediately has been questioned concerning their external validity, since they do not correspond from what happens in reality (Kogler et al., 2016; Muehlbacher et al., 2012). The effect of audit time lag feedback on tax compliance recently accomplished by Kogler et al. (2016) showed a direct effect of time-delayed in

knowing the audit result with the percentage of compliance in the payment of taxes. Their findings were in line with the field experiment conducted by Muehlbacher et al. (2012).

Three mechanisms could explain these results. Firstly, Kogler et al. (2016) assume the premise that individuals who deal with elections, occurring over time, tend to avoid suffering the fear experienced from the expectation of an adverse or unpleasant result (like an audit that would imply a higher cost for evasion). Secondly, the likely presence of negative or adverse sentiment related to leaving outstanding issues (Zeigarnik, 1927, quoted by Kogler et al., 2016, p. 81). Thirdly, predictions of people's behavior may differ between decisions based on description and those based on experience or feedback (Barron & Erev, 2003; Hertwig, Barron et al., 2004).

As the knowledge and experiences an individual face could play notable roles in determining whether a particular frame is accepted or deflected (Rothman & Salovey, 1997), in this study we also evaluate whether the delayed feedback moderates the effect of message-framing. As delayed feedback could change the fear experienced from the expectation of the punished (for the tax evasion) (Kogler et al., 2016), could also change the impact of the frame.

### III. METHOD

#### **2.1 Participants**

The experiment was carried out at the Costa Rica Institute of Technology's Laboratory of Experimental Economics (LEX-TEC). The participants were 186 undergraduate students enrolled in various engineering and business administration academic programs, of which 69% were male. The sample size was calculated in the GPower 3.1 software, assuming: effect size=0.05, alpha=0.05, B (power) =0.92 and nine predictors in multiple linear regression. We recruit them by using the SR 2.0 system, in which students interested in participating in experiments could register. It is important to mention that, before deciding to inscribe, students must accept the recruitment policies. We send a call for the experimental sessions through the system to all registered students who had not participated in experiments. A total of nine experimental sessions were held in September of 2019.

We use students because of the ease to find participants of the experiment and because the cost of participating in an experiment for a student is certainly lower (Fréchette, 2015). Besides, student and nonstudent subjects have shown similar behavior in the laboratory in different research related with economy outputs (i.e Charness & Villeval, 2009; Güth & Kirchkamp 2012; Güth et al., 2007) and even in tax compliance experiments (Alm et al., 2015).

#### **2.2 Experimental design**

The experiment consisted of 21 rounds. In each round, the experimental subjects received a random income between 2,500 and 3,000 ECUs, which they had to report for tax payment. Subsequently, they had to decide how much of the amount of income received they would report charging a tax, equivalent to 30% of what the subject outline. They were also informed regarding a probability of auditing, so in case 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 having under-reported their income. The audit was random with a probability of 0.15. We computed the final income in each round as follows:

$$\text{Final income} = \text{Initial income received} - \text{taxes paid} - \text{taxes not paid} - \text{fine.}$$

At the end of the 21 rounds, the program randomly chose one of the rounds, taking the final income reported in that round to make the respective payment. The exchange rate for ECUs to Costa Rican colones was 2:1. The average tax payment was 4,200 colones per subject (equivalent to \$ 7.3). The average time of the experimental game was approximately 20 minutes. Java was used to program the experiment.

The experimental design was a 3 \* 2 factorial design, which results in six treatments. The factors are:

1. Delayed feedback. It has two levels: Immediate feedback: participants were informed at the end of each round if they were audited and the amount of final income obtained, and Delayed feedback: subjects must wait until the 21 rounds were completed to know if he or she was audited and the amount of final income procured in each round.
2. Frame. It has three levels. Without frame: the participants didn't receive a message about paying taxes, Positive frame: The participants received in each round a message about the positive effect of the taxes in society, and Negative frame: The participants received in each round a posting about the negative impact on society by not paying taxes.

The combination of these factors gives rise to six versions of the game – that is, the six treatments (T1 to T6) shown in Table 1.

TABLE 1  
FACTORIAL DESIGN 3\*2

		FACTOR: FRAME		
		NO FRAME	Positive	NEGATIVE
Immediate	T1	T3	T5	
After 21 rounds	T2	T4	T6	

Source: authors' own creation.

Finally, it should be noted that the participants were randomly assigned to each treatment. Thirty-three subjects participated in treatment T1; Thirty-one subjects participated in treatment T2; Thirty-three subjects participated in treatment T3, while thirty in treatments T4, T5 and T6.

### 2.3 Instruments

After the game finished, the participants filled out a computerized questionnaire with the short version of the Regulatory Focus Scale of Fellner et al. (2007). This scale measures the promotion and prevention dimensions. After executing the Confirmatory Factor Analysis to evaluate the validity of the scale, we decided to delete two of the ten items proposed for the authors because these affect the construct validity of the scale. In this manner, the proposed model has four items for the Promotion dimension and four items for the Prevention dimension. The ACF reported a *RMSEA* of 0.021 and a *CFI* and *TLI* of 0.985 and 0.978. These results give evidence of the scale validity.

The items of Promotion were: "I like trying out lots of different things", "I am often successful in doing so", "I like to do things in a new way", "I generally solve problems creatively", "I prefer to work without instructions from others". The items of Prevention were: "It is important to me that my achievements are recognized and valued by other people", "I always try to do my work as accurate and error-free as possible", "I am not bothered about reviewing or checking things really closely", "For me, it is very important to carry out the obligations placed on me". The Likert scale had 7 points. To compute the score of each dimension, we average the items.

### III. RESULTS

We ran two statistical methods for data analysis. First, we utilize linear regression models to evaluate the effect of the variables on the total tax compliance after 21 rounds. Second, a mixed linear regression model having fixed, and random effects were the statistical approaches employed to evaluate the impact of the variables on tax compliance, round by round. This model takes into account the autocorrelation in the residuals because the subject is repeated in each round.

Table 2 reports the results of the first approach. There are three models. The first one is used to analyze the simple effects of the experimental variables (frame and delayed feedback). The second includes simple effects and interaction. Finally, model 3 contains the experimental variables, non-experimental variables (promotion and prevention scale), and the interaction between frame and non-experimental variables.

TABLE 2  
COEFFICIENTS OF LINEAR REGRESSION MODELS OF TAX COMPLIANCE  
AGGREGATED AFTER 21 ROUNDS

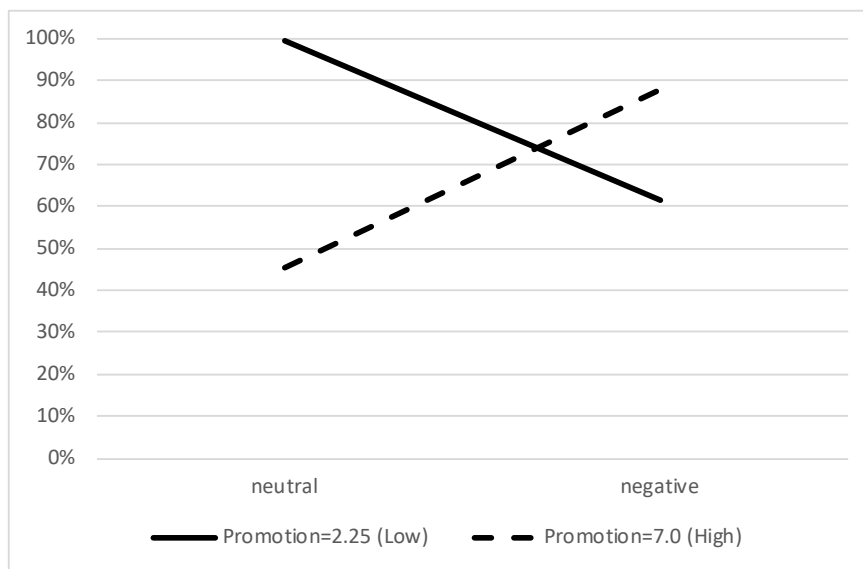
VARIABLES	MODEL 1	MODEL 2	MODEL 3
(Intercept)	0.67*	0.67*	0.88**
FramePos	0.02	0.06	0.15
FrameNeg	0.11*	0.08	-0.61
Delayed Feedback	0.06	0.07+	0.07*
FramePos: Delayed Feedback		-0.09	
FrameNeg: Delayed Feedback		0.06	
PRE			0.07
PRO			-0.11**
FramePos:PRE			-0.08
FrameNeg:PRE			-0.03
FramePos:PRO			
FrameNeg:PRO			

Note. FramePos=Positive frame, FrameNeg=Negative frame, Delayed Feedback = Feedback after 21 rounds, PRE=Prevention, PRO=Promotion, +p<0.10, \*, p<0.05, p<0.01.

Source: authors' own creation.

In the first approach, when we analyzed the simple effects, the results revealed that the interaction does not influence tax compliance (model 2), and only the negative frame has a statistically significant effect on tax compliance (model 1). It increases tax compliance in 11 percentual points. On the other hand, when we include the non-experimental variables and their interactions with the frame, the delayed feedback shows a significant effect. It increases seven percentual points the tax compliance. Besides, the interaction between negative frame and promotion it is significative. In Figure 1, we can see the effect of interaction in a case where there is no delayed feedback and positive frame. Figure 1 also shows that when subjects have high promotion, the negative frame generates a substantial increment on tax compliance. However, when subjects have low promotion, the negative frame has the opposite effect.

FIGURE 1  
EFFECT OF INTERACTION BETWEEN NEGATIVE FRAME AND PROMOTION



Note: Promotion=2.25 is the minimum score among participants, and Promotion=7.0 is the maximum score among participants.

Source: authors' own creation.

In the second approach, we executed two models. The first one shows simple effects and their interaction with round, and the latter adds the interaction between the simple effects and the triple interaction between the frame, delayed feedback, and round (Table 3). The idea behind these models is to evaluate if the effects of experimental variables change with time. We find that there is a statistically significant effect on the interaction between delayed feedback and round. As can be seen in Figure 2, when the experimental game begins, there is a little difference between delayed feedback and immediate feedback; however, in round 21, the change is more prominent. In precise terms, as time goes by, the effect of delayed feedback increases.

**TABLE 3**  
**COEFFICIENTS OF MIXED MODELS OF TAX COMPLIANCE**

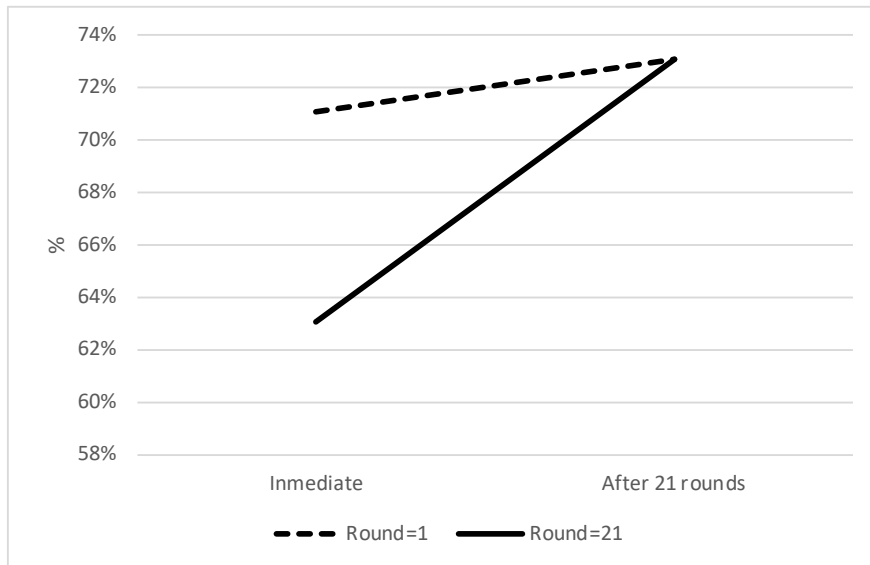
VARIABLES	MODEL 1	MODEL 2
<b>Fixed</b>		
(Intercept)	0.715	0.712
FramePos	0.041	0.104
FrameNeg	0.094+	0.038
Delayed Feedback	0.016	0.022
Round	-0.004*	-0.004+
Delayed Feedback:Round	0.004*	0.005
FramePos:Round	-0.002	0.004
FrameNeg:Round	0.002	-0.004
FramePos: Delayed Feedback		-0.129
FrameNeg: Delayed Feedback		0.106
FramePos: Delayed Feedback:Round		0.004
FrameNeg: Delayed Feedback:Round		-0.004
<b>Random</b>		
(Intercept)**	0.254**	0.251**
Round**	0.007**	0.008**

Note. FramePos=Positive frame, FrameNeg=Negative frame, Delayed Feedback = Feedback after 21 rounds, PRE=Prevention, PRO=Promotion, +p<0.10, \*, p<0.05, p<0.01.

Source: authors' own creation.



**FIGURE 2**  
**EFFECT OF INTERACTION BETWEEN DELAYED FEEDBACK AND ROUND**



Source: authors' own creation.

#### IV. CONCLUSIONS

The experimental research was proposed to explore the effect of goal framing and delayed feedback -as experimental variables- and regulatory focus -as a non-experimental variable- on tax compliance. Among the experimental variables, the results showed that audit delaying feedback influences tax compliance. The result of this study is consistent with those of Muehlbacher et al. (2012), and Kogler et al. (2016), but in a different cultural context.

This research underpins, methodologically, the importance of considering the time lag when bearing in mind audit as an experimental variable. As the experiment confirms, subjects in delayed feedback condition -knowing, up to the last round of the game, whether they were audited- revealed significantly less tax evasion than those subjects who were exposed to immediate feedback condition (knew, round after round, whether they were audited) as the round goes.

Regarding goal framing, as an experimental variable, those subjects who received a message related to unpleasant consequences to the society because of tax evasion -negative framing- showed a positive and significant effect on tax compliance. On the contrary, positive framing did not contribute to tax compliance. Literature has posited a negativity bias concerning that valuation of negative stimuli would have much more impact upon subjects than equally positive stimuli (Baumeister et al., 2001; Levin et al., 1998).

The results showed that the negative frame help to increase tax compliance as the promotion trait increase. Winning and achieving potential gains is consistent for people under promotion focus (Higgins, 2000). Therefore, the presence of this trait could be related to subjects who evade taxes to increase their gains, and a negative frame can contribute to neutralize this effect showing the negative impact of tax evasion. On the other hand, when there is a low promotion focus, the best option is not to apply a negative frame. Additionally, we also found that the positive frame didn't change the effect of promotion or prevention focus on tax compliance.

These findings did not support the conclusions of Holler et al. (2008). The difference in the findings of both studies should be deeply examined in future research because the methodologies are different. In our experiment, we try to mimic reality with a game and payments. We also evaluate the interaction between negative frame with promotion focus and prevention focus, while Holler et al. (2008) only assess the interaction between positive frame and promotion, and negative frame with prevention because, according to their theory, in this situation regulatory focus occurs.

Our study opens a future line of research to replicate the effect of the interaction between the frame and regulatory focus. We suggest future research should classify the subjects, between promotion and prevention, previously to the experiment. Later, to apply an experimental design where a group of prevention people, randomly chosen, to be exposed to positive frame and another group to a negative frame, replicating the latter for the promotion people. In this way, the interaction of the regulatory focus and frame can be proved in two ways with the groups and the score of the scale. Besides, it is important to execute an experiment with a game that will try to mimic reality.

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