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Tax avoidance and voting on income redistribution: A real-effort task experiment[1]

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Abstract: In this paper, we analyze theoretically and experimentally the relationship of tax avoidance and voting decisions over the size of taxation. We propose a basic model of redistributive politics in which there are two types of voters (skilled and unskilled workers) and two exogenous tax schemes to vote for. We design a laboratory experiment to test the results of the model. We consider a control treatment where tax avoidance is not feasible. In the main treatments, only the high skilled workers are allowed to avoid taxes with a fixed cost that varies in two different treatments. We also consider two additional treatments with explicit or implicit information about tax avoidance decisions. The impossibility of tax avoidance favors the support for the high tax rate. A sufficiently high cost of tax avoidance makes unskilled workers vote mostly for a low tax rate and skilled workers opt for almost no tax avoidance. Nevertheless, if tax avoidance is cheap enough, a higher than predicted proportion of unskilled workers still vote for the low tax rate, even in a high tax avoidance context. The only effect of information occurs when the cost of tax avoidance is low, and it entails a decrease in tax avoidance levels. Finally, regardless the tax avoidance cost, a higher rate of tax avoidance yields to a higher likelihood of unskilled workers voting for the high tax rate, and, vice versa, a higher probability of voting for the high tax rate results in a higher tax avoidance level.

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1. Introduction

Many advanced nations operate under democratic systems where elected representatives decide on public finances, among other issues. How voters perceive the effectiveness of taxation significantly influences representatives who prioritize re-election. Unfortunately, recent scandals related to tax avoidance and evasion[2], such as the Panama Papers and Falciani's list, have raised concerns about the effectiveness of the welfare state and the role of taxation in income redistribution.

The annual report of the Tax Justice Network (2024) reveals that countries are losing over $492 billion in taxes each year to global tax abuse. One of the easiest ways to avoid taxes is to disguise labor income as capital income. Smith *et al*. (2019) estimated in their study that about $1 trillion of annual income from private businesses in the US is mostly labor income in disguise. Another investigation by Eisinger *et al*. (2021) estimates that the 25 wealthiest Americans (including Jeff Bezos, Warren Buffett, and Elon Musk) paid a "true" average tax rate of just 3.4% between 2014 and 2018, despite their collective net worth rising by more than $400 billion in the same period. Another example in the UK is the study by Advani *et al*. (2023) that uses administrative tax data from the UK tax authority at an individual level from 2008 until 2018. They find that the effective average tax rate decreases at the top of the income redistribution. In particular, 10% of individuals earning £3 million or more pay only 37% or less in taxes, the same as someone earning £311,000. Therefore, studying the impact of this misconduct on attitudes toward taxation is essential for developing effective policies that can diminish tax avoidance activities and support income redistribution.

Our objective is to theoretically and experimentally investigate the relationship between tax avoidance and voting decisions in a labor market framework, considering variations in the cost of tax avoidance and the information available to voters. We propose a similar experimental design to that of Jimenez *et al.* (2023), introducing the possibility of tax avoidance after determining the tax rate through majority voting. We have chosen to analyze the effects of tax avoidance because we believe that the behavior observed in the laboratory setting resembles real-world tax avoidance more closely than

[2] The main difference between tax avoidance and tax evasion lies in their legality.

tax evasion. One reason for this is that the non-monetary consequences of being caught for tax evasion, such as damage to reputation or feelings of shame, are almost negligible in tax avoidance. Despite this distinction, our research could also be interpreted through the lens of tax evasion, as both activities are similar in the sense that they both involve costs for the performer.[3]

We consider a basic model of redistributive politics featuring two types of voters (skilled and unskilled) and two pre-defined tax schemes (low and high). In this model, when tax avoidance is either impossible or straightforward, unskilled workers, as the median voter, tend to support higher taxes. In contrast skilled workers engage in tax avoidance when feasible. However, when the cost of tax avoidance becomes sufficiently high, unskilled workers may vote for lower taxes to discourage skilled workers from avoiding taxes, thereby mitigating losses in income redistribution. To test this model, we design a laboratory experiment with five treatments. The first treatment is a control, where tax avoidance is not permitted. In the other four treatments, we vary the cost of tax avoidance and the information provided about tax avoidance decisions.

Overall, the experimental findings align with our theoretical predictions, especially in scenarios where tax avoidance is either difficult or not feasible or when the costs associated with tax avoidance are sufficiently high. First, when tax avoidance is impossible (or too costly), unskilled workers predominantly vote for the high tax rate, which supports standard theoretical results. Second, when the cost of tax avoidance is sufficiently high, unskilled voters tend to support a low tax rate to prevent reductions in income redistribution caused by tax avoidance. In this scenario, skilled workers opt not to avoid taxes, resulting in the Subgame Perfect Nash equilibrium occurring most of the time. Notably, information does not significantly impact voting decisions or tax avoidance behaviors.

Conversely, when the cost of tax avoidance is low, we find that unskilled workers' voting decisions deviate from theoretical predictions. In particular, a more significant than expected proportion of unskilled workers still vote for a low tax rate, even knowing that skilled workers systematically avoid taxes and, therefore, unskilled workers will end up worse off. Consequently, the Subgame Perfect Nash equilibrium is

[3] Tax avoidance implies a certain cost, while tax evasion carries uncertain costs that depend on the likelihood of being audited (see Slemrod and Yitzhaki (2002) for a complete comparison between these terms). Additionally, both are significantly affected by the efficiency of the tax authorities and the framework of tax enforcement laws.

not frequently observed. In this cost scenario, providing explicit information on tax avoidance activities reduces the likelihood that skilled workers avoid taxes.

Finally, we find that, regardless of the tax avoidance cost, the higher the tax avoidance levels, the lower the likelihood of unskilled workers voting for the low tax rate, and vice versa: the higher the probability that the low tax rate is implemented, the lower the tax avoidance levels. This reciprocal behavior between skilled and unskilled workers is not always consistent with theoretical predictions and suggests the presence of other-regarding preferences.

Theoretical studies on income redistribution choices in democracies indicate that more unequal societies tend to vote for higher taxes in equilibrium (Romer (1975), Roberts (1977) and Meltzer and Richards (1981)).[4] More recent theories that incorporate the possibility of tax evasion suggest a non-monotonic relationship between individual income and preferences for higher taxes (Ronie, 2006; Borck, 2009 and Solano-García, 2017)[5]. We build on this line of research by presenting a dynamic game in which voters first decide on the tax rate to be implemented, followed by individuals determining their level of tax compliance.

Extensive experimental research has examined voting behavior regarding redistributive policies (see, among others, Cabrales *et al*., 2012; Agranov and Palfrey, 2015; and Cappelen *et al*., 2019). However, only a few studies have integrated real-effort tasks into their experimental designs to investigate how taxation influences redistribution choices (Jimenez *et al*., 2020; Sausgruber *et al.*, 2021; and Jimenez *et al.*, 2023).

Studies that include tax evasion and tax avoidance in experimental economics have proliferated in recent decades. Cadsby *et al*. (2006) find in a laboratory experiment that the obedience of an authority decreases the tax evasion levels. Escobar *et al.* (2023) analyze a natural experiment in Sweden where subjects can avoid taxes by partly or wholly ceding their inheritances to their grandchildren, reporting 66% tax avoidance. Blaufus *et al.* (2016) conduct a laboratory experiment considering joint tax avoidance and tax evasion. They observe that including an "illegal" label decreases the tax evasion

[4] This phenomenon occurs because the preference for higher taxes and public spending generally decreases as income increases. However, alternative theories challenge these findings (see, e.g., Roemer, 1998 and citations therein), offering explanations such as the prospects for upward mobility (Bénabou and Ok, 2001), the consideration of multi-dimensional policy impacts (Lee and Roemer, 2006), and the inclusion of individual beliefs about the factors that determine economic success (Alesina & Angeletos, 2005; Fong, 2001; Piketty, 1998).

[5] Slemrod (2001) proposes a behavioral model with avoidance and labor supply decisions. Traxler (2009) develops a theoretical model on tax evasion with voting decisions.

levels even without a penalty (with respect to a "legal" label). Malik *et al*. (2018) design a laboratory experiment to test how anti-avoidance tax policies affect tax avoidance (non-monetary cost to avoid) and tax evasion in a labor market setting. They find a "substitution effect" between tax avoidance and tax evasion levels.[6]

In all previous studies, there are either no voting decisions or no real tasks in a labor market setting, or tax avoidance is analyzed jointly with tax evasion. As far as we are aware, our study is the first one to analyze tax avoidance (without tax evasion) in a setting where workers vote for income redistribution through taxation.

In section 2 we present our theoretical setting. Section 3 presents the design of the experiment. Section 4 states our main hypothesis. Section 5 reports the main results of the experiment and discusses the validity of the theoretical predictions and Section 6 concludes.

2. Theoretical Predictions

In this section, we first present a general model, with and without the possibility of tax avoidance, and characterize the equilibrium under the assumption of rational, self-interested agents in a non-repeated setting. After that, we discuss how the inclusion of some assumption about agents' ethical cost of tax avoidance might shape equilibria.

2.1. General theoretical setting.

2.1.1 No feasible tax avoidance

In our economy, there are n_s skilled workers and n_u unskilled workers, with $0 < n_s < n_u$, each receiving wages of w_s or w_u, respectively, such that $w_s > w_u > 0$. Each worker pays a proportion of her wage in taxes and receives a lump-sum transfer, meaning that tax revenues are equally distributed among all workers through a public transfer system. There are two eligible tax rates $t_l, t_h \in]0,1[$, with $t_l < t_h$. Each worker votes for one of these tax rates and the tax rate that is implemented, $t \in \{t_l, t_h\}$, is determined by majority voting. We assume that workers only care about consumption

[6] Weber *et al*. (2014) compile results from experiments and empirical studies to do a survey on tax compliance and tax evasion.

and after-tax income is fully consumed. The following expression represents worker i's utility function:[7]

$$u_i(t) = w_i(1-t) + \frac{t}{n_s+n_u}(n_s w_s + n_u w_u),\ i = s,u \quad \textbf{(1)}$$

From (1), it is straightforward that the tax rate preferred for unskilled (skilled) workers is $t_h(t_l)$. Then, since the median voter is an unskilled worker ($n_s < n_u$), according to the Median Voter Theorem (Black, 1948) the implemented tax rate is t_h.

2.1.2 Feasible tax avoidance

Assume the same economy as before, but now, the skilled workers have the possibility of reducing their tax base at a cost (tax avoidance), after the tax rate is determined by majority voting. For a tax rate implemented t, the after-tax payoff functions for both types of voters are:

$$u_s(A,t) = w_s(1-A)(1-t) + w_s A - c\frac{A}{\alpha} + \frac{t}{n_s+n_u}(n_s w_s(1-A) + n_u w_u) \quad \textbf{(2)}$$

$$u_u(A,t) = w_u(1-t) + \frac{t}{n_s+n_u}(n_s w_s(1-A) + n_u w_u),$$

where $A \in \{0,\alpha\}$ is the proportion of wage that is avoided from taxation, with $\alpha \in]0,1[$, and $c > 0$ is the cost of avoiding this proportion.[8]

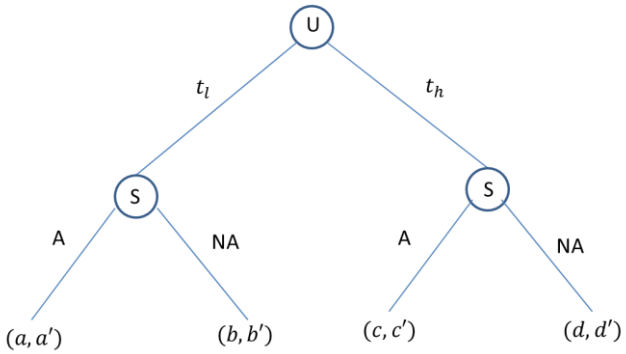
From (2), it can be deduced that the low tax rate, t_l, is the optimal tax rate for skilled workers if and only if they report a higher income than the unskilled workers, i.e., $w_s(1-A) > w_u$. In other words, to the tax authority skilled workers are officially still earning more than unskilled workers even if they avoid taxes. We assume that this is the case from now on. If unskilled workers have the same utility function and wage, we can also assume they are identical so that they will vote for the same tax rate. Therefore, in equilibrium skilled workers will vote for t_l, since skilled workers' voting decisions do not affect the tax rate chosen by majority voting.[9] This model can be described as a two-player extensive form game G, in which unskilled workers (U) choose first the tax rate implemented and after that, skilled workers (S) decide whether to avoid (A) or not avoid (NA) taxes.

[7] We have chosen this utility function for the sake of simplicity. However, a more general utility function could be considered without altering the main results of the model. This more general analysis can be provided upon request.

[8] We are aware that this cost of avoiding could be considered a variable depending on wages and the amount of tax avoidance. For the sake of exposition (simplicity), we assume that it is exogenous as well as wages and the proportion of taxes that skilled workers can avoid.

[9] In Appendix A, we relax this assumption and analyze the game by assuming that unskilled workers may vote for a different tax rate.

Figure 1. Extensive form game G



Note: U = unskilled worker, S = skilled worker, A = avoidance, NA = not avoidance, t_l = low tax rate = 0.3, t_h = high tax rate = 0.6.

The equilibrium concept used in our analysis is the Subgame Perfect Nash Equilibrium (SPNE). Solving by backward induction, the first decision to analyze is whether skilled workers prefer to avoid taxes or not. For given t, α, and c, a skilled worker prefers to invest in paying less taxes if and only if:

$$w_s(1-\alpha)(1-t) + w_s\alpha - c + \frac{t}{n_s + n_u}(n_s w_s(1-\alpha) + n_u w_u)$$
$$> w_s(1-t) + \frac{t}{n_s + n_u}(n_s w_s + n_u w_u) \Leftrightarrow$$
$$c < w_s t\alpha\left(\frac{n_u}{n_s+n_u}\right) \qquad (3)$$

Notice that skilled workers decide to avoid taxes if the benefit from avoidance overtakes its cost. Also, observe that the benefit from avoidance increases with the tax rate implemented.

According to condition (3), we consider three scenarios that represent how difficult is to avoid taxes, each leading to different equilibrium results.

Case 1. *Very difficult tax avoidance, i.e.* $c > w_s t_h \alpha\left(\frac{n_u}{n_s+n_u}\right)$.

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In this scenario, the cost of avoiding taxes is so high that it is never profitable. This is similar to the previous basic model in which avoidance is not feasible. This scenario is more likely to happen when the proportion of skilled workers is high and their wage is relatively low, i.e., when pre-tax income inequality is very low.

Solving game G by backward induction (see Figure 1), it is straightforward that skilled workers do not avoid taxes no matter the tax rate implemented. If this is the case, unskilled workers prefer to vote for the high tax rate to maximize their after-tax payoff. From this, we can state the following result:

Proposition 1: If $c > w_s t_h \alpha \left(\frac{n_u}{n_s+n_u}\right)$, the SPNE of G is $(t_h, (NA, NA))$. Thus, unskilled workers implement the high tax rate, and skilled workers do not avoid taxes.

Case 2. *Moderate difficulty of tax avoidance, i.e.*

$$c \in \left[w_s t_l \alpha \left(\frac{n_u}{n_s+n_u}\right), w_s t_h \alpha \left(\frac{n_u}{n_s+n_u}\right)\right].$$

In this scenario, the cost of avoiding taxes is moderate. More precisely, this is the case where the cost of avoiding taxes is higher than the benefit only if the low tax rate is implemented. Compared with Case 1, this scenario is more likely to happen when, first, income inequality is high enough, and second, there exists a large polarization of policy proposals (the high tax rate is very high, and the low tax rate is very low).

Solving game G by backward induction, skilled workers do not avoid taxes only if the low tax rate is implemented, and they avoid taxes otherwise. Thus, unskilled workers prefer to vote for the low tax rate as long as their utility is higher than in the case where they vote for the high tax rate and the skilled workers avoid taxes:

$$w_u(1-t_l)+\frac{t_l}{n}(n_s w_s + n_u w_u) \geq w_u(1-t_h)+\frac{t_h}{n}(n_s w_s(1-\alpha)+n_u w_u) \leftrightarrow$$

$$t_l \geq t_h\left(\frac{w_s(1-\alpha)-w_u}{w_s-w_u}\right)$$

Then, we can state the following result.

http://www.upo.es/econ

Proposition 2. If $c \in \left[w_s t_l \alpha\left(\frac{n_u}{n_s+n_u}\right), w_s t_h \alpha\left(\frac{n_u}{n_s+n_u}\right)\right]$, the SPNE of G is $(t_l, (NA, A))$. Thus, unskilled workers implement the low tax rate, and skilled workers do not avoid taxes if and only if $t_l \geq t_h\left(\frac{w_s(1-\alpha)-w_u}{w_s-w_u}\right)$. Otherwise, the SPNE of G is $(t_h, (NA, A))$.

This result underlines the importance of the possibility of tax avoidance in the relationship between pre-tax income inequality and the democratic choice of the policy to redistribute income. In this scenario, different from the traditional models of redistributive politics, a significant level of income inequality is compatible with choosing a low tax rate in equilibrium.

Case 3. *Very easy tax avoidance, i.e.* $c < w_s t_l \alpha\left(\frac{n_u}{n_s+n_u}\right)$

In this scenario, skilled workers have a dominant strategy in avoiding taxes. Solving the game by backward induction, unskilled workers always vote for the high tax rate, which is the strategy that maximizes their payoff. From this, we state the following result:

Proposition 3. If $c < w_s t_l \alpha\left(\frac{n_u}{n_s+n_u}\right)$ the SPNE of G is $(t_h, (A, A))$. Thus, unskilled workers implement the high tax rate, and skilled workers avoid taxes.

In our model we assume that all workers know perfectly how tax revenues are collected and redistributed. We also assume that they know whether tax avoidance has occurred or not. Moreover, we assume that skilled workers do not suffer any ethical or psychological cost of being recognized publicly as tax avoiders. If we relax this assumption, the monetary cost of tax avoidance may increase from c to $c + \beta$ with $\beta > 0$, which may affect the equilibrium, since this extra cost changes the boundaries of Cases 1 to 3. We consider this possibility in our experimental design by explicitly including information on tax avoidance decisions in some of the treatments.

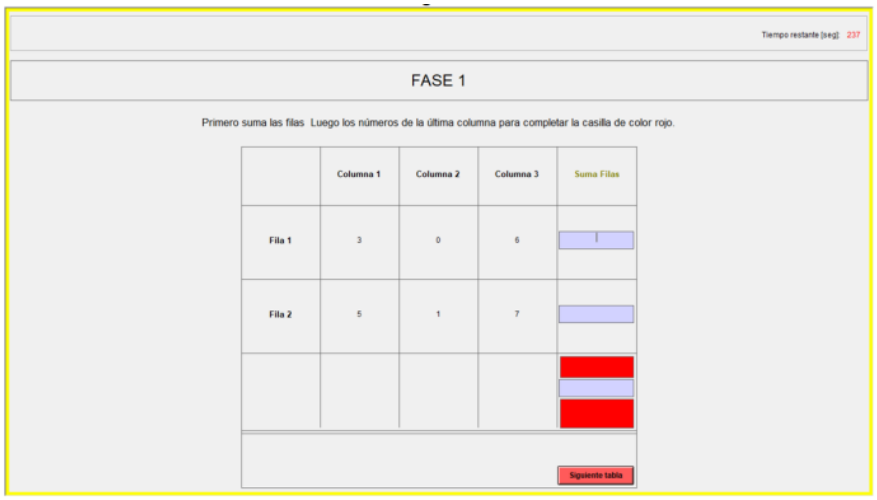
3. Experimental design

Based on the previous model, we designed an experiment in which agents with different skills had to choose between two exogenous tax rates. We consider five

treatments. The first one is the control where tax avoidance is not feasible. In the other four, we vary the avoidance cost and the information we provide about tax avoidance decisions (and how these decisions affect earnings after tax redistribution).

In our experiment, subjects had to perform a real-effort task to earn income before voting for the preferred tax rate. This task was taken from Corgnet *et al*. (2015) and consisted of adding up several numbers. In particular, subjects had to add one-digit numbers in 2x3 tables (see Figure 2). They had to add the sum of all columns and rows in a table before writing the final solution (see the shaded cell in the lower right corner of Figure 2). They were not allowed to use a calculator or any other electronic devices. This stage was the only source of real payoffs for subjects, which was known information (see instructions in Appendix B).

Figure 2. The real-effort task



Each treatment consisted of two phases:

Phase 1: Tournament. This phase consisted of a tournament where each subject performed the aforementioned real-effort task for 4 minutes. The best third of the subjects in this phase was assigned to Group A (skilled workers) and the rest to Group B (unskilled workers). In the event of ties, the subjects competed again in an additional round for 1.5 minutes. After this round, if there were additional ties, the subjects were randomly assigned to groups A or B. In this first stage, subjects knew that Group A members would earn 500 ECUS if they finished the task in the second phase, whereas

those in Group B would earn 100 ECUS. The tournament was played only once at the beginning of the session.

Phase 2: Voting. In the second phase, subjects were assigned to groups of three people, each comprising one person from Group A and two from Group B. The groups were fixed throughout the rest of the session. This phase lasted 15 periods, but the subjects were not informed about this length. At the beginning of each period, each group member had to vote for one of the two tax rates proposed to them to be implemented in their group: a low tax rate of 0.3 and a high one of 0.6. In each group, the tax rate was selected by a simple majority and announced for all group members. Subsequently, subjects had to perform the previous real-effort task for 2 minutes (see Figure 2). Subjects earned a positive amount of ECUS as long as they correctly added at least 1 table in a round; those of Group A earned 500 ECUS, and subjects of Group B earned 100 ECUS.

In all treatments, except for the Baseline in which there was no tax avoidance, at the end of Phase 2, a new decision stage was opened for the Group A (skilled workers) subjects in each group. Each had to decide whether to declare all the income obtained in that round or just 30%. If they decided to avoid taxes, they had to pay a cost, and we considered two different scenarios according to our model, one in which avoidance was easy (cost = 60 ECUS) and another when the cost was moderate (130 ECUS). We also vary tax avoidance information provided in the last screen of each round. Table 1 specifies this information. In sum, we consider five treatments: the **Baseline** (tax avoidance is not feasible), **Noinfo_60** (cost of tax avoidance 60), **Noinfo_130** (cost of tax avoidance 130), **Info_60** (cost of tax avoidance 60 and additional information on tax avoidance), **Info_130** (cost of tax avoidance 130 and additional information on tax avoidance).

Table 1. Information provided by treatment.

Treatment	Information
Baseline	All agents in a group were informed of the following: • All members' pre-tax incomes. • Tax rate chosen by the majority. • All members' after-tax incomes.
Noinfo_60	
Noinfo_130	
Info_60	All agents in a group were informed of the following: • All members' pre-tax incomes. • Tax rate chosen by the majority. • All members' after-tax incomes **In addition, agents in Group B were informed about the decision made by the subject of Group A in their group and their after-tax incomes if this subject had made the other alternative decision.**
Info_130	

Next, we show the payoff functions for each scenario. If there was no tax avoidance (NA) in a group (including the baseline), the payoff in ECUS after taxes for subject i = U (unskilled, group B), S (skilled, group A) when the tax implemented is t and the wage is w_i in each period is given by the following function:

$$u_i(NA) = (1 - t) \cdot w_i + t \cdot \frac{500 + 100 + 100}{3}$$

where t is the tax rate selected by a simple majority within a group ($t \in \{0.3, 0.6\}$), w_i $(w_U = 100, w_S = 500)$ is the pre-tax income obtained by subject i (0 ECUS if the task is not completed). Notice that the tax revenue is equally distributed among all members of the group.

If the skilled worker decides to avoid taxation, the payoffs are given by the following functions:

$$u_S(A) = 500 - (1 - \alpha) \cdot t \cdot 500 - c + t \cdot \frac{(1 - \alpha) \cdot 500 + 100 + 100}{3}$$

$$u_U(A) = (1 - t) \cdot 100 + t \cdot \frac{(1 - \alpha) \cdot 500 + 100 + 100}{3}$$

where α is the percentage of income that the skilled worker avoids in taxes ($\alpha = 0.7$), and c is the cost of avoiding taxation ($c \in \{60, 130\}$).

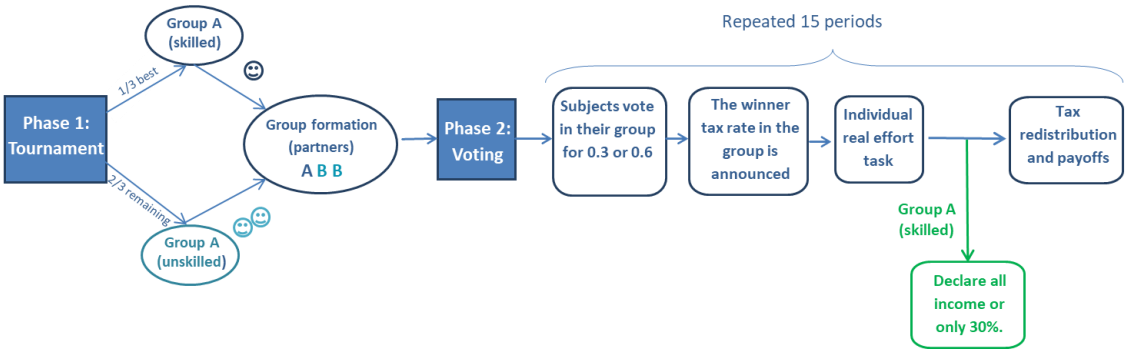
At the end of the experiment, participants answered a questionnaire that included gender, age, studies, zip code, political ideology, income, risk aversion (Bomb Risk Elicitation Task by Crosetto and Filippin, 2013), Cognitive Reflection Test (Toplak *et al*. 2014), reasons for most voted tax rate and tax avoidance (for further details on these questions see Online Appendix). The answers to the questionnaire allow us to control for subjects' heterogeneity.

All treatments in our experiment were conducted at the University Jaume I by the LEE experimental laboratory, with 90 subjects per treatment except in the Baseline treatment that there were only 60 (420 subjects in total), recruited online using ORSEE software. All sessions were run using z-Tree software (Fischbacher, 2007). None of the subjects were allowed to participate in more than one session.

We paid out one randomly selected period among the 15 periods of the second phase of the experiment. Every ECU earned by subjects was converted into Euros at an exchange rate of 1€ = 18 ECUS. All previous information was available to all participants.[10] On average, each person received about 15.37€ (including a 3€ show-up fee) for a 90-minute session.

Figure 3 presents a timeline of the phases and decisions of the experiment.

Figure 3. Timeline of treatments



[10] See instructions and simple screens in Appendix B.

Finally, we summarize the main features of our five treatments in Table 2.

Table 2. Summary of experimental design.

Treatment	*Tax avoidance*	*Low tax rate*	*High tax rate*	*Unskilled wage*	*Skilled wage*	*Proportion of income avoided*	*Avoidance cost*
Basel	No	0.3	0.6	100	500	-	-
Noinfo_130	Yes	0.3	0.6	100	500	0.7	130
Info_130	Yes	0.3	0.6	100	500	0.7	130
Noinfo_60	Yes	0.3	0.6	100	500	0.7	60
Info_60	Yes	0.3	0.6	100	500	0.7	60

4. Main Hypotheses.

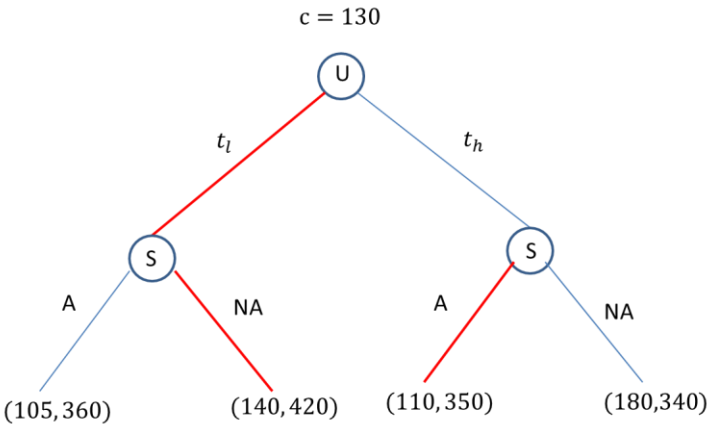
In the experimental design, we consider the following values of the parameters of the general model described in Section 2: $n_s = 1$; $n_u = 2$; $w_s = 500$; $w_u = 100$; $t_h = 0.6$; $t_l = 0.3$; $\alpha = 0.7$.

In the first treatment (Baseline) when tax avoidance is not feasible, it is straightforward that in equilibrium unskilled workers will vote for the high tax rate (0.6) since the median voter is unskilled (see subsection 2.1.1).

The parameters used in the experimental design imply that the avoidance cost is moderate if $c \in [70, 140]$ and low if $c < 70$. Therefore, the treatments Noinfo_130 and Info_130 have a moderate avoidance cost, while Noinfo_60 and Info_60 have a low cost. From now on, since we will only consider two specific avoidance costs, we will refer to $c = 60$ as a low avoidance cost and to $c = 130$ as a high avoidance cost.

When avoidance is feasible, the choice of the tax rate is affected by avoidance decisions. Figure 4 represents the extensive form of game G, given the parameters defined before and an avoidance cost of $c = 130$, and the equilibrium paths.

Figure 4. Extended form of game G when avoidance cost is c = 130

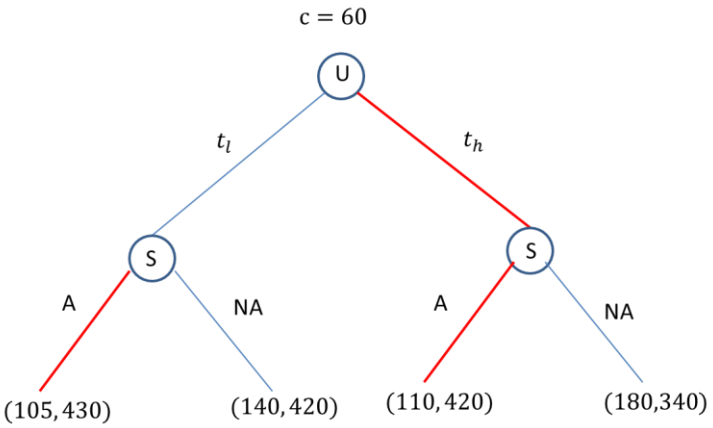


Note: U = unskilled worker, S = skilled worker, A = avoidance, NA = not avoidance, t_l = low tax rate = 0.3, t_h = high tax rate = 0.6.

From Proposition 2 (Section 2), we can state that in equilibrium, unskilled workers will vote for the low tax rate (0.3), and skilled workers will not avoid taxes.

The second possibility is that the avoidance cost is so low that avoiding taxes is profitable for both tax rates. This is the case when c = 60. In this case, the extensive form of game G and the equilibrium paths are represented in Figure 5.

Figure 5. Extended form of game G when avoidance cost is c = 60



Note: U = unskilled worker, S = skilled worker, A = avoidance, NA = not avoidance, t_l = low tax rate = 0.3, t_h = high tax rate = 0.6.

From Proposition 3, we can state that in equilibrium, unskilled workers will vote for the high tax rate (0.6) and skilled workers will engage in tax avoidance. Based on the previous results in equilibrium, we can establish our first two hypotheses regarding voting decisions and tax avoidance:[11]

H1 (Voting by unskilled). *In equilibrium:*

a) There are no differences in the voting decisions between the control treatment (tax avoidance is not feasible) and the scenario where the avoidance cost is low (c = 60).

b) Unskilled workers are more likely to vote for the low tax rate (0.3) when the avoidance cost is high (c = 130) compared to when tax avoidance is not possible.

c) *Unskilled workers are more likely to vote for the low tax rate (0.3) when the avoidance cost is high (c = 130) compared to when the cost is low (c = 60).*

Note that in H1, we do not address the voting decisions of skilled workers. The reason is that in all scenarios (and treatments), the equilibrium decision for skilled workers is to vote for the low tax rate. Previous experiments (see Jimenez *et al*. 2020 and 2023), have strongly supported this theoretical prediction. Our focus in this paper is on understanding the voting decisions of unskilled workers and how the tax avoidance decisions of skilled workers change across different treatments.

Due to the voting decisions, the tax rate implemented is high (0.6) when tax avoidance is not available or when the avoidance cost is low (c = 60). Conversely, the implemented tax rate is low (0.3) when the avoidance cost is high (c = 130). As the tax rate implemented is a direct result of the voting decisions and the distribution of unskilled votes within groups, we will not consider this result in our main hypotheses.

H2 (Tax avoidance by skilled): *In equilibrium:*

a) There is more tax avoidance when the avoidance cost is low (c = 60) compared to when the cost is high (c = 130).

[11] As it is paid out one randomly selected period of the game among the 15 periods of the experiment and there is a unique SPNE in each period, any succession of SPNE equilibria of the stage game will constitute a subgame perfect equilibrium of the repeated game.

b) *When the avoidance cost is high (c = 130), a high tax rate (0.6) leads to more tax avoidance than a low tax rate (0.3).*

c) *When the avoidance cost is low (c = 60), the implemented tax rate does not have an impact on the levels of tax avoidance.*

We state these two hypotheses, based on the assumption that individuals are rational, and they are pure *homo economicus*. Next, we will introduce additional hypotheses concerning bounded rationality and the potential psychological costs associated with engaging in tax avoidance.

Sophisticated players may be able to determine whether skilled workers are avoiding taxes even in the treatments in which they do not have explicit information about it. Consequently, additional information regarding this behavior should not alter players' strategies related to voting or tax avoidance. However, we can assume that players suffer bounded rationality, and they do not identify if the skilled worker in their group is avoiding taxes unless she is informed explicitly about it. They observe the payoffs, but they are not able to deduct the tax avoidance decision. Moreover, if this is the case, providing explicit information to players about the tax avoidance decision may have psychological consequences in tax avoiders. More precisely tax avoiders may experience a psychological cost if this behavior becomes publicly known. If the psychological cost is sufficiently high, we can expect that both players' strategies regarding voting and tax avoidance may differ from the SPNE.

Regarding voting decisions made by unskilled workers, when the avoidance cost is high (c = 130), the equilibrium tax rate is low, and there is no tax avoidance. Therefore, we should not expect any changes in voting behavior. When the avoidance cost is low (c = 60), some skilled workers who experience a high psychological cost (from being publicly identified as tax avoiders) may decide to cease such avoidance. However, unskilled workers will benefit more from a higher tax rate, so they will have no incentives to change their vote.

Focusing on tax avoidance decisions, we may observe a reduction in tax avoidance if the psychological cost of avoiding taxes is sufficiently high. In cases where the avoidance cost is high and no tax avoidance occurs in equilibrium, additional explicit information is unlikely to have any impact. Conversely, when avoidance cost is low, we expect to have a positive effect of providing explicit information, observing

lower levels of tax avoidance. We summarize the previous predictions in the following hypothesis:

> ***H3 (Information):*** *Providing explicit information about tax avoidance decisions:*
>
> *a) Does not change voting behavior regardless the cost of tax avoidance.*
>
> *b) Does not affect tax avoidance levels when the cost is high (c = 130).*
>
> *c) Decreases tax avoidance levels when the cost is low (c = 60).*

5. Results

In this section, we will test the previous hypotheses using data collected from the laboratory experiment. We will employ nonparametric statistics at an individual level to ensure independence, calculating the average of all observations in the fifteen periods. They will reflect Mann-Whitney one-tailed tests unless stated otherwise. First, we will analyze voting behavior and the implemented tax rate. Second, we will examine tax avoidance decisions. Third, we will explore how frequently the theoretical equilibria are played and their convergence over time. Additionally, payoffs and after-tax income inequality are studied. Finally, we will conduct some regressions to account for the panel data structure and to use the information gathered from the post-questionnaire.

Before presenting the descriptive statistics, we need to check whether differences in individual behavior between treatments might be due to variations in ability during the real task. To do this, we will consider the average number of correct tables submitted by subjects in Phase 1 (Tournament). We find that the difference in skill distributions between treatments is not statistically significant (minimum p = 0.190, two-tailed test), except for the Baseline treatment, which exhibits lower skill levels compared to the others (maximum p = 0.022). We will include skill as an explanatory variable in our econometric analysis to account for this factor.

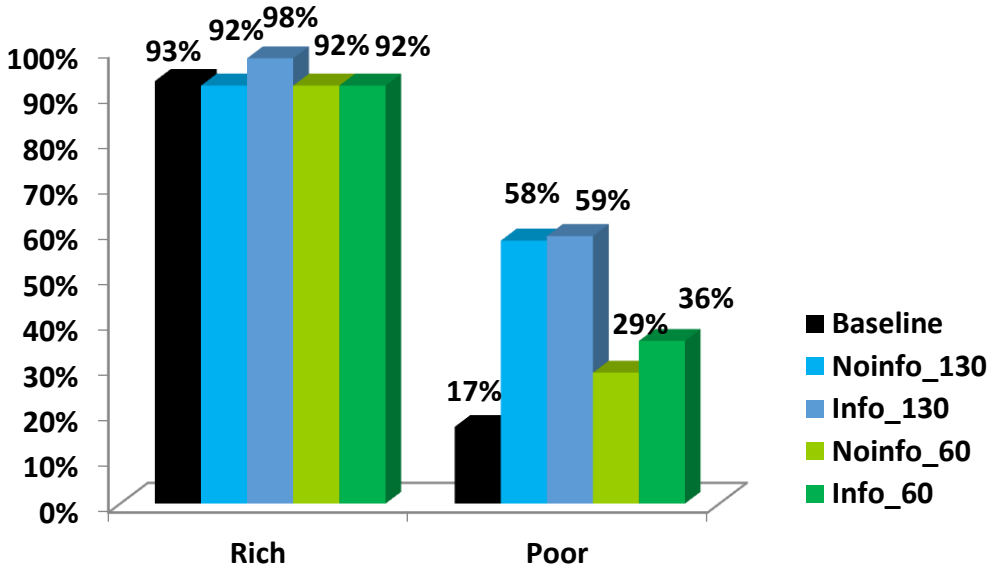
Voting decisions

Next, we will analyze individual behavior across treatments. Figure 6 presents the average percentage of votes for the low tax rate (t = 0.3) for the two types of

subjects in each treatment. From now on, we will label skilled workers as "Rich" and unskilled workers as "Poor" in graphs and tables.

We observe that skilled workers consistently vote for the low tax rates in all treatments (differences are not statistically significant with the minimum p = 0.263, two-tailed test), as predicted in our theoretical model. In contrast, the voting behavior of unskilled workers varies substantially across treatments. On the one hand, when tax avoidance is not feasible (Baseline treatment), unskilled workers vote significantly less for the low tax rate than in all the other treatments (maximum p = 0.025). This indicates that the feasibility of tax avoidance increases the likelihood that unskilled workers vote for the low tax rate. This result supports hypothesis H1b) but contradicts H1a). We observe that a considerable proportion of unskilled workers vote for the low tax rate when the cost of tax avoidance is low (Noinfo_60 and Info_60), particularly when information about tax avoidance is provided (Info_60). On the other hand, when the cost of tax avoidance is high (c = 130), unskilled workers vote more frequently for the low tax rate compared to when the cost is low (c = 60), which supports H1c) (maximum p = 0.003). We will further analyze the motivations behind this behavior using econometrics tools. Finally, as predicted by H3a), there are no significant differences in the voting decisions of unskilled workers when information about tax avoidance is provided (minimum p = 0.168, two-tailed test, Noinfo vs Info for both costs).

Figure 6. Average frequency of votes for the low tax rate

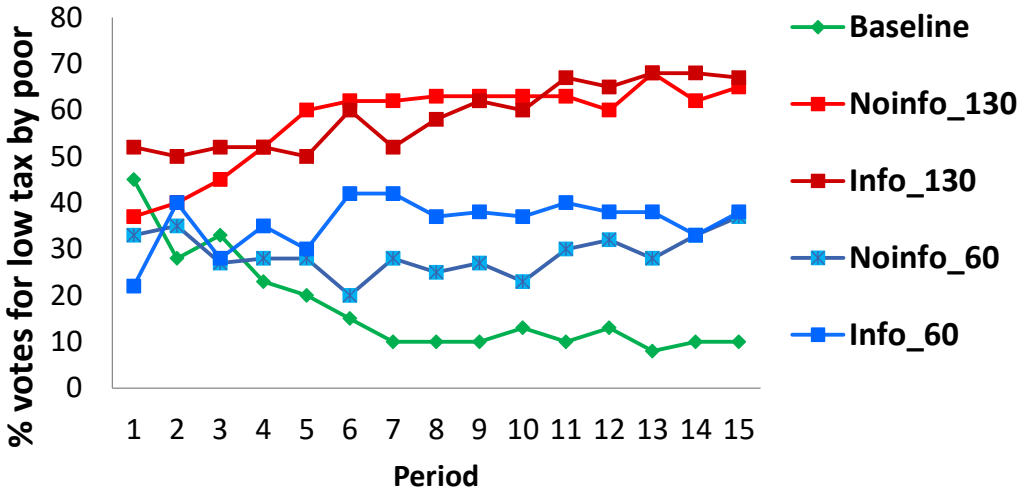


Note: In all treatments there are 30 Rich and 60 Poor, except in Baseline where there are 20 Rich and 40 Poor.

Figure 7 illustrates the evolution of votes for the low tax rate among unskilled workers in all five treatments. In the Baseline treatment, the trend is decreasing from 45% to 10% (τ = -0.272, $p < 0.001$). This indicates that voting decisions of unskilled workers are converging toward the equilibrium of voting the high tax rate. In contrast, the two treatments where the cost of avoidance is 130 (Noinfo_130 and Info_130) show an increasing and much more consistent trend, rising from 40-50% to 70% (τ = 0.114, $p < 0.001$). This trend also suggests convergence toward the equilibrium of voting for the low tax rate.

When the cost of avoidance is 60 (Noinfo_60 and Info_60), the information provided seems to have an impact on the convergence trends. In the presence of information, the trend increases from 20% to 45% (τ = 0.051, $p = 0.051$). Conversely, without information, the trend initially decreases over the first 10 periods, but then slightly increases in the last 5 periods. The overall change from the initial round is minimal, from 33% to 37%, and not statistically significant (τ = -0.039, $p = 0.142$). As the equilibrium in these treatments is for unskilled workers to vote for the high tax rate, it appears that information may hinder convergence to the equilibrium in this scenario. One possible explanation may be that in the Info_60 treatment, the provided information reduces the frequency of tax avoidance among skilled workers, prompting unskilled workers to vote more for the low tax rate as a form of reciprocity. This behavior is not observed when no information is provided. We will further explore this explanation in regression analysis, where we will jointly examine voting decisions and tax avoidance behavior.

Figure 7. Evolution on time of votes for the low tax rate by Poor



Result 1 (Voting decisions).

a) *When tax avoidance is feasible, unskilled workers tend to vote more frequently for the low tax rate compared to situation where tax avoidance is not an option. Therefore, H1b) is supported, while H1a) is not; a significant number of unskilled workers vote for the low tax rate when the avoidance cost is low (c = 60).*

b) *When the cost of tax avoidance is high (c = 130), unskilled workers vote even more frequently for the low tax rate than they do when the cost is low (c = 60). Consequently, H1c) is supported.*

Implemented tax rate

The implemented tax rate is mainly determined by voting decisions, but the way votes are distributed among different groups also plays a role. The average frequency of votes for the low tax rate among unskilled workers aligns with the implemented tax rate as follows: Baseline (30%), Noinfo_130 (75%), Info_130 (82%), Noinfo_60 (37%) and Info_60 (54%). In the Baseline treatment, the low tax rate is implemented significantly less often compared to the other treatments (maximum $p = 0.033$). Moreover, the presence of information does not appear to affect the implemented tax rate ($p = 0.719$ and $p = 0.568$, two-tailed test, for cost 130 and 60, respectively). Finally, the low tax rate is implemented more frequently at a cost of 130 than at a cost of 60 (maximum $p < 0.001$).

Tax avoidance

Table 3 presents the average frequency of tax avoidance among skilled workers. As expected, skilled workers exhibit a significantly higher frequency of tax avoidance when the cost is 60 (73% or 52%) compared to when the cost is 130 (15% or 18%) (maximum $p < 0.001$), thereby supporting H2a). When we analyze the data based on the implemented tax rate at the cost of 130, we find that skilled workers are more likely to avoid taxes when the tax rate is high compared to when it is low (maximum $p = 0.011$), which supports H2b). At a cost of 60, skilled workers also tend to avoid taxes more frequently when the high tax rate is implemented (91% or 85%) rather than when it is the low rate (51% or 22%) (maximum p-value = 0.001). This result does not support H2c) but explains the difference in the trends found in Figure 7 for the low avoidance costs treatments and suggests that skilled workers reciprocate unskilled workers when they vote for the low tax rate.

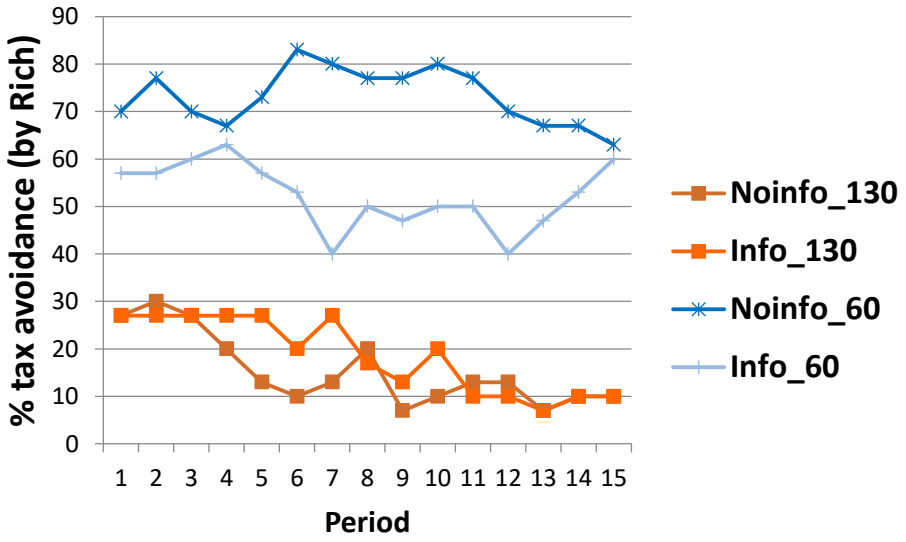
Regarding the impact of information, we observe no significant differences in avoidance decisions at a cost of 130 ($p = 0.951$, two-tailed test). Conversely, there is a negative (decreasing) effect on tax avoidance when the cost is 60 ($p = 0.029$), supporting H3b) and H3c). Furthermore, when we split the sample by the implemented tax rate, we find that when it is the high tax rate, there is slightly more tax avoidance in the Info_130 treatment compared to the Noinfo_130 ($p = 0.0569$). This difference may arise because, when information is available, skilled workers signal to unskilled workers that if they do not vote for the low tax rate, they will avoid taxes even if it is not profitable. However, when the implemented tax rate is low, information does not significantly influence tax avoidance ($p = 0.719$, two-tailed test). Finally, at a cost of 60, we observe only a weakly significant effect of information when the low tax rate is implemented, as skilled workers avoid taxes more frequently in the Noinfo_60 treatment compared to the Info_60 ($p= 0.090$).

Table 3. Average levels of tax avoidance across treatments

	All	**Low tax rate winner (0.3)**	**High tax rate winner (0.6)**	**N**
Noinfo_60	73%	51%	91%	30
Info_60	52%	22%	85%	30
Noinfo_130	15%	3%	58%	30
Info_130	18%	4%	76%	30

Figure 8 plots how the average frequency of tax avoidance evolves over time across different treatments. As indicated by Table 3, the trend in the treatments with a cost of 130 is quite similar, showing a decreasing pattern that converges to around 10%, which is very close to the theoretical equilibrium of 0%. In contrast, with a cost of 60, the trend is quite different between treatments. In the absence of information, tax avoidance increases in the first rounds but decreases in the last rounds. Conversely, when information is provided, the trend appears to be nearly opposite. The most significant observation is the notable gap between the two treatments, which supports H3c): public information about tax avoidance leads to a reduction in the tax avoidance behavior. We will explore this effect further in our econometric analysis.

Figure 8. Evolution on time of tax avoidance levels (by Rich)



Result 2 (Tax avoidance decisions).

a) *When the cost of tax avoidance is low (c = 60), skilled workers tend to avoid taxes more frequently compared to when the cost is high (c = 130). Therefore, H2a) is supported.*

b) *When the cost of tax avoidance is high (c = 130), skilled workers are more likely to avoid taxes when the implemented tax rate is high, rather than when it is the low. Hence, H2b) is supported.*

c) *When the cost of tax avoidance is low (c = 60), skilled workers almost always engage in tax avoidance, but they do so more frequently when the*

implemented tax rate is high compared to when it is low. Thus, H2c) is not supported.

We summarize our previous findings on the impact of information as follows:

Result 3 (Information).

a) Providing explicit information about tax avoidance does not influence voting decisions, thus supporting H3a).

b) When the cost of tax avoidance is high (c = 130), explicit information about tax avoidance does not impact tax avoidance decisions, supporting H3b).

c) When the cost of tax avoidance is low (c = 60), explicit information about tax avoidance has a negative effect on tax avoidance decisions, which supports H3c).

Equilibria

In the previous analysis, we studied decisions regarding voting and tax avoidance at an individual level. However, to analyze the frequency of equilibria in each treatment, we must conduct a group-level analysis. Table 4 shows the percentage of time that each equilibrium is achieved.

First, in the Baseline treatment, the equilibrium where the skilled worker votes for the low tax rate while both unskilled workers vote for the high tax rate occurs 64% of the time. Next, we consider the treatments where the cost is 130. In these cases, the equilibrium is that all group members vote for the low tax rate, and the skilled worker does not avoid taxes. Note that, even if one of the unskilled workers votes for the high tax rate, the resulting equilibria are outcome-equivalent to the one in which all workers vote for the low tax rate (see Appendix A). We observe that the equilibrium is reached a significant percentage of the time, 71% and 77%, indicating that there appears to be no effect of information.

In the treatments where the cost is 60, the equilibrium is such that the skilled worker votes for the low tax rate and avoids taxes, while both unskilled workers vote for the high tax rate. Note that in this case, there is no other equilibrium in which one unskilled worker votes for the low tax rate. The equilibrium occurs 46% of the time in the Noinfo_60 treatment and 37% of the time in the Info_60 treatment. When comparing this with the case where the cost is 130, we observe that the percentages for

the equilibrium are lower, particularly in the Info_60 treatment. In fact, the strategies that correspond to the equilibrium for the cost of 130 appear more frequently, 41%, than those for the cost of 60, which are only 37% in Info_60. This observation suggests that the information provided regarding tax avoidance may influence the frequency of the observed equilibrium. In the current treatment, where tax avoidance is consistently high favorable, if unskilled workers are explicitly informed that skilled workers are not avoiding taxes, unskilled workers might choose to vote for the low tax rate reciprocating the skilled workers' "kindness". We will explore this explanation further in the econometric analysis.

Table 4. Percentage of time that each equilibrium is played[12]

Strategies	**Baseline**	**Noinfo_130**	**Info_130**	**Noinfo_60**	**Info_60**
Rich = low, Poor = high Poor = high	64%	19%	18%	50%	41%
Rich = low, Poor = low Poor = low/high + No Avoid	-	71%	76%	19%	41%
Rich = low, Poor = high Poor = high + Avoid	-	13%	14%	46%	37%
N	300	450	450	450	450

Note: "Rich = low, Poor=low Poor=low/high + No Avoid" refers to the strategy profile in which the skilled worker votes for the low tax rate and does not avoid taxes, one of the unskilled workers also votes for the low tax rate, and the other unskilled worker votes either for the low or the high tax rate. "Rich = low, Poor=high Poor= high + Avoid" refers to the strategy profile in which the skilled worker votes for the low tax rate and avoids taxes, and all unskilled workers vote for the high tax rate. The percentages underlined correspond to strategies that are Subgame Perfect Equilibria in a specific treatment.

[12] There are other strategies that are also equilibrium but are not intuitive because the Rich has to vote for the high tax rate (only happens between 1%-6% of the cases) or all members vote for the low tax rate and the Rich avoid taxes (only happens between 0.2%-4% of the cases).

Result 4 (Equilibria at the group level).

a) When tax avoidance is not possible, the equilibrium is reached 64% of the time.

b) When the cost of tax avoidance is high (c = 130), the equilibrium is achieved 71% or 77% of the time. There is no effect of information on the equilibrium frequency.

c) When the cost of tax avoidance is low (c = 60), the equilibrium is reached 46% or 37% of the time. When information about tax avoidance decisions is provided, the most frequent outcome (41%) is not the equilibrium where both unskilled workers vote for the high tax rate. Instead, it is the strategy profile where at least one unskilled worker votes for the low tax rate.

Before-tax and after-tax payoffs

As explained in the experimental design, the before-tax payoffs are 500 ECUS for skilled workers and 100 ECUS for unskilled workers, (except in cases where a subject did not sum correctly at least one table and then the payoff is 0 ECUS). However, after-tax payoffs are influenced by the implemented tax rate and the levels of tax avoidance, if available. Table 5 presents the payoffs (before and after-tax redistribution) and the share of the sum of payoffs within groups for skilled and unskilled workers in each treatment.

Table 5. Average payoffs before and after taxes and redistribution by treatment.

	RICH				POOR				N (Rich/Poor)
	Before taxes	**After taxes**	**Share before**	**Share after**	**Before taxes**	**After taxes**	**Share before**	**Share after**	
Baseline	496.7	361.8	0.71	0.52	99.2	166.6	0.14	0.24	20 / 40
Noinfo_60	500	462.3	0.72	0.66	99	118.2	0.14	0.17	30 / 60
Info_60	500	446.5	0.72	0.64	99.3	125.8	0.14	0.18	30 / 60
Noinfo_130	500	421.6	0.72	0.60	99.3	138.2	0.14	0.20	30 / 60
Info_130	500	427.5	0.72	0.61	99	135.6	0.14	0.19	30 / 60

As expected, skilled workers earn less when they do not have the option of tax avoidance compared to when they do. Complementarily, unskilled workers earn more when tax avoidance is not possible (maximum $p < 0.001$). When the cost of tax

avoidance is high (c = 130), skilled workers earn significantly less than when the cost is low (c = 60) ($p < 0.001$ across both information scenarios). As a consequence, when the avoidance cost is 130, unskilled workers earn significantly more than when it is 60 ($p < 0.001$ for both information scenarios). This result arises from the fact that, at c =130, skilled workers avoid taxes with a low frequency (15% or 18%), while at c = 60, the frequency is notably high (52% or 73%). For skilled workers, the information provided does not impact after-tax payoffs (minimum p = 0. 660). Analogously, information has no effect on after-tax payoffs for unskilled workers when the tax avoidance cost is 130 ($p = 0.669$). Nevertheless, unexpectedly, when the tax avoidance cost is 60, unskilled workers earn significantly more when explicit information about tax avoidance is provided compared to when it is not ($p = 0.004$). We summarize these findings in the following result.

Result 5 (After-tax income inequality).

a) When tax avoidance is not feasible income inequality is the lowest.

b) There is more income inequality when the tax avoidance cost is low (c = 60) than when it is high (c = 130).

c) When the cost of tax avoidance is low (c = 60), explicit information decreases income inequality.

Econometric analysis

In this section, we will conduct an econometric analysis to check the robustness of our results, taking into account the panel data structure of our sample. It is important to note that by averaging the observations across the 15 rounds in the previous statistic inference, we may lose significant information. Our analysis will control for heterogeneity, specifically individual characteristics that may influence decisions between treatments, an aspect that is particularly important in laboratory experiments with reduced sample sizes. First, we will utilize a Random Effects (RE) Logit model where the dependent variable is the probability of unskilled workers voting for the low tax rate in the current period. This model will help us analyze the effect of tax avoidance on voting decisions and examine the influence of information. Next, we will

use the same model, but this time the dependent variable will be the probability of tax avoidance among skilled workers in the current period. This model will enable us to analyze the impact of avoidance costs and the role of information in tax avoidance decisions.

Table 6 presents the coefficients (marginal effects) of two RE logit regressions on the probability of voting for the low tax rate in the current period. In specification (1), we compare the Baseline treatment with Noinfo_130 & Info_130 treatments. In specification (2), we compare the Baseline treatment with Noinfo_60 & Info_60 treatments. The explanatory variables include a gender dummy that equals 1 if the agent is a woman (*Female*), the number of correct tables summed in the Tournament Phase (*Skill*), an index for risk lovers (*Risk lover*), the Cognitive Reflection test index (*CRT index*), and treatment dummies for NoInfo and Info treatments (*NoInfo_130/60*, *Info_130/60*). We cluster errors at an individual level.

Table 6. RE Logit on Poor voting for the low tax rate

VARIABLES	(1) **Basel, Noinfo_130 Info_130**	(2) **Basel, Noinfo_60 Info_60**
Female	-0.044	0.077
	(0.080)	(0.064)
Skill	0.194	-0.218
	(0.658)	(0.457)
Risk lover	-0.015	0.018*
	(0.013)	(0.009)
CRT index	-0.226	-0.346
	(0.329)	(0.221)
Period	0.140***	0.017
	(0.021)	(0.018)
Noinfo_130[60]	**3.886*** **	**1.099***
	(0.723)	(0.621)
Info_130[60]	**3.455*** **	**1.845*** **
	(0.628)	(0.648)
Constant	1.129	-2.386*
	(1.631)	(1.321)
N	2,170	2,170

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In line with statistic inference, we observe that the low tax rate is more frequently voted for when tax avoidance is possible, as indicated by the positive and significant treatment dummies in all specifications. Furthermore, consistent with our

previous findings, the effect is greater when the avoidance cost is 130 (specification (1)) compared to when it is 60 (specification (2)). These results support H1b) and H1c), but contradict H1a).

Table 7 presents two RE logit regressions on the probability of voting for the lower tax rate in the current period. As found previously, there is no significant effect of information (dummies **Info_130 and Info_60** not significant in specifications (3) and (4)) on the decision of voting for the lower tax rate, supporting H3a). Additionally, across all treatments, we observe that when skilled workers engage in tax avoidance in the previous period, unskilled workers respond by increasing their preference for the high tax rate. This effect is consistent in both information scenarios (dummies **Avoidance in t-1*Info130 [60], Avoidance in t-1*NoInfo130 [60],** both significant and with negative coefficients). This effect is stronger when the cost is 60, suggesting that unskilled workers may be "punishing" skilled workers by choosing to vote for the higher tax rate to deter tax avoidance. When analyzing the effects by cost, we find that the impact of tax avoidance on voting for the low tax rate is quite similar in both information treatments when the cost is high (c = 130). However, when the cost is low (c = 60), the effect is significantly greater—almost double—when information is available compared to when it is not. This finding suggests that information influences the effect of tax avoidance on voting.

Table 7. RE Logit on Poor voting for the low tax rate (Information effect)

VARIABLES	(1) **Noinfo_130 vs. Info_130**	(2) **Noinfo_60 vs. Info_60**	(3) **Noinfo_130 vs. Info_130**	(4) **Noinfo_60 vs. Info_60**
Avoidance in t-1*Info130 [60]	**-0.614***	**-1.506*****	-	-
	(0.356)	(0.278)		
Avoidance in t-1*Noinfo130 [60]	**-0.623****	**-0.845*****	-	-
	(0.308)	(0.271)		
Avoidance in t-1	-	-	**-0.619*****	**-1.171*****
			(0.237)	(0.194)
Skill	-0.044	0.080	-0.044	0.077
	(0.080)	(0.064)	(0.080)	(0.064)
Female	0.194	-0.224	0.194	-0.218
	(0.658)	(0.454)	(0.658)	(0.457)
Risk lover	-0.015	0.018**	-0.015	0.018*
	(0.013)	(0.009)	(0.013)	(0.009)
CRT index	-0.226	-0.361	-0.226	-0.346
	(0.329)	(0.220)	(0.329)	(0.221)
Period	0.140***	0.015	0.140***	0.0168
	(0.021)	(0.018)	(0.021)	(0.018)

Info_130	-0.027	-	-0.026	-
	(0.312)		(0.309)	
Info_60	-	0.389	-	0.194
		(0.245)		(0.218)
Constant	1.183	-4.582**	1.180	-3.358*
	(1.927)	(2.002)	(1.923)	(1.878)
N	1,680	1,680	1,680	1,680

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8 presents the coefficients (marginal effects) of two RE logit regressions about the probability of tax avoidance in the current period. To assess the impact of the cost of avoidance, we compare treatments that provide the same information but differ in cost. In specification (1), we compare Noinfo_130 treatment to Noinfo_60 treatment. In specification (2), we compare Info_130 treatment to Info_60 treatment. Additionally, we introduce an explanatory variable: a dummy that is 1 if the low tax rate is implemented in the current period (*Low tax winner in t*). Through these regressions, we aim to study the effect of the avoidance cost on the decision of skilled workers to avoid taxes.

Table 8. RE Logit on the probability of tax avoidance (Cost)

VARIABLES	(1) **Noinfo_130 vs. Noinfo_60**	(2) **Info_130 vs. Info_60**
Low tax winner in t	**-3.754*** **	**-4.753*** **
	(0.353)	(0.456)
Skill	0.104	0.021
	(0.075)	(0.105)
Female	-0.321	1.758*
	(0.597)	(1.021)
Risk lover	0.002	0.019
	(0.013)	(0.021)
CRT index	-0.075	0.256
	(0.230)	(0.382)
Period	-0.018	-0.062*
	(0.028)	(0.035)
Noinfo130[Info130]	-1.390***	-0.884***
	(0.203)	(0.267)
Constant	-5.368**	-4.532
	(2.301)	(3.412)
N	900	900

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

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As before, in the statistic inference, we find that tax avoidance is more frequent when the cost is 60 compared to when it is 130. This is indicated by the negative and significant coefficients of the dummies Noinfo_130 and Info_130, supporting H2a). Interestingly, when probability of implementing the low tax rate in the previous period is higher, the likelihood of skilled workers avoiding taxes decreases. It appears that skilled workers respond to unskilled workers voting for the low tax rates by avoiding taxes less, as if they were reciprocating the unskilled workers' voting decisions.

To further analyze the impact of information on tax avoidance decisions, we conducted four RE logit regressions on the probability of avoiding taxes in the current period (see Table 9). Again, we find that information does not have a significant effect on tax avoidance decisions by skilled workers when the cost is high (the dummy Info130 in the specification (3) is not significant). In contrast, information has a negative effect when the cost is low (the dummy Info60 in the specification (4) is negative and significant), supporting H3b) and H3c). Finally, we observe that the coefficient for Low tax winner is negative and significant for both cost scenarios and both information conditions. This finding aligns with our earlier explanation (Table 3) that skilled workers are more likely to avoid taxes when the implemented tax is high.

Table 9. RE Logit on the probability of tax avoidance (Information effect)

VARIABLES	(1) **Noinfo_130 vs. Info_130**	(2) **Noinfo_60 vs. Info_60**	(3) **Noinfo_130 vs. Info_130**	(4) **Noinfo_60 vs. Info_60**
Low tax winner*Noinfo130 [60]	-5.832***	-3.743***	-	-
	(0.742)	(0.499)		
Low tax winner*Info130 [60]	-5.030***	-2.916***	-	-
	(0.608)	(0.436)		
Low tax winner	-	-	-5.375***	-3.308***
			(0.499)	(0.328)
Skill	0.053	0.108	0.056	0.110
	(0.081)	(0.098)	(0.080)	(0.098)
Female	1.460**	-0.435	1.397**	-0.449
	(0.692)	(0.802)	(0.681)	(0.801)
Risk lover	0.003	0.042*	0.002	0.042*
	(0.013)	(0.023)	(0.013)	(0.023)
CRT index	0.070	-0.120	0.062	-0.153
	(0.258)	(0.332)	(0.256)	(0.330)
Period	-0.017	-0.026	-0.017	-0.027
	(0.038)	(0.028)	(0.038)	(0.028)
Info130/Info60	0.622	-0.587	0.395	-0.880**
	(0.390)	(0.455)	(0.292)	(0.390)
Constant	-2.614	2.857	-1.950	4.611

	(2.634)	(4.297)	(2.505)	(4.053)
N	900	900	900	900

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In summary, our findings indicate that both the impact of tax avoidance on the voting decisions of unskilled workers and the influence of the implemented tax rate on tax avoidance behaviors are significant and negative across both avoidance cost levels. Nevertheless, there are some notable differences. When the avoidance cost is low (c = 60), the effect of tax avoidance is stronger (almost double) compared to when the cost is high (c =130). Conversely, when the avoidance cost is high (c = 130), the impact of the implemented tax rate is greater than when the cost is low (c = 60).

Result 6 (Interaction voting-tax avoidance)

a) *The interaction between unskilled workers' voting decisions and tax avoidance is similar for both avoidance costs. As the frequency of tax avoidance increases, the likelihood of voting for the low tax rate decreases. Conversely, when the low tax rate is implemented more frequently, the probability of tax avoidance decreases.*
b) *When the cost is low (c = 60), skilled workers start avoiding more taxes (dominant strategy) compared to when the cost is high (c=130). As a result, unskilled workers are less likely to vote for the low tax rate at a low cost (c =60) than at a high cost (c = 130).*
c) *When the cost is high (c = 130), the outcome converges to the implementation of the low tax rate along with a low level of tax avoidance.*

The previous result may help explain why we find a very high frequency of the equilibrium outcomes at c = 130, which is not the case at c = 60. The interaction between voting decisions and tax avoidance leads to strategies that deviate from equilibrium in the case of c = 60. This effect is even more pronounced when explicit information is presented (coefficients Avoidance in t-1*Info60 and Avoidance in t-1*Noinfo60 in specification (2) on Table 7). Consequently, the lowest frequency of equilibrium outcomes is observed in the Info_60 treatment.

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6. Concluding Remarks

In this paper, we analyze theoretically and experimentally the interaction of decisions on voting over income redistribution and tax avoidance. To do so, we propose a basic dynamic model of redistributive politics in which both tax avoidance and tax rates are endogenous variables. We characterize the equilibria depending on the cost of tax avoidance and information about tax avoidance decisions. To test the results of the model we design a laboratory experiment.

Overall, the experimental results support our theoretical predictions. First, the impossibility of tax avoidance favors the support for the high taxes. Second, a high cost of tax avoidance makes unskilled workers choose to vote for a low tax rate to prevent a reduction of income redistribution through tax avoidance. In this scenario, most skilled workers optimally do not avoid taxes because there is a credible threat of facing a high tax rate if they do it. Third, when tax avoidance is so cheap that avoidance is a dominant strategy for any tax rate, a higher than predicted proportion of unskilled workers still vote for the low tax rate. We find that this counterintuitive result can be explained by the fact that unskilled workers may vote for the low tax rate to induce skilled workers not to avoid taxes. This behavior is in line with the results in Cappelen *et al.* (2019) in which individuals tend to overestimate the negative effect of taxes on the economy and therefore on income redistribution.

Interestingly, skilled workers sub-optimally avoid less when the low tax rate is implemented. This result suggests that skilled workers might reciprocate unskilled workers' voting decisions. This is also in line with the findings of Corazzini *et al.* (2024) that show the existence of wealthy-interest bias in coordination on public goods and a reciprocal disproportional share that reduces income inequality.

Regarding the effect of information on tax compliance, when unskilled workers are informed explicitly about the level of tax avoidance and its consequences, skilled workers reduce their tax avoidance levels. This result might indicate the existence of an implicit cost for tax avoiders when this activity becomes public information.

In our experiment, income inequality is the lowest when tax avoidance is not feasible. Although the most unequal scenario is the one when the tax avoidance cost is low, providing explicit information about tax avoidance activities compensates for this negative effect.

The policy implications of our findings may help to reduce aggressive tax avoidance and prevent income inequality after taxes. Tax avoidance harms income inequality directly by reducing tax revenues and indirectly increasing support for lower tax rates. Tax enforcement is costly. For instance, it eats up around 10% of taxes collected in the US when combining costs for government (tax administration) and private agents (tax compliance costs) (see Andreoni *et al.* 1998 or Slemrod and Yitzhaki, 2002). However, according to our findings, tax enforcement is worthy: An efficient tax enforcement system with a strict tax code increases tax compliance and income redistribution. To this end, policymakers may approve anti-avoidance rules aimed to provide mechanisms to deny the tax benefits of avoidance considered not to be in the spirit of the tax code (such as the ones announced by the UK's Chancellor of the Exchequer, George Osborne, in his 2013 Budget speech).

As tax authorities become less effective in tax compliance, we find that the role of information about the level of tax avoidance and its consequences is key. According to our results, public advertising campaigns aimed at raising awareness of the level of tax avoidance may also effectively increase tax compliance and income redistribution. Our findings also affect parties' platforms on tax enforcement. More precisely, they indicate that we should expect parties against a high welfare state to be less strict with tax avoidance, while parties in favor would tend to be more severe with tax compliance.

Finally, we are aware that our study is not free of caveats. The roles of skilled and unskilled workers are determined through a tournament. An alternative scenario is to consider that luck (instead of merit) is the main income source. According to Jimenez *et al.* (2020), this consideration affects voting decisions over income redistribution in a setting without the possibility of tax avoidance. Comparing both scenarios in this setting may be worth studying in the future. We also assume pure homo-economicus preferences in our theoretical setting but observe some reciprocal behavior in our experiment, suggesting the presence of other-regarding preferences.

While preparing this work, the authors used Grammarly Pro to provide suggestions regarding spelling, grammar, and clarity. After using this tool, the authors reviewed and edited the content as needed. We take full responsibility for the content.

References

Advani, A., Hughson, H., and Summers, A. (2023). "How much tax do the rich really pay? Evidence from the UK." *Oxford Review of Economic Policy*, 39(3), 406-437.

Agranov, M., and Palfrey, T. R. (2015). "Equilibrium Tax Rates and Income Redistribution: A laboratory Study." *Journal of Public Economics* 130, 45-58.

Andreoni, J., Erard B., and Feinstein J. (1998). "Tax Compliance." *Journal of Economic Literature*, 36(2), 818- 860.

Bénabou, R, and Ok. E. A. (2001). "Social Mobility and the Demand for Redistribution: The POUM Hypothesis." *Quarterly Journal of Economics* 116 (2), 447–87.

Black, D. (1948). "On the Rationale of Group Decision-making". *Journal of Political Economy*, 56 (1), 23–34.

Blaufus, K., Hundsdoerfer, J., Jacob, M., and Sünwoldt, M. (2016). "Does legality matter? The case of tax avoidance and evasion." *Journal of Economic Behavior & Organization*, 127, 182-206.

Borck, R. (2009). "Voting on redistribution with tax evasion." *Social Choice and Welfare*, 32, 439–454.

Cabrales, A., Nagel R. and Rodríguez Mora, J.V. (2012). "It is Hobbes, not Rousseau: an experiment on voting and redistribution." *Experimental Economics*, 15(2), 278–308.

Cadsby, C. B., Maynes, E., and Trivedi, V. U. (2006). "Tax compliance and obedience to authority at home and in the lab: A new experimental approach." *Experimental Economics*, 9, 343-359.

Cappelen, A.W., HaalandI. K., and Tungodden, B. (2019). "Beliefs about Behavioral Responses to Taxation." Working Paper.

Corazzini, L., Cotton, C. S., Longo, E., and Reggiani, T. (2024). "Coordinated selection of collective action: Wealthy-interest bias and inequality." *Journal of Public Economics*, *238*, 105172.

Corgnet, B., Hernán-González, R., and Schniter, E. (2015). "Why Real Leisure Really Matters: Incentive Effects on Real Effort in the Laboratory." *Experimental Economics* 18(2), 284-301.

Crosetto, P., and Filippin, A. (2013). "The "bomb" risk elicitation task." *Journal of Risk and Uncertainty*. 47, 31-65.

Durante, R., Putterman, L., and Weele, J. (2014). "Preferences for Redistribution and Perception of Fairness: An Experimental Study." *Journal of the European Economic Association* 12(4), 1059-1086.

Eisinger, J., Ernsthausen, J., and Kiel, P. (2021). The secret IRS files: Trove of never-before-seen records reveal how the wealthiest avoid income tax. *ProPublica June, 8.*

Escobar, S., Ohlsson, H., & Selin, H. (2023). "Giving to the children or the taxman?: Lessons from a Swedish inheritance tax loophole." *European Economic Review*, 153, 104382.

Fischbacher, U. (2007). "Z-Tree: Zurich Toolbox for Ready-made Economic Experiments," *Experimental Economics*, 10(2), 171-178.

Fong, C. M. (2001). "Social Preferences, Self-Interest, and the Demand for Redistribution." *Journal of Public Economics* 82 (2), 225–46.

Jiménez-Jiménez, N., Molis, E., and Solano-García, A. (2020). "The effect of initial inequality on meritocracy: A voting experiment on tax redistribution." *Journal of Economic Behavior and Organization* 175, 380-394.

Jiménez-Jiménez, N., Molis, E., and Solano-García, A. (2023). "Don't shoot yourself in the foot! A (real-effort task) experiment on income redistribution and voting." *European Journal of Political Economy* 78, 102325.

Lee, W., and Roemer, J. E. (2006). "Racism and redistribution in the United States: A solution to the problem of American exceptionalism." *Journal of Public Economics*, 90(6-7), 1027-1052.

Malik, S., Mihm, B., and Timme, F. (2018). "An experimental analysis of tax avoidance policies." *International Tax and Public Finance*, 25, 200-239.

Meltzer, A. H., and Richard S. F. (1981). "A Rational Theory of the Size of Government." *Journal of Political Economy*, 89, 914–927.

Piketty, T. (1998). "Self-fulfilling beliefs about social status." *Journal of Public Economics* 70, 115–132.

Roberts K. W. (1977). "Voting over Income Tax Schedules." *Journal of Public Economics*, 8, 329–340.

Romer T. (1975). "Individual Welfare, Majority Voting, and the Properties of a Linear Income Tax." *Journal of Public Economics*, 4, 163–185.

Roemer, J. E. (1998). "Why the poor do not expropriate the rich: An old argument in new garb." *Journal of Public Economics*, 70 (3), 399-424.

Ronie, J. (2006). "The political economics of not paying taxes." *Public Choice*, 126, 107–13.

Sausgruber, R., Sonntag, A., and Tyran, J. R. (2021). "Disincentives from redistribution: evidence on a dividend of democracy." *European Economic Review*, 136, 103-749.

Slemrod, J. (2001). "A general model of the behavioral response to taxation." *International Tax and Public Finance*, 8, 119-128.

Slemrod, J., and Yitzhaki, S. (2002): Tax Avoidance, Evasion, and Administration in *Handbook of Public Economics*, Volume 3, Pages 1423-1470.

Smith, M., Yagan, D., Zidar, O., and Zwick, E. (2019). "Capitalists in the twenty-first century." *The Quarterly Journal of Economics*, 134(4), 1675-1745.

Solano-García A (2017). "Fairness in Tax compliance: A Political Competition Model." *Journal of Public Economic Theory*, 19 (5), 1026 - 1041.

Tax Justice Network. State of Tax Justice 2024: Methodological Note on Estimating the Scale of Corporate Tax Abuse. 2024. url: https://taxjustice.net/wpcontent/uploads/2024/11/sotj2024_methodology_corporateTaxAbuse.pdf (visited on 18/11/2024) (cit. on pp. 26, 29).

Toplak, M. E., West, R. F., and Stanovich, K. E. (2011). "The Cognitive Reflection Test as a predictor of performance on heuristics-and-biases tasks." *Memory and Cognition*, 39(7), 1275-1289.

Traxler, C. (2009). "Voting over taxes: the case of tax evasion." *Public Choice*, 140, 43-58.

Weber, T. O., Fooken, J., and Herrmann, B. (2014). "Behavioural economics and taxation." *European Commission Taxation Papers*.

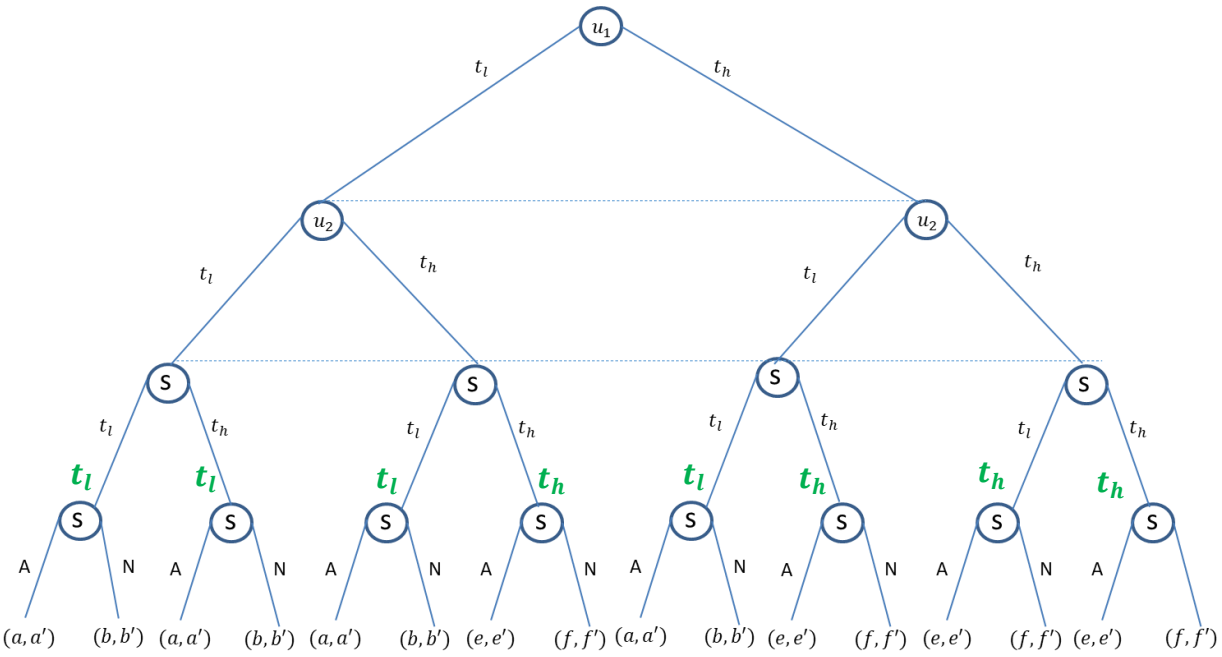
Appendix A:

Feasible tax avoidance model when unskilled workers are not identical.

We solve this model for a simple economy formed by three workers, one skilled (s) and two unskilled (u_1, u_2), which is the size considered in our experiment. In this economy, all players must vote simultaneously for a tax rate (t_h or t_l), and after a simple majority of workers elects a tax rate, the skilled worker must decide whether to avoid taxes (A) or not (N).

The following decision tree can represent the dynamic game with imperfect information played in this economy. In green, we represent the elected tax rate before each possible decision to avoid taxes or not.

Figure A.1. Extensive form game G



Note: u_1, u_2 = unskilled workers, S = skilled worker, A = avoidance, NA = not avoidance, t_l = low tax rate = 0.3, t_h = high tax rate = 0.6.

We analyse the Subgame Perfect Nash Equilibria (hereafter, SPNE) in three different scenarios, each based on the difficulty of tax avoidance.

Case 1. *Very difficult tax avoidance, i*.e. $c > w_s t_h \alpha\left(\frac{n_u}{n_s+n_u}\right)$.

We solve the game by backward induction. In the last stage of the game, the skilled worker does not avoid taxes ($b' > a'$ and $f' > e'$). By notational convenience, we denote this strategy by N^*.

In the first stage, voting for t_h is a weakly dominant strategy for unskilled workers ($b < e$). On the other hand, t_l is a weakly dominant strategy for the skilled worker ($b' > f'$).

In this game, there are three SPNE: $s_1^* = \big((t_h),(t_h),(t_l,N^*)\big)$, $s_2^* = \big((t_h),(t_h),(t_h,N^*)\big)$ and $s_3^* = \big((t_l),(t_l),(t_l,N^*)\big)$. Notice that, although the skilled worker has no incentives to vote for t_h, s_2^* is also a SPNE, since once both unskilled workers vote for t_h, the skilled worker`s vote has no effect. Both equilibria, s_1^* and s_2^* are payoff-equivalent. Although not very probable, there is also a SPNE in which all workers vote for the low tax rate.

Case 2. *Intermediate difficulty of tax avoidance, i.e.*

$$c \in \left[w_s t_l \alpha\left(\frac{n_u}{n_s+n_u}\right), w_s t_h \alpha\left(\frac{n_u}{n_s+n_u}\right)\right].$$

In this scenario, in the last stage of the game, the skilled worker prefers do not avoid taxes if the elected tax rate is t_l ($b' > a'$) and prefers to avoid taxes if the elected tax rate is t_h ($e' > f'$). By notational convenience, we denote this strategy by N^{**}. The decision tree after solving this stage is represented in Figure A.2.

In the second stage, unskilled workers will vote for t_l if and only if it is high enough. In particular, if $t_l \geq t_h\left(\frac{w_s(1-\alpha)-w_u}{w_s-w_u}\right)$. Under this assumption, t_l is a weakly dominant strategy for unskilled workers ($b \geq e$). On the other hand, the skilled worker will vote for t_l if and only if $c \geq \frac{n_u}{n_u+n_s}\big(t_l(w_s-w)-t_h(w_s(1-\alpha)-w_u)\big)$. Then, there are five Subgame Perfect Nash Equilibria: $s_1^{**} = \big((t_l),(t_l),(t_l,N^{**})\big)$, $s_2^{**} = \big((t_h),(t_l),(t_l,N^{**})\big)$, $s_3^{**} = \big((t_l),(t_h),(t_l,N^{**})\big)$, $s_4^{**} = \big((t_l),(t_l),(t_h,N^{**})\big)$, and $s_5^{**} = \big((t_h),(t_h),(t_h,N^{**})\big)$. Note that s_1^{**}, s_4^{**} and s_5^{**} are equilibria in which both unskilled players vote the same tax rate. Note also that s_1^{**}, s_2^{**}, s_3^{**} and s_4^{**} are payoff-equivalent. In the case in which $c < \frac{n_u}{n_u+n_s}\big(t_l(w_s-w)-t_h(w_s(1-\alpha)-w_u)\big)$, the

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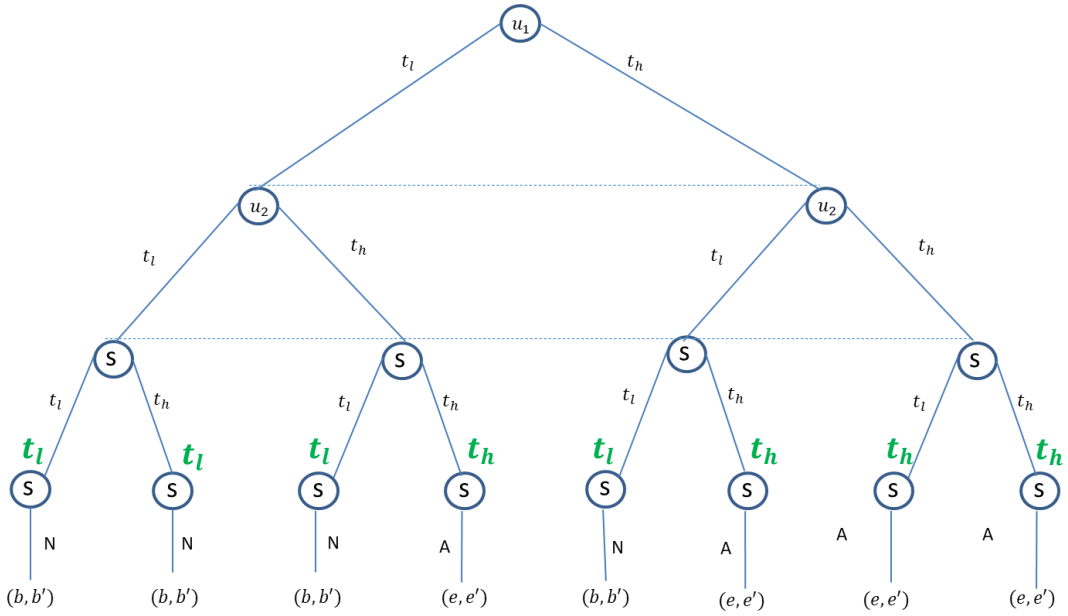
skilled worker will vote for t_l. In this case, there are three SPNE that are s_1^{**}, s_4^{**} and s_5^{**}.

Figure A.2. Second stage of backward induction in Case 2



Note: u_1, u_2 = unskilled workers, S = skilled worker, A = avoidance, NA = not avoidance, t_l = low tax rate = 0.3, t_h = high tax rate = 0.6.

Case 3. *Very easy tax avoidance, i*.e. $c < w_s t_h \alpha \left(\frac{n_u}{n_s+n_u}\right)$.

In the last stage of the game, the skilled worker obtains the highest profit by avoiding taxes ($a' > b'$ and $e' > f'$). By notational convenience, we denote this strategy by A^*.

In the second stage, t_h is a weakly dominant strategy for unskilled workers ($a < e$), and t_h is a weakly dominant strategy for the skilled worker ($a > e'$).

In this game, there are three SPNE: $s_1^* = \big((t_h),(t_h),(t_h,A^*)\big)$, $s_2^* = \big((t_h),(t_h),(t_l,A^*)\big)$ and $s_3^* = \big((t_l),(t_l),(t_l,A^*)\big)$. Notice that, although the skilled worker has no incentives to vote for t_h, s_1^* is also a SPNE, since once both unskilled workers vote for t_h, the skilled worker`s vote has no effect. Both equilibria, s_1^* and s_2^* are payoff-equivalent. Although not very probable, there is also a SPNE in which all workers vote for the lowest tax rate.

Appendix B:

INSTRUCTIONS (translated from Spanish)

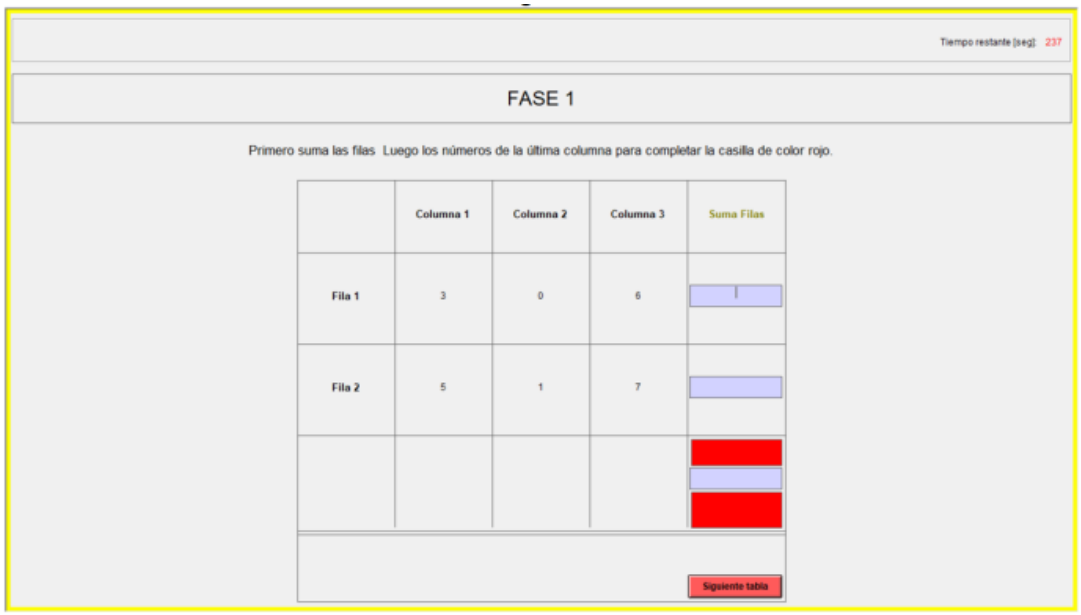
The purpose of this experiment is to study how individuals make decisions in certain contexts. The instructions are simple and if you follow them carefully you will receive an amount of cash at the end of the experiment in a confidential way, since no one will know the payments received by the rest of the participants. You can ask us any questions you have at any time by raising your hand first. Other than those questions, any kind of communication between you is forbidden and will be subject to immediate exclusion from the experiment.

This experiment consists of two phases.

Phase 1

In the first phase you will have to perform an addition-based task for a total time of 4 **minutes**. The task will consist of adding 6 numbers from a table of 2 rows and 3 columns. The difficulty of the tables will be the same for all participants. Before writing on the screen your final answer (the total sum of all the numbers in the table), you will have to complete the 2 cells corresponding to the sum of each row. You will only be able to write the final answer of the table (red box in Figure 1) once you have completed the 2 previous cells.

Figure 1



The use of a calculator or any electronic device is prohibited. If you use any of them, you will be expelled from the experiment and you will not receive any payment.

When the **4 minutes** are up, the number of correctly added tables for each participant in this session will be calculated. **The number of correct tables will depend only on the result written in the red box** (the other cells will help you to calculate the final result, but will not be taken into account). The one third of participants with the best results will be assigned **Type A** while the remaining two thirds will be assigned **Type B**. Type A participants will receive in the second phase of the experiment **500 points** if they correctly perform the task asked of them. While Type B participants will receive in the second phase **100 points** if they correctly perform the task. In case of a tie in the number of correct sums, the tied participants will perform the same task again for **1.5 minutes**. If there is a tie again, the tie-breaker will be broken randomly among all tied participants.

Phase 2

In the second phase you will be randomly paired with two other people in the room to form a group of three, so that in each group there will be **one type A** and **two type B participants**. It is important for you to know that during all the rounds of this phase **your group will always be the same**. This means that you will be paired with the same people during all the rounds.

The second phase will consist of several rounds of a total duration of **2 minutes** each. During this time, you will have to perform a **task** consisting of adding up the numbers in a table (similar to Phase 1). If you perform the task correctly, you will get a certain fixed number of points (depending on your type). These points will be **taxed** and the total tax collected in your group **will be divided equally** among all members of the group.

At the beginning of each round, two taxes will be presented. You will have to choose one of them. The most voted within the group will be the one that will finally be applied in this round. Note that as the groups are formed by 3 people there is no possibility of a tie in the voting. Before starting the 2 minutes of the total time of the round, the tax

chosen by the majority of the group will be announced. The **first two rounds will be test rounds** to familiarize you with the voting process, so they will not count towards your winnings.

At the end of each round there will be an additional stage for type A participants. If you are the **type A participant** in your group of three people, you have to decide whether to **declare all the winnings** obtained in this round or to **declare only 30% of the winnings in exchange for paying a cost.** For type A participants, the tax chosen in your group will only be applied to the part of the winnings you have decided to declare. For type B participants, the tax chosen in their group will be applied to all winnings.

Your winnings in each round

Your winnings in a round will be determined as follows:

- **STEP 1** (**Earnings before tax).** If you are type A, you will earn 500 points if you correctly complete **at least one addition table** and 0 points otherwise. If you are type B, you will earn 100 points if you correctly complete **at least one addition table** and 0 points otherwise.

- **STEP 2** (**Payment of taxes**). For the points obtained in STEP 1 you must **pay taxes**.
    - If you are **type A**, your payment will depend on the decision you made in the additional stage of the round.
        - **If you have decided to declare all the points obtained in STEP 1** and you have completed the task correctly, you will pay $t \cdot 500$ (if you have failed to complete the task you will pay 0).
        - **If you have decided to declare 30% of the points obtained in STEP 1** and you have completed the task, you will pay $t \cdot 0.3 \cdot 500$ (if you have failed to complete the task you will pay 0), being t the tax chosen by majority vote in the voting process in this round and 0.3 the proportion you have decided to declare. As you have decided not to declare all the points, you will also have to pay a cost of 130 points.

- If you are **type B** and you have correctly completed the task you will pay $t \cdot 100$ (otherwise you will pay 0), being t the tax chosen by majority vote in the voting process in this round.

- **STEP 3 (The share of the total collection you receive).** The **total points collected with the tax** in your group will be divided equally among the 3 members of your group. The total collection will depend on your group's type A decision in the additional stage of the round.
    - **If in STEP 2 Type A has decided to declare all the taxes obtained in STEP 1**, and we assume that everyone performed the task correctly, the total collection will be $500 \cdot t + 100 \cdot t + 100 \cdot t$. Therefore, each member of the group will receive $\left(\frac{t \cdot 500 + t \cdot 100 + t \cdot 100}{3}\right)$.
    - **If in STEP 2 Type A has decided to declare 30% of the points obtained in STEP 1,** and we assume that everyone performed the task correctly, the total collection will be $[t \cdot 0.3 \cdot 500 + t \cdot 100 + t \cdot 100\ ]$. Therefore, each member of the group will receive $\left(\frac{t \cdot 150 + t \cdot 100 + t \cdot 100}{3}\right)$.[13]

The points you will earn in each round will be your pre-tax earnings (STEP 1) minus the taxes paid (and an additional cost in case you decide not to declare all the points earned) (STEP 2) plus your share of the tax collection of your group (STEP 3). These earnings can be expressed as follows (assuming that all group members have completed at least one correct table):

- If **the type A member of the group has decided to declare all the points obtained in STEP 1, then the group member must declare all the points obtained in STEP 2.**

$$Ganancias\ (tipo\ A) = 500 - t \cdot 500 + \left(\frac{t \cdot 500 + t \cdot 100 + t \cdot 100}{3}\right)$$

[13] If in STEP 1 you scored 0 points, the taxes you will have to pay in STEP 2 will be 0 points. However, in STEP 3 you will receive one third of your group's collection.

$$Ganancias\ (tipo\ B) = 100 - t \cdot 100 + \left(\frac{t \cdot 500 + t \cdot 100 + t \cdot 100}{3}\right)$$

- If **the type A member of the group has decided to declare 30% of the points obtained in STEP 1, the group member must declare 30% of the points obtained in STEP 2.**

$$Ganancias\ (tipo\ A) = 500 - t \cdot 150 - 130 + \left(\frac{t \cdot 150 + t \cdot 100 + t \cdot 100}{3}\right)$$

$$Ganancias\ (tipo\ B) = 100 - t \cdot 100 + \left(\frac{t \cdot 150 + t \cdot 100 + t \cdot 100}{3}\right),$$

Where *t* is the tax, 500 and 100 are the points obtained in STEP 1 by type A and type B participants, respectively, and 130 is the cost paid by A for deciding not to declare all the points obtained.

Example

Let's assume that the tax chosen by vote in your group in this round is 45%, i.e., $t = 0{,}45$ and that during the 2 minutes of the round type A has correctly added at least one board (500), and the two types B have correctly added at least one board (100). The winnings in this round will be:

STEP 1. Pre-tax earnings in points:

Type A = 500
Type B = 100

STEP 2. Tax payment in points.

- If **type A of the group has decided to declare all the points obtained in STEP 1, then the group's type A will declare all the points obtained in STEP 2.**

Type A = $t \cdot 500 = 0.45 \cdot 500 = 225$

Type B = $t \cdot 100 = 0.45 \cdot 100 = 45$

- **If type A has decided to declare 30% of the points obtained in STEP 1 for a cost of 130 points:**

  Type A =$[t \cdot 150] + 130 = 0{,}45 \cdot 150 + 130 = 197.5$ (the taxes you pay on the declared portion plus the cost of not declaring)

  Type B = $t \cdot 100 = (0{,}45) \cdot 100 = 45$

STEP 3. The portion of the total collection in points that each group member receives:

- If **type A of the group has decided to declare all the points obtained in STEP 1, the share of the total proceeds received by each member of the group will be:**

  Type A = Type B =$\left(\frac{t \cdot 500 + t \cdot 100 + t \cdot 100}{3}\right) = \left(\frac{0.45 \cdot 500 + 0.45 \cdot 100 + 0.45 \cdot 100}{3}\right) = 105$

- **If type A has decided to declare 30% of the points obtained in STEP 1 for a cost of 130 points, the share of the total proceeds received by each member of the group will be:**

  Type A = Type B $= \left(\frac{t \cdot 150 + t \cdot 100 + t \cdot 100}{3}\right) = \left(\frac{0.45 \cdot 150 + 0.45 \cdot 100 + 0.45 \cdot 100}{3}\right) = 52{,}5$

The final earnings in points of each round for each type will be the result of the points of STEP 1 (earnings before taxes) minus the points of STEP 2 (payment of taxes and an additional cost in case of deciding not to declare all the points obtained) plus the points of STEP 3 (sharing of tax collection). Therefore, the final earnings of a round in points will be:

- If **type A of the group has decided to declare all the points obtained in STEP 1:**

  Type A $=500 - 225 + 105 = \mathbf{380}$

  Type B $=100 - 45 + 105 = \mathbf{160}$

- **If type A has decided to declare 30% of the points obtained in STEP 1 for a cost of 130 points:**

  Type A $= = 500 - 197{,}5 + 52{,}5 = \mathbf{355}$

  Type B $= 100 - 45 + 52{,}5 = \mathbf{107{,}5}$

At the end of each round, we will inform you of the payments obtained by each member of your group before taxes (remember that, if they have done the task correctly, the earnings before taxes will be 500 points for type A and 100 points for type B, otherwise they will be 0 points for all types). We will also inform you of the tax chosen by the majority in your group and your after-tax earnings, as well as the after-tax earnings of the other members of your group. Finally, if you are type B we will inform you if the type A of your group has decided to declare all the points earned in that round before tax or only a proportion p (less than 100% of them). We will also inform you what your winnings would have been if type A had made the alternative decision (declare everything if he has decided to declare a proportion p<100% or declare a proportion p<100% if he has decided to declare everything). In addition, you will have a calculator in case you want to do some calculations. At the end of the experiment, we will pay for your decisions for **1 round**, randomly chosen, not including the two test rounds.

To pay you for your decisions, we will convert your earnings in points to euros, using the rate of **18 points = 1€**. In addition to this payment, we will also pay you 3€ for your participation in this experiment. Your winnings will be received anonymously at the end of the experiment.

Next, before moving on to Phase 1 of the experiment, you will have to answer a short questionnaire to make sure that you have understood these instructions correctly.