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# The value of tax progressivity: Evidence from survey experiment

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# The value of tax progressivity: Evidence from survey experiments.

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## Abstract

The aim of this paper is to investigate how people value tax progressivity. More precisely, I study the potential trade-off between improvement of the final income distribution and progressivity of the tax schedule. To do this, I designed survey experiments, in which respondents are asked to rank different taxation-redistribution schemes in different treatments differing in terms of information availability: (1) when only information about final incomes is provided; (2) when information about average tax rates is also available. Using a within-subject design, the instability of ranking between (1) and (2) indicates whether or not they value tax progressivity. The main result is that respondents have a strong preference for tax progressivity, that is, they accept to worsen the final income distribution in exchange for tax progressivity. This finding is robust to two experimental variations: First, the mere fact of providing a new information can not account for this finding; Second, providing information pieces about pre-tax incomes and tax liabilities does not affect the preference for progressive taxation.

**JEL Codes:** D63, H21, C9

**Keywords:** Tax progressivity, Optimal taxation, Survey experiment

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# 1 Introduction

The modern theories of optimal income taxation as initiated by Mirlees (1971) emphasize the limits to raising tax revenues due to the fact that one is not able to observe information about individual abilities. In this approach, the social planner is assumed to seek maximizing a social welfare function (typically, the total utility or the minimal utility in the society) under feasible and incentive-compatible constraints. The hypothesis one makes here is that the social planner is consequentialist, i.e., its preferences over taxation schemes depend solely on the quality of the final situation (Sen, 1987). The social planner is neutral towards how the tax burden is allocated among taxpayers. This paper aims to investigate whether people support such a view or, on the contrary, exhibit a preference for some forms of taxation to others. In particular, I design a survey experiment in order to study whether or not people attach a value to tax progressivity *independently of the consequences on the final situation*.

To illustrate the problem, consider the choice between the two (feasible and incentive-compatible) taxation and redistribution schemes described in Table 1: A is not progressive while B is. As work effort made by the richest individuals is decreasing with taxation, A allows for tax revenues and level for the disposable income of the worst-off individuals to be higher than with B. How should one compare A and B? Is A *fairer* than B, or B *fairer* than A? According to a utilitarian/consequentialist view with sufficient inequality aversion (i.e., giving priority to the worst-off), A may be preferred to B. But tax progressivity may be perceived as a desirable property of taxation: That is, it may be an argument of the social objective function, or compatible with a fair sharing of sacrifice among people.<sup>1</sup> A strong preference for progressive taxation should lead to judging B as the fairest, while a larger weight on the final situation pushes to prefer A.

	Policy A			Policy B		
	Poor (30%)	Middle (60%)	Rich (10%)	Poor (30%)	Middle (60%)	Rich (10%)
Pre-tax incomes	200	1800	3700	200	1800	3400
Post-tax incomes	1040	1440	3330	790	1620	2720
Average tax rates	-420%	20%	10%	-295%	10%	20%

Table 1: Illustration

To study how people deal with such a trade-off, I ran survey experiments where participants placed in the position of social planner are asked to compare alternative tax and redistribution policies. These alternatives differ in pre- and post-tax income distributions and tax schedule, so that they are differently ranked according to consequentialist or non-consequentialist views. To elicit the participants' preference for tax progressivity, I vary the information pieces they are provided with and study how adding a relevant information affects their judgements about tax policies (see also Faravelli (2007) for a similar

<sup>1</sup>There exist some historical instances showing that people are concerned with the fair sharing of taxation among people. For example, the Article 13 of the Declaration of the Rights of Man and of the Citizen asserts that "For the maintenance of the public force, and for administrative expenses, a general tax is indispensable; it must be equally distributed among all citizens, in proportion to their ability to pay."

methodology). More precisely, participants are given two treatments differing in terms of information availability, and they face one after the other. In the first one, only the final incomes of different groups of workers are known, while, in the second one, they are *also* provided with information about the average tax rates. In this second treatment, they are also informed that the taxation affects the work effort made by some workers and, consequently, their gross earnings. The change in preferences over taxation alternatives translates how respondents value progressivity as a desirable property of taxation.

The main result is that the respondents are likely to change their ranking over the tax policies between the informational contexts, i.e., adding information about average tax rates lead them to change their evaluation of the different taxation and redistribution policies. In particular, they tend to switch from a regressive taxation to a progressive one. This result suggests that they accept to decrease the total utility (as elicited in the first treatment) in exchange for a more equal sharing of the tax burden. In other words, people seem to have an “intrinsic” taste for tax progressivity. I ran two additional experiments in order to test the robustness of this result. In the first one, participants *only* face the second treatment, i.e., they have information about post-tax income distribution and tax schedule and do not experience the addition of a new information. The second robustness experiment works as the main experiment except that they are also provided with information about the pre-tax incomes and tax liabilities in the richer informational treatment. These additional results seem to indicate that the preference for tax progressivity is robust to these two experimental variations.

This paper is attached to a growing body of papers which aim to elicit people’s judgments concerning social justice.<sup>2</sup> This line of research provides evidence that people often depart from utilitarianism and, conversely, prefer a mixed normative view. In particular, some papers provide evidence that people do not judge taxation and redistribution schemes only on the basis of the final distribution, but also consider pre-tax incomes and tax liabilities as relevant information. Using survey studies, Weinzierl (2014, 2017) show that a majority of (American) respondents reject consequentialism (e.g., they reject full equalization if there is no efficiency costs) and, on the contrary, seem to endorse the principles of Equal Sacrifice and of benefit-based taxation. Saez and Stantcheva (2016) found that people judge tax and redistribution systems on the basis of various fairness principles from utilitarianism (only post-tax incomes matter) to libertarianism (only tax liabilities matter). In a laboratory experiment run by Charité et al. (2015), respondents in a position of social planner are found to have a lower taste for redistribution when taxpayers know their initial endowments, which can be interpreted as a consideration for the reference point of others. However, these papers study the effect of non-consequential principles on the taste for progressivity but do not pay attention to progressivity as a desirable property of taxation. One exception is a paper by Gaertner and Schwettmann (2017). They use a questionnaire-experimental study in order to examine how people allocate an *extra* tax burden between unequal individuals. If their respondents tend to opt for progressive schemes (at least in some South-European countries), it is not clear whether the roots for such a preference are welfarist or non-welfarist.<sup>3</sup> My survey experiment study allow the conclusion that respondents are willing to sacrifice total utility in exchange for progressive taxation, i.e., they attach an

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<sup>2</sup>See for instance Yaari and Bar-Hillel (1984), Konow (2000), Faravelli (2007), Bosmans and Schokkaert (2009), Cettolin and Riedl (2016), Tarrow (2015), and, for surveys, Konow (2003) and Gaertner and Schokkaert (2012).

<sup>3</sup>Indeed, people’s preference for progressive taxation may be rooted in the belief that it minimizes the loss of total utility.

intrinsic value to tax progressivity.

This paper is organized as follows. The next section presents the theoretical framework of the paper and Section 3 details the survey experiment methodology. The main results are presented in Section 4 and Section 5 reports the results of the robustness experiments. I discuss the results in Section 6 and the last section concludes.

## 2 The social planner's problem

**General setting.** Consider  $I$  groups of workers or taxpayers and denote  $p_i$  the proportion of total population belonging to group  $i \in \{1, \dots, I\}$ . They differ in their ability, denoted  $w_i$ . An individual belonging to group  $i$  derives utility from consumption denoted  $c_i$  and disutility of working effort  $\frac{y_i}{w_i}$  with  $y_i$  the gross income:

$$u_i = u\left(c_i, \frac{y_i}{w_i}\right) = u\left(y_i - T(y_i), \frac{y_i}{w_i}\right)$$

where  $T(y_i)$  is the amount of income tax liability paid by an individual of group  $i$ .

The social planner's problem is to choose the allocation that maximizes a *social ranking* subject to feasibility and incentive compatibility constraints. Denote  $\{c_i^*, y_i^*\}_{i=1}^I$  as this allocation. The set of feasible allocations denoted  $\mathbb{F}$  consists of all the allocations such that  $\sum_{i=1}^I p_i T(y_i) = 0$  (pure redistribution problem). The set of incentive-compatible allocations denoted  $\mathbb{IC}$  is described as follows:

$$\mathbb{IC} = \left\{ \{c_i, y_i\}_{i=1}^I : u\left(c_i, \frac{y_i}{w_i}\right) > u\left(c_j, \frac{y_j}{w_j}\right) \quad \forall i, j \in \{1, \dots, I\} \text{ and } i \neq j \right\}$$

In this framework, a utilitarian (or consequentialist) social planner aims to maximize the sum of the individual utilities.<sup>4</sup> We can thus introduce the definition of utilitarianism in the choice of tax policy:

### Definition 1 (Utilitarian social planner)

*The choice of a utilitarian social planner is the allocation such that:*

$$\sum_i p_i u\left(c_i^*, \frac{y_i^*}{w_i}\right) \geq \sum_i p_i u\left(c_i, \frac{y_i}{w_i}\right) \quad \forall \{c_i, y_i\}_{i=1}^I \in \mathbb{F} \cap \mathbb{IC}$$

The preference relation for the non-consequentialist motives requires assuming some *preferred* or *acceptable* tax properties *independently* of the consequences of taxation on distribution of resources. Let  $\mathbb{T}$  be the set of all possible tax functions and  $\mathbb{A}$  be the set of acceptable tax functions with  $\mathbb{A} \subseteq \mathbb{T}$ . The latter may be more or less large. For instance, it may consist of all possible proportional ( $\mathbb{A}_{\mathbf{F}}$ ) or progressive ( $\mathbb{A}_{\mathbf{P}}$ ) tax functions:

$$\mathbb{A}_{\mathbf{F}} = \left\{ \{T(y_i)\}_{i=1}^I : \frac{T(y_i)}{y_i} = \frac{T(y_j)}{y_j} \quad \forall y_i \neq y_j \right\} \quad ; \quad \mathbb{A}_{\mathbf{P}} = \left\{ \{T(y_i)\}_{i=1}^I : \frac{T(y_i)}{y_i} < \frac{T(y_j)}{y_j} \quad \forall y_i < y_j \right\}$$

The following definition defines the behavior of a non-consequentialist social planner:

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<sup>4</sup>Utility functions may be interpreted in a utilitarian perspective but this is not the only possibility. Indeed one can consider that they translate the evaluation of individual situations made by a social planner.

**Definition 2 (Non-consequentialist social planner)**

The choice of a non-consequentialist social planner is the allocation such that:

$$\sum_i p_i u\left(c_i^*, \frac{y_i^*}{w_i}\right) \geq \sum_i p_i u\left(c_i, \frac{y_i}{w_i}\right) \quad \forall \{c_i, y_i\}_{i=1}^I \in \mathbb{F}_\mathbb{A} \cap \mathbb{I}\mathbb{C}$$

with  $\mathbb{F}_\mathbb{A} \subseteq \mathbb{F}$  the set of allocations such that  $T(y) \in \mathbb{A}$ .

This definition states that a non-consequentialist social planner chooses the allocation that maximizes the sum of individual utilities *under the constraint that* the corresponding tax function respects desirable properties.<sup>5</sup>

**Social planner with multiple values.** A social planner is said to have multiple values if both total utility and progressivity of the tax function are an argument of her social objective function. Thus, social ranking over policies may be the result of a trade-off between desirable properties the tax function should respect and its consequences in terms of total utility. A (simple) example of a social objective function capturing value diversity is:<sup>6</sup>

$$\mathcal{W} = \alpha \sum_i p_i u\left(c_i, \frac{y_i}{w_i}\right) + (1 - \alpha) \mathbb{I}[T(y) \in \mathbb{A}] \quad \text{with } 0 \leq \alpha \leq 1$$

with  $\alpha$  and  $(1 - \alpha)$  denoting the intensities of the concern with total utility and desirable properties of taxation;  $\mathbb{I}[T(y) \in \mathbb{A}] = 1$  if  $T(y) \in \mathbb{A}$  and 0 otherwise. It is obvious that  $\alpha = 1$  corresponds to the case of a utilitarian social planner while  $\alpha = 0$  for a non-consequentialist one. The following definition clarifies the choice made by such a social planner.

**Example 1 (An illustration of a social planner with multiple values)**

The choice of a social planner with multiple values is the allocation such that:

$$\alpha \sum_i p_i u\left(c_i^*, \frac{y_i^*}{w_i}\right) + (1 - \alpha) \mathbb{I}[T^*(y) \in \mathbb{A}] \geq \alpha \sum_i p_i u\left(c_i, \frac{y_i}{w_i}\right) + (1 - \alpha) \mathbb{I}[T(y) \in \mathbb{A}] \quad \forall \{c_i, y_i\}_{i=1}^I \in \mathbb{F} \cap \mathbb{I}\mathbb{C}$$

This definition has two interesting implications. On the first hand, if the social planner has the choice between two tax functions  $\widehat{T} \in \mathbb{A}$  and  $\widetilde{T} \notin \mathbb{A}$ , which lead to two (possibly different) consumption distributions with the same level of social welfare, then she will always choose the tax function belonging to the set of desirable functions, i.e.,  $\widehat{T}$ . On the other hand, consider that the social planner has to choose between two alternative redistributive policies,  $\widehat{T}$  and  $\widetilde{T}$ , such that: (1)  $\widehat{T} \in \mathbb{A}$  and  $\widetilde{T} \notin \mathbb{A}$  and (2)  $\widehat{\mathcal{U}} = \sum_i p_i u(\widehat{c}_i, \frac{\widehat{y}_i}{w_i}) < \sum_i p_i u(\widetilde{c}_i, \frac{\widetilde{y}_i}{w_i}) = \widetilde{\mathcal{U}}$ , then, the social planner with multiple values prefers  $\widehat{T}$  to  $\widetilde{T}$  (i.e.,  $\widehat{\mathcal{W}} > \widetilde{\mathcal{W}}$ ) if and only if:

$$\widehat{\mathcal{U}} - \widetilde{\mathcal{U}} < \frac{1 - \alpha}{\alpha}$$

<sup>5</sup>According to this definition, a non-consequentialist social planner is minimally consequentialist, i.e., she is not indifferent to tax functions respecting some desirable properties. Thus, according to this definition, non-consequentialism is a kind of lexicographic preference.

<sup>6</sup>See Weinzierl (2014) and Saez and Stantcheva (2016) for alternative (and more sophisticated) theoretical frameworks.

Thus the ratio  $(1 - \alpha)/\alpha$  can be interpreted as the maximal sacrifice in terms of the sum of individual utilities that a social planner accepts in exchange for a tax function respecting some desirable properties.

**Revealed preference for non-consequentialist value and tax progressivity.** The following definition identifies whether a social planner (i.e., a respondent in our survey) is concerned with non-consequentialist values:

**Definition 3 (Revealed non-consequentialist social planner)**

A social planner is revealed not to be a consequentialist if there exists at least one allocation  $\{\tilde{c}_i, \tilde{y}_i\}_{i=1}^I \in \mathbb{F} \cap \mathbb{IC}$  such that  $\sum_i p_i u(c_i^*, \frac{y_i^*}{w_i}) < \sum_i p_i u(\tilde{c}_i, \frac{\tilde{y}_i}{w_i})$ .

According to this definition, if a social planner does not select a feasible and incentive-compatible allocation, which allows to maximize the sum of the individual utilities, this reveals that she is concerned with non-consequentialist principles. In particular, this paper aims to study whether or not respondents are willing to select a *regressive* tax function, even if it maximizes the sum of individual utilities. The following definition clarifies how preference for tax progressivity may be revealed.

**Definition 4 (Revealed preference for tax progressivity)**

Consider two allocations  $\{\tilde{c}_i, \tilde{y}_i\}_{i=1}^I \in (\mathbb{F} \setminus \mathbb{F}_{\mathbb{A}\mathbb{P}}) \cap \mathbb{IC}$  and  $\{\hat{c}_i, \hat{y}_i\}_{i=1}^I \in \mathbb{F}_{\mathbb{A}\mathbb{P}} \cap \mathbb{IC}$  (i.e., one has the choice between a regressive tax function and a progressive one). A social planner is revealed to have a preference for tax progressivity if  $\{\hat{c}_i, \hat{y}_i\}_{i=1}^I$  is preferred to  $\{\tilde{c}_i, \tilde{y}_i\}_{i=1}^I$ , and  $\sum_i p_i u(\hat{c}_i, \frac{\hat{y}_i}{w_i}) < \sum_i p_i u(\tilde{c}_i, \frac{\tilde{y}_i}{w_i})$ .

In other words, a social planner is said to exhibit preference for tax progressivity if she chooses a progressive taxation even if there exists at least one feasible and incentive-compatible tax function that leads to higher social welfare. One should note that it is possible that a social planner chooses  $\{\tilde{c}_i, \tilde{y}_i\}_{i=1}^I$  rather than  $\{\hat{c}_i, \hat{y}_i\}_{i=1}^I$  even though she has a taste for tax progressivity. This is explained by the fact that the price to accept in terms of the decrease in the sum of the individual utilities is viewed as too high.

### 3 The survey experiment design

#### 3.1 Questionnaires

Participants were invited to imagine a society which consists of three distinct groups of workers (groups I, II and III) differing in terms of *skill*.<sup>7</sup> The size of groups differs: group I (the poorest) represents 30% of the population of the society, group III is the richest 10% of individuals and, in the middle, group II corresponds to the enlarged middle-class (60% of the population). Difference in skills is only due to difference in family background, which is not under the control of individuals. To make the problem as simple as possible for the respondents, it is clearly stated that individuals with higher skills earn more than the ones with intermediary skills, who themselves earn more than the ones with the lowest skills, given that all of them make the same effort in the absence of taxation.

<sup>7</sup>See the Appendix D for the detailed instructions.

Participants in the position of an impartial social planner were asked to rank different redistributive policies in terms of *fairness*. Each policies carries out a transfer of income from the two richest groups of people (i.e., groups II and III) to the poorest one (i.e., group I). The experimental design consists in varying the availability of information about the different tax schemes given to participants. Table 2 summarizes the overall experimental design: There are three treatments and three experiments.

	Treatments		
	MININFO	INFOTAXRATES	MAXINFO
Information about:			
Post-tax incomes	yes	yes	yes
Average tax rates	no	yes	yes
Pre-tax incomes and tax liabilities	no	no	yes
Survey experiments:			
Main survey experiment	yes	yes	no
Robustness survey experiments			
No saliency of new info.	no	yes	no
Info. about pre-tax incomes	yes	no	yes

Table 2: Summary of the survey experiment design

The *main survey experiment* consists of two treatments, which are successively presented to respondents (within-respondent design). In both treatments, they were asked to rank the five redistributive policies (policies A to E) described in Table 3.<sup>8</sup> Respondents were told to:

“rank the five alternative policies from the fairest (1) to the unfairest (5).”

	Post-tax income distribution			Average tax rates	
	group I	group II	group III	group II	group III
policy A	550	1800	2450	0%	30%
policy B	925	1530	3145	15%	15%
policy C	1100	1350	4000	25%	0%
policy D	1040	1440	3330	20%	10%
policy E	790	1620	2720	10%	20%

Table 3: Alternative policies

The first treatment, called MININFO, may be considered as the baseline: The only information respondents have for ranking alternative policies is the final income distribution, i.e., after incomes tax and redistribution transfers, for each alternative. This allows to elicit individual attitudes towards income

<sup>8</sup>Note that the level of incomes is labelled in euros and participants are likely to be familiar with such amounts. In 2013, the *average* gross and disposable equivalent incomes of the poorest 20% of individuals were 576 and 925 euros, that of the 3rd quintiles were 1,793 and 1,673 euros, and, finally, that of the richest 20% of individuals were 4,757 and 3,822 euros respectively (INSEE, 2014).



distributions without any reference to tax progressivity, that is, the form of the social welfare function they seek to maximize.

Information about *average* tax rates is made available in the second treatment, called INFO TAX RATES. The order of information is the following. First, it has been clearly indicated that “alternative policies consist in taxing citizens of type II and/or III in order to help citizens of type I.” Second, respondents were provided with a table showing the average tax rates that taxpayers of type II and III face. Finally, final income distributions were displayed in a table, just after the following statement: “Given the effects of taxation on the number of hours worked by citizens, the monthly income in euros after taxes and redistribution of each type according to each policy is:” It is worth noting that the survey timing was as follows: (1) respondents had to evaluate alternative policies in the MIN INFO treatment and (2) once the first stage was finished, they were given the INFO TAX RATES treatment. Thus, there was no chance that information about tax scheme was known from the first stage.

Respondents were not provided with information about *marginal* tax rates, which has an effect on the effort made by workers. This choice may be justified on the following grounds. First, progressivity is defined as the increase in the average tax rate with respect to gross income. Second, the task would be too cognitively demanding. Indeed, the concept of marginal tax rate is not self-evident (in particular, for students who are not used to paying income tax).

I also ran two “*robustness*” *survey experiments* in order to test the effect of two possible drawbacks of the main survey experiment. The first one is related to the within-respondent feature of the design. In particular, respondents may overreact to the addition or saliency of newly available information. To study the importance of this kind of demand effect (Zizzo, 2010), a sample of respondents only see the INFO TAX RATES treatment, as it is presented above. In this way, they are not confronted with the addition of a new information piece.

In a second robustness survey experiment, I test whether or not adding information about the pre-tax income distribution and tax liabilities affects the people’s attitude towards tax progressivity. Participants of this robustness experiment are asked to compare the policies D and E (called policies (a) and (b) in the questionnaire) of the main study in two different treatments. The first one is MIN INFO described above. In the second one, called MAX INFO, four pieces of information are given in the following order: (1) average tax rates, (2) pre-tax incomes distribution, (3) tax liabilities, and (4) post-tax income distribution. This highlights the fact that the most talented people decide to reduce their work effort and, thus, their taxable earnings before taxation. It is clearly stated (between (2) and (3)) in the survey: “A citizen of type III chooses to earn 3,700 euros if his gross earnings are taxed at 10%, and 3,400 euros if his gross earnings are taxed at 20%”. Table 4 summarizes the information pieces that are given to respondents. Respondents were asked to rank the two alternatives. The question they have to answer is: “Could you indicate which policy appears as the fairer one, in your view.”

What implication(s) should providing information about pre-tax incomes and tax liabilities have? On the one hand, it may weaken the preference for tax progressivity. Indeed, respondents may consider pre-tax income as reference point and their aversion to others’ loss may temper their willingness to redistribute. Moreover, as rationalized by Saez and Stantcheva (2016), they may put higher *social* weight on the utility

change of losers rather than winners. On the other hand, providing information about pre-tax incomes for each taxation schemes makes salient the fact that the richest individuals decrease their work effort if top income taxation is higher. This may be perceived as free-riding behavior (considering income distribution as public good) or, on the contrary, pushes respondents to take into account the cost of redistribution.<sup>9</sup>

	Policy D			Policy E		
	group I	group II	group III	group I	group II	group III
Pre-tax incomes	200	1800	3700	200	1800	3400
Post-tax incomes	1040	1440	3330	790	1620	2720
Average tax rates	<i>-420%</i>	20%	10%	<i>-295%</i>	10%	20%
Tax liabilities	<i>-840</i>	360	370	<i>-590</i>	180	680

Information in italic is not *explicitly* given to respondents.

Table 4: Alternative policies in the robustness experiment

### 3.2 Hypotheses

Two (contradicting) hypotheses about respondents' preferences may be introduced based on the theoretical framework. The first one states that respondents' choices are in line with the traditional view in optimal taxation literature: The optimal taxation scheme is the one that leads to the preferred final income distribution. This implies:

**Hypothesis 1 (Utilitarian view)** If the respondent is utilitarian, then the ranking of policies should be the same irrespective of the informational treatment.

However, one cannot ascertain *with certainty* that a respondent who reports the same ranking of taxation schemes in all the treatments is purely utilitarian. Indeed, it is possible that the decrease in the total utility is judged to be too large for preferring progressive taxation. But the respondent reveals that she is not a consequentialist if her ranking of tax schemes differs with information availability. How her ranking varies with information gives an indication about her attitude towards progressivity. The main hypothesis that this paper aims to test can be formulated as follows:

**Hypothesis 2 (Intrinsic preference for progressive taxation)** A respondent is revealed to have a preference for progressive taxation if her/his ranking of policies differs with information in such a way that policies C and D are less attractive in the MININFO treatment than in the INFO TAX RATES treatment, while policies A, B and E become more attractive.

<sup>9</sup>However, it is beyond this paper to investigate the various effects of information about pre-tax incomes and tax liabilities on the evaluation of taxation schemes. Rather the aim is to check the robustness of preference for progressive taxation with respect to such information.

### 3.3 Sample and procedures

The survey experiments were conducted among 412 respondents from two pools of respondents: users from the main Public Library in Rennes and students in the second year of economics at the University of Rennes 1. I exclude from the analysis respondents who gave (at least one time) the same rank to two or more policies (e.g., policies A and B are both ranked second) or ‘dubious’ rankings.<sup>10</sup> At the end, 348 respondents gave ‘valid’ patterns of answers. The 166 respondents from the Public Library participated in the main survey experiment. The remaining 189 are from the pool of students in economics: 71 of them participated to the main survey experiment, 48 to the first robustness one, and 63 to the second robustness one. Table 5 presents a brief description of the pool of respondents. The Public Library pool of respondents is, by nature, more diverse in terms of age<sup>11</sup> and occupation. This sample is mildly more politically left-oriented than our student sample.<sup>12</sup>

Sample:	Public Library		University	
Experiment:	Main	Main	Robustness experiments	
			No saliency of new info.	Info. about pre-tax incomes
Nb of obs.	166	71	48	63
Women	57.49%	54.79%	33.33%	50.82%
Mean age	30.21	19.61	19.31	20.5
≤29 years old	51.8%	97.26%	100%	100%
Occupation				
student	49.52%	100%	100%	100%
employed	35.92%			
unemployed	10.18%			
retired	3.59%			
Politics (scale between 1 and 9)				
mean value	4.20	4.78	4.81	4.63
left (≤ 4)	42.77%	43.66%	50.00%	44%
center (= 5)	37.35%	21.13%	18.75%	25%
right (≥ 6)	19.88%	34.21%	31.25%	31%

Table 5: Sample description

The public library part of the study was conducted in June 2015. The users of the public library were *individually invited* by an ‘experimenter’ to participate in a survey on social justice and redistributive

<sup>10</sup>A typical example of dubious ranking is the case where policy A is ranked first, policy B is second, ..., policy E is fifth (or the reverse). This only represents 6 respondents.

<sup>11</sup>Concerning the city of Rennes, 51.8% of the population is under 29 years old.

<sup>12</sup>A  $\chi^2$  test rejects the hypothesis of homogeneity of left/center/right distribution across the samples:  $p = 0.002$ . The political preferences of our samples are close to that of the city as measured by the results of the last presidential elections: In the city, the leftwing candidates garnered 41.2% of the votes, 31.86% of voters chose the center candidate (Emmanuel Macron), and the rightwing ones obtained around 25.6%.

policies. If individuals accepted, the experimenter then explained the topic and general instructions of the survey to them. Respondents were invited to pay particular attention to the fact that there was no ‘right’ answer and the objective of the survey was to investigate their personal opinion. They next read for themselves the different scenarios and answered the survey while the experimenter was free to answer them in case of misunderstanding or difficult questions. Note that all the rooms in the public library where the survey was run are peaceful.

The questionnaire experiment was run at the Faculty of Economics of the University of Rennes 1 in November 2015 (the main study) and February 2017 (the robustness studies). All the surveys were conducted in undergraduate microeconomics classes during lecture time. To make a comparison with the Public Library sample possible, I tried to use the same procedure as best I could. The general instructions were read out loud by the experimenter but the scenarios were read individually, minimizing the difference with the Public Library sample. Next, students answered the survey and were free to ask any question to the experimenter. Despite the context of classroom experiment, participation was voluntary and anonymous. Completion of the survey lasted between 10 and 20 minutes depending on the version.

## 4 Main evidence of preference for tax progressivity

This section provides the main evidence that respondents are not consequentialist and exhibit preference for implementing progressive taxation. In the subsequent statistical analysis, only non-parametric tests are reported and all the regression results are detailed in the Appendix B.

### 4.1 Aggregate rankings over taxation schemes

I first examine the aggregate ranking over tax policies in the two treatments of the main survey experiment. To do this, I examine the ‘fairest’ policy, the Condorcet method and the Borda score of each alternative. The findings may be summarized as follows:

**Result 1** Progressive taxation schemes are more popular for the participants when they have information about average tax rates.

*The fairest policy.* Figure 1 shows the choice of the fairest tax policy among respondents. Table 6 displays the  $p$ -values of McNemar tests when the null hypothesis is the equality of proportions of respondents preferring policy  $j$  in the two informational contexts. Overall, regressive taxation schemes (policies D and C) are more likely to be considered as the fairest by the respondents when not being provided with information about average tax rates. On the contrary, progressive taxation (policies A and E) are more popular if average tax rates are known. In the MININFO treatment, a majority of respondents (around 45% of them) judge policy D as the fairest option, while about 20% of them select E or A.<sup>13</sup> In the INFO TAXRATES treatment, respondents have a clear preference for progressive taxation schemes, i.e.,

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<sup>13</sup>This choice seems to be a compromise between pure Rawlsian objective and egalitarian motives (this result is in line with that of Schwettmann, 2012).

policies A and E. In both samples, 90% of respondents choose one of the three non-regressive tax schemes, and two thirds of them select a strictly progressive taxation (policies E and A). Finally, the proportion of respondents choosing policy B as the fairest one is the same in both treatments.

	The fairest policy		Borda counts	
	Public Library	University	Public Library	University
	(1)	(2)	(3)	(4)
policy A (Highly prog)	<0.001	0.6547	<0.001	<0.001
policy E (Prog)	<0.001	<0.001	<0.001	<0.001
policy B (Prop)	0.4461	1.000	0.0534	0.0367
policy D (Reg)	<0.001	<0.001	<0.001	<0.001
policy C (Highly reg / R)	0.001	<0.001	<0.001	<0.001

This table displays the results of statistical tests ( $p$ -values) for the comparison of proportions of respondents considering policy  $j$  as the fairest one and of the mean Borda scores for each policy between in treatments MININFO and INFOTAXRATES.

Col. (1) and (2): results of McNemar tests when the null hypothesis is the equality of proportions of respondents preferring policy  $j$  in treatments MININFO and INFOTAXRATES. Col. (3) and (4): results of Wilcoxon tests when the null hypothesis is that Borda scores for policy  $j$  has the same distribution in both treatments.

Table 6: Statistical tests ( $p$ -value)

*The Condorcet ranking.* It turns out that, for both samples, the Condorcet winner is policy D in the MININFO treatment and policy E in the INFOTAXRATES one. The complete collective orderings is given in Table 7. It clearly appears that progressive taxation schemes E and A are dominated by policies D, B and, mildly, C when respondents have only information about final incomes. On the contrary, when knowing average tax rates, respondents tend to prefer tax progressive schemes (i.e., E and B to D and C).<sup>14</sup> Moreover, 58% of respondents facing INFOTAXRATES treatment consider that policies D and C are the two worst options. There is a difference between samples: these policies are judged as the worst ones by 49% of the students in economics, but by 62% of the users of the Public Library.<sup>15</sup>

*The Borda scores.* Figure 2 presents the Borda mean score of each policy in both treatments and Table

<sup>14</sup>Tables 12 to 14 in the Appendix A display all the binary comparisons between policies, for treatments MININFO and INFOTAXRATES and both samples of respondents.

<sup>15</sup>A binomial test concludes that the proportion of respondents who judge policies D and C as the two worst options is statistically different from 0.5 for all the sample and the “Public Library” sample:  $p = 0.0134$  and  $p = 0.0024$ . Concerning the sample of students in economics, one can not reject that half of them give the worst ranks to these policies.

	MININFO	INFOTAXRATES
Public Library	$D \succ C \sim B \succ E \succ A$	$E \succ B \succ A \succ D \succ C$
University	$D \succ B \succ E \succ A$	$E \succ B \succ D \sim A \succ C$
	$D \succ C \succ A, B \sim C$ and $C \sim E$	

One-sided binomial test at 5% significance level:  $i \sim j$ : non-rejection of the null hypothesis that prop. of respondents preferring  $i$  to  $j$  is equal to 0.5;  $i \succ j$ : prop. of respondents preferring  $i$  to  $j$  is higher than 0.5 at 5% significance level.

Table 7: The Condorcet ranking (main survey exp.)

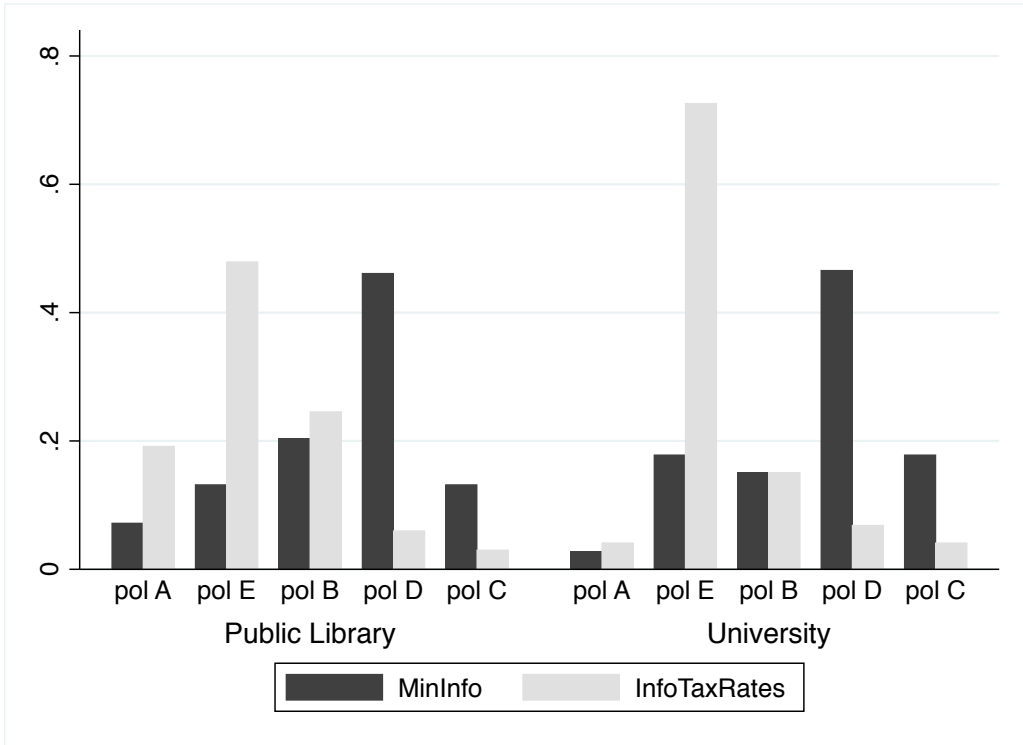


Figure 1: The fairest policy, fraction of respondents (main survey exp.)

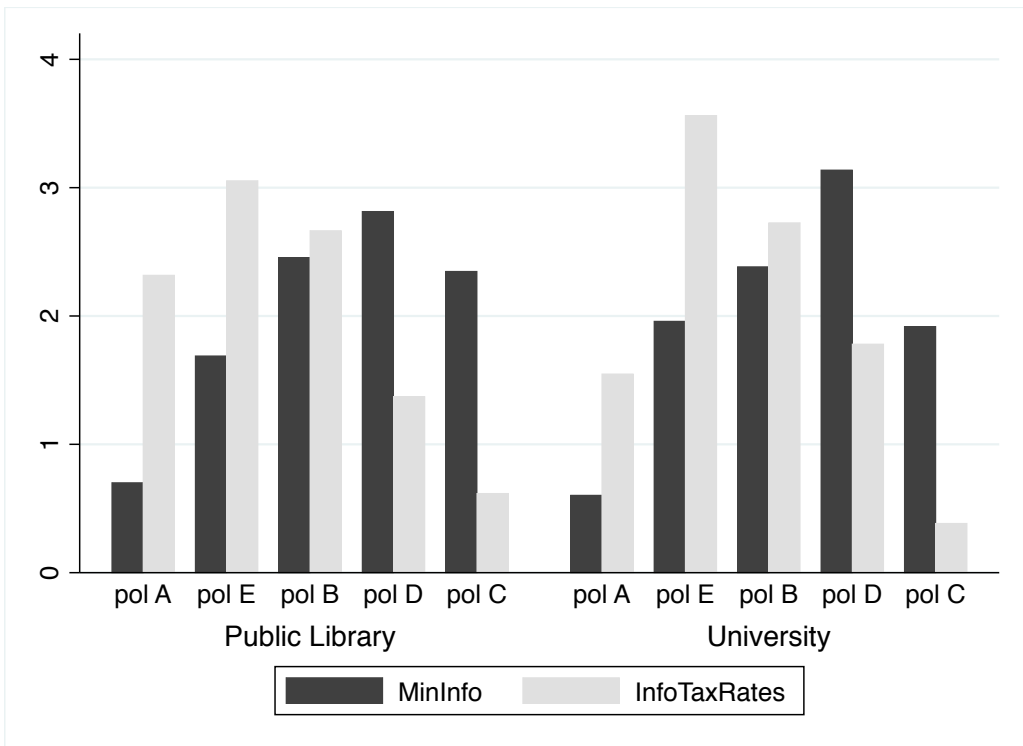


Figure 2: Mean Borda scores (main survey exp.)

6 provides the results of Wilcoxon tests ( $p$ -value).<sup>16</sup> Again, it appears that regressive taxation schemes are significantly less attractive to respondents while progressive ones are more attractive in INFOTAXRATES treatment than MININFO one. For the pooled samples, when information about average tax rates is provided, D’s and C’s Borda mean scores decrease from 2.91 and 2.21 to 1.90 and 0.55 respectively. On the other hand, the policies A and E have significantly higher Borda scores when information about tax rates is provided: the mean values taken by Borda scores is about 0.67 and 1.77 in the MININFO treatment, and 2.08 and 3.21 in the INFOTAXRATES treatment. As for scheme B (i.e., proportional taxation), it obtains the second rank but its Borda score increases when respondents obtain information about tax rates: from 2.43 to 2.68. Finally, the rankings generated by the Borda score are similar to the ones using Condorcet method.

*Difference between samples.* The econometric analysis detailed in the Appendix B (see Tables 15 and 16) reveals that there is no difference between samples (Public Library or University) in terms of choice of the fairest policy. But there exists a significant difference between students in economics and the rest of respondents concerning the Borda score. In particular, the formers seems to be more consequentialist in the sense that the scores given in the two treatments are *more* correlated for the students in economics than for the other respondents.

## 4.2 Change in respondents’ preference with information availability

I then study the effect of information about tax function at the individual level. Table 8 displays the proportions of respondents who ‘choose’ the same policy in the MININFO and INFOTAXRATES treatments, of non-consequentialist respondents (i.e., respondents who change their views when they are informed about average tax rates) and of respondents who choose a more progressive taxation in INFOTAXRATES treatment. I also report the results of binomial tests ( $p$ -value) for the null hypothesis that the proportion of “Same choice” (“More progressivity”) answers is equal to 0.5.

The results may be summarized as follows:

**Result 2** A large majority of respondents exhibit an intrinsic preference for progressive (or non-regressive) taxation.

Considering all the sample, around 18% of respondents choose the same policy in both frames and 71% of them choose a more progressive taxation when they are given with information about tax rates. However, more than 90% of respondents selecting policies D and C in the absence of any information about tax function change their preference once they know the average tax rates. Note also that almost all of them switch to a more progressive taxation: about 92% of respondents choosing D in the MININFO treatment prefer higher progressivity in the INFOTAXRATES one.<sup>17</sup> Respondents who declare to prefer policy B in the MININFO treatment are less likely to change their views than the ones preferring policy

<sup>16</sup>The Borda score given by respondent  $i$  for policy  $X$  in treatment  $\alpha$  is:  $b_{iX,\alpha} = 5 - r_{iX,\alpha}$  where  $r_{iX,\alpha}$  is the rank that  $i$  gives to policy  $X$  in treatment  $\alpha$ .

<sup>17</sup>One should also note that, among respondents who preferred C in the MININFO treatment, only 4 of them (11%) select D or C in the INFOTAXRATES treatment, i.e., rather than choosing less regressivity, they choose progressivity.

	Preferred policy in MININFO treatment					
	All	policy A	policy E	policy B	policy D	policy C
The same preferred policy	18.14	28.57	62.86	15.91	7.34	5.71
Non-consequentialist	81.86	71.43	37.14	84.09	92.66	94.29
More progressivity	71.49	.	11.43	70.45	91.74	94.29
$N =$	237	14	35	44	109	35
Binomial tests ( $p$ -value)						
$H_0 : \Pr(\text{Same choice})=0.5$	<0.001	0.1796	0.1755	<0.001	<0.001	<0.001
$H_0 : \Pr(\text{More prog})=0.5$	<0.001	.	<0.001	0.0096	<0.001	<0.001

This table displays the change in the preferred taxation schemes when information about average tax rates is provided to respondents. “The same preferred policy” means that respondent chooses the same policies in MININFO and INFOTAXRATES treatments as the fairest policy. Respondent is said to be “Non-consequentialist” if her choices of the fairest policy vary with information availability. “More progressivity” means that respondent selects a more progressive taxation in INFOTAXRATES treatment.

Table 8: Change in the fairest policy chosen by respondents (%)

D or C.<sup>18</sup> Yet, about 70% of respondents decide to switch to a more progressive taxation. Finally, it is more difficult to infer robust conclusions about respondents preferring policies A and E in the MININFO treatment due to the low number of observations. One can note that a significant proportion of respondents preferring E when minimal information decide not to change their view.

The analysis of the change in individual Borda score also informs the support for tax progressivity. Table 9 indicates, for each policy, the proportions of respondents who report the same Borda score (or rank) in both treatments, of respondents who give a better score in INFOTAXRATES treatment, and of respondents who give a worse score in INFOTAXRATES treatment. It is found that between 17% and 28% of respondents give the same rank to policies, and only 4% of them (10 over the 237 respondents) choose the same ranking over the five options. There is thus no evidence that respondents behave as consequentialist. Moreover, it is clear that respondents give a higher Borda score to progressive taxation schemes when they have information about tax rates, while they give a lower score to regressive ones.

	Policies				
	policy A	policy E	policy B	policy D	policy C
The same Borda score (rank)	17.72	19.41	28.69	19.41	20.68
Higher Borda score in INFOTAXRATES	73.42	69.20	43.46	10.13	8.02
Lower Borda score in INFOTAXRATES	8.86	11.39	27.85	70.46	71.31
Binomial tests ( $p$ -value)					
$H_0 : \Pr(\text{Same Borda})=0.5$	<0.001	<0.001	<0.001	<0.001	<0.001
$H_0 : \Pr(\text{Higher Borda})=\Pr(\text{Lower Borda})$	<0.001	<0.001	<0.001	<0.001	<0.001

Table 9: Change in respondents’ Borda scores (% of respondents)

<sup>18</sup>A homogeneity chi-squared test indicates that the difference is slightly statistically significant ( $p = 0.070$ ).



## 5 Robustness results

### 5.1 Robustness to saliency of new information

To test whether the change in respondents’ preferences is not due to the mere fact of giving information about average tax rates (a kind of demand effect), I study how respondents only answering the INFO-TAXRATES treatment rank policies compared to respondents from the main survey. Figure 3 displays the fairest policy, which respondents of the main survey experiment choose when they face MININFO and INFO-TAXRATES treatments, and the one selected by respondents facing INFO-TAXRATES treatment in the robustness survey experiment. Figure 4 shows the mean Borda scores of each policies in the different treatments. Table 10 reports the results of the non-parametric tests for the effect of providing information.<sup>19</sup>

To sum up the findings, it is fair to conclude:

**Result 3** Even if there exists an effect of providing new information on preferences reported by respondents, taste for progressive taxation appears robust.

It turns out that preferences reported by respondents who only face the INFO-TAXRATES treatment seem to be “closer” than the preferences reported by the main survey respondents in the INFO-TAXRATES treatment than in the MININFO one. Regarding the fairest policy, a noticeable difference lies in the attractiveness of policies E and B. Policy E seems to be less attractive in view of the respondents of the main study, while policy B is chosen more as the fairest option. However, this difference seems to disappear if the Borda scores are considered. The examination of the variation in Borda scores also indicates that policies A and E are significantly less attractive for the main study respondents (resp.,  $p = 0.045$  and  $p = 0.033$ , Wilcoxon-Mann-Whitney test), while D is better ranked even if the statistical significance is quite low ( $p = 0.070$ ). No difference is found for policies B and E.

The Condorcet collective ranking is the following:<sup>20</sup>

$$E \sim B \succ D \succ A \succ C$$

It seems that there are two differences. The first difference is that  $E$  and  $B$  are closer in view of respondents in the robustness survey experiment.<sup>21</sup> The reversal of the ranking of  $D$  and  $A$  is the second difference. Among respondents of the robustness study, there is a relatively large fraction of them who rank  $D$  as fairer than  $A$ , while respondents of the main one are less unanimous.

### 5.2 Robustness to the presence of information about pre-tax incomes

In the second survey experiment I ran, respondents are asked to compare policies D and E in two informational contexts: (i) when they are provided with final incomes (MININFO treatment), and (ii) when

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<sup>19</sup>See the Appendix B for regression results.

<sup>20</sup>The non-parametric tests, on which this ranking is based, can be found in the Appendix A: See Table 14.

<sup>21</sup>In fact, 62.5% of the respondents prefer  $E$  to  $B$ , but the null hypothesis of equality to 0.5 cannot be rejected against the alternative hypothesis of no-equality ( $p = 0.111$ ). Moreover, at a 10% significance level, the alternative hypothesis that the proportion of respondents preferring  $E$  to  $B$  is larger than 0.5 is accepted ( $p = 0.056$ ).

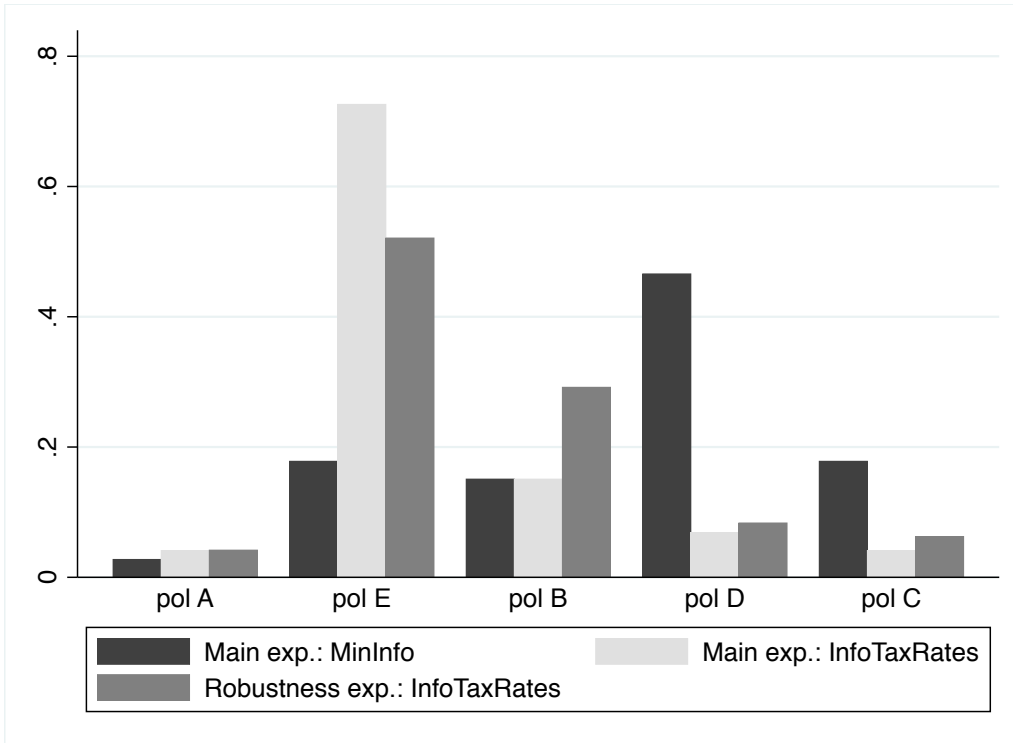


Figure 3: The fairest policy, fraction of respondents

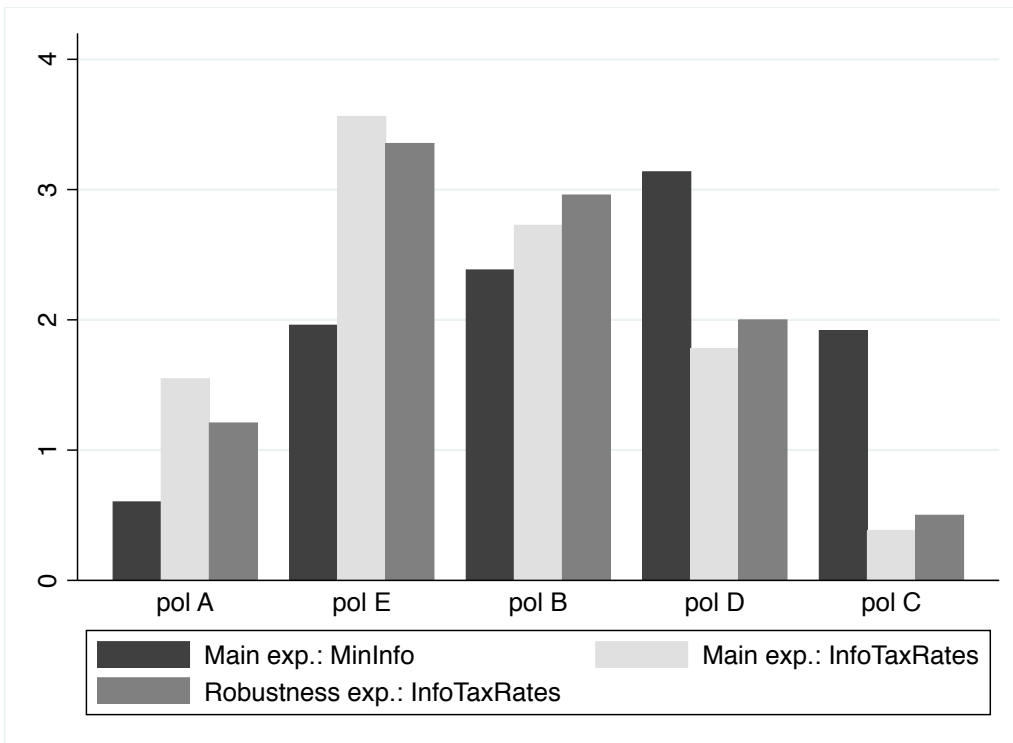


Figure 4: Mean Borda scores

Main experiment vs robustness experiment				
	The fairest policy ( $\chi^2$ homogeneity test)		Borda scores (WMW test)	
	INFOTAXRATES	MININFO	INFOTAXRATES	MININFO
policy A (Highly prog)	0.988	0.689	0.045	<0.001
policy E (Prog)	0.018	<0.001	0.033	<0.001
policy B (Prop)	0.044	0.044	0.153	0.001
policy D (Reg)	0.564	<0.001	0.070	<0.001
policy C (Highly reg / R)	0.360	0.059	0.551	<0.001

The first column tests the null hypothesis that the proportion of respondents preferring policy  $j$  in the INFOTAXRATES treatment is the same in both experiments. In the second column, the null hypothesis is that the proportion of respondents preferring policy  $j$  in the INFOTAXRATES treatment in the robustness experiment is equal to that of respondents preferring policy  $j$  in the MININFO treatment in the main experiment. The third and fourth columns correspond to tests for Borda scores..

Table 10: Robustness to information saliency: Statistical tests ( $p$ -value)

information pieces about pre-tax incomes, average tax rates and tax liabilities are also made available (MAXINFO treatment). The result may be outlined as follows:

**Result 4** The respondents exhibit an intrinsic preference for tax progressivity even if one introduces information about pre-tax incomes and tax liabilities.

In the MININFO treatment, 71% of the respondents select policy D as the fairest one, while D is selected by 30% of respondents in the MAXINFO treatment. A Stuart-Maxwell test indicates that this difference is statistically significant ( $p < 0.001$ ).

In Table 11, I present the distribution of respondents across typology of preferences: seemingly consequentialist (i.e., same choice), preference for tax progressivity, and preference for less progressivity. In total, 40% seem to be consequentialist, i.e., make the same choice in the two informational contexts. Among the respondents choosing policy D in MININFO treatment, more than 70% of them change their evaluation of the two policies when they are provided information about tax rates and pre-tax incomes. Only 28% of respondents choose the same option. The difference seems to be statistically robust. The respondents who prefer E to D in MININFO seem to be more likely to make the same choice rather than to choose D. Using a binomial test one can not reject the equality between the two proportions, but the low number of observations may explain this lack of statistical robustness.

As in the main study, respondents tend to reverse their preference when information about the tax scheme is revealed. But is the extent of preference reversals comparable with the one founded in the main study? The following result gives an answer:

**Result 5** The availability of information about pre-tax incomes and tax liabilities (in the robustness survey experiment) mildly affects the respondents' preference for progressive taxation compared to the availability of information about tax rates (in the main survey experiment).

In the main survey experiment, 75% of the respondents prefer D to E in the MININFO treatment, and this proportion is 11% in the INFOTAXRATES treatment (see Table 13 in the Appendix A). According to an

	All	Preferred policy in MININFO treatment	
		policy D	policy E
Same choice	39.68	28.89	66.67
Pref. for progressivity	50.79	71.11	
Pref. for less progressivity	9.52		33.33
Binomial tests ( $p$ -value)			
$H_0 : \Pr(\text{Same choice})=0.5$	0.1299	0.0066	0.2379
$H_0 : \Pr(\text{Prog})=0.5$	0.5993		
Nb of observations	63	45	18

Table 11: Non-consequentialist respondents, %

homogeneity test ( $\chi^2$  test), the distribution of answers given in the MININFO treatment is the same in the two experiments ( $p = 0.675$ ). However, when we compare the distribution of respondents’ preferences in the INFO TAX RATES treatment (main study) and in the MAXINFO treatment (robustness study), it turns out that the null hypothesis of homogeneity is rejected ( $p = 0.007$ ).

The same conclusion emerges when one focuses on the probability of making the same choice or reversing preferences. In the main study, 86% of respondents who prefer D to E in the MININFO treatment change their ranking when information about tax rates is introduced. This proportion is higher than that in the robustness survey (see Table 11) and the difference is statistical significant ( $\chi^2$  test,  $p = 0.0549$ ). Similarly, among respondents preferring E to D, preference reversal is more frequent in the robustness study than in the main one (only one over 18 respondents reverse his/her choice) and a  $\chi^2$  homogeneity test conclude that this difference is again significant ( $p = 0.0352$ ). To sum up, it seems that providing additional information about pre-tax incomes and tax liabilities does significantly affect their choices, even if it does not undermine the preference reversals founded in the main analysis.

## 6 Discussion

This section discusses issues related to the empirical methodology and the interpretation of the results.

*Methodological issues.* In the experimental design, the variation in relevant information is used to get a more accurate picture of the respondents’ preferences and motivations (see also Faravelli, 2007; Schwettmann, 2012). Studying change in respondents’ preferences with information availability helps us to elicit the weight they assign to the different arguments of their social choice function. However, in a within-respondent design, there exist two potential limits. First, respondents can “overreact” to the addition of a new information. Indeed, the new information (given in the richer informational context) is more *salient* since respondents have already assimilated all the other ones (presented in the poorer informational context). In addition, if respondents have limited cognitive ability to handle context with too much information, they are likely to evaluate taxation schemes on the basis of this new information (i.e., average tax rates). Second, our results might be affected by a training effect. For instance, participants

may have the opportunity to think about the situations more deeply and have a more precise view of their judgements. In other words, if they had thought enough in the first treatment, they would rank the alternatives in the same way as in the subsequent treatment. The analysis of the preferences given by respondents who do not experience the addition of new information (robustness experiment) shows that such effects may exist but do not undermine the fact that they have a preference for progressive taxation schemes over regressive ones.

*Interpretation of the results.* The main result is that a majority of respondents have a preference for progressive taxation, in the sense that the utilitarian-maximizing scheme (the one selected when only information about final incomes is provided) is not considered as the fairest one in the richer informational treatment (when average tax rates (and pre-tax incomes) are known). It means that they accept a sacrifice in terms of total utility in exchange for tax progressivity. Thus, the taste for progressive taxation does not simply translate a classic trade-off between efficiency (cake size) and equity (sharing of the cake)<sup>22</sup> but reveals that tax progressivity is judged as a *desirable* property of taxation.

An important question concerns the interpretation of these results: Can one say that the value attached to tax progressivity is *intrinsic*? Or, do people believe that tax progressivity is a means of implementing a “superior” principle of taxation? There exist some ethical motivations for progressivity and a natural candidate is the *equal sacrifice* principle that was originally put forward by John Stuart Mill. This principle states that all taxpayers should experience the *same* loss of utility. As theoretical literature show, equal sacrifice can justify the implementation of a progressive tax schedule.<sup>23</sup> It is also possible that respondents evaluate taxation schemes on the basis of their ability to reduce inequality. As Jakobsson (1976) shows, the post-tax income distribution is more equal than the pre-tax one (according to the Lorenz criterion) if, and only if, taxation is progressive. This suggests that the tax progressivity value lies in the decrease in inequality, more than being a desirable property about sharing the tax burden.

According to another interpretation, respondents are willing to punish the rich or the most talented individuals for reducing their work effort in response of taxation insofar as such a behavior is perceived as free-riding. There is now widespread evidence in experimental economics that people punish free-riding behaviors and deviations from social norms even if the act of punishment is costly (see, for instance, Fehr and Gächter, 2002). Furthermore, they seem to judge such behaviors as not morally neutral. Cubitt et al. (2011) report the results of an experimental survey where respondents are asked to evaluate the morality of free-riding in a (hypothetical) public good game. Their subjects are found to condemn free-riding (even though their perception depends on others’ behavior). In the context studied in this paper, selecting higher tax rate on the top incomes is the means to punish the richest individuals for not contributing to income redistribution or assistance to the worst-off individuals of the society.

More generally, the dilemma explored in these survey experiments echoes the debate about the role and the moral evaluation of material incentives. The desire for implementing progressive taxation may be an illustration of the relative reluctance to accept the general prescriptions based on incentives made by the economists (“more progressivity is not optimal due to the presence of deterrent effect on work effort”). Bénabou and Tirole (2011) argue that such prescriptions are perceived as “bad news about

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<sup>22</sup>If it was the case, the ranking of final income distributions would capture it.

<sup>23</sup>See for instance Young (1987, 1988, 1990); Berliant and Gouveia (1993); Ok (1995), or Moyes (2003).

human nature and behavior”. Following their intuitions, preference for progressivity might be grounded on the resistance to the incentive argument, that is itself explained by the aversion to bad news and the preference for pleasant illusions (“work disincentive of labor taxation and tax evasion do not exist”). This means that people may be consequentialist but their own psychological failures impeach them to act as consequentialist.

To an alternative view, the results cast light on that people may not perceive material incentive constraints (e.g., a decrease in work effort) as *exogenous*. The belief that constraints driven by selfish utility maximization is not immutable is defended by scholars like Cohen (1991) and Roemer (2012). Roemer (2012) points out that “there is an important difference between technological constraints on the one hand and informational constraints and psychological propensities on the other. For it is useful to imagine, from the normative viewpoint, a transformation of preferences into selfless ones; it is not ethically interesting, however, to imagine as a normative exercise a world with much greater technological knowledge” (p. 292).<sup>24</sup> It is not obvious how the belief about morality of individual actions affects the rankings of taxation schemes. On the one hand, a regressive policy that maximizes the minimal income may not be judged as the *fairest* because it allows the high ability workers to adopt immoral actions. On the other hand, if one is sufficiently inequality averse, such a policy should be *chosen* among the available ones as the minimal income is maximized, even if it cannot be judged as the fairest.<sup>25</sup>

Overall, these issues do not undermine the finding that respondents have a preference for implementing progressive taxation. Rather, it is not clear whether tax progressivity has an intrinsic value or grounded on the willingness to implement a higher principle of taxation.

*Comments by respondents.* After the fairness ranking task, the (student) respondents facing the INFO TAX RATES treatment are invited to provide some justifications for their choice. These comments may be useful to glimpse their motivations.<sup>26</sup> I present here the main lessons that can be drawn; the Appendix C provides more details. First, a wide majority of respondents (more than 80% of them) evoke a concern about distribution of tax burden and, for more than 50% of them, the mere support for tax progressivity is given (comments of type “the richest should be taxed more than the middle-class”). Second, the concern about the post-tax distribution of income is mentioned by 20% of respondents. Third, it seems that respondents do not anticipate any positive or negative macroeconomic effect of progressive taxation (on growth or unemployment for instance). Fourth, if the comments seem to confirm that progressive taxation is perceived as fairer than other forms of taxation, they do not allow for discriminating between the roots of this judgement (intrinsic value, equal sacrifice or willingness to punish the richest for non cooperation). More research is needed to understand the motivations for implementing tax progressivity and to explore the link between people’s judgments about public policies and their belief about the morality of incentives.

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<sup>24</sup>Thus, there may exist some rules of behavior that could be considered as more moral: In a situation where members of a community share social ethos, an increase in the marginal tax rate is expected to have a small, even zero, effect on their work effort. See Boadway et al. (2007) or Roemer (2015) for theoretical investigation of ethical or Kantian behavior.

<sup>25</sup>In a similar vein, Kolm (1971) makes the difference between choosing the best policy among the feasible and incentive-compatible ones (*practical justice*) and among the feasible ones (*justice*).

<sup>26</sup>The discussion of experimental results in the light of the written comments given by respondents or the declared motivations for their choices is not common in experimental economics but there are some exceptions: See Cowell et al. (2015) or Tavoni et al. (2011).

## 7 Conclusion

The desire to implement progressive income taxation may have two motivations. First, tax progressivity may have a consequentialist virtue: it allows for decreasing inequality and poverty or, more generally improving social welfare. Second, one can have a preference for progressive schemes independently of the final situation: In particular, progressivity may be perceived as a desirable principle of *fair* taxation. The main assumption of the Mirrlees's theory of optimal taxation is that a social planner should choose the scheme that maximizes the sum of individual utilities (or another form of social welfare depending on the final incomes). As a consequence, the existence of informational and incentive constraints makes an increase in progressivity not always socially desirable. This paper aims to investigate the empirical support of this assumption of consequentialism in the choice of taxation and its implication on the value of tax progressivity. To do this, I run survey experiments in which respondents are asked to rank redistributive policies in different informational contexts: (i) when only information about final incomes is provided, (ii) when they are *also* informed about average tax rates and, (iii) when there is information about incomes before tax and transfers, and tax liabilities. The change in respondents' preferences between (i) and (ii) or (iii) reveals whether or not they are consequentialist and how they value tax progressivity.

It turns out that the majority of the (French) respondents do not consider, in treatment (ii) or (iii), the utilitarian-maximizing scheme (the one chosen in treatment (i)) as the fairest one and opt for a progressive (or non-regressive) one, revealing that they have a preference for implementing progressive taxation scheme. This result might show that people's attitude towards tax policies does not only depend on inequality aversion, cost of redistribution or beliefs about what explain disparities in income, but also considerations about how the tax burden is or should be allocated between individuals. An implication for optimal taxation theory and practice might be the restriction of the set of *admissible* tax and redistribution schemes: A social planner should choose the tax function among the progressive (or non-regressive) ones that help maximize the utilitarian social welfare function.

There are some interesting extensions for future research. As it is discussed in the previous section, it should be interesting to study whether taste for tax progressivity is intrinsic or a means of implementing a higher principle of taxation such as equal sacrifice. Since these survey experiments detect that people tend to attach a non-consequential value to tax progressivity, another topic would be to estimate the *weight* they attach to the different values, i.e, final situation and tax progressivity. An interesting instance is the comparison between a progressive scheme and a *more* progressive one: Which *level* of loss in total utility they accept in exchange for more progressivity? Do they have a preferred level of progressivity in mind? Or, do they select the best policy in the set of admissible taxation schemes?

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## Appendix

## A Condorcet ranking: Non-parametric tests

Treatment MinInfo					Treatment InfoTaxRates				
	policy E	policy B	policy D	policy C		policy E	policy B	policy D	policy C
pol. A	.199***	.139***	.163***	.205***	pol. A	.301***	.416**	.735***	.855***
pol. E		.331***	.247***	.313***	pol. E		.633***	.837***	.873***
pol. B			.428*	.494	pol. B			.819***	.886***
pol. D				.645***	pol. D				.765***

Table 12: Condorcet ranking: Public Library sample

Treatment MinInfo					Treatment InfoTaxRates				
	policy E	policy B	policy D	policy C		policy E	policy B	policy D	policy C
pol. A	.099***	.127***	.085***	.296***	pol. A	.056***	.225***	.493	.803***
pol. E		.338***	.254***	.451	pol. E		.803***	.887***	.958***
pol. B			.282***	.563	pol. B			.831***	.944***
pol. D				.789***	pol. D				.958***

Table 13: Condorcet ranking: University sample

Treatment InfoTaxRates				
	policy E	policy B	policy D	policy C
pol. A	.042***	.146***	.25***	.75***
pol. E		.625	.833***	.938***
pol. B			.833***	.896***
pol. D				.917***

Table 14: Condorcet ranking: University Control

These tables indicate the proportion of respondents who prefer the policy in the row to the policy in the column for both frames A and B and each sample. Binomial tests for null hypothesis equal to 0.5 are performed: \* Significant at 10% level, \*\* Significant at 5% level, \*\*\* Significant at 1% level.

## B Regression results

### B.1 Preference for tax progressivity in the main survey experiment

The first model aims to evaluate the effect of treatments and samples in the choice of the preferred item made by respondents:

$$\text{Fairest Policy}_i^f = \alpha f + \beta s_i + \gamma x_i + \varepsilon_{if} \quad (1)$$

where  $f$  is an indicator for the treatment ( $f = 0$  for treatment MININFO treatment and 1 for the INFOTAXRATES treatment),  $s_i$  is a variable indicating sample ( $s_i = 1$  if University and 0 if Public Library) and  $x_i$  is a vector of individual control variables. The controls are the following: gender, political preference, age, occupation (student/non-student) and field of study if student (economics, math & economics and other). The possible outcome of the endogenous variable  $\text{Fairest Policy}_i^f$  is increasingly ordered with respect to the degree of progressivity:  $\text{Fairest Policy}_i^f = 1$  if  $i$  chooses policy A,  $= 2$  if  $i$  chooses policy E, etc.,  $= 5$  if  $i$  chooses policy C. This is then an ordered probit model and parameters  $\alpha$ ,  $\gamma$  and  $\beta$  of equation (1) are estimated by the maximum likelihood method.

Table 15 reports the results of the estimation of equation (1): in the first one, the only explanatory variable is the treatment, while, in the second one, sample (Public Library or University) and control variables are integrated. For both regressions, being provided information about average tax rates leads respondents to be more likely to choose more progressive taxation. It is also found that, all other things being equal, there is no difference in the choice of the fairest policy between respondents of the Public Library sample and the University one.

I also rely on a model where the endogenous variable is the Borda score given by  $i$  to policy  $j$  in the INFOTAXRATES treatment:

$$b_{ij} = \alpha + \beta P_j + \gamma \tilde{b}_{ij} + \delta \tilde{b}_{ij} \times P_j + \varepsilon_{ij} \quad (2)$$

where  $b_{ij}$  is the Borda score given by  $i$  to policy  $j$  in the INFOTAXRATES treatment,  $P_j$  captures tax progressivity and  $\tilde{b}_{ij}$  is the Borda score given by  $i$  to policy  $j$  in the MININFO treatment. As for the shape of taxation ( $P_j$ ), I use three binary variables for progressive (A and E), proportional (B) and regressive (D and C) schemes.

Table 16 report the estimation of equation (2) by OLS (with clustered standard-errors by individuals): in columns (1), (2), (3) and (5), the Borda score given by respondents in the MININFO treatment is a continuous variable, while, in column (3), binary variables for the possible outcomes are used. In columns (2) and (3), cross-effect variables between tax shape variables/Borda score and sample are added. In column (3), are also added cross-effect variables between sample and controls (female, gender, political preference, age, occupation and field of study). In column (4), cross-effect variables between tax shape and the Borda score are integrated. In all the regressions, progressive and proportional tax policies are more likely to rank well than regressive ones. Also, it seems that switching from tax progressivity to proportionality has no effect on the rank of a policy:  $p = 0.1285$ , Wald tests based on regression displayed

Fairest Policy (ordered probit)			
	(1)	(2)	(3)
	Coef./(se)	Coef./(se)	Coef./(se)
<i>f</i>	-1.177***	-1.179***	-1.219***
(=1 if InfoTaxRates)	(.1144)	(.1144)	(.1193)
<i>s</i>		-.08486	.1497
(=1 if University)		(.1061)	(.2032)
Female			-.1101 (.1085)
Pol: Left			-.2449** (.1247)
Pol: Center			(ref)
Pol: Right			-.04655 (.1502)
Age			-.01202** (.005039)
No Student			(ref)
Student			-.4979*** (.1558)
Student in Eco.			.445** (.1824)
Student in Math.			.2883 (.2602)
N	480	480	460
Pseudo- $R^2$	.09045	.09186	.1058
chi2	106	108.7	133.9
<i>p</i> -value	<0.001	<0.001	<0.001

Table 15: Regression results: Fairest policy

	Borda score in MININFO (OLS)				
	(1) Coef./ <i>(se)</i>	(2) Coef./ <i>(se)</i>	(3) Coef./ <i>(se)</i>	(4) Coef./ <i>(se)</i>	(5) Coef./ <i>(se)</i>
Progressive tax	1.839*** (.09942)	1.79*** (.1238)	1.838*** (.6486)	1.827*** (.09827)	1.744*** (.1191)
Proportional tax	1.683*** (.09404)	1.68*** (.1162)	1.451** (.6443)	1.637*** (.09785)	2.042*** (.1981)
Regressive tax	(ref)	(ref)	(ref)	(ref)	
Borda score in MININFO	.1595*** (.03022)	.07121* (.03654)	.01882 (.2019)		
<i>s</i> interacted with:					
Progressive tax		-.4994*** (.1529)	-.3216 (.2031)		
Proportional tax		-.6079*** (.2098)	-.3716 (.2505)		
Regressive tax		-.6231*** (.1586)	-.7614*** (.204)		
Borda score in MININFO		.2829*** (.06098)	.2548*** (.07112)		
Borda score in MININFO					
=0				.5764*** (.113)	
=1				.6315*** (.1212)	
=2				.6355*** (.1193)	
=4				.768*** (.1304)	
Borda in MININFO interacted w.:					
Progressive tax					.2205*** (.04483)
Proportional tax					.003471 (.06663)
Regressive tax					.1513*** (.03554)
cons	.6119*** (.08374)	.8102*** (.1067)	.9161 (.6299)	.4229*** (.09303)	.6329*** (.09265)
Addionnal controls	(no)	(no)	(yes)	(no)	(no)
N	1200	1200		1075 1200	1200
$R^2$	.3401	.3552		.3737 .3506	.3441
chi2					
<i>p</i> -value	<0.001	<0.001	<0.001	<0.001	<0.001

Table 16: Regression results: Borda score

in column (1).

The Borda score that the respondents gave to  $j$  in the MININFO treatment has, on average, a positive and significant effect on its attractiveness in INFOTAXRATES, but the effect appears lower. For instance, based on regression in column (3), it turns out that the relative effect of tax progressivity with respect to regressivity is significant larger than the effect of an increase in the Borda score by 4 points (score going from 0 to 4):  $p < 0.001$ , Wald test. The results displayed in column (4) also indicate that the Borda score given in the MININFO treatment has a non-linear effect. Indeed, an increase from 0 to 1 significantly improves the attractiveness of  $j$  ( $p < 0.01$ ), but, for a higher value, the effect is negligible. A series of Wald tests applied to column (5) shows that the increase from 1 to 2, from 2 to 3 and from 3 to 4 has no significant effect: resp.,  $p = 0.6713$ ,  $p = 0.9702$  and  $p = 0.2138$ . Likewise, there is no effect of an increase in  $\tilde{b}_{ij}$  from 1 to 3 ( $p = 0.6225$ ) or from 2 to 4 ( $p = 0.2518$ ), and from 1 to 4 ( $p = 0.1110$ ). The Borda score given in the MININFO treatment seems to have a different effect on that given in the INFOTAXRATES one according to the tax shape of  $j$ . However, if one can conclude that  $\tilde{b}_{ij}$  has a stronger effect if  $j$  is progressive or regressive than if  $j$  is proportional (resp.,  $p = 0.0086$  and  $p = 0.0392$ ), the hypothesis that it has the same effect if  $j$  is progressive or regressive cannot be rejected ( $p = 0.1354$ ).

Finally, columns (2) and (3) suggests that there is a significant difference between samples. Indeed, the Borda score given in the INFOTAXRATES treatment is more sensitive to the one given in the MININFO treatment for respondents from the University sample than for the ones from the Public Library one. That is, student in economics put more weight on the final situation than on properties of the tax function.

## B.2 Robustness to information saliency

This section tests the statistical significance of the robustness to saliency of new information. The following models are estimated:

$$\begin{aligned} \text{Fairest Policy}_i^f &= \alpha_0 + \alpha_1 f_{\text{INFOTAXRATES,Main}} + \alpha_2 f_{\text{INFOTAXRATES,Robust.}} + \lambda x_i + \varepsilon_{if} & (3) \\ b_{ij} &= \beta_0 + \text{Prog}_j \times (\beta_1 f_{\text{MININFO,Main}} + \beta_2 f_{\text{INFOTAXRATE,Main}} + \beta_3 f_{\text{INFOTAXRATE,Robust.}}) \\ &\quad + \text{Prop}_j \times (\gamma_1 f_{\text{MININFO,Main}} + \gamma_2 f_{\text{INFOTAXRATE,Main}} + \gamma_3 f_{\text{INFOTAXRATE,Robust.}}) + \epsilon_{ij} & (4) \end{aligned}$$

where  $f_{x,e} = 1$  if respondent  $i$  belongs to experiment  $e$  ( $=$  Main if main survey experiment;  $=$  Robust. if robustness survey experiment) and sees treatment  $x$  ( $=$  MININFO or INFOTAXRATES), 0 otherwise. Equation (3) is estimated using ordered probit and equation (4) using OLS methods. Table (17) presents the results of these estimations. First, the between-respondent analysis allows for testing the effect of providing information about tax rates by studying the sign of  $\alpha_2$  in equation 3 and that of  $\beta_1 - \beta_3$  and  $\gamma_1 - \gamma_3$ . The results displayed in Table 17 indicate that there is a significant effect of provision of information about tax rates. Indeed, as columns (1) and (2) show, the preferred alternative chosen by the respondents significantly differs between the control sample and the main sample. Moreover, the estimation of equation (4) shows that progressive or proportional policies are better ranked by control sample respondents than by main sample ones in treatment MININFO:  $p < 0.001$ , bi-sided Wald tests with  $H_0 : \beta_1 = \beta_3$  or  $H_0 : \gamma_1 = \gamma_3$ .

Second, estimating the sign of  $\alpha_1 - \alpha_2$  in equation (3) and that of  $\beta_2 - \beta_3$  and  $\gamma_2 - \gamma_3$  in equation (4) allows for testing the effect of the saliency of new information on respondents' preferences. It turns out that there is a mild but significant difference in response between respondents from the main experiment given the INFO TAX RATES and those from the robustness one:  $p = 0.115$  and  $p = 0.080$ , bi-sided Wald test with  $H_0 : \alpha_1 = \alpha_2$ , response based on models in col. 1 (without controls) and 2 (with controls). From column (3), it is also found that progressive policies are (mildly) better ranked in the INFO TAX RATES treatment in the main experiment respondents than the robustness experiment ones:  $p = 0.055$ , bi-sided Wald tests with  $H_0 : \beta_2 = \beta_3$ . This is not the case for proportional policy:  $p = 0.1408$ , bi-sided Wald tests with  $H_0 : \gamma_2 = \gamma_3$ .

	Fairest Policy (ordered probit)		Borda score in INFOTAXRATES (OLS)
	(1)	(2)	(3)
	Coef./(se)	Coef./(se)	Coef./(se)
MININFO, Univ.	(ref)	(ref)	
$f_{\text{INFOTAXRATES,Univ.}}$	-1.299*** (.208)	-1.37*** (.2267)	
$f_{\text{INFOTAXRATES,Control}}$	-.9727*** (.2246)	-.9618*** (.2415)	
Prog <sub>j</sub> interacted with:			
$f_{\text{MININFO,Univ.}}$			-.3867** (.1631)
$f_{\text{INFOTAXRATES,Univ.}}$			.8873*** (.143)
$f_{\text{INFOTAXRATES,Control}}$			.6137*** (.1483)
Prop <sub>j</sub> interacted with:			
$f_{\text{MININFO,Univ.}}$			.716*** (.1592)
$f_{\text{INFOTAXRATES,Univ.}}$			1.059*** (.1406)
$f_{\text{MININFO,Univ.}}$			1.291*** (.1512)
constant			1.668*** (.07287)
controls	(no)	(yes)	(no)
N	194	190	970
Pseudo- $R^2$	.09404	.1289	.1029
chi2	40.28	52.28	190.5
$p$ -value	<0.001	<0.001	<0.001

Table 17: Regression results: Robustness to saliency of new information



## C Comments by respondents

This section reports the comments given by respondents just after the fairness ranking task in the INFO-TAXRATES treatment. I collected comments from 56 (student) respondents of the main survey experiment, and 25 (student) respondents of the robustness one, that is, the participation rate is 79% in the main survey experiment, and 52% in the robustness one.

There are three categories of comments: (A) concerns about final situations (distribution of final incomes), (B) concerns about taxation and (C) concerns about merit. Concerning the main experiment, a majority of respondents (more than 80%) evoke considerations related to the shape of the tax function and more than half of them justify their fairness ranking based on tax progressivity (i.e., comments such as “the richest should be taxed more than the middle-class”). About 25% of respondents believe that taxing only one group of taxpayers is not fair, and a small part of them (less than 15%) think that tax liability paid by the richest should not too much high and middle-class should also contribute. Only 19% of respondents report concerns about the post-tax distribution of incomes and it seems that they mainly focus on inequality between groups. Only 11% mention both concerns about final situations and tax function shape. The comments provided by the respondents of the robustness experiment are not significantly different. The proportion of respondents concerned by final situations seems to be higher in the robustness experiment, but a  $\chi^2$  homogeneity test does not reject the null hypothesis of equality in both treatments ( $p = 0.656$ ).

	Number of respondents (fraction)	
	Main exp. [56 respondents]	Robustness exp. [25 respondents]
A: Concerns about final situations	11 (0.19)	6 (0.24)
A-1: income inequality	9 (0.16)	4 (0.16)
A-2: minimal income	2 (0.04)	2 (0.08)
B: Concerns about taxation	46 (0.82)	21 (0.84)
B-1: Type III should pay more than Type II	31 (0.55)	14 (0.56)
B-2: Type III should not pay too much in tax	7 (0.13)	5 (0.2)
B-3: Type II should contribute	8 (0.14)	5 (0.12)
B-4: Average tax rate should be the same for all	4 (0.07)	3 (0.24)
B-5: Taxing only one group is not fair	15 (0.27)	6 (0.24)
B-6: Incentive argument	0 (0)	1 (0.04)
A and B	6 (0.11)	4 (0.07)
C: Concerns about merit	5 (0.09)	3 (0.12)

Table 18: Category of comments

## D The survey experiments (translated from the French)

### D.1 General instructions: Both studies

[*Read out loud by the experimenter.*] This questionnaire was developed by a researcher in economics and social sciences in the University of Rennes 1. The aim is to help identify the fairest public policies. The answers you give are anonymous. There are no good or bad answers. What we are interested in is **your personal opinion**.

This questionnaire consists of **[2-3] parts**. In the [-2] first part[s], you are asked to study **various scenarios**. In each scenario, you are asked to **evaluate income taxation and redistribution schemes**. In the last part, you are invited to answer some additional questions.

The mean response time is about 10 minutes.

[*From there, read individually by the respondents.*] We consider a society. In this society, there are three 'types' of citizens: type I (30% of the population); type II (60% of the population); type III (10%). The citizens of type I are the ones with the lowest skills, while the ones of type III have the highest skills. Those of type II have intermediary skills. These differences are **only** due to **differences in family background**.

Thus, for one working hour, the persons of type I earn a lower income than the ones of type II, who earn a lower income than the ones of type III.

The **sole** source(s) of individual income is **earnings from working** and possibly **social transfers**.

The government can implement taxation and income redistribution policy. In the scenarios, you are asked to evaluate different possible policies.

### D.2 The main study

#### Scenario A (*scenario* MININFO)

The government has the choice between five income redistribution policies: policies (a), (b), (c), (d) and (e). Each of these policies leads to difference personal incomes. The following table shows the **monthly incomes in euros after taxes and redistribution** for the alternative policies:

	Types		
	Type I	Type II	Type III
policy (a)	550	1800	2450
policy (b)	925	1530	3145
policy (c)	1100	1350	4000
policy (d)	1040	1440	3330
policy (e)	790	1620	2720

*Reading.* The **first line (policy (a))** indicates that **after** implementing **policy (a)**, the income of a person of type I is of 550 euros, the income of a person of type II is of 1,800 euros and the income of a person of type III is of 2,450 euros.

Question: **Please rank these five alternative policies from the fairest (1) to the least fair (5).**  
 For each column of the following table, please indicate the policy of your choice.

Alternative policies	Ranking				
	fair 1	2	3	4	least fair 5
policy (a)					
policy (b)					
policy (c)					
policy (d)					
policy (e)					

*Table completion.* In the column ‘1’, you can indicate the policy you judge as the fairest. In the column ‘2’, you can indicate the policy you rank second, etc. In the last column, you can indicate the least fair policy.

**Scenario B** (*scenario* INFOTAXRATES)

The government has the choice between five income redistribution policies: policies (a), (b), (c), (d) and (e). Each of these policies leads to different personal incomes.

These policies consist in redistributing income from citizens of type II and/or III to the ones of type I. The following table shows the level of tax rate for each type of individual:

	Types		
	Type I	Type II	Type III
policy (a)	-	0%	30%
policy (b)	-	15%	15%
policy (c)	-	25%	0%
policy (d)	-	20%	10%
policy (e)	-	10%	20%

*Reading.* The **first line (policy (a))** indicates that, if **policy (a)** is implemented, the tax rate faced by a person of type III is of 30%. That is, for 100 euros of earnings, the tax liability is of 30 euros. There is no tax on income of citizens of type I.

Given the effects of taxation on the number of working hours, the **monthly incomes in euros after taxes and redistribution** for the alternative policies are:

	Types		
	Type I	Type II	Type III
policy (a)	550	1800	2450
policy (b)	925	1530	3145
policy (c)	1100	1350	4000
policy (d)	1040	1440	3330
policy (e)	790	1620	2720

Question: (*same question*)

### D.3 The follow-up study

#### Scenario A (*scenario MININFO*)

The government has the choice between two? income redistribution policies: policies (a) and (b). Each of these policies leads to different personal incomes. The following table shows the **monthly incomes in euros after taxes and redistribution** for the alternative policies:

	Types		
	Type I	Type II	Type III
policy (a)	1040	1440	3420
policy (b)	790	1620	2720

*Reading.* The **first line (policy (a))** indicates that **after** implementing **policy (a)**, the income of a person of type I is of 1040 euros, the income of a person of type II is of 1440 euros and the income of a person of type III is of 3420 euros.

Question: Please indicate **the policy you judge as the fairest**.

Policy (a):

Policy (b):

#### Scenario B (*scenario MAXINFO*)

The government has the choice between two? income redistribution policies: policies (a) and (b). Each of these policies leads to different personal incomes. The following table shows the **monthly incomes in euros after taxes and redistribution** for the alternative policies:

These policies consist in redistributing income from citizens of type II and/or III to the ones of type I. The following table shows the level of tax rate for each type of individual:

	Types		
	Type I	Type II	Type III
policy (a)	-	20%	10%
policy (b)	-	10%	20%

*Reading.* The **first line (policy (a))** indicates that, if **policy (a)** is implemented, the tax rate faced by a person of type II is of 20%. That is, for 100 euros of earnings, his tax liability is of 20 euros. The tax rate faced by a person of type III is of 10%. That is, for 100 euros of earnings, his tax liability is of 10 euros.

When taxation increases, citizens of type III decide to decrease their working hours. Thus, their monthly earnings before tax and redistribution (i.e., their salary) is lower.

The following table presents the **monthly incomes in euros BEFORE taxes and redistribution** for the alternative policies:

	Types		
	Type I	Type II	Type III
policy (a)	200	1800	3700
policy (b)	200	1800	3400

You can note:

- A citizen of type III decide to earn € 3,700 when the tax rate he faces is of 10% (policy (a)) and € 3,400 when the tax rate he faces is of 20% (policy (b)). The other members of the society have the same income before tax and redistribution for the two alternative policies.

- **If policy (a) is implemented**, the tax liability of a citizen of type II is equal to 20% of €1,800 , i.e., €360 , and the tax liability of a citizen of type II is equal to 10% of €3,700 , i.e., €370.

- **If policy (b) is implemented**, the tax liability of a citizen of type II is equal to 10% of €1,800 , i.e., €180 , and the tax liability of a citizen of type II is equal to 20% of €3,700 , i.e., €680 .

The following table presents the **monthly incomes in euros AFTER taxes and redistribution** for the alternative policies:

	Types		
	Type I	Type II	Type III
policy (a)	1040	1440	3330
policy (b)	790	1620	2720

Question: *(same question)*