



Arbeitskreis Quantitative Steuerlehre
Quantitative Research in Taxation – Discussion Papers

Kay Blaufus / Matthias Braune / Jochen Hundsdoerfer / Martin Jacob

Does Legality Matter?
The Case of Tax Avoidance and Evasion

arqus Discussion Paper No. 193

October 2015

www.arqus.info

ISSN 1861-8944

Does Legality Matter? The Case of Tax Avoidance and Evasion

Kay Blaufus, Matthias Braune, Jochen Hundsdoerfer, Martin Jacob*

This version: October 2015[†]

Abstract

Previous research argues that law expresses social values and could, therefore, influence individual behavior independently of enforcement and penalization. Using three laboratory experiments on tax avoidance and evasion, we study how legality affects individuals' decisions. We find that, without any risk of negative financial consequences, the qualification of tax minimization as illegal versus legal reduces tax minimization considerably. Legislators can thus, in principle, affect subjects' decisions by defining the borderline between legality and illegality. However, once we introduce potential negative financial consequences, legality does not affect tax minimization. Only if we use moral priming to increase subjects' moral cost do we again find a legality effect on tax minimization. Overall, this demonstrates the limitations of the expressive function of law. Legality appears to be an important determinant of behavior only if we consider activities with no or low risk of negative financial consequences or if subjects are morally primed.

Keywords

Expressive Law · Legality · Moral Appeals · Tax Avoidance · Tax Evasion · Real Effort Experiment

JEL Classification

M41 · M48 · H20 · H30 · Z18

* Kay Blaufus, Leibniz Universität Hannover.

Matthias Braune, Freie Universität Berlin.

Jochen Hundsdoerfer (corresponding author), Freie Universität Berlin, Garystr. 21, 14195 Berlin, Germany; email jochen.hundsdoerfer@fu-berlin.de.

Martin Jacob, WHU – Otto Beisheim School of Management.

[†] We thank Philipp Dörrenberg, Juan Mendoza Rodriguez, Ulrich Schreiber, and several seminar participants at NHH Bergen, the Vienna University of Economics and Business, Friedrich Schiller University Jena, the ZEW Mannheim Empirical Taxation Research Workshop, Otto-von-Guericke University Magdeburg, the Berlin–Cologne Doctoral Workshop, the Verein für Socialpolitik Standing Field Committee in Accounting, and the German Law and Economics Association Annual Conference for helpful comments and suggestions. Matthias Braune gratefully acknowledges financial support from KPMG.

1. Introduction

How can legality affect individual decision making? The answer to this question is important for a variety of individual decisions. Still, very little is empirically known about the effectiveness of changing the legality of actions on actual behavior. Whereas the early law and economics literature focused on the effects of legal sanctions (*imperative function of law*, Posner 1981), a growing body of literature interprets legal rules as part of the social norms system. In other words, people follow norms for reasons other than the sole fear of legal sanction (Stout 2006), for example, because of socialization (Elickson 1998) or an increase of endowment from voluntary compliance after an initial threat of sanction (DePianto 2014). The legality or illegality of an action is an explicit way for policy makers to affect the social acceptance of this action (*expressive function of law*, Sunstein 1996). Law expresses social values and legality may act as a reference point when individuals rationalize their decisions (Cooter 1998, 2000). This expressive function of law may work independently of the enforcement and penalization of illegal actions (McAdams 2000). For example, the possession of cannabis is illegal in most countries, but many countries do not prosecute the possession of small amounts. Abortion is another example. In some countries illegal abortions are not or have not been prosecuted, often depending on the stage of pregnancy and other circumstances (“laws that symbolically oppose abortion,” McAdams 2000, p. 363). We contribute to this theoretical debate and empirically test whether declaring a specific action—in our case tax minimization—as illegal affects individual decisions, even if illegal actions are not penalized.

Legality is important in many individual decisions, but is of particular importance in the case of taxation, since taxation affects (almost) all individuals in society and represents a major revenue source for governments. However, the legality of tax minimization behavior is unclear since the line between legal and illegal tax actions is often blurred and differs across countries. Still, policy makers appear to use legality to affect individual decisions and thus ultimately tax revenues. For example, a key tax reform proposal element of the new Greek government during the recent sovereign debt crisis is to “*broaden [the] definition of tax fraud and evasion.*”¹ In general, tax avoidance and tax evasion are alternative methods of reducing taxes (Stiglitz 1985; Alm 1988; Neck et al. 2012) that differ in their lawfulness: Tax avoidance describes activities within the boundaries of the law, whereas tax evasion is illegal. Individuals as well as corporations may anchor the rationalization of their reporting decisions on the legality of tax minimization strategies.

¹ See the letter of Yanis Varoufakis, Minister of Finance to the President of the Eurogroup, February 25, 2015.

Qualification of a tax avoidance opportunity as lawful may cause fewer tension between individuals' self-concept and their tax minimization actions.

Several studies compare tax with non-tax situations (e.g., Alm et al. 1992, Durham et al. 2014) but there is very little empirical research on the effect of legality on tax minimization behavior. In a perception study, Kirchler et al. (2003) show that the respondents perceived tax evasion as illegal and immoral and associated it with fraud, criminal prosecution, risk, tax audits, and penalties. In contrast, they perceived tax avoidance as legal and moral, associated it with cleverness, and considered it a good idea. In addition, the survey of Bobek and Hatfield (2003) indicates that engaging in an illegal behavior leads to a "psychic cost" that influences taxpayers' attitude to a larger extent than concerns about penalties. However, there is no empirical evidence on the effect of legality on real tax minimization decisions. We contribute to this literature, to the political debate, and to the literature on the role of legality in individual decision making processes by examining empirically how and when legality affects an individual's tax minimization decisions.

The key challenge when examining this research question is finding a suitable empirical setting. Since tax evasion is not observable in archival or administrative tax data, we address this research question in a series of experiments. Despite the usual concerns about external validity, an experimental approach has obvious advantages in answering our research question: We can easily manipulate the legality of a tax minimization opportunity in the lab. We can also manipulate whether tax minimization is associated with risky penalties and we can induce moral priming. This can hardly be achieved with archival data or even administrative tax data, where tax evasion is typically not observable.

In the first experiment, we compare tax minimization behavior in the absence of any detection and penalty risk. Subjects earned money in a real effort task and faced either a legal or an illegal tax minimization opportunity. We find that labeling a tax minimization opportunity as unambiguously illegal results in significantly less tax minimization compared to labeling tax minimization as unambiguously licit, even though there are no penalties and detection. This finding is consistent with the perceptions documented by Bobek and Hatfield (2003) and Kirchler et al. (2003). Importantly, the effects are economically large. In the legal treatment, average tax minimization is close to the maximum amount, indicating that moral costs do not play an important role. Tax minimization is reduced by over 50% if a subject is in the illegal treatment. More generally, this finding is consistent with the expressive function of law. Declaring an action as illegal affects behavior even if the illegal action is not penalized. This suggests that engaging in illegal behavior leads to significant moral costs and that legislators can thus affect behavior by defining the borderline between legal and illegal activities, even if there is no actual possibility of detecting wrongdoings.

However, in the context of tax minimization, one concern about the first experiment is its external validity. Outside the lab, tax evasion is typically associated with positive detection and penalty risk. Moreover, due to tax law ambiguity, tax avoidance usually bears the risk that the revenue agency will assess an additional income tax payment and corresponding interest charges upon audit. Therefore, we conduct a second experiment in which we compare legal and illegal tax minimization behavior in a setting with detection risk, negative detection consequences, and implicit monitoring (penalties in the case of evasion and interest charges in the case of avoidance). In this setting, we do not observe any difference between legal and illegal tax minimization. Thus, the legality effect disappears once we introduce risky negative detection consequences. This reveals an important limitation of the expressive law approach that had not been previously considered in theory.

There are three possible explanations: First, by introducing the risk that the revenue agency will not accept the tax avoidance strategy, the borderline between legal and illegal behavior is blurred and thus the difference in subjects' moral evaluations disappears. Second, interventions such as penalties and the implicit introduction of monitoring could undermine intrinsic motivation (Gneezy and Rustichini 2000a, Fehr and Falk 2002, Falk and Kosfeld 2006). Since the first experiment shows that legal tax minimization does not lead to significant moral cost but illegal tax minimization does, the crowding out of intrinsic motivation mainly matters for illegal tax minimization behavior. Thus, the introduction of negative financial consequences reduces the return of both legal and illegal tax planning. However, regarding illegal behavior, there is an opposing crowding out effect that offsets the reduced return. Third, penalties increase the cognitive load of taxpayers (Dohmen et al. 2010). This could reduce the importance of intrinsic preferences for obeying the law and could reduce the effectiveness of injunctive norms (Kredentser et al. 2012).

Our third experiment addresses the crowding out explanation by introducing moral priming. In theory, moral priming reduces the crowding out effect and could thereby reinforce the legality effect. We use the same setting as in the second experiment and hold the complexity of the environment constant. However, we now use moral priming to increase the moral costs of the illegal activity. Consistent with the argument that moral priming reduces crowding out and reinforces the legality effect, we observe a legality effect in the third experiment. The average reduction in tax minimization amounts to about 30% if participants are morally primed. The effect of legality is therefore still economically significant but weaker than in the baseline experiment without risk and moral priming.

Taken together, our series of experiments show that legality can have strong effects on individuals' behavior. In line with the expressive law approach, defining the borderline between legality and illegality can be used to affect moral costs. If audits are too costly and thus detection risk is very low, this approach may be an effective policy option. However, regarding the application for tax policy, we identify severe

limitations. Tax minimization is usually subject to the risk of negative financial consequences. In such a setting, legality affects moral costs and thus tax minimization behavior only if subjects have a high tax morale (as in our third experiment, induced by moral priming). Such high tax morale, however, cannot be generally assumed, as our second experiment demonstrates. Moreover, our results suggest that the legality effect differs between countries due to the cross-country variation in tax morale (Alm and Torgler 2006). Thus, clearly defining some tax shelters as illegal could work in high tax morale countries such as the United States but does not seem to be a promising policy option in countries with only low or moderate tax morale.

2. Experiment 1: Baseline Setting

2.1 Method, Data, and Procedure

In the baseline experiment, we use two different presentations of a tax minimization opportunity to examine the effect of legality in accordance with Kirchler et al. (2003). We use a between-subjects setting. In the *Legal Tax Avoidance* group, a licit tax avoidance opportunity with the wording *legal tax loophole* is available to the participants. We change the wording for the group *Illegal Tax Evasion* to *illegal tax evasion*. All else is equal between these two groups.

The experiment was programmed and conducted with the software z-Tree (Fischbacher 2007) and performed in the XXX laboratory of the XXX University in January 2014. The 64 participants were graduate students (27%) and undergraduate students (73%) from different departments of the XXX University; 59% of the participants were male and the average age was 25.36 years (SD 9.12). All participants were recruited by email.

We randomly assigned the treatments to computer workstations before the arrival of the participants. The computer workstations were equipped with screen walls to prevent communication and visual contact between the participants. After arrival, we randomly assigned the participants to a computer workstation by using an identification number (double-blind trial to avoid an experimenter effect). After each participant was seated at their workstation, general information was loudly spoken. General information included basic information about the workstation's utilities (a computer, printer instructions, a pen, a calculator, and a stack of sheets), the experimental procedure, the rules (no talking, no leaving the room while the experiment is running), and a request to ask questions if something remained unclear (asking and answering in private). Then, the experiment was started. After completing the experiment and the questionnaire, the participants were remunerated in cash. The participants received on average €19.44. The average duration was around two hours but there was no time limit.

To increase the external validity of the experiment and to rule out house money effects (Thaler and Johnson 1990), participants earned income by conducting a real effort task. The real effort task was a simple data input task. Paper test sheets from a modified multiple-choice test had to be keyed into the computer. The gross wage was 10 ECU (1 ECU = €0.07) per correctly recorded sheet.² After passing a trial round, the participant contracted on his/her labor supply (number of sheets to digitize, between zero and 48 sheets). The participants had to fulfill this contract to earn the wage. In other words, the subjects agreed on a contract with a self-determined amount of labor supply. They only received the full remuneration after correctly typing in the contracted amount of sheets. Additional sheets typed in were not remunerated. To decrease time uncertainty, the computer displayed the processing time for the trial round.

The earned income was subject to taxation. We set up a salient progressive tax scheme. The first four sheets were tax exempt, the fifth (and above) sheet was taxed at 30%, and the 29th sheet (and above) was taxed at 65%. The tax was earmarked; that is, the tax revenues remained in the budget of the XXX Business School. Since we aim to measure the effect of tax minimization legality, we had to use loaded tax instructions instead of neutral instructions. Although this method generally bears the risk of subjects using individual scripts when interpreting loaded terms (Alm 2010), it increases external validity (Abbink and Henning-Schmidt 2006).

We offered a tax reduction opportunity with the wording *legal tax loophole* or *illegal tax evasion* and asked the participants about the number of sheets between zero and six they did *not* want to declare as taxable income. Tax minimization (legal tax avoidance or illegal tax evasion) would not be challenged or detected and consequently would not be penalized. Besides stating in the instructions that potential tax evasion would not be uncovered, we increased the salience of missing penalties by providing subjects with full information regarding the financial consequences of their decision (see Figure 1). In other words, we manipulated the legal qualification of tax minimization but implemented identical monetary consequences for the participants.

The participants chose their labor effort and the amount of tax minimization (tax base reduction) by positioning sliders on a screen (see Figure 1). Participants had to decide simultaneously on their labor effort and tax minimization. To prevent experimenter effects, we ensured that the experimenter did not observe participants' actual avoidance or evasion decisions during the experiment. Since tax avoidance depends on tax awareness (Alstadsæter and Jacob 2013) and since we did not want to analyze different levels of tax awareness, we communicated the tax burden in a very salient way: We displayed the gross wage (in ECU),

² There was a limited number of possible box ticking schemes. Therefore, we were able to control for correct and incorrect keyed sheets.

the tax burden (in percent) and the net wage (in ECU) *for an additional sheet* for current labor effort and tax minimization, that is, depending on the sliders' positions a participant chose. The sliders' positions could be changed until the participant confirmed his/her choices by pressing the Next button. The participant then had to confirm the decision a second time to enter the labor contract. We present a translation of the instructions in Appendix I. Figure 1 includes a translated screenshot from the experimental program for the treatment *Legal Tax Avoidance* to illustrate the decision process.

Figure 1: Example of the decision situation for the treatment Legal Tax Avoidance with no negative detection consequences

The screenshot shows a task interface with the following content:

Task
 By using the first slider you set up your labor supply (amount of sheets which you will digitize). By using the second slider you determine the use of the legal tax loophole. The higher you determine the use of the legal tax loophole, the more sheets are not taxed.
 You can reposition each slider as often as you like.
 The processing time from the trial round is displayed.
 Below the two sliders the following is displayed depending on the positions of the sliders:
 1. **Additional gross wage (before taxes)** in ECU if you would digitize an **additional** sheet correctly.
 2. **Additional tax burden** in percent if you would digitize an **additional** sheet correctly.
 3. **Additional net wage (after taxes)** in ECU if you would digitize an **additional** sheet correctly, par
 Please note: You will receive 10 ECU (experimental currency unit) for each correctly digitized sheet.
 Please confirm your **mandatory labor supply** as soon as you have decided by clicking on "Next".

Your processing time from the trial round (in seconds):	7
Number of sheets (mandatory labor supply):	30
Use of legal tax loophole in sheets :	2
Additional gross wage (before taxes) in ECU, if you would digitize an additional sheet correctly:	10.0
Additional tax burden in percent, if you would digitize an additional sheet correctly:	65
Additional net wage (after taxes) in ECU, if you would digitize an additional sheet correctly:	3.5

Next

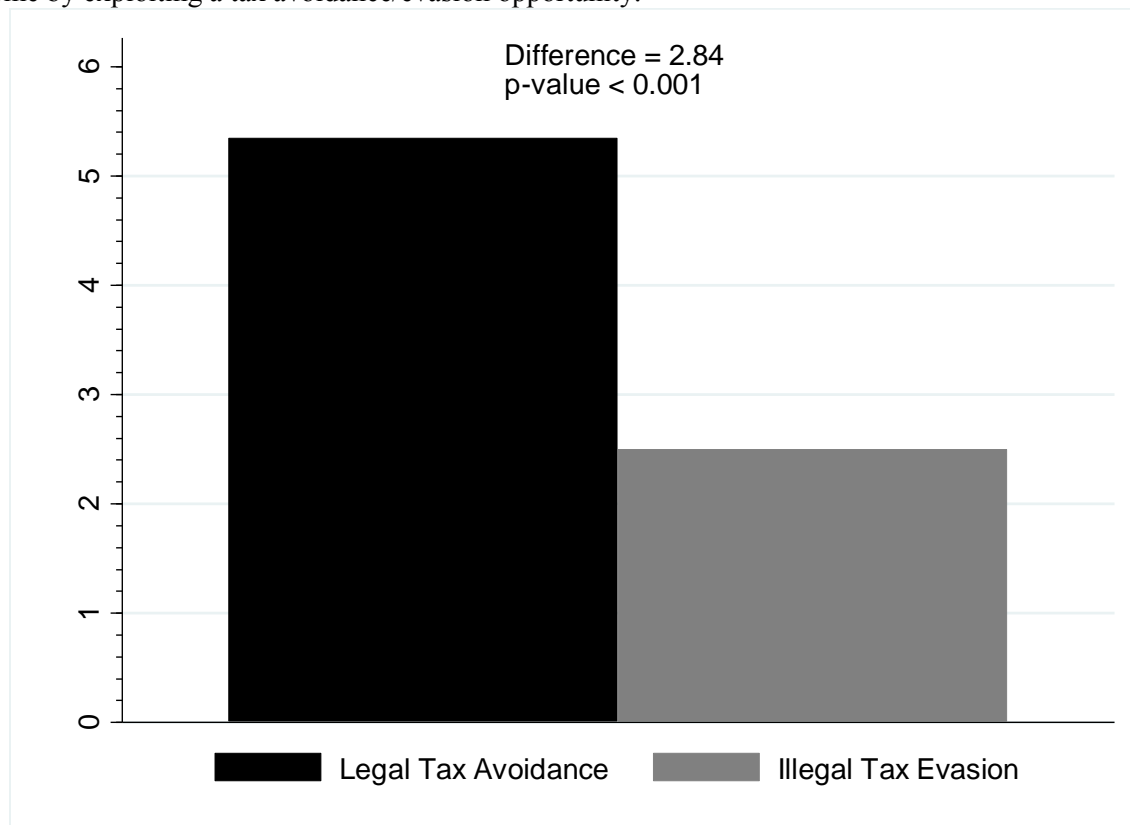
In this example, the participant chose 30 sheets to digitize. Additionally, he/she chose to legally reduce his/her taxable income by two sheets. Thus, 28 sheets are taxable. Using the legal tax loophole, the participant effectively avoided the high tax bracket, with a marginal income tax of 65% for the last two sheets.

After the participant confirmed the individual labor effort and level of tax reduction, he/she was asked to fill out the first part of a post-experimental questionnaire that included questions regarding morale and tax system fairness (see Appendix IV). After the participant fulfilled the labor task, the second part of the questionnaire was presented. The second part included control questions and sociodemographic questions concerning, for example, gender, age, net income, and university courses (see Appendix IV).

2.2 Empirical Results and Discussion

Figure 2 compares the average tax base reduction (measured in sheets, between zero and six) between the treatments *Legal Tax Avoidance* and *Illegal Tax Evasion*. The reduction in the tax base is our measure of tax minimization. In the evasion treatment, the tax base reduction is, on average, 2.84 sheets lower compared to the avoidance treatment. The difference is statistically significant ($p < 0.01$, $N = 64$). This finding is in line with our prediction. In the absence of negative detection consequences, the legal presentation of tax minimization opportunities matters. Recall that the monetary consequences are the same for both treatments. Importantly, the effect we observe is economically significant: Labeling a tax minimization opportunity as illegal versus legal reduces tax base reduction by 53.18% ($= 2.84/5.34$).

Figure 2: Comparison of Legal Tax Avoidance and Illegal Tax Evasion in Experiment 1
Subjects had to key in paper test sheets from a modified multiple-choice test. Earned income was subject to taxes but the subjects could choose between zero and six sheets they did *not* want to declare as taxable income by exploiting a tax avoidance/evasion opportunity.



To control for different sociodemographic variables and subjects' tax minimization incentives, we use multivariate ordinary least squares (OLS) and Tobit regressions. As described above, we use a tax system with three brackets to increase tax rate salience. Since one unit of tax base reduction leads to relatively high tax savings when the taxpayer is in the highest bracket compared to the other brackets, we control for subjects' tax minimization incentives by including *MTR* as a control variable. The variable *MTR* is defined

as the participants' counterfactual marginal tax rate before tax minimization. We also control for gender. In untabulated results, we included other demographic variables, such as age, net income, and education, because they have at least some effect on tax compliance in other studies (Pickhardt and Prinz 2014). In our sample, however, only gender affects tax minimization behavior. The other demographic variables are insignificant and do not affect the results regarding the treatment effects. Thus, we only include a gender dummy variable in the results.

Panel A of Table 1 presents the results from an OLS regression. We present the results for all three experiments in Table 1. Column 1 contains the results from the first experiment. The tax base reduction is, on average, 2.73 sheets lower when the tax minimization opportunity is labeled *illegal tax evasion* compared to *legal tax loophole* (variable *Evasion*). This difference is significant at the 1% level and supports our univariate finding. Again, the economic magnitude is large: The coefficient estimate suggests that declaring tax minimization as illegal reduces tax base reduction by 50.98% of the sample mean. Since the effect in the multivariate regression is very close to our non-parametric result, none of our additional control variables appears to bias the effect of interest.

In addition, we find the marginal tax rate has a strong effect. The tax base reduction is, on average, 1.259 (= $3.598 \cdot (0.65 - 0.3)$) sheets higher when a participant is in the higher tax bracket compared to a participant in the lower tax bracket (p -value < 0.05). Male participants avoid or evade, on average, 1.269 sheets more than female participants do (p -value < 0.05).³ To address concerns that using OLS in the presence of a truncated dependent variable biases our results, Panel B of Table 1 shows the Tobit regression results for all three experiments. Again, column 1 contains the results for our first experiment. The results are qualitatively similar to those in the OLS setting. We again find a strong effect of legality on tax reduction and the coefficients for *Male* and *MTR* are statistically significant.⁴ Overall, we find a strong legality effect in our first experiment. Thus, in line with the expressive law approach, subjects' moral costs and thus their behavior could be influenced by defining the borderline between legal and illegal activities, even in the absence of any enforcement.

However, regarding the tax policy implications, one may be concerned about the external validity of our setting, since we assume that there is no detection and penalty risk. Outside the lab, tax evasion is under penalty of law. Tax avoidance also bears the risk of non-acceptance by revenue services due to tax law

³ In untabulated results, we analyze potential interaction effects between *Evasion* and *MTR* or *Male*. We find no interaction effects between *Evasion* and the other two independent variables.

⁴ As a robustness test, we solely included observations from participants who were able to calculate their marginal tax burden. We asked for the marginal tax burden in our post-experimental questionnaire. The results remain qualitatively the same for the OLS and Tobit regressions for all three experiments.

ambiguity. The risk of detection/non-acceptance and negative consequences (penalties in the case of evasion and interest charges in the case of avoidance) could influence and overlay the observed legality effect.

To analyze whether the legality effect holds for tax minimization with audit risk and penalization, we conduct a second experiment. We introduce audit risk and potential negative detection consequences. Audit risk and the financial consequences of detection are equal for legal and illegal tax minimization; the only difference is the wording. Again, we compare legal and illegal tax minimization between subjects.

3. Experiment 2: Uncertainty

3.1 Method, Data, and Procedure

The experiment was again programmed and conducted with the software z-Tree (Fischbacher 2007) and performed in the XXX laboratory of the XXX University in June 2014. The 65 participants were graduate students (23%) and undergraduate students (77%) from different departments of the XXX University; 60% of the participants were male and the average age was 22.42 years (SD 3.62). All the participants were recruited by email to prevent subjects' repeated participation.

We change the baseline experiment with respect to detection consequences. In the first experiment, no tax minimization is detected; the tax savings are certain. Thus, only moral costs but no financial costs can occur. In our second experiment, we introduce negative detection consequences as a lottery, all else being equal. In the *Legal Tax Avoidance* treatment, the detection is called denial (versus acceptance) and the negative financial consequences are called tax payments plus interest. In the *Illegal Tax Evasion* treatment, we use the terms *detection* and *tax payments plus penalty*. The detection probability (25%) and negative financial consequences (1.5 times the avoided or evaded tax) are equal in the legal avoidance and illegal evasion treatments. We thereby ensure that the decision problems of legal tax avoidance and illegal tax evasion are still financially identical. During the experiment, the experimenter did not observe participants' actual avoidance or evasion decisions.

Similar to our first experiment, we maximize salience by providing subjects with full information on the financial consequences of their decisions (see Figure 3). In this example, the participant again chose 30 sheets to digitize. Additionally, he/she chose to legally reduce his/her taxable income by two sheets. We display the financial consequences for an *additional* digitized sheet given current labor effort and tax minimization choices. In addition, we present the consequences for the two possible stages (detection vs. no detection). Our design thus ensures a salient presentation of all possible financial consequences of subject's choices. We present a translation of the experiment instructions in Appendix II.

Figure 3: Example of the decision situation for the treatment Legal Tax Avoidance with negative detection consequences

Task

By using the first slider you can determine your labor supply (amount of sheets that you will digitize). By using the second slider you determine the use of the legal tax loophole. The higher you determine the use of the legal tax loophole, the more sheets are not taxed. The probability that the tax authority does not accept the use of the loophole is 25 %. In this case you will have to pay the so-far unpaid taxes. In addition, you will have to pay interest amounting to **half** of the subsequent tax payment.

You can adjust the slider as often as you want.
The processing time from the trial round is displayed.

Below the two sliders the following information is displayed depending on the positions of the sliders:
The effect of a deferment of the **upper** slider by one sheet to the right (You digitize one additional sheet - what happens?):
1. the amount of the additional pre-tax and pre interest income in ECU,
2. the amount of the additional tax burden in ECU,
3. the amount of the additional interest in ECU,
4. the amount of the additional post-tax and post interest income in ECU.
The effect of a deferment of the **lower** slider by one sheet to the right (You extend the use of the legal loophole by one additional sheet - what happens?):
1. the amount of the additional tax savings in ECU,
2. the amount of the additional interest in ECU.

The presentation of the effects is separated for Case 1 and Case 2.
For every correctly digitized sheet you will receive 10 ECU (currency during the experiment) as a gross wage.
Please confirm your **mandatory labor supply** as soon as you have decided by clicking on "Next".

Your processing time from the trial round (in seconds): 105

Number of sheets (mandatory labor supply):

Use of the legal tax loophole in sheets :

The effect of a deferment of the upper slider by one sheet to the right (You digitize one additional sheet - what happens?):	Case 1: Loophole is being accepted (probability = 75%):	Case 2: Loophole is not accepted (probability = 25%):	
	Additional pre tax and pre interest income in ECU:	10.00	10.00
	Additional tax burden in ECU:	6.50	6.50
	Additional interest in ECU:	0.00	0.00
The effect of a deferment of the lower slider by one sheet to the right (You extend the use of the legal loophole by one additional sheet - what happens?):	Case 1: Loophole is being accepted (probability = 75%):	Case 2: Loophole is not accepted (probability = 25%):	
	Additional post-tax and post interest income in ECU:	3.50	3.50
	Additional tax savings in ECU:	3.00	0.00
	Additional interest in ECU:	0.00	1.50

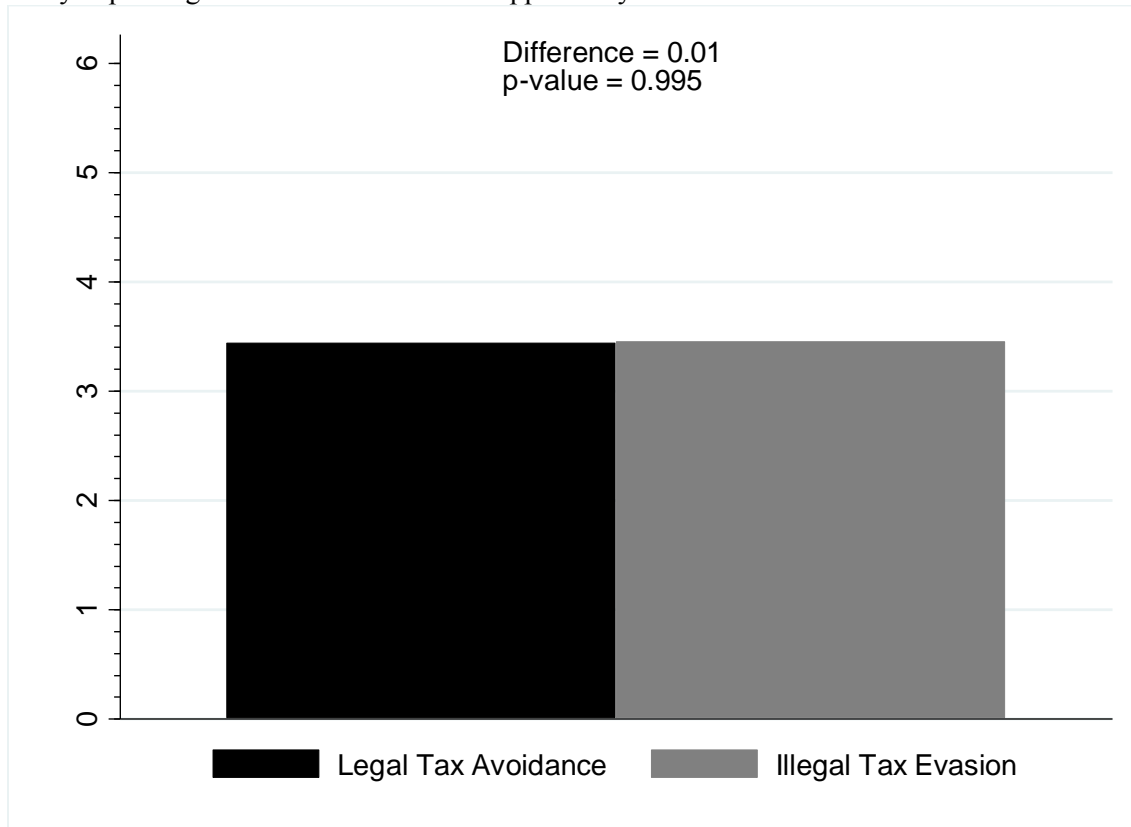
To summarize, there are two key differences between the second and first experiments. First, there are potential negative financial consequences. This leads to a second cost component in addition to moral cost of tax minimization. Second, the detection consequences are now uncertain. Thus, risk taking behavior should also influence the tax minimization behavior.

3.2 Empirical Results and Discussion

Figure 4 displays the average tax base reduction (in sheets) for our two legality treatments, *Legal Tax Avoidance* and *Illegal Tax Evasion*, for participants with uncertain negative detection consequences.

Figure 4: Comparison of Legal Tax Avoidance and Illegal Tax Evasion in Experiment 2

Subjects had to key in paper test sheets from a modified multiple-choice test. Earned income was subject to taxes but subjects could choose between zero and six sheets they did *not* want to declare as taxable income by exploiting a tax avoidance/evasion opportunity.

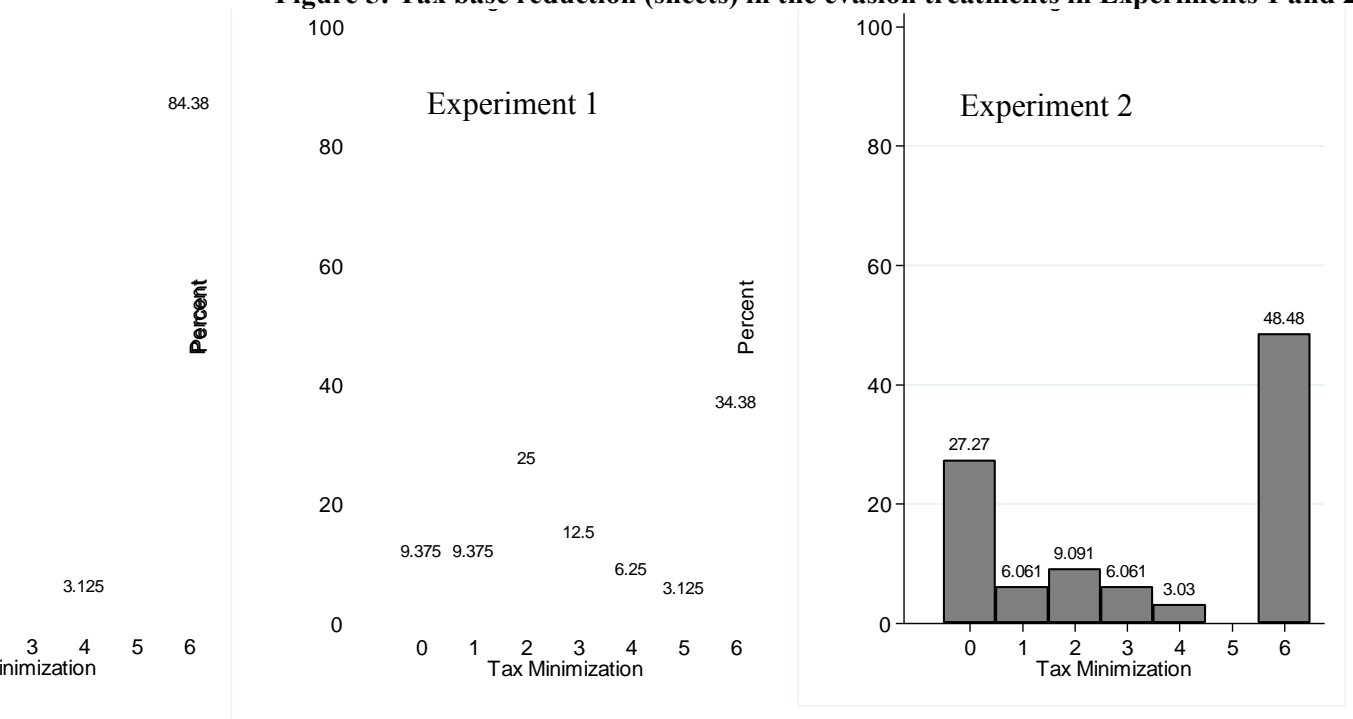


On average, the tax base reduction amounts to 3.44 sheets (3.45 sheets) when the tax minimization is declared as legal avoidance (illegal evasion). It thus appears that legality does not matter in the presence of detection risk and uncertainty, since the difference is statistically and economically insignificant. In other words, we observe a strong moderating effect of detection consequences with respect to legality. The results of the multivariate OLS and Tobit regressions confirm this finding (Table 1, column 2). As in the first experiment, we control for the counterfactual marginal tax rate before tax minimization and for gender. Additionally, we control for participants' risk attitude (variable *risk*). We use the answers from one of our post-experimental questions to measure the risk attitude from zero (no risk taking at all) to 10 (high risk taking behavior).⁵ Our treatment variable *Evasion* fails to explain the tax minimization behavior. Moreover, we find no significant effects of *MTR* or *Male*. Only risk attitude explains the observed tax minimization behavior (p-value < 0.01).

⁵ The wording for the question is taken from the German Socio-Economic Panel (SOEP) and is experimentally validated in Dohmen et al. (2011). See <http://www.diw.de/soep> for details.

One potential explanation for our findings is that participants in the evasion treatment decide to use only a small fraction of the maximum income concealment (e.g., two or three sheets out of six). This behavior would allow participants to realize a financial advantage while maintaining their positive self-concept (Mazar et al. 2008). It is possible that a relatively small fine would not change their behavior. However, the vast majority of our participants in the first experiment evaded either nothing or they evaded the full amount of six sheets (see Figure 4). When we introduced penalties and detection risk, we still find that over 75% of the participants evaded either nothing or all six sheets. We interpret the findings in Figure 5 as evidence against the explanation that individuals try to maintain their self-concept by evading only small amounts.

Figure 5: Tax base reduction (sheets) in the evasion treatments in Experiments 1 and 2



There remain three explanations for our findings. First, by introducing the risk that the revenue agency will not accept the tax avoidance strategy, the line between legality and illegality can be blurred and thus the difference in subjects' moral evaluations may disappear. Second, external interventions can undermine intrinsic motivation (Deci and Ryan 1985, Gneezy and Rustichini 2000a, 2000b, Fehr and Falk 2002, Gneezy et al. 2011). In case of tax evasion, the financial risk could crowd out intrinsic compliance in the treatment where subjects have an evasion opportunity (Scholz and Lubell 1998, Feld and Frey 2007, Boyer

et al. 2014, Dwenger et al. 2014).⁶ Thus, the effect of financial penalties on legal and illegal tax minimization behavior could differ: Negative detection consequences reduce the financial returns of both alternatives but, in the illegal setting, they could additionally crowd out intrinsic tax morale. The introduction of detection risk and penalties could also be interpreted as the introduction of monitoring. Participants know that their compliance behavior is now observable (monitored) or at least they know that it is possible that their compliance behavior will be observed due to auditing. Introducing monitoring could lead to side effects. In particular, monitoring could crowd out intrinsic motivation when monitoring is interpreted as a signal of distrust (Falk and Kosfeld 2006). This could also affect unmonitored dimensions (Belot and Schröder 2015). Thus, the introduction of monitoring itself could crowd out intrinsic motivation to comply. Again, the effect of penalties on legal and illegal tax minimization behavior could differ because the crowding out of intrinsic tax morale is more important in the illegal tax evasion treatment.

Third, the penalty setting comes with a higher cognitive load. The introduction of risky penalties increases the participants' cognitive load. Dohmen et al. (2010) have argued that decisions under risk are complex, so that cognitive ability influences risk aversion. Under the additional cognitive load of a risky penalty the participants may neglect tax morale issues. Previous research has shown that a high cognitive load reduces the effectiveness of injunctive norms (Kredentser et al. 2012).

To address the crowding out explanation, we conduct a third experiment. In this experiment, we use the same penalty setting as in the second experiment; in other words, we hold the complexity of the environment constant. The only difference is that we now prime the participants prior to the actual experiment during the instruction period. Moral priming (affective priming) is a technique to temporarily promote empathy in laboratory experiments. It can but does not have to be directly related to the topic in question (e.g., taxes). By giving the participants a simple task pertaining to a moral question, we try to temporarily increase their morality. In line with Boyer et al. (2014) who find no crowding out for subjects with high tax morale, this should reduce crowding out and reinforce the legality effect.

⁶ Whereas Dwenger et al. (2014) do not observe that deterrence crowds out intrinsic motivation to pay a voluntary church tax, Boyer et al. (2014), in a similar setting, find a crowding out of intrinsic motivation in a group of weakly intrinsically motivated individuals. For subjects with high tax morale no crowding out was observed. Thus, crowding out seems to depend on the strength of the intrinsic motivation.

4. Experiment 3: Moral Priming

4.1 Method, Data, and Procedure

The experiment was programmed and conducted with the software z-Tree (Fischbacher 2007) and performed in the XXX laboratory of the XXX University in June 2014. The 62 participants were graduate students (26%) and undergraduate students (74%) from different departments of the XXX University; 48% of the participants were male and the average age was 22.02 years (SD 3.22). All the participants were recruited by email. Hence, we were again able to prevent subjects' repeated participation.

We base our third experiment on the setting of the second experiment with uncertain detection consequences and extend the setting by introducing the moral priming of all participants. We rely on the affective priming introduced to tax research by Calvet Christian and Alm (2014), which has already been proven effective. In contrast to these authors, we concentrate on individual tax reporting decisions and do not consider group interactions.

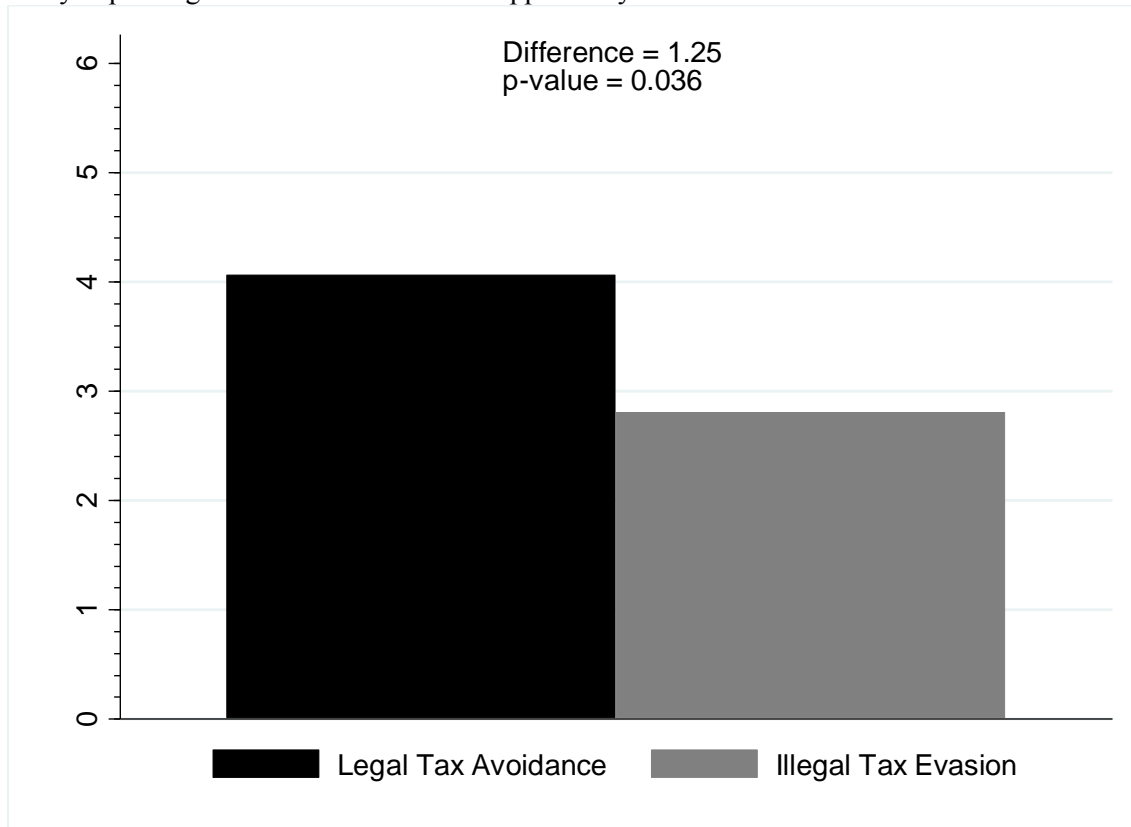
Immediately before the participants set their simultaneous labor supply and tax base reduction, they had to solve a moral priming task. For the moral priming, following Calvet Christian and Alm (2014), we used six different versions of the Golden Rule and asked the participants to summarize the common ground in their own words by using a special sheet of paper. At the end of the experiment, the participants had to hand out the sheet to the experimenter. As financial remuneration for the additional time, the participants received €5 for the priming part of the experiment. We present a translation of the instructions in Appendix III.

4.2 Empirical Results and Discussion

Figure 6 shows the mean tax base reduction (in sheets) for the two legality treatments *Legal Tax Avoidance* and *Illegal Tax Evasion* for the participants with uncertain negative detection consequences and moral priming.

Figure 6: Comparison of Legal Tax Avoidance and Illegal Tax Evasion in Experiment 3

Subjects had to key in paper test sheets from a modified multiple-choice test. Earned income was subject to taxes but the subjects could choose between zero and six sheets they did *not* want to declare as taxable income by exploiting a tax avoidance/evasion opportunity.



On average, the tax base reduction amounts to 4.06 sheets (2.81 sheets) when the tax minimization is denoted legal avoidance (illegal evasion). The difference is statistically significant ($p\text{-value} < 0.05$). It thus appears as if legality matters when uncertain negative detection consequences and a moral priming task are set. The economic effect is not as strong as in our first experiment, but it is still economically significant. Labeling a tax minimization opportunity as illegal versus legal reduces tax base reduction, on average, by 1.25 sheets. This is equivalent to a decrease of 30.79%, compared to 53.18% in the first experiment. Still, the effect is economically significant.

In column 3 of Panel A in Table 1, we present the corresponding OLS results. As in our second experiment, we control for the counterfactual marginal tax rate before tax minimization and participants' risk attitude and gender. We find a significant lower tax base reduction when the tax minimization opportunity is labeled as illegal (on average, 0.945 sheets lower, $p\text{-value} = 0.075$). In the sample mean, declaring tax minimization as illegal reduces tax base reduction by 24.19%. As in experiment 2, we do not find significant effects of *MTR* or *Male*. The risk attitude strongly explains the observed tax minimization behavior ($p\text{-value} < 0.01$). The Tobit regression in column 3 of Panel B in Table 1 yields a similar result. This result also helps us to

rule out that the increase in cognitive load or the blurred line between risky tax avoidance and evasion explains our insignificant findings in the second experiment. If cognitive load or a blurred line is responsible for the null result, we would have obtained the same insignificant result in the case of moral priming.

Taken together, legality affects an individual's tax minimization decisions. However, when the risk of detection and penalties is introduced, legality no longer matters. The legality effect is reestablished under moral priming. In terms of economic magnitude, we do not find the legality effect to be as strong as in our first experiment. However, the economic magnitude of the effect remains significant, since legality reduces tax minimization by 30%. This result is consistent with moral priming increasing the moral costs of tax evasion, which in turn seems to mitigate the crowding out effect of penalties. Stated simply, moral priming increases the salience of legality as the expressive function of law.

5. Robustness Checks

We next subject our analysis to a set of robustness tests. The first concern relates to our dependent variable, that is, the number of sheets that the participants did not declare as taxable income. There may be concerns that, due to the progressive tax rate, one avoided or evaded sheet may be associated with different amounts of actual tax reduction. To address the concern that the actual tax savings matter, we use the tax reduction in euros as an alternative dependent variable. Table 2 shows the results from OLS regression. The results are qualitatively similar. Using the coefficient estimate for our first experiment, we find that declaring tax minimization as illegal reduces the amount of tax reduction, on average, by 54.6%. This economic magnitude is very similar to our baseline estimate. Importantly, we observe exactly the same pattern of effects as before. When risk is introduced, the legality effect disappears but is reestablished once there is moral priming. Again, the economic magnitude of the effect decreases from the first to the third experiment but remains economically significant.

The second analysis relates to the selection of subjects. In our analysis, we use data from all the participants who completed the experiments. However, it is not clear that all the participants correctly understood the actual tax burden. In our experimental setup, we maximize the salience of the tax code but concerns could remain. Hence, as an additional robustness check, we restricted the sample to those participants who correctly answered a manipulation check on the tax rate. This was a question about the actual marginal tax rate. To be more precise, we asked the participants to indicate their marginal tax rate depending on their real effort and tax minimization without considering any negative detection consequences. In this robustness test, we include only participants who indicated the correct marginal tax rates.⁷ The OLS

⁷ We also include participants who quoted 30% (60%) as the marginal tax rate; 35% (65%) was the correct answers.

regression results are presented in Panel A of Table 3 (with tax base reduction as the dependent variable) and Panel B (with actual tax reduction as the dependent variable). Again, the results are qualitatively similar. We find a significant effect of legality in the first experiment (column 1). As before, the legality effect disappears when we introduce detection and penalty risk (second experiment, column 2) but the effect is reestablished when there is moral priming.

6. Conclusion

The law not only sets prices for behavior (penalties, imperative function) but also expresses social values (expressive function). Therefore, it could influence individual behavior independent of enforcement and penalties. In this expressive law approach, legality could act as a reference point for individuals in rationalizing their decisions. We apply this approach to tax minimization that can be either legal (tax avoidance) or illegal (tax evasion).

Using three real effort laboratory experiments, we examine how legality affects tax minimization behavior. Our experiments confirm the assumption that legislators can affect individual moral evaluations by defining the borderline between legality and illegality. However, the experiments also reveal important limitations of the expressive law approach not previously discussed in the literature.

Without detection and penalty risk, we find that the qualification of a tax minimization opportunity as illegal evasion as opposed to legal avoidance significantly reduces tax minimization. In line with the expressive law approach, legality appears to be an important determinant of tax minimization behavior. However, once we include detection and penalty risk, legality no longer affects tax minimization. This finding is consistent with the crowding out effect of penalties on the intrinsic motivation to comply. To test whether the legality effect can be reestablished in an environment with risky penalties, we conduct a third experiment where we add moral priming to the second experiment. Our findings indicate that moral priming reestablishes the legality effect, which implies that there is indeed a crowding out effect of penalties in the case of tax evasion.

While our findings are subject to the typical external validity concerns of experiments, we can cautiously draw some conclusions for tax policy. One policy implication of our result is that labeling specific tax minimization strategies as unambiguously illegal can reduce aggressive tax avoidance only if the taxpayers in the country in question have a high tax morale (as induced by moral priming in the third experiment). In

this vein, the recent approach of the Greek government to broaden the definition of tax evasion does not seem a promising policy tool to increase tax revenues if tax morale remains at its currently low level.⁸

Regarding future tax research, our paper contributes to the small but growing body of research that stresses the differences between avoidance and evasion (e.g. Alm 1988, Kirchler et al. 2003, Neck et al. 2012). We add to this literature by demonstrating that moral costs differ significantly between legal and illegal tax minimization, which should be considered in future work. In particular, experimental research should be aware of this legality effect. When, for example, designing experiments on tax compliance, the wording (*tax avoidance* vs. *tax evasion*) may have substantial effects on participant behavior and may lead to surprising findings.

Besides their direct importance for tax policy and research, our results should be of interest in other areas in which legislators or organizations are trying to achieve compliance. Future research could, for example, address whether our findings also apply to compliance programs in multinational companies. According to our results, one could expect companies to affect behavior by defining codes of conduct, even in the absence of any penalties for non-compliance. However, the evidence on the effectiveness of business codes is mixed (Kaptein and Schwartz 2008). Thus, future research could address to what extent subjects' moral costs differ between engaging in an illegal activity and being non-compliant regarding organizational business codes.

⁸ Based on banks' perception of true income, Artavanis et al. (2012) estimate that unreported annual income for Greece exceeds €28 billion.

References

- Abbink K, Henning-Schmidt H (2006) Neutral versus loaded instructions in a bribery experiment. *Experimental Economics* 9(2):103–121.
- Alm J (1988) Compliance costs and the tax avoidance–tax evasion decision. *Public Finance Quarterly* 16(1):31–66.
- Alm J (2010) Testing behavioral public economics theories in the laboratory. *National Tax Journal* 63(4):635–658.
- Alm J, Torgler B (2006) Culture differences and tax morale in the United States and in Europe. *Journal of Economic Psychology* 27:224–246
- Alm J, McClelland GH, Schulze WD (1992) Why do people pay taxes? *Journal of Public Economics* 48(1):21–38.
- Alstadsæter A, Jacob M (2013) Who participates in tax avoidance? WHU – Otto Beisheim School of Management FAccT Center, Working Paper No. 08/2012. http://EconPapers.repec.org/RePEc:ces:ceswps:_4219.
- Artavanis, N. T., Morse, A., Tsoutsoura, M. (2012) Tax evasion across industries: Soft credit evidence from Greece. Chicago Booth Research Paper No. 12–25, <http://www.chicagobooth.edu/blogs/informingreform/docs/taxevasion.pdf>
- Belot M, Schröder M (2015) The spillover effects of monitoring: A field experiment. *Management Science*, forthcoming. <http://dx.doi.org/10.1287/mnsc.2014.2089>.
- Bobek DD, Hatfield RC (2003) An investigation of the theory of planned behavior and the role of moral obligation in tax compliance. *Behavioral Research in Accounting* 15(1):13–38.
- Boyer P, Dwenger N, Rincke J. (2014) Do taxes crowd out intrinsic motivation? Field-experimental evidence from Germany. Max Planck Institute for Tax Law and Public Finance Working Paper 2014 – 23.
- Calvet Christian R, Alm J (2014) Empathy, sympathy, and tax compliance. *Journal of Economic Psychology* 40:62–82.
- Cooter R (1998) Expressive law and economics. *Journal of Legal Studies* 27(2):585–608.
- Cooter R (2000) Do good laws make good citizens: An economic analysis of internalized norms. *Virginia Law Review* 86(8):1577–1601.
- Deci EL, Ryan RM (1985) *Intrinsic Motivation and Self-Determination in Human Behavior*. Plenum Press, New York.
- DePianto D (2014) Sticky compliance: An endowment account of expressive law. *Utah Law Review* 2:327–367.
- Dohmen T, Falk A, Huffman D, Sunde U (2010) Are risk aversion and impatience related to cognitive ability? *American Economic Review* 100(3):1238–1260.
- Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., Wagner, G. G. (2011) Individual risk attitudes: Measurement, determinants, and behavioral consequences. *Journal of the European Economic Association*, 9(3), 522-550.
- Durham Y, Manly TS, 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.

- Dwenger N, Kleven H, Rasul I, Rincke J (2014) Extrinsic and intrinsic motivations for tax compliance: Evidence from a field experiment in Germany. Discussion paper, <http://econpapers.repec.org/paper/zbwvfsc14/100389.htm>.
- Ellickson RC (1998) Law and Economics Discovers Social Norms. Faculty Scholarship Series. Paper 407, http://digitalcommons.law.yale.edu/fss_papers/407.
- Falk A, Kosfeld M (2006) The hidden costs of control. *American Economic Review* 96(5): 1611–1630.
- Fehr E, Falk A (2002) Psychological foundations of incentives. *European Economic Review* 46(4–5):687–724.
- Feld LP, Frey BS (2007) Tax compliance as the result of a psychological tax contract: The role of incentives and responsive regulation. *Law & Policy* 29(1):102–120.
- Fischbacher U (2007) z-Tree: Zurich Toolbox for ready-made economic experiments. *Experimental Economics* 10(2):171–178.
- Gneezy U, Meier S, Rey-Biel P (2011) When and why incentives (don't) work to modify behavior. *Journal of Economic Perspectives* 25(4):191–210.
- Gneezy U, Rustichini A (2000a) A fine is a price. *Journal of Legal Studies* 29(1):1–17.
- Gneezy U, Rustichini A (2000b) Pay enough or don't pay at all. *Quarterly Journal of Economics* 115(3):791–810.
- Kaptein M, Schwartz MS (2008). The effectiveness of business codes: A critical examination of existing studies and the development of an integrated research model. *Journal of Business Ethics* 77(2), 111–127.
- Kirchler E, Maciejovsky B, Schneider F (2003) Everyday representations of tax avoidance, tax evasion, and tax flight: Do legal differences matter? *Journal of Economic Psychology* 24(4):535–553.
- Kredentser MS, Fabrigar LR, Smith SM, Fulton K (2012) Following what people think we should do versus what people actually do. *Social Psychological and Personality Science* 3(3):341–347.
- Mazar N, Amir O, Ariely D (2008) The Dishonesty of Honest People. A Theory of Self-Concept Maintenance. *Journal of Marketing Research*. 45(6):633-644.
- McAdams R (2000) An attitudinal theory of expressive law. *Oregon Law Review* 79(2):339–390.
- Neck R, Wächter J, Schneider F (2012) Tax avoidance versus tax evasion: On some determinants of the shadow economy. *International Tax and Public Finance* 19(1):104–117.
- Pickhardt M, Prinz A (2014) Behavioral dynamics of tax evasion – A survey. *Journal of Economic Psychology* 40:1–19.
- Posner R. (1981) *The Economics of Justice*. Harvard University Press, Cambridge, MA.
- Scholz JT, Lubell M. (1998) Trust and taxpaying: Testing the heuristic approach to collective action. *American Journal of Political Science* 42(2):398–417.
- Stiglitz JE (1985) The general theory of tax avoidance. *National Tax Journal* 38(3):325–337.
- Stout L (2006) Social norms and other-regarding preferences. Drobak J, ed. *Norms and the Law*. Cambridge University Press, Cambridge, 13–34.
- Sunstein C (1996) Social norms and social roles. *Columbia Law Review* 96(4):903–968.
- Thaler RH, Johnson EJ (1990) Gambling with the house money and trying to break even: The effects of prior outcomes on risky choice. *Management Science* 36(6):643–660.

Table 1: Multivariate analysis

This table presents the regression results from OLS estimations (Panel A) and Tobit estimations (Panel B). The three columns represent the results from our three different experiments. Experiment 1 is our baseline experiment, with no negative detection consequences and no moral priming. Experiment 2 includes negative detection consequences and experiment 3 includes negative detection consequences and moral priming. The dependent variable, *Tax Base Reduction*, is measured in sheets. Subjects had to key in paper test sheets from a modified multiple-choice test. Earned income was subject to taxes but the subjects could choose between zero and six sheets they did not want to declare as taxable income by exploiting a tax avoidance/evasion opportunity. The variable *Evasion* equals one if the tax minimization opportunity is labeled as illegal tax evasion, *MTR* is the marginal income tax rate before tax minimization, *Male* equals one if the participant is male, and *Risk* is participants' self-reported risk taking behavior (Socio-Economic Panel (SOEP) question, from zero, no risk taking, to 10, very high risk taking). We report standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: OLS estimation

Experiment	1	2	3
Dependent Variable	Tax Base Reduction	Tax Base Reduction	Tax Base Reduction
Evasion	-2.732*** (0.525)	-0.286 (0.524)	-0.945* (0.521)
MTR	3.598** (1.512)	1.913 (1.476)	0.221 (1.459)
Male	1.269** (0.540)	0.206 (0.563)	0.116 (0.521)
Risk		0.476*** (0.115)	0.348*** (0.0977)
Constant	3.000*** (0.778)	0.135 (0.862)	2.058** (0.952)
Observations	64	65	62
Adj. R-squared	0.398	0.254	0.206

Panel B: Tobit estimation

Experiment	1	2	3
Dependent Variable	Tax Base Reduction	Tax Base Reduction	Tax Base Reduction
Evasion	-15.16*** (4.938)	-0.464 (1.235)	-1.729* (0.945)
MTR	20.51* (10.39)	3.490 (3.477)	0.712 (2.626)
Male	7.128* (3.615)	-0.0628 (1.339)	0.0592 (0.950)
Risk		1.241*** (0.324)	0.664*** (0.193)
Constant	3.853 (4.238)	-3.335 (2.190)	1.038 (1.743)
Observations	64	65	62
Pseudo R-squared	0.212	0.106	0.077

Table 2: OLS estimation—Tax reduction (in euros) as the dependent variable

This table presents the regression results from OLS estimations. The three columns represent the results of our three different experiments. Experiment 1 is our baseline experiment with no negative detection consequences and no moral priming. Experiment 2 includes negative detection consequences and experiment 3 includes negative detection consequences and moral priming. The dependent variable, *Tax Reduction*, is measured in euros; *Evasion* equals one if the tax minimization opportunity is labeled as illegal tax evasion, *Male* equals one if the participant is male, and *Risk* is participants' self-reported risk taking behavior (Socio-Economic Panel (SOEP) question, from zero, no risk taking, to 10, very high risk taking). We report standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Experiment	1	2	3
Dependent Variable	Tax Reduction	Tax Reduction	Tax Reduction
Evasion	-0.925*** (0.226)	0.0288 (0.216)	-0.348* (0.189)
Male	0.584** (0.230)	-0.0234 (0.232)	-0.105 (0.190)
Risk		0.184*** (0.0467)	0.117*** (0.0355)
Constant	1.346*** (0.205)	0.227 (0.268)	0.727** (0.239)
Observations	64	65	62
Adj. R-squared	0.241	0.184	0.177

Table 3: Multivariate analysis—Reduced sample analysis

This table presents the regression results from OLS estimations. The sample is restricted to those participants who correctly answered the manipulation check question on the marginal tax rate. The three columns represent the results of our three different experiments. Experiment 1 is our baseline experiment with no negative detection consequences and no moral priming. Experiment 2 includes negative detection consequences and experiment 3 includes negative detection consequences and moral priming. The dependent variables are *Tax base reduction* (in sheets, Panel A) and *Tax reduction* (in euros, Panel B). The variable *Evasion* equals one if the tax minimization opportunity is labeled as illegal tax evasion, *Male* equals one if the participant is male, and *Risk* is participants' self-reported risk taking behavior (Socio-Economic Panel (SOEP) question, from zero, no risk taking, to 10, very high risk taking). We report standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: OLS estimation (tax base reduction, in sheets)

Experiment	1	2	3
Dependent Variable	Tax Reduction	Tax Reduction	Tax Reduction
Evasion	-3.210*** (0.550)	-0.735 (0.606)	-1.216* (0.672)
MTR	3.765** (1.573)	1.659 (1.640)	-1.117 (1.844)
Male	0.975* (0.557)	0.235 (0.635)	0.0880 (0.652)
Risk		0.590*** (0.120)	0.389*** (0.117)
Constant	3.079*** (0.800)	-0.533 (0.942)	2.696** (1.218)
Observations	56	43	45
Adj. R-squared	0.460	0.397	0.231

Panel B: OLS estimation (tax reduction, in euros)

Experiment	1	2	3
Dependent Variable	Tax Reduction	Tax Reduction	Tax Reduction
Evasion	-1.077*** (0.244)	-0.0324 (0.245)	-0.516** (0.232)
Male	0.526** (0.245)	-0.126 (0.259)	-0.105 (0.231)
Risk		0.197*** (0.0483)	0.119*** (0.0413)
Constant	1.405*** (0.211)	0.0420 (0.293)	0.793** (0.312)
Observations	56	43	45
Adj. R-squared	0.280	0.250	0.225

Appendix I

[Instructions from the first experiment]

By participating in this experiment, you have the opportunity to earn money. The experiment serves to examine economic decision making. The remuneration you will receive at the end of the experiment depends on your decisions concerning your labor supply. Please read the instructions carefully and attentively.

Should you have further questions, please contact the experimenter.

1. Anonymity

We want to inform you that throughout the experiment you are not allowed to talk to the other participants or leave your workstation. To start the experiment, you received a table tennis ball with an identification number. Please carefully keep the ball. You will need it to identify yourself when the remuneration is paid. The identification number enables you to hide your true identity from the experimenter and the other participants.

2. Set up of the experiment

Labor supply decision, questionnaire part 1, working phase, and questionnaire part 2.

You begin with a trial round to become acquainted with the task. We then ask you to submit a mandatory labor supply and fill out part 1 of the questionnaire. Afterward you will have to fulfill your mandatory labor supply. The phase will end with another questionnaire. Finally, you will receive your remuneration according to your performance.

1. Trial round

Your task is to digitize the answers marked on the sheets in front of you into an entry form on the computer. The sheets contain the answers from a multiple-choice exam. In a first step we ask you to enter the number of the sheet, which can be found at the top left corner of the page, into the field provided for it and press Next. Afterward, you will see the entry form for the sheet. It will be set up similarly to the hard copy of the sheet in front of you. Please translate the marked answers for all of the 60 questions into the entry form on the computer. When you have finished translating the sheet, please press Next.

The computer will calculate the time you need to type up the single sheet. This processing time will be displayed for you. Based on the processing time, you will then be able to estimate how many sheets you want to digitize for your mandatory labor supply.

2. Determining your labor supply

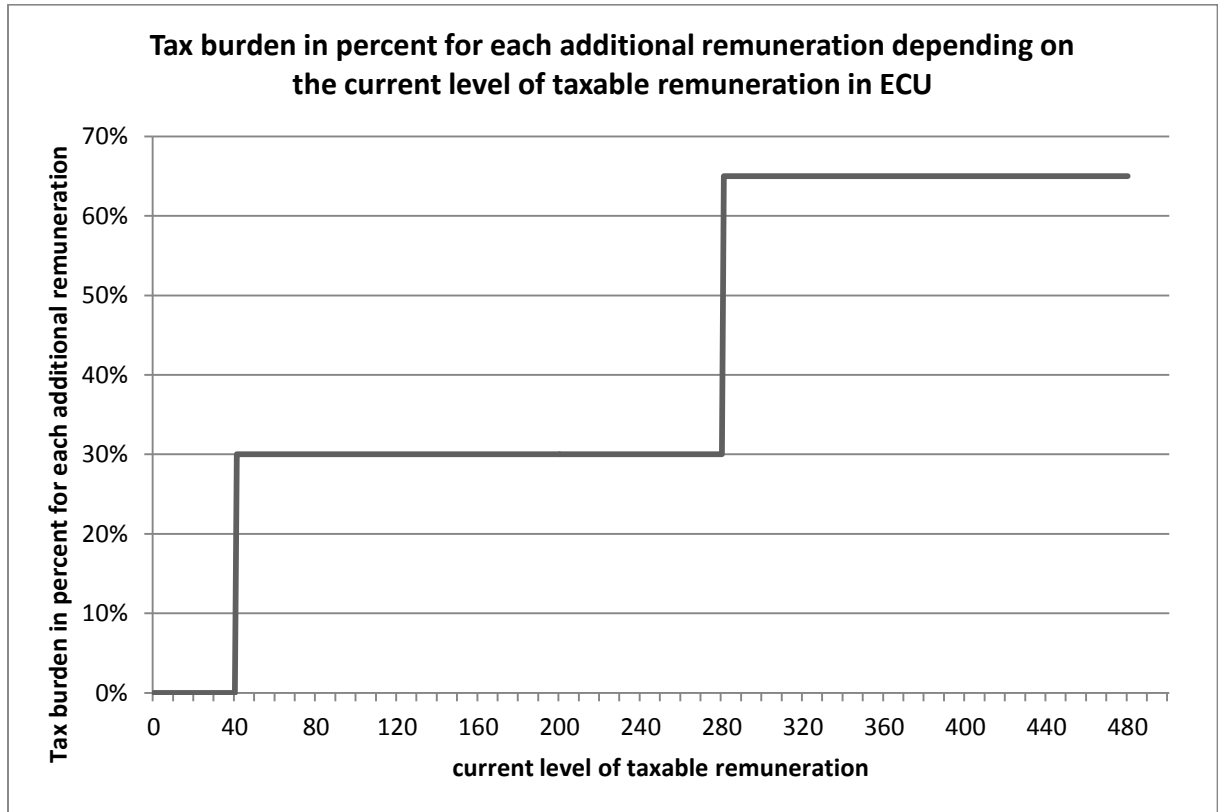
You became acquainted with your task during the trial round and know your approximate processing time by now. We now want to know how many sheets you will digitize. You will submit a **mandatory** labor supply, which you will have to fulfill afterward.

Please note: Only if you fulfill your labor supply will you get compensated for your work.

For every **correctly** digitized sheet you will receive **10 ECU** (currency during the experiment) as a gross wage (10 ECU equal 0.70 euros).

You have to pay taxes: The first four correctly digitized sheets remain tax free (equals 40 ECU). Starting with the fifth correctly digitized sheet, you will have to pay a tax of **30 percent** for each additional sheet. Starting with the 29th correctly digitized sheet, you will have to pay a tax of **65 percent** for each additional sheet.

The tax will remain in the budget of the XXX Business School. You will be paid out your net remuneration (earnings after taxes). The following graphic illustrates the tax system:



By using a **slider**, you can determine how many sheets you will correctly digitize. You can **adjust the slider as often as you want**. Depending on the slider's position, the following information will be displayed to you according to the tax system:

- Additional gross wage (**before** taxes) in ECU if you digitize **an additional sheet** correctly,
- Additional tax burden in percent if you digitize an **additional sheet** correctly,
- Additional net wage (**after** taxes) in ECU if you digitize an **additional sheet** correctly.

[Legal Tax Avoidance treatment only: You can legally reduce your tax burden by using a loophole in the tax code. This will reduce the number of sheets to be taxed. Your tax burden will thereby be reduced. You will find an additional slider to determine the use of the legal loophole. The more you use the loophole, the more sheets will not be taxed. Up to six sheets will not be taxed when fully using the loophole You can adjust the slider as often as you want.]

[Illegal Tax Evasion treatment only: In principle, you have to honestly pay tax on your compensation. However, you can illegally reduce your tax burden through tax evasion. This will reduce the number of sheets to be taxed. Your tax burden will thereby be reduced. You will find an additional slider to determine the use of illegal tax evasion. The more you use tax evasion, the more sheets will not be taxed. Up to six sheets will not be taxed when fully using illegal tax evasion. Potential tax evasion will not be uncovered. You can adjust the slider as often as you want.]

If you don't want to make further adjustments, please submit your **mandatory** labor supply by pressing Next. Subsequent correction is not possible from this point on.

3. Questionnaire part 1

Please read the questions attentively and answer them conscientiously. Your answers are an important component of our experiment and will be analyzed anonymously. Afterward press Next.

4. Fulfilling your labor supply

You became acquainted with your task during the trial round and submitted a binding labor supply, which you will have to fulfill now. After every sheet you will be informed whether you digitized it correctly or not. The number of sheets left to be correctly digitized to fulfill your labor supply will be displayed to you. Please enter every sheet only once, since the repeated entry of a sheet number will not be considered and therefore not remunerated.

5. Questionnaire part 2

Please read the questions attentively and answer them conscientiously. Your answers are an important component of our experiment and will be analyzed anonymously. Afterward press Continue.

6. Payment

In summary, you will see an evaluation of your labor supply (remuneration after taxes converted into euros). By then the experiment is over. **Please press Continue for your payment file to be created.** Quietly pack your belongings and come to the front to be paid. You will receive your remuneration after taxes from the working phase according to your fulfilled labor supply decision.

After carefully reading and understanding these instructions, **please start the experiment independently.** Should you have any questions, do not hesitate to ask the experimenter.

Thank you for your participation!

Appendix II

[Additional instructions for the second experiment]

[Legal Tax Avoidance only: Whether use of the loophole will be accepted by the tax authority is unknown.

- Case 1: The use of the legal loophole is **accepted**. The probability of this happening is 75%.
- Case 2: The use of the legal loophole is **not accepted**. The probability of this happening is 25%. In this case you will have to pay the so-far unpaid taxes (on a maximum of six sheets). In addition, you will have to pay **interest** amounting to **half** of the subsequent tax payment.

The two possible outcomes are randomly selected. To arrive at a decision, you will have to choose one out of four table tennis balls by the end of the experiment. Three of the four balls will be labeled Case 1, while one of them will be labeled Case 2. Depending on the slider's position, the following information will be displayed to you according to the tax system.

The **effect** of a deferment of the **upper** slider by one sheet to the right (You digitize one additional sheet → what happens?):

- the amount of the **additional pre-tax and pre interest** income in ECU,
- the amount of the **additional** tax burden in ECU,
- the amount of the **additional** interest in ECU,
- the amount of the **additional post-tax and post interest** income in ECU.

The **effect** of a deferment of the **lower** slider by one sheet to the right (You extent the use of the legal loophole by one additional sheet → what happens?):

- the amount of the **additional** tax savings in ECU,
- the amount of the **additional** interest in ECU.

The presentation of the effects is **separated** for **Case 1** and **Case 2**.

In the following 3 **fictitious** numerical examples will be presented. The presentation of the examples equals that of the numbers on your screen during your working decision. Please try to comprehend the examples. In case of questions you are duly asked to contact the supervisor before you start.

Example 1

Number of sheets specified by slide control (labor supply)	10 sheets	
Extent of the use of legal loophole in sheets as specified by slide control	0 sheets	
	Case 1: Loophole is being accepted (probability = 75%)	Case 2: Loophole is not accepted (probability = 25%)
Effect of a deferment of the upper slide control by one sheet to the right (what happens if you digitize one additional sheet):		
Additional pre-tax and pre interest income in ECU	10 ECU	10 ECU
Additional tax burden in ECU	3.00 ECU	3.00 ECU
Additional interest in ECU		0.00 ECU
Additional post-tax and post interest income in ECU	7.00 ECU	7.00 ECU
Effect of a deferment of the lower slide control by one sheet to the right (what happens if you extent the use of the legal loophole by one additional sheet):		
Additional tax savings in ECU	3.00 ECU	
Additional interest in ECU		1.50 ECU

In case of a sole deferment of the **upper** slide control by one sheet to the right, additional effects are identical for Case 1 and Case 2. Your additional income for the 11th sheet amounts to 7.00 ECU (post-tax and post-interest).

In case of a sole deferment of the **lower** slide control by one sheet to the right (the use of the legal loophole now comprises one sheet), you save 3.00 ECU of taxes in Case 1 (tax rate = 30%) while in Case 2 these savings are lost and you have to pay additional interest of 1.50 ECU (half of the subsequent tax payment).

Example 2

Number of sheets specified by slide control (labor supply)	4 sheet	
Extent of the use of legal loophole in sheets as specified by slide control	1 sheet	
	Case 1: Loophole is being accepted (probability = 75%)	Case 2: Loophole is not accepted (probability = 25%)
Effect of a deferment of the upper slide control by one sheet to the right (what happens if you digitize one additional sheet):		
Additional pre-tax and pre interest income in ECU	10 ECU	10 ECU
Additional tax burden in ECU	0.00 ECU	3.00 ECU
Additional interest in ECU		1.50 ECU
Additional post-tax and post interest income in ECU	10.00 ECU	5.50 ECU
Effect of a deferment of the lower slide control by one sheet to the right (what happens if you extent the use of the legal loophole by one additional sheet):		
Additional tax savings in ECU	0.00 ECU	
Additional interest in ECU		0.00 ECU

In general, without using the legal loophole, an additionally digitized sheet (5th sheet) would be taxed with 30% in case of a sole deferment of the **upper** slide control by one sheet to the right. But due to the use of the legal loophole one sheet remains tax free in Case 1, the additional tax burden for the 5th sheet therefore amounts to 0.00 ECU. In Case 2 the use of the legal loophole is not accepted. As a consequence the 5th sheet is taxed at a tax rate of 30%. In addition interest of 1.50 ECU (half of the subsequent tax payment) has to be paid.

In case of a sole deferment of the **lower** slide control no additional tax savings arise in Case 1 as all 4 sheets are already taxed at a tax rate of 0%. Respectively in Case 2 no additional interest arises.

Example 3

Number of sheets specified by slide control (labor supply)	40 sheets	
Extent of the use of legal loophole in sheets as specified by slide control	5 sheets	
	Case 1: Loophole is being accepted (probability = 75%)	Case 2: Loophole is not accepted (probability = 25%)
Effect of a deferment of the upper slide control by one sheet to the right (what happens if you digitize one additional sheet):		
Additional pre-tax and pre interest income in ECU	10 ECU	10 ECU
Additional tax burden in ECU	6.50 ECU	6.50 ECU
Additional interest in ECU		0.00 ECU
Additional post-tax and post interest income in ECU	3.50 ECU	3.50 ECU
Effect of a deferment of the lower slide control by one sheet to the right (what happens if you extend the use of the legal loophole by one additional sheet):		
Additional tax savings in ECU	6.50 ECU	
Additional interest in ECU		3.25 ECU

In case of sole deferment of the **upper** slide control by one sheet to the right the additional (41st) sheet is always taxed at a tax rate of 65%. Additional interest due to the 41st sheet does not arise in Case 2 as the overall subsequent tax payment remains unaffected by the 41st sheet.

In case of a sole deferment of the **lower** slide control by one sheet to the right, tax savings on the additional (6th) sheet of 6.50 ECU arise in Case 1. In Case 2 these savings are lost while additional interest of 3.25 ECU (half of the subsequent tax payment) has to be paid.]

[Illegal Tax Evasion only: Whether a potential tax evasion is detected by the tax authority is unknown:

Case 1: The tax evasion remains **undetected**. Probability for this to happen is 75%.

Case 2: The tax evasion is **being detected**. Probability for this to happen is 25%. In this case you will have to pay the so far unpaid taxes (tax on a maximum of 6 sheets) plus in addition you will have to pay a **penalty** amounting to **half** of the subsequent payment.

Which of the 2 possible outcomes might be the case is randomly selected. To arrive at a decision you will have to choose one out of four table tennis balls by the end of the experiment. Three of the four balls will be labeled “Case 1” while one out of them will be labeled “Case 2”. Depending on the slider’s position the following information will be displayed to you according to the tax system:

The **effect** of a deferment of the **upper** slider by one sheet to the right (You digitize one additional sheet → what happens?):

- the amount of the **additional pre-tax** and **pre-penalty** income in ECU,
- the amount of the **additional** tax burden in ECU,
- the amount of the **additional** penalty in ECU,
- the amount of the **additional post-tax** and **post-penalty** income in ECU.

The **effect** of a deferment of the **lower** slider by one sheet to the right (You extent the tax evasion by one additional sheet → what happens?):

- the amount of the **additional** tax savings in ECU,
- the amount of the **additional** penalty in ECU.

The presentation of the effects is **separated** for **Case 1** and **Case 2**.

In the following 3 **fictitious** numerical examples will be presented. The presentation of the examples equals that of the numbers on your screen during your working decision. Please try to comprehend the examples. In case of questions you are duly asked to contact the supervisor before you start.

Example 1

Number of sheets specified by slide control (labor supply)	10 sheets	
Extent of illegal tax evasion in sheets as specified by slide control	0 sheets	
	Case 1: tax evasion remains undetected (probability = 75%)	Case 2: tax evasion is detected (probability = 25%)
Effect of a deferment of the upper slide control by one sheet to the right (what happens if you digitize one additional sheet):		
Additional pre-tax and pre-penalty income in ECU	10 ECU	10 ECU
Additional tax burden in ECU	3.00 ECU	3.00 ECU
Additional penalty in ECU		0.00 ECU
Additional post-tax and post-penalty income in ECU	7.00 ECU	7.00 ECU
Effect of a deferment of the lower slide control by one sheet to the right (what happens if you extend the illegal tax evasion by one additional sheet):		
Additional tax savings in ECU	3.00 ECU	
Additional penalty in ECU		1.50 ECU

In case of a sole deferment of the **upper** slide control by one sheet to the right, additional effects are identical for Case 1 and Case 2. Your additional income for the 11th sheet amounts to 7.00 ECU (post-tax and post-penalty).

In case of a sole deferment of the **lower** slide control by one sheet to the right (the illegal tax evasion now comprises one sheet), you save 3.00 ECU of taxes in Case 1 (tax rate = 30%) while in Case 2 these savings are lost and you have to pay an additional penalty of 1.50 ECU (half of the subsequent tax payment).

Example 2

Number of sheets specified by slide control (labor supply)	4 sheets	
Extent of illegal tax evasion in sheets as specified by slide control	1 sheet	
	Case 1: tax evasion remains undetected (probability = 75%)	Case 2: tax evasion is detected (probability = 25%)
Effect of a deferment of the upper slide control by one sheet to the right (what happens if you digitize one additional sheet):		
Additional pre-tax and pre-penalty income in ECU	10 ECU	10 ECU
Additional tax burden in ECU	0.00 ECU	3.00 ECU
Additional penalty in ECU		1.50 ECU
Additional post-tax and post-penalty income in ECU	10.00 ECU	5.50 ECU
Effect of a deferment of the lower slide control by one sheet to the right (what happens if you extend the illegal tax evasion by one additional sheet):		
Additional tax savings in ECU	0.00 ECU	
Additional penalty in ECU		0.00 ECU

In general, without illegal tax evasion, an additionally digitized sheet (5th sheet) would be taxed with 30% in case of a sole deferment of the **upper** slide control by one sheet to the right. But due to the use of illegal tax evasion one sheet remains tax free in Case 1, the additional tax burden for the 5th sheet therefore amounts to 0.00 ECU. In Case 2 the use of illegal tax evasion is being detected. As a consequence the 5th sheet is taxed at a tax rate of 30%. In addition the penalty of 1.50 ECU (half of the subsequent tax payment) has to be paid.

In case of a sole deferment of the **lower** slide control no additional tax savings arise in Case 1 as all 4 sheets are already taxed at a tax rate of 0%. Respectively in Case 2 no additional penalty arises.

Example 3

Number of sheets specified by slide control (labor supply)	40 sheets	
Extent of illegal tax evasion in sheets as specified by slide control	5 sheets	
	Case 1: tax evasion remains undetected (probability = 75%)	Case 2: tax evasion is detected (probability =25%)
Effect of a deferment of the upper slide control by one sheet to the right (what happens if you digitize one additional sheet):		
Additional pre-tax and pre-penalty income in ECU	10 ECU	10 ECU
Additional tax burden in ECU	6.50 ECU	6.50 ECU
Additional penalty in ECU		0.00 ECU
Additional post-tax and post-penalty income in ECU	3.50 ECU	3.50 ECU
Effect of a deferment of the lower slide control by one sheet to the right (what happens if you extent the illegal tax evasion by one additional sheet):		
Additional tax savings in ECU	6.50 ECU	
Additional penalty in ECU		3.25 ECU

In case of sole deferment of the **upper** slide control by one sheet to the right the additional (41st) sheet is always taxed at a tax rate of 65%. An additional penalty due to the 41st sheet does not arise in Case 2 as the overall subsequent tax payment remains unaffected by the 41st sheet.

In case of a sole deferment of the **lower** slide control by one sheet to the right, tax savings on the additional (6th) sheet of 6.50 ECU arise in Case 1. In Case 2 these savings are lost while an additional penalty of 3.25 ECU (half of the subsequent tax payment) has to be paid.]

Appendix III

[Additional instructions for the third experiment]

Please enter your identification number and PIN and press “continue” at the screen in front of you. You will now see 6 quotes. Your task is to **attentively** read the 6 quotes and describe the similarities of the 6 quotes in your own words. **Therefore, please use the attached sheet.** When you have finished your task please press “Next”.

The first phase of the experiment will then be over.

Please hand over the sheet at the end of the experiment (during the remuneration phase).

For the **first phase** of the experiment you will receive a remuneration of **5 Euro**.

After attentively reading and understanding these instructions you can start the experiment.

Should you have any questions, do not hesitate to ask the experimenter.

Sheet to write down the common ground of the 6 quotes

Udanavarga 5:18

“Hurt not others in ways that you yourself would find hurtful”

Matthew 7:12

“Do to others what you want them to do to you. This is the meaning of the law of Moses and the teaching of the prophets”

Confucius

“Never impose on others what you would not choose for yourself.”

Mahabharata Anusasana Parva, Section CXIII, Verse 8

“One should never do that to another which one regards as injurious to one’s own self. This, in brief, is the rule of dharma. Other behavior is due to selfish desires.”

Hadith 13

“None of you truly believes until he wishes for his brother what he wishes for himself.”

Talmud Shabbat 31a

“That which is hateful to you, do not do to your fellow. That is the whole Torah; the rest is the explanation; go and learn it.”]

Please write down the common ground of these 6 quotes in own words:

Appendix IV: Questionnaire Parts 1 and 2

Questionnaire Part 1 out of 2

Please tell me for each of the following whether you think it can always be justified, never be justified, or something in between:

- Claiming state benefits which you are not entitled to
- Cheating on tax if you have the chance
- Lying in your own interest
- Someone accepting a bribe in the course of their duties
- Avoiding taxes by using legal means if you have the chance

Radio line from 1 = “never be justified” to 10 = “always be justified”

How fair do you consider the tax system applied during the experiment on a scale of 1 = very unfair to 10 = very fair?

[Experiment 2 and Experiment 3 only: Are you generally a risk-seeking person or do you try to avoid risk?

Radio line from 0 = “no risk taking”; 10 = “high risk taking”]

[Experiment 2 and Experiment 3 only: What religion do you belong to?]

[Experiment 2 and Experiment 3 only: In the past 12 months, how often did you attend religious services?]

Questionnaire Part 2 out of 2

Did you participate in a similar experiment (labor supply decision) before?

Were the instructions understandable?

Please tell us the amount of the remuneration (wage) before taxes per sheet in ECU!

Reminder: You digitized xxx sheets correctly [Legal Tax Avoidance only: and xxx sheets were not taxed due to the use of the loophole in the tax code.] [Illegal Tax Evasion only: and xxx sheets were not taxed due to the use of tax evasion.] Please tell us the tax burden in percent regarding the **last** sheet you digitized!

Reminder: You digitized xxx sheets correctly [Legal Tax Avoidance only: and xxx sheets were not taxed due to the use of the loophole in the tax code.] [Illegal Tax Evasion only: and xxx sheets were not taxed due to the use of tax evasion.] Please tell us the tax burden in percent regarding **all** the sheets you digitized!

How would you rate your tax law knowledge on a scale from 1 = no knowledge to 9 = exceptionally knowledge?

How old are you?

Are you female or male?

Which faculty are you enrolled for?

0 = architecture and landscape; 1 = construction engineering and geodesy; 2 = electrical engineering and computer science; 3 = law; 4 = mechanical engineering; 5 = mathematics and physics; 6 = natural sciences; 7 = philosophy; 8 = business and economics; 9 = other; 10 = I am not a student

What qualification are you aiming at right now?

0 = bachelor; 1 = master; 2 = diploma; 3 = *Magister* [comparable to Master of Arts]; 4 = 1st state examination; 5 = 2nd state examination; 6 = doctoral degree; 7 = other

Which academic semester are you in?

What's your marital status?

0 = marriage / registered partnership; 1 = unmarried; 2 = divorced / widowed

Do you have children?

What is your monthly disposable income (after rent; approximately)?

0 = < 300 EUR; 1 = 301 EUR – 600 EUR; 2 = 601 EUR – 900 EUR; 3 = 901 EUR – 1,200 EUR; 4 = >1,200 EUR

How many siblings do you have?

Impressum:

Arbeitskreis Quantitative Steuerlehre, arqus, e.V.

Vorstand: Prof. Dr. Ralf Maiterth (Vorsitzender),
Prof. Dr. Kay Blaufus, Prof. Dr. Dr. Andreas Löffler
Sitz des Vereins: Berlin

Herausgeber: Kay Blaufus, Jochen Hundsdoerfer,
Martin Jacob, Dirk Kiesewetter, Rolf J. König,
Lutz Kruschwitz, Andreas Löffler, Ralf Maiterth,
Heiko Müller, Jens Müller, Rainer Niemann,
Deborah Schanz, Sebastian Schanz, Caren Sureth-
Sloane, Corinna Treisch

Kontaktadresse:

Prof. Dr. Caren Sureth-Sloane, Universität Paderborn,
Fakultät für Wirtschaftswissenschaften,
Warburger Str. 100, 33098 Paderborn,
www.arqus.info, Email: info@arqus.info

ISSN 1861-8944