

Working Paper Series
(ISSN 2788-0443)

725

**Mist Over a Meadow: Tax Designation
Effects on Compliance**

**Lubomír Cingl
Tomáš Lichard
Tomáš Miklánek**

CERGE-EI
Prague, March 2022

ISBN 978-80-7343-532-5 (Univerzita Karlova, Centrum pro ekonomický výzkum a doktorské studium)
ISBN 978-80-7344-634-5 (Národohospodářský ústav AV ČR, v. v. i.)

Mist Over a Meadow: Tax Designation Effects on Compliance *

Lubomír Cingl[†] Tomáš Lichard[‡] Tomáš Miklánek[§]

Abstract

Tax designation has been a popular attribute of the tax plans in a rising number of countries, yet evidence of its effects on tax compliance remains scarce. We conduct an online experiment with 830 Czech taxpayers who are self-employed or regular employees. Our approach mimics the actual tax designation mechanism: it allows subjects to express their preferences for how a part of their taxes is used by redirecting some of the money to a non-governmental organization (NGO). We exogenously vary the presence of the tax designation mechanism, the possibility to choose the recipient NGO from a list, the tax rate, and the use of tax revenues. We find no consistent significant effects of the tax designation mechanism on overall compliance, though for employees, we do find a small effect on the probability of them being fully compliant. This result complements previous findings of experiments with students, who, like employees, also do not personally file their tax returns. Our results imply that the tax designation mechanism does not encourage higher compliance among taxpayers with the greatest opportunities for tax evasion.

Keywords: tax-enforcement, tax compliance, online tax experiment, tax designation

JEL Classification: C91, C93, D02

*The authors would like to thank Jan Vávra for great research assistance, Topi Miettinen, Michal Šoltés, Ben Greiner, research seminar participants at the Prague University of Economics and Business, and conference participants at the 91st Southern Economic Association Annual Meeting and at the 7th International Conference on "The Shadow Economy, Tax Behaviour and Institutions" for useful feedback and discussion. The authors acknowledge financial support from the Czech Science Foundation through Project no. 19/15943S.

[†]Prague University of Economics and Business, Prague, Nám. W. Churchilla 4, 130 67 Prague 3, Czech Republic; CERGE-EI Career Integration Fellow. E-mail: lubomir.cingl@vse.cz. ORCID iD 0000-0001-8842-4876.

[‡]Prague University of Economics and Business; CERGE-EI Career Integration Fellow. E-mail: tomas.lichard@vse.cz. ORCID iD 0000-0003-1497-7974.

[§]Prague University of Economics and Business; CERGE-EI Career Integration Fellow. E-mail: tomas.miklanek@vse.cz. ORCID iD 0000-0002-8775-9460.

1 Introduction

Imperfect tax compliance is a pervasive phenomenon many states and institutions have to deal with when securing their finances, which many studies have already addressed. Batrancea et al. (2019) broadly categorize the research on tax-compliance into two main approaches: tax enforcement and tax-morale.

Using the canonical approach of Allingham and Sandmo (1972) that models tax-payers as purely rational decision-makers weighing only the financial pros and cons of (not) paying taxes, predictions with respect to enforcement are quite straightforward: only a higher (perceived) probability of punishment and/or more serious punishment for tax evasion can drive higher compliance. However, measures that can be taken along these lines, such as changing existing legislation, are often costly and take extensive time to implement. Moreover, for a reasonable range of parameters like individual risk aversion and the probability of being audited, the model predicts much lower compliance than is actually observed (Slemrod & Yitzhaki, 2002). One thread of literature that attempts to explain this discrepancy is based on the tax-morale approach, which argues that tax-payers respond to “soft” behavioral motivations related to cultural or psychological aspects of tax evasion, such as trust and reciprocity to the government, peer-effects, cultural and social norms, information frictions, patriotism, and shame (for an overview, see Luttmer & Singhal, 2014). Another strand of literature attributes high compliance to a proliferation of third-party reporting, where a tax-payer herself is not the person responsible for reporting and transferring the tax to the government (Kleven, Knudsen, Kreiner, Pedersen, & Saez, 2011).¹

In this paper, we investigate compliance effects of a new tax morale approach recently brought to light both in research and in policy practice. The core idea is based on giving tax payers certain power over how the tax revenue they pay is used; this is coined the tax designation. In the realm of policy practice, tax designation plans, in which a taxpayer can decide how a portion of their income tax is used, have been adopted in multiple countries. Italy pioneered a tax designation plan in 1985 by allowing individual taxpayers to allocate 0.8% of their tax liability to religious organizations of their choice

¹Examples include income tax paid by an employee from wage income (especially with a single employer), tax on interest from a savings account reported and paid automatically by the bank in which the account is located, and others.

(*otto per mille* system). Later, two additional plans were introduced – *cinque per mille* and *due per mille* – which allowed taxpayers to assign 0.5% of their tax liability to other non-profit non-governmental organizations, and 0.2% of their taxes to political parties, respectively (Strečanský & Török, 2016). Spain allows individual taxpayers to assign 0.7% of their income tax to either the Catholic Church, charitable organizations, or to the state (Brockmann, Genschel, & Seelkopf, 2016). Japanese taxpayers can assign a portion of their income tax to a rural town (*ibid*). As recorded by Strečanský and Török (2016), Central and Eastern European (CEE) countries have adopted similar plans with a degree of enthusiasm. Hungary kicked off the CEE adoption wave in 1997, with Slovakia, Romania, Lithuania, and Poland following later. While the initial policy justification for the introduction of these plans was not to increase tax compliance per se, but rather to give taxpayers an opportunity to support a charity of their choice, and to provide charities with an additional source of revenue, recent literature suggests these plans could potentially have the unintended consequence of increasing tax compliance. The Czech Republic is in the CEE region but the tax designation has not been introduced into the tax system. Therefore, Czech taxpayers have no previous experience with this feature, thus our results should not be confounded by their *ex-ante* attitudes towards it.

The first potential explanation is a positive change in how taxpayers perceive procedural/institutional justice when they are asked for their opinions (MacCoun, 2005; Tyler, 2006), increasing trust and reciprocal feelings towards the government. Erard and Feinstein (1994) associate tax evasion with disapproval of the uses of tax revenue. A similar association was found by Hanousek and Palda (2004), who studied the relationship between tax compliance and satisfaction with government services. The second potential explanation is based on the idea that allowing agents to express their opinions fosters closer relationships between taxpayers and governments, and discourages taxpayers from taking “exit strategies,” which, in this case, means non-compliance with tax laws (Hirschmann, 1970). The third set of explanations is based on the fact that, if a government allows its own citizens to express their “voice”, this may on its own lead to an increase in utility when tax-payers use this option (Lamberton, De Neve, & Norton, 2018; Torgler, 2005).

In this paper, we focus on the third set of explanations and investigate the effects of preference expression about the use of a part of taxes paid on tax compliance, as the other two sets of explanations require much longer to manifest. We overcome the limitations of

previous studies and conduct an online experiment with several design features that bring it close to a real-world setting and thus increase its external validity, to provide relevant predictions for policy making. Specifically, (i) we use two types of non-student subjects based on who is responsible for filing their tax returns (self-employed and employees), (ii) the order of magnitude of tax-rates and transfers to a non-governmental organization are set similarly as in the tax-codes of countries that introduced it, and (iii) the transfers are actually delivered to the accounts of the recipient organizations. We focus on actual tax-payers, as they would be directly impacted by the policy, and distinguish employees from self-employed, as the latter may have a larger space for tax evasion than the former, who are usually subject to third-party reporting by their employers. This focus helps us to make an informed guess about how a new policy would affect tax collections.

We fill the gap in the current literature in several ways. To the best of our knowledge, there is no other study investigating the causal compliance effects of a tax designation mechanism with real direct payoff consequences, though such policies have been introduced in many countries. We also disentangle two channels of the compliance effect and analyze the heterogeneity of the effect with respect to employment type, and to the tax rates. More generally, we contribute to the literature on tax-compliance experimental methods. Our study uses one of the largest sets of non-student subjects among the non-field experimental studies analyzing aspects of tax compliance, and the design resembles actual tax-designation plans that have been introduced in real-world settings.

Our design allows us to disentangle two immediate potential channels underlying this effect on tax compliance. The first channel is driven by altruism, either in the spirit of Andreoni (1990), when charitable giving on its own increases utility, or when a person genuinely cares about helping others. Eckel and Grossman (1996) provide evidence of higher transfers in dictator games if the recipient is a charitable organization.² The second channel is the power of voice, in which a pure expression of preferences about the uses of taxes collected directly influences compliance. However, the real impact of this approach on tax designation may be limited, since typically only a small fraction of paid taxes could be redirected by taxpayers. Moreover, the expressions of preference are mostly restricted to only a handful of categories of recipients (e.g. churches, charitable organizations, other

²More about experimental literature on altruistic behavior can be found in Andreoni, Harbaugh, and Vesterlund (2010). Note that when giving to NGOs is the motive, it would be more efficient to donate directly and evade taxation than it would be to increase tax compliance.

NGOs) and may not include a taxpayer's preferred choice of beneficiary.

Another key aspect to consider is that, when a tax designation plan is introduced in a country, it mechanically implies a reallocation of some tax revenues from the public budget towards the non-governmental sector, which reduces the resources available to a policy maker.³ Therefore it is important to also investigate the aggregate effects of tax designation on total tax revenues. To do so, we compare two versions of how a tax designation feature can be introduced into a tax system: one version introduces a tax designation feature *within* a current tax rate, and another version introduces the feature *on top* of the current tax rate.

Only a handful of prior experimental studies have analyzed the effects of giving voice to tax payers in a causal way. conducted. Alm, Jackson, and McKee (1993) show that tax compliance is higher when subjects have an opportunity to vote on how tax revenues will be distributed among the group members in laboratory conditions. Other studies that examine the effects of voice expression over financing public goods or state budget expenditures generally find higher compliance (Abbiati, Antinyan, & Corazzini, 2014; Casal, Kogler, Mittone, & Kirchler, 2016; Djawadi & Fahr, 2013; Lamberton et al., 2018). The common limitation of the design of these studies is that the expression of voice has no direct consequences for the allocation of resources, and the subjects, who are mostly students, express preferences over the total tax revenues collected. We argue that these experimental environments more closely resemble an expression of voice through elections than a direct allocation decision via tax designation.

While the approach taken by these studies allows disentanglement of voice expression from the effects of actual consequences, it may overestimate the effect, because the subject expressed preferences over the total tax revenue rather than the small part of taxes paid by her. Another reason for potential overestimation of the effect may stem from studying a student population, as Choo, Fonseca, and Myles (2016) find a sizeable difference in compliant behavior between student and non-student populations. We argue that using non-student subject pool is essential when investigating the potential effects of changes in an institutional setting on the real-world behavior of tax-payers.

³This might be offset by a decrease in initial transfers towards the non-governmental sector, but if one of the declared intentions is to support the non-governmental sector, this compensation is not likely to make up for the full drop in tax revenues.

Lamberton et al. (2018) find higher compliance under the voice expression treatment when they elicit hypothetical evasion in two of their experiments with no actual payoff consequences for their subjects. Finally, as Mittone (2006) and Doerrenberg (2015) suggest, there may be differences in compliant behavior depending on how the “tax” money paid in an experiment is used, i.e., whether it is returned to the experimenter and “burned”, or is actually allocated to a state budget or public organization. To address this, we exogenously vary whether the money paid in taxes and the requested allocations to NGOs are really delivered to the organization’s accounts or not.

Our results reveal no significant direct effects of a tax designation mechanism on overall tax compliance for either of our two subject groups. We do find some evidence of effects on the probability of being fully compliant, but it depends on employment status: for employees, we find a small positive and statistically significant effect and thus replicate the results of previous literature, but we find a null effect on the self-employed who we argue are a more important group for policy makers, because they face the largest opportunity to evade taxes. Further, we find strong evidence of an association of tax evasion with reported attitudes toward dishonesty and risk. Our other findings are in line with previous studies with respect to several parameter variations and associations with demographic characteristics.

2 Experimental design

2.1 Task

We build on the usual tax game based on the Allingham and Sandmo (1972) approach to tax evasion, with a refinement by Yitzhaki, 1974. Each subject is asked to report her income (Y_R) that is subject to taxation (tax rate = τ). Remaining unreported income is kept by the subject. The reported income is taxed and the subject receives his/her reported income minus the tax. If we do not consider any audit and if the unreported income is denoted by Y_U , then the net income is $Y_{no\ audit} = (1 - \tau) \times Y_R + Y_U$. However, with probability p there is a tax audit which reveals the true income for certain. In case of positive unreported income, this income is also taxed and a fine is imposed, which is calculated as a multiple F of evaded tax. In case of an audit, the net income is then

$Y_{audit} = (1 - \tau)(Y_R + Y_U) - F \times \tau \times Y_U$ and the expected income from reporting income of Y_R is $\mathbf{E}(Y) = (1 - p) \times [(1 - \tau) \times Y_R + Y_U] + p \times [(1 - \tau)(Y_R + Y_U) - F \times \tau \times Y_U]$.

We follow previous literature with respect to the parametrization of this game, and our parameter choices are in the middle of the range of previously used parameters (Malezieux, 2018). We set the probability of an audit to $p = 0.1$, fine size to $F = 3$, and tax rates to either $\tau = 0.2$ or $\tau = 0.25$. The amount of the lower tax rate approximates the actual income tax rate in the Czech Republic at the time of the experiment. Therefore, expected income under the higher tax rate is $0.75Y_R + 0.9Y_U$ meaning that a risk-neutral person should always choose to report zero income.⁴ In line with existing experimental studies in the tax literature, the task instructions are framed in a tax context.⁵

We employ a within-subject approach to identify potential effects of tax designation and tax rates on compliance. Subjects earn experimental monetary units, tokens, in a single real-effort task. Then, we present four within-subject treatments – income-reporting decisions – labeled “scenarios”, with varying presence of tax designation mechanism and tax rates. The underlying tax game is the same in all of the scenarios. One scenario is randomly drawn to be payoff-relevant at the end of the experiment.⁶

We employ a between-subject approach to identify channels of potential tax designation effects and potential “tax revenue burning” effects that was present in previous studies (Doerrenberg, 2015; Mittone, 2006). We manipulate (i) the possibility to choose an NGO in the tax designation scenario and (ii) whether the tax revenue from reported income is actually sent to the state budget or not.⁷

The experiment was carried out online with help of a market research agency, to reach an appropriate subject pool which includes both self-employed and employee subjects. These two groups have very different degrees of opportunities for tax evasion. In general, employees have fewer options how to conceal their income from authorities than do self-employed workers. Moreover, employees in the Czech Republic can ask their employer to automatically process their taxes based on their income from this employer, which reduces

⁴Even for risk averse subjects with Constant Relative Risk Aversion function, evading at least one quarter of their income is preferred to full reporting for all empirically relevant values of γ parameter (e.g. Dave, Eckel, Johnson, & Rojas, 2010).

⁵See Alm, Bloomquist, and McKee (2015); Boylan and Sprinkle (2001) for further evidence.

⁶Details of the experimental procedure and underlying tax game are described in subsection 2.4.

⁷Details of treatment differences are described in subsection 2.3.

the scope for evasion to a minimum.⁸

2.2 Treatments – within subject

Two scenarios out of four (labeled B and $B+$) contain only the underlying tax game with different tax rates (20% or 25%). Two other scenarios (TD and $TD+$) contain a tax designation mechanism in which a predetermined share of taxes paid is sent to an NGO. This share varies with the tax rate, but it is set so that it is always 5% of the subject's reported income. Before the first display, the tax mechanism is introduced on a separate screen followed by two comprehension questions, and then is followed by a detailed explanation of correct answers. So the combination of two tax rates and the presence/absence of a tax designation mechanism leads to our four scenarios:

- **Baseline (B):** A standard tax game with a 20% tax rate .
- **Baseline+ (B+):** A standard tax game with an increased tax rate of 25%.
- **Tax designation (TD):** The tax rate is 20%, but one quarter of tax revenue (5% of reported income) is sent to an NGO.
- **Tax designation+ (TD+):** The tax rate is 25%, but one fifth of tax revenue (5% of reported income) is sent to an NGO.

These scenarios are shown in random order.⁹ To prevent potential confusion from too frequent changes in parameters, we present the tax designation mechanism scenarios either in the first two or the last two scenarios. Each decision screen contains a detailed overview of all important parameters. After inputting reported income, but before it is confirmed, the screen also displays real-time recalculations of all potential outcomes of the specific decision. Subjects are informed of their potential earnings with and without audit and transfers to the NGO following each change in the reported income input. Subjects must confirm each decision before moving to the next scenario.

⁸About 60% of our regular employee subjects use this option and always report whole income. More about differences in tax compliance between these two groups can be found in Alm, Clark, and Leibel (2016) or in Alm (2019).

⁹Order of the within-subject treatments is not significantly associated neither with economic status ($p = 0.713$ using χ^2 test) nor with between-subject treatment assignment ($p = 0.280$ using χ^2 test).

The levels of tax rates are chosen so that the higher tax rate mimics the introduction of a tax designation on top of the lower rate. Comparing compliance between the B and B+ (or TD and TD+) scenarios identifies a potential effect of a tax rate increase. Comparing compliance between B and TD (or B+ and TD+) scenarios identifies potential effects of a tax designation plan within a current tax system. Comparing compliance between B and TD+ scenarios identifies potential effects of a tax designation plan on top of the baseline tax system.

2.3 Treatments – between-subject

In addition to making decisions in the four scenarios in the previous subsection, each subject was randomly allocated into one of four between-subject treatments. We use a 2x2 factorial design to analyze tax compliance along two dimensions: use of experimental tax revenue and an option to choose an NGO in the tax designation scenarios.

The first dimension manipulates whether tax revenue (along with potential fines) is actually used as real tax revenue would be used, or if it is simply a “money burning” process, as in most previous studies. Therefore, the tax revenue could simply be burned (labeled *No Use/ NU* in the rest of the paper) or transferred to the state budget in the Czech Republic (*Transfer to Government / TG*) after the experiment. This variation should identify to what extent previous experimental results from tax games are driven by the fact that they do not fully resemble actual uses of tax revenue.

The second dimension manipulates the way the recipient NGO is chosen. Subjects can either choose the recipient NGO from a list of NGOs (*Choice/C*), or the recipient NGO is predetermined, and subjects are not informed that others were given a choice option (*Altruism/A*). If subjects are assigned to the *Choice* treatment, they can choose one of four NGOs on a list, or opt out of the choice completely, in which case the unallocated tax amount is treated as a tax revenue. The list of NGOs (Czech Red Cross, People in Need, Médecins Sans Frontières, Czech Olympic Committee) includes only well known and positively evaluated NGOs as indicated in a pre-test run before the experiment. For subjects assigned to the *Altruism* treatment, the recipient NGO is the Czech Red Cross, which is the most positively evaluated NGO of the *Choice* treatment options. This variation should identify the channel behind a potential positive effect of tax designation on

tax compliance. The *Altruism* treatment disentangles the “voice” channel from altruistic motives to help NGOs, which is a feature of both variations. Table 1 presents the treatments in a comprehensive way.

Table 1: Treatments

		Choice of recipient NGO	
		Chosen by subject <i>Choice (C)</i>	Pre-determined <i>Altruism (A)</i>
Use of tax revenue	<i>No use (NU)</i>	Four scenarios in randomized order (B, B+, TD, TD+)	Four scenarios in randomized order (B, B+, TD, TD+)
	<i>Transfer to Government (TG)</i>	Four scenarios in randomized order (B, B+, TD, TD+)	Four scenarios in randomized order (B, B+, TD, TD+)

2.4 Procedures

Each subject started at a welcome screen introducing the timeline of the experiment, information about the experimental currency (tokens), the corresponding exchange rate to Czech Koruna (CZK), and contacts of the researchers.¹⁰ This is followed by a description of a real effort task in which subjects earn tokens. This task should help their decisions resemble a real-life situation with earned, not “windfall”, money.¹¹ We used a text rewriting task from pictures known as the Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA), which is widely used online; we assumed that our subjects would be familiar with it. Moreover, it does not require any specific technical or mathematical skills. The task description is followed by a practice round and the paid-for rounds. For each correctly answered round, each subject earned 50,000 tokens. The maximum tokens that can be earned in our experiment was 350,000. When the maximum income had been earned, or the time limit expired, the subject moved on to the next phase of the experiment. To minimize variations in income and stress on the subjects with less experience with CAPTCHAs, we set the time limit to three minutes, which was sufficient for the vast majority of the subjects to earn the maximum possible income.

After the earning phase was finished, we introduced the tax game to subjects. They were informed that there are four decision-making scenarios in which they must make a decision about how much income to report, from the same amount of earned income in each scenario. Their understanding of the instructions was tested using comprehension questions with no impact on actual earnings (see Appendix 4). Subjects selected one answer of four. When they were finished, the correct answers were revealed along with a detailed explanation of the correct answer. At the end of the experiment, a computer randomly selected one scenario and their decision(s) from this selected scenario became relevant for their experiment payoff. Subjects were also told about the probability of an audit and related procedures. Instructions were available for the subjects during the whole experiment via a button on the screen. The potential outcomes from their reported income (audited/ non-audited) was also visible on their screens in real time while they

¹⁰An exchange rate of 2,000 tokens = CZK 1 is selected to mimic the usual nominal values of income in the Czech Republic.

¹¹For more about differences in decisions about earned and windfall earnings in the tax game see e.g. Durham, Manly, and Ritsema (2014) or Boylan and Sprinkle (2001).

were filling out the reported income before submitting their decision.

After subjects finished making their decisions in all four scenarios, they were asked to fill out a questionnaire eliciting their subjective opinions about the experiment (difficulty, understanding), attitude towards different forms of cheating based on the World Values Survey (Inglehart et al., 2014), attitudes towards tax systems and use of tax revenue in the Czech Republic, personal experience with the tax payment process, attitude towards NGOs in general and towards the specific NGOs used in our experiment, attitude towards general risk-taking, and the impact of the Covid-19 pandemic on their incomes. We obtained the demographic characteristics of our subjects from the research agency. When the subjects finish the questionnaire, a feedback screen with information about the randomly selected payoff-relevant scenario was displayed together with a breakdown of their decision, potential audit outcome, their personal earnings, and, if the selected scenario included it, information about the transfer to the NGO.

Prior to the online experiment, we organized two pilot sessions in the *Laboratory of Experimental Economics* at the Prague University of Economics and Business to test the clarity of the instructions, subject’s opinions of the selected NGOs, and the technical viability of the software. Subjects were contacted by the research agency with an offer to participate in an online experiment. The experiment was conducted online through a market research agency (MEDIAN s.r.o.) to reach the desired subject pool.

2.5 Sample

We collected data for 830 subjects living in the Czech Republic.¹² Our sample consists of two subgroups: 412 regular employees and 418 self-employed workers. Our sample size allows identification of treatment effects at the size of 0.225 of standard deviation along our between-subject dimensions when we pool the treatment groups together in the orthogonal dimension, and parameters of $\alpha = 0.05$, power $(1 - \beta) = 0.9$, two tailed t-test. When taking the results of Lambertson et al. (2018) as a proxy for our expected effect size of the choice treatment, our sample size provides power of 0.968 to detect this effect at the 5% significance level when pooled over the orthogonal dimension varying the use of

¹²Špalek and Špačková (2016) show that subjects in the Czech Republic react comparably to subjects from other countries to changes in the usual parameters of interest.

tax revenue.¹³

We used stratified random sampling for treatment allocation of subjects, based on dichotomous values of six variables; gender, age, income, size of the municipality of residence, education, and whether or not subject donated to an NGO in the past (all known from the records of the agency). Except for gender and donation to an NGO, we reduced the number of values of the remaining stratification variables by using a cutoff value set such that the proportions of subjects above/below the value roughly followed the distribution of the values of the variable in the labor force population in the Czech Republic, as measured by the Czech Labor Force Survey. In the stratification specification, we use equal proportions in each treatment cell for gender, age, income, and the size of the municipality of residence. We aimed to include one third of subjects with a university degree and two thirds of subjects without any university degree; and for approximately 50% who had made at least one past donation to an NGO, to ensure variation in subject's attitudes towards NGOs, and to study potential heterogeneity in treatment effects. There are no statistically significant differences between the subjects in treatments with respect to these variables.¹⁴ There are also no statistically significant differences between employees and the self-employed with respect to these variables.¹⁵ The mean age of our subjects was 45 and around 46% are women. Table A.1 in Appendix presents a summary of the rest of the demographic characteristics in our sample.

The median final payoff, including a CZK 40 fixed participation fee, was CZK 180 (the mean payoff was CZK 174) for approximately 20 - 25 minutes participation.¹⁶ Subjects could check if any potential transfer to the NGO or the state budget based on their decisions would be realized based on a personal code they received. A list of the codes with payments was presented on the web page of the Laboratory of Experimental Economics.

¹³The G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) has been used for power calculations.

¹⁴The lowest p-value is 0.716; Kruskal-Wallis rank test.

¹⁵The lowest p-value is 0.127 for the age difference; Kruskal-Wallis rank test.

¹⁶This was approximately €6.6 or \$7.8 at the time of the experiment. For a comparison, the mean hourly wage in the Czech Republic is approximately 200 CZK.

3 Results

3.1 Descriptive results

Almost 90% of the subjects earned the full amount of 350,000 tokens; fewer than 1% earned less than 200,000 tokens. Due to this small heterogeneity in earnings, we report compliance decisions as the share of reported income on the earned income in the rest of the paper. Figure 1 presents the means of compliance rates by treatments and scenarios. Overall, the mean compliance rate across all treatments and scenarios is 0.853 ($SD = 0.292$) and there are only minor differences when we break this down into treatments. The compliance rate is close to an upper bound found in the previous literature (Malezieux, 2018).

Looking at basic demographic characteristics, there is significantly higher compliance by self-employed and older subjects (over 45) by 3.6 percentage points (p.p.) and 4.4 p.p. relative to regular employees and younger subjects, respectively.¹⁷ There is also a higher but statistically insignificant compliance rate for females when we make these raw comparisons ($p = 0.170$).¹⁸ These findings are in line with previous literature (Alm, 2019; Alm et al., 2016).

3.2 Overall compliance analysis

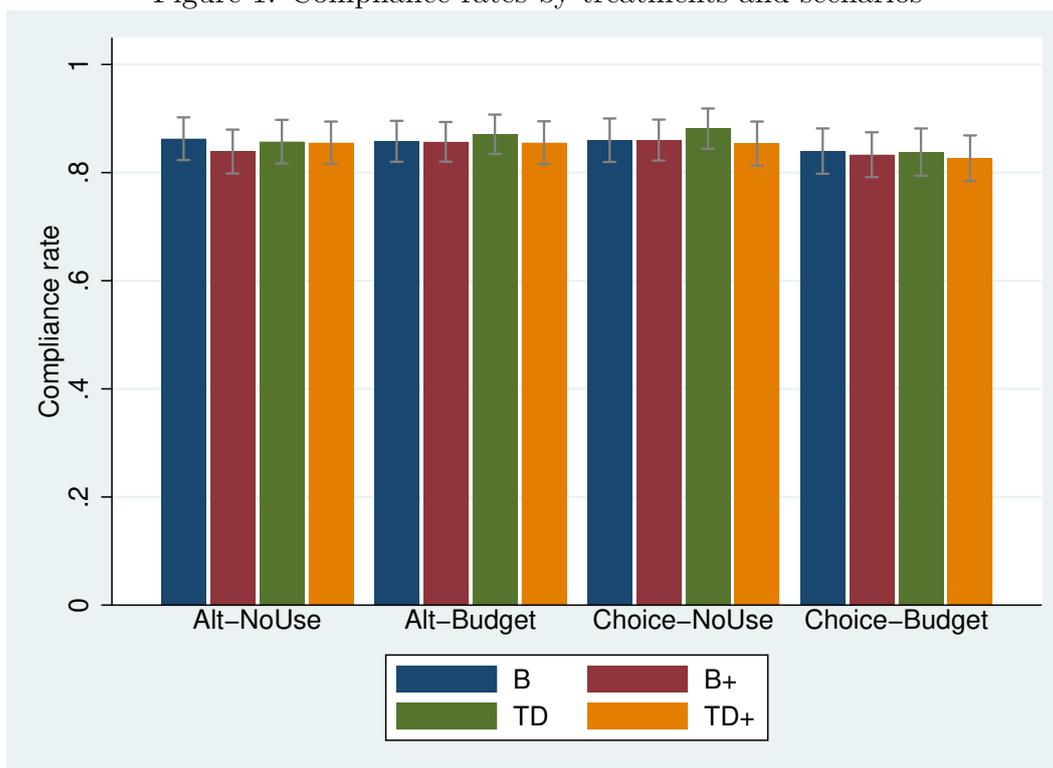
We estimate the effects of exogenously manipulated variables, the treatments, and scenarios, on overall tax compliance. Starting with non-parametric tests, almost all differences in compliance rates between treatments and scenarios are statistically insignificant at any conventional significance level after we adjust for multiple hypothesis testing (the lowest p-value equals 0.184 for these comparisons, using the Holm’s 1979 adjustment method). The only exception is the variation in the tax rate, which effect comes out significant and negative ($p = 0.010$).

Results of ordinary least squares (OLS) regression analysis of the shares of earned income subjects reported appear in Table 2. We employ several specifications: in column 1, we include only the dummy variables indicating treatments and scenarios, and the

¹⁷Corresponding p-values are 0.051 for the employment type and 0.017 for the age category using t-test and standard errors clustered at the subject level.

¹⁸We use the Mann-Whitney rank-sum test with clustering at the subject level. For details of the method see Datta and Satten (2005); Newson (2002).

Figure 1: Compliance rates by treatments and scenarios



socio-demographic controls used in stratification (gender, age, education, size of the municipality of residence, income, and whether the subject had made a past donation to an NGO). In columns 2-7, we additionally control for attitudes towards cheating (*Dishonesty*), towards NGOs (*Disliking NGOs*), and towards the current tax system in the country (*Tax system satisfaction*) by using one variable in each of these dimensions, obtained via a principal component analysis from the corresponding sets of questionnaire answers.¹⁹ In column 3, we add interaction terms between the treatment/scenarios and the self-employed dummy variables to estimate the treatment effects for both subject pools. Columns 4 and 5 estimate the specification in column 2 but separately for the two subject pools, for the clarity of interpretation. A potential concern might be that the experiment was too complicated and confusion on the part of subjects might confound our results. Therefore, in column 6 and 7 we restrict the analysis to subjects who answered all the comprehension questions correctly, and estimate the specifications in columns 4

¹⁹The influence of all individual variables on creating these resulting single measures goes in the intuitively expected ways. We label these measures with names suggesting directions for changes in the measures: Dishonesty, Tax-system satisfaction, and Disliking NGOs. More information about this approach can be found in Jackson (2005). More information about questionnaire answers and the differences between subgroups can be found in Appendix 4

and 5, respectively.²⁰

²⁰The share of subjects with full understanding and an average number of correctly answered control questions does not differ across the two subject groups ($p = 0.144$ for employees and $p = 0.145$ for the self-employed).

Table 2: Regressions - Overall compliance

	(1)	(2)	(3)	(4) self-empl.	(5) empl.	(6) self-emp.(correct)	(7) empl. (correct)
Choice of NGO	-0.007 (0.018)	-0.012 (0.017)	0.020 (0.027)	-0.042* (0.022)	0.023 (0.027)	-0.058* (0.033)	0.077** (0.038)
Transfer to government	-0.011 (0.018)	-0.018 (0.018)	-0.029 (0.027)	-0.007 (0.022)	-0.026 (0.027)	0.010 (0.035)	-0.014 (0.030)
Scenario “+” (Higher tax rate)	-0.011** (0.004)	-0.011** (0.004)	-0.000 (0.006)	-0.022*** (0.006)	-0.000 (0.006)	-0.018* (0.010)	-0.005 (0.008)
Scenario “TD” (Tax-designation)	0.004 (0.005)	0.004 (0.005)	0.004 (0.008)	0.003 (0.007)	0.004 (0.008)	0.000 (0.010)	-0.020 (0.013)
Self- employed	0.037** (0.018)	0.033* (0.018)	0.064* (0.035)				
Self-employed Choice			-0.064* (0.035)				
Self-employed × Transfer to government			0.024 (0.035)				
Self-employed × Higher tax rate			-0.022** (0.008)				
Self-employed × Tax designation			-0.001 (0.011)				
Other demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<u>“Attitudinal” controls</u>							
Dishonesty		-0.039*** (0.007)	-0.039*** (0.007)	-0.051*** (0.010)	-0.027*** (0.009)	-0.057*** (0.021)	-0.031** (0.013)
Tax system satisfaction		-0.006 (0.006)	-0.006 (0.006)	-0.007 (0.008)	-0.007 (0.010)	0.006 (0.013)	-0.016 (0.015)
Disliking NGOs		-0.005 (0.005)	-0.006 (0.005)	-0.007 (0.006)	-0.006 (0.008)	-0.007 (0.010)	-0.012 (0.010)
Risk attitude (Self-reported)		-0.027*** (0.007)	-0.027*** (0.007)	-0.021** (0.008)	-0.033*** (0.011)	-0.027** (0.013)	-0.021 (0.018)
Constant	0.795*** (0.032)	0.920*** (0.037)	0.902*** (0.041)	0.977*** (0.045)	0.887*** (0.055)	1.044*** (0.067)	0.988*** (0.057)
Observations		3320		1672	1648	684	592
R ²	0.012	0.081	0.100	0.149	0.072	0.162	0.111

OLS. Standard errors (in parentheses) adjusted for clustering at subject level. Statistically significant in two-tailed tests at: * 10%, ** 5 %, *** 1%. The dependent variable is reported share of earned income.

Columns 6 and 7 includes only subjects who answered all comprehension questions correctly. Other demographic controls include gender, age, education, size of the municipality of residence, income, and whether the subject has made a past donation to an NGO.

The main take-away is that our between-subject variations do not have a robust effect on the overall tax compliance. The estimated coefficients of *Choice of NGO* and *Transfer to government* from column 2 are small and not significantly different from zero ($p = 0.518$ and $p = 0.246$, respectively). When adding interactions with employment type in column 3, we find compliance for the self-employed to be lower by 4.4 p.p. when they can choose from the list of NGOs (coefficient *Self-employed X Choice + Choice*, $p = 0.047$). Our results suggest that the *Choice* treatment might have the opposite effect on compliance for the two subgroups, as evident from columns 4 and 5 (and 6 and 7), where the coefficients of *Choice of NGO* have the opposite signs. Although it is not clear what the channel for this behavior is, this evidence points to the risk that introducing a tax designation mechanism allowing a recipient choice could potentially have adverse effects on compliance of some tax payers. Other results are qualitatively similar to previous literature (Choo et al., 2016; Gërkhani & Schram, 2006): Self-employed subjects report significantly higher shares of their income, by approximately 3 to 6 p.p., depending on specification, and a higher tax rate leads to lower compliance by about 1.1 p.p., which is solely driven by the self-employed, as is evident from column 5. From the control “attitudinal” variables, two are significantly correlated with compliance across all specifications: acceptance of dishonest behavior (“*Dishonesty*”) and self-reported risk aversion.²¹

Another approach to the data is to run a proper *intensive margin* analysis including only those subjects who report positive shares of income in all scenarios. The results are qualitatively the same with minimal changes in the size of the estimated coefficients. This is because only 4.7% of the subjects switch from full evasion in one scenario to reporting a positive share of income in at least one other scenario in our sample. We employ tobit and hurdle models with several different specifications as robustness checks for overall compliance analysis. The results do not qualitatively differ from the results presented in Table 2.

3.3 Extensive margin analysis

Similar to subjects in previous studies, a large share of subjects report their whole income. 61.6% of our subjects are fully compliant for all four decisions and report the full amount of

²¹For more about the general validity of hypothetical measures, see Bauer, Chytilová, and Miguel (2020) and Falk et al. (2018).

earned income, while around 70% of all decisions of all subjects report their full income. Given limited variation in reporting, we analyze switching behavior between reporting full income and any under-reporting in this section. Lichard, Hanousek, and Filer (2019) consider tax evasion to be a two-stage decision making process. First, an agent decides whether to be honest or not, and if not, then the second-stage decision is about the size of evasion. The mean of dishonest decisions of those subjects who are fully compliant in at least one scenario and dishonest in at least one other scenario is 57.4% of earned income (median 71.4%) and there are almost no decisions reporting between 90% and 100% (boundaries not included) of earned income. This pattern in the data is also consistent with Gneezy, Kajackaite, and Sobel (2018), who introduce a fixed cost of lying into the utility function.

We use a binary probability approach to estimate the effects of exogenously manipulated variables on truthful reporting. Our dependent variable has a value 1 if the compliance decision is to report the full amount earned, and 0 otherwise. We employ a linear probability model (LPM) and logit model for estimation. Both models provide qualitatively similar results, so for the sake of brevity and convenience of interpretation, we report only estimates of LPM. Table 3 presents estimates of seven specifications that are the same as in the overall compliance analysis.

Table 3: Regressions: full -compliance analysis

	Truthful reporting						
	(1)	(2)	(3)	(4) self-emp	(5) employees	(6) self-emp (correct)	(7) employees (correct)
Choice of NGO	0.002 (0.029)	-0.004 (0.027)	0.029 (0.040)	-0.039 (0.037)	0.034 (0.040)	-0.030 (0.047)	0.106* (0.060)
Transfer to government	-0.031 (0.029)	-0.042 (0.028)	-0.081** (0.040)	-0.003 (0.037)	-0.079* (0.040)	0.068 (0.050)	-0.056 (0.057)
Scenario “+” (Higher tax rate)	-0.020*** (0.008)	-0.020*** (0.008)	-0.005 (0.011)	-0.036*** (0.011)	-0.005 (0.011)	-0.059*** (0.019)	-0.030 (0.020)
Scenario TD (Tax designation)	0.019** (0.008)	0.019** (0.008)	0.029** (0.012)	0.010 (0.011)	0.029** (0.012)	0.006 (0.017)	0.017 (0.021)
Self- employed	0.038 (0.029)	0.034 (0.028)	0.053 (0.049)				
Self-employed×Choice			-0.067 (0.055)				
Self-employed×Transfer to government			0.079 (0.055)				
Self-employed ×Higher tax rate			-0.031** (0.016)				
Self-employed ×Tax designation			-0.020 (0.017)				
Other demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dishonesty		-0.060*** (0.009)	-0.059*** (0.009)	-0.073*** (0.013)	-0.047*** (0.013)	-0.099*** (0.023)	-0.067*** (0.024)
Tax system satisfaction		-0.007 (0.009)	-0.007 (0.009)	-0.017 (0.012)	0.004 (0.014)	-0.004 (0.017)	-0.014 (0.022)
Disliking NGOs		-0.001 (0.008)	-0.002 (0.008)	-0.010 (0.011)	0.005 (0.013)	-0.014 (0.015)	-0.017 (0.017)
Risk aversion (Self-reported)		-0.032*** (0.010)	-0.032*** (0.010)	-0.037*** (0.014)	-0.027 (0.016)	-0.043** (0.018)	-0.000 (0.027)
Constant	0.626*** (0.046)	0.780*** (0.057)	0.770*** (0.061)	0.867*** (0.075)	0.711*** (0.080)	0.975*** (0.100)	0.849*** (0.102)
Observations		3320		1672	1648	684	592
R ²	0.013	0.078	0.082	0.119	0.059	0.173	0.130

LPM. Standard errors (in parentheses) adjusted for clustering at subject level. The dependent variable is 1 for a full compliance and 0 otherwise.

Statistically significant in two-tailed tests at: * 10%, ** 5 %, *** 1%.

Columns 6 and 7 include only subjects who answered all comprehension questions correctly. Other demographic controls include gender, age, education, size of the municipality of residence, income, and whether the subject has made a past donation to NGOs.

Compared to the results of overall compliance, we find that the *Tax designation* treatment results in a higher probability of being fully compliant of about 2 p.p. ($p < 0.05$). When broken down by subject-group in columns 4 and 5, we can see that this result is driven solely by regular employees, who are more likely to report truthfully by about 3 p.p. For the self-employed, we do not find any statistically significant effect. Further, we find that subjects react to higher tax rates with a 2 p.p. lower probability of truthful reporting. This effect is driven solely by the self-employed. Next, we provide suggestive evidence in favor of a different response from self-employed and regular employees to our exogenous variations with respect to the use of tax revenue (*transfer to government*): employees demonstrate about an 8 p.p. lower probability of reporting truthfully (column 3, $p = 0.045$; column 6, $p = 0.05$). From the “attitudinal” control variables, similarly to the overall compliance analysis, truthful reporting is significantly associated with acceptance of dishonest behavior and risk aversion.

3.4 Discussion of results

To summarize our results, we do not find any significant effects of a tax designation mechanism on overall tax compliance. However, we do find a small effect of tax designation on the extensive margin, which is predominantly driven by the behavior of employees. This complements Lambertson et al. (2018), who identify a significant increase in the probability of compliance when students in a laboratory tax game had an opportunity to express their preferences about the use of tax revenue. We replicate this result on our subject group of employees who, similarly to students, usually do not file their taxes on their own. Moreover, the effect of the *Choice* treatment for this group is statistically insignificant, which supports the altruistic channel as a driver for this behavior, rather than “voice expression”. We also want to highlight the null effect that we find in the subgroup of the self-employed, who are arguably a more important target group for policy makers, as they have a greater scope for tax evasion, , though there are notably fewer self-employed in the population than employees.

We need to be cautious when interpreting differences between our two subject groups. Being part of either the self-employed or regular employees group is not an exogenous decision, but a result of a self-selection process. The temptation to exploit different cor-

relations of compliance with some experimental variations by targeting tax policies to different employment types might result in changes in employment type instead. Therefore, when comparing our two sub-samples, we can only say that the behavior of the self-employed is more sensitive to changes in tax system parameters.

We used self-employed and regular employees sub-samples to proxy for potential experience with tax evasion when filling out tax returns in the past, given that most employees are subject to third-party reporting of their income taxes by their employers. However, as some employees may file their own taxes, and some self-employed workers hire an accountant to file their taxes, we also replicate our analysis using self-reported information about filling out tax-returns. Instead of the self-employed and employees categories, we divide the sample into two groups based on whether subject's taxes of subjects are filed automatically by employers vs. "other" ways, which we interpret as allowing more room for tax-evasion. The results are presented in the Appendix, in Tables B.1 and B.2. The estimates are qualitatively similar to the main analysis presented in Section 3. The only robust difference we find is for the analysis of full compliance, where having an opportunity for tax evasion (tax returns are not filled out automatically by employers) is associated with a 6.4 p.p. higher probability of truthful reporting ($p = 0.032$). This result is in line with our overall compliance analysis and with previous literature (Gërkhani & Schram, 2006).

To make our study relevant for practitioners and policy makers, unlike previous studies, our design closely mimics the actual tax designation mechanisms introduced in many countries. Subjects can express their preferences about the use of only a small part of the overall tax revenue, but, their decision has real monetary consequences. Second, our subjects are actual taxpayers, and at least half of them (mostly the self-employed) have real-life experience with decisions involving potential tax evasion. Third, subjects in our experiment have to earn their endowment, in contrast to other studies that used windfall endowments.

Another potentially informative result for policy makers is the attitude toward introduction of a tax designation system; the Czech Republic has not (yet) adopted such a plan. Around two thirds of our subject indicated via the questionnaire that they would welcome introduction of a tax designation plan into the tax system, while only 12% opposed the idea. A limitation of our study is its one-shot nature, as we do not test a long run

effects of this system, though it might work through building trust towards government and increase the perceived legitimacy and fairness of the tax system (Erard & Feinstein, 1994; Tyler, 2006). Therefore, we cannot discount the possibility that the tax designation mechanism might affect tax compliance in long run.

Another important message from our analysis is that the “standard” associations with tax compliance found in the previous literature remain valid when the tax system is augmented by a designation mechanism. Sizable and significant correlations of risk attitudes and social norms about honesty are in accordance with Batrancea et al’s (2019) findings about both “soft” and “hard” compliance determinants being relevant for the resulting tax compliance decisions.

4 Conclusion

We experimentally test hypotheses about the effects of a tax designation mechanism on tax compliance. We use an online experiment with 830 subjects who are actual taxpayers, with either a self-employed status or a regular employee contract. We exogenously vary the presence of a tax designation mechanism, the possibility for subject to choose a recipient NGO, tax rates, and use of the total tax revenue. We build our design on the canonical tax game by Allingham and Sandmo (1972). Our experimental tax designation mechanism allows subjects to express their preferences for the use of their taxes by redirecting part of their paid tax to a charitable organization, which is either pre-specified (the Czech Red Cross), or which they can choose from a menu of several well known charitable organizations. Our approach mimics the actual tax designation mechanism introduced in many countries, rather than allowing taxpayers to express their preferences, which have been used in previous studies that are closer to real-life voting decisions than tax-paying.

We find no consistent significant effects of the presence of a tax designation mechanism on overall tax compliance. We do find a small positive effect on extensive margin, but only for employees. Our other findings are in line with previous studies with respect to parameter variations and associations with demographic characteristics. We find higher compliance by the self-employed relative to regular employees. They are also more sensitive to changes in parameters: if there is a significant effect of some exogenous parameter change in our

analysis, it is likely to be associated with self-employed status. Our results convey two main messages, one for methodology and one for policy making.

The usual experimental subjects, university students, do not often make tax reporting decisions in real life. Several previous studies have also used a hypothetical tax compliance decisions to estimate the effect of expressing preferences about the use of tax revenue with no real payoff consequences. We overcome these departures from actual tax compliance decisions and observe different results. Extrapolation of experimental results to real-life decisions might be misleading for these specific types of decisions.²²

Although a tax designation mechanism is positively perceived by tax payers in our experiment, our findings show that it is probably not an appropriate tool to drive immediate increases in tax compliance. It might be suitable to finance a non-government sector, or to build closer relationships with taxpayers in the long run (in the spirit of Erard & Feinstein, 1994) and may lead to increases in compliance through this channel. However, when higher tax compliance is an immediate goal of tax system changes, our results imply that a standard change in tax system parameters, as described in previous studies, is more likely to be efficacious.

²²More on extrapolation of the results of economic experiments to other subject types, situations, and environment can be found in List (2020), or, more specifically for tax compliance behavior, in Alm et al. (2015) .

References

- Abbiati, L., Antinyan, A., & Corazzini, L. (2014). *Are taxes beautiful? A survey experiment on information, tax choice and perceived adequacy of the tax burden* (Discussion Paper No. 02/2014). Friedrich-Alexander University Erlangen-Nuremberg, Institute for Economics.
- Allingham, M. G., & Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of Public Economics*, 1(3-4), 323–338.
- Alm, J. (2019). What motivates tax compliance? *Journal of Economic Surveys*, 33(2), 353–388.
- Alm, J., Bloomquist, K. M., & McKee, M. (2015). On the external validity of laboratory tax compliance experiments. *Economic Inquiry*, 53(2), 1170–1186.
- Alm, J., Clark, J., & Leibel, K. (2016). Enforcement, socioeconomic diversity, and tax filing compliance in the u nited s tates. *Southern Economic Journal*, 82(3), 725–747.
- Alm, J., Jackson, B. R., & McKee, M. (1993). Fiscal exchange, collective decision institutions, and tax compliance. *Journal of Economic Behavior & Organization*, 22(3), 285–303.
- Andreoni, J. (1990). Impure altruism and donations to public goods: A theory of warm-glow giving. *Economic Journal*, 100(401), 464–477.
- Andreoni, J., Harbaugh, W. T., & Vesterlund, L. (2010). Altruism in experiments. In *Behavioural and experimental economics* (pp. 6–13). Springer.
- Batrancea, L., Nichita, A., Olsen, J., Kogler, C., Kirchler, E., Hoelzl, E., . . . Zukauskas, S. (2019). Trust and power as determinants of tax compliance across 44 nations. *Journal of Economic Psychology*, 74, 102191.
- Bauer, M., Chytilová, J., & Miguel, E. (2020). Using survey questions to measure preferences: Lessons from an experimental validation in Kenya. *European Economic Review*, 103493.
- Boylan, S. J., & Sprinkle, G. B. (2001). Experimental evidence on the relation between tax rates and compliance: The effect of earned vs. endowed income. *Journal of the American Taxation Association*, 23(1), 75–90.
- Brockmann, H., Genschel, P., & Seelkopf, L. (2016). Happy taxation: Increasing tax compliance through positive rewards? *Journal of Public Policy*, 36(03), 381–406.

doi: 10.1017/S0143814X15000331

- Casal, S., Kogler, C., Mittone, L., & Kirchler, E. (2016). Tax compliance depends on voice of taxpayers. *Journal of Economic Psychology*, *56*, 141–150.
- Choo, C. L., Fonseca, M. A., & Myles, G. D. (2016). Do students behave like real taxpayers in the lab? evidence from a real effort tax compliance experiment. *Journal of Economic Behavior & Organization*, *124*, 102–114.
- Datta, S., & Satten, G. A. (2005). Rank-sum tests for clustered data. *Journal of the American Statistical Association*, *100*(471), 908–915.
- Dave, C., Eckel, C. C., Johnson, C. A., & Rojas, C. (2010). Eliciting risk preferences: When is simple better? *Journal of Risk and Uncertainty*, *41*(3), 219–243. doi: 10.1007/s11166-010-9103-z
- Djawadi, B. M., & Fahr, R. (2013). *The impact of tax knowledge and budget spending influence on tax compliance* (Discussion Paper No. 7255). IZA.
- Doerrenberg, P. (2015). Does the use of tax revenue matter for tax compliance behavior? *Economics Letters*, *128*, 30–34.
- Durham, Y., Manly, T. S., & Ritsema, C. (2014). The effects of income source, context, and income level on tax compliance decisions in a dynamic experiment. *Journal of Economic Psychology*, *40*, 220–233.
- Eckel, C. C., & Grossman, P. J. (1996). Altruism in anonymous dictator games. *Games and economic behavior*, *16*(2), 181–191.
- Erard, B., & Feinstein, J. S. (1994). Honesty and evasion in the tax compliance game. *The RAND Journal of Economics*, 1–19.
- Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D., & Sunde, U. (2018). Global evidence on economic preferences. *The Quarterly Journal of Economics*, *133*(4), 1645–1692.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using g*power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*, 1149–1160.
- Gërxxhani, K., & Schram, A. (2006). Tax evasion and income source: A comparative experimental study. *Journal of Economic Psychology*, *27*(3), 402–422.
- Gneezy, U., Kajackaite, A., & Sobel, J. (2018). Lying aversion and the size of the lie. *American Economic Review*, *108*(2), 419–53.

- Hanousek, J., & Palda, F. (2004). Quality of government services and the civic duty to pay taxes in the czech and slovak republics, and other transition countries. *Kyklos*, 57(2), 237–252.
- Hirschmann, A. O. (1970). *Exit, voice and loyalty*. Cambridge, MA: Harvard University Press.
- Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian journal of statistics*, 65–70.
- Inglehart, R., Haerpffer, C., Moreno, A., Welzel, C., Kizilova, K., Diez-Medrano, J., . . . others (2014). World values survey: Round six-country-pooled datafile version. *Madrid: JD Systems Institute*, 12.
- Jackson, J. E. (2005). *A user's guide to principal components* (Vol. 587). John Wiley & Sons.
- Kleven, H. J., Knudsen, M. B., Kreiner, C. T., Pedersen, S., & Saez, E. (2011). Unwilling or unable to cheat?: Evidence from a tax audit experiment in Denmark. *Econometrica*, 79(3), 651–692.
- Lamberton, C., De Neve, J.-E., & Norton, M. I. (2018). The power of voice in stimulating morality: Eliciting taxpayer preferences increases tax compliance. *Journal of Consumer Psychology*, 28(2), 310–328.
- Lichard, T., Hanousek, J., & Filer, R. K. (2019). Hidden in plain sight: Using household data to measure the shadow economy. *Empirical Economics*, 1–28.
- List, J. A. (2020). Non est disputandum de generalizability? a glimpse into the external validity trial. *NBER Working Paper*(w27535).
- Luttmer, E. F., & Singhal, M. (2014). Tax morale. *Journal of Economic Perspectives*, 28(4), 149–168. doi: 10.1257/jep.28.4.149
- MacCoun, R. J. (2005). Voice, control, and belonging: The double-edged sword of procedural fairness. *Annu. Rev. Law Soc. Sci.*, 1, 171–201.
- Malezieux, A. (2018). A practical guide to setting up your tax evasion game.
- Mittone, L. (2006). Dynamic behaviour in tax evasion: An experimental approach. *The Journal of Socio-Economics*, 35(5), 813–835.
- Newson, R. (2002). Parameters behind “nonparametric” statistics: Kendall’s tau, somers’ d and median differences. *The Stata Journal*, 2(1), 45–64.
- Slemrod, J., & Yitzhaki, S. (2002). Tax avoidance, evasion, and administration. In

- Handbook of public economics* (Vol. 3, pp. 1423–1470). Elsevier.
- Špalek, J., & Špačková, Z. (2016). Daňové úniky v laboratoři: vliv kontextu na ochotu platit daně [tax evasion in the lab: How context affects tax compliance]. *Politická ekonomie*, 2016(5), 524–540.
- Strečanský, B., & Török, M. (Eds.). (2016). *Assessment of the Impact of the Percentage Tax Designations: Past, Present, Future*. ERSTE Stiftung Studies.
- Torgler, B. (2005). Tax morale and direct democracy. *European Journal of Political Economy*, 21(2), 525–531.
- Tyler, T. R. (2006). Psychological perspectives on legitimacy and legitimation. *Annu. Rev. Psychol.*, 57, 375–400.
- Yitzhaki, S. (1974). A note on income tax evasion: A theoretical analysis. *Journal of Public Economics*, 3, 201–202.

Appendices

A. Demographic characteristics of subjects

Table A.1: Demographic characteristics of subjects

Characteristic	Employees (N=412)	Self-employed (N=418)	Testing for differences p-values
Age (mean)	44.39 (10.25)	45.52 (10.95)	0.127
Female (share)	0.49 (0.50)	0.44 (0.50)	0.148
Education (shares)			
- University degree	0.36 (0.48)	0.38 (0.48)	0.625
- High school (with a leaving-exam)	0.45 (0.50)	0.50 (0.50)	0.162
- Lower	0.19 (0.39)	0.12 (0.33)	0.010***
Net income above 25 000 CZK (share)	0.50 (0.50)	0.49 (0.50)	0.729
Municipality size (shares)			
< 20k citizens	0.50 (0.50)	0.48 (0.50)	0.680
20k - 100k citizens	0.19 (0.39)	0.17 (0.38)	0.467
> 100k citizens	0.31 (0.46)	0.35 (0.48)	0.299

Standard deviations in parentheses. Asterisk denotes that Pearson's χ^2 test is used to compare shares.

Mann-Whitney test used to compare means.

P-values displayed without adjustment for multiple hypotheses testing.

B. Robustness checks

In the following robustness checks, we have replaced the classification by employment type with a classification based on whether the individual submits their tax returns themselves or whether their employer does it for them.

Table B.1: Overall compliance

	(1)	(2)	(3)	(4) FTR	(5) auto TR	(6) FTR (correct)	(7) auto TR (correct)
Choice of NGO	-0.007 (0.018)	-0.012 (0.017)	0.044 (0.035)	-0.037* (0.019)	0.042 (0.035)	-0.052** (0.026)	0.172*** (0.054)
Transfer to government	-0.011 (0.018)	-0.018 (0.018)	0.007 (0.035)	-0.030 (0.020)	0.014 (0.036)	-0.022 (0.027)	0.049 (0.056)
Scenario “+” (Higher tax rate)	-0.011** (0.004)	-0.011** (0.004)	0.005 (0.009)	-0.019*** (0.005)	0.005 (0.009)	-0.017** (0.008)	0.002 (0.009)
Scenario “TD” (Tax-designation)	0.004 (0.005)	0.004 (0.005)	0.009 (0.011)	0.001 (0.006)	0.009 (0.011)	-0.005 (0.009)	-0.022 (0.018)
Filling tax return (FTR)	0.051** (0.021)	0.046** (0.021)	0.119*** (0.040)				
FTR x Choice			-0.081** (0.040)				
FTR x Transfer to government			-0.035 (0.040)				
FTR x Higher tax rate			-0.024** (0.010)				
FTR x Tax designation			-0.007 (0.013)				
Other demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
“Attitudinal” controls							
Dishonesty		-0.039*** (0.007)	-0.038*** (0.007)	-0.046*** (0.008)	-0.024* (0.012)	-0.046*** (0.015)	-0.032 (0.021)
Tax system satisfaction		-0.006 (0.006)	-0.006 (0.006)	-0.006 (0.007)	-0.007 (0.012)	0.010 (0.011)	-0.017 (0.020)
Disliking NGOs		-0.005 (0.005)	-0.005 (0.005)	-0.005 (0.005)	-0.007 (0.010)	-0.003 (0.008)	-0.017 (0.013)
Risk aversion (Self-reported)		-0.027*** (0.007)	-0.027*** (0.007)	-0.0207*** (0.007)	-0.044*** (0.014)	-0.024** (0.012)	-0.052* (0.029)
Constant	0.782*** (0.0336)	0.908*** (0.038)	0.855*** (0.046)	0.951*** (0.040)	0.893*** (0.074)	1.061*** (0.054)	0.971*** (0.070)
Observations		3320		2,272	1,048	952	324
R ²	0.021	0.098	0.104	0.122	0.080	0.129	0.255

LPM. Standard errors (in parentheses) adjusted for clustering at subject level. Statistically significant in two-tailed tests at: * 10%, ** 5 %, *** 1%.

Columns 6 and 7 includes only subjects who answered all comprehension questions correctly. Other demographic controls include gender, age, education, size of the municipality of residence, income, and whether the subject has made a past donation to an NGO.

Table B.2: Full-compliance

	(1)	(2)	(3)	(4) FTR	(5) auto TR	(6) FTR (correct)	(7) auto TR (correct)
Choice of NGO	0.002 (0.029)	-0.004 (0.027)	0.088* (0.052)	-0.048 (0.032)	0.092* (0.052)	-0.038 (0.043)	0.212** (0.081)
Transfer to government	-0.030 (0.029)	-0.041 (0.028)	-0.054 (0.052)	-0.036 (0.032)	-0.047 (0.052)	0.007 (0.043)	-0.031 (0.088)
Scenario “+” (Higher tax rate)	-0.021*** (0.008)	-0.021*** (0.008)	0.0095 (0.015)	-0.034*** (0.009)	0.010 (0.015)	-0.055*** (0.016)	-0.019 (0.027)
Scenario TD (Tax designation)	0.019** (0.008)	0.019** (0.008)	0.032** (0.015)	0.013 (0.010)	0.032** (0.015)	0.008 (0.016)	0.019 (0.025)
Filing tax return (FTR)	0.070** (0.032)	0.064** (0.031)	0.152*** (0.056)				
FTR x Choice			-0.134** (0.061)				
FTR × Transfer to government			0.021 (0.061)				
FTR × Higher tax rate			-0.044** (0.017)				
FTR × Tax designation			-0.019 (0.018)				
Other demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dishonesty		-0.060*** (0.009)	-0.059*** (0.009)	-0.068*** (0.011)	-0.038** (0.017)	-0.075*** (0.020)	-0.098*** (0.027)
Tax system satisfaction		-0.007 (0.009)	-0.007 (0.009)	-0.012 (0.011)	0.003 (0.018)	-0.000 (0.015)	-0.015 (0.027)
Disliking NGOs		-0.001 (0.008)	-0.001 (0.008)	-0.006 (0.009)	0.006 (0.016)	-0.010 (0.012)	-0.022 (0.029)
Risk aversion (Self-reported)		-0.033*** (0.010)	-0.033*** (0.010)	-0.026** (0.012)	-0.046** (0.020)	-0.033* (0.017)	-0.032 (0.036)
Constant	0.601*** (0.048)	0.758*** (0.058)	0.696*** (0.069)	0.814*** (0.065)	0.754*** (0.107)	0.994*** (0.086)	0.888*** (0.124)
Observations		3320		2,272	1,048	952	324
R ²	0.018	0.081	0.086	0.102	0.071	0.115	0.242

LPM. Standard errors (in parentheses) adjusted for clustering at subject level. Statistically significant in two-tailed tests at: * 10%, ** 5 %, *** 1%.

Columns 6 and 7 include only subjects who answered all comprehension questions correctly. Other demographic controls include gender, age, education, size of the municipality of residence, income, and whether the subject has made a past donation to an NGO.

C Questionnaire results

We asked subjects to answer a series of questions in the last part of the experiment. We use their answers to control for potential correlations with their behavior and to explore potential channels for the observed behavior. Table C.1 summarizes subject's answers for each subgroup, together with p-values of χ^2 tests of differences between the subgroups. For most questions, there are no statistically significant differences between our two subgroups after correcting for multiple hypothesis testing (Holm, 1979). Outside of the questions where differences based on subgroup characteristics are expected (e.g. who files their tax returns or their experience with tax audit), there are significant differences only in responses to the two questions asking about subject attitude towards the current tax system in the Czech Republic. However, these questions are included in the measures we use as control variables in most of our specifications.

Table C.1: Questionnaire answers

Question	Employees	Self-employed	diff.=0 Prob> χ^2
Experiment opinion			
Understanding of the tasks: 1 No, 7 Yes	5.16	5.47	0.056
Difficulty of effort task: 1 Easy, 7 Difficult	2.42	2.42	0.605
Acceptance of different forms of cheating (creating measure <i>Dishonesty</i>)			
Requesting benefits from gov if not eligible: 1 Never, 7 Always	2.34	2.33	0.845
Free riding in public transport: 1 Never, 7 Always	2.57	2.44	0.688
Stealing public property: 1 Never, 7 Always	1.60	1.51	0.296
Tax cheating, if possible: 1 Never, 7 Always	1.97	2.06	0.281
Taking bribes when fulfilling duties: 1 Never, 7 Always	1.88	1.69	0.094
Opinion of the tax system in the Czech Republic (creating measure <i>Tax system satisfaction</i>)			
Tax rates too high.: 0 DK, 1 Agree, 7 Disagree (DK 21)	2.45	2.72	0.029
Tax system is unfair: 0 DK, 1 Agree, 7 Disagree (DK 48)	2.66	2.96	0.016
Tax laws unclear and complicated: 0 DK, 1 Agree, 7 Disagree (DK 26)	2.10	2.14	0.936
Too frequent changes in tax system: 0 DK, 1 Agree, 7 Disagree (DK 56)	2.57	2.24	0.013
Tax audits are insufficient: 0 DK, 1 Agree, 7 Disagree (DK 201)	2.43	3.48	0.000
Fines do not discourage evasion: 0 DK, 1 Agree, 7 Disagree (DK 157)	2.41	3.49	0.000
General satisfaction with tax management			
General satisfaction with use of tax revenues: 1 Yes, 7 No	5.36	5.56	0.006
General satisfaction with level of public services: 1 Yes, 7 No	4.29	4.39	0.784
Would you like to decide about part of tax revenue? 1 Yes, 0 No (DK 205)	0.84	0.84	0.908
Experience with taxes			
Who fills out your tax returns?			0.000
Employer	0.59	0.04	0.000
Other	0.41	0.96	
Have you been asked by any tax authority to correct/explain your tax return? 1 Yes, 0 No	0.28	0.46	0.000
Have you been fined for an incorrectly filled out tax return? 1 Yes, 0 No	0.03	0.06	0.079
Opinion about NGOs (creating measure <i>Disliking NGOs</i>)			
NGOs: trustworthy, 1 Agree, 7 Disagree	3.94	3.84	0.137
NGOs: important for society, 1 Agree, 7 Disagree	3.35	3.29	0.646
NGOs: their projects not sustainable, low benefits for recipients, 1 Agree, 7 Disagree	4.04	4.31	0.406
NGOs: employees misuse bulk of the money, 1 Agree, 7 Disagree	3.63	3.82	0.017
Experience with NGOs and evaluation of the used recipient NGOs			
Cooperation with NGOs (present/past): 1 Yes, 0 No (DWTA 49)	0.32	0.39	0.040
Opinion: Cesky Cerveny Kriz (Czech Red Cross), 0 DK, 1 Negative, 7 Positive (DK 34)	5.35	5.26	0.769
Opinion: Clovek V Tisni (People in Need), 0 DK, 1 Negative, 7 Positive (DK 41)	4.81	4.80	0.987
Opinion: Cesky OlympVybor (Czech Olympic Committee), 0 DK, 1 Negative, 7 Positive (DK 116)	4.10	3.81	0.255
Opinion: Lekari Bez Hranic (Médecins Sans Frontières), 0 DK, 1 Negative, 7 Positive (DK 39)	5.02	4.93	0.350
Self-reported risk attitude: 1 Averse, 7 Loving	3.55	3.62	0.704
Effect of the COVID-19 pandemic on your income			0.000
Notes: Exclusion of "Dont-know" answers for comparisons. The presented p-values are before correcting for multiple hypotheses testing.			
DK: Dont- know, DWTA: Dont want to answer			

D Instructions

D.1 No use scenarios

In this section, you will make decisions in four possible scenarios concerning the payment of tolar taxes from your earnings. Only one scenario will be randomly drawn by the computer at the end of the interview to determine your additional reward. At the moment of your decisions you won't know which scenario will be drawn at the end, and so it is important for you to make decisions in each scenario independently of the other scenarios. In each scenario, you will be asked to complete a tax return in which you will declare the amount of income from the previous part. Declared income will be taxed at the relevant rate, which may differ from the rate in other scenarios. The amount of money that remains after deducting the tax represents your additional reward if that scenario is the one drawn at the end of the survey. Example: If you were granted an income of 1,000 tolar and a tax rate of 15 %, the tax would be calculated at $1,000 * 15 \% = 150$ tolar. So your additional reward in this scenario would be $1,000 - 150 = 850$ tolar. As with actual tax returns, there is also a possibility that your tax return will be audited. The chance that you will be selected for an audit is 10 %. This chance does not change, for example, according to the income you declare. This probability is the same for all scenarios. If you were selected for an audit, your real earnings from the first part would be compared with the income you declared in the tax return. If you did not declare your entire income, you would have to pay the missing tax and you would also be charged a fine amounting to three times the amount of unpaid tax.

D.2 Transfer to government scenarios

In this section, you will make decisions in four possible scenarios concerning the payment of tolar taxes from your earnings. Only one scenario will be randomly drawn by the computer at the end of the interview to determine your additional reward. At the moment of your decisions you will not know which scenario will be drawn at the end, and so it is important for you to make decisions in each scenario independently of the other scenarios. In each scenario, you will be asked to complete a tax return in which you will declare the amount of income from the previous part. Declared income will be taxed at the relevant rate, which may differ from the rate in other scenarios. The amount of money

that remains after deducting the tax represents your additional reward if that scenario is the one drawn at the end of the survey. Example: If you were granted an income of 1,000 tolar and a tax rate of 15 %, the tax would be calculated at $1,000 * 15 \% = 150$ tolar. So your additional reward in this scenario would be $1,000 - 150 = 850$ tolar. As with actual tax returns, there is also a possibility that your tax return will be audited. The chance that you will be selected for an audit is 10 %. This chance does not change, for example, according to the income you declare. This probability is the same for all scenarios. If you were selected for an audit, your real earnings from the first part would be compared with the income you declared in the tax return. If you did not declare your entire income, you would have to pay the missing tax and you would also be charged a fine amounting to three times the amount of unpaid tax. All paid tax and any fines from the scenario drawn for your additional remuneration will be sent to the account of the Ministry of Finance (MF) and will thus become revenue of the state budget. This payment will be sent to the Ministry of Finance in aggregate for all research participants without any stated reason or without identifying the individual participants.

D.3 Choice scenarios

[either D.1 or D.2 plus:] In some scenarios, part of the tax you paid will be transferred to the account of the non-profit organization of your choice. This payment will be sent to the non-profit organization in aggregate for all research participants without any stated reason or without identifying the individual participants. You will choose from the following options:

- Czech Red Cross
- People In Need
- Czech Olympic Committee
- Médecine Sans Frontières
- No organization

D.4 Altruism scenarios

[either D.1 or D.2 plus:] In the following scenarios, part of the tax you paid will be transferred to the account of the non-profit organization, the Czech Red Cross. This payment will be sent to the Red Cross in aggregate for all research participants without any stated reason or without identifying the individual participants.

E Comprehension questions

Please answer the following questions. You will not receive any reward for answering them. The goal of this task is only to make sure you understand the rules correctly.

1. If the amount of your declared income is 1,000 tolar, the tax rate is 10% and you will not be selected for an audit, the amount of the additional remuneration will be (in case the given scenario is drawn at the end of the research):

- 850 tolar
- 1,000 tolar
- 900 tolar
- 100 tolar

Answer: The tax on declared income is $1,000 * 10\% = 100$ tolar. After paying the tax, you will be left with $1,000 - 100 = 900$ tolar. Your possible additional reward is therefore 900 tolar.

2. If you do not declare 20 tolar in income on your tax return, the tax rate is 10% and you will not be selected for an audit:

- Of these 20 tolar, you will pay 2 tolar as a tax and 18 will remain yours.
- You pay a fine of 6 tolar and 14 tolar will remain yours.
- You will pay 2 tolar as a tax and a fine of 6 tolar. You will have 12 remaining tolar.
- You will have 20 tolar left in your reward.

Answer: If you are not selected for an audit, you will have 20 tolar left in your reward.

3. If you do not declare 20 tolar in your tax return, the tax rate is 10% and you have been selected for audit:

- Of these 20 toalars, you will pay 2 toalars as a tax and 18 will remain yours.
- You pay a fine of 6 toalars and 14 toalars will remain yours.
- You will pay 2 toalars as a tax and a fine of 6 toalars. You will have 12 remaining toalars.
- You will have 20 toalars left in your reward.

Answer: If you are selected for an audit, you will pay a tax on unreported income (2 toalars) and a fine of 3 times the unpaid tax (6 toalars). So you will have $20 - 2 - 6 = 12$ toalars.

4. If the amount of income you declare is 1,000 toalars, the tax rate is 10% and half of the tax you pay will be transferred to the account of a non-profit organization: this organization will receive:

- 100 toalars
- 50 toalars
- 500 toalars
- 1,000 toalars

Answer: The tax paid is $1,000 * 10\% = 100$ toalars. Half of this amount is $100 : 2 = 50$ toalars. The non-profit organization will receive 50 toalars.

5. If your earnings are 1,000 toalars, the amount of income you declare is 0 toalars, the tax rate is 10% and half of the tax you pay will be transferred to the account of a non-profit organization: this organization will receive:

- 100 toalars
- 50 toalars
- 500 toalars
- 0 toalars

Answer: The organization will receive half of the tax paid, which is now zero.

Abstrakt

Daňová designace je oblíbeným atributem daňových systémů v rostoucím počtu zemí, nicméně důkazy o jejich účincích na dodržování daňových předpisů jsou stále vzácné. V tomto článku přinášíme informace o našem online experimentu uskutečněném s 830 českými daňovými poplatníky, kteří jsou buď OSVČ nebo standardní zaměstnanci. Design rozhodovací situace subjektů co nejvíce napodobuje skutečný mechanismus daňové designace: umožňuje subjektům vyjádřit své preference ohledně využití části jejich daní tím, že mohou přeměrovat část peněz zaplacených na dani pro nevládní organizaci (NGO). Exogenně měníme přítomnost mechanismu daňové designace, možnost vybrat si příjemce NGO ze seznamu, sazbu daně a konečné použití vybraných daní. Naše výsledky ukazují, že daňová designace žádné konzistentní významné účinky na výši přiznané daně nemá, pouze u skupiny zaměstnanců jsme našli malý vliv na pravděpodobnost, že na daních přiznají celou vydělanou částku. Tento výsledek doplňuje zjištění z dřívějších experimentů uskutečněných se studenty, kteří stejně jako zaměstnanci také osobně nepodávají daňové přiznání. Naše výsledky celkově naznačují, že mechanismus daňové designace nepodněcuje k lepšímu dodržování daní u daňových poplatníků s největšími možnostmi daňových úniků (OSVČ).

Working Paper Series
ISSN 2788-0443

Individual researchers, as well as the on-line version of the CERGE-EI Working Papers (including their dissemination) were supported from institutional support RVO 67985998 from Economics Institute of the CAS, v. v. i.

Specific research support and/or other grants the researchers/publications benefited from are acknowledged at the beginning of the Paper.

(c) Lubomír Cingl, Tomáš Lichard, Tomáš Mikláneek, 2022

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical or photocopying, recording, or otherwise without the prior permission of the publisher.

Published by
Charles University, Center for Economic Research and Graduate Education (CERGE)
and
Economics Institute of the CAS, v. v. i. (EI)
CERGE-EI, Politických vězňů 7, 111 21 Prague 1, tel.: +420 224 005 153, Czech Republic.
Phone: + 420 224 005 153
Email: office@cerge-ei.cz
Web: <https://www.cerge-ei.cz/>

Editor: Byeongju Jeong

The paper is available online at <https://www.cerge-ei.cz/working-papers/>.

ISBN 978-80-7343-532-5 (Univerzita Karlova, Centrum pro ekonomický výzkum a doktorské studium)
ISBN 978-80-7344-634-5 (Národohospodářský ústav AV ČR, v. v. i.)