Preferences for Redistribution and Perception of Fairness: An Experimental Study*

Ruben Durante† Louis Putterman†

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Abstract

Why is there significant political support for progressive taxation and equalizing government transfers in western democracies? Possibilities include individual social preferences for a less unequal distribution than what market forces alone would dictate, demand for social insurance, or successful political coalitions to redistribute away from the rich. We study the relative importance of fairness preferences, risk aversion, and self-interest in determining support for redistribution through a set of experiments in which a large number of subjects are asked to choose what level of taxation to implement under different decision conditions and with four alternative determinants of pre-tax income (two task-based, one random, and one based on socio-economic background). Treatments using varying costs of redistribution to the decision-maker and efficiency losses to recipients are used to study willingness to pay for redistribution and concern for aggregate inefficiency. Most of our subjects prefer that there be less inequality among others and demand for redistribution responds in predictable ways to the cost of taxation and to the dead-weight loss associated with it. The external validity of the experiment is supported by the high correlation between tax decisions and political preferences. We also find evidence that preferred levels of redistribution are highly responsive to whether pre-tax incomes are determined according to task performance, a trend that is much more evident among men than among women. Comparisons between redistributive choices under different experimental conditions provide interesting insights with regard to the relative importance of inequality aversion and self-interest when choosing under uncertainty and when uncertainty is resolved. In the first case, individuals' expectation about their future position in the income distribution has a considerable impact on their tax choices. When sure of the effect on their own earnings, subjects tax choices are primarily governed by self-interest, but fairness preferences continue to play a role.

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† Brown University Department of Economics. Contact: Ruben_Durante@brown.edu ; Louis_Putterman@brown.edu.

1 Introduction

Redistribution of income through government taxes and transfers has long been normal practice in industrial democracies. Using data from the Luxembourg Income Study, Branko Milanovic (2000) estimated that the income share of the bottom two quintiles of households in 14 OECD countries in the early 1990s was on average 14.7% higher when measured on a post-tax-and-transfer than on a pre-tax-and-transfer basis. Even in the U.S., the least redistributive of the wealthy industrialized countries, Milanovic found a difference of almost 8% between the income share of the bottom 40% of households after versus before taxes and transfers.

The question of how much redistribution there ought to be is one that in the end must cross the boundary between positive and normative discussion. But there are many points on which positive economic analysis can be helpful. Studies that attempt to estimate the magnitude of the trade-off between equality and efficiency are one example. An understanding of why income is redistributed can also be pursued as a matter of positive analysis.

Among the possible explanations of why redistribution occurs in democracies is that there is a social consensus behind it, that is, a large majority of citizens feel better off living in a society with less inequality because it reflects their ethical values, increases their perceived personal and property security (Thurow, 1971), or some combination of these or other reasons. In the limit, redistribution could be Pareto improving, i.e. even those with high incomes could prefer some degree of redistribution to occur despite the material cost to them. If redistribution were universally preferred, then an efficient amount of redistribution could in principle be found, whether using the Pareto criterion or by a Benthamite social welfare function.

At the other end of the spectrum of explanations is the possibility that redistribution results from the combination of majority rule and self-interest, as emphasized in traditional political-economic models of redistribution (Meltzer and Richard, 1981; Alesina and Rodrik, 1994; Sinn, 1995 among others).[1] The distribution of incomes in most societies is right-skewed, with the income of the median individual or household being far below the arithmetic mean. Thus, assuming that a given amount of

[1] In contrast with this view, however, there is evidence of high levels of support for redistributive programs even among those who are unlikely to benefit from them (Gillens, 1999, Fong 2003) and, on the other hand, of relatively strong opposition to redistributive policies among those who are likely to benefit from them (Fong, 2001)

revenue has to be raised by either a head tax (taking a fixed amount per person), a flat tax (taking an equal proportion of income from each person), or a progressive tax (taking a proportion of income that is higher the greater the individual's income), a self-interested median voter will always prefer the flat over the head tax and the progressive over the flat tax, assuming absence of incentive considerations. If government expenditure benefits all more or less equally, political economy models that assume equal participation in elections always predict that progressive taxes will be adopted in market democracies. In the absence of incentive and other dynamic considerations, however, such models predict the complete leveling of incomes, something not observed in practice. The addition of incentive concerns could explain this, although other factors may also be operating.

The above discussion leaves out one more important reason why self-interest might lead to redistribution: in the absence of adequate means of insuring themselves against negative shocks, individuals with average or above-average incomes may favor redistributive taxation as a form of social insurance (Benabou and Ok, 2001; Alesina and La Ferrara, 2005). For this to happen, tax regimes must be relatively persistent over time, and voters must have some degree of uncertainty about how they will fare in the future. Both these assumptions are reasonable in real contexts.

Our remarks about social or ethical preferences for redistribution are also incomplete insofar as they fail to consider that the value judgments in question may depend on the nature and causes of pre-tax inequality, and on how these are perceived by the voters. Some authors have suggested that differences in voter preferences may depend, at least in part, on their perceptions of whether the distributive outcomes of the market economy are perceived as fair or not (Piketty 1995; Ravallion and Lokshin, 2000; Graham and Pettinato, 2002; Alesina, Di Tella, and McCulloch, 2004; Alesina and Angeletos, 2005; Benabou and Tirole, 2006). Using survey data from several sources, Fong (2001, 2003) finds supporting evidence for the United States that such fairness considerations matter to people.

An extensive experimental literature has investigated how agents' choices may be dictated by forces other than self-interest, such as aversion to inequality (Charness and Rabin, 2002; Fehr and Schmidt, 2003; Camerer, 2003) and how the origin of initial entitlements affects the extent of non-self-interested behavior (Hoffman and Spitzer, 1985; Burrows and Loomes, 1994). Nevertheless, most of these studies have focused on small group interactions, and it is unclear how these findings can be

generalized to explain attitudes toward equality and redistribution at the societal level. Our experiment joins a relatively small existing set of studies of preferences on redistribution that are designed with a macro-political economy application in mind and involve choices that are potentially costly in real money terms to the decision-maker (Beck, 1994; Ackert, Martinez-Vazquez and Rider, 2004; Beckman, Formby and Smith, 2004).

To investigate the extent of social preferences for redistribution, their sensitivity to the determinants of inequality and to perceptions of fairness, and the more general role that self-interest plays in voting for redistributive taxes, we conducted a series of laboratory decision experiments involving a large number of subjects. One goal was to shed light on the degree to which observed redistributive outcomes in democracies are explained by self-interest versus social preferences for equality. Thus, each subject in our experiments was asked to express a preference for redistribution among the micro community of participants both under the condition of being an outside observer of a distribution of income among others, and in the situation of being an affected party with a specific interest stemming from the expectation or knowledge of having a higher or lower pre-tax income. To investigate subjects' willingness to pay for income equalization and their concern over the possibly "leaky" nature of taxation and redistribution, we varied across treatments both a direct cost to the decision-maker and an administrative or efficiency loss to recipients. We also had subjects make decisions both under uncertainty about their relative position in the pre-tax distribution and when uncertainty had been resolved. We used mainly student subjects but also a non-student adult comparison group. Our design contains several new elements, including large group size and multiple income determination methods in combination with multiple decision contexts.

We find most subjects willing to pay to increase equality of earnings among others whom they do not know. This willingness varies in predictable ways with the direct cost to the decision-maker, and with their political views and (real world) incomes. It varies in an intuitive way with whether subjects "earn" their unequal laboratory incomes, although this difference itself is sensitive to gender in an interesting manner echoing the political "gender gap" (females are more reluctant to accept even "earned" inequality). Subjects value efficiency, redistributing less when more income is thereby lost. Despite the clear evidence of "social preferences" most subjects' choices regarding redistribution reflect their personal interest when this is also at stake. Evidence

for this includes a greater desire for redistribution when own income is more difficult to predict. We provide estimates of the relative weights placed on social preferences and self-interest.

The reminder of the paper is organized as follows. Section 2 describes the design and rationale of our experiments. Section 3 provides a theoretical framework for predicting and interpreting the results. In section 4 we illustrate and discuss our main results. Section 5 concludes.

2 Experiment Design

Experimental sessions took place in a computer lab and lasted approximately ninety minutes. Each session involved twenty-one subjects. A $5.00 participation fee was given to each subject who completed the session. Participants' additional earnings were contingent on the outcome of the experiment, averaging around $21.30 but with a potential range unusual for laboratory experiments - from $0.11 to $103.

The sessions began with a set of instructions that appeared on the subjects' computer screens and were simultaneously read aloud by the experimenter so that all subjects were aware of the rules and procedures. At the end of the instruction stage, subjects were invited to ask questions and then answered five questions to test their comprehension of the procedures.

As part of the on-screen instructions, we presented a table describing the set of provisional experimental payoffs to be assigned to each of the participants (Table 1). The distribution of the payoffs, ranging from $0.11 to $100.00, reproduced the distribution of the average pre-tax incomes of the lowest to highest earning twentieths of the US population, which was also included in the table. Participants were informed that the provisional earnings might be altered by a tax and transfer process.

Each experimental session consisted of two main parts ('Part I' and 'Part II' henceforth) in which participants were asked to make a set of redistributive choices under different experimental conditions. At the end of the session one of the two parts was randomly selected to be the basis for payments.[2]

In Part I each subject was asked to choose a proportional tax rate (0%, 10%, 20%, ..., 100%) to be applied to the pre-tax payoff distribution among the other twenty

[2]As will be explained later, a subsidiary stage, Part III, also occurs in certain sessions.

participants with the proceeds being distributed equally among all subjects. Participants were informed that, at the end of the session, one person would be randomly selected as the "decisive individual", and his preferred tax rate would be applied to the pre-tax earnings distribution of the other twenty participants to determine their final payoff. The decisive individual himself, however, would be affected neither by Table 1's pre-tax income profile nor by the tax and transfer to be implemented. By requiring all subjects to indicate their tax preferences at the outset, we aimed at eliciting "outside observer" preferences from the entire subject pool. We used a dictator rather than a median voter design so that subjects would have no reason to vote strategically.

Two additional dimensions of treatment variation were included in order to study agents' willingness to pay for a more equal earnings distribution and their concern for aggregate efficiency. The first parameter (which we will refer to as 'tax cost') measures the cost of each additional 10% tax in terms of a direct reduction in the decisive individual's payoff (compare Andreoni and Miller, 2002). The tax cost parameter could take four alternative values: \$0, \$0.25, \$0.5, or \$1. For example, in a session with tax cost equal to \$0.5, the decisive individual was charged 50 cents for imposing a tax of 10%, \$1 for a tax of 20%, continuing up to \$5 for a tax of 100%. The second parameter measures 'efficiency loss', or the loss in the aggregate payoff of the other participants associated with each additional 10% tax, in line with Okun's (1975) "leaky bucket"argument (Amiel, Creedy and Hurn, 1999; Beckman, Formby and Smith, 2004)[3]. This could take three alternative values: 0%, 12.5%, or 25%. For instance, in a session with efficiency loss of 25%, for each \$10 collected as tax, \$2.50 is lost and \$7.50 is divided equally among the twenty affected subjects.

Formally, the post-tax earnings of the twenty affected subjects are given by:

$$\tilde{y}_i = (1-t)y_i + t(1-e)\frac{1}{20}\sum_{j=1}^{20} y_j \tag{1}$$

with y_i being individual i's pre-tax earnings, t being the tax rate chosen by the decisive individual, and e the dead weight loss associated with the tax. The (expected) payoff

[3]The efficiency loss parameter could be interpreted as the a measure of the dead weight loss associated with distortionary taxation, or alternatively, as the cost of administering the tax

of the decisive individual is given by:

$$\tilde{y}_d = y_d - c(10 \cdot t)$$

with y_d being the decisive individual's base-payoff, t his preferred tax rate, and c the cost of each 10% tax. Participants were informed that the base payoff of the decisive individual would be randomly drawn from the interval between \$19.80 (the mean pre-tax payoff of the other 20 subjects), and \$21.80.[4] Therefore, the final payoff of the decisive individual was either entirely unaffected by taxes and transfers (when $c = \$0$, our pure "disinterested observer"benchmark), or else was affected only by the cost of the tax he would choose to impose ("modified disinterested observer"scenario). Both the tax cost and the efficiency loss parameters were held constant during a given session, allowing their effects to be measured only by between-subject comparisons. The effects of taxation were explained to subjects verbally, graphically, using a table (Table 2), and by means of an equation resembling (1), so that both more and less mathematically inclined subjects could understand them. Subjects were required to pass a comprehension test before making any decision.

Prior to making their Part I choice, participants were also informed that the pre-tax earnings distribution would be determined by one of four possible methods: a) randomly ("Random"); b) based on the average income of their place of origin ("Where From,"derived from their home ZIP code, or home country income for subjects from countries other than the US); c) according to their performance on a general knowledge quiz ("Quiz"; similar to the SAT II); d) according to their score on a computer-based game of skill ("Tetris").[5] The actual method to be employed

[4]Although it was impossible to totally eliminate comparisons between his own income and that of the other twenty subjects, we chose a base income at least equal to the group average for the decisive individual with the aim of moderating the salience of such concerns. A higher base income would reduce the likelihood of invidious comparisons with higher earners, but increase the likelihood of guilty comparisons with low earners. The impact of the choice of base income can be explored in future experiments. Subjects were told that the identity of the decisive individual would never be revealed, a measure we adopted to eliminate worry over the social tension that he might feel from anyone unhappy with the chosen t. The decisive individual's base income had a random element to make it difficult even for that individual to be sure he had been chosen, again to reduce worries about feelings of tension at the end of the session (this is also the reason why a revision stage was not added in cases in which Part I was randomly selected.). We wanted each subject to focus as much as possible, when choosing tax rates, on the consequences for her and others' earnings, and not on any consequences for their own social interactions with the others at the close of the experiment.

[5]Subjects were told that the version of Tetris to be played was specially modified to put more and less experienced players on a more equal footing.

would be randomly selected at the end of the experiment. Each subject was asked to choose a tax rate for each of the methods. The four methods were designed to mimic different determinants of economic success in real life (luck, initial conditions, effort and/or ability, respectively) and were used to assess differences in agents' attitude toward redistribution relative to their perception of fairness.

After each subject chose four preferred tax rates for Part I, the nature of Part II was explained, questions were invited, and subjects again took a comprehension test.

In Part II each participant was again asked to choose a tax rate for each the four methods, this time on the understanding that if selected to be the decisive individual, his base payoff would be one of the twenty earnings levels described in Table 1 and his preferred tax rate would be applied to the pre-tax earning distribution among twenty participants, including himself ('involved observer' scenario). In this case, another subject was randomly selected to receive \$19.80 to \$20.80 and be unaffected by either the redistribution or the tax cost. This section was designed to analyze the effect of involvement on subjects' choices. The tax cost and efficiency loss parameters did not vary between Part I and II.

Before choosing Part II tax rates, subjects had to pass another comprehension test. They were then asked to report how they expected to rank under each of the four earnings determination methods, and how confident they were about their guess. They then chose the tax rates, took the 20 question Quiz, practiced the Tetris game for two minutes, and played the Tetris game for five minutes. After this, a coin was tossed to determine whether payments would be based on Part I or II. If Part II was selected, participants were informed of their actual ranking in each of the four methods and were offered the possibility of revising their tax choice (we will refer to this stage as 'Part III'). This arrangement was designed in order to remove subjects' uncertainty about their relative position in the pre-tax distribution and to study the effects of self-interest under certainty and with a wider range of costs than in Part I. [6] Then the earnings-determination method was selected (by the roll of two dice), the decisive individual was chosen (drawing a code number from a hat),[7] and the final

[6] Whereas the net cost of taxation to the decisive individual ranges from 0 to $1 in Part I, it ranges from + \$9.3 per 10\% tax for the top earner to -2.0$ per 10% tax for the lowest earner in the revised decision stage. As mentioned in the previous note, there was no revision of tax choices if Part I was chosen.

[7] Although subjects themselves had no way to identify code numbers with individuals, this method was used to help convince subjects that the identity of a decisive individual was indeed being

payoffs were announced.

Before exiting the session, subjects were asked to make a series of choices between earning a dollar with certainty and participating in a lottery with a 50% probability of earning nothing and a 50% probability of earning a positive amount which increased from one question to the next ($1.80 in the first choice, $2.00 in the second, $2.33 in the third, $2.67 in the fourth, and $3.00 in the last). This is a simple example of the "multiple price list" method of eliciting risk attitudes; see Harrison and Rutstrom, 2008. This section, which was not pre-announced to the subjects, contributed on average an extra $1.50 (about 6%) to total earnings, and was included in order to generate an indicator of subjects' risk aversion. After completing it, subjects answered a series of background questions regarding their gender, area of study, socioeconomic background, political inclination, and views on inequality and taxation, while cash payments were counted out and brought to them in closed envelopes. The timing of the experimental session is summarized in Figure 1. All the instructions are available at:`http://www.brown.edu/Research/IDE/walkthrough`.

Overall, sixteen experimental sessions were held, involving a total of 336 Brown University undergraduate students from a wide range of disciplines. Table 4 summarizes the number of sessions and subjects organized by the exogenous parameters tax cost and efficiency loss. To check the sensitivity of the results to the subject pool, additional sessions were conducted involving a total of 55 adult non-student subjects recruited from the surrounding community. Results of the analysis of these additional sessions are not reported in this version, but in general they are not qualitatively different than those with students.

3 Hypothesis and Predictions

In order to predict how subjects will behave in the experiment we need to make some assumptions about their utility functions. A general form for subject i's utility function is given by:

$$U_i = f(\tilde{y}_1, \tilde{y}_2, \ldots, \tilde{y}_i, \ldots, \tilde{y}_{21})$$

where $\tilde{y}_{j \neq i}$ represent the post-tax earnings of each of the twenty other participants potentially affected by agent i's decision. $\tilde{y}_i$, which can be also written as $\tilde{y}_i =$

determined randomly.

$y_i - c(10 \cdot t)$, represents i's payoff if he/she is selected as the decisive individual, net of the cost of taxation to i.

If individual i is purely self-interested, arguments other than $\tilde{y}_i$ can be ignored without loss of predictive power. Under this assumption, we can predict:

H_{0a}: In the "disinterested observer"scenario (Part I) a purely self-interested individual will never select $t > 0$ if $c > 0$, namely if tax cost is strictly positive. When $c = 0$ a purely self-interested agent will be equally likely to select any of the possible tax rates $(0, 0.1, ...1)$.

In the "veil of ignorance"condition (Part II under random assignment), agent i's choice will depend on the values of c (tax cost), and e (efficiency loss), as well as on his degree of risk aversion. The following hypothesis can be formulated:

H_{1a}: In Part II under random income determination, a purely self-interested agent will never select $t > 0$ if he is risk neutral, and if both $c > 0$ and/or $e > 0$. The more risk averse the agent is, the higher the tax he will choose, with $t = 0$ remaining a possible option and being more likely the larger c and e.

For the other three methods in Part II, we predict:

H_{2a}: In Part II under the Where From, Tetris, and Quiz methods, subjects confident of their predictions about their relative standing will choose 0% or 100% taxation, depending on which maximizes their own expected income. In order to maximize their expected utilities, risk averse subjects lacking confidence in their predictions may select positive tax rates which will be higher the lower the tax cost or efficiency loss, the greater is their degree of risk aversion, the lower is their predicted rank for the method in question, and the less is their confidence (ability to predict their standing).

Consider now an individual who, due to social preferences, attaches a positive weight to the earnings of other subjects. We are interested in two types of preferences: preferences regarding equality and preferences regarding efficiency.

Assuming that agents' utility increases with equality in the distribution of incomes, and given that equality is monotonically increasing in the tax rate, under our set-up, we can write $h(t)$ as a general function linking utility and equality, with $h' \geq 0$.

Abstracting from agents' concern for their own income, preference for aggregate efficiency can be formalized in relation to the sum of others' aggregate payoffs. Intuitively, the more efficient redistribution is, the larger the total pie will be, *ceteris*

paribus. Thus, the utility individual i gets from aggregate efficiency can be written as: $g(\sum_{j\neq i}\tilde{y}_j)$, with $g\prime \geq 0$.

We allow the extent of concern for inequality and for efficiency, to vary across individuals. Formally:

Hence, we can write:

$$U_i = f_i(\tilde{y}_i, x_i) + h_{m,i}(t, x_i) + g_i\left(\sum_{j\neq i}\tilde{y}_j, x_i\right)$$

The functions $f_i(\cdot)$, $h_i(\cdot)$, and $g_i(\cdot)$ vary across individuals both randomly and in relation to a vector of measurable characteristics x_i such as gender, ethnicity, political inclination, and socioeconomic background.

The subscript m in $h_{m,i}$ indicates that i's desire for equality may depend on what method is used to determine pre-tax earnings. For example i may have a strong desire for income equalization under the Where From method if basing earnings on socioeconomic background is perceived by her as unfair, but a much weaker or possibly no desire to redistribute if pre-tax income has been determined by performing a task.

We propose the following compound hypothesis:

H_{0b}. Both in Part I and Part II (under random assignment), a subject displaying some level of social preferences may select $t > 0$ even if $c > 0$.

Several sub-hypotheses can be spelled out:

1. The larger c (tax cost) and e (efficiency loss), the smaller the value of t that will be selected, *ceteris paribus*.

2. The greater i's preference for equality under the pre-tax income determination method in question, the larger the value of t the agent will select at every stage, *ceteris paribus*

3. Agents with similar characteristics x will tend to select lower values of t in sessions with larger values of e, the efficiency loss. *ceteris paribus*.

Concern for equality or efficiency does not imply the absence of simultaneously operating self-interest. For example, in both Part II (for any methods other than Random) and Part III, an agent's tax choice will be affected by his expected rank in the pre-tax income distribution via the $f_i(\cdot)$ function. Individuals with higher (lower)

expected pre-tax incomes will have a stronger bias toward a low (high) tax. However, concerns (2) and (3) may have effects countervailing those of self-interest, which will be stronger the closer i's (expected) rank is to the point at which $\partial y_i/\partial t = 0$ (e.g. between ranks 7 and 8, when there is no efficiency loss). Also, since Part II decisions are taken prior to learning one's rank according to the various methods, subjects are expected to prefer higher taxes the greater their lack of confidence in their estimate of their relative performance and the greater their degree of risk aversion.

And subjects with (almost) any degree of risk aversion have self-interested reason to choose a high tax under the Random method, in Part II, if tax cost and efficiency loss are zero (low).

4 Results

The following analysis is based on the results of the sixteen experimental sessions in which all participants were undergraduate students. Students from a wide range of disciplines participated in the experiment. Subjects were not drawn from particular courses; hence they were not likely to know each other before the sessions. The large majority of participants appeared to have no difficulty understanding the instructions, and answering the control questions. Accordingly, all subjects took full part, making tax choices for each of the four methods - both in Part I and II, and in Part III when this occurred (7 out of 16 sessions). All but one subject also completed the debriefing questions as well as the test for the assessment of risk aversion.

The background questions allowed us to collect information about several participants' personal characteristics. These variables, as well as the risk aversion indicator [8], are used in the econometric analysis. The distribution of participants by personal characteristics is presented in Appendix Table 1. The questions used to construct the indicators are reported in the Appendix.

We next illustrate our key findings by presenting the main descriptive statistics. We also show the results of a a set of multiple regressions estimated using data from

[8] Of the 335 subjects completing these parts, 308 answered the risk-aversion questions consistently and 27 in an inconsistent fashion, that is they rejected a gamble with high expected value but accepted one with lower expected value. To keep the sample as large as possible, we defined a second measure of risk aversion which could be calculated for both consistent and inconsistent responders. To check robustness, we carried out each piece of analysis also for the restricted sample composed by those who replied consistently. Since the results turn out to be quite similar, we present in what follows, the analysis for the larger sample.

all experimental sessions. [9] The dependent variable - the tax rate selected by each subject - is regressed on a set of explanatory variables which includes: tax cost, efficiency loss,[10] method dummies, risk aversion, a gender dummy variable, ethnic dummy variables, political philosophy, home area income, socioeconomic status, and number of economics courses taken.[11]

Considering the significant share of 0% and 100% tax choices (Figure 1), in order to address the concern that, if allowed, some subjects may have chosen a tax rate less than 0 % (regressive) or more than 100%, we estimate the regressions using a Tobit model, censored at 0 and 1. We also estimated the same set of regressions using ordinary least squares (OLS) obtaining very similar results. In what follows, we report the results of the Tobit regressions.

4.1 The "disinterested observer"scenario: Part I

Do agents' tax choices suggest the existence of a demand for redistribution among the micro-community of the twenty other participants? As depicted in Table 4 the large majority of subjects display some degree of egalitarianism, in the sense that, all things being equal, they prefer earnings to be distributed more equally than the *status quo*, no matter which method is used to determine pre-tax income distribution[12]. Considering all the experimental sessions taken together, in 76.4% of the cases subjects favored some equalization of earnings ($t > 0$), in 44.2% of the cases a tax rate of 50% or higher was chosen, and in 14% of the time subjects decided to fully equalize earnings among other participants (mean tax rate: 42.4%). In principle this result could be due to the choices of those individuals participating in sessions in which redistribution was free or very cheap. However, when only those sessions with a positive tax cost are considered (12 sessions, 251 participants, 1004 tax choices) we

[9] In some cases, we restrict our attention to the sample of tax choices for one of the four methods of pre-tax determination (335 observations). Most of the time, however, we use the larger sample obtained by pooling together all of the 1340 observations (335 subjects by four choices)

[10] Since subjects's choices were very similar for levels of tax cost other than \$1 per 10%, in order to simplify the interpretation of the coefficient we use a dummy variable which equals 1 for sessions with tax cost = \$1, and 0 for the others. Similarly for the efficiency loss parameter, we use a dummy which equals 1 for sessions with efficiency loss = 25%, and 0 for the others.

[11] Some of these variables are highly correlated with each other (e.g. home area income and self-reported socioeconomic status) and when included together on the right hand side do not add any predictive power. As a consequence, in order to reduce problems of multicollinearity, we usually include only one of them. The correlation matrix is presented in the appendix.

[12] A comprehensive description of the distribution of participants tax choices in Part I, II and III is reported in Appendix Table 2

observe a very similar pattern. Furthermore, even restricting the analysis to those sessions in which redistribution was more expensive (tax cost = \$1 per 10%) the qualitative result remains the same. A large majority (69.9%) of the participants still opted for a positive level of taxation, more than a third (34.8%) for a tax rate of 50% or higher, and 7.7% were willing to pay a full \$10.00 (approximately half of their expected payoff [13]) to equalize earnings among the other participants. This evidence supports hypothesis H_{0b} against the alternative hypothesis H_{0a}.

Does the existence of widespread support for redistribution imply that agents are not responsive to the cost of taxation? The evidence suggests that this is not the case. In fact, as shown in Figure 2, participants in sessions characterized by high values of tax cost chose lower levels of taxation than participants in sessions with zero tax cost. The difference is negligible for low levels of tax cost but significant when taxation becomes relatively expensive. Performing a series of Mann-Whitney tests for between-subject comparison we do not find any significant difference in the preferred tax between subjects facing \$0 up to \$0.5 cost per 10% tax, but do find tax choices to be significantly lower at \$1 tax cost than at lower levels (significant at the 5% level in a two-tailed test). This pattern is consistent with the view that redistribution is a conventional good with demand being downward sloping in the price of taxation.

Another interesting question is whether individuals are concerned with aggregate inefficiency when choosing their preferred tax rate. By comparing sessions with different efficiency settings, we find that subjects tend to choose lower levels of redistribution when taxation involves a higher cost in terms of aggregate payoffs, even when this have no impact on their own expected pay-off. As depicted in Figure 3, this effect is important only when the share of tax revenue lost reaches 25%, the highest value included in our design, which, in the case of complete equalization, implies that a fourth of the total pie is foregone. Again, this result is confirmed by Mann-Whitney two-tailed tests which show no difference in preferred tax between 0% and 12.5% efficiency loss, but a lower preferred tax at 25% efficiency loss than at 12.5% (significant at the 10% level) and 0% efficiency loss (significant at the 5% level).

In the first set of regressions (Table 5) we estimate the effect of the cost of taxation and the efficiency loss on subjects' redistributive choices. Both coefficients have the expected sign, and remain large and highly statistically significant (1% level) when

[13] Excluding the earning from the risk aversion test which subjects did not then know about.

several controls are included. According to this result, when tax cost rises to $1 per each additional 10% tax, the preferred tax rate falls by approximately ten percentage points. This is in line with the average tax falling from 45%, in sessions with 0 tax cost, to 34%, in sessions with tax cost of $1. Similarly, when the leakage associated with redistribution rises to 25%, the preferred tax rate falls by about seven percentage points, *ceteris paribus.*

Individual demand for redistribution may also be influenced by beliefs about the determinants of inequality. The set up of Part I, which lets subjects choose different tax rates for each of the four methods, allows us to study how perception of fairness informs redistributive decisions. If agents are indifferent about how initial income is determined, we should observe no systematic differences in tax choices across different methods. However, such differences are, in fact, observed. In particular, as depicted in Figure 4, subjects tend to express a greater desire for redistribution when pre-tax earnings are determined according to the Random and the Where From methods (mean tax rates of 49.3% and 45.1%, respectively) than when relative performances in the Tetris and Quiz games are used (37.7% and 37.3 respectively)[14].

To make sure these differences are not driven by a relatively small number of extreme observations, we perform a series of Wilcoxon matched pair tests for within-subject comparisons. The tests confirm our main finding, showing that subjects were somewhat more likely to choose a higher tax for the Random than for the Where From method (p-value: .021), and much more likely to choose a higher tax for both the Random or Where From methods than for the Quiz or Tetris ones (p-values below 0.001 in all four comparisons). Finally, we find no evidence of significant differences in preferences between the Tetris and Quiz methods (p-value: .276).

To test whether there are any significant differences in tax rates across methods in the last two columns of Table 7 we include in the regression method specific dummy variables. Separate dummies for the Tetris and the Quiz methods, as well as a joint dummy Tetris-Quiz (which equals 1 for Tetris and Quiz tax choices and 0 for the other methods) are included. In both specifications the coefficients are large, negative, and statistically significant (1% level), suggesting that, all things being equal,

[14]When all sessions are considered, the percentage favoring some equalization in Part I ranges from 80% when pre-tax payoffs are determined randomly, to 74.3% when the Tetris method is used. Similarly, the share of choices supporting a tax rate of 50% or higher varies from 54.9% (Random) to 36.7% (Quiz). Finally, the percentage of subjects choosing complete equalization ($t = 1$) declines from 19.1% (Random and Where From) to 8.4% (Tetris).

subjects chose lower redistribution in the Tetris and the Quiz methods compared to the Random and the Where From ones.

These results are in line with recent evidence supporting the view that individuals demand less redistribution when they perceive the pre-tax earnings to be "deserved"(which in our experiment, is presumably the case for methods based on effort and ability in performing some simple tasks rather than pure luck or family background) and supports the view that aversion to inequality and demand for redistribution may crucially depend on agents' beliefs about what causes one to be rich or poor, and, in general, about how fair is the process that generates income distribution.

We now turn to the question as to whether different types of subjects express different preferences for equality and fairness.

The comparison of the average tax rates provides some interesting insights about differences in redistributive choices across agents with different personal characteristics.

With respect to political inclination, those subjects who identify themselves as liberal chose much higher levels of redistribution compared to moderates and, especially, to conservatives (average tax rates of 45.2%, 36.2%, and 31.8 %, respectively). That individual political beliefs are highly correlated with redistributive choices is confirmed by the results of the regressions in Table 7 (column 5). Not surprisingly, a more liberal political philosophy is associated with a preference for higher taxation. For every additional point on the 7-point ideological scale (going from "very conservative"to "very liberal"), the preferred tax rate increases by 3.3% , with a potential maximum difference of about 20 percentage points. The same pattern holds for all methods. This result supports the view of egalitarianism as a preference. Furthermore, its intuitiveness provides welcome reassurance that the laboratory environment of our experiment succeeded in eliciting social preference information from which at least some inferences at the more macro-social level might be made.

With regard to ethnic background, we do not observe any important difference across groups, with average tax rates ranging between 40% (African-Americans) and 43.8% (Hispanics). That ethnic background does not seem to have a considerable impact on agents' redistributive choices [15]is confirmed by the relative regressions

[15]The only exception is the relatively surprising pattern of African-American males, who tend to support lower levels of redistribution than men with other ethnic background, especially for the Random and Where From methods (see tables 12 and 13). A similar pattern is not observed among

coefficients none of which is statistically significant.

Average tax rates are also not very dissimilar across income groups, with the exception of participants coming from relatively poor locations, who, on average, chose higher taxes (47.8% against averages ranging between 39.8% and 41.8% for middle to high income groups). When turning to the regressions (column 5), however, the (home area) income variable displays a negative and statistically significant coefficient (at the 5% level). This result, however, is mainly due to the strong negative impact of income on tax choices for the Where From method, while income has essentially no predictive power for the other methods(Appendix Table 3)[16].

The interpretation of this result is not straightforward, since there is no clear-cut prediction of the relationship between family background and redistributive preferences under the "disinterested observer"condition. One possible interpretation, however, is that individuals from richer areas may carry a self-interested aversion to redistribution over into this quite different context. Even when the motive of direct self-interest is absent, they may still express this aversion when earnings are determined according to economic background. Similarly, it might be the case that agents display some form of solidarity towards other participants with similar background, and are hence reluctant to tax earnings based on those characteristics.

Interestingly, the coefficient on risk aversion is also positive, significant at the 1% level, and robust to the introduction of controls. And considering the scale of the variable (from 0 to 15), the difference between a (very) risk averse and a risk loving subject can reach 5 percentage points. This result is also stable across methods and it suggests that, even when the tax choice has no direct impact on the decision-maker's expected payoff, risk aversion may be in some way correlated with inequality aversion (one possibility is that subjects who dislike risk assume others to be similar and are willing to incur some cost to protect them from it).

Finally, subjects' preferred level of redistribution is also correlated with the number of economics courses attended. In fact, the effect is negative (-0.012) and significant at the 1% level. This result is essentially driven by subjects'choices in the Random and in the Where From methods. For the other methods the coefficient on economics courses is close to zero and statistically insignificant (Appendix Table 4).

women. In view of the relatively small number of African-American subjects included in our sample, this result should be treated with caution.

[16]The coefficient on income is positive for the Random and the Tetris method, but negative for the Quiz method; in all three cases it is not statistically significant.

Apart from political-ideological cleavages, the most striking difference in demand for redistribution is between women and men. Female subjects choose much higher taxes than males, with an average difference of about 12.6 percentage points (49.3% versus 36.7%). The regressions in Table 5 confirm this result. In fact, the coefficient on female is positive, and remains large and statistically significant (1% level) when variables such as risk aversion, political beliefs, and income are controlled for. This result is in line with previous experimental evidence describing women as more socially oriented than men (Eckel and Grossman, 1998).

A related, and possibly more interesting question, is whether men and women's choices vary in a similar fashion when taxation becomes more expensive to the decision-maker, or when redistribution entails larger loss in aggregate income. To shed light on this aspect we compare average tax rates between sessions with high and low levels of tax cost and efficiency loss for women and men (see Appendix Figure 1). All subjects decide to redistribute less when taxation is more costly. However, the difference is much larger for men than for women both in absolute value (-13.1 against -8.3 percentage points) and relative to choices in sessions with low tax cost (-32.7% and -16.2%, respectively)[17].

The result is even more striking when comparing sessions with different efficiency settings. The average tax in sessions with 25% leakage is 8 percentage points less than in sessions with lower efficiency loss. When only men are considered, however, this difference rises to almost 10 points (- 25%). Women, by contrast, make very similar choices in sessions with high and low efficiency settings, the difference being less than 3 percentage points.

To test whether men and women's respond differently to changes in tax cost and efficiency loss, in Table 6 (column 3 and 4) we interact the gender dummy with both these parameters. The coefficients on both terms are positive, significant and relatively large, confirming that women's choices vary less than men's when taxation is more costly or inefficient. These findings suggest that not only do women seem to always support higher redistribution than men (larger intercept), but they also tend to be relatively less responsive to the cost of taxation and, even less sensitive to

[17]This result is in line with previous findings by Andreoni and Vesterlund (2001) who study gender differences in altruism by examining a modified dictator game with varying incomes and prices and find evidence that men are more responsive to price changes than women. However, these authors also claim that "male and female demand curves for altruism cross", a conclusion that is not supported by our data which shows that women support more redistribution than men at any level of tax cost.

efficiency concerns (lower slope).

Do we observe similar differences between men and women in their attitude toward fairness?

Indeed, when comparing average tax rates for different methods separately for women and men (Figure 5), it is striking how, on average, women's choices tend to vary much less across methods.

For women, in fact, the difference between Random and Where From methods, on the one hand, and Quiz and Tetris methods, on the other, is fairly small (about 4 percentage points). For men, by contrast, we observe fairly high levels of taxation for the Random and the Where From methods, but a much lower demand for redistribution in the Tetris and Quiz methods (about 14 percentage-point difference).

To further investigate this issue, in Table 6 we interact the gender variable with the Tetris-Quiz dummy. As expected, the corresponding coefficient on the interaction term is large (0.100), positive, and significant(1% level). At the same time, the coefficient on Tetris-Quiz becomes larger (from -0.096 to -0.142) and the coefficient on female gets smaller (falling from 0.104 to 0.055) and less significant.[18].

Much of the difference between men and women can therefore be attributed to a very different perception of what is fair and what is not. Men seem much more reluctant than women to redistribute when they perceive earnings to be "deserved", and hence consider high-performance subjects to be entitled to higher payoffs. Women, on the other hand, are much less affected by this concern, and display similarly high demand for redistribution regardless of how pre-tax incomes are determined.

Finally, when all the interactions terms (method, efficiency loss and tax cost) are included together (column 5), the effect of the gender dummy disappears [19] This supports the view that most of the difference between men and women's attitudes towards redistribution reflects gender-specific differences in: a) perception of fairness and merit; b) willingness to pay for more equality; c) concern for aggregate efficiency.

[18]Consistent results are obtained when running separate regressions for the Random and Where From methods, and the Tetris and Quiz methods, respectively (Appendix Table 4).

[19]Consistent results are obtained when running separate regressions for male and female samples (Table 13).

4.2 The "involved observer" scenario: Part II

In Part II of the experiment respondents were invited to select a tax rate for each of the four earnings assignment methods, knowing that if selected, their preferred tax would be applied to the earning distribution among twenty participants, including themselves. When making their choice, individuals were uncertain about which position they would eventually occupy in the distribution of payoffs.

When directly affected by redistribution, agents' choice is influenced by obvious self-interest considerations. In fact, based on the self-assessment of their qualities and background, subjects could (except under the Random method) form a more or less accurate expectation of their possible ranking, and would take this into account when deciding how much to redistribute. If confident enough about their guess, subjects with relatively high (low) expected rank would have an interest in choosing a low (high) tax rate. Presumably, as in Part I, individual tax choice would also reflect agents' social preferences and aversion to inequality (if any).

Before turning to the crucial question of how expectations about one's future position in society affect demand for redistribution, we want to compare tax choices in Part II under the Random method to those in Part I under the same method. This comparison holds particular interest since the former corresponds to the "veil of ignorance"condition studied by Harsanyi [20]while the latter resembles more the "disinterested observer"discussed by Adam Smith [21].

Given the considerable skewness of the pre-tax earnings levels, we would expect subjects who place any weight on self-interest and are even slightly risk-averse to prefer a tax of 100% if the tax cost and efficiency loss are both zero. Moderately risk-averse subjects can likewise be expected to select substantial taxes when the tax cost and efficiency loss are low. Because there's no self-interested reason to favor redistribution in Part I and yet most choose $t > 0$ there, tastes for equality are evidently widespread and would add to the self-interested reasons for choosing to tax and redistribute in Part II. The addition of this second factor leads to an expectation

[20]According to Harsanyi's own words (1953, p.435), a value judgment on the distribution of income is truly impersonal "if the evaluating person had exactly the same chance of obtaining the first position (corresponding to the highest income) or the second or the third, etc., up to the last position (corresponding to the lowest income) available within that scheme". See also Vickrey, 1945; Harsanyi, 1955, 1977, 1978.

[21]We use for comparison Part I taxes choices under the Random method only because any pure preference for redistribution among others is thereby held constant

of higher taxes in the Part II decision than in its Part I counterpart.

Do we observe any significant difference in tax choices for the Random method when subjects are directly involved and when they are not?

Average tax rates for the Random method in Part I and Part II, for different groups, under different tax costs and efficiency settings are shown in Appendix Table 6. Regardless of what sub sample we consider, we see that, on average, agents tend to choose higher tax rates under the "involved observer"condition. The average difference between Part I and II is fairly heterogeneous across ethnic, income, and ideological groups, but usually ranges between 3 and 7 percentage points.

Regressions in Table 15 supports this result. When Random tax choice for Part I and II are pooled together (670 observations) and a dummy for Part II is included in the standard specification, this has a positive and statistically significant coefficient (at the 5% level). The magnitude of the coefficient suggests that, on average, participants chose a tax rate of about 5-6 percentage points higher when directly affected by redistribution [22].

One way to check whether the preference for more redistribution under the Random method in Part II is due to risk aversion, as is predicted by the theory, is by interacting the "Involvement"dummy with our risk aversion measure (Table 7, column 3). If the measure performs well and if risk aversion is a driver of the desire to redistribute, the coefficient on the interaction term should be positive and significant. Surprisingly, it is neither. This finding, while disappointing, is not necessarily devastating to the theory, since risk aversion is notoriously difficult to measure. Other coefficients, including the significant positive coefficient on the risk aversion level term, remain unaffected.

We now turn to the issue of whether, and to what extent, demand for redistribution is influenced by the expectation about what position one will occupy in society in the future. We can address this question by looking at the difference between choices in Part I and Part II for methods other than the Random one.

[22] Amiel, Cowell and Gaertner (2006) compare involved and disinterested choices using hypothetical questionnaires. They use multiple subject pools (in Germany, the UK and Israel) and find contrasting evidence for their different samples. Our result is consistent with their findings for the Israeli sample, but contrasts with the results for the Germany and the UK samples. Unlike these authors, we do not find a significant difference between females' and males' choices in the case of the Random method.

Overall average tax rates for the three other methods appear to be very similar between Part I and Part II. For the Where From method the average tax in Part I and II are essentially the same (45.1%); for the Tetris method the difference is less than 1 percentage point (37.7% in Part I, and 36.8% in Part II), and for the Quiz method about 2.6% (37.3% in Part I against 39.9% in Part II).

However, this result covers important variations at the individual level. In fact, almost half of the subjects change their preferred tax choice in Part II relatively to Part I, although these changes are generally small (not larger than 20%). This pattern holds for all methods, with a slight tendency for larger changes in the Where From method. The proportion of participants who choose a higher tax is similar to the share of those choosing a lower tax, both ranging around 20%.

As depicted in Table 8 (column 1), most of the results discussed in Part I continue to hold in Part II. In particular, average tax rates decreases with tax cost and efficiency loss; female, liberal, and more risk averse individuals tend to support more redistribution than male, conservative and less risk averse subjects; preferred tax continues to be negatively correlated with the level of income[23].

As in Part I, also in Part II subjects support more redistribution when pre-tax earnings are determined according to the Where From method (average tax: 45.1%), than when performances in Tetris (36.7%) and quiz (39.8%) are used (Figure 6). Again, this difference is very marked for men, and almost negligible for women (Figure 7).

Before making their tax choice and performing the tasks, participants were asked to predict their ranking in each of the three methods (we did not ask this question for the Random method) and to report how confident they were about their prediction[24].

In what follows, we will use participants' self-reported expected rank to represent their personal interest in a higher or a lower tax in Part II. Intuitively, the higher (lower) an individual expect to rank, the lower (higher) tax she/he should be expected to chose, *ceteris paribus*. Furthermore, for any given expected rank, the more

[23]As in Part I, also in Part II the result on the income variable is driven by the tax choices for the Where From method. When the other two methods are considered the income variable has essentially no predictive power.

[24]With regard to the expected rank participants could select one of the following options: "Positions 1-2" (where 1 is the highest income); "Positions 3-5"; "Positions 6-8"; "Positions 9-11"; "Positions 12-14"; "Positions 15-17"; "Positions 18-20". With regard to the level of confidence, three options were available: "Very confident"; "Somewhat confident"; "Not at all confident".

confident an individual is about her/his guess (i.e. the more skewed the distribution of the beliefs about her/his future position in the ranking), the stronger the effect of the expected rank on the tax choice should be.

Interestingly, the expected rank measure works fairly well in predicting participants'actual rank. In fact, the pairwise correlation between expected and actual rank is positive (0.3552) and statistically significant at the 1% level. Furthermore, the magnitude of the correlation coefficient varies considerably between those participants who reported themselves to be very confident in their guess and the others (0.505 and 0.296 respectively), suggesting that these individuals were *in fact* more accurate in predicting their actual rank.

In Table 9 we test the effect of agents' expected rank on their redistributive choices by including the expected rank in our usual specification (column 2). In line with our prediction, the coefficient on expected rank is positive, large and statistically significant. The worse one expects to rank, the more redistribution she/he will support[25].

The size of the coefficient (0.038) on expected ranking provides some information about the possible magnitude of this effect. According to our estimate, a participant who expects to occupy the first position would choose, on average, a tax rate about forty percentage points lower than someone expecting to rank eleventh, and about eighty percentage points lower than someone expecting to rank last, *ceteris paribus*. This result is consistent with the distribution of responses in Part II (Figure 8) and supports the view that the prospect of higher pre-tax income has a powerful influence on people's redistributive choices when they are directly affected by redistribution.

To investigate whether this effect is larger when agents feel less uncertain about what their rank will be, in column 3 we interact the expected rank variable with an indicator of confidence (which equals 1 for those subjects who reported themselves to be very confident about their guess, and 0 for the others).

In line with our prediction, the coefficient on the interaction term is positive and significant (1%) suggesting that expected rank has an even larger impact on preferred tax for those subjects who are more confident about their prediction than for the others (0.46 and 0.34 respectively). Hence, confidence tends to reinforce the tendency towards "polarization", with subjects expecting to rank high choosing

[25]Not surprisingly, due to the strong correlation between expected rank and home area income in the Where From method (-0.5389), when expected rank is included in the regression the coefficient on the income variable becomes much smaller, despite remaining statistically significant.

even lower taxes, and subjects expecting to perform poorly supporting even more redistribution. The fact of being confident in one's predicted pre-tax earnings rank also has a significant positive effect in its own right, for reasons that remain unclear to us. Appendix Figure 2 provides a graphical representation of these result based on the regression coefficients.

Finally, we notice that the expected rank appears to influence subjects' tax choices more strongly in the Where From case than under the Quiz and Tetris methods. Subjects' abilities to guess what rank their home area's income will give them may have been greater than with the other methods, with the difference not fully captured by their different answers on the confidence question. The last two columns of Table 20 confirms that the impact of expected rank on tax choices tend to be larger for the Where From method. In fact, when expected rank is interacted with a dummy for the Where From method, the coefficient is positive and statistically significant (1% level), even when controlling for the level of confidence.

4.3 The "involved observer" under perfect information: Part III

The revised decisions in Part III, made after the revelation of exact rank under each of the four methods, provide evidence on subjects' distributive preferences and on the weight they place on them relative to own earnings in the absence of uncertainty and over a substantially wider range of private costs than in Part I. Risk aversion has no direct relevance in this case, and in principle, a purely self-interested subject should choose either a 100% tax or a 0% tax, depending on his revealed rank under each particular method [26]. A deviation toward redistribution by those whose earnings would be maximized by a 0% tax must reflect concern for lower earners or a preference for equality. By contrast, downward deviations by subjects whose self-interest favors a 100% tax could be motivated by a belief that the higher incomes are rightfully earned or deserved or by some other source of reluctance to alter the unequal earnings pattern.

Overall, 147 subjects in 7 experimental sessions were offered the opportunity to

[26] Unlike some previous studies (e.g. Herne and Suojanen, 2004) in our experiment participants are not allowed to communicate after having learned their actual position in the distribution. Furthermore, when making his/her revised tax choices each subject had in hand a printed copy of Table 2, or of the variant appropriate to the relevant efficiency loss

revise their initial tax choice in each of the four methods (for a total of 588 observations). In addition to the usual tax cost, when revising their preferred tax, individuals took into account their potential additional payoff from redistribution. This was positive, if their ranking was such that they would benefit from taxation, or negative, otherwise [27].

Altogether, 53.7% of the observations are of subjects facing methods in which their own earnings would be maximized with a tax of 100%, while for the remaining 46.3% observations own income would be maximized by a tax of 0

Although agents had no difficulty in recognizing and pursuing what was in their interest, about one third of the subjects (34.2%) chose a tax rate that did not maximize their own earnings[28]. There were proportionally slightly more deviations toward more redistribution (35.3% of those with income-maximizing tax of 0%) than toward less redistribution (33.2% of those with income-maximizing tax of 100%). The average deviation was also higher among those with income maximizing tax of 0% (+ 19.6 %), than among those with income-maximizing tax of 100% (-17.5%). In both cases, most of the deviations from the earnings-maximizing tax were not very large[29]. Nevertheless, in 52 cases (25.8% of the total deviations), subjects decided to deviate a full 100% from what was in their self-interest[30].

Even among subjects with the same income-maximizing tax, the cost of taxation varied significantly depending on the exact rank. Intuitively, the cost or redistribution in terms of foregone earnings for someone at the top of the ranking is higher than for someone ranked 2nd, and so on. Similarly, the net benefit from redistribution for someone ranked 20th is higher than for someone ranked 19th and so on. To account for this, we calculated the net cost of a 10% increase in tax for each income rank, tax cost, and efficiency loss. For example, someone ranked 1st in a session with zero

[27]In sessions with no efficiency loss, for example, redistribution harms the decisive individual if he is ranked between the 1st and the 7th position when tax cost is zero, between the 1st and the 8th position, when tax cost is \$0.25, between the 1st and 12th position when tax cost is \$1. The cut-off point is between the 14th and the 15th position when efficiency loss is 12.5% and tax cost is \$1, between the 9th and the 10th position when efficiency loss is 25% and tax cost is \$0 and between the 11th and the 12th position when efficiency loss is 25% and tax cost is \$0.25.

[28]This proportion is high compared with the findings of previous similar experiments involving no income uncertainty and no strategic considerations, such as Rutstrom and Williams (2000).

[29]In 37.8% of the cases the absolute difference between actual tax choice and earnings-maximizing tax was between 10% and 30%; in 25.9% of the cases between 40% and 60%; and in about 10% of the cases between 70% and 90%.

[30]Of the 52 full deviations, 31 were deviations upward to 100%, while 21 were deviations downward to 0%.

efficiency loss and \$1 tax cost, would sacrifice about \$9 of his potential payoff per each additional 10% tax he would impose if selected to be decisive. By contrast, in the same session, someone ranked 9th would still have a positive incentive to choose a zero tax, but deviation would only cost him about 65 cents per 10% tax. Similarly, for subjects who would potentially benefit from redistribution, low ranked participants had a much greater incentive to choose a 100% tax than subject ranked toward the middle.

In Figure 9 we plot the average tax rate for each value of the total cost of redistribution (which can be positive or negative). [31] As expected, those individuals who, given their revealed ranking, should choose a zero tax rate (net losers) generally support low levels of redistribution. Furthermore, pro-redistribution deviations from self-interest are decreasing in the cost of taxation. In other words, when their position in the pre-tax earnings distribution is high and deviating is very costly in terms of foregone earnings, subjects choose a tax rate very close to 0. However, when deviating from the purely selfish option becomes sufficiently cheap, individuals tend to support higher levels of redistribution and their choices are fairly responsive to variations in the cost of taxation.[32] This pattern is intuitive and certainly reassuring of the fact that subjects had a good understanding of the experiment and a relatively clear perception of the incentives they faced.

Turning to those subjects who, based on their rank, would benefit from redistribution (net winners) and should hence choose complete equalization, we observe that the large majority of these selected a very high tax rate (70% or higher), and about two thirds chose to fully equalize earnings (average tax rate 82.5%, standard deviation 0.30). The scatter of points suggests some modest responsiveness to the size of the loss suffered by not selecting full redistribution, but the relationship is much flatter than for costs in the positive range. Nonetheless, many subjects do not choose full redistribution even when this would be in their own interest. This suggests that it is not the case that subjects are either strictly self-interested or fully egalitarian. Some subjects, in some circumstances, are willing to sacrifice personal earnings to maintain some inequalities (and, when $e > 0$, to avoid shrinking the pie through redistribution).

[31] Costs on the tails of the distribution are not shown to permit closer inspection of the main part of the data. 4.7% of the observations lie in the ranges thus excluded.

[32] When the net cost of taxation is between \$0 and 1\$ per 10%, the average tax rate is 37%, similar to the average tax choice in Part I (42.3%).

In Table 10 we estimate a regression model for Part III tax choices as a function of the cost to the decision-maker (per 10% tax), the square of that cost, and (in column 3 and higher) a dummy variable "earnings maximizing tax rate"(EMTR), which in Part III must be either 1 (100%) or 0.

As expected, tax choices appear to be very sensitive to the net cost of taxation faced by each subject (both the coefficients on cost of taxation and its square term have the expected sign and are statistically significant). However, the fact of having a net gain from redistribution has an independent, strong and positive impact on preferred tax rate.

Indeed, the coefficients on the interaction term between EMTR and the cost of taxation imply that a change in the total cost (benefit) of taxation has a significant impact only on those subjects with an earnings-maximizing tax of 0, but essentially no effect on the choices of net winners.

How do preferences for equality affect individuals' redistributive choices when uncertainty is resolved? In principle we would expect individuals with more egalitarian views to be, on the one hand, more inclined to deviate from the purely self-interested zero tax choice, and, on the other, less likely to deviate from 100% tax choice when this is in their interest. One way to test this prediction is by using the tax rate chosen by the same individual for the same method under the "disinterested observer"condition (Part I) as an indicator of the subject's genuine "disinterested"attitude toward equality. To do so in column 2 we include in the initial specification a dummy variable "Part I Tax High"which equals one for those subjects who chose a tax rate of 50% or higher for the same method in Part I, and 0 otherwise.

In line with our prediction, the coefficient on the Part I tax choice is positive and statistically significant. This result confirms that participants who selected higher taxes in Part I tend to support more redistribution than others in Part III, and this regardless of their actual ranking and of the cost they face[33].

Figure 10 shows the relationship between selected tax rate and total cost of redistribution according to the regression coefficients in column 1 of Table 10. Figure 11 plots the relationships separately for those choosing high and those choosing low taxes in Part I, based on the coefficients in column 2. It is worth noting again that the predicted tax choice in Part III when the cost is zero is quite close to that in Part I, suggesting that Part III choices indeed help us to extent Part I conclusions to

[33]In fact, when we interact the Part I tax variable with the total cost of taxation, the coefficient turn out to be small and statistically insignificant

a broader set of both positive and negative costs of taxation to the decisive individual. Also worth noting are the sharp discontinuity between the positive and negative cost sides of the figures, and the considerably gentler slope of the curves to the left, indicating lesser sensitivity to cost. Finally, the fact that the average tax remains below 100% even when in the self-interest of the decision-maker suggests that some inequalities had legitimacy.

5 Conclusions

What is the relative importance of social preferences for equality as opposed to other forces such as self-interest and risk aversion in determining support for redistribution at the societal level? Does demand for redistribution vary with the perception of whether earnings are 'deserved' or not?

Our contribution addresses these two fundamental issues by presenting the results of a set of experiments involving large groups in which subjects were asked to choose what level of redistribution to implement among participants under different decision conditions, and when different methods were used to determine the initial distribution of earnings.

According to our results, a large majority of subjects are willing to sacrifice a significant fraction of their anticipated payoffs in order to realize a more equal distribution among the other twenty participants. The demand for redistribution is responsive to the cost of taxation incurred by the decision maker. However, the relationship is discontinuous: the supported level of taxation is fairly inelastic for low and intermediate levels of tax cost, but displays a sharp decline when redistribution becomes relatively costly. When making their redistributive choices, participants also seem to be concerned with aggregate inefficiency, even when this does not directly impact their expected payoff. In fact, the demand for redistribution decreases when taxation generates a larger dead-weight loss. However, for the values considered, this effect is large only when taxation is associated with a 25% dead-weight loss.

We also find evidence that personal characteristics such as gender, socioeconomic status, risk aversion, political self-identification, and the number of economics courses taken have a significant effect on participants' redistributive choices. In particular, women appear to choose systematically higher tax levels than men. Furthermore,

their choices tend to vary less with changes in the private cost of taxation and in the dead-weight loss associated with redistribution.

With regard to the fairness perception, intra-subject comparisons show that participants tend to choose significantly higher levels of taxation when pre-tax earnings are determined either randomly, or according to socioeconomic background, rather than on the basis of the performances in some simple games, which are perceived as relatively fairer mechanisms of resource allocation. Interestingly, this trend is much more evident among men than among women, whose choices appear to be less sensitive to the perception of 'merit'.

Finally, comparisons between redistributive choices made under different 'original positions' provide interesting insights with regard to the effect of both involvement and uncertainty on individual demand for redistribution. Our subjects tended to chose higher taxation when they were an affected party in the redistributive process than when they were acting as disinterested observers. When choosing under uncertainty individuals' expectation about their future position in the income distribution has a considerable impact on their tax choices. When sure of the effect on their own earnings, subjects' tax choices are primarily governed by self-interest, but preferences for equality and beliefs in the fairness of earned inequalities continue to play a role for at least a third of subjects[34].

[34]In a later version of the paper we plan to provide a more integrated quantitative assessment of the relative importance of social preference versus self-interest factors in our subjects' choices. We also plan to use a social welfare function to determine what levels of redistribution maximize subjects' aggregate utilities under the various income-determination methods, and to compare preferred redistribution levels to those observed in a range of OECD member countries.

Table 1. U.S. Individual Income Distribution and Possible Experiment Earnings

Twentieth/Rank	Income	Earnings
1	$157,423	$100.00
2	$72,488	$46.05
3	$57,538	$36.55
4	$48,516	$30.82
5	$41,776	$26.54
6	$36,697	$23.31
7	$32,458	$20.62
8	$28,991	$18.42
9	$25,637	$16.29
10	$22,795	$14.48
11	$20,028	$12.72
12	$17,525	$11.13
13	$15,052	$9.56
14	$12,818	$8.14
15	$10,715	$6.81
16	$8,699	$5.53
17	$6,792	$4.31
18	$4,878	$3.10
19	$2,383	$1.51
20	$166	$0.11

Source: US Census Bureau, 2000

Table 2. Part I Participants Earnings Distribution under Different Tax Rates (with efficiency loss=0%)

Rank	*t = 0%*	*t = 10%*	*t = 20%*	*t = 30%*	*t = 40%*	*t = 50%*	*t = 60%*	*t = 70%*	*t = 80%*	*t = 90%*	*t = 100%*
1	100.0	92.0	84.0	75.9	67.9	59.9	51.9	43.9	35.8	27.8	19.8
2	46.1	43.4	40.8	38.2	35.6	32.9	30.3	27.7	25.1	22.4	19.8
3	36.6	34.9	33.2	31.5	29.9	28.2	26.5	24.8	23.2	21.5	19.8
4	30.8	29.7	28.6	27.5	26.4	25.3	24.2	23.1	22.0	20.9	19.8
5	26.5	25.9	25.2	24.5	23.8	23.2	22.5	21.8	21.2	20.5	19.8
6	23.3	23.0	22.6	22.3	21.9	21.6	21.2	20.9	20.5	20.2	19.8
7	20.6	20.5	20.5	20.4	20.3	20.2	20.1	20.1	20.0	19.9	19.8
8	18.4	18.6	18.7	18.8	19.0	19.1	19.3	19.4	19.5	19.7	19.8
9	16.3	16.6	17.0	17.3	17.7	18.0	18.4	18.8	19.1	19.5	19.8
10	14.5	15.0	15.5	16.1	16.6	17.1	17.7	18.2	18.7	19.3	19.8
11	12.7	13.4	14.1	14.9	15.6	16.3	17.0	17.7	18.4	19.1	19.8
12	11.1	12.0	12.9	13.7	14.6	15.5	16.3	17.2	18.1	18.9	19.8
13	9.6	10.6	11.6	12.6	13.7	14.7	15.7	16.7	17.8	18.8	19.8
14	8.1	9.3	10.5	11.6	12.8	14.0	15.1	16.3	17.5	18.6	19.8
15	6.8	8.1	9.4	10.7	12.0	13.3	14.6	15.9	17.2	18.5	19.8
16	5.5	7.0	8.4	9.8	11.2	12.7	14.1	15.5	17.0	18.4	19.8
17	4.3	5.9	7.4	9.0	10.5	12.1	13.6	15.2	16.7	18.3	19.8
18	3.1	4.8	6.4	8.1	9.8	11.5	13.1	14.8	16.5	18.1	19.8
19	1.5	3.3	5.2	7.0	8.8	10.7	12.5	14.3	16.1	18.0	19.8
20	0.1	2.1	4.0	6.0	8.0	10.0	11.9	13.9	15.9	17.8	19.8

Figure 1. Sequence of the Experimental Session

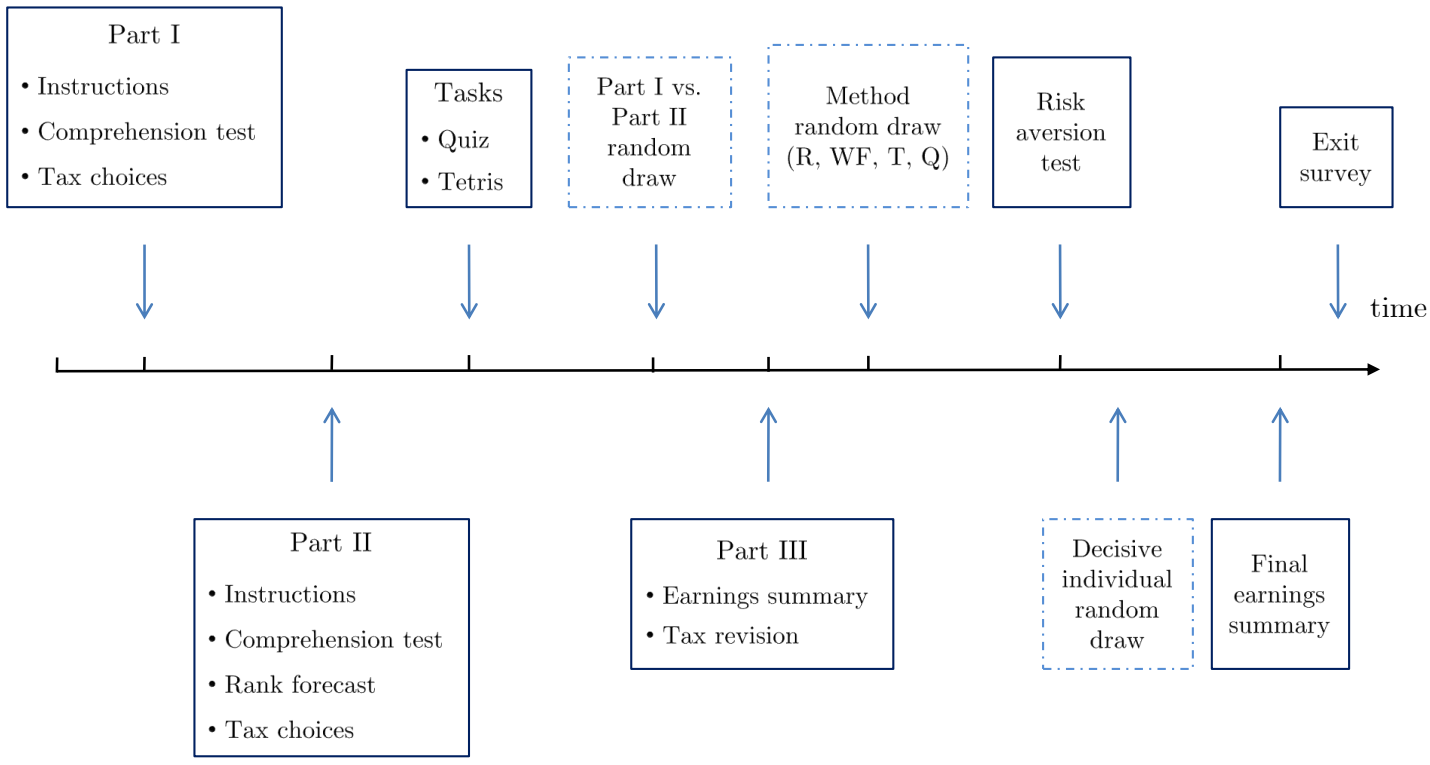


Table 3. Experimental Sessions and Subjects by Tax Cost and Dead Weight Loss

		Tax Cost				
		\$0	\$0.25	\$0.50	\$1	Total
Dead Weight Loss	0%	2 (42)	2 (42)	2 (42)	2 (42)	8 (168)
	12.5%	1 (21)	1 (21)	1 (20)	1 (21)	4 (83)
	25%	1 (21)	1 (21)	1 (21)	1 (21)	4 (84)
	Total	4(84)	4(84)	4(83)	4(84)	**16 (336)**

Note: numbers in parenthesis indicate the total number of subjects participating in the experimental sessions.

Table 4. Part I Share of Tax Choices by Tax Cost

Tax Choice	All (16 sessions)	Tax Cost > \$0 (12 sessions)	Tax Cost = \$1 (4 sessions)
t = 0	23.6%	24.6%	30.1%
t ≥ 10%	76.4%	75.4%	69.9%
t ≥ 50%	44.2%	42.4%	34.8%
t = 100%	14.0%	13.3%	7.7%

Figure 2. Part 1 Average Tax Rate by Tax Cost

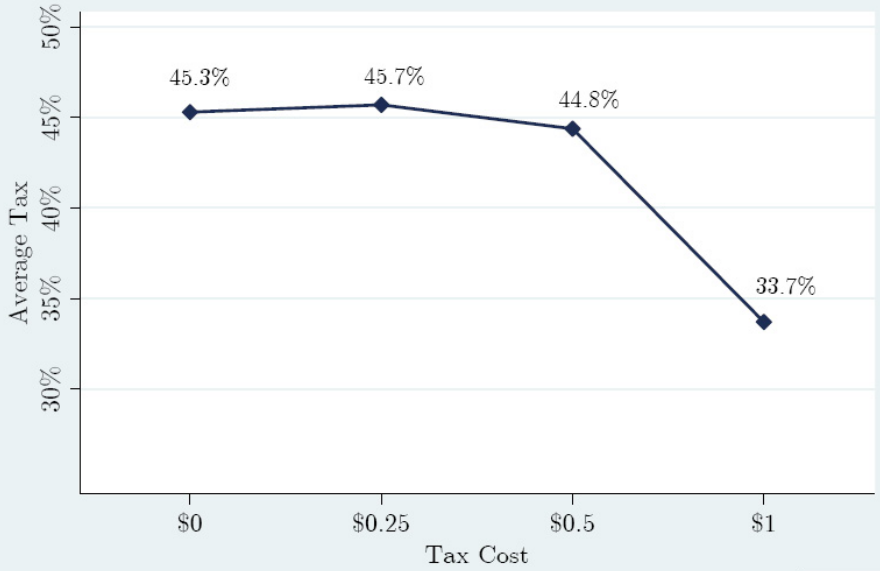


Figure 3. Part I Average Tax Rate by Efficiency Loss

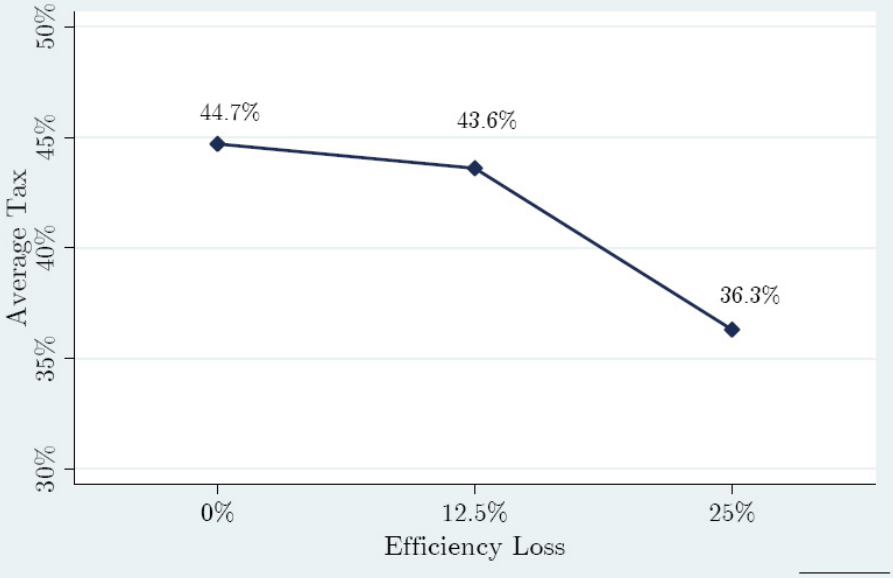


Table 5. Tobit Regressions for Part I (All methods)

Dependent variable: Part I Tax Choice

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tax Cost	-0.116	-0.113	-0.111	-0.109	-0.105	-0.105	-0.105
	[0.022]***	[0.022]***	[0.022]***	[0.023]***	[0.023]***	[0.023]***	[0.023]***
Efficiency Loss	-0.082	-0.087	-0.076	-0.076	-0.072	-0.073	-0.073
	[0.023]***	[0.022]***	[0.023]***	[0.023]***	[0.023]***	[0.023]***	[0.023]***
Risk Aversion		0.010	0.006	0.007	0.007	0.007	0.007
		[0.002]***	[0.002]***	[0.002]***	[0.002]***	[0.002]***	[0.002]***
Female			0.118	0.119	0.104	0.104	0.104
			[0.020]***	[0.020]***	[0.020]***	[0.020]***	[0.020]***
Asian				0.002	0.006	0.006	0.006
				[0.026]	[0.026]	[0.026]	[0.026]
African American				-0.022	-0.051	-0.052	-0.052
				[0.038]	[0.039]	[0.039]	[0.039]
Hispanic				0.025	0.000	-0.001	-0.001
				[0.040]	[0.041]	[0.040]	[0.040]
Income					-0.037	-0.037	-0.037
					[0.017]**	[0.016]**	[0.016]**
Political Philosophy					0.033	0.033	0.033
					[0.008]***	[0.008]***	[0.008]***
Economics Courses					-0.012	-0.012	-0.012
					[0.005]***	[0.005]***	[0.005]***
Tetris						-0.096	
						[0.023]***	
Quiz						-0.094	
						[0.023]***	
Tetris-Quiz							-0.096
							[0.019]***
Constant	0.303	0.255	0.218	0.216	0.446	0.496	0.496
	[0.012]***	[0.017]***	[0.018]***	[0.019]***	[0.178]**	[0.177]***	[0.177]***
Observations	1340	1340	1340	1340	1340	1340	1340
Pseudo R^2	0.017	0.025	0.040	0.040	0.054	0.065	0.065

Coefficients shown are marginal effects.
*Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%*

Figure 4. Part I Average Tax Choice by Method

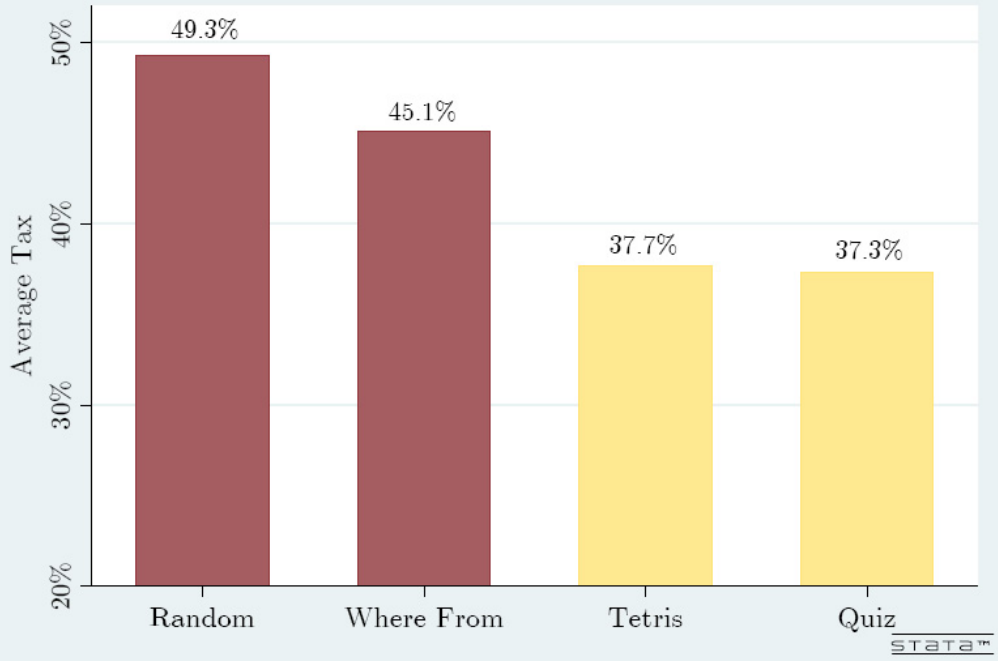


Table 6. Tobit Regressions for Part I with Gender Interaction Terms

Dependent variable: Part I Tax Choice

	(1)	(2)	(3)	(4)	(5)
Tax Cost	-0.105 [0.023]***	-0.105 [0.023]***	-0.140 [0.030]***	-0.104 [0.023]***	-0.142 [0.030]***
Efficiency Loss	-0.073 [0.023]***	-0.073 [0.023]***	-0.072 [0.023]***	-0.112 [0.030]***	-0.114 [0.030]***
Female	0.104 [0.020]***	0.055 [0.028]*	0.083 [0.023]***	0.081 [0.023]***	0.009 [0.032]
Tetris-Quiz	-0.096 [0.019]***	-0.142 [0.026]***			-0.143 [0.026]***
Female * Tetris-Quiz		0.100 [0.038]***			0.101 [0.038]***
Female * Tax Cost			0.086 [0.045]*		0.088 [0.045]*
Female * Efficiency Loss				0.098 [0.046]**	0.100 [0.046]**
Constant	0.496 [0.177]***	0.520 [0.177]***	0.426 [0.178]**	0.475 [0.178]***	0.529 [0.178]***
Observations	1340	1340	1340	1340	1340
Pseudo R^2	0.065	0.068	0.055	0.056	0.071

The following controls are included in the regression and maintain the expected sign and statistical significance: measure of risk aversion, ethnic dummies, log income, self-reported political identification, # of economics courses taken.
*Coefficients shown are marginal effects. Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%*

Figure 5. Part I Average Tax Choice by Method and Gender

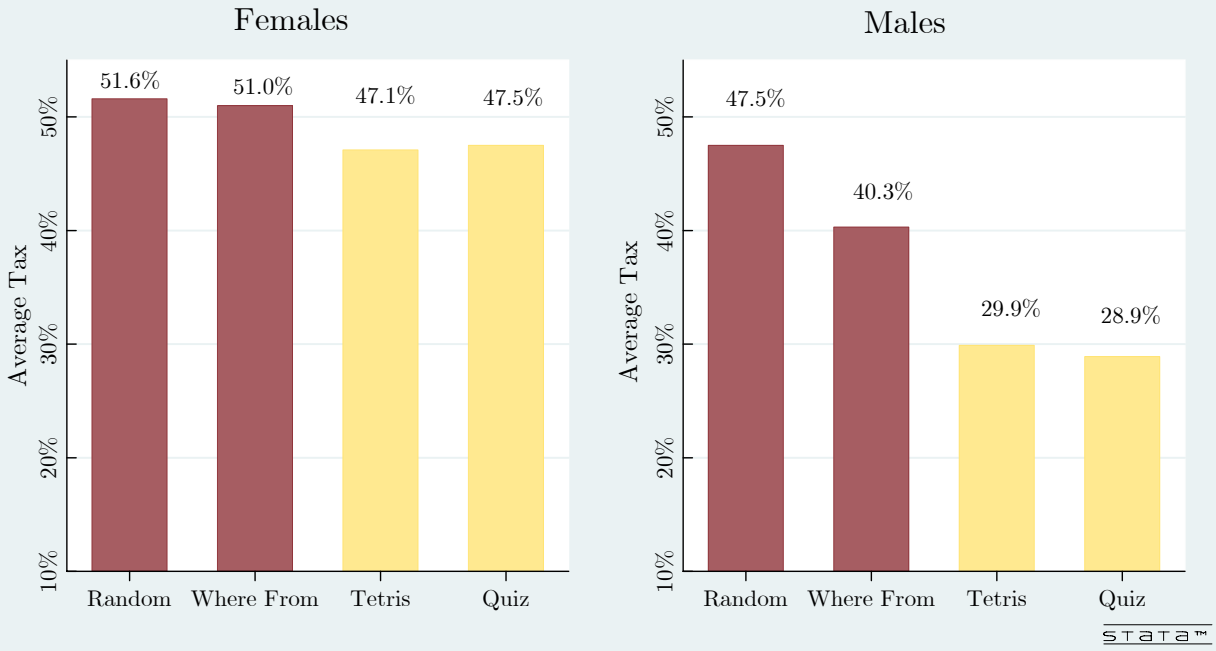


Table 7. Tobit Regressions for Parts I and II Pooled (Random Method)

Dependent variable: Part I and II Tax Choice

	(1)	(2)	(3)
Tax Cost	-0.145	-0.145	-0.145
	[0.032]***	[0.032]***	[0.032]***
Efficiency Loss	-0.101	-0.101	-0.101
	[0.032]***	[0.032]***	[0.032]***
Risk Aversion	0.008	0.008	0.010
	[0.003]**	[0.003]**	[0.005]**
Female	0.017	0.017	0.017
	[0.029]	[0.029]	[0.029]
Income	0.047	0.047	0.047
	[0.024]**	[0.024]**	[0.024]**
Political Philosophy	0.045	0.045	0.045
	[0.011]***	[0.011]***	[0.011]***
Economics Courses	-0.021	-0.021	-0.021
	[0.007]***	[0.007]***	[0.007]***
Part II		0.059	0.076
		[0.027]**	[0.043]*
Part II * Risk Aversion			-0.003
			[0.007]
Constant	-0.311	-0.342	-0.351
	[0.253]	[0.253]	[0.254]
Observations	670	670	670
Pseudo-R^2	0.068	0.072	0.072

Ethnic dummies are included in the regression.

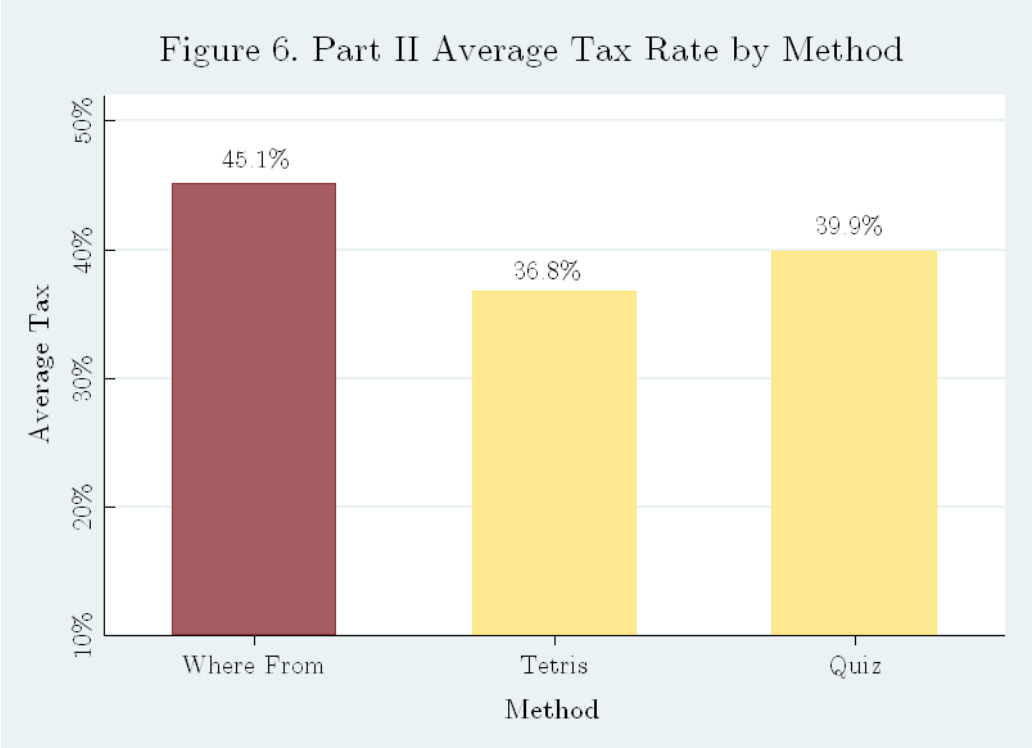
Coefficients shown are marginal effects.

*Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%*

Table 8. Tobit Regressions for Part II (Where From, Quiz, and Tetris Methods)

	Dependent variable: Part II Tax Choice			
	(1)	(2)	(3)	(4)
Tax Cost	-0.087 [0.025]***	-0.088 [0.025]***	-0.088 [0.025]***	-0.088 [0.025]***
Efficiency Loss	-0.073 [0.025]***	-0.073 [0.025]***	-0.073 [0.025]***	-0.073 [0.025]***
Risk Aversion	0.008 [0.003]***	0.008 [0.003]***	0.008 [0.003]***	0.008 [0.003]***
Female	0.132 [0.022]***	0.133 [0.022]***	0.133 [0.022]***	0.043 [0.038]
Income	-0.109 [0.019]***	-0.109 [0.019]***	-0.109 [0.019]***	-0.109 [0.019]***
Political Philosophy	0.025 [0.009]***	0.025 [0.009]***	0.025 [0.009]***	0.025 [0.009]***
Economics Courses	-0.007 [0.005]	-0.007 [0.005]	-0.007 [0.005]	-0.007 [0.005]
Tetris		-0.083 [0.026]***		
Quiz		-0.045 [0.026]*		
Tetris-Quiz			-0.065 [0.023]***	-0.128 [0.031]***
Tetris-Quiz * Female				0.135 [0.045]***
Observations	1005	1005	1005	1005
Pseudo-R^2	0.087	0.093	0.092	0.097

Ethnic dummies are included in the regression. Coefficients shown are marginal effects.
*Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%*



Note: Tax choices under the Random Method are analyzed separately. We include only the three methods for which subjects could forecast their ranks.

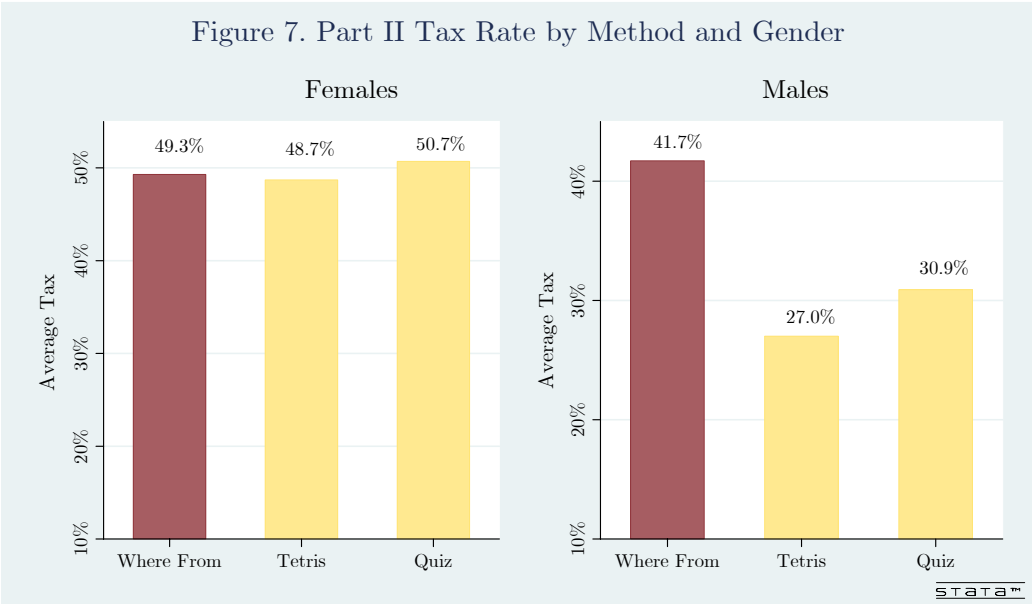


Table 9. Tobit Regressions for Part II with Expected Rank and Confidence (WF, Tetris, and Quiz Methods)

	Dependent variable: Part II Tax Choice				
	(1)	(2)	(3)	(4)	(5)
Tax Cost	-0.088 [0.025]***	-0.094 [0.024]***	-0.093 [0.024]***	-0.093 [0.024]***	-0.093 [0.024]***
Efficiency Loss	-0.073 [0.025]***	-0.076 [0.024]***	-0.070 [0.024]***	-0.070 [0.024]***	-0.065 [0.024]***
Risk Aversion	0.008 [0.003]***	0.005 [0.003]**	0.005 [0.003]**	0.006 [0.003]**	0.005 [0.003]**
Female	0.133 [0.022]***	0.084 [0.022]***	0.083 [0.022]***	0.096 [0.022]***	0.094 [0.022]***
Political Philosophy	0.025 [0.009]***	0.021 [0.008]**	0.020 [0.008]**	0.022 [0.008]***	0.020 [0.008]**
Economics Courses	-0.007 [0.005]	-0.005 [0.005]	-0.004 [0.005]	-0.004 [0.005]	-0.003 [0.005]
Expected Rank		0.038 [0.003]***	0.034 [0.003]***	0.031 [0.003]***	0.028 [0.004]***
Confidence			0.012 [0.005]**		0.010 [0.005]*
Confidence*Expected Rank			0.012 [0.005]**		0.010 [0.005]*
Where From * Expected Rank				0.017 [0.005]***	0.016 [0.005]***
Observations	1005	1005	1005	1005	1005
Pseudo-R^2	0.092	0.225	0.233	0.232	0.240

Income, ethnic dummies as well and a dummy variable for the Where From method are included in the regression.
*Coefficients shown are marginal effects. Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%*

Figure 8. Part II Tax Choices Distribution by Expected Rank

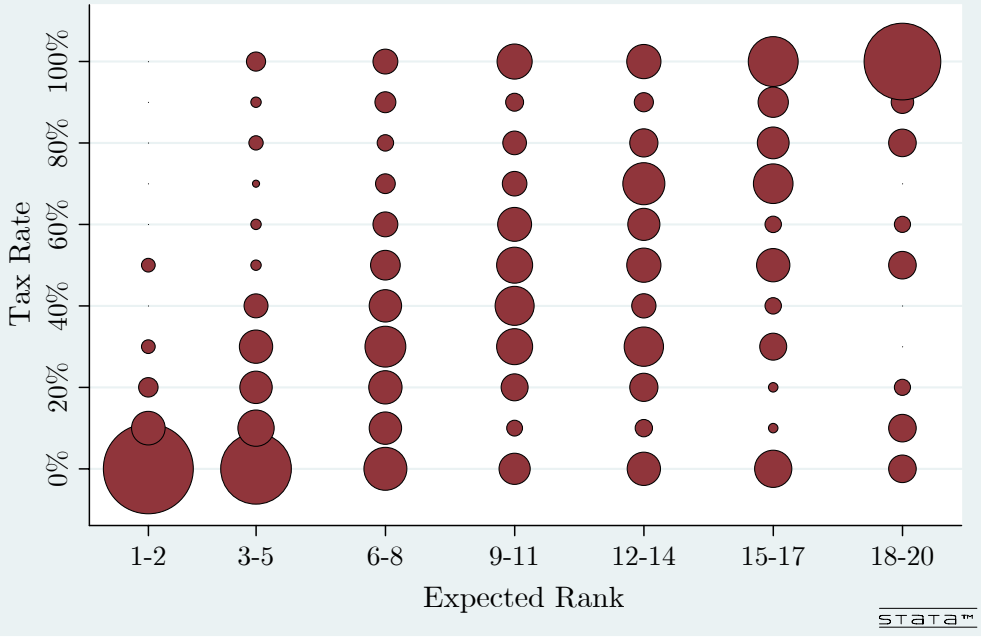
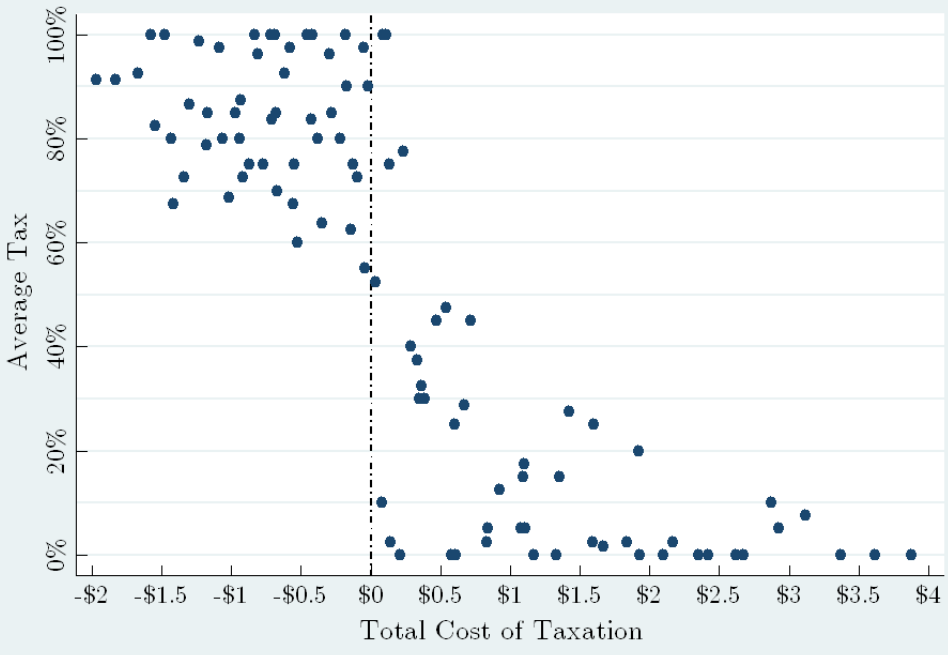


Figure 9. Part III. Average Tax Choice by Total Cost of Taxation



Note: The "Total Cost of Taxation" includes the regular tax cost parameter used in the experimental session as well as the additional cost of redistribution which depends on each individual's revealed rank.

Table 10. Tobit Regressions for Part III (All Methods)

Dependent variable: Part III Tax Choice

	(1)	(2)
Tot. Cost of Taxation ($ per 10%)	-0.36	-0.350
	[0.056]***	[0.057]***
Tot. Cost of Taxation ^{2}	0.032	0.030
	[0.006]***	[0.006]***
Earnings-Maximising Tax	0.312	0.332
	[0.071]***	[0.071]***
EMTR * Cost of Taxation	0.358	0.362
	[0.082]***	[0.083]***
Part I High Tax		0.149
		[0.040]***
Constant	0.223	0.151
	[0.051]***	[0.055]***
Observations	588	588
Pseudo-R^2	0.302	0.314

Coefficients shown are marginal effects.
*Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%*

Figure 10. Part III. Tax Choice by Total Cost of Taxation

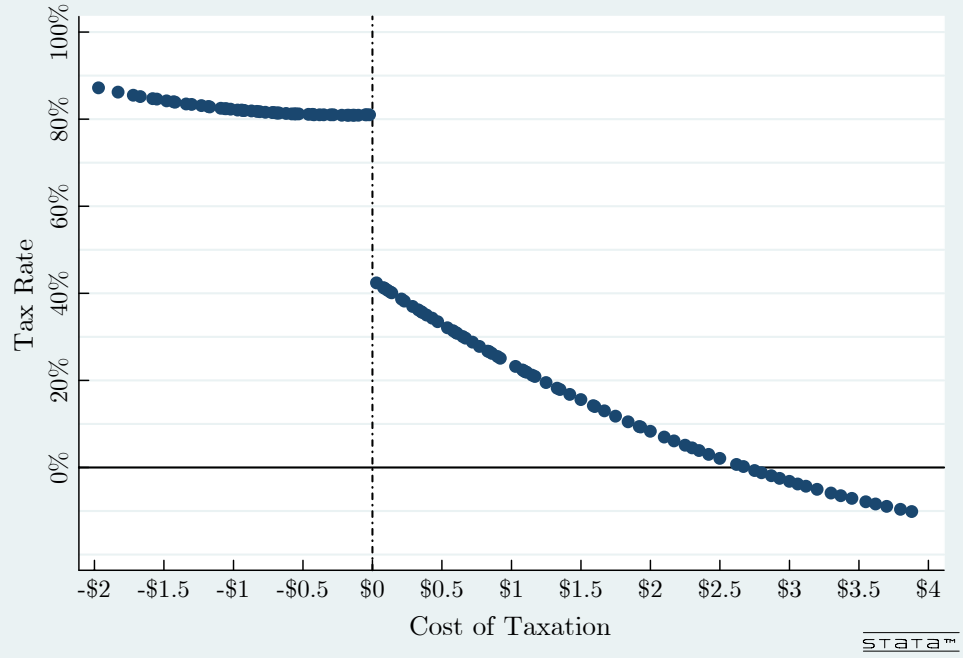
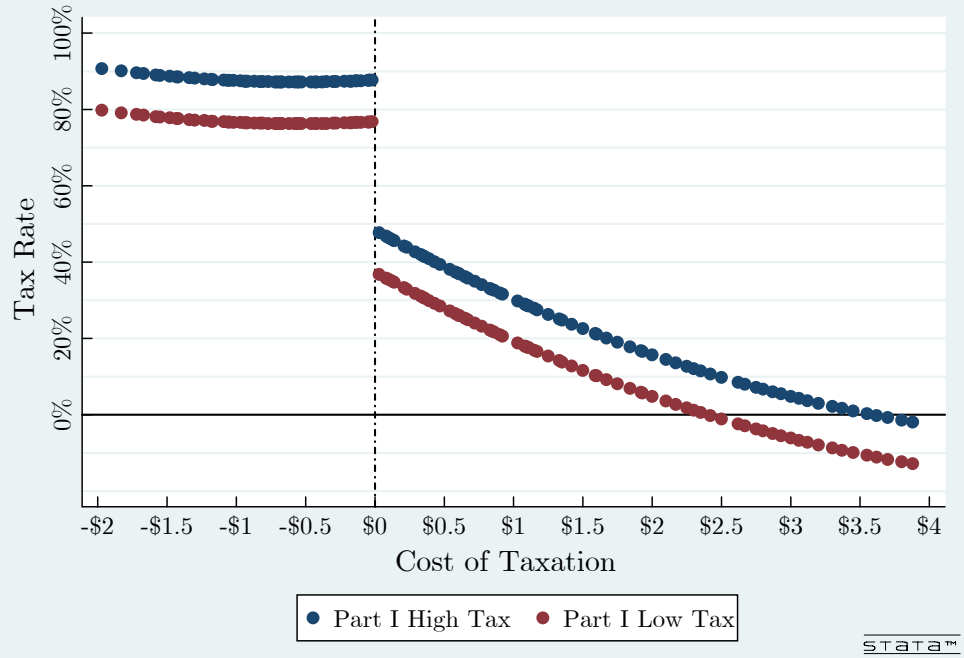


Figure 11. Part III Tax Choice by Cost of Taxation



Appendix

Appendix Table 1. Distribution of Participants by Personal Characteristics

		Subjects	% Subjects
Gender			
	Female	151	45.1%
	Male	184	54.9%
Ethnic background			
	White	213	63.6%
	African-American	25	7.5%
	Asian	58	17.3%
	Hispanic	21	6.3%
Home Area Income			
	$<$ \$ 20,000	65	19.4%
	\$ 20,000 - \$ 40,000	176	52.5%
	\$ 40,000 - \$ 60,000	67	20.0%
	$>$ \$ 60,000	27	8.1%
Socioeconomic Status			
	Middle-low	162	48.4%
	Middle-high	173	51.6%
Political Inclination			
	Liberal	247	73.7%
	Moderate	50	14.9%
	Conservative	38	11.3%
Economics Courses			
	2 or less	283	84.5%
	More than 2	52	15.5%

Appendix Table 2. Distribution of Tax Choices for Part I, II, and III by Method

Part I (335 subjects, 1340 choices)

	All	Random	Where From	Tetris	Quiz
t=0%	23.6%	20.0%	24.5%	25.7%	24.2%
t=10%	6.2%	3.9%	8.1%	5.7%	7.2%
t=20%	6.6%	5.1%	5.7%	8.4%	7.5%
t=30%	11.0%	8.1%	9.3%	13.4%	13.1%
t=40%	8.4%	8.1%	5.1%	9.3%	11.3%
t=50%	10.2%	14.6%	7.5%	8.4%	10.5%
t=60%	5.5%	5.4%	4.8%	6.6%	5.1%
t=70%	5.8%	5.1%	6.6%	5.7%	6.0%
t=80%	5.2%	5.7%	5.1%	5.4%	4.5%
t=90%	3.6%	5.1%	4.5%	3.3%	1.5%
t=100%	14.0%	19.1%	19.1%	8.4%	9.3%

Part II (335 subjects, 1340 choices)

	All	Random	Where From	Tetris	Quiz
t=0%	21.0%	13.1%	26.0%	25.1%	19.7%
t=10%	6.0%	3.6%	7.5%	6.3%	6.9%
t=20%	7.2%	5.4%	5.4%	9.3%	8.7%
t=30%	11.2%	8.7%	9.6%	13.1%	13.4%
t=40%	8.2%	8.1%	3.6%	10.2%	11.0%
t=50%	10.5%	16.1%	5.7%	8.7%	11.3%
t=60%	5.8%	4.8%	6.3%	5.1%	7.2%
t=70%	6.8%	7.5%	7.5%	6.9%	5.4%
t=80%	5.1%	5.7%	5.4%	5.1%	4.2%
t=90%	4.0%	5.1%	3.9%	3.9%	3.3%
t=100%	14.3%	22.1%	19.4%	6.6%	9.0%

Part III (147 subjects, 588 choices)

	All	Random	Where From	Tetris	Quiz
t=0%	33.5%	35.4%	34.7%	30.6%	33.3%
t=10%	3.9%	0.7%	5.4%	4.8%	4.8%
t=20%	1.5%	1.4%	0.7%	3.4%	0.7%
t=30%	3.1%	3.4%	3.4%	2.7%	2.7%
t=40%	3.1%	2.7%	1.4%	0.7%	7.5%
t=50%	3.7%	6.8%	3.4%	2.7%	2.0%
t=60%	2.0%	2.0%	2.0%	1.4%	2.7%
t=70%	3.2%	3.4%	2.0%	4.8%	2.7%
t=80%	2.0%	0.7%	3.4%	2.7%	1.4%
t=90%	2.7%	2.0%	2.7%	4.1%	2.0%
t=100%	41.2%	41.5%	40.8%	42.2%	40.1%

Appendix Table 3. Tobit Regressions for Part I with Where From Dummy

Dependent variable: Part I Tax Rate

	(1)	(2)
Tax Cost	-0.105	-0.106
	[0.023]***	[0.023]***
Efficiency Loss	-0.073	-0.073
	[0.023]***	[0.023]***
Risk Aversion	0.007	0.007
	[0.002]***	[0.002]***
Female	0.104	0.105
	[0.020]***	[0.020]***
Income	-0.037	0.001
	[0.016]**	[0.019]
Political Philosophy	0.033	0.033
	[0.008]***	[0.008]***
Economics Courses	-0.012	-0.013
	[0.005]***	[0.005]***
Random-Where From	0.096	0.117
	[0.019]***	[0.023]***
WhereFrom		0.883
		[0.378]**
Where From* Income		-0.156
		[0.037]***
Constant	0.399	0.013
	[0.177]**	[0.199]
Observations	1340	1340
Pseudo R^2	0.065	0.073

Ethnic dummies are included in the regression.
Coefficients shown are marginal effects.
*Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%*

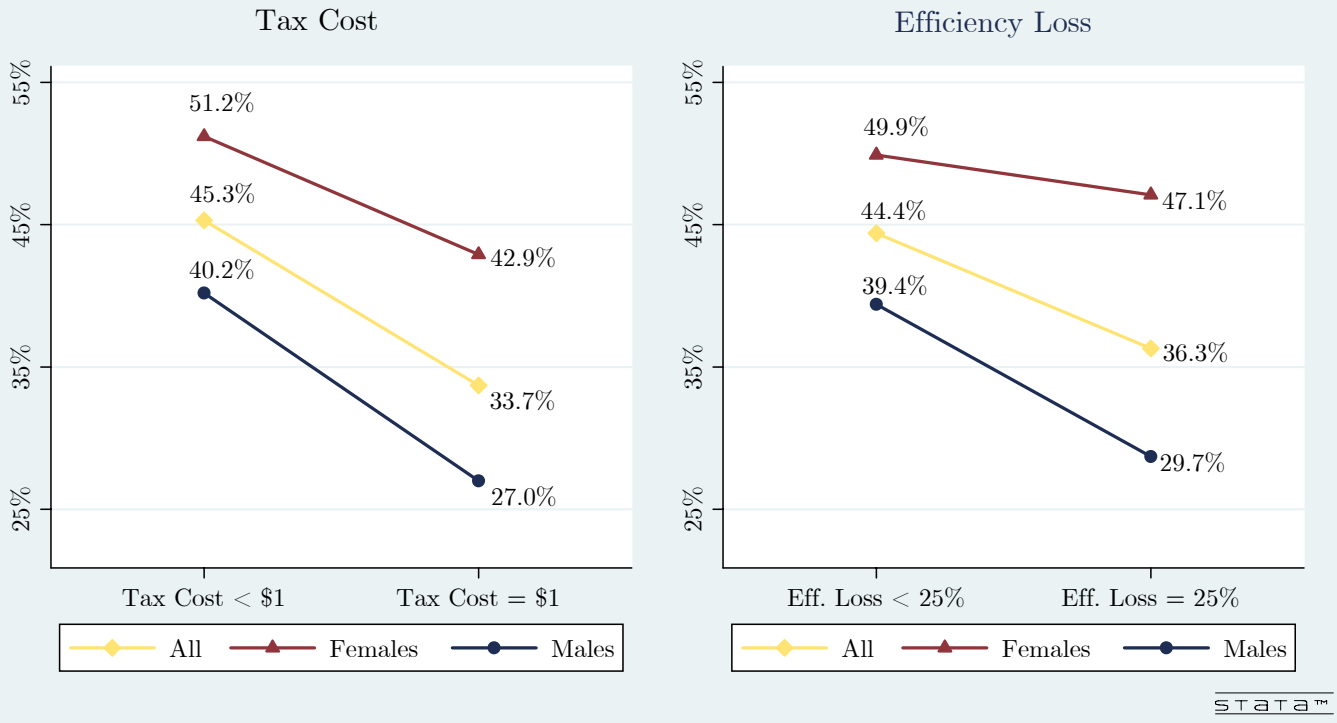
Appendix Table 4. Tobit Regressions for Part I by Method

Dependent variable: Part I Tax Choice

	Random-Where From	Tetris-Quiz
Tax Cost	-0.131	-0.078
	[0.034]***	[0.029]***
Efficiency Loss	-0.093	-0.053
	[0.034]***	[0.029]*
Risk Aversion	0.007	0.007
	[0.004]**	[0.003]**
Female	0.047	0.162
	[0.030]	[0.026]***
Asian	0.018	-0.007
	[0.039]	[0.034]
African American	-0.126	0.026
	[0.058]**	[0.051]
Hispanic	0.031	-0.036
	[0.060]	[0.053]
Income	-0.068	-0.005
	[0.025]***	[0.021]
Political Philosophy	0.039	0.027
	[0.011]***	[0.010]***
Economics Courses	-0.023	-0.001
	[0.007]***	[0.006]
Constant	0.818	0.078
	[0.264]***	[0.230]
Observations	670	670
Pseudo-R^2	0.058	0.077

Coefficients shown are marginal effects.
*Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%*

Appendix Figure 1. Part I Tax Rate by Tax Cost and Efficiency Loss (by Gender)



Appendix Table 5. Tobit Regressions for Part I by Gender

Dependent variable: Part I Tax Choice

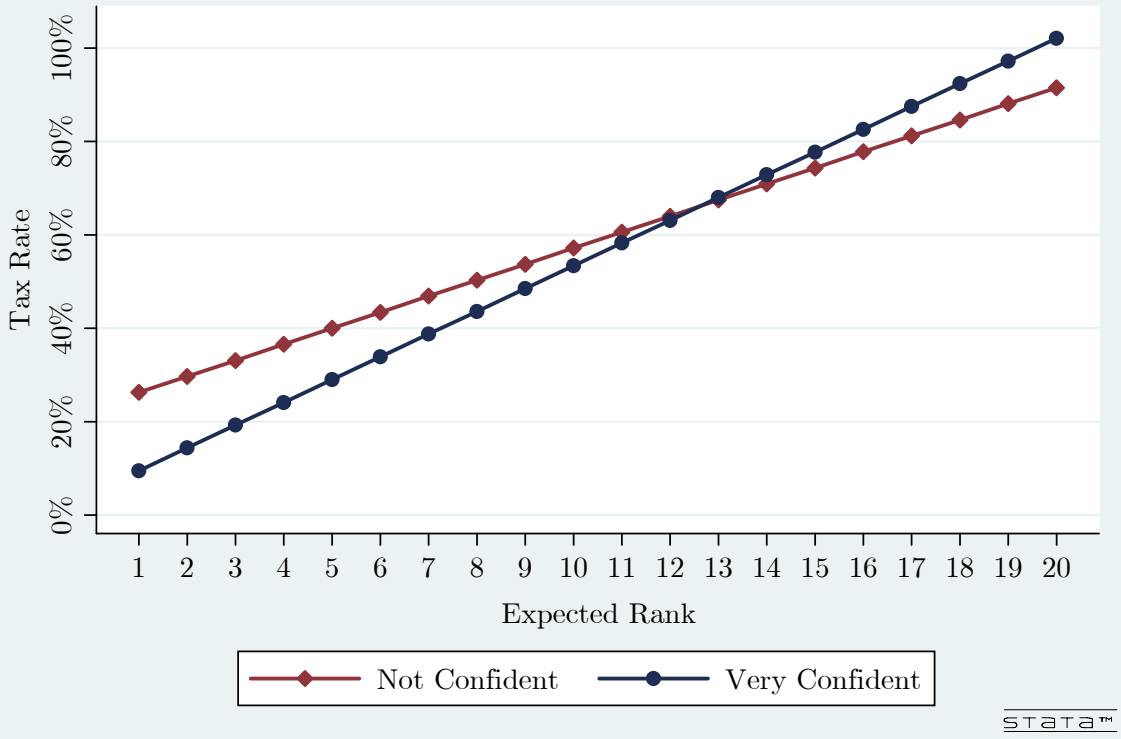
	Females	Males
Tax Cost	-0.087	-0.127
	[0.034]***	[0.030]***
Efficiency Loss	-0.016	-0.103
	[0.034]	[0.030]***
Risk Aversion	0.008	0.007
	[0.003]**	[0.004]*
Asian	-0.022	0.024
	[0.040]	[0.035]
African American	0.052	-0.156
	[0.053]	[0.058]***
Hispanic	0.030	-0.024
	[0.063]	[0.052]
Income	-0.042	-0.034
	[0.022]*	[0.024]
Political Philosophy	0.033	0.033
	[0.012]***	[0.010]***
Economics Courses	-0.026	-0.005
	[0.008]***	[0.006]
Tetris-Quiz	-0.044	-0.133
	[0.027]	[0.026]***
Constant	0.656	0.471
	[0.241]***	[0.258]*
Observations	604	736
Pseudo R^2	0.048	0.063

Coefficients shown are marginal effects. Standard errors in brackets.
** significant at 10%; ** significant at 5%; *** significant at 1%*

Appendix Table 6. Tax Choice in Part I vs. Part II (Random Method)

	Part 1	Part 2	Difference
All	49.3%	54.6%	+5.3%
Gender			
Female	51.6%	57.2%	+5.6%
Male	47.5%	52.4%	+4.9%
Ethnic background			
White	49.3%	54.6%	+5.3%
African-American	36.0%	46.4%	+10.4%
Asian	55.2%	61.4%	+6.2%
Hispanic	51.0%	52.9%	+1.9%
Home Arean Income			
< $ 20,000	48.5%	49.4%	+0.9%
$ 20,000 - $ 40,000	48.0%	55.3%	+7.3%
$ 40,000 - $ 60,000	50.6%	56.3%	+5.7%
> $ 60,000	57.4%	58.5%	+1.1%
Socioeconomic Status			
Middle-low	49.3%	52.8%	+3.5%
Middle-high	49.4%	56.3%	+6.9%
Political Inclination			
Liberal	53.6%	57.5%	+3.9%
Moderate	40.2%	47.2%	+7.0%
Conservative	33.7%	45.5%	+11.8%
Economics Courses			
2 or less	50.7%	55.7%	+5.0%
More than 2	41.9%	48.7%	+6.7%
Tax Cost			
< $1	53.7%	58.2%	+4.5%
= $1	36.2%	43.7%	+7.5%
Efficiency Loss			
< 25%	51.5%	57.3%	+5.8%
= 25%	42.9%	46.5%	+3.7%

Appendix Figure 2. Part II Tax Rate by Exp. Rank and Confidence



Appendix Table 7. Questions used to construct the Political Philosophy and the Socioeconomic Status indicators

	Political Phylosophy	
1.	Question: Possible answers:	Which of the following best describes your political inclination (affiliation)? Republican; Democrat; Independent; don't know; other
2.	Question: Possible answers:	Which of the following best describes your political philosophy (ideology)? On a scale of 1 (Very Conservative) to 7 (Very Liberal)
	Socioeconomic Status	
1.	Question: Possible answers:	When you were in high school, did your family live in: an apartment; a single family house; a multi-family house; other
2.	Question: Possible answers:	When your father was growing up, were his parents: working class ; middle class; upper middle class; rich
3.	Question: Possible answers:	When your mother was growing up, were her parents: working class ; middle class; upper middle class; rich
4.	Question: Possible answers:	When you were growing up, were your parents: working class ; middle class; upper middle class; rich
5.	Question: Possible answers:	How would you characterize the principal wage-earner in your family? a professional (doctor, lawyer, dentist, accountant, etc.) ; a business person, executive, or manager ; a small business owner ; an ordinary employee ; other
6.	Question: Possible answers:	Considering your family s income, what your family has to live on and the cost of living, how would you say your family is making out today? all right ; fairly well ; quite pinched ; not making ends meet

Appendix Table 8. Test for the Assessment of Risk Aversion

1) Please indicate whether you would like to receive \$1 or would prefer to let the computer randomly select for you either \$0 or \$1.80 (each with a 50% probability).

- [x] Guaranteed \$1
- [ ] Random Selection between \$0 and \$1.80

2) Please indicate whether you would like to receive \$1 or would prefer to let the computer randomly select for you either \$0 or \$2 (each with a 50% probability).

- [x] Guaranteed \$1
- [ ] Random Selection between \$0 and \$2.00

3) Please indicate whether you would like to receive \$1 or would prefer to let the computer randomly select for you either \$0 or \$2.33 (each with a 50% probability).

- [x] Guaranteed \$1
- [ ] Random Selection between \$0 and \$2.33

4) Please indicate whether you would like to receive \$1 or would prefer to let the computer randomly select for you either \$0 or \$2.67 (each with a 50% probability).

- [x] Guaranteed \$1
- [ ] Random Selection between \$0 and \$2.67

5) Please indicate whether you would like to receive \$1 or would prefer to let the computer randomly select for you either \$0 or \$3.00 (each with a 50% probability).

- [ ] Guaranteed \$1
- [x] Random Selection between \$0 and \$3.00

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