

# Tax compliance under tax regime changes<sup>\*</sup>

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**Abstract:** In this paper we focus on the compliance effects of tax regime changes. According to the economic model of tax evasion, a tax reform should affect compliance through its impact on tax rates and incentives. Our findings demonstrate the importance of at least two further effects not covered by the traditional model: First, reform losers tend to evade more taxes after the reform. Second, a reform from a proportionate towards a progressive system decreases compliance compared to a switch in the reverse direction. Interestingly, however, the level of compliance is generally higher under a progressive than under a proportionate regime.

20 February 2009

**JEL classification:** C72, C91, H26

**Keywords:** tax reforms, tax compliance, experiment

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\* Kocher gratefully acknowledges financial support by the Munich Experimental Laboratory for Economics and Social Sciences (MELESSA). We thank seminar participants in Munich for helpful comments on the design of the experiment and Julius Pahlke for excellent research assistance.

# 1 Introduction

Economists typically discuss tax regime changes or tax reforms under aspects of economic incentives and efficiency regarding labor supply, investment as well as savings decisions and similar issues. A potentially important incentive effect of tax reforms which has largely been neglected so far is the interest of this paper: the impact of a tax regime changes on the inclination or willingness of tax payers to comply with tax rules.

Our contribution can be based on the far advanced theoretical and empirical literature on tax compliance. This literature continues to be inspired by the striking contrast between high observable tax compliance and low compliance predicted by the economic model of tax compliance (Allingham and Sandmo, 1972) for a realistic degree of risk aversion. This does not only hold for studies based on survey or field data but also for experimental studies where “in most cases the level of tax compliance was higher than predicted” (Torgler, 2002, p. 677).

In the course of the last two decades important explanations have emerged which contribute to understand this contrast (for a more complete coverage of the literature see Kirchler, 2007, Torgler, 2002, and Andreoni, 1998): Individuals tend to overweight the probability of an audit (Alm, McClelland and Schulze, 1992). The perception that tax payments are linked to the financing of beneficial public goods fosters compliance (Alm, Jackson at McKee, 1992). Feld and Frey (2002, 2007) interpret the interaction of taxpayers and tax authorities in the context of a reciprocal “psychological contract” which effectively binds taxpayers if their political participation rights are developed and if they are friendly treated by tax authorities. In line with the view of tax payments as reciprocal behavior is the finding that the perceived equity of a tax system influences compliance rates (the starting point of this line of research was Spicer and Becker, 1980; for subsequent experimental studies see Torgler, 2002). Further attempts to explain the tax compliance puzzle point to the role of social norms or social preferences, which can affect the tax compliance decision. Social norms on tax compliance (or “tax morale”) may explain different compliance experiences for countries with similar fiscal systems (Alm, Sanchez and De Juan, 1995). Tax morale itself is dependent on institutions. E.g., Torgler (2005) establishes a positive impact of Swiss direct democracy on tax morale. Recently, Maciejovsky, Kirchler and Schwarzenberger (2007) have put emphasis on the dynamic dimension of tax compliance in an experimental setting which explores the effects of audits over time.

We follow the latter authors in the respect that we focus on the dynamics of tax compliance, too. However, our context is that of tax reform. As far as we know, we are the first to investigate compliance effects of tax regimes switches experimentally. We implement this through fully incentivized, individual decisions on tax compliance in the experimental laboratory. More specifically, our study focuses on the impact of a reform from a progressive towards a proportionate tax tariff and vice versa on individual tax compliance. Furthermore, our study is novel by analyzing the behavioral determinants of individual choices regarding the preferred tax regime after participants have experienced both regimes. A further innovative feature of our empirical approach is that the taxable income in the experiment depends on individual achievements (see also Anderhub et al., 2001). This feature induces stronger entitlements over the taxable income and increases the external validity of our experimental setup.

Our empirical results corroborate the view that compliance is affected by regime changes beyond the predictions of the traditional economic model of tax evasion. A change from a progressive to a proportionate system is significantly more beneficial in terms of tax compliance than a switch in the reverse direction. This result hints to the importance of the pre-reform point of reference in the individual compliance decision. Furthermore, reform losers tend to evade taxes to a greater extent after the reform compared to reform winners. The preference for one of the two systems on the individual is strongly influenced by monetary considerations. Other considerations and individual characteristics play a minor role in shaping this preference.

Changes to the degree of a tax system's progressiveness are a key element of many tax reforms introduced or debated. For decades, income tax reforms in industrial countries have been characterized by a combination of base broadening and cuts in tax rates (OECD, 2006). An even more radical approach is the introduction of flat tax regimes, which are highly heterogeneous in reality but share the common feature of a single marginal tax rate for incomes above a tax free allowance. Flat tax reforms have received increasing interest resulting from their popularity among Eastern European countries (Keen, Kim and Varasano, 2008). Proponents claim that their simplicity and incentives raise compliance. Indeed, on the basis of household panel data, Ivanova, Keen and Klemm (2005) report that the Russian flat tax reform from 2001 has been associated with a higher degree of compliance.

However, natural experiments do not allow for an unambiguous identification of the driving forces behind tax compliance because it is next to impossible to disentangle several competing explanations. Relevant variables such as the tax tariff, changes in the effectiveness of the tax administration and the general social and economic environment change concurrently. Moreover, the impact of reforms on compliance cannot be measured precisely from field data or surveys because of the secret nature of tax evasion. Controlled laboratory experiments also have their weak points but they allow for a much finer-tuned assessment of behavioral incentive effects, because they allow sustaining control over all important determinants of decisions and, more importantly, causally ascribing changes of behavior to exogenous treatment variations. Hence, often the combination of both empirical results from the laboratory and results based on field data permits drawing definite conclusions that are valuable for policy makers.

The merits of laboratory experiments on tax compliance decisions as a complement to field or survey studies has recently increased the number of experimental papers in that area quite rapidly. Existing contributions, which we survey briefly in the next section, have substantiated diverse factors impacting on compliance ranging from tax rates, the frequency of audits, the size and structure of fines over social norms and cultural factors to institutional factors related, e.g., to fiscal decentralization. They serve as an important starting point for our study, even though they have not yet dealt with the impact of a tax regime change on compliance.

Our paper is structured as follows: After deriving our theoretical expectations on the impact of tax reform on compliance (in section 2) we present our experimental design in section 3. Section 4 contains the results, and section 5 concludes the paper.

## **2 Tax regimes and tax compliance: Theoretical expectations**

The brief literature review above has clarified that the economic model of tax compliance is not sufficient to explain the extent of honest tax declaration. Hence, studying the impact of tax reform on compliance must allow for at least two kinds of effects. First, according to the logic of the economic model, a tax reform should influence compliance if it involves changes of tax rates, the level and construction of fines or variations of audit probabilities. Second, a tax regime change may have effects on compliance because it influences compliance norms or the perceived fairness of a tax regime where the latter may be influenced by individual gains or losses from the reform.

### **Tax reform effects in the economic model of tax compliance**

The seminal paper which has inspired the broad theoretical and empirical literature studying the driving forces behind tax compliance is Allingham and Sandmo (1972, henceforth: AS). In the AS-model tax cheating is regarded as an investment into a risky asset. By hiding a certain fraction of income tax payers embark on a lottery with two possible outcomes: Either they are not caught and “earn” the tax on the income not declared or they are audited and lose the fine. Key parameters that according to the AS-model should drive tax compliance are the fine rate, the audit probability, the tax rate, the level of income and individual risk preferences. *Ceteris paribus*, investment into tax cheating will be the larger, the lower the risk of detection (determined by the audit system and the audit probability), the lower the potential loss (determined by the construction and the size of the fine), the higher the potential return (determined by the tax rate) and the lower individual risk aversion (which is usually negatively correlated to income).

Since changes in tax rates are a defining characteristic of tax regime reforms, it is particularly important to understand the incentive effects of a variation in the income tax rate (Andreoni, Erard and Feinstein, 1998). In the original AS-model, the fine is constructed to be proportionate to the *income* evaded. Under this assumption raising the tax rate has an ambiguous effect on compliance. On the one hand, it lowers net income which should make people more risk averse under the standard assumption of absolute risk aversion falling with income. On the other hand, a higher tax rate increases the returns to cheating without increasing the size of the fine, since the latter depends on the income

evaded. By contrast, the effect is unambiguous if the fine is proportionate to the *tax* evaded (Yitzhaki, 1974): The income effect and the substitution effect now both work towards more compliance with an increasing tax rate. With the Yitzhaki-type of fine we would expect tax compliance to increase (decrease) if a tax reform increases (decreases) the tax rate.

### **Tax reform effects beyond the economic model**

A tax reform may impact on compliance beyond its pure incentive effects linked to changing parameters of the tax system. Here, the finding of the tax compliance literature (see above) according to which tax compliance is supported by reciprocity and the perception of the tax system's fairness, is relevant. A new tax regime change offers a direct comparison between two systems and may lead to a reassessment of the system's fairness with consequences for compliance. In this regard, it is relevant that the perceived fairness of a tax regime is closely linked to self-interest: Based on a survey of US citizens, Bobek and Hatfield (2001) show that the perceived fairness of the introduction of a flat tax is driven by the individual gains or losses pointing to the relevance of a self-serving bias also in the context of assessments of tax regime changes. The essence of the self-serving bias is "to conflate what is fair with what benefits oneself" (Babcock and Lowenstein, 1997, p. 110). From these considerations we derive the following prediction: Beyond the impact associated with changing tax parameters, tax reform impacts on compliance if the regime change affects the perceived fairness of the tax system. Part of this perceptual effect will be connected to individual losses and gains from the regime change where losses (gains) will be associated with less (more) compliance.<sup>1</sup>

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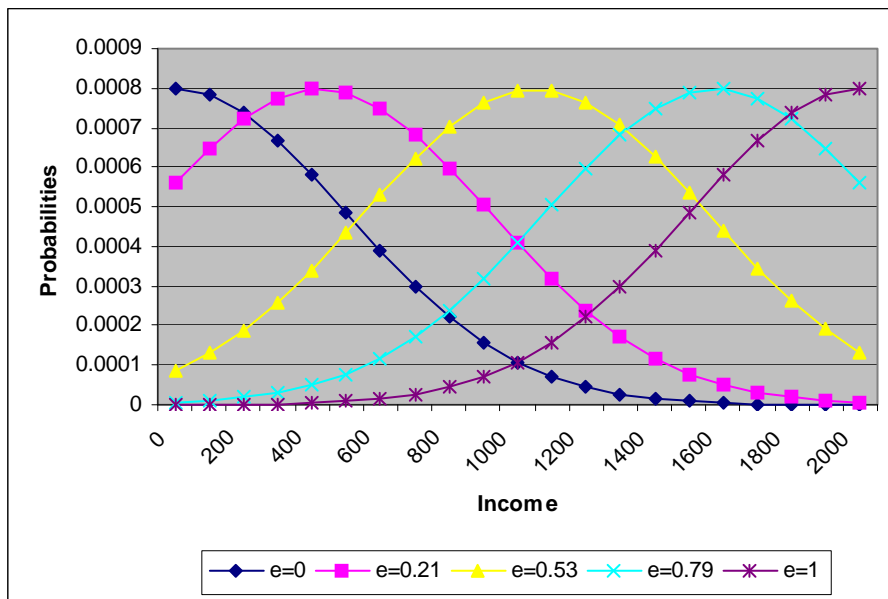
<sup>1</sup> This hypothesis not only rests on a possible self-serving bias and the corresponding fairness judgments but can also be explained by the motive of "loss repair": Andreoni, Erard and Feinstein (1998) explain the unexpectedly negative effect of audit on compliance with the intention to get back some of the money foregone after a fine. In analogy, a tax reform confronting the individual tax payer with losses should lead to more evasion motivated by a compensation strategy.

### 3 Model and experimental design

Our experimental design extends the standard experimental approach to study tax compliance decisions in at least three respects. First, we model individual expected income to depend on individual achievements in order to induce stronger entitlements over the taxable income. Second, individuals experience a fundamental tax regime change from a proportionate towards a progressive system and vice versa. And third, subsequent to the experience of both tax regimes, participants can choose their preferred tax regime and decide about compliance in final period with strongly increased monetary incentives.

In our experimental setup the incomes of  $i \in I$  individuals in period  $t$ ,  $Y_{i,t}$ , is distributed over the closed interval  $[0,2000]$ . The expected income  $E[Y]$  of the population is equal to 1000 but the individual probability distribution is dependent on an individual characteristic  $e_i \in [0,1]$  that is an indicator for relative ability to earn income. Each individual is assigned this parameter in a way such that the relatively best-performing individual is assigned  $e_i = 1$  and the least-performing individual  $e_i = 0$ . If  $n$  is the number of individuals in the economy,  $1/(n - 1)$  is the difference between two adjacent  $e$ -values. The parameter  $e_i$  can be interpreted as a general, time-independent personal pre-disposition for the ability to earn income with  $\partial E[Y]/\partial e_i > 0$ .

Figure 1: Probability distribution of income for an economy with 20 individuals



More specifically, an  $e_i > 0.5$  shifts the expected value of individual income in a given period  $E[Y_{i,t}]$  to the right, and an  $e_i < 0.5$  shifts the expected value of individual income  $E[Y_{i,t}]$  to the left of the median income while, however, leaving the population expected income unchanged.<sup>2</sup> In the experiment, the individual probability distribution over income is normally distributed with  $X = N(\mu_i; \sigma^2) = N(\mu_i; 500^2)$  with cut-offs at 0 and 2000, and  $e_i$  is proportional to  $\mu_i$ , i.e.  $\mu_i = 2000e_i$ . Figure 1 shows the distributions for  $e=0$ ,  $e=0.21$ ,  $e=0.53$ ,  $e=0.79$  and  $e=1$  for the purpose of illustration.

Table 1: Overview of tax regimes

Income	Progressive tax regime		Proportionate tax regime	
	Average tax rate	Tax amount	Average tax rate	Tax amount
0	0.00	0.00	0.25	0.00
100	0.00	0.00	0.25	25.00
200	0.00	0.00	0.25	50.00
300	0.00	0.00	0.25	75.00
400	0.00	0.00	0.25	100.00
500	0.00	0.00	0.25	125.00
600	0.016	9.72	0.25	150.00
700	0.046	32.34	0.25	175.00
800	0.076	60.96	0.25	200.00
900	0.106	95.58	0.25	225.00
1000	0.136	136.20	0.25	250.00
1100	0.166	182.82	0.25	275.00
1200	0.196	235.44	0.25	300.00
1300	0.226	294.06	0.25	325.00
1400	0.256	358.68	0.25	350.00
1500	0.286	429.30	0.25	375.00
1600	0.316	505.92	0.25	400.00
1700	0.346	588.54	0.25	425.00
1800	0.376	677.16	0.25	450.00
1900	0.406	771.78	0.25	475.00
2000	0.436	872.40	0.25	500.00

In each period  $r \in \{1, 2, \dots, R\}$  individuals learn their actual income and have to declare an amount  $0 \leq D_{i,r} \leq Y_{i,r}$ .  $D_{i,r}$  is taxed according to a tax function  $T_{i,r}$  that can take on two forms (the two tax regimes): (i) either being *proportionate* with  $T_{i,r}^{prop} = t * D_{i,r}$ , or (ii) being *progressive* with  $T_{i,r}^{prog} = t D_{i,r} (D_{i,r} - g) / f$  if  $D_{i,r} \geq g$  and 0 otherwise, where  $t$

<sup>2</sup> This is an important feature when introducing a tax regime change, because it allows us to directly compare the two regimes.



denotes the tax rate,  $g$  is the tax-free income and  $f$  is a parameter that determines at which income the maximum marginal tax rate kicks in.<sup>3</sup> Table 1 displays the tax function. Note that the expected revenues of the two tax regimes are identical.<sup>4</sup>

Tax jurisdictions are formed out of  $1 < m < n$  individuals, and tax revenues within a jurisdiction (i.e.,  $\sum_{i=1}^m D_{i,r}$ ) are divided equally among the  $m$  individuals each period. A tax audit take place with a commonly known probability  $p$ , and failing to comply with  $D_{i,r} = Y_{i,r}$  in the audit leads to a fine  $s$ , with  $s_{i,r} = q[T_{i,r}(Y_{i,r}) - T_{i,r}(D_{i,r})]$ , i.e.  $q$  times the evaded tax in this period. Thus, we have implemented the Yitzhaki (1974) type of fine which safeguards that the expected effect of a tax rate increase has an unambiguously positive effect on compliance (see above). Fines are forfeit and are not redistributed within the jurisdiction. Tax evasions that are not detected do not bear any consequences.

Thus, a player  $i$  faces the following payoff function in a single period (suppressing the time index):

$$\pi_i = p\{Y_i - T(D_i) - q[T_i(Y_i) - T_i(D_i)] + \frac{\sum_{j=1}^m D_j}{m}\} + (1-p)[Y_i - T(D_i) + \frac{\sum_{j=1}^m D_j}{m}] \quad (1)$$

In the experiment we choose the following parameters: size of the jurisdiction  $m = 2$ , size of the economy  $n = 10$ , audit probability  $p = 0.15$ <sup>5</sup>, the fine rate  $q = 3$ , the tax function parameters  $g = 546$ ,  $f = 1,500$ , the proportionate tax rate  $t^* = 0.25$ , and the top marginal tax rate of the progressive tax  $t = 0.45$ . It is easy to show for both of our tax regimes – the

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<sup>3</sup> For reasons of parsimony and analytical clarity we chose very easy tax regimes. Moreover, straightforward tax formulae make it much easier for subjects to understand their task. Since we never intended to exactly copy real-world tax regimes, we will not interpret the absolute level of tax compliance. Our focus is on the causal effects of our treatment variations. For the latter, clear incentive effects facilitate inferences on behavioral consequences of tax regime switches.

<sup>4</sup> Note that our experimental program induced the expected income  $E[Y]$  of the population to be slightly skewed to the right and, hence, the expected revenues of the two tax regimes were not identical in the experiment. All our results and conclusions are unaffected by this feature. We will return to this issue in the results section.

<sup>5</sup> Like in many other experiments, we choose an auditing probability that is considerably higher than the one in the real world. This is to account for the fact that several real-world leveraging effects of auditing such as potential social disapproval after being caught cheating or increased auditing scrutiny after once being caught cheating are not separately modeled in our experiment.

progressive and the proportionate tax – that risk-neutral money-maximizing individuals would always declare  $D_{i,t} = 0$ .

As already mentioned, entitlement over money is strengthened by making the individual ability-to-earn-money parameter  $e_i$  dependent on the individual performance in a quiz at the beginning of the experiment. The quiz contained 20 trivia questions (which can be found in Appendix B). Each of them offered four possible answers of which only one was correct. Subjects learned that their endowment in later parts of the experiment will depend on their performance in the quiz, and they learned in the instructions (see Appendix A) for the tax game that per-period income contains a stochastic component, but they did not learn in what exact way income was determined. Specifically, in the instructions there was no reference to the tournament-like or relative nature in which  $e_i$  was determined.

Each of our four experimental sessions followed the protocol described below. 20 subjects were welcomed to the laboratory and received written instructions for the trivia quiz (part one in the instructions) and the first part (part two in the instructions) of the tax game (either under the progressive tax regime in two sessions or under the proportionate tax regime in the other two sessions).<sup>6</sup> At this stage, participants only knew that there would be further parts of the experiments but had no idea on their contents. The instructions were read aloud, and we gave plenty of time to ask private questions before we started the experiment.

Upon completion of the second part of the experiment, subjects received written instruction that were again read aloud for part three of the experiment (the tax game under a progressive tax regime or under a proportionate tax regime). Hence, we implemented a within-subject design. Both tax game parts (periods  $r_1$ - $r_{10}$  and periods  $r_{11}$ - $r_{20}$ ) lasted for 10 periods each, and this was common knowledge at the beginning of each part. Before the final period  $r = 21$  (denoted part four in the instructions), subjects in the experiment are asked which tax regime they prefer, and this regime is, then, implemented for the final period for the individual decision-maker. Monetary incentives for this final period were five times higher than for a period in the previous parts in order to make the self-selection into the preferred regime highly salient. Each period subjects were paired (remember,  $m = 2$ ) randomly in a stranger design (this was common knowledge) in matching groups of size

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<sup>6</sup> Providing subjects with instructions for the first two parts right away helps to make the claim that later endowments depend on the performance in the quiz more credible.

10 for obtaining one statistically independent observation. At the end of each experimental session, subjects went through a risk test (Holt and Laury, 2002) and were asked to answer several attitudinal (tax morale) and personal (socio-economic variables) survey questions.

The experiment was run with the help of z-tree (Fischbacher, 2007). In total, we had 80 participants (students with a variety of majors) in four sessions, each of them lasting less than two hours. Subjects earned €24.15 on average. During the experiment, earnings were framed in experimental points with a pre-announced exchange rate of experimental points into euro. Sessions ended with private, in-cash payment.

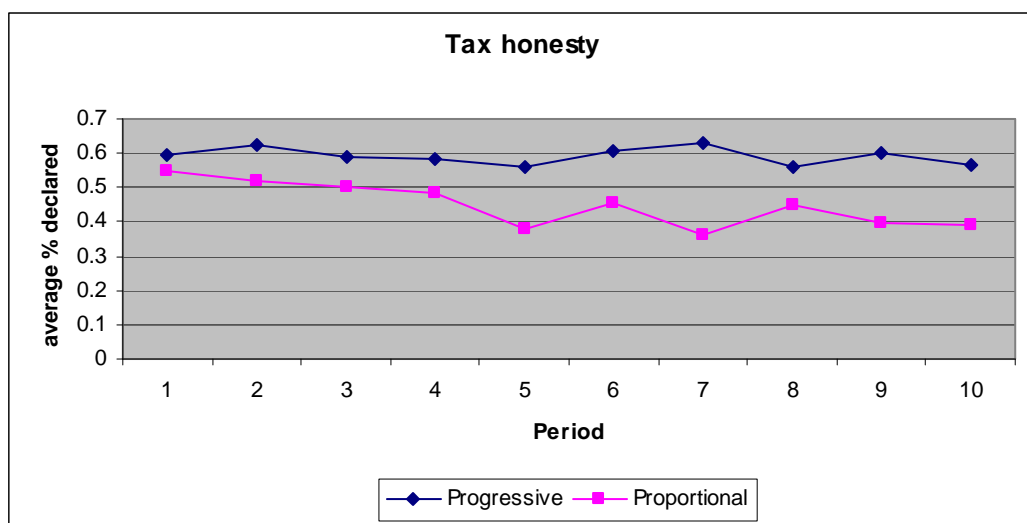
## 4 Experimental results

We first present a short overview of the main descriptive results of our experiment (section 5.1). Section 5.2 investigates the driving forces behind compliance, and section 5.3 analyzes the determinants of the endogenous choice of the tax regime.<sup>7</sup>

### 4.1 Overview of main descriptive results

In the following, our discussion will mainly focus on the impact of the tax regime switch, because our general results on tax compliance are in line with the existing experimental literature.

Figure 2: Tax compliance under the two regimes



<sup>7</sup> The raw data from our experiment can be found in Appendix C.

Figure 2 provides average results on tax compliance under the two regimes. It shows that under the progressive tax regime, the average percentage of declared income stays quite stable around 0.60, whereas it drops from 0.55 in the first period to below 0.40 in the final period of the proportionate regime. Note that we pool data in Figure 2, regardless of whether subjects experienced the progressive scheme or the proportionate scheme first. The average percentage of compliance in the progressive treatment (0.59) is significantly higher than the average percentage of compliance in the proportionate treatment (0.45) (Wilcoxon-signed ranks test;  $p = 0.025$ ;  $N = 8^8$ ).

Figure 3 allows for a more disaggregated view on the effects of tax regime switches. The sessions that started with the progressive scheme exhibit a very high level of tax honesty in the initial periods which, however, decays over time. The introduction of the proportionate scheme leads to a drop of about ten percentage points in average compliance. In contrast, the average compliance is much lower in the sessions that started with the proportionate scheme. The nature of the decay, however, is very similar to the sessions with the reverse order, albeit on a much lower level of compliance. The introduction of the progressive tax regime after period 10 increases average tax compliance by about ten percentage points. Of course, this descriptive view does not allow to distinguish between the different reform effects which originate from altering incentives through changing tax rates on the one hand and the change in the tax regime as such.

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<sup>8</sup> Note that this is a very conservative test on the level of matching group averages. On the individual level, the difference is highly significant ( $p < 0.001$ ).

Figure 3: Effects of the regime change

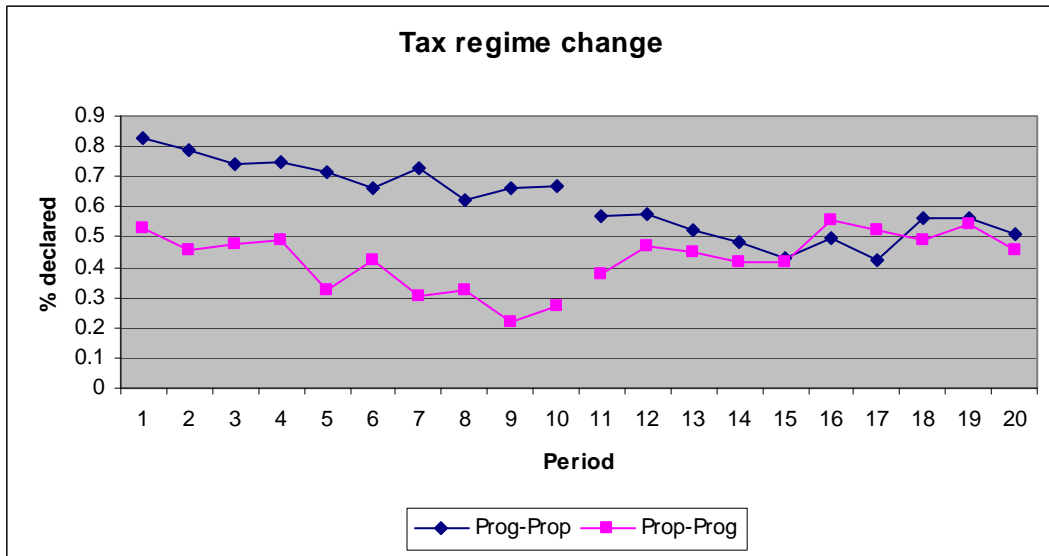
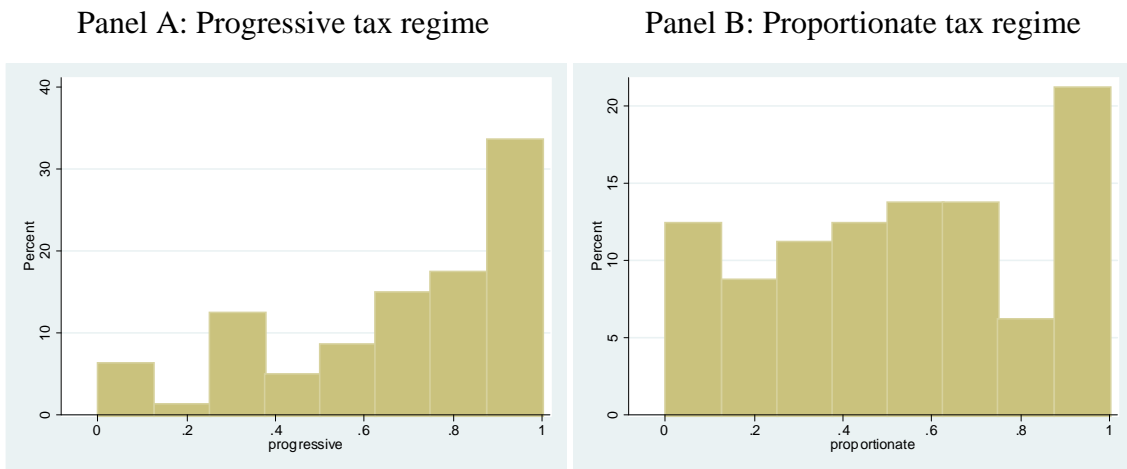


Figure 4: Distributional histograms of compliance



Neither do average results properly reflect the fact that there is quite some individual heterogeneity in tax compliance. We observe both subjects that always report their true income and subjects that always report zero income. Subjects also declare amounts below their true income but above zero, and quite a few subjects change their compliance behavior over the course of the experiment contingent on audits. Figure 4 provides distributional histograms of compliance under the two regimes. It is immediately obvious that tax evasion is much higher under the proportionate system.

## ***4.2 Econometric analysis compliance***

Our econometric approach for the explanation of the share of total income declared reflects the preceding theoretical consideration. Hence, the estimation model includes a full set of variables related to incentives in the light of the AS model and some further control variables of importance in the light of the experimental tax compliance literature. But, in addition, we also take account of possible effects related to the individual experience with the tax regime change.

Given the censored dependent variable we apply a Tobit regression employing Huber-White standard errors. Column (1) in Table 2 presents the baseline regression. Income, risk aversion (identified from the risk test according to Holt and Laury, 2002) and the marginal tax rate are the control variables corresponding to the AS model. We also include a number of control variables whose importance has been repeatedly demonstrated in the experimental literature: A dummy for a fine in the last period, a period index and a gender dummy. Although the audit probability is common knowledge in experimental design and should not affect compliance of rational agents it is well known from the literature that a preceding fine tends to lower subsequent compliance. This is explained by both a misperception of chance and, to a weaker extent, a tendency of subjects to “repair their losses” from a preceding fine (Maciejovsky, Krichler and Schwarzenberger, 2007). The repetition of tax compliance games also matters for compliance. The degree of tax evasion decays over time during a series of repeated declarations. Concerning the impact of gender, females have been identified to have higher tax morale than males (e.g., Torgler, 2007). Note however, that it is also known that women tend to be rather risk-averse (Meier-Pesti and Penz, 2008). Hence, the gender effect on compliance is unpredictable if the higher tax morale of women is only a consequence of their higher degree of risk aversion for which we control separately. Finally, we include a variable related to reciprocity; in our post-experimental questionnaire we asked subjects for their expectation of “which percentage of the participants has always declared their true gross income according to your judgment?” Since reciprocity is a key mechanism for the enforcement of social norms (Fehr and Gächter, 2000), we expect a positive correlation between the tax honesty expectation on the one hand and individual tax compliance on the other.

Our baseline regression reveals that the predictions of the AS-model of tax evasion are supported. An increasing income significantly increases evasion whereas an increasing risk aversion and an increasing marginal tax rate have the opposite effect. In line with the experience from the experimental literature, tax honesty tends to decline with each new period of the experiment. Also the additional control variables prove to be important. The dummy for a fine in the preceding period has a significantly negative impact. Female participants tend to be less honest compared to males, although this effect is only weakly significant. This stands in contrast to the standard finding of the tax morale literature that females have higher tax morale than males. However, since we control for risk aversion separately, and women tend to be more risk averse than men (Meier-Pesti and Penz, 2008)<sup>9</sup>, the untypical sign is not too surprising. As expected, the perceived tax honesty of other participants is positively linked to the share of income declared with high significance. Conditional cooperation (Fischbacher, Gächter and Fehr, 2001; Kocher et al., 2008) obviously plays a role in tax declaration decisions.

In a second step, we compare the two tax regimes. The regression in column (2) adds a proportionate tax regime dummy which shines up significantly negative. This inclusion does not seriously affect the other explanatory variables with the exception of the marginal tax rate which loses significance. The high negative correlation of individual marginal tax rates and the proportionate tax dummy (amounting to -0.48) can explain this effect: Compared to the progressive tax system, the proportionate tax tends to lower marginal tax rates for most participants which in line with the AS-model decreases compliance.

The third regression in column (3) shifts the focus towards the impact of a regime change as such beyond pure tax rate effects. For this purpose, we try to disentangle the different potential effects of regime change. One aspect is that the change confronts tax payers with new rules and the need to newly reflect individual tax paying strategies based on the experience with the old system. We add a dummy for the second regime to account for this. A different aspect of regime change is the direction of change and the resulting reference points: It could make a difference whether a proportionate tax follows a progressive system or vice versa. We control for this through an interaction of the second

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<sup>9</sup> For our participants, the switching point risk measure is, on average, 6.7 for men and 7.1 for women.

regime and the proportionate regime dummy. This interaction isolates the effect of a regime change from a progressive towards a proportionate system (compared to the reversed direction). Finally, the tax regime change implies gains and losses from the individual perspective which again may impact on tax honesty as discussed above. We calculate an indicator of individual gains from regime change: The gain is calculated as the difference of the taxes paid in the first ten periods (the old regime) and the tax burden under the new regime assuming that the income in these ten periods is equal to the average income in the first ten periods – an assumption which represents rational income expectations in the moment of the regime change. The second regime dummy turns out to be far from any significance.<sup>10</sup> However, the direction of change has a significant impact: A regime change from progressive to proportionate tends to increase tax compliance compared to a change in the reverse direction, when controlling for all other influences. This contradicts the first impression that one could have had from the previous section. The regression in Table 2 clearly indicates that the level of compliance is lower in a proportionate system but the change from a progressive to a proportional regime is better in terms of compliance than the reverse change. Finally, individual gains or losses influence compliance as expected: Reform losers tend to step up their evasion activities. Obviously, participants use tax evasion as a strategy to “defend” themselves against reform losses.

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<sup>10</sup> Note, however, that by construction the second regime dummy is highly correlated (correlation coefficient +0.87) with the period indicator. This means that we cannot decide whether the decreasing tax honesty over the course of the experiment is simply a consequence of time and experimental experience or also affected by the regime change.



Table 2: Driving forces behind tax compliance

Tobit regression; dependent variable: share of total income declared

	(1)	(2)	(3)
Income	-0.0005*** [0.0001]	-0.0003*** [0.0001]	-0.0003*** [0.0001]
Risk aversion	0.1370*** [0.0181]	0.1360*** [0.0179]	0.1187*** [0.0180]
Marginal tax rate	0.4120*** [0.0989]	-0.1144 [0.1474]	-0.1181 [0.1457]
Fine last period	-0.3376*** [0.0897]	-0.3204*** [0.0895]	-0.3062*** [0.0888]
Period index	-0.0115*** [0.0042]	-0.0123*** [0.0042]	-0.0227*** [0.0084]
Female	-0.0861* [0.0505]	-0.0798 [0.0498]	-0.1235** [0.0520]
Share of honest taxpayers	0.0105*** [0.0012]	0.0105*** [0.0012]	0.0096*** [0.0014]
Constant	0.1589 [0.1525]	0.3711** [0.1547]	0.6450*** [0.1693]
Dummy proportionate tax regime	-	-0.3711*** [0.0746]	-0.5104*** [0.0924]
Dummy second tax regime	-	-	0.0000 [0.1125]
Proportionate tax * second regime	-	-	0.2802** [0.1137]
Gain from regime change	-	-	0.0004** [0.0002]
Observations	1363	1363	1363
Number of subjects	73	73	73
Pseudo R2	0.1142	0.1236	0.1295

Robust standard errors in parentheses; \*/\*\*/\*\*\*: significant at 10%/5%/1%.

### 4.3 Preferences over tax regimes

Before period 21 all subjects were asked to indicate their preferred tax system and told that their individually preferred system would be implemented for one final period under five times higher incentives than in any previous period of the experiment.

Out of the 80 subjects, 37 prefer the progressive tax regime, although 47 should do so if they were selfish, rational and risk-neutral decision-makers. 28 participants correctly prefer the progressive regime because of their low income expectations, and 24 subjects correctly prefer the proportionate regime because of their high income expectations. Interestingly, there are only 9 subjects who prefer the progressive over the proportionate

tax regime, although they should prefer the proportionate tax system, whereas there are 19 subjects who prefer the proportionate over the progressive tax regime, although they should prefer the progressive tax system. The first group could have some form of social preferences; the preference of the second group could be explained through an aversion against complexity, i.e., a preference for simple tax systems even at one's own cost.

Table 3: Determinants of tax regime preferences

Probit regression; dependent variable: system choice (0: proportionate, 1: progressive), reporting marginal effects

	(1)	(2)	(3)
Average income	-0.0005*** [0.0001]	-0.004*** [0.0001]	-0.004** [0.0002]
Average tax honesty	-	0.3893* [0.2271]	0.1179 [0.2843]
Average fine last period	-	-	-0.0014 [0.0011]
Female	-	-	0.0634 [0.1359]
Risk aversion	-	-	0.0402 [0.0448]
Dummy for the order of treatments	-0.236 [0.1194]	-	0.0977 [0.1419]
Observations	80	80	73
Pseudo R2	0.1551	0.1817	0.2101

Standard errors in parentheses; \*/\*\*/\*\*\*: significant at 10%/5%/1%.

Running Probit regressions in Table 3 reveals that only the average income over the periods 1-20 (i.e., the resulting income possibilities from the quiz questions) comes out significant in any specification. The higher the income, the more likely a subject prefers a proportionate regime. Although only marginally significant in column (2), it is interesting to note that more honest tax payers have a tendency to prefer the progressive regime, controlling for income. This is a slight indication that the progressive tax regime is viewed as being fairer than the proportionate scheme. No other variable comes close to being significant. Not surprisingly, however, a dummy for those who win in monetary terms after the introduction of a progressive tax regime is also highly significant.<sup>11</sup>

<sup>11</sup> Results are available on request.

Table 4: Driving forces behind tax compliance in period 21

Tobit regression; dependent variable: share of total income declared

	(1)	(2)	(3)
Preference for progressive system	0.7010*** [0.2215]	0.7025*** [0.2191]	1.0114*** [0.2741]
Dummy for the order of treatments	-	-0.1572 [0.2059]	-0.1857 [0.2013]
“Wrong” preference for progressive	-	-	-0.7018** [0.3374]
“Wrong” preference for proportionate	-	-	0.2844 [0.2702]
Constant	0.4068*** [0.1406]	0.4856*** [0.1722]	0.3730* [0.2156]
Uncensored observations	32	32	32
Pseudo R2	0.0669	0.0703	0.1033

Standard errors in parentheses; \*/\*\*/\*\*\*: significant at 10%/5%/1%.

A closer look at individual behavior in the final period reveals that there is not only a relationship between the tax regime and compliance – as already established before – but that there is also an association between the *preference* for a tax regime and tax compliance. Table 4 presents Tobit regressions with compliance behavior in the period 21 as the dependent variable and shows that those who choose the progressive system exhibit a significantly higher degree of compliance, regardless of the controls introduced. Column (2) adds a dummy for the order of treatments (i.e., the order of experience), which is unsurprisingly insignificant for compliance in the final period. Column (3) adds two dummies for whether an individual complies with the standard selfish prediction (based on expected income) or not. “Wrong’ preference for progressive” means that the person should have – according to payoff maximization under risk neutrality – opted for the proportional system, but did not. “Wrong’ preference for proportionate” means that the participant should have preferred the progressive regime, but did not. The main result that those preferring the progressive system declare a higher share of their income remains unchanged. We do not have any explanation for the significantly negative effect of the “Wrong’ preference for progressive”-dummy, but one has to bear in mind that it relies on only six valid cases. Note finally that a gender dummy and our risk measure come out insignificant when added to the independent variables in Table 4.

## **5 Discussion and conclusion**

So far the literature on tax compliance has neglected the impact of tax reforms. We argue that tax reforms may affect tax compliance and implement an experiment that allows disentangling possible effects of a tax reform.

Our first result is in line with the vast empirical literature on tax compliance: The economic model of tax evasion performs well but is incomplete. It performs well because tax rates, risk preferences and income have the predicted effects. However, it is not the full story, because aspects such as reciprocity considerations play a role as well. A further and novel result is that a tax regime change affects compliance beyond the incentives to be expected from the economic model. A change in the tax regime creates winners and losers which in turn affects compliance. According to our experimental evidence losers tend to defend themselves by increased tax evasion under the new regime.

A distinct effect of a tax reform is that the direction of change matters: In our setting the change from a progressive towards a proportionate regime tends to increase compliance compared to the reverse order. If participants learn to know both tax regimes it works in favor of compliance under proportionate taxation relative to progressive. A possible explanation hints to the perceived advantages of proportionate taxation compared to a progressive system: the direct comparison may make transparency and simplicity of the proportionate system appealing which in turn could foster compliance. However, the level of compliance is generally lower under the proportionate regime than under the progressive regime.

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## **Appendix A: Instructions [for referees' convenience; not for publication; will be made available online]**

These are the experimental instructions for the sessions with the experience of the progressive tax regime first and the proportionate tax regime second. The reverse order instructions are analogous and available on request.

### **Willkommen beim Experiment & vielen Dank für die Teilnahme!**

- ***Bitte sprechen Sie von nun an nicht mit anderen Teilnehmern des Experiments***

- **Allgemeines zum Ablauf**

Dieses Experiment dient der Untersuchung von Entscheidungsverhalten. Sie können dabei Geld verdienen. Dieses wird Ihnen im Anschluss an das Experiment in bar ausbezahlt.

Während des Experiments werden Sie bzw. die anderen Teilnehmer gebeten, Entscheidungen zu treffen. Sowohl Ihre eigenen Entscheidungen als auch jene der anderen Teilnehmer bestimmen Ihre Auszahlung entsprechend den im Folgenden erklärten Regeln.

Das gesamte Experiment dauert etwa zwei Stunde. Wenn Sie Fragen haben oder wenn etwas unklar ist, heben Sie bitte Ihre Hand. Einer der Experimentleiter wird dann zu Ihnen kommen und Ihre Fragen privat beantworten.

Während des Experiments sprechen wir nicht von Euro, sondern von **Experiment-Punkten (EP)**. Ihr Verdienst im Laufe des Experiments wird in EP berechnet. Am Ende des Experiments werden alle EP, die Sie verdient haben, in Euro umgerechnet. Dabei gilt folgender Wechselkurs:

**1000 Experiment-Punkte = 1 €**

Der sprachlichen Einfachheit halber verwenden wir im Folgenden nur die männlichen Bezeichnungen.

- **Das Experiment**

Das Experiment besteht aus 5 Teilen. Die Instruktionen zu den Teilen erhalten Sie in der Regel nach Beendigung des jeweiligen vorhergehenden Teils. Die Teile sind grundsätzlich unabhängig voneinander; wenn es Entscheidungen in einem Teil gibt, die sich auf einen der folgenden Teile auswirken können, werden wir Ihnen das jedenfalls vor der jeweiligen Entscheidung mitteilen. Die Summe Ihrer Einkommen aus den fünf Teilen ergibt Ihren Gesamtverdienst aus dem Experiment.

- **Anonymität**

Sie erfahren weder während noch nach dem Experiment, mit wem Sie in den einzelnen Runden verbunden sind bzw. waren. Die anderen Teilnehmer erfahren weder während noch nach dem Experiment, wie viel Sie verdient haben. Wir werten die Daten aus dem Experiment nur im Aggregat aus und verknüpfen Namen nie mit den Daten aus den Experimenten. Am Ende des Experiments müssen Sie eine Quittung über den Erhalt des Verdienstes unterschreiben, die nur der Abrechnung mit unserem Sponsor dient. Auch dieser erhält natürlich keine anderen Daten aus dem Experiment.

- **Hilfsmittel**

An Ihrem Platz finden sie einen Kugelschreiber, den wir Sie bitten, nach dem Experiment am Tisch liegen zu lassen.

## 1. Teil

Im ersten Teil des Experiments werden Sie gebeten, 20 Wissensfragen aus verschiedenen Themengebieten zu beantworten. Es gibt für jede Frage vier Antwortmöglichkeiten, wobei immer nur jeweils eine Antwort richtig ist. Man kann auch immer nur eine Antwort anklicken. Wenn Sie alle Fragen auf einem Bildschirm beantwortet haben, klicken Sie bitte auf den OK-Knopf, um zum folgenden Bildschirm zu gelangen. Ihre Grundausstattung in einigen der folgenden Teile des Experiments ist unter Anderem von der richtigen Beantwortung der Fragen abhängig. Je mehr Fragen Sie richtig beantworten, desto höher wird Ihre Grundausstattung sein. Falsche Antworten führen nicht zu Punktabzügen. Am Ende des ersten Teils erfahren Sie, wie viele Fragen Sie richtig beantwortet haben.



## 2. Teil

- **Ablauf**

Der zweite Teil des Experiments besteht aus **10 Perioden**, deren Ablauf identisch ist.

- **Gruppen**

Zu Beginn jeder Periode werden Gruppen aus 2 Personen gebildet. **Die Zusammensetzung ändert sich jede Periode zufällig.** Sie werden also in jeder Periode mit einem zufällig ausgewählten anderen Experimentteilnehmer eine Gruppe bilden. Sie werden aber zu keiner Zeit die Identität der Teilnehmer, mit denen Sie im Lauf des Experiments eine Gruppe gebildet haben, erfahren.

- **Entscheidungen und Ablauf einer Periode**

Zu **Beginn jeder Periode** erhalten Sie eine **Grundausrüstung, Ihr Brutto-Einkommen.** Die Höhe dieses Brutto-Einkommens hängt von Ihrem Abschneiden bei den Wissensfragen und einer Zufallskomponente ab. Haben Sie bei den Fragen gut abgeschnitten, dann ist die Wahrscheinlichkeit höher, dass Ihr Brutto-Einkommen höher ist, und umgekehrt. Bedingt durch die Zufallskomponente kann das Brutto-Einkommen von Periode zu Periode variieren. Es ist aber jeweils pro Periode begrenzt auf das Intervall zwischen 0 und 2000 Experimentpunkte.

Am Bildschirm sehen Sie zu Beginn jeder Periode Ihr Brutto-Einkommen und werden gebeten, die Höhe Ihres Brutto-Einkommens anzugeben. Anhand dieser Angabe wird bestimmt, wie viel Ihnen von Ihrem Brutto-Einkommen als Steuerbetrag abgezogen wird. Der Steuerbetrag ergibt sich aus folgender Tabelle:

Brutto-Einkommen	Steuerbetrag
0	0,00
100	0,00
200	0,00
300	0,00
400	0,00
500	0,00
600	9,72
700	32,34
800	60,96
900	95,58
1000	136,20
1100	182,82
1200	235,44
1300	294,06
1400	358,68
1500	429,30
1600	505,92
1700	588,54
1800	677,16
1900	771,78
2000	872,40

Er folgt dabei folgender Formel (AB = angegebenes Brutto-Einkommen):

$$\text{Steuerbetrag} = \frac{0,45 \cdot AB \cdot (AB - 546)}{1500}, \text{ wenn } AB \geq 546; \text{ und } 0, \text{ wenn } AB < 546.$$

Wenn Sie Berechnungen anstellen wollen, klicken Sie einfach auf das Taschenrechnersymbol am rechten unteren Rand des Bildschirms, das den Windows-Taschenrechner öffnet (Achtung: Punkt- vor Strichrechnungsregel berücksichtigen!).

Sie müssen sich aber natürlich nicht mit der Formel auseinandersetzen; die Tabelle bietet genügend Information, um Sie bei Ihrer Entscheidung zu unterstützen.

Das *angegebene Brutto-Einkommen* muss nicht dem *tatsächlichen Brutto-Einkommen* entsprechen. Das angegebene Brutto-Einkommen kann gleich dem tatsächlichen Brutto-Einkommen sein oder geringer. Allerdings wird Ihr *angegebenes Brutto-Einkommen* mit einer **Wahrscheinlichkeit von 15 Prozent kontrolliert**. Sollte sich bei einer Kontrolle herausstellen, dass Sie weniger als das *tatsächliche Brutto-Einkommen* angegeben haben, werden Ihnen zusätzlich Punkte abgezogen. Dieser zusätzliche Abzug ist umso größer, je stärker Ihr angegebenes Brutto-Einkommen von dem tatsächlichen abweicht und berechnet sich folgendermaßen:

Zusätzlicher Abzug =  $3 \times (\text{Steuerbetrag}_{\text{tatsächliches Brutto-Einkommen}} - \text{Steuerbetrag}_{\text{angegebenes Brutto-Einkommen}})$

Der zusätzliche Abzug ist also das Dreifache der Differenz zwischen

- dem Betrag, der abgezogen worden wäre, wenn Sie das tatsächliche Brutto-Einkommen angegeben hätten und
  - dem Betrag, der Ihnen aufgrund des Brutto-Einkommens, das Sie angegeben haben, wirklich abgezogen wurde.
- **Berechnung der Verdienste in einer Periode**  
Wie bereits erwähnt, werden in jeder Periode Gruppen von 2 Personen neu gebildet. In jeder Gruppe werden die Steuerbeträge, die sich aus den angegebenen Brutto-Einkommen der 2 Gruppenmitglieder ergeben, addiert. Das heißt, jedes Gruppenmitglied bekommt die Hälfte des Inhaltes dieses Topfes. Zusätzliche Abzüge, die sich durch kontrollierte falsche Einkommensangaben ergeben, kommen nicht in diesen Topf, sondern werden vernichtet.

Zusammenfassend berechnet sich der Verdienst eines Teilnehmers in einer bestimmten Periode also folgendermaßen:

Möglichkeit 1: Der Teilnehmer wurde nicht kontrolliert oder das *angegebene Brutto-Einkommen* entspricht dem *tatsächlichen Brutto-Einkommen*:

**Verdienst** = *tatsächliches Brutto-Einkommen*  
- Abzug auf das *angegebene Brutto-Einkommen* = *Steuerbetrag* (laut Tabelle bzw. Formel)  
+ *Rückerstattung* (die Hälfte der Summe aus dem eigenen Steuerbetrag und dem Steuerbetrag, den das andere Gruppenmitglied bezahlt hat)

Möglichkeit 2: Der Teilnehmer wurde kontrolliert und das *angegebene Brutto-Einkommen* ist kleiner als das *tatsächliche Brutto-Einkommen*:

**Verdienst** = *tatsächliches Brutto-Einkommen*

- *Abzug auf das angegebene Brutto-Einkommen = Steuerbetrag* (laut Tabelle bzw. Formel)
- + *Rückerstattung* (die Hälfte der Summe aus dem eigenen Steuerbetrag und dem Steuerbetrag, den das andere Gruppenmitglied bezahlt hat)
- *zusätzlicher Abzug* (3 Mal die Differenz aus  $\text{Steuerbetrag}_{\text{tatsächliches Brutto-Einkommen}}$  und  $\text{Steuerbetrag}_{\text{angegebenes Brutto-Einkommen}}$ )

Nachdem die Verdienste berechnet und Ihnen mitgeteilt wurden, beginnt die nächste Periode. Ihr Brutto-Einkommen in dieser Periode ergibt sich erneut aus Ihrem Abschneiden im Wissenstest und einer Zufallskomponente. Der Verdienst aus der Vorperiode wird nicht dazuaddiert, sondern in Ihr separates Punktekonto gespeichert. Nachdem dieser Ablauf 10 Mal wiederholt wurde, ist der zweite Teil zu Ende.

### 3. Teil

- **Ablauf**

Der dritte Teil des Experiments besteht aus **10 Perioden**, deren Ablauf identisch ist.

- **Gruppen**

Zu Beginn jeder Periode werden Gruppen aus 2 Personen gebildet. **Die Zusammensetzung ändert sich jede Periode zufällig.** Sie werden also in jeder Periode mit einem zufällig ausgewählten anderen Experimentteilnehmer eine Gruppe bilden. Sie werden aber zu keiner Zeit die Identität der Teilnehmer, mit denen Sie im Lauf des Experiments eine Gruppe gebildet haben, erfahren.

- **Entscheidungen und Ablauf einer Periode**

Zu **Beginn jeder Periode** erhalten Sie eine **Grundausrüstung, Ihr Brutto-Einkommen.** Die Höhe dieses Brutto-Einkommens hängt von Ihrem Abschneiden bei den Wissensfragen und einer Zufallskomponente ab. Haben Sie bei den Fragen gut abgeschnitten, dann ist die Wahrscheinlichkeit höher, dass Ihr Brutto-Einkommen höher ist, und umgekehrt. Bedingt durch die Zufallskomponente kann das Brutto-Einkommen

von Periode zu Periode variieren. Es ist aber jeweils pro Periode begrenzt auf das Intervall zwischen 0 und 2000 Experimentpunkte.

Am Bildschirm sehen Sie zu Beginn jeder Periode Ihr Brutto-Einkommen und werden gebeten, die Höhe Ihres Brutto-Einkommens anzugeben. Anhand dieser Angabe wird bestimmt, wie viel Ihnen von Ihrem Brutto-Einkommen als Steuerbetrag abgezogen wird. Der Steuerbetrag ergibt sich aus folgender Tabelle:

<u>Brutto-Einkommen</u>	<u>Steuerbetrag</u>
0	0,00
100	25,00
200	50,00
300	75,00
400	100,00
500	125,00
600	150,00
700	175,00
800	200,00
900	225,00
1000	250,00
1100	275,00
1200	300,00
1300	325,00
1400	350,00
1500	375,00
1600	400,00
1700	425,00
1800	450,00
1900	475,00
2000	500,00

Er folgt dabei folgender Formel (AB = angegebenes Brutto-Einkommen):

$$\text{Steuerbetrag} = 0,25 \cdot AB$$

Wenn Sie Berechnungen anstellen wollen, klicken Sie einfach auf das Taschenrechnersymbol am rechten unteren Rand des Bildschirms, das den Windows-Taschenrechner öffnet (Achtung: Punkt- vor Strichrechnungsregel berücksichtigen!).

Sie müssen sich aber natürlich nicht mit der Formel auseinandersetzen; die Tabelle bietet genügend Information, um Sie bei Ihrer Entscheidung zu unterstützen.

Das *angegebene Brutto-Einkommen* muss nicht dem *tatsächlichen Brutto-Einkommen* entsprechen. Das angegebene Brutto-Einkommen kann gleich dem tatsächlichen Brutto-Einkommen sein oder geringer. Allerdings wird Ihr *angegebenes Brutto-Einkommen* mit einer **Wahrscheinlichkeit von 15 Prozent kontrolliert**. Sollte sich bei einer Kontrolle

herausstellen, dass Sie weniger als das *tatsächliche Brutto-Einkommen* angegeben haben, werden Ihnen zusätzlich Punkte abgezogen. Dieser zusätzliche Abzug ist umso größer, je stärker Ihr angegebenes Brutto-Einkommen von dem tatsächlichen abweicht und berechnet sich folgendermaßen:

$$\text{Zusätzlicher Abzug} = 3 \times (\text{Steuerbetrag}_{\text{tatsächliches Brutto-Einkommen}} - \text{Steuerbetrag}_{\text{angegebenes Brutto-Einkommen}})$$

Der zusätzliche Abzug ist also das Dreifache der Differenz zwischen

- dem Betrag, der abgezogen worden wäre, wenn Sie das tatsächliche Brutto-Einkommen angegeben hätten und
  - dem Betrag, der Ihnen aufgrund des Brutto-Einkommens, das Sie angegeben haben, wirklich abgezogen wurde.
- **Berechnung der Verdienste in einer Periode**  
Wie bereits erwähnt, werden in jeder Periode Gruppen von 2 Personen neu gebildet. In jeder Gruppe werden die Steuerbeträge, die sich aus den angegebenen Brutto-Einkommen der 2 Gruppenmitglieder ergeben, addiert. Das heißt, jedes Gruppenmitglied bekommt die Hälfte des Inhaltes dieses Topfes. Zusätzliche Abzüge, die sich durch kontrollierte falsche Einkommensangaben ergeben, kommen nicht in diesen Topf, sondern werden vernichtet.

Zusammenfassend berechnet sich der Verdienst eines Teilnehmers in einer bestimmten Periode also folgendermaßen:

Möglichkeit 1: Der Teilnehmer wurde nicht kontrolliert oder das *angegebene Brutto-Einkommen* entspricht dem *tatsächlichen Brutto-Einkommen*:

$$\begin{aligned} \text{Verdienst} &= \text{tatsächliches Brutto-Einkommen} \\ &- \text{Abzug auf das angegebene Brutto-Einkommen} = \text{Steuerbetrag (laut Tabelle bzw. Formel)} \\ &+ \text{Rückerstattung (die Hälfte der Summe aus dem eigenen Steuerbetrag und dem Steuerbetrag, den das andere Gruppenmitglied bezahlt hat)} \end{aligned}$$

Möglichkeit 2: Der Teilnehmer wurde kontrolliert und das *angegebene Brutto-Einkommen* ist kleiner als das *tatsächliche Brutto-Einkommen*:

**Verdienst =** *tatsächliches Brutto-Einkommen*

- *Abzug auf das angegebene Brutto-Einkommen = Steuerbetrag* (laut Tabelle bzw. Formel)
- + *Rückerstattung* (die Hälfte der Summe aus dem eigenen Steuerbetrag und dem Steuerbetrag, den das andere Gruppenmitglied bezahlt hat)
- *zusätzlicher Abzug* (3 Mal die Differenz aus Steuerbetrag<sub>tatsächliches Brutto-Einkommen</sub> und Steuerbetrag<sub>angegebenes Brutto-Einkommen</sub>)

Nachdem die Verdienste berechnet und Ihnen mitgeteilt wurden, beginnt die nächste Periode. Ihr Brutto-Einkommen in dieser Periode ergibt sich erneut aus Ihrem Abschneiden im Wissenstest und einer Zufallskomponente. Der Verdienst aus der Vorperiode wird nicht addiert, sondern in Ihr separates Punktekonto gespeichert. Nachdem dieser Ablauf 10 Mal wiederholt wurde, ist der dritte Teil zu Ende.

## 4. Teil

Der vierte Teil des Experiments besteht aus **einer einzigen Periode**.

Zu Beginn des vierten Teils müssen Sie entscheiden, welches der beiden Systeme für die Berechnung der Steuerbeträge Sie bevorzugen – jenes aus Teil 2 oder jenes aus Teil 3.

Nach dieser Entscheidung erfahren Sie Ihr Brutto-Einkommen für diese eine Periode im vierten Teil. Die Grundausrüstung im vierten Teil bestimmt sich wiederum aus Ihrem Abschneiden bei den Wissensfragen aus Teil 1 und einer Zufallskomponente, genauso wie in den Teilen 2 und 3.

Nach Bekanntgabe des tatsächlichen Brutto-Einkommens werden Sie auch wieder gebeten, Ihre Brutto-Einkommen anzugeben, wobei das angegebene Brutto-Einkommen nicht mit dem tatsächlichen Brutto-Einkommen übereinstimmen muss. In Abhängigkeit davon, ob Sie das Berechnungssystem von Teil 2 oder das von Teil 3 gewählt haben, wird der Steuerbetrag berechnet. Auch die Regeln bezüglich des zusätzlichen Abzugs gelten genauso wie in Teil 2 oder Teil 3.

Allerdings wird Ihr Verdienst, den Sie in der einzigen Periode in Teil 4 erzielen, **verfünffacht**, d.h. Sie erhalten grundsätzlich 5 Mal mehr in dieser Periode als in einer Periode in Teil 2 oder Teil 3 (natürlich abhängig von Ihren Entscheidungen).

Wenn Sie Berechnungen anstellen wollen, klicken Sie einfach auf das Taschenrechnersymbol am rechten unteren Rand des Bildschirms, das den Windows-Taschenrechner öffnet (Achtung: Punkt- vor Strichrechnungsregel berücksichtigen!).

Bevor Sie Ihre Entscheidung bezüglich Ihres bevorzugten Berechnungssystems treffen, ist es vielleicht hilfreich, noch einmal kurz zur Erinnerung die Instruktionen für die Teile 2 und 3 zu konsultieren.

## 5. Teil

Sie erhalten **10 Entscheidungsprobleme**. In jedem dieser Probleme können Sie zwischen **zwei alternativen Lotterien** auswählen. Ihre Entscheidung ist erst gültig, wenn Sie für alle Probleme eine Auswahl getroffen und dann auf den OK-Knopf im unteren Bereich des Bildschirms geklickt haben. Nehmen Sie sich genügend Zeit für Ihre Entscheidungen, weil Ihre Wahl – wie weiter unten beschrieben – Ihre Auszahlung aus dem 5. Teil bestimmt.

Hier ein Beispiel für ein solches Entscheidungsproblem:

• <b>Lotterie X</b>	• <b>Lotterie Y</b>	• <u>Ihre Wahl</u>
Sie erhalten 2 EUR mit Wahrscheinlichkeit 8/10 oder 1,60 EUR mit Wahrscheinlichkeit 2/10	Sie erhalten 3,85 EUR mit Wahrscheinlichkeit 8/10 oder 0,10 EUR mit Wahrscheinlichkeit 2/10	<input type="checkbox"/> Lotterie X  <input type="checkbox"/> Lotterie Y

Wenn Sie Berechnungen anstellen wollen, klicken Sie einfach auf das Taschenrechnersymbol am rechten unteren Rand des Bildschirms, das den Windows-Taschenrechner öffnet (Achtung: Punkt- vor Strichrechnungsregel berücksichtigen!).

Ihr Gewinn wird folgendermaßen bestimmt: Zuerst wählt der Computer zufällig und mit gleicher Wahrscheinlichkeit eines der 10 Entscheidungsprobleme aus. Die Lotterie, die



Sie ausgewählt haben, wird danach simuliert und das Ergebnis am Bildschirm angegeben.

Zum Beispiel: Nehmen Sie an, der Computer wählt zufällig das in der Tabelle angegebene Entscheidungsproblem aus, und Sie haben Lotterie X bevorzugt. Dann simuliert der Computer Lotterie X, und Sie erhalten entweder 2 EUR (mit Wahrscheinlichkeit  $8/10 = 80\%$ ) oder 1,60 EUR (mit Wahrscheinlichkeit  $2/10 = 20\%$ ) als Ihre Auszahlung für den fünften Teil des Experiments.

Beachten Sie bitte, dass es sich in Teil 5 um Euro-Beträgen handelt und nicht um Experimentpunkte! Der Euro-Verdienst aus Teil 5 wird zur Summe der in Euro umgerechneten Experimentpunkte aus den Teilen 1-4 addiert und ergibt Ihre Gesamtauszahlung aus dem Experiment.

Nur Sie, aber keine anderen Teilnehmer, werden diese Information erhalten. Vor der Auszahlung bitten wir sie noch einen Fragebogen am Bildschirm auszufüllen.

Nach dem fünften Teil endet das Experiment. Es gibt keine weiteren Teile oder Wiederholungen.