



Research article

A survey experiment on information, taxpayer preferences, and perceived adequacy of the tax burden

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ABSTRACT

We report results of a survey experiment aimed at testing whether eliciting taxpayer preferences on how to allocate the collected taxes over national public goods as well as providing information about the composition of the public expenditure influence the tax rate that taxpayers consider adequate to pay. We find that information exerts no effects on the level of the adequate tax rate. However, taxpayers are willing to accept a higher tax burden when they express their preferences on how to use tax revenues to finance public goods and services.

1. Introduction

In 2007, during a national TV show, the Italian Minister of Economy and Finance, Tommaso Padoa-Schioppa (1940–2010) notoriously claimed that “we should have the courage to say that taxes are a beautiful thing, a very civilized way for everyone to contribute in essential areas like education, safety, healthcare and the environment.”¹ Taxes are undoubtedly beneficial for individuals when used to finance fundamental public goods that are valuable for the community. Nevertheless, despite the potential benefits, citizens of various countries (e.g., the United States of America and Italy among others) exhibit strong dissatisfaction with taxation (Sussman and Olivola, 2011; Harvard Political Review, 2009).

Among other factors, the quality of the tax governance (e.g., Cummings et al., 2009; Torgler and Schneider, 2009), the overall fiscal pressure (Alm et al., 1992), the relevance of the social norm prescribing to pay taxes (Wenzel, 2005), and the level of generalized trust in taxpayers (Scholz and Lubell, 1998) can strongly affect citizen perception of fiscal justice and the overall level of dissatisfaction with taxes. Finally, and more importantly for the aim of the present paper, citizen

dissatisfaction with the tax system may be caused by lack of information and involvement in government fiscal decisions.

Taxpayers are generally under-informed about the rules followed by the government to define the priority order of the public goods and services to be financed. For instance, according to poll results, most Americans have no clue how their taxes are spent (HuffPost, 2014). Under-information can induce taxpayers to disregard the (social) benefits of the public spending (see the excellent discussion in Lambertson et al., 2018) and perceive taxes as an exogenously imposed deadweight loss. To solve this problem, tax agencies have started to provide detailed information about government expenditure to taxpayers. Notable examples include the American “Taxpayer Receipt” and the British “HMRC Tax Calculator.”

Concerning taxpayer involvement, excluding taxpayers from the decision about how to allocate taxes can generate a mismatch between citizen preferences and government priorities, which in turn induces taxpayers to consider the tax burden as an inefficient and costly sacrifice. For instance, Alm et al. (1993) experimentally illustrate that tax compliance is low when taxpayers do not value government decisions

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about the allocation of fiscal revenues: tax evasion is higher when the public expenditure is exogenously imposed than in a situation in which taxpayers express their choice on how to use tax revenues. Excluding taxpayers from the tax allocation decision can also result in loss of control over fiscal resources and a generalized sense of coercion (Li et al., 2011). Indeed, there is empirical evidence showing that tax evasion decreases when taxpayers participate in budgetary decision making (Pommerehne and Weck-Hannemann, 1996; Frey and Palacios-Huerta, 1997; Djawadi and Fahr, 2013).

The aim of this paper is twofold. First, we study whether eliciting taxpayer preferences on the allocation of collected taxes over national public goods affects the *adequate* tax rate, namely the proportion of income that taxpayers consider fair to pay as taxes. Second, we investigate whether providing information on the national public expenditure to taxpayers influences the adequate tax rate. We report results from a survey experiment allowing us to disentangle the preference elicitation effect from the information effect and assess their causal impact on taxpayer attitude toward taxes.

We believe that our study can contribute to the flourishing debate on the psychological elements affecting tax compliance (Kirchler, 2007). Making taxpayers think about how tax revenues are allocated over different public goods and services, and enhancing their participation in the tax allocation decision can increase the perceived benefits of paying taxes, the judgment about the adequacy of the tax burden and, more in general, their tax compliance.

The results of the present study move in the expected direction, as they indicate that eliciting preferences of the taxpayers enhances their willingness to accept a higher tax burden. Nevertheless, providing information about government public expenditure does not influence the level of the adequate tax rate.

The rest of the paper is structured as follows. Section 2 depicts a brief review of existing studies and discusses our contribution to the literature. Section 3 details the design of the survey experiment. Section 4 illustrates the results. Section 5 concludes the paper.

2. Literature review and predictions

2.1. Taxpayer participation in government decisions

Empirical evidence reveals that the behavior of the taxpayers and their attitude toward taxes is influenced by the extent to which they perceive to be involved in government decisions. For instance, by analyzing the effects of democratic institutions on tax morale, Torgler (2005) illustrates that direct democratic involvement exerts strong positive effects on tax compliance. Pommerehne and Weck-Hannemann (1996) and Frey and Palacios-Huerta (1997) show that tax evasion is lower in those (direct democratic) Swiss cantons where budgetary decisions are democratically taken through general referenda. Feld and Tyran (2002) provide evidence that individuals have higher tax compliance if they can democratically choose how to punish tax evasion.

However, elections and referenda are not the only mechanisms through which taxpayers participate in government decisions. Several recent papers document a positive influence of tax choice (i.e., taxpayer involvement in the allocation of fiscal revenues over public goods) on taxpayer attitude and compliance. In particular, Lambertson (2013) finds that tax choice significantly increases taxpayer satisfaction with taxes. Similarly, Djawadi and Fahr (2013) and Casal et al. (2016) find that tax choice positively influences tax compliance.

Of course, both unwillingness of formal institutions in representative democracies (Lamberton et al., 2018) and the corresponding high costs of organizing referenda and elections in direct democracies (BBC, 2013) limit the possibility in “real world” contexts to involve taxpayers in the allocation of tax revenues.

Diverging from extant studies, Lambertson et al. (2018) show that taxpayer participation in government decisions can be confined to

eliciting taxpayer preferences only. Such mechanism is shown to curb tax evasion, even if taxpayer opinion is not implemented in subsequent government expenditures. Similar to Lambertson et al. (2018), we focus on preference elicitation as an effective mechanism to make taxpayers perceive that they are part of government decisions.

The main difference between Lambertson et al. (2018) and our study is that while they focus on tax evasion, in our study we elicit the tax rate that taxpayers are willing to pay to finance the public expenditure. Indeed, the tax rate and tax evasion are strongly interrelated, since it has been illustrated by multiple studies that increasing the tax burden can trigger tax evasion (see Bernasconi et al., 2014, for a review of the related literature). Thus, one can conjecture that asking taxpayers to report their non-binding preferences about how to use the tax revenues can mitigate the negative consequences of augmenting the tax rate.

In sum, we diverge from the literature in two important directions. On the one hand, while the majority of extant papers that illustrate the benefits of tax choice require the taxpayer decisions to have binding consequences for public expenditure (e.g., Lambertson, 2013; Djawadi and Fahr, 2013; Casal et al., 2016), we elicit non-binding preferences of the taxpayers. On the other hand, while the literature considering non-binding opinion of taxpayers studies the relationship between preferences and tax evasion (e.g., Lambertson et al., 2018), we look at the impact of eliciting preferences on what taxpayers consider adequate to pay.

2.2. The impact of information on taxpayer behavior

While the impact of taxpayer participation in government decisions by-and-large clear, understanding how information affects tax morale remains an open question in the literature. For instance, it has been illustrated that taxpayers hold biased beliefs about the wealth distribution (Norton and Ariely, 2011), which in turn can affect their attitude toward redistribution (e.g., Page and Goldstein, 2016). In this regard, providing information can help correcting biased beliefs of the taxpayers and, therefore, exerts a significant impact on their behavior (e.g., Cruces et al., 2013; Karadja et al., 2014). Nevertheless, the impact of information about public spending is rather ambiguous in both field and laboratory settings. As for the latter, Lambertson (2013) finds no relationship between information about public spending and taxpayer satisfaction with taxation. Meanwhile, Djawadi and Fahr (2013) and Lambertson et al. (2018) document that information enhances tax compliance. Regarding field studies, a formal meta-analysis provides suggestive evidence that informing taxpayers on how tax money is spent does not seem to increase tax compliance. (e.g., Antinyan and Asatryan, 2019 and the references therein).

A recent study by Lergetporer et al. (2016) on a representative German sample finds that information can even reduce the support for public spending. Furthermore, the authors illustrate that prior knowledge about the public spending may be a strong predictor of the effect of additional information on taxpayer behavior. In particular, those who underestimate the current levels of public spending are more sensitive to the information correcting their biased beliefs. On the other hand, information does not exert any significant effect on subjects reporting correct estimates as well as on those overestimating the public spending levels. Differently from the abovementioned studies we focus on the relationship between the information on public spending and the level of the tax burden that taxpayers consider adequate to pay.

2.3. Predictions

As already discussed in the previous sections, taxpayers may be dissatisfied with taxes because of preference misalignment (i.e., actual composition of the public spending does not coincide with the desired composition of taxpayers), lack of information about the effective use of tax revenues, and coercion (i.e., taxpayers do not participate in government decisions on the allocation of the tax revenues). If information

aligns taxpayer preferences with actual public spending, one may expect taxpayers to increase their satisfaction with taxes and their perceived adequacy of the tax burden. Nonetheless, the negative feelings of coercion may still outweigh the positive feelings of preference alignment, which may ultimately result in dissatisfied taxpayers. It may also be the case, that the provision of information preserves the preference mismatch between taxpayer desires and public spending, which implies that information disclosure exerts, if any, only negligible effects on taxpayer attitude toward taxes. In sum, the impact of information provision is not conclusive and may yield differential results, as documented by the extant literature.

Unlike information provision, we believe that eliciting taxpayer preferences resolves the abovementioned problems. Specifically, it may create either a sense of control over fiscal resources or expectations that their voice can be considered when defining the public spending of the state (e.g., [Lamberton et al., 2018](#)). Given these thoughts, we hypothesize that preference elicitation may have positive impact on taxpayer feelings and behavior, therefore increasing the tax burden the taxpayers are willing to accept.

3. The survey experiment

3.1. The design

We administer a survey experiment to identify the causal effects of information and preference elicitation on the level of the adequate tax rate reported by subjects. To this date, survey experiments have been successfully used by economists to investigate such important research questions as the concerns for relative standing ([Pingle and Mitchell, 2002](#); [Johansson-Stenman et al., 2002](#)), the determinants of life satisfaction ([Angelini et al., 2017](#)), the willingness to pay for insurance plans ([Krueger and Kuziemko, 2013](#)), the perceptions and concerns for distributional fairness ([Faravelli, 2007](#); [Cruces et al., 2013](#)), the effects of information about inequality and taxes on preferences for redistribution ([Kuziemko et al., 2015](#)), as well as the effects of information about public spending on its acceptance ([Lergetporer et al., 2016](#)). The survey experiment is a powerful tool to establish the causal link between information, tax choice and the acceptability of the adequate tax rate. Nevertheless, important methodological concerns can limit its external validity. For instance, the results may suffer from a hypothetical bias, i.e., the responses to the hypothetical scenarios may substantially differ from real behavior. Alternatively, the results may be attributed to the specific wording used in the questionnaire. While there is no doubt about the relevance of these potential limitations, there is evidence showing that causal relationships established through (controlled) survey experiments tend to be confirmed in natural experiments ([Hainmueller et al., 2015](#)).

In details, our survey experiment consists of three treatments: “Control,” which represents our benchmark, “Information,” and “Preference.”² In all treatments, subjects are invited to complete an online questionnaire made of two parts. The first part, kept constant across treatments, includes questions about the demographic and socio-economic conditions of the respondents. The second part of the questionnaire includes questions about respondents’ willingness to pay taxes. We consider three treatments, each introducing a manipulation in the second part of the questionnaire.³

In particular, the subjects in “Control” report the income tax rate that they consider adequate to pay in order to finance the Italian public expenditure, with their answer ranging from 0 to 100 percent. As discussed below, the questionnaire was written in Italian. It is important to

emphasize that the direct translation of the word “adequate” (“*adeguata*” in Italian) is “fair enough”. In other words, the adequate tax rate refers to the tax burden that Italian participants perceive as “high enough” and “fair” to pay to finance the Italian public expenditure. It is also worth noting that we deliberately decided to adopt a neutral framework, requiring subjects to report a tax rate that is “enough” to cover the public expenditure, without altering their subjective perception of “fairness” ([Erlei, 2008](#)).

The difference between “Control” and “Information” is that, before stating the adequate tax rate, subjects in the latter are presented with the 10 first level COFOG components of the Italian public expenditure ranked in descending order based on their weight in public spending.⁴ Apart from the labels and the ordering of the public expenditure components, no other information on the 10 items (such as their relative size in terms of the overall public expenditure) is provided. By comparing responses in “Control” and “Information,” we are able to assess the effect of information about the public expenditure on taxpayer willingness to pay taxes. We tried to keep the format of the information as close to previous studies as possible. For instance, [Lamberton \(2013\)](#) uses seven (general) public expenditure categories as defined by the Center on Budget and Policy Priorities (2010, p. 231), illustrating that this information structure is enough to guarantee respondents’ understanding of tax utilization. Similarly, [Djawadi and Fahr \(2013\)](#) elaborate a tax list containing the items with the highest tax expenditure as reported in the federal budget of the 14 federal ministries in Germany (p. 7). [Lamberton et al. \(2018\)](#) provide information on the allocation of taxes using the categories and descriptions listed in the “tax receipt” webpage of the White House.

Finally, “Preference” is split into two consecutive tasks. In Task 1, subjects are presented with the same list of 10 functional items used in “Information” and, for each item, they state the corresponding adequate tax rate. Again, for each item, the stated tax rate ranges from 0 to 100 percent. Furthermore, the sum of all the stated tax rates should not exceed 100 percent. In Task 2, subjects are asked (as in the other two treatments) to report the income tax rate they consider adequate to finance the (overall) Italian public expenditure. In presenting results, we will mainly focus on the adequate tax rates reported by subjects in Task 2. In particular, by comparing responses in the “Information” treatment with those in Task 2 of “Preference” we are able to assess how preference elicitation influences the level of the adequate tax rate, net of the information effect.

After 15 days from the first phase of the survey experiment, subjects in “Control” and “Information” are unexpectedly invited to take part in the “Preference” treatment. We will refer to responses in the second phase of “Control” and “Information” as “Preference1” and “Preference2,” respectively. Thus, by comparing answers in “Control” (“Information”) with those in “Preference1” (“Preference2”), we are able to assess the within-subject effect of eliciting taxpayer preferences on the level of the adequate tax rate.

The hypothetical nature of the experiment can represent an issue as subjects’ answers are not associated with any material payoff or implication. If any, we believe that the hypothetical nature of the experiment has exerted only marginal effects on the results. First, [Lamberton \(2013\)](#) and [Lamberton et al. \(2018\)](#) document no difference in the effects of tax choice and preference elicitation when comparing hypothetical scenarios with incentivized ones. Second, even if the answers are inflated because of the absence of incentives, there is no reason to expect the size of the bias to depend on the treatment manipulations, thus preserving the economic interpretation of differences between treatments.

² The design of our survey experiment mimics the one proposed by [Angelini et al. \(2017\)](#) to study the effects of unpacking important life domains on the self-reported level of life satisfaction.

³ In the Appendix, we report the questions used to elicit the adequate tax rate in the three treatments of the survey experiment.

⁴ This information is publicly available online. See the COFOG (Classifications of the Functions of the Government) scale elaborated by the OECD: <http://www.oecd.org/gov/48250728.pdf>. The functional groups of the first-level COFOG are “Social Protection,” “Housing,” “General Public Services,” “Defense,” “Public Order and Safety,” “Economic Affairs,” “Environmental Protection,” “Health,” “Recreation, Culture and Religion,” “Education.”

3.2. Procedures

The survey experiment took place between May and July 2013 and was administered via Qualtrics (<http://www.qualtrics.com>). Subjects, mainly undergraduate students from three universities in the north of Italy,⁵ were recruited by e-mail after advertising the experiment through Facebook. Once they agreed to participate in the study, each subject was randomly and anonymously assigned to (only) one of the three different treatments. On average, completing the questionnaire required 10–15 min and subjects were not paid to participate in the questionnaire. In order to guarantee anonymity and correctly match the responses across the two phases of “Control” and “Information,” subjects were required to provide the first six digits of their personal (16 alpha-numeric character) tax code. To complete the questionnaire, subjects proceeded across consecutive screens, with no possibility to revise their choices in the previous screens. In this way, we could control for potential context effects (Tourangeau and Rasinski, 1988; Schwarz, 1999) that are due to the order of the questions. Specifically, in all of the three treatments, the first screen contained a short preamble providing information about the purpose of the study. Then, in the next screens, subjects were presented with general and neutral socio-demographic questions. Finally, the last part of the questionnaire contained the sensitive questions about the perception of the tax burden. This study was approved by the Ethical Committee of the Department of Economic Sciences, University of Venice.

4. Experimental results

Overall, 282 subjects completed the (first phase of the) survey experiment: 105 participated in “Control”, 102 in “Information” and 75 in “Preference”. As explained above, subjects in “Control” and “Information” also participated in a second phase of the experiment. In the second phase, we collected responses from 48 out of 105 subjects who had previously participated in “Control” (“Preference1”) and from 43 out of 102 subjects who had previously participated in “Information” (“Preference2”). Table 1 shows some socio-demographic characteristics of the participants in the three treatments:

32% of the participants are male, with a mean age of 25 years. Participant are mainly students, while white collar workers constitute the second largest group. Subjects mainly belong to middle and high-income families. To test for balancing in sample composition across treatments, we regress each of the variables presented in Table 1 on a constant and two treatment dummies (“Information” and “Preference”), using “Control” as the reference category. Results are reported in Table 2.

Overall, results document good balancing. However, we still detect some imbalances across the three groups, probably due to the limited sample size: for example, relative to the “Control” treatment, participants in “Information” are younger and there are significantly fewer males in “Preference.” To make sure that we remove any bias due to unbalances in the observable covariates, we will report results of both non-parametric tests and parametric regressions (controlling for the socio-demographic characteristics of the respondents).

4.1. Phase 1 analysis

Result 1. *The reported adequate tax rate substantially increases when taxpayer preferences on the tax allocation are elicited. Providing information has negligible effect on the reported adequate tax rate.*

Figure 1 shows the frequency of the stated adequate tax rates in 5 percentage point intervals in the three treatments of the first phase.

By focusing on “Control” and “Preference,” we detect substantial differences in the distribution of the reported adequate tax rates. In

⁵ Bocconi University in Milan, University of Varese-Insubria, and University of Padova.

Table 1. Descriptive statistics of the sample.

Variable	Mean	Standard Deviation	Observations
Age	24.621	5.238	282
Male	0.316	0.466	282
<i>Professional Status</i>			
Student	0.592	0.492	282
White Collar	0.216	0.412	282
Unemployed	0.067	0.251	282
Other	0.124	0.330	282
<i>(Family) Income</i>			
Income [0; 20k]	0.046	0.210	282
Income (20k; 40k]	0.188	0.391	282
Income (40k; 60k]	0.436	0.497	282
Income (60k; ∞)	0.330	0.471	282

Note. Socio-demographic characteristics of subjects who participated in the survey experiment.

Table 2. Balancing tests.

Variable	Average	Information	Preference
Age	24.590	-1.257*** (0.457)	1.823* (1.032)
Male	0.410	-0.057 (0.068)	-0.276*** (0.062)
Student	0.590	0.086 (0.067)	-0.110 (0.075)
White Collar	0.276	-0.119** (0.057)	-0.063 (0.065)
Unemployed	0.038	0.060* (0.035)	0.029 (0.035)
Other	0.095	-0.027 (0.038)	0.145*** (0.057)
Income [0; 20k]	0.057	0.002 (0.033)	-0.044* (0.026)
Income (20k; 40k]	0.181	-0.004 (0.054)	0.032 (0.061)
Income (40k; 60k]	0.390	0.110 (0.069)	0.023 (0.075)
Income (60k; ∞)	0.371	-0.107 (0.065)	-0.011 (0.073)

Note. This table reports the mean values of the covariates for individuals in “Control”, and differences in mean values between “Information” and “Control” (column 2) as well as between “Preference” and “Control” (column 3). Robust standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

particular, the stated tax rates in “Control” are skewed toward lower percentages, while answers in “Preference” concentrate on higher values. In line with this graphical observation, we find that the proportion of subjects reporting an adequate tax rate greater than 30% is 58% in “Preference,” 31% in “Information,” and 27% in “Control.”

Table 3 reports the mean adequate tax rates in the three treatments and in the two phases of “Control” and “Information.”

We focus on the adequate tax rates in the first phase and perform a non-parametric analysis. We can reject the null hypothesis of equality of the median adequate tax rates across treatments (according to a Kruskal-Wallis test, $\chi^2(2) = 7.368$, $p = 0.025$). According to a Mann-Whitney U test, the median adequate tax rate is higher in “Preference” than in both “Information” ($W = 3203$, $p = 0.061$) and “Control” ($W = 3009.5$, $p = 0.007$), while no significant difference is detected between “Information” and “Control” ($W = 5028$, $p = 0.443$).

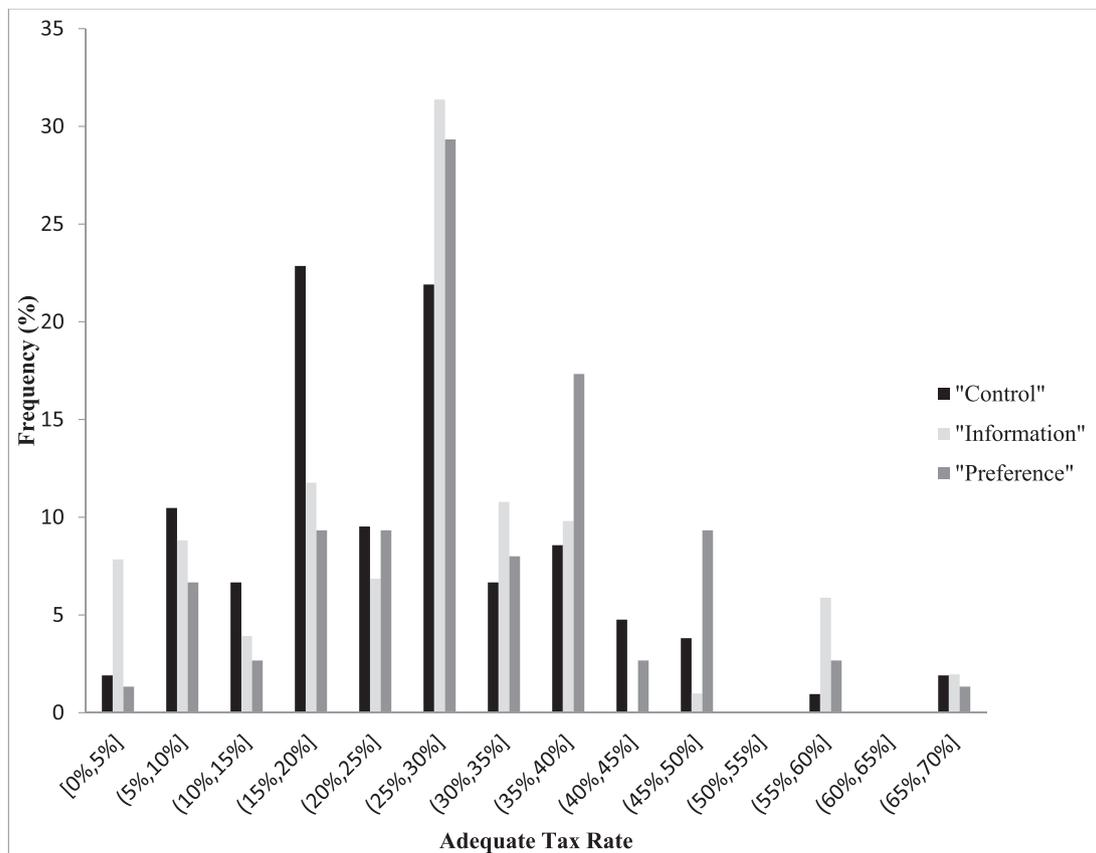


Figure 1. Distributions of the adequate tax rates in phase 1.

Table 3. Reported adequate tax rates in the three treatments.

Phase 1	Control	Information	Preference
Mean	0.273	0.284	0.319
Std. dev.	0.129	0.145	0.127
N	105	102	75
Phase 2	Preference1 (*)	Preference2 (*)	
Mean	0.329 (0.297)	0.337 (0.267)	
Std. dev.	0.096 (0.146)	0.085 (0.097)	
N	48	43	

Note. This table reports means and standard deviations of the reported adequate tax rate by subjects (in both phases of) the three treatments of the survey experiment. We report Phase 1 responses of the individuals who took part in Phase 2 in brackets.

As shown by Table 4, the non-parametric results are parametrically confirmed by the regression analysis.

The sign and the magnitude of the treatment dummies suggest that subjects in “Preference” report significantly higher adequate tax rates than in the other two treatments (for the difference between the

⁶ According to the “unpacking effect” (Rottenstreich and Tversky, 1997), there are situations in which “the whole is less than the sum of its parts” (Van Boven and Epley, 2003). This phenomenon has been detected in several domains, including voluntary contributions to public goods (Bernasconi et al., 2009) and self-reported life satisfaction (Angelini et al., 2017). We find evidence of the “unpacking effect” in our survey experiment. Indeed, by looking at responses in “Preference,” we find that the sum of the percentages stated in Task 1 is significantly higher than the adequate tax rate reported in Task 2 (Wilcoxon signed-rank test, $V = 220$, $p = 0.000$). We also observe similar results in “Preference1” and “Preference2,” albeit differences are statistically non-significant (Wilcoxon signed-rank test: $V = 306.5$, $p = 0.255$ in “Preference1”; $V = 99$, $p = 0.148$ in “Preference2”).

coefficients of “Preference” and “Information”, $F(1; 272) = 5.48$, $p = 0.020$). Column 2 confirms that results on differences between treatments remain unchanged when including participants' socio-demographic characteristics.⁶

4.2. Phase 2 analysis

Result 2. Results about the effects of both eliciting taxpayer preferences and providing information on the adequate tax rate are confirmed by a “within-subject” analysis.

As already mentioned, around 66% of the subjects who participated in the first phase of “Control” and “Information” dropped out from the survey experiment between the two phases. Therefore, longitudinal findings might be biased because of panel attrition. For instance, those who have a more favorable attitude towards taxation may be more willing to take part in the follow-up study. It can also be that the participation in the second phase is correlated with some socio-demographic characteristics of the subjects. First, we compare the socio-demographic characteristics of the full sample of Phase 1 with the sample of ‘stayers’ in Phase 2 (Fitzgerald et al., 1998). In particular we regress each variable included in Table 1 on a Phase 2 dummy, which takes the value of 1 if the subjects participate in Phase 2 and of 0 otherwise. The results of the tests are reported in Table 5.

The table reveals no significant socio-demographic differences across participants in the two phases of “Control” and “Information”. Second, we regress the adequate tax rates reported by subjects in these two treatments on the set of socio-demographic covariates reported in Table 4 and a dummy indicating whether the subject participated in Phase 2 or not. Table 6 depicts the results of the regression analysis.

With these regressions we intend to check whether the participation in the second phase of the experiment is related with more favorable

Table 4. Parametric regressions.

	OLS, Ph. 1	OLS, Ph. 1
Intercept	0.218*** (0.028)	0.273*** (0.013)
Male	0.028 (0.019)	
Student	0.027 (0.025)	
White Collar	0.059** (0.030)	
Unemployed	0.046 (0.036)	
Income [0; 20k]	0.033 (0.046)	
Income (20k; 40k]	-0.001 (0.023)	
Income (40k; 60k]	0.019 (0.018)	
Information	0.012 (0.019)	0.011 (0.019)
Preference	0.060*** (0.020)	0.046** (0.019)
R ²	0.053	0.019
F (or χ^2)	2.23	2.99
p > F (or χ^2)	0.021	0.052
N	282	282

Note. The first and second columns include results from an OLS model (robust standard errors in parentheses). Dependent variable: Reported Adequate Tax Rate. Independent variables: Male, Student, White Collar, Unemployed, Income1, Income2, Income3-Dummies = 1 if the respondent is male, student, white collar, unemployed, has income below 20.000 Euros, between 20001 and 40000 Euros, between 40001 and 60000 Euros, respectively, = 0 otherwise. Significance levels: *p < 10%, **p < 5%, ***p < 1%.

Table 5. Attrition.

Variable	Average	Phase 2
Age	24.62057	-0.467 (0.370)
Male	0.316	0.058 (0.317)
Student	0.592	0.012 (0.837)
White Collar	0.216	0.047 (0.052)
Unemployed	0.067	-0.012 (0.028)
Other	0.124	-0.047 (0.169)
Income [0; 20k]	0.046	0.042 (0.196)
Income (20k; 40k]	0.188	-0.034 (0.444)
Income (40k; 60k]	0.436	-0.019 (0.756)
Income (60k; ∞)	0.330	0.011 (0.849)

Note. We report the mean values of the sample in Phase 1 as well as the comparison of the full sample in Phase 1 with that of Phase 2 in column 2. Robust Standard errors in parentheses. Significance levels: *p < 10%, **p < 5%, ***p < 1%.

Table 6. Comparing subject types.

	OLS, Control	OLS, Information
Intercept	0.242*** (0.044)	0.257*** (0.045)
Male	0.006 (0.028)	0.050 (0.034)
Student	0.008 (0.053)	-0.024 (0.042)
White Collar	0.020 (0.060)	0.032 (0.051)
Unemployed	0.034 (0.069)	0.043 (0.065)
Income [0; 20k]	0.054 (0.065)	0.030 (0.078)
Income (20k; 40k]	-0.017 (0.034)	0.051 (0.052)
Income (40k; 60k]	-0.001 (0.032)	0.033 (0.032)
Participate Phase 2	0.039 (0.026)	-0.027 (0.028)
R ²	0.045	0.083
F (or χ^2)	0.54	1.27
p > F (or χ^2)	0.826	0.270
N	105	102

Note. Results from an OLS model (robust standard errors in parentheses). Participate Phase 2-Dummy = 1 if the respondent participates in Phase 2 respectively, = 0 otherwise. All other remarks of Table 4 apply. Significance levels: *p < 10%, **p < 5%, ***p < 1%.

attitude toward taxation. As shown by the statistically non-significant coefficient of the dummy, we do not detect the mentioned effect.

Table 7 shows the results of the longitudinal analysis conducted on the two phases of “Control” and “Information.” This analysis allows us to test robustness of the effects of preference elicitation and information on the adequate tax rate in a within-subject framework.

The positive and significant coefficient of Phase 2 dummy suggests that subjects report significantly higher tax rates in the second phase of “Control” and “Information”, namely when preference elicitation is introduced. Again, this finding is supported by non-parametric tests. A Wilcoxon signed-rank test confirms that subjects respond to the manipulation by significantly increasing the reported adequate tax rates in both “Preference1” (V = 222; p = 0.004) and “Preference2” (V = 68; p = 0.000).⁷

4.3. Stated preferences and real expenditure

Result 3. There is no relationship between taxpayer preferences about the allocation of the tax revenues and the (real) government expenditure.

Finally, we compare the 2013 Italian public expenditure (according to the COFOG scale) with subjects' ranking as inferred by aggregating the stated percentages for the 10 government functions in “Preference,” “Preference1” and “Preference2.”⁸

⁷ When comparing the adequate tax rates in the first phase of “Preference” with those in the second phase of the other two treatments, differences in responses disappear (according to a Kruskal-Wallis test, $\chi^2(2) = 1.314$, p = 0.518; according to a pairwise Mann-Whitney U test between the first phase of “Preference” and the second phase of “Control,” W = 1685, p = 0.550, while between the first phase of “Preference” and the second phase of “Information,” W = 1405.5, p = 0.244).

⁸ In order to compare responses with the COFOG scale, we pull subjects' percentages for the 10 components in Task 1 of “Preference”, “Preference1” and “Preference2” and report the corresponding means on a 100% scale.

Table 7. Parametric regressions.

	GLS, Ph. 1&2	GLS, Ph. 1&2
Intercept	0.299*** (0.046)	0.284*** (0.013)
Male	0.023 (0.023)	
Student	-0.037 (0.043)	
White Collar	-0.048 (0.047)	
Unemployed	-0.055 (0.055)	
Income [0; 20k]	0.013 (0.036)	
Income (20k; 40k]	-0.010 (0.030)	
Income (40k; 60k]	0.035 (0.026)	
Ph. 2	0.049*** (0.010)	0.049*** (0.010)
R ²	0.071	0.049
Wald χ^2	30.22	24.31
p > Wald χ^2	0.000	0.000
N	182	182

Note. This table reports results from GLS random-effects models (robust standard errors in parentheses). Ph. 2- Dummy = 1 in the second phase of the survey experiment, = 0 otherwise. All other remarks of Table 4 apply. Significance levels: *p < 10%, **p < 5%, ***p < 1%.

As shown by Figure 2, we detect remarkable discrepancies between the (real) distribution of tax revenues across the government functions with the stated preferences of the subjects in our experiment. While social protection and general public services are the items with the highest priority according to the 2013 Italian public expenditure (41.186% and 17.163%, respectively), subjects in our experiment place education and health on top of their ranking (17.889% and 19.844%, respectively). Moreover, as a Kendall rank coefficient test suggests, we cannot reject the null hypothesis of independence between the ranking according to the 2013 Italian public expenditure and the ranking as implied by subjects' stated tax rates in the preference elicitation settings ($\tau = 0.333$, $p = 0.211$).

5. Discussion and conclusions

In this paper, we report results of a survey experiment aimed at studying whether providing information on the national public expenditure to taxpayers and eliciting taxpayer preferences on the allocation of collected taxes over national public goods affect taxpayer considerations about the adequate tax rate – namely, the proportion of income that they consider fair to pay as taxes. We show that mere elicitation of taxpayer preferences substantially increases the proportion of income that taxpayers consider adequate to pay to finance the public expenditure.

We also show that simply providing information on the public expenditure does not influence taxpayer opinion of the adequate tax rate. This result is in line with the findings of Lambertson (2013) and Lambertson et al. (2018) who illustrate that information alone is not enough to enhance taxpayer satisfaction with taxation.

5.1. Theoretical implications

There are two possible explanations to account for the differential effects of information provision and preference elicitation on the level of the adequate tax rate. First, while information provision does not alter the volitional element of taxation, preference elicitation enhances taxpayers' responsibility to pay taxes by stimulating their possible participation in the provision of public goods. Second, eliciting preferences aligns taxpayer preferences over national public goods with government spending. Indeed, when comparing the (real) distribution of tax revenues across the government functions with the stated preferences of the subjects in our experiment, we detect relevant differences. While social protection and general public services are the items with the highest priority according to the 2013 Italian public expenditure, subjects in our experiment place education and health on top of their ranking.

5.2. Managerial implications

Our results inform the literature on tax evasion that non-classical interventions aimed at motivating taxpayers can be as important as standard policies of increasing the penalty surcharge and the audit probability (Allingham and Sandmo, 1972). Starting from the seminal contributions of Thaler and Sunstein (2008), using information manipulation to shape behaviors and improve decisions has shown its potential in relevant contexts, including health, propensity to save, retirement decisions, and tax compliance. In particular, our findings illustrate that, what really matters for enhancing taxpayers' attitude toward taxes is not really the information about how the government exogenously chooses to use tax revenues, but rather the degree at which they feel to be part of the decisional process of allocating (their) taxes. Thus, asking taxpayers to reveal their (non-binding) preferences on the use of tax revenues when filing tax declarations can represent an effective (nudging) intervention to stimulate tax compliance.

5.3. Limitations and directions for future research

We envisage several directions for prospective research. First, future research should exert effort in assessing the influence of tax choice and preference elicitation on the psychological costs of tax evasion. The more taxation is perceived as adequate, socially relevant, and satisfactory due to tax choice or preference elicitation, the more evading taxes is likely to impose substantial psychological costs on tax evaders (in the form of guilt and shame; see Erard and Feinstein, 1994; Hashimzade et al., 2013; Andreoni et al., 1998, for excellent reviews on the psychological costs of tax evasion), which in its turn can substantially deter tax evasion (e.g. Baldry, 1986; Coricelli et al., 2010).

Second, future research should identify the effect of increasing the tax burden on tax evasion in the presence of preference elicitation. In light of our results, preference elicitation (and tax choice) can weaken the positive relationship between the tax rate and tax evasion that has been documented by a solid body of literature (see Bernasconi et al., 2014).

Future research should also investigate the long-term effects of tax choice on the evolution of fiscal institutions. In particular, eliciting taxpayer preferences may have an impact on the tax burden the taxpayers are willing to accept in the short run (e.g., first months of the policy implementation), but such an effect may disappear in the long run, if the state does not take taxpayers' voice into account when defining the public spending priorities.

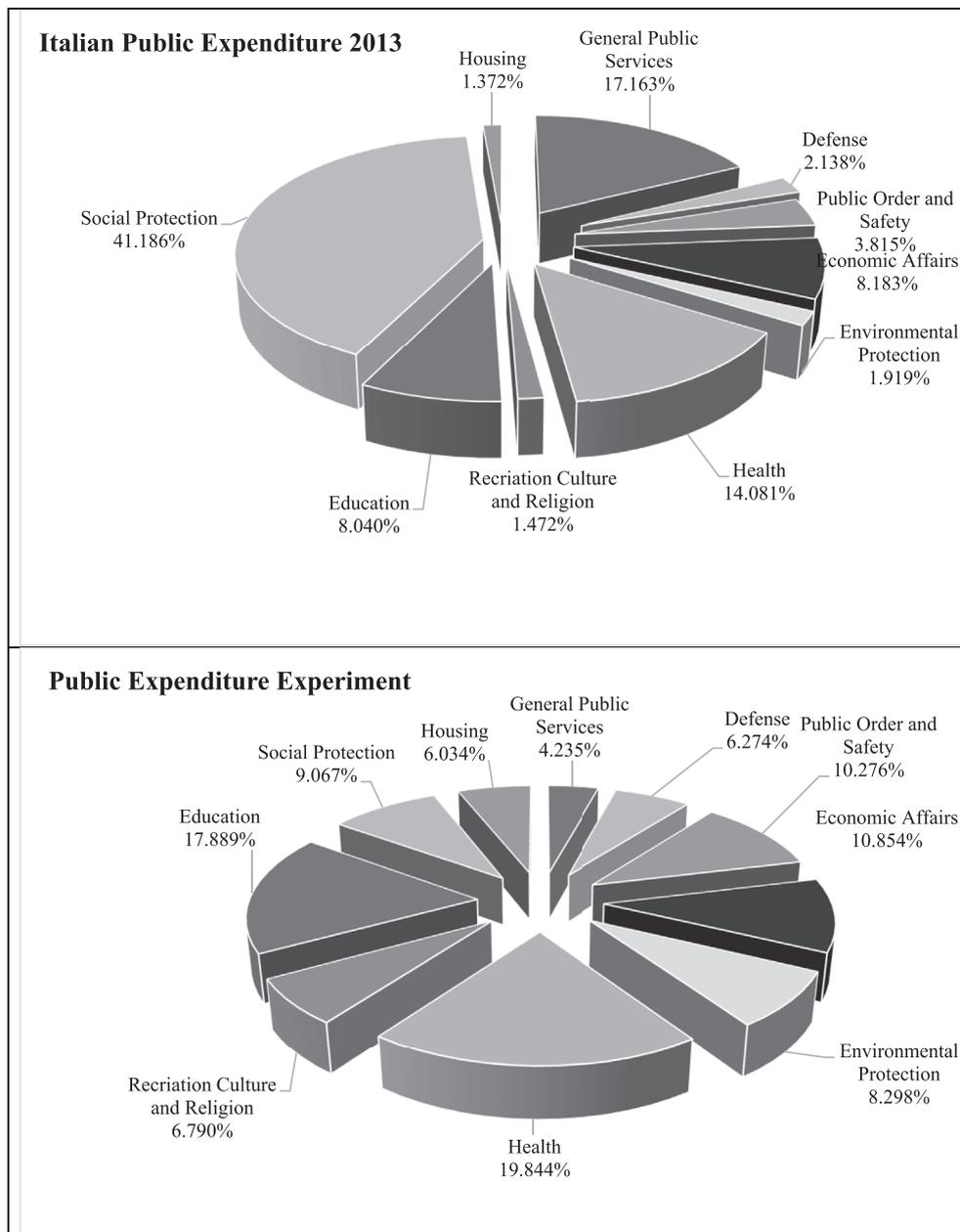


Figure 2. COFOG Scale and Taxpayer Preferences. Note. The upper part shows the Italian public expenditure in 2013 according to the COFOG scale. https://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE11. The lower part shows priorities of the public expenditure as inferred by aggregating the adequate tax rates reported by subjects in the “preference” conditions (Task 1 of treatments “Preference,” “Preference1” and “Preference2”).

Declarations

Author contribution statement

Luca Corazzini, Lorenzo Abbiati, Armenak Antinyan: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Competing interest statement

The authors declare no conflict of interest.

Additional information

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