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Tax compliance within the context of gain and loss situations, expected and current asset position, and profession

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Abstract

This study on 60 self-employed and 59 business entrepreneurs investigates self-reported tax evasion within the context of taxpayers' previous expected tax payments at filing time (payment or refund), their asset position (expected versus current asset position), and their tax category (self-employed versus business entrepreneurs).

It examines whether different tax categories have an impact on the habitual decision-making framework and hence influence the reference point employed in the decision process. The results indicate that for the self-employed in the study an unexpected surprise payment leads to low tax compliance, whereas an unexpected surprise refund leads to high tax compliance. Thus, their self-reported tax compliance can be best described by the current asset position.

By contrast, the reference point business entrepreneurs employ in making tax decisions can be best described as dictated by their expected asset position. As a result, expected payments are associated with low and expected refunds are associated with high tax compliance on the part of these individuals.

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In addition, the findings of the study showed that knowledge of the legal principles of Austrian tax law is correlated with tax morality, and that women are less compliant than men. Attitudes towards the tax system and the perceived justice of the system are not correlated significantly with self-reported tax evasion. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

Paying taxes is considered to be an aversive action capable of increasing collective utility for each citizen yet contrary to individual interests. A non-compliant individual can benefit from taxation as long as the vast majority is willing to pay taxes lawfully. Research on tax compliance is of great interest to economic psychology because tax payments can be seen as posing a social dilemma, and egoistic actions violate collective interests. In this context, tax morality is understood to be the subjective rejection of tax evasion, and an individual's actual behavior is assumed to be dependent on tax morality (Schmolders, 1975). The present study investigates tax compliance within the context of gain and loss situations, expected and current asset position, and profession within the theoretical framework of prospect theory (Kahneman & Tversky, 1979).

The balance of the paper is organized as follows. Section 1.1 discusses prospect theory and its predictions with regard to tax-related decisions, Section 1.2 deals with the nature of the reference point employed in the decision process, and finally in Section 1.3 the opportunity to evade taxes and legal principles of the Austrian tax law are discussed. Section 2 deals with the research method, participants, experimental design, material and procedure. Section 3 discusses the results, and Section 4 deals with concluding remarks, possible policy implications and limitations of the study.

1.1. Prospect theory and tax-related decisions

According to prospect theory (Kahneman & Tversky, 1979) tax compliance is assumed to depend on the subjective interpretation of conditions that

shape individual attitudes towards risk and actual behavior. While expected utility theory (Von Neumann & Morgenstern, 1944) assumes that taxpayers are risk averse, prospect theory distinguishes between gain and loss situations that determine taxpayers' attitude towards risk. Thus, tax compliance and tax evasion are expected to be affected by tax payments and refunds, which correspond to loss and gain situations, respectively. Taxpayers who expect a loss are assumed to display risk-seeking behavior, whereas taxpayers who expect a gain are assumed to be risk-averse.

Prospect theory can be regarded as a theoretical framework with implicit relevance to real-world decision-making, able to explain observed behavior in a wide variety of economic domains (Camerer, 1998). Taxpayers who realize that too much of their income was withheld by tax-authorities, expect a refund that is perceived as a reduced gain. In this case, they are expected to be risk-averse to safely collect the gain. However, considering taxpayers for whom tax-authorities have not enough withheld and who now expect an additional tax payment that is perceived as a loss. In this case, they are expected to be risk-seeking in order to reduce the loss.

The relevance of prospect theory on tax-related decisions was confirmed empirically, for instance by Chang, Nichols, and Schultz (1987), who found that risk-seeking behavior occurs more frequently in situations where tax payments are perceived as pure loss (65%) than as reduced gain (23%). Likewise, the influence of prospect theory on tax-related decisions could be confirmed by Robben et al. (1990), who conducted an international study in six countries. They showed that noncompliance and tax cheating were more pronounced among subjects facing the prospect of an additional tax payment after withholding. In a different study Robben, Webley, Elffers, and Hessing (1990) could also show that tax evasion is more likely when taxpayers have to pay extra tax after insufficient tax was withheld. Also, with real-world tax returns, Cox and Plumley (1988) showed that the number of supplementary payments is positively correlated with the percentage of tax returns needing correction. Hasseldine (1998) demonstrated that in the US taxpayers who have additional tax to pay at the time they file their tax return exhibit lower compliance rates than taxpayers who are entitled to a tax refund. Yaniv (1999) applied prospect theory to a simple model of tax evasion, particularly focussing on the role that advance tax payments may play in enforcing tax laws. Derived from prospect theory, Elffers and Hessing (1997) suggest to introduce a standard deduction to increase taxpayer compliance.

1.2. The nature of the reference point

The reference point employed in decisions where the outcome is uncertain, determines whether a situation is framed by the person involved as a gain or a loss. Two major theoretical possibilities within the framework of prospect theory were discussed to describe a tax reporting decision; the expected asset position and the current asset position.

The former refers to a situation in which the reference outcome would be the taxpayer's expected total tax liability less expected amounts withheld at source for the fiscal year. Accordingly, a payment due at filing that exceeded what was expected or a refund due that fell short of what was expected would both be framed as losses, whereas a payment due that was less than what was expected at filing or a refund due that was greater than what was expected would both be framed as gains.

The current asset position refers to a situation in which expectations are not included in the reference outcome. Accordingly, taxpayers for whom too little was withheld at the time of filing would have an additional payment due which would be framed as a loss, whereas taxpayers for whom an excess amount was withheld would receive a refund which would be framed as a gain. In this case, the tax reporting decision is made when the tax return is filled out. Both possible reference points include the taxpayer's current asset position at filing time. However, the expected asset position also includes the expected year-end settlement amount that is either added to or subtracted from the taxpayer's current asset position (Schepanski & Shearer, 1995).

Note, that in contrast to expected utility theory neither current nor expected asset position implies the anticipation of final wealth states. Decisions that are based on expected asset position imply that relative wealth changes are anticipated within a certain limited time-span, whereas expected utility theory assumes that final wealth states are anticipated. According to prospect theory changes in wealth matter in the decision process, whereas expected utility theory assumes that just final outcomes are of relevance to the decision-maker. Thus, reference points are only employed in prospect theory not in expected utility theory.

In general, prospect theory is based on the assumption that the reference point, underlying the decision process, corresponds to the current asset position, in which gains and losses coincide with the actual amounts that are received or paid. However, the location of the reference point can be affected by the formulation of the offered prospects and by

the expectations of the decision maker (Kahneman & Tversky, 1979) and actual behavior depends on the reference point employed in the decision process.

The present research examines whether the reference point employed in the decision process can be varied by offering different taxpayers different scenarios. Precisely, it is investigated whether different tax categories (self-employed versus entrepreneurs) have an impact on the habitual decision-making framework and hence influence individual expectations by employing different asset positions.

The expected asset position is the implicit reference point in the prospect theory account of tax compliance given by Kahneman and Tversky (1979). Instead of using the current asset position as a reference point, people code gains and losses in tax-related decisions to an expectation or aspiration level that differs from the status quo. For example, an unexpected tax withdrawal from a monthly salary check is experienced as a loss, not as a reduced gain. Individuals compare tax outcomes with the neutral reference point in order to make relative decisions, that is to speak of gains or losses. Taxpayers who receive tax refunds higher than they expected or who actually anticipated a higher tax payment are predicted to frame such outcomes as gains, whereas taxpayers who receive tax refunds lower than they expected or whose tax payments are higher than they expected are predicted to frame such outcomes as losses.

Instead of expected asset position, Schepanski and Shearer (1995) emphasize the current asset position as being employed in tax-related decisions within the framework of prospect theory. Taxpayers for whom too little was withheld are predicted to be surprised by tax payments and to frame them as losses, whereas taxpayers for whom too much was withheld are predicted to be surprised by refunds and to frame them as gains.

Decision-making according to prospect theory is based on the use of either expected or current asset position. The location of the reference point, and the consequent coding of outcomes as gains or losses, is assumed to be affected either by the formulation of the offered prospects or by the expectations of the decision maker. In addition, we believe that individual expectations are also determined by the tax code leading to different reference points employed in the decision process.

Taxpayers who employ the expected asset position in their tax-related decisions are predicted to be less compliant in the case of an expected payment and more compliant in the case of an expected refund. By contrast, those taxpayers whose reference point is their current asset position are

predicted to be less compliant in the case of an unexpected payment and more compliant in the case of an unexpected refund.

1.3. The opportunity and legal principles of tax law

There is a considerable amount of research confirming the influence of opportunity on self-reported tax compliance and tax evasion (e.g., Wärneryd & Walerud, 1982). In most industrialized countries, taxes for the employed are usually withheld from salaries and wages. By contrast, the self-employed and business entrepreneurs pay taxes based on the information they provide. Consequently, the employed have less control over their declared income than the self-employed and business entrepreneurs.

Opportunity to evade taxes differs not only between the employed and the self-employed, but also between the self-employed and business entrepreneurs. In Austria, self-employed individuals such as medical doctors, lawyers or psychologists can choose the cash receipts and disbursements method instead of the otherwise binding accrual method. The former is characterized by less restrictive accounting principles. By contrast, business entrepreneurs are obliged to use the more restrictive accrual method.

It is assumed that individual habits are at least partly formed by accounting principles implied by the Austrian tax code and in turn, determine the use of the asset position. Within the theoretical framework of prospect theory, Kahneman and Tversky (1979) ascertain that the location of the reference point can only be affected by the formulation of the offered prospects or by the expectations of the decision maker. The present study investigates whether individual expectations and thus the reference point employed in the decision process can be manipulated experimentally by varying the tax code and its accounting principles, respectively.

Since the self-employed can choose the less restrictive accounting method and thus base their evaluation of economic outcomes on the present, it is hypothesized that an unexpected payment leads to low tax compliance, whereas an unexpected refund leads to high tax compliance. However, for business entrepreneurs, who are obliged to use the more restrictive accrual method and who usually employ the expected asset position in their tax-related decision process, it is hypothesized that an expected payment leads to low tax compliance, whereas an expected refund leads to high tax compliance. Taxpayers who think short term and who have static expectations base their decisions on the current asset

position, whereas taxpayers who think long term tend to employ the expected asset position. We believe that short term as well as long-term thinking is at least partly determined by the Austrian tax code. Self-employed are used to decide on a short-term basis, whereas entrepreneurs have to think long term and strategically.

In summary, it is hypothesized that tax compliance is dependent on gain and loss situations and on the reference point used. Kahneman and Tversky's (1979) approach implicitly suggests that tax-related decisions are based on the expected asset position, whereas Schepanski and Shearer (1995) are of the opinion that the current asset position best describes the reference point. In this study it is assumed that individual habits affect which reference point is used, for instance influence whether a person uses expected asset position or current asset position as a reference point in making tax-related decisions. The self-employed, who have the option of choosing the cash receipts and disbursements method, are assumed to employ the current asset position in tax reporting decisions. Therefore, it is predicted that unexpected payments should lead to low tax compliance, whereas unexpected refunds should lead to high tax compliance. Conversely, business entrepreneurs, who are obliged to use the more restrictive accrual method think long term and strategically. Thus, the reference point they employ in making tax-related decisions is their expected asset position. It is predicted that expected payments lead to low tax compliance, whereas expected refunds lead to high tax compliance for this group of respondents.

Empirical results on self-reported tax morality and tax evasion indicate that tax compliance is also influenced by gender. Spicer and Hero (1985) point out that men are less compliant than women, whereas the findings of other researchers suggest the opposite to be true (Friedland, Maital, & Rutenberg, 1978). These results might have their origin in different risk attitudes, suggesting that females are more risk averse than males (Grossman & Eckel, 2000). There is also some evidence indicating that tax compliance is likewise affected by attitudes towards the tax system, perceived justice of the tax system, knowledge of the legal principles underlying tax law and other determinants (Falkinger, 1995; Groenland & Van Veldhoven, 1983; Kirchler, 1997; Vogel, 1974; Webley, Robben, Elffers, & Helsing, 1991). The present study investigates the influence of gains and losses, asset position, tax category, attitudes towards the tax system, perceived justice of the tax system, subjective knowledge about the legal principles of Austrian tax law, and socio-demographic variables on subjective tax compliance.

2. Method

2.1. Participants

Questionnaires were distributed to a study group of self-employed and business entrepreneurs living in major cities in Austria. The respondents were approached through friends, colleagues and relatives using a snowball-system and were asked to fill out the questionnaire in their firms and stores. Non-response occurred rarely. Overall, 172 subjects, 94 men and 74 women (4 missing values) participated. Average age of self-employed was 44.75 years ($SD = 11.13$) and average age of business entrepreneurs was 40.14 years ($SD = 11.12$).

A more detailed analysis of the sample shows that there are systematic differences between the subsamples of the self-employed and the business entrepreneurs with respect to education (MD_S = university education; MD_B = mandatory school) and income ($MD_S = 32,000$; $MD_B = 20,000$, monthly net income in ATS). There is evidence that differences in education level correspond to the occupational requirements of some professions. For instance, becoming a self-employed medical doctor, lawyer or psychologist requires an academic degree whereas entrepreneurs wishing to run their own business require no more than a license to do so.

One possible explanation of the income differences between the two subsamples could be that the subsample of self-employed is more homogeneous than that of business entrepreneurs. Entrepreneurs in the study could be running a business with just a few employees or with a huge number of employees. This size factor can lead to quite substantial differences in income.

2.2. Experimental design

Participants were asked to fill out a questionnaire covering tax compliance and evasion, attitudes towards the tax system, perceived justice of the tax system, and knowledge about the legal principles of the Austrian tax law. An experimental between-subjects design was used to manipulate three independent variables: (i) the gain and loss situation (payment or refund), (ii) the asset position (expected versus current asset position) and (iii) tax category (self-employed versus business entrepreneurs).

The variation of the gain and loss situation as well as the variation of the asset position was manipulated through scenarios describing a self-employed lawyer and an owner of a jeweler's shop, respectively. According to Hite

(1987), research in areas sensitive to social desirability, like subjective tax compliance, must be approached with extreme caution. She found in an empirical study that results of a tax questionnaire are systematically influenced by the self versus other framing. Thus, in this paper it is assumed that a scenario describing possible actions of a third party can reduce the likelihood of the participants giving socially desired responses.

The expected asset position was manipulated using two scenarios, (a) an expected payment, and (b) an expected refund, both shown in Fig. 1(a). They either expected an additional payment of ATS 40,000 or a refund of ATS 40,000 at filing time. Those subjects confronted with the expected asset position were given the following scenario: Mr. L., either a self-employed lawyer (if respondents were self-employed) or the owner of a jeweler's shop (if respondents were business entrepreneurs), learns that his declared income includes a non-deductible write-down amounting to ATS 17,500. In the case of an expected tax payment, Mr. L. would have to pay a total of ATS 57,500 to the tax authorities to comply fully with the law. In the case of an expected

Please put yourself in the position of Mr. L., a self-employed lawyer (a store owner of a jeweler's shop).

Imagine that Mr. L., a self-employed lawyer (a store owner of a jeweler's shop), has already prepaid ATS 150,000 (ATS 230,000) on income taxes for the current fiscal year.

On filing his tax return, Mr. L. learns that because of his previous tax payments, he can expect an additional payment of ATS 40,000 (he can expect a refund of ATS 40,000).

(a)

Please put yourself in the position of Mr. L., a self-employed lawyer (a store owner of a jeweler's shop).

Imagine that Mr. L., a self-employed lawyer (a store owner of a jeweler's shop), has already prepaid the exact amount of income taxes due, that is ATS 190,000.

This was just the amount he anticipated. Thus, no further tax payments or tax refunds are expected.

(b)

Fig. 1. (a) The scenario of the expected asset position. (b) The scenario of the current asset position.

refund, Mr. L. would obtain only ATS 22,500 instead of the anticipated amount of ATS 40,000 (Fig. 2).

The current asset position was likewise manipulated using two scenarios: (a) an unexpected payment, and (b) an unexpected refund, both shown in Fig. 1(b). Participants were informed that Mr. L. has paid the exact amount of taxes due. Thus, any further payments or refunds are not expected. In a second scenario the participants learn that the declared income of Mr. L. included a nondeductible write-down of ATS 17,500. In the case of an unexpected payment, Mr. L. is now facing a tax payment of ATS 17,500. In the case of an unexpected refund, Mr. L. realizes that his income declaration not only includes a nondeductible write-down, but that he should also get a refund of ATS 40,000. Perfect tax compliance in this condition would thus lead to a net refund of ATS 22,500.

	Experimental conditions (all monetary figures in ATS)			
	Expected payment	Expected refund	Unexpected payment	Unexpected refund
Pre-payment	150,000	230,000	190,000	190,000
Expected refund	-	40,000	-	-
Refund minus depreciation	-	22,500	-	22,500
Expected payment	40,000	-	-	-
Payment plus depreciation	57,500	-	17,500	-
Expected tax burden if compliant	17,500	17,500	17,500	17,500
Number of participants				
Self-employed	14(21)	20(28)	13(19)	13(18)
Business entrepreneurs	25(32)	12(17)	11(21)	11(16)

Fig. 2. Experimental conditions and participants.

Note: Original number of the participants recruited is indicated in parentheses. 1000 ATS equal 7.27 Euro.

Taxpayers who base their tax-related decisions on their expected asset position should use the expected payment and the expected refund as their reference points, whereas taxpayers who base their decisions on the current asset position should employ the unexpected payment and the unexpected refund as their reference points. Thus, expected asset position implies a reference point of ATS 40,000 in the expected refund condition, and a reference point of – ATS 40,000 in the expected payment condition. On the other hand, current asset position, by its nature, implies a reference point of ATS 0 in both conditions; unexpected refund and unexpected payment.

In summary, non-deductible depreciation items discovered after filing consistently entail a loss of ATS 17,500 for compliant taxpayers in all four scenarios, that is in the case of: (i) an expected payment, (ii) an expected refund, (iii) an unexpected payment, and (iv) an unexpected refund. This was done to ensure that final wealth states would be constant for each choice alternative across all four experimental conditions. Thus, according to expected utility theory no difference with regard to self-reported tax compliance should occur between the conditions. However, if prospect theory can explain tax-related decisions differences between conditions are expected.

After hearing the scenario participants were asked to answer questions to evaluate whether the manipulation of experimental conditions was understood. They (i) had to state how much Mr. L. has already prepaid on income taxes for the current year (condition expected payment: ATS 150,000; condition expected refund: ATS 230,000; condition unexpected payment: ATS 190,000; condition unexpected refund: ATS 190,000) and (ii) what Mr. L. still expects (condition expected payment: additional payment of ATS 40,000; condition expected refund: refund of ATS 40,000; condition unexpected payment: no further payment; condition unexpected refund: no refund). Note, that participants were not given the detailed information in the parentheses, but had to recall the information solely from the scenario.

2.3. Material

A five-part questionnaire was compiled. It consisted of several sets of questions to assess: (i) tax compliance and tax evasion (Schmolders, 1975), (ii) attitudes towards the tax system (Vogel, 1974), (iii) perceived justice of the tax system (Kirchler, 1997), (iv) knowledge about the legal principles underlying Austrian tax law and (v) socio-demographic characteristics. The set of questionnaires can be found in Appendix A.

2.4. Procedure

Completion of the questionnaires took about 30–40 minutes. First, the participants had to answer questions about their attitudes towards the tax system, their perception of the justice of the tax system, and their knowledge of the legal principles underlying tax law. Then, they were confronted with one of the four scenarios and the control items as a manipulation check. Participants were asked to put themselves in the position of Mr. L. and answer the questionnaire items about tax compliance and tax evasion from this perspective. Finally, participants were asked to answer questions about socio-demographic characteristics.

3. Results

The only responses analyzed were the ones from participants who correctly answered the control items after the presentation of one of the four scenarios. Overall, 122 persons out of 172 managed to answer the manipulation check correctly. The others either (i) failed to recall the correct amount Mr. L. has already prepaid, or they (ii) could not remember whether Mr. L. expected an additional payment, a refund, or neither of both, or (iii) could not correctly answer both questions. Being very restrictive in deciding who of the subjects to include in our analysis, implies that only the responses of those participants are analyzed who really perfectly understood the treatment. The response of the participants was also used as a selection criterion. Three further participants were excluded from the analysis because their self-reported tax compliance deviated by more than twice the standard deviation from the mean, leaving a total sample of 119 participants.

Besides the assumed influence of tax payments and refunds on self-reported tax compliance it is investigated whether different tax categories (self-employed versus entrepreneurs) have an impact on the habitual decision-making framework and hence influence individual expectations by employing different asset positions. Correspondingly the present research aims to test whether subjective tax compliance is better described by the use of expected asset position or by the use of current asset position as the reference point in evaluating tax-related outcomes.

Investigating the influence of the gain and loss situation (payment versus refund), the asset position (expected versus current asset position), and tax category (self-employed versus business entrepreneurs) on self-reported tax

compliance was conducted in a $2 \times 2 \times 2$ covariance-analysis for independent samples. The covariates considered in the process were: (i) attitudes towards the tax system, (ii) perceived justice of the tax system, (iii) knowledge of the legal principles underlying Austrian tax law, (iv) gender, and (v) age. A significant three-way interaction effect ($F(1, 98) = 4.05$; $p < 0.05$, $\eta = 0.18$) was observed, as was a significant main effect for the gain and loss situation ($F(1, 98) = 5.91$; $p < 0.05$). The covariates gender ($F(1, 98) = 15.33$; $p < 0.001$) and knowledge of the legal principles underlying Austrian tax law ($F(1, 98) = 6.76$; $p < 0.05$) were also found to be significant. Average tax compliance under all three sets of experimental conditions are presented in Fig. 3, adjusted for the influence of the covariates.

Theoretical predictions derived from prospect theory suggest that if current asset position better represents the reference point employed in the decision process of the self-employed, then the adjusted means are predicted to be significantly greater than zero, in the unexpected refund condition, and significantly less than zero in the unexpected payment condition. The adjusted means for the expected refund condition and the expected payment

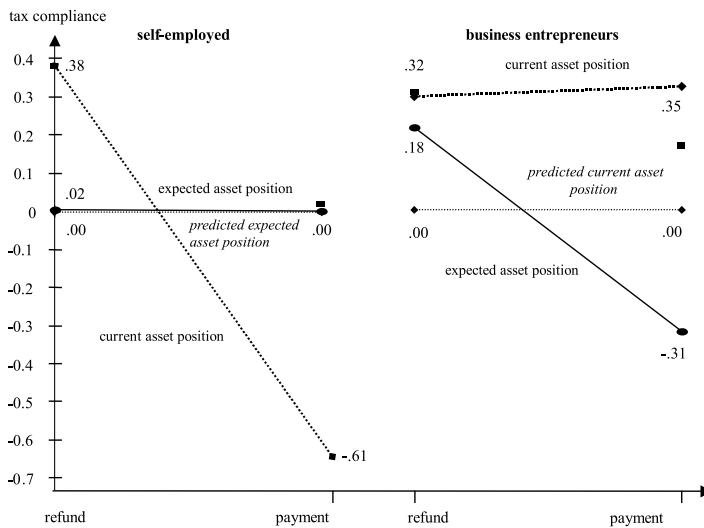


Fig. 3. Tax compliance of the self-employed and of business entrepreneurs in the context of refunds and payments.

Note: Average tax compliance reflects residuals, with influence of covariates partialled out. Residuals vary on average by about 0, with positive values indicating high tax compliance.

condition, on the other hand, should not differ significantly from zero if self-employed do not use expected asset position as their reference point (Fig. 3).

If expected asset position better represents the reference point employed in the decision process by business entrepreneurs, then the adjusted means are predicted to be significantly greater than zero in the expected refund condition, and significantly less than zero in the expected payment condition. The adjusted means for the unexpected refund condition and the unexpected payment condition, on the other hand, should not differ significantly from zero if business entrepreneurs do not use current asset position as their reference point (Fig. 3).

The study confirmed the assumption according to which self-employed base their tax-related decisions on their current asset position. This finding is consistent with the legal option this group has of choosing the less restrictive cash receipts and disbursements method. Due to the use of this less restrictive accounting method, the self-employed do not have to anticipate future revenues and expenses. Their tax compliance is low only when they are faced with an unexpected surprise payment and high when they are faced with an unexpected surprise refund. Long-term decisions seem not being part of their habitual decision-making framework. Thus, it should be no surprise that anticipated gain and loss situations do not significantly affect the self-reported tax compliance of the self-employed and in fact, the study showed that an expected payment is not associated with low tax compliance, and an expected refund is not associated with high tax compliance. In the case of decisions involving surprising changes in wealth, however, the findings confirmed that self-reported tax compliance is systematically influenced by the gain and loss situation, that is whether a person is faced with a payment or a refund.

Conversely, the study confirmed that business entrepreneurs base their tax-related decisions on their expected asset position. It was shown for this group that an expected payment leads to low tax compliance, whereas an expected refund leads to high tax compliance. This finding is consistent with the fact that entrepreneurs must use the more restrictive accrual method, requiring them to form expectations in their decisions. Thinking long term is part of business entrepreneurs' habitual decision-making framework. It comes as no surprise then that their self-reported tax compliance does not differ when entrepreneurs are confronted with unexpected payments or with unexpected refunds, respectively. However, both an unexpected payment as well as an unexpected refund led to a high level of absolute tax compliance. Business entrepreneurs are very cautious when facing surprising incidents, such as an

unexpected payment or an unexpected refund. Past experience with tax authorities may be responsible for such a risk-averse and cautious behavior.

Aside from questions on tax compliance and tax evasion, respondents also had to answer questions on their attitudes towards the tax system, their perception of the justice of the tax system, and their knowledge of the legal principles underlying Austrian tax law. A significant correlation was found between tax compliance and knowledge of the legal principles underlying Austrian tax law ($r(119) = 0.26$; $p < 0.01$), and also between tax compliance and the gender of the participants ($r(119) = 0.36$; $p < 0.01$). The better respondents' knowledge of legal principles, the higher was their self-reported tax compliance. Tax compliance was also shown to be higher for men than for women. Attitudes towards the tax system are not significantly correlated with tax compliance ($r(119) = 0.13$; $p = 0.15$) but are with knowledge ($r(119) = 0.42$; $p < 0.01$) and perceived justice ($r(119) = 0.56$; $p < 0.01$). In addition, a positive significant correlation between knowledge and perceived justice ($r(119) = 0.42$; $p < 0.01$) was found. The more knowledge participants had of the legal principles underlying Austrian tax law, the fairer they considered the tax system to be.

The present study does not support the positive correlation suggested by Groenland and Van Veldhoven (1983) between attitudes towards the tax system and tax compliance. Nor was any significant positive correlation found between tax compliance and perceived justice of the tax system. However, the study findings indicate a correlation between knowledge of the legal principles underlying Austrian tax law and tax compliance. Those results are consistent with the findings of Erikson and Fallan (1996), who could show that an increase in tax knowledge leads to perceive taxation fairer and to evaluate other people's tax evasion stricter. Contrary to the findings of Groenland and Van Veldhoven (1983), who showed that profound knowledge implies low tax compliance, the present study leads one to conclude the opposite, namely, little knowledge is associated with low tax compliance. A plausible explanation could be that knowledge of the legal principles underlying Austrian tax law is highly correlated with tax compliance and thus negatively correlated with illegal tax evasion. At the same time it is assumed that knowledge is positively correlated with legal tax avoidance.

The empirical findings on the influence gender has on self-reported tax compliance also appear to be inconsistent. Spicer and Hero (1985) as well as Vogel (1974) report that men are less compliant than women, whereas Friedland et al. (1978) assert the opposite. The latter finding was not confirmed by the present study. However, it must be noted that the actual sample

is not representative and thus conclusions about the correlation between gender and tax compliance cannot be generalized.

4. Conclusion

Since paying taxes reduces an individual's disposable income, economists and others assume that taxpayers will try to minimize the tax payments they make to the state by legal means such as tax avoidance, as well as by illegal means such as tax evasion.

Neoclassical economic models are based on the simplifying assumptions of rationality, constant preferences, and utility maximization. Although, these simplified assumptions are suitable for formal and mathematical purposes, numerous empirical results suggest or support the view that actual behavior is more likely to be based on non-rational general rules, which may also play an important role in tax-related decisions.

The aim of the present study was to investigate taxpayers' decision-making processes and to outline non-rational cognitive concepts used which violate expected utility theory. Self-reported tax compliance was found to be dependent on the gain and loss situation, that is on the presence of a tax payment or a tax refund. In addition, the asset position (current versus expected asset position) was shown to have an impact on the decision-making process as regards tax compliance. Both variables have to be considered in conjunction with a third: the tax category of the individuals involved. Individual habits, formed by accounting principles, were shown to affect the asset position employed in tax reporting decisions.

The self-employed respondents were shown to respond to an unexpected surprising payment with low tax compliance and to an unexpected surprising refund with high tax compliance. The self-employed base their tax-related decisions on their current asset position. This choice is consistent with the option they have of choosing the cash receipts and disbursements method of accounting instead of the otherwise binding accrual method. The former is characterized by less restrictive accounting principles and entails a need to evaluate economic revenues and expenses from a present orientated viewpoint. Thus, self-employed base their decisions on a short-term basis and in a static way.

By contrast, business entrepreneurs are obliged to use the more restrictive accrual method, leading them to think and decide on a long-term basis. Thus, expected asset position is the reference point they employ in

making tax-related decisions. This group was found to respond to an expected payment with low tax compliance and to an expected refund with high tax compliance. Surprising incidents, such as an unexpected payment or an unexpected refund, lead to a high absolute level of tax compliance. Business entrepreneurs are very cautious when facing surprising incidents. This behavior may be the result of prior experiences this group has made with tax authorities.

Based on the diverging results between the self-employed and business entrepreneurs, one can conclude that it is not a question whether current asset position better represents the reference point or expected asset position. Instead, both asset positions are commonly used, depending on the habitual decision framework of the individual and his/her expectations. Current asset position explains tax compliance within the context of unexpected payments and unexpected refunds, whereas expected asset position explains tax compliance within the context of expected payments and expected refunds. The effect of unexpected surprise incidents and expected incidents seem to be systematically influenced by the habitual decision-making framework of the individual involved. In addition, this research also shows that the habitual decision-making framework is at least partly determined by accounting principles and the Austrian tax code. Individual experience thus leads to the use of different reference points employed in the decision process. Self-employed use the current asset position, whereas business entrepreneurs employ the expected asset position.

The results may have important implications for the various parties in the tax system, that is tax advisors, tax authorities and tax policy-makers, and may also be important when considering tax differences across countries and the aim of the European Union to harmonize tax laws. In order to induce high compliance in tax-related decisions, those taxpayers who are used to evaluate prospects from a present orientated viewpoint, by employing current asset position, should be confronted with unexpected surprising refunds. Conversely, taxpayers whose habitual decision-making framework is future orientated display high compliance in the case of an expected refund.

Little knowledge of the legal principles underlying Austrian tax law was also shown to be associated with low tax compliance. One explanation for this finding could be that taxpayers who lack a detailed knowledge of government regulations are unable to correctly anticipate the consequences of intended tax evasion, for instance penalties or the probability of an audit. The findings also indicate that knowledge is correlated with perceived justice.

This correlation suggests that people with little knowledge believe they contribute too much to the state based on the services they receive in return and that they may seek to correct this perceived imbalance by engaging in non-compliant behavior.

Limits of this research project are first generalizability, because respondents seem unlikely to be representative for the population of Austrian's self-employed and business entrepreneurs. In addition, results of this study are also not generalizable to private taxpayers, because their taxes are already withheld from salaries and wages. So private taxpayers usually lack the opportunity to engage in income tax evasion in first place. Second, the scenarios were constructed by describing possible actions of a third party and were not constructed from the viewpoint of the respondents directly in order to reduce socially desired responses. For future research, however, it would be interesting to investigate whether differences in the use of the reference point can also be confirmed when respondents are asked directly about their tax compliance.

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Appendix A

(i) *Tax compliance and tax evasion*: The following set of seven questions is based on Schmolders (1975).

1. Mr. L. has additional earnings of ATS 36,000 which he has not yet reported to the tax-authorities. He obtained the money in cash and did not issue an invoice. Mr. L. will include the following amount in his tax return: (seven-step item ranging from ATS 0, ATS 6,000 to ATS 36,000).
2. Mr. L. asks his clients (customers) if they need an invoice. If they do not, he charges them a slightly lower price and does not include these extra earnings in his books. This practice can earn him an additional ATS 36,000. How much unreported income do you think Mr. L. will decide to earn? (seven-step item ranging from ATS 0, ATS 6,000 to ATS 36,000).

3. Mr. L. uses his phone 50% for business and 50% for private purposes. How probable do you think it is that he will declare the entire phone bill as a business expense? (1 = very probable to 5 = very improbable).
4. Mr. L. has bought new curtains for his home. How probable do you think it is that he will write off the full price of the curtains as a business expense? (1 = very probable to 5 = very improbable).
5. Mr. L. also earned some money from other activities (lectures, articles, expert opinions). These earnings account for 10% of his annual income. How probable do you think it is that he will exclude these extra-earnings from his tax return? (1 = very probable to 5 = very improbable).
6. Could you imagine Mr. L. would doctor his books by making false entries? (1 = I can image it to 5 = I cannot imagine it).
7. Do you believe Mr. L. would still include the non-deductible depreciation in his tax return with regard to the items mentioned in the above presented scenario? (1 = very probable to 5 = very improbable).

After being subjected to a reliability analysis (Cronbach's $\alpha = 0.61$), the above responses were transformed to ensure equivalent range of all items and added up. The findings were then arranged on a scale of 1 (low-tax compliance) to 7 (high-tax compliance).

(ii) *Attitudes towards the tax system*: The following set of questions is based on a questionnaire developed by Vogel (1974). Following a reliability analysis, the original 22 items were cut down to 14 (Cronbach's $\alpha = 0.86$). Each five-step item was assigned a score from 1 (negative attitude towards the tax system) to 5 (positive attitude towards the tax system).

1. Large part of taxes is used for meaningless purposes (1 = I fully agree to 5 = I completely disagree).
2. Government has executed a great number of unnecessary social reforms. (1 = I fully agree to 5 = I completely disagree).
3. The burden of taxes must be reduced at any costs (1 = I fully agree to 5 = I completely disagree).
4. The tax system produces a fair distribution of the burden of taxes (1 = I fully agree to 5 = I completely disagree).
5. Income tax rate should be the same regardless of amount of income (1 = I fully agree to 5 = I completely disagree).
6. Extra income should not be liable to taxes (1 = I fully agree to 5 = I completely disagree).
7. Marginal rates of taxes are far too high (1 = I fully agree to 5 = I completely disagree).

8. What do you think of public expenditure for the social welfare program? (1 = much too high to 5 = much too low).
9. What do you think of public expenditure for aid to underdeveloped countries? (1 = much too high to 5 = much too low).
10. What do you think of taxes for married people? (1 = much too high to 5 = much too low).
11. What do you think of sales taxes on cars? (1 = much too high to 5 = much too low).
12. Considering all social benefits, taxes are not too high (1 = I completely disagree to 5 = I fully agree).
13. What do you think of sales taxes on alcohol? (1 = much too high to 5 = much too low).
14. Do you think the taxes you have to pay is reasonable considering the benefits received? (1 = I do not consider them to be reasonable to 5 = I do consider them to be reasonable).

(iii) *Perceived justice of the tax system*: The perceived justice of the tax system was assessed in terms of vertical justness (Kirchler, 1997). Three items were developed to assess personal contributions to the state and another four items to assess transfer payments from the state. The items were scored on a five-step scale. Reliability analysis yielded an alpha coefficient of 0.79, and 0.83, respectively (Cronbach). Differences between the responses to the first three items and the latter four items were aggregated to a subjective justice index, ranging from -4 to $+4$. High scores imply perceived justice, whereas low scores imply perceived injustice.

1. The amount of taxes I have to pay is (1 = very high to 5 = very low).
2. My contribution to financing government spending is (1 = very high to 5 = very low).
3. My contribution to financing social welfare benefits is (1 = very high to 5 = very low).
4. My claim to government benefits is (1 = very low to 5 = very high).
5. The possibilities I have for receiving public services in return for tax payments is (1 = very low to 5 = very high).
6. The state ensures me a level of security which is (1 = very low to 5 = very high).
7. My claim to social welfare benefits is (1 = very low to 5 = very high).

(iv) *Knowledge about the legal principles of Austrian tax law*: Five items were developed to assess respondents' knowledge of the legal principles

underlying Austrian tax law (Cronbach's $\alpha = 0.64$). The participants were told to choose the correct answer out of four possible ones for each question. Then all correct answers were added up. The higher his or her score, the more knowledgeable about the legal principles of tax law the respondent was assumed to be.

1. Which tax had to be harmonized after Austria joined the European Community? (sales tax, income tax, tax on capital income, land transfer tax).
2. In Austria the top marginal income tax rate is? (50%, 32%, 42%, 60%).
3. How does sales tax differ from value-added tax in Austria? (they are identical, the sales tax is 10% and the value-added tax is 20%, the sales tax is 20% and the value-added tax is 10%).
4. Which tax was abolished after the last tax reform? (wealth tax, tax on capital income, estate duties, land transfer tax).
5. Which of the following taxes yield the most revenues for the Austrian government? (income tax, sales tax, corporate tax, tax on capital).

(v) *Socio-demographic characteristics*: The participants had to answer questions about their age, gender, formal education, professional experience, and income.

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