

# ***DETERRENCE AND MORALE IN TAXATION:***

## ***An Empirical Analysis***

by

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(this version 1<sup>st</sup> April 2003)

### **Abstract**

The standard model of tax evasion based on the subjective expected utility maximization does not perform particularly well in econometric analyses: it predicts too little evasion and produces unsatisfactory econometric parameter estimates. The model is extended by looking at how the tax authority deals with the taxpayers. Based on econometric estimates, it is shown that taxpayers' *tax morale* is raised when the tax officials treat them with respect. In contrast, when tax officials solely rely on deterrence taxpayers tend to respond by actively trying to avoid taxation.

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## ***I.A Challenge to Research***

### *The standard model of tax evasion*

The path-breaking contribution by Allingham and Sandmo (1972) on taxpayer behavior is based on the expected utility maximization calculus. It represents a special application of the economic theory of crime championed by Becker (1968). The fundamental insight is that the extent of tax evasion depends negatively on the probability of being caught and the size of the punishment if caught. This model has been extended in various directions. (see Andreoni, Erard and Feinstein 1998: 824 – 835 and Slemrod and Yitzhaki 2002).

In the model underlying most econometric research, a taxpayer with exogenous income  $y$  faces an exogenous (marginal) tax rate  $t$ . Taxpayers are periodically asked to declare their true income,  $y^d$ . Honest taxpayers report  $y^d = y$ , dishonest taxpayers report  $y^d < y$ . They thus evade taxes corresponding to the amount of income  $e = y - y^d$ . The tax administration does not know the actual (true) income  $y$  and attempts to enforce tax compliance by a system of audits and penalties. The audits take the form of controls by the tax authority that entail a specific probability of detection,  $p$ , for each individual taxpayer. Penalties range from fines,  $f$ , often paid as a multiple of the amount evaded, to prison sentences,  $s$ . According to the first order conditions the taxpayers declare less than their true income when the expected fine (as a multiple of the undeclared income) is less than the marginal tax rate, i.e.  $p \cdot f < t$ .

In this simple model, the share of income evaded decreases in higher expected fines. Most theoretical studies arrive at the conclusion that both increases in the probability of detection and the size of the fine reduce tax evasion. The higher this deterrence is, the lower is tax evasion. The impact of income and the marginal tax rate are however ambiguous. Risk neutral taxpayers evade

a lower income share relative to their total true income when true income increases. In the case of risk-averse taxpayers, the share of evaded income may decrease, stay constant or increase with increasing true income, as relative risk aversion is an increasing, constant or decreasing function of income. This result holds for proportional income taxes and for an expected fine as a function of income evaded. Similarly, the impact on the share of evaded income of the marginal tax rate is ambiguous because of a substitution effect and an income effect. According to the substitution effect, taxpayers evade more income because tax evasion becomes more profitable at the margin. The extent of an opposite income effect depends on the type of risk aversion of taxpayers. These results are also influenced by whether the income tax schedule is proportional, linearly progressive or linearly regressive.

From an empirical point of view this model is confronted with two major problems:

*1. Too little evasion predicted*

It is difficult, if not impossible, to account for the *level* of tax evasion. In view of the low deterrence applied in most countries, taxpayers should evade much more than they actually do, i.e. compliance is too high. For the United States Alm, McClelland and Schulze (1992: 22) argue: “A purely economic analysis of the evasion gamble implies that most individuals would evade if they are ‘rational’, because it is unlikely that cheaters will be caught and penalized“. Arrow-Pratt measures of risk aversion of more than 30 (!) must exist in order to account for the present compliance rate in the U.S. Graetz and Wilde (1985) or Alm et al. (1992) report however a range of between one and two for the U.S.

For Switzerland, Pommerehne and Frey (1992) calculate that a coefficient of relative risk aversion of about 8 would be necessary for achieving the compliance rate of 82.5 percent in their

sample of Swiss cantons. This coefficient is computed on the basis of the Allingham-Sandmo-model with the mean values from their sample for the probability of detection (0.001), the fine (1.16) and the marginal tax rate (0.21). According to these authors field evidence for Switzerland suggests that relative risk aversion varies between 1 and 2 like in the U.S. Using the mean values for the probability of detection (0.00055), the fine (0.97) and the marginal tax rate (0.24) from a sample of the Swiss cantons that is extended to the more recent years 1985, 1990, 1995, an Arrow-Pratt measure of risk aversion of even 30.75 is necessary in order to achieve the compliance rate of 76.52 that is prevailing in this extended sample. It looks like the standard tax evasion model is explaining compliance less and less satisfactorily.

## *2. Unsatisfactory econometric parameter estimates*

Not surprisingly, the econometric estimates of the parameters for the probability of being caught and the size of the fine are not as impressive as one might hope. Often, they turn out not to be statistically significant, and sometimes their signs are inconsistent with the theory.

Using pooled cross section time series data for the 26 cantons of Switzerland over the period 1970-1995<sup>1</sup> *column (1)* in Table 1 presents econometric estimates for the effect of the probability of detection and of the size of the fine on income evaded.<sup>2</sup> In addition to the probability of detec-

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1. The source of the data is fully explained in section III below and in Appendix B.

2. Income evaded is calculated by using the GAP method as the difference between national accounts measures of primary income and income reported to the tax authorities in percent of the national accounts measure of primary income. While the national accounts data compute the purchasing side, the tax data indicate income accrual. Differences between both indicate that more is spent than is earned officially and thus raise the suspicion of tax evasion. The tax gap method is also used by the IRS to compute aggregate tax evasion in the U.S. Slemrod and Yithzaki (2002) criticize that measure on two grounds: First, some of the national accounts data are based on tax return data. In contrast, both series are derived independently from each other in Switzerland. Second, there are many inconsistencies in the definition of both income measures. Engel and Hines (1999) find however that the GAP measure of tax evasion performs extraordinarily well to capture the dynamics of tax compliance in the U.S.

tion and the size of punishment as the main variables of the standard model of tax evasion the model also includes the marginal tax rate, income per capita, the existence of tax indexation to inflation, population size, the proportion of people older than 65 years of age, the share of self-employment from total employment, the share of employment in the agricultural sector and time dummies as explanatory variables (see e.g. Pommerehne and Weck-Hannemann 1996, Feld and Frey 2002a).

The OLS regression in *column (1)* of Table 1 indicates that the basic tax evasion model is not performing in a satisfactory way. While more than 70 percent of tax evasion in the cantons can be traced, only the size of the fine for tax evasion is statistically significant at the 5 percent level in the OLS estimate, and only at the 10 percent level in the TSLS estimate in *column (2)*. The probability of detection is far from being statistically significant and moreover has a theoretically unexpected *positive* sign suggesting that people evade more taxes the more likely they are detected. In addition, the marginal tax rate has a significant positive impact on tax evasion on the 1 percent significance level.

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from 1947 to 1993. These latter results provide us with confidence in our data on tax evasion in the Swiss cantons between 1970 and 1995. Since the indirect method of calculating income evaded poses an error in the variables problem, it is necessary to include socio-demographic variables that capture the opportunity of evading taxes of different taxpayers. For example, estimates of the size of the shadow economy by Schneider and Enste (2000) indicate that the agricultural sector in Switzerland is particularly prone to the shadow economy.

**Table 1: Unbalanced Panel Regressions of Cantonal Share of Income Evaded in Percent of True Income upon Treatment by the Tax Authority and Control Variables, 1970 to 1995**

Variables	OLS (1)	TOLS (2)
Probability of Detection (in %)	0.021 (1.56)	0.024 (1.15)
Standard Fine (in %)	-0.030* (2.19)	-0.041(*) (1.86)
Marginal Tax Rate (in %)	0.470** (3.19)	0.442** (2.84)
Income per Capita (in 1'000 SFr)	0.199 (1.31)	0.186 (1.11)
Tax Indexation	-0.791 (0.85)	-0.709 (0.76)
Population (in 1'000)	-0.001 (0.28)	-0.001 (0.56)
Proportion of People older than 65 (in %)	-0.579** (2.72)	-0.610* (2.45)
Share of Self-Employment from Total Employment (in %)	-0.605* (2.34)	-0.661* (2.26)
Share of Employment in the Agricultural Sector (in %)	0.482** (3.74)	0.416* (2.52)
F-Test: Time Dummies	45.179**	48.841**
$\bar{R}^2$	0.719	0.750
SER	4.915	4.718
J.-B.	2.705	0.053

Notes: Instruments are the amount of evaded income from true income, the probability of detection and the standard fine all three of the former period. OLS has 128, TOLS 102 observations. The numbers in parentheses are the t-statistics of the estimated parameters based on White heteroscedasticity consistent standard errors. The F-Test is a statistics on the joint significance of the mentioned variables. SER is the standard error of regression, J.-B. is the value of the Jarque-Bera-Statistic for normality of the residuals. ‘(\*)’, ‘\*’, or ‘\*\*\*’ denotes significance at the 10, 5, or 1 percent level, respectively. The computations were performed by EViews, Version 3.1.

These results are disappointing for the standard model of tax evasion. They are not due to outliers as the Jarque-Bera-test statistics indicate. In all equations, the hypothesis of normal distribution of the residuals cannot be rejected according to that test statistics. Only demographic variables like the proportion of people older than 65 years of age, the share of self-employment from total employment and the share of employment in the agricultural sector have an additional statistically significant influence on tax evasion but the standard tax evasion model does not make any prediction about the effect of these particular variables on tax evasion. All in all, it has to be concluded that the crucial explanatory variables of the standard model of tax evasion do not fare well in empirical tests. This is not a specific feature of an application of the model to the case of Switzerland but has also been observed in a great number of empirical studies for the U.S. (Clotfelder 1983 for a positive impact of the marginal tax rate; Beron, Tauchen and Witte 1992 and Slemrod, Blumenthal and Christian 2001 for a sometimes even significant positive impact of the probability of detection on tax evasion in some income groups).

### ***1.B Reacting to the Challenge***

This paper argues that important insights on tax compliance and tax evasion can be gained by looking at how the tax authority deals with the taxpayers. The issue of tax compliance and tax evasion has been dealt with in the literature almost exclusively by studying the behavior of taxpayers. This concentration on the taxpayers is well reflected, for instance, in the comprehensive surveys on tax compliance by Andreoni, Erard and Feinstein (1998) and Slemrod and Yitzhaki (2002). In contrast, the behavior of the tax authority has been almost totally neglected.<sup>3</sup> In the few

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3. With respect to tax authorities' behavior, most of the respective models focus on endogenizing the probability of audits, depending on whether the tax authority can, or cannot, announce and commit itself to a particular audit rule before taxpayers file their tax returns. See Andreoni et al. (1998: 824 – 835). Earlier surveys on tax compliance are e.g. Pyle (1990), Cowell (1990) and Slemrod (1992).

cases in which the tax authority has been the object of study, both the theoretical and empirical work is only in the initial stages.

Taxpayers respond in a systematic way to how the tax authority treats them. In particular, the taxpayers' willingness to pay their taxes, or *tax morale*, is supported, or even raised, when the tax officials treat them with respect. In contrast, when the tax officials consider taxpayers purely as 'subjects' who have to be forced to pay their dues, the taxpayers tend to respond by actively trying to avoid taxation. The importance of tax morale has been realized by many scholars<sup>4</sup> but its effect on tax evasion has been rarely studied in a systematic way. In particular, it has been neglected to introduce tax morale in a theoretically consistent way with the deterrence effects. Tax morale has been introduced to account for the *level* of tax evasion (i.e. to account for the first shortcoming identified above) but not to deal with the disappointing *econometric estimates* of the *marginal effects* on tax evasion (the second shortcoming identified above).

Recent legal thought has focused on the importance of social norms in studying the effects of law (Ellickson 1991, Tyler 1990).<sup>5</sup> In addition to the direct deterrent effects of legal sanctions emphasized by the economic analysis of law, legal scholars have suggested various indirect ways how lawmaking may affect behavior (Cooter 1998, 2000, McAdams 2000, Posner 1998, 2000a, Posner and Rasmusen 1999, Sunstein 1996, 1999). Posner (2000b) studies the role of social norms for tax compliance. According to his analysis, good governance and fair procedures lead to higher tax compliance by taxpayers. The government can shape tax morale by following these

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4. See e.g. Schwartz and Orleans (1967), Roth, Scholz and Witte (1989), Alm, McClelland and Schulze (1992), Cullis and Lewis (1997), Kucher and Goette (1998).

5 See also the special issue on Social Norms, Social Meaning, and the Economic Analysis of Law in the *Journal of Legal Studies* 27 (June 1998). However, the relevance of norm-mediated effects of lawmaking ("expressive law") is contested (Adler 2000, Anderson and Pildes 2000).

behavioral norms in order to signal citizens that they can rely on such a treatment by themselves trusting in government. In contrast to Posner (2002b), we have a closer look at the administrative procedures that shape tax compliance.

We attempt to analyze the interaction between the tax authority and the taxpayers affecting tax morale by using a partial model of the behavior of the tax authority based on *Crowding Theory*. This approach establishes a systematic relationship between external intervention (in this case, how the tax officials deal with taxpayers) and intrinsic motivation (in this case, individuals' tax morale). The emphasis lies on the empirical analysis of the theoretical propositions derived. With a sample of Swiss cantons in the years 1970, 1978, 1985, 1990 and 1995, we show that the tax authorities in Switzerland do indeed behave *as if* they were aware of the reaction of taxpayers to being treated with respect or not. This result offers a perspective seldom taken into consideration with regard to the issue of tax compliance: Deterrence is only one of the motivational forces in getting people to pay their taxes. Quite another is the set of policies available to the tax authority to bolster taxpayers' tax morale. A '*respectful*' relationship of the tax authorities to the taxpayers bolsters or *crowds in* tax morale while an '*authoritarian*' relationship using instruments of deterrence has two countervailing effects: on the one hand the change in relative prices (the higher probability of being punished) reduces the incentives to evade taxes but on the other hand tax morale is undermined or *crowded out*. Which effect dominates depends on specific circumstances. The paper presents empirical evidence that (a) an authoritarian approach crowds out tax morale more strongly when citizens have high participation rights; and (b) a respectful approach crowds in tax morale more strongly when the citizens have high participation rights.

Section II outlines Crowding Theory and discusses the respective empirical evidence. Section III applies Crowding Theory to taxation by analyzing the interaction between taxpayers and the tax

authority. Deterrence and tax morale are identified as major determinants of tax evasion in a theoretical model. Econometric estimates using cross section/time series data for Switzerland are used to empirically test the theoretical propositions derived. Section IV takes a further step by assuming that government policy is endogenous. Section VI concludes.

## ***II. Crowding Theory***

That external interventions in the form of rewards or sanctions may crowd out intrinsic motivation emanates from two quite different literatures in the social sciences. Thirty years ago, Titmuss (1970) argued in his book *The Gift Relationship* that being paid for giving blood undermines cherished social values and would therefore reduce or totally destroy people's willingness to donate blood. Though he was unable to come up with any serious empirical evidence, his thesis attracted much attention.

A second body of literature stems from psychology. A group of cognitive social psychologists have identified that, under particular conditions, monetary (external) rewards undermine intrinsic motivation.<sup>6</sup> Giving of rewards for undertaking an activity thus has indirect negative consequences. For that reason the effect has been termed '*The Hidden Cost of Reward*' (see Lepper and Greene 1978 for their account and extensive references) or '*Overjustification Hypothesis*' (Lepper, Greene and Nisbett 1973). More recently, the idea has been called '*Cognitive Evaluation Theory*' (Deci, Koestner and Ryan 1999).

The undermining effect of rewards on intrinsic motivation has been introduced into economics as '*Crowding Theory*' (Frey 1997a). At the same time it has been generalized in three ways:

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6. Headed by Deci (1971, 1972, 1975). The work is summarized and extended in Deci and Ryan (1980, 1985, 1987). Extensive surveys are given e.g. in Pittman and Heller (1987), and Lane (1991, esp. ch. 19).

- (a) All types of external interventions may negatively affect intrinsic motivation, i.e. not only offering rewards but also issuing commands, imposing rules and regulations as well as punishments. Thus, *deterrence* imposed by the tax authority, may undermine individuals' intrinsic willingness to conform to tax laws.
- (b) The intrinsic motivation affected by external intervention is broadly conceived. It comprises actions undertaken for their own sake, i.e. without expectation of external reward (see Deci 1975: 105), as well as *internalized norm guided behavior*. The latter is the relevant concept as far as taxpaying is concerned.
- (c) External interventions undermine intrinsic motivation when they are perceived to be intrusive by the individuals concerned ('crowding out effect'), and they maintain or raise intrinsic motivation when they are perceived to be supportive. The underlying psychological processes depend on how self-determination and self-esteem are affected (see Deci and Ryan 1985, Deci and Flaste 1995). Tax audits as intrusion by tax authorities can be hypothesized to undermine tax morale more strongly if the taxpayers' sense of self-determination is high.

Few researchers seem to be aware that an increasing number of studies has indeed obtained laboratory as well as field evidence for the supporting and undermining effects of external interventions on motivation. There are such a large number of laboratory experiments in psychology on the crowding effect that it is impossible to summarize the results here. Fortunately, there have already been no less than seven formal meta-analytical studies of the crowding theory. Rummel and Feinberg (1988) used 45 experimental studies covering the period 1971-85; Wiersma (1992) 20 studies covering 1971-90; and Tang and Hall (1995) 50 studies from 1972-92. These meta-analyses essentially support the findings that intrinsic motivation is undermined if the externally

applied rewards are perceived to be intrusive by the recipients. This view was challenged by Cameron and Pierce (1994), Eisenberger and Cameron (1996) and Cameron, Banko and Pierce (2001) who on the basis of their own meta-analysis of studies published in the period 1971-1991 (the two studies are based on a virtually identical set of studies) concluded that the undermining effect is by and large 'a myth'. These studies attracted a great deal of attention and, based on that, many scholars seem to have concluded that no such thing as a crowding-out effect exists.

Deci, Koestner and Ryan (1999) conduct an extensive study to show that these conclusions are unwarranted and that the crowding-out effect is a robust phenomenon of significant size under the specified conditions. They identify a number of important shortcomings and misinterpretations in the Cameron and Pierce study. One is that Cameron and Pierce omitted nearly 20 percent of the relevant studies as outliers, used mistaken control groups and mis-classified some of the studies. Another is that they included dull and boring tasks for which a crowding-out effect cannot occur as the participants had no intrinsic motivation to begin with. It turns out that tangible rewards undermine intrinsic motivation for interesting tasks (i.e. tasks for which the experimental subjects show an intrinsic interest) in a highly significant and very reliable way.

Experimental research in economics lacks the long and rich tradition concerning crowding effects on motivation found in psychology. There are nonetheless an increasing number of studies conducted on the subject. The experiments by Gächter and Fehr (1997), as well as Fehr, Gächter and Kirchsteiger (1997), suggest that an 'unfriendly', i.e. disciplining, contract reduces the tendency for reciprocal behavior. The study by Bohnet, Huck and Frey (2001) is closely related, analyzing crowding-out effects in contract enforcement with respect to the trustworthiness of the participants. They model an experiment with repeated games, in which a first mover relies to a certain degree (differing between various groups) on the trustworthiness of a second mover. The first

mover can either offer a contract or not play at all, while the second mover has the choice of performing or breaching the contract. The level of contract enforcement is given by the probability of bearing the resulting costs of non-compliance. The authors find that low levels of legal enforcement tend to crowd in trustworthiness: the first movers must take careful decisions on whom to enter a contract with, as they cannot rely on the legal system. As a consequence, the second mover is motivated to behave in a trustworthy way. In contrast, when contracts are near-perfectly enforced, there is no observable crowding effect taking place, as first movers enter the contracts because they know that the second movers are deterred from breaching. Personal trust is replaced by institutional trust. With intermediate levels of law enforcement, however, trust is crowded out as the first movers can neither rely on the second movers' reciprocal behavior nor on the legal system, resulting in a non-monotonic relation between trust and the degree of contract enforcement.

Crowding Theory has also been empirically analyzed, and generally supported, in field studies, such as Barkema (1995) on the monitoring of managers, Gneezy and Rusticchini (2000) on monetary payments to make up for a breach of contract, or Frey and Oberholzer-Gee (1997) on compensating in the context of NIMBY (Not-In-My-BackYard) siting problems. These studies do not, however, deal with topics directly relevant for the relationship between the tax authority and the taxpayers, and are therefore not further discussed here (see Frey and Jegen 2001 for a survey on the evidence from field studies).

This paper assumes that tax officials are aware of the effects on taxpayers' behavior suggested by Crowding Theory. In order to maximize net tax revenue, they aim to keep down the costs of collecting taxes. They know that a disrespectful treatment of taxpayers undermines their tax morale and therewith raises the costs of raising taxes. Tax authorities will only behave in a respectful

way towards taxpayers when there is a substantial extent of tax morale to begin with. Tax officials are at the same time well aware that tax payments do not solely depend on tax morale but that extrinsic incentives play a major role. In particular, deterrence for tax evasion has to be used to prevent taxpayers with low tax morale or lacking tax morale altogether to exploit the more honest taxpayers and to escape paying their due share. A combination of respectful treatment and deterrence is possible and, as will be demonstrated in the empirical part, widely practiced. The sole reliance on deterrence, as suggested by a large part of the tax compliance literature based on subjective expected utility maximization, represents a special case which only applies under restrictive conditions. Such a special case occurs when the tax officials are convinced that individuals' tax morale is low or does not exist at all. In general, however, it is optimal to simultaneously use both respectful treatment as well as deterrence. The higher the initial level of tax morale, and the stronger the crowding effect, the less weight is put on deterrence, and the more respectfully taxpayers are treated.

Summarizing these arguments, it can be concluded that the better the tax officials pursue their policy with regard to treating the taxpayers respectfully and deterring tax evasion, the more prepared are the taxpayers to pay the taxes due, and the lower is tax evasion. Respectful treatment can be split into two different components. First, the procedures used by auditors in their contact with taxpayers must be transparent and clear. In the case of arbitrary procedures, taxpayers feel helpless and get the impression that they are not taken seriously. Such behavior reduces the intrinsic motivation to pay taxes. Second, respectful treatment has a direct personal component in the sense of how the personality of taxpayers is respected by tax officials. If they treat taxpayers as partners in a psychological tax contract, instead of inferiors in a hierarchical relationship, taxpayers have incentives to pay taxes honestly.

### ***III. Determinants of Tax Evasion: Deterrence and Tax Morale***

The relationship between taxpayers and tax authorities can be modeled as an implicit or relational contract (see e.g. Akerlof 1982). It then involves strong emotional ties and loyalties, and goes well beyond transactional exchanges (see e.g. Williamson 1985). Social psychologists (Schein 1965, Rousseau and McLean Parks 1993) have been using this concept for a long time, calling it a ‘psychological’ contract to set it clearly apart from formal contracts, which are obeyed because the parties respond to the explicit and material sanction previously agreed upon. Psychological contracts have been successfully used to analyze relationships within the firm (e.g. Osterloh and Frey 2000).

We follow the majority of the literature (Andreoni, Erard and Feinstein 1998: 826) by assuming that the objective of the tax authority is to maximize expected net revenue, i.e. tax revenue less administration costs. In contrast to most other studies, the administrative costs do not solely consist of audit costs. Rather, the tax officials take into account that the way they treat the taxpayers systematically affects the latter’s tax morale, and therefore their willingness to pay taxes, which in turn affects the cost of raising taxes. The tax authority optimally chooses that way of dealing with the taxpayers which maximizes net tax returns. Tax payment is thus taken to be a ‘quasi-voluntary’ act (see Levi 1988). Nobody likes paying taxes, not least because it involves a public good and there are incentives to free ride. Therefore, deterrence is needed to enforce taxation. At the same time, there is a voluntary component to paying taxes.

Two diametrically opposite cases of treating taxpayers can be distinguished:

- (a) *A respectful* treatment supporting, and possibly even raising, tax morale;
- (b) *An authoritarian* treatment undermining tax morale.

The tax officials can choose between these extremes in many different ways. For instance, when they detect an error in the tax declaration, they can immediately suspect an intention to cheat, and impose legal sanctions. Alternatively, the tax officials may give the taxpayers the benefit of the doubt and inquire about the reason for the error. If the taxpayer in question indeed did not intend to cheat but simply made a mistake, he or she will most likely be offended by the disrespectful treatment of the tax authority. The feeling of being controlled in a negative way, and being suspected of tax cheating, tends to crowd out the intrinsic motivation to act as an honorable taxpayer and, as a consequence, tax morale will fall. In contrast, if the tax official makes an effort to locate the reason for the error by contacting the taxpayer in an informal way (e.g. by phoning him or her), the taxpayer will appreciate this respectful treatment and tax morale will be upheld.

### *The Model*

Taxpayers derive a marginally decreasing benefit  $B$  from evading taxes  $e$

$$(1) B = B(e); B_e > 0, B_{ee} < 0.$$

The costs of evading taxes  $C$  depends on the size of evasion. As the probability of being detected, there are increasing marginal costs of doing so. The costs of evasion also rises in the extent of deterrence  $D$  applied by the tax authority as well as in the level of tax morale  $M$ : the higher tax morale, the higher are the psychic costs of evading taxes.

$$C = C(e, D, M);$$

$$(2) C_e > 0, C_{ee} > 0;$$

$$C_D > 0, C_M > 0.$$

The optimal extent of tax evasion  $e^*$  for a taxpayer is defined by

$$(3) B_e = C_e.$$

In line with Crowding Theory, and as argued above, tax morale  $M$  is the higher, the higher the extent of the tax authority's respectful behavior towards the taxpayer  $R$ , and the lower the extent of deterrence  $D$  applied.

$$(4) M = M(R, D); M_R > 0, M_D \leq 0.$$

From (3) and (4) it follows that a taxpayers optimal amount of tax evasion depends on the extent of respectful and deterring behavior of the tax authority

$$(5) e^* = f(D, R).$$

#### *Deterrence and tax evasion*

The effect of a change in deterrence on optimal evasion is

$$(6) \frac{\partial}{\partial D} (B_e - C_e) = \frac{-C_{eD} - C_{eM}M_D}{C_{ee} - B_{ee}} \leq 0.$$

as the denominator is positive, the sign depends on  $-C_{eD} - C_{eM}M_D \leq 0$ .

Three cases can be distinguished:

#### (a) *Standard deterrence effect*

Deterrence policy raises the marginal costs of evading,  $C_{eD} > 0$  (relative price effect). In the absence of a crowding effect, i.e. if tax morale is disregarded ( $M = 0$ ), or if tax morale is constant ( $M_D = 0$ ), deterrence unequivocally reduces tax evasion

$$(6a) \frac{\partial}{\partial D} (B_e - C_e) = \frac{-C_{eD}}{C_{ee} - B_{ee}} < 0,$$

$f_D < 0$  and  $e^*$  falls.

This allows us to formulate

*Proposition 1:* A deterrence policy reduces tax evasion provided tax morale does not exist or is constant.

(b) *Endogenous tax morale*

The application of instruments of deterrence is perceived as controlling by taxpayers and therefore crowds out tax morale:  $M_D \leq 0$ . A higher tax morale raises the marginal (psychic) costs of tax evasion:  $C_{eM} > 0$ . Hence in equation (6)  $-C_{eM} \cdot M_D \geq 0$ . If deterrence does not have any effect through relative price changes,  $C_{eD} = 0$ , and

$$(6b) \quad \frac{f}{fD} (B_e - C_e) = \frac{-C_{eM} M_D}{C_{ee} - B_{ee}} \geq 0.$$

$f_D > 0$  and  $e^*$  is larger.

*Proposition 2:* In the absence of a relative price effect, the application of deterrence raises tax evasion as tax morale is crowded out.

(c) *Deterrence and crowding-out effect*

When deterrence affects relative prices ( $C_{eD} > 0$ ) and crowds out tax morale ( $-C_{eM} M_D \geq 0$ ), there are countervailing effects on tax evasion. The overall effect depends on the relative size of the deterrence and relative price effects.

*Proposition 3:* When the deterrence effect is larger than the crowding out effect, tax evasion is reduced.

*Respectful treatment and tax evasion*

The effect of a more respectful treatment on equilibrium evasion by a taxpayer is given by

$$(7) \quad \frac{\partial}{\partial R} (B_e - C_e) = \frac{-C_{eM} M_R}{C_{ee} - B_{ee}}.$$

When taxpayers are treated in a more respectful way by the tax authority, their tax morale is supported and there is a crowding-in effect of tax morale:  $M_R > 0$ . As before,  $C_{eM} > 0$ , hence

$$(7a) \quad -C_{eM} \cdot M_R < 0,$$

$f_R < 0$  and  $e^*$  is lower.

*Proposition 4:* A more respectful treatment of taxpayers by the tax authority unequivocally reduces tax evasion as tax morale is bolstered.

### *The Data*

In order to test the propositions theoretically derived to investigate the relationship between taxpayers and tax authorities, a survey was sent to the tax authorities of the 26 Swiss cantons.<sup>7</sup> The survey asked detailed questions about the legal background of tax evasion, like the use and size of fines, whether an explicit link is established between tax payments and the provision of public services, the perceived feedback effect of tax evasion on the level of public services, the intensity of control by tax authorities, the existence of tax amnesties, and whether the tax register is published in a jurisdiction. The survey also included questions on the treatment of taxpayers by tax authorities in day-to-day audits, in particular when a taxpayer is suspected of not declaring his or her true taxable income. These questions are very detailed. The legally oriented part of the questionnaire, for example, stresses the differences according to how severe tax evasion is, the penalty

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7. It should be noted that the Swiss cantons have the basic power to tax personal and corporate income, while the local jurisdictions levy a surcharge on cantonal income taxes. Cantons can set tax rates and define tax bases autonomously. Both lead to a strong variation in (effective) tax rates among cantons and local jurisdictions. The federal level mainly raises indirect taxes, but also a highly progressive federal income tax. See Feld (2000) for a more detailed description of the Swiss fiscal system. Tax evasion laws form part of the legal power of the Swiss cantons as well. It has to be noted also that Swiss citizens and foreigners with a permanent residence permit are not taxed at source. Taxpayers declare their taxable income each year. The exception to this rule is the source tax on interest and dividend incomes which can be deducted on the cantonal tax declaration.

in case of tax fraud, the period considered and so on.<sup>8</sup> Similarly, detailed questions apply to other parts of the survey.

The following questions serve to specifically identify the policy parameters included in the theoretical model:

(a) The extent of *respectful treatment* of the taxpayers is captured by:

- Fully observing procedures based on formal and informal rules (questions 38 to 40): What happens typically if a taxpayer does not declare taxable income at all (procedures, fines), if a tax declaration is mistakenly filled out or, in a second stage, if taxpayers do not react?
- Acknowledgment of individual citizens' rights and personality (questions 41 to 44): What does the tax administration do if taxpayers declared taxable income by mistake too high? Are there any differences in the treatment whether these mistakes are formally wrong, e.g. mistakes in adding up columns of figures, or possibilities for legal tax avoidance, e.g. tax deductions, are not used? Are there attempts to find out whether taxpayers intentionally or mistakenly declare too low a taxable income? Are mistakes in the tax declaration to the advantage or to the disadvantage of *taxpayers*?
- Avoidance of high penalties for minor offenses and giving taxpayers the benefit of the doubt (questions 1 to 5): What are the minimum, maximum and standard fines for tax evasion, the fines in the case of inheritances and of self-declaration, as a multiple of the tax payment (or in percent of the tax payment)?

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8. In Switzerland, fines for tax evasion are not considered as previous convictions. They are treated as a contravention of regulations. To be punished for tax fraud counts as a previous conviction. Tax evasion is distinguished from tax fraud by forgery of a document.

(b) *Deterrence* of tax evasion:

- Clearly establish taxpayers' legal duties and penalties for not complying (questions 6 to 11): Is the criminal code applied in the case of tax fraud, i.e. is it possible to impose a prison sentence or a monetary fine? Which is the maximum monetary fine in the case of tax fraud (maximum fine in thousands of Swiss Francs)? What is the average monetary fine for tax fraud? Are the monetary fines for tax fraud added to the fine for tax evasion if tax fraud is part of the criminal code? What is the maximum prison sentence for tax fraud? What is the average prison sentence for tax fraud?

The way taxpayers are treated by tax authorities reveals interesting differences between the Swiss cantons. Only 58 percent of Swiss cantonal tax authorities believe that mistakes in reported incomes are, on average, in favor of taxpayers. 31 percent believe that mistakes are neither to the advantage nor to the disadvantage of taxpayers, and 12 percent believe that mistakes are to the disadvantage of taxpayers. These answers indicate a general lack of distrust towards taxpayers.

If a taxpayer does not report his or her true taxable income, tax authorities can contact her in several ways.<sup>9</sup> 54 percent of the cantons phone the person concerned and ask how the mistake(s) occurred in the tax reporting form and what explanation the taxpayer has. All of the cantons send a letter to the taxpayer, half of them with a standard formulation. Nearly 85 percent ask the taxpayer to pay a visit to the tax administration office, but only half of the cantons mention the possibility of punishment. Thus, tax authorities rarely adopt the strategy of explicit deterrence, but rather seek to gain additional information. 96 percent of the cantonal tax authorities correct reported incomes that are too high, i.e. reduce taxable incomes when taxpayers commit mistakes

that are to their disadvantage. 27 percent of the tax authorities correct reported taxable income even if taxpayers fail to profit from legal tax savings.

### *Econometric Estimates*

*Column (3)* of Table 2 presents TSLS-estimates of the four hypotheses derived. The equation contains the two standard variables for deterrence already included in Table 1 as well as the control variables used there. The probability of detection is statistically significant (at the 5 percent level) and has a theoretically unexpected *positive* sign. It suggests that a higher probability of being caught raises (rather than lowers) tax evasion. An increase in the standard fine lowers tax evasion in a statistically significant way (1 percent level) which corresponds to theoretical expectations. In addition to these two deterrence variables, deterrence is moreover represented by the ‘authoritarian’ procedure of the tax authority. The more it is applied, the lower is tax evasion. This effect is statistically significant (5 percent level).

Two variables in *column (3)* capture the respectful treatment of taxpayers by the tax authority. The variable ‘Typical procedure if no tax declaration’ indicates that there is a statistically significant (1 percent level) positive influence on tax evasion when the tax authority becomes less respectful. The variable ‘respectful procedure’ captures the other aspects of how the tax authority deals with the taxpayers collected by our survey. The effect is again statistically significant (5 percent level) and indicates that tax evasion is reduced when taxpayers are treated more respectfully.

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9. The role of reminder letters has been analyzed in an experimental setting by Wenzel (2001) and Taylor and Wenzel (2001).

These results can now be confronted with *Propositions 1 to 4*. *Proposition 1* and *2* can be rejected. The empirical evidence suggests that neither pure deterrence nor pure crowding-out is the appropriate model. Various variables indicate in a statistically significant way that *both* deterrence and crowding-out of tax morale play a role for explaining tax evasion. The empirical estimates suggest that deterrence via the size of punishment and authoritarian behavior is able to reduce tax evasion. But that is not the case for the probability of being detected where the crowding-out effect possibly dominates the direct deterrence effect, leading to a higher extent of tax evasion. Our theoretical model including endogenous tax morale thus allows to account for this result which in the framework of pure deterrence contradicts theoretical expectations.

The empirical evidence is fully consistent with *Proposition 4*. A more respectful treatment of taxpayers leads to less tax evasion. The respectful treatment does however not certainly reduce tax evasion to a larger extent than the authoritarian procedure. According to an F-test the hypothesis that both effects are of the same magnitude cannot be rejected on any conventional significance level ( $F = 0.284$ ). Estimating the model without the ‘authoritarian’ treatment variable but with the respectful treatment variable (not reported in Table 2) indicates that a respectful treatment reduces tax evasion at the 10 percent significance level while the impact of the control variables remains robust.<sup>10</sup>

#### ***IV. Endogenous Government Policy***

Our analysis has so far assumed that government policy is exogenous to the model of tax evasion. However, there is evidence that the way tax policy is undertaken depends on the politico-economic framework within which the government acts. It has, in particular, been argued that the

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10. The parameter estimate is  $-2.039$  while the t-statistics is  $1.67$ .

extent of citizens' political participation rights systematically affects the kind of tax policy pursued by the government and its tax authority. Empirical studies by Weck-Hannemann and Pommerehne (1989), Pommerehne and Weck-Hannemann (1996), Pommerehne and Frey (1992) and Frey (1997b) focus on the impact of constitutional differences of the cantons on tax evasion. The more direct democratic the political decision-making procedures of a canton are, the lower is tax evasion according to those studies. In addition, Feld and Frey (2002b) have found that the treatment of taxpayers by the tax authority can partly be explained by these constitutional differences between the Swiss cantons as well. The more strongly developed citizens' participation rights are the more respectfully they are treated by the tax authority.

Taking into account endogenous government policy amends the model developed above in the following way. More participation rights  $P$  are associated with a smaller extent of deterrence

$$(8) D = D(P); D_P < 0.$$

Equation (2) now reads

$$(9) C = C\{e, D(P), M[P, D(P)]\}.$$

Taking account of equilibrium condition (3), a taxpayer's optimal amount of tax evasion  $e^*$  is

$$(10) e^* = h[D(P), P] = g(P).$$

The influence of a change in the extent of citizens' participation rights on tax evasion is determined by

$$(11) \frac{\partial}{\partial P}(B_e - C_e) = \frac{-D_P(C_{eD} + C_{eM}M_D) - C_{eM}M_P}{C_{ee} - B_{ee}} \leq 0.$$

In the standard deterrence model  $M_D = 0$  and  $M_P = 0$ , so that

$$(11a) \frac{\partial}{\partial P}(B_e - C_e) = \frac{-D_P C_{eD}}{C_{ee} - B_{ee}} > 0.$$

due to  $D_P < 0$  and  $C_{eD} > 0$ . This allows us to formulate a prediction for the pure deterrence model.

*Proposition 5:* In the standard deterrence context, higher participation rights of the citizens increase tax evasion because of the lower degree of deterrence induced.

In contrast, in a context in which deterrence via relative price effects does not work ( $C_{eD} = 0$ ), the effect of changing participation rights depends on the effects of participation rights and deterrence on tax morale. Participation rights crowd in tax morale ( $M_P > 0$ ) and deterrence crowds out tax morale ( $M_D < 0$ ). Hence we have

$$(11b) \quad \frac{\partial}{\partial P}(B_e - C_e) = \frac{-C_{eM}(D_P M_D + M_P)}{C_{ee} - B_{ee}} < 0,$$

$g_P < 0$  and  $e^*$  is lower.

*Proposition 6:* In the absence of a pure deterrence effect via relative prices, higher participation rights for the citizens decrease tax evasion as tax morale is bolstered.

Combining *Propositions 5* and *6* leads to the conclusion that the net effect on tax evasion depends on the relative sizes of the pure deterrence and the crowding-in effects.

*Proposition 7:* A higher extent of political participation rights reduces tax evasion as taxpayers are treated more respectfully and increases it because pure deterrence is reduced. The overall outcome depends on which effect is dominant

**Table 2: Unbalanced Panel Regressions of Cantonal Share of Income Evaded in Percent of True Income, Exogenous Government Behavior, 1970 to 1995**

Variables	TOLS (3)	TOLS (4)	TOLS (5)
Typical Procedure if No Tax Declaration	2.908** (2.97)	3.712** (3.49)	2.153* (2.21)
Respectful Procedure	-4.574* (2.61)	-5.726** (3.84)	5.783 (0.86)
'Authoritarian' Procedure	-3.888* (2.06)	-6.673* (3.31)	-7.129 (0.88)
Respectful Procedure * Direct Democracy	–	–	-2.529* (2.01)
'Authoritarian' Procedure * Direct Democracy	–	–	0.844 (0.49)
Index of Direct Democracy	–	-2.291** (3.14)	-0.462 (0.33)
Probability of Detection (in ‰)	0.057* (2.43)	0.066** (2.74)	0.035 (1.50)
Standard Fine (in ‰)	-0.059** (3.00)	-0.055* (2.48)	-0.064** (2.72)
Marginal Tax Rate (in ‰)	0.475** (3.37)	0.709** (4.92)	0.718** (5.26)
Income per Capita (in 1'000 SFr)	0.428* (2.40)	0.353* (2.20)	0.423** (2.65)
Tax Indexation	-0.321 (0.30)	-1.038 (0.91)	-0.365 (0.32)
Population (in 1'000)	-0.002 (0.96)	-0.005(*) (1.94)	-0.006* (2.26)
Proportion of People older than 65 (in ‰)	-0.420(*) (1.71)	-0.463(*) (1.95)	-0.778** (3.09)
Share of Self-Employment from Total Employment (in ‰)	-0.605* (2.12)	-0.687* (2.61)	-0.581* (2.34)
Share of Employment in the Agricultural Sector (in ‰)	0.329(*) (1.95)	0.403** (2.69)	0.329* (2.14)
Dummy for French and Italian Speaking Cantons	–	-7.432** (3.10)	-6.786** (3.08)
F-Test: Respectful Equals Authoritarian	0.284	0.315	7.829*
F-Test: Direct Democracy	–	–	9.485**
F-Test: Respectful Procedure	–	–	18.284**
F-Test: 'Authoritarian' Procedure	–	–	1.222
$\bar{R}^2$	0.767	0.798	0.814
SER	4.559	4.242	4.072
J.-B.	0.535	1.846	0.877

For notes see Table 1.

The extent of direct democratic participation rights of the citizens is measured by an index proposed by Stutzer (1999) and successfully used by Frey and Stutzer (2000) in an analysis of subjective well-being of citizens and Schaltegger and Feld (2001) in an analysis of government centralization in Switzerland. The index is extensively discussed in these papers, such that it suffices to note the following: This index is constructed on the basis of the different constitutional provisions concerning the extent of direct democracy at the Swiss cantonal level. All Swiss cantons have mandatory constitutional referendums, but already in the case of an optional constitutional referendum the number of signatures and the time span in which they have to be collected vary across cantons. The variation between the cantons is even higher in the cases of constitutional and statutory initiatives, mandatory and optional statutory referendums, and fiscal referendums. All this information is used by Stutzer (1999) to construct the index employed in this paper.

In addition to the index of direct democracy, a regional dummy variable is included that measures whether a canton has a majority of German or of French and Italian speaking citizens.<sup>11</sup> It is often argued that the cultural differences between Swiss cantons, most visible in the language differences among the Swiss population, are strongly reflected in Swiss politics as well. The French and Italian speaking cantons in the West and South of Switzerland appear to be internationally more open, e.g. reflected by their position towards the European Union, and appear to favor government solutions to a larger extent than the German speaking cantons. It is thus also argued that this translates into fiscal policies. In addition, the French and Italian speaking cantons usually have lower rankings in the index of direct democracy such that this variable could well indicate

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11. It should be noted that aside the respective and 'authoritarian' treatment variables, the typical procedure if no tax declaration and the dummy for French and Italian speaking cantons, all variables vary over time. The direct democracy index does so only moderately, but the fine, the probability of detection, tax indexation and so on vary

the impact of cultural differences when they are not controlled for. Therefore, this regional dummy variable is included in the econometric model for testing robustness.

The estimation results in *column (4)* of *Table 2* suggest again that both the pure deterrence model and the pure crowding-in model are inappropriate. *Proposition 5* has to be rejected. However, direct democracy and thus higher participation rights have a significant negative impact on tax evasion such that *Proposition 6* cannot be rejected. Including political participation rights in the analysis does however not affect the results obtained with respect to *Propositions 1* to *4*. Higher audit rates are still associated with higher tax evasion, while a higher fine and the authoritarian procedure successfully deter taxpayers from evading taxes. In addition, the respectful procedure reduces tax evasion as well.

The most interesting point shows up when the interaction between higher participation rights and treatment by the tax authority are considered in *column (5)* of *Table 2*. The respectful procedure has indeed a negative impact on tax evasion in more directly democratic cantons while it increases tax evasion in more representative democratic cantons. And vice versa for the ‘authoritarian’ procedure: It has a dampening effect on tax evasion in more representative democratic cantons and increases tax evasion in more direct democratic cantons. While the single effects of the interaction terms with the respectful procedure do not reach any conventional significance level, they are individually significant in the case of the interaction terms with the ‘authoritarian’ procedure. Nevertheless, the tests on the joint significance of the respectful procedure variables and the direct democracy variables, reported on the bottom of *Table 2*, indicate that each of these variables has a significant impact on tax evasion while that of the ‘authoritarian’ procedure is not

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considerably. Thus, sufficient degrees of freedom remain in the cross section domain despite of the reduced number of Swiss cantons.

significant at any conventional significance level according to that Wald test. In addition, the hypothesis that the effects of respectful and authoritarian treatment are equal can now be rejected at the 5 percent significance level. These results are consistent with *Proposition 7*. The dampening effect of the ‘authoritarian’ procedure on tax evasion mainly arises in representative democracies while the dampening effect of the respectful procedure mainly occurs in direct democracies. Distinguishing both constitutional systems underlines the dominance of a respectful as compared to an authoritarian treatment.<sup>12</sup>

## ***V. Concluding Remarks***

The standard model of tax evasion based on the subjective expected utility maximization does not perform particularly well in econometric analyses. The model predicts too little evasion and produces unsatisfactory econometric parameter estimates. It is argued that important insights on tax compliance and tax evasion can be gained by looking at how the tax authority deals with the taxpayers. Taxpayers respond in a systematic way to how the tax authority treats them. In particular, the taxpayers’ willingness to pay their taxes, or *tax morale*, is supported, or even raised, when the tax officials treat them with respect. In contrast, when the tax officials consider taxpayers purely as ‘subjects’ who have to be forced to pay their dues, the taxpayers tend to respond by actively trying to avoid taxation.

We analyze the interaction between the tax authority and the taxpayers affecting tax morale by using a model of the behavior of the tax authority based on *Crowding Theory*. This approach establishes a systematic relationship between external intervention (in this case, how the tax offi-

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12. These results are robust to several variations in the model. We have alternatively used different indicators of fines or of probability of detection without obtaining any significant changes. In addition further control variables did not affect the estimation results.

cials deal with taxpayers) and intrinsic motivation (in this case, individuals' tax morale). The emphasis lies on the empirical analysis of the theoretical propositions derived. With a sample of Swiss cantons in the years 1970-1995, we show that the tax authorities in Switzerland do indeed behave *as if* they were aware of the reaction of taxpayers to being treated with respect or not. This result offers a perspective seldom taken into consideration with regard to the issue of tax compliance: Deterrence is only one of the motivational forces in getting people to pay their taxes. Quite another is the set of policies available to the tax authority to bolster taxpayers' tax morale. A '*respectful*' relationship of the tax authorities to the taxpayers *crowds in* tax morale while an '*authoritarian*' relationship using instruments of deterrence has two countervailing effects: on the one hand the change in relative prices (the higher probability of being punished) reduces the incentives to evade taxes but on the other hand tax morale is undermined or *crowded out*. It has been shown that an authoritarian approach crowds out tax morale more strongly when citizens have high political participation rights. In contrast a respectful approach crowds in tax morale more strongly when the citizens have high political participation rights.

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*Appendix A: The Questionnaire*<sup>13</sup>

With this questionnaire, we would like to record information about the legal and institutional rules for coping with tax evasion in the Swiss cantons. If you cannot answer any questions, we would appreciate your indicating the reasons for that.

Please do not forget to write the name of the canton in the space allocated. We would particularly appreciate it if you could mention a person in the cantonal tax administration (along with his or her phone number) who could provide us with specific information and serve as a contact.

The results of our research are for scientific purposes only and will be treated with the utmost confidentiality. Please send the questionnaire to Lars P. Feld, University of St. Gallen, S.I.A.S.R., Dufourstr. 48, 9000 St. Gallen. We are prepared to answer any questions you may have if you call 071/224 23 45.

We would like to thank you very much in advance for your cooperation. Your answer is of great importance for our research.

**I. Penalty for Tax Evasion**

1. What is the minimum fine for tax evasion in your canton, for example as a multiple of the tax payment (or as a % of the tax payment)?
2. What is the maximum fine for tax evasion in your canton, for example as a multiple of the tax payment (or as a % of the tax payment)?

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13. Each question was supplemented by the question whether there have been any changes since 1978.

3. What is the regular fine for tax evasion in your canton, for example as a multiple of the tax payment (or as a % of the tax payment)?
4. What is the fine for tax evasion in your canton in the case of a legacy (‘inventory case’), for example as a multiple of the tax payment (or as a % of the tax payment)?
5. What is the fine for tax evasion in your canton in the case of self-declaration, for example as a multiple of the tax payment (or as a % of the tax payment)?
6. Do you apply the criminal code in the case of tax fraud, i.e. is it possible to have a prison sentence or a monetary fine?

Do you treat tax fraud in the same way as tax evasion?

7. Is there a monetary fine in the case of tax fraud?
8. What is the maximum monetary fine in the case of tax fraud (maximum fine in thousands of Swiss Francs)?

What is the average monetary fine for tax fraud in your experience?

9. Do you add the monetary fine for tax fraud to the fine for tax evasion, if tax fraud is part of the criminal code?
10. Do you apply a prison sentence in the case of tax fraud?
11. How many months does the prison sentence for tax fraud amount to at maximum?

What is the average prison sentence for tax fraud according to your experience?

12. What is the fine for minor tax evasion (in hundreds of Swiss Francs)?

13. What is the fine for major tax evasion (in hundreds of Swiss Francs)?
14. How long is the period of fining for tax evasion (in years)?
15. How long is the period of fining for tax fraud (in years)?
16. How long is the limitation period of fining for tax evasion (in years)?
17. How long is the limitation period of fining for tax fraud (in years)?
18. Does your canton apply any reduced limitation periods for minor tax offences?
19. Do you propose an interest surcharge for foregone tax revenue in addition to the fine?
20. In the description on the tax declaration form, do you mention to the taxpayers the necessity of collecting taxes in order to fulfil public duties?  
  
Do you mention to the taxpayers the potential fines for false tax declarations?  
  
Do you mention both?  
  
Do you mention problems of increasing tax evasion in the description of the tax declaration form?
21. Do you mention tax evasion in the public accounts?

## **II. Intensity of Cantonal Control**

22. How many cantonal tax officials do you have in total (employed full-time)?
23. How many cantonal tax officials do you have to control dependent employees (employed full-time)?

24. How many cantonal tax officials do you have to control self-employed people (employed full-time)?
25. How many taxpayers (natural persons) do you have in your canton?
26. What is the cantonal average for cases of tax evasion in the last few years?
27. How many taxpayers (natural persons including foreign workers and firms) do you have in your canton?

### **III. Tax Amnesties**

28. How many tax amnesties have taken place in your canton since 1985?
29. How many tax amnesties took place in your canton from 1978 to 1985?
30. How many years have passed since the last tax amnesty?

### **IV. Publicity of Tax Evasion**

31. Is the tax register public in your canton?
32. In how many local jurisdictions of your canton is the tax register public?
33. Do you give any general information on taxpayers in your canton at the *cantonal level*?
34. Do you give any general information on taxpayers in your canton at the *local level*?
35. Do you give any general information on taxpayers in your canton at the *cantonal level* only in the case of a well-founded application?
36. Can taxpayers have a look at the tax register in your canton?

## V. Final Questions

37. Does your canton have a tax indexation?

38. What happens if a taxpayer does not declare taxable income at all?

What is the fine in this case, if any?

Is the same objection in your canton possible in the case of non-declaration or self-declaration?

39. What do you do if a tax declaration is wrongly filled out?

– Do you call the taxpayer first?

– Do you write a letter to the taxpayer?

– Do you use a standardized letter?

– How is it typically formulated?

– Do you invite the taxpayer to show up in person in the tax administration office?

– Do you indicate any potential fines to the taxpayer right at the beginning?

– If so, how do you indicate it to the taxpayer?

40. What happens if taxpayers do not react in the case of a false declaration of taxable income?

41. What do you do if taxable income is declared mistakenly high?

42. Are there any differences in your treatment if these mistakes are obviously formally wrong, e.g. mistakes in adding up figures, or if possibilities for legal tax avoidance, such as tax deductions, are not used?

What is the difference?

43. Do you attempt to find out whether taxpayers declare too low a taxable income intentionally or by mistake?

44. Do you think that mistakes in the tax declaration are to the advantage or to the disadvantage of *taxpayers*?

Thank you very much for your help!

*Appendix B: Data Description***Table A1: Data Description**

<i>Variable Name</i>	<i>Description</i>	<i>Source</i>
Tax Evasion	The difference between adjusted household income reported in the tax authorities' statistics and gross household income on a national accounts' basis (in percent).	Own calculations and those of Pommerehne and Weck-Hannemann (1996) based on unpublished data of the Swiss Federal Tax Administration and on data by the Swiss Federal Statistical Office (personal correspondence).
Probability of Detection	Number of tax auditors as a percentage of the total number of taxpayers.	Own calculations and those of Pommerehne and Weck-Hannemann (1996) based on questionnaire data (Appendix A, Q. 22).
Fine for Tax Evasion	Standard legal fine as a multiple of the evaded tax amount (in percent).	Own calculations and those of Pommerehne and Weck-Hannemann (1996) based on questionnaire data (Appendix A, Q. 3).
Marginal Tax Rate	Maximum marginal tax rate.	Swiss Federal Tax Administration and Pommerehne and Weck-Hannemann (1996).
Income per Capita	Gross effective primary income per capita (in 1'000 Sfr).	Swiss Federal Statistical Office (personal correspondence) and Pommerehne and Weck-Hannemann (1996).
Tax Indexation	Dummy = 1 if there is an indexation to inflation, and 0 otherwise.	Own calculations and those of Pommerehne and Weck-Hannemann (1996) based on questionnaire data (Appendix A, Q. 37).
Population	Cantonal population (in 1'000).	Swiss Federal Statistical Office.
Older Population	The percentage of people over 65 in the population.	Swiss Federal Statistical Office (personal correspondence) and Pommerehne and Weck-Hannemann (1996).
Self-Employment	Share of self-employment from total employment (in %)	Swiss Federal Statistical Office.
Agricultural Employment	Share of employment in the agricultural sector	Swiss Federal Statistical Office.
Index of Direct Democracy	Index designed to reflect the extent of direct democracy within a range between 1 (lowest) and 6 (highest degree).	Own calculations for an index proposed by Frey and Stutzer (2000) on the basis of Stutzer (1999).
French and Italian Speaking Cantons	Dummy = 1 for French and Italian speaking cantons, and 0 otherwise	Own calculations

**Table A1 (cont.): Data Description**

<i>Variable Name</i>	<i>Description</i>	<i>Source</i>
Typical Procedure if No Tax Declaration	Ordered variable = 0 if a reminder is sent and direct income assessment follows; 1 if a reminder followed by a penalty and an assessment by the tax authority; 2 if a direct income assessment by the authority without any other contact to taxpayers; 3 if there is a penalty and an official assessment without a reminder and without an attempt to check out the situation.	Own calculations based on questionnaire data (Appendix A, Q. 38).
Respectful Procedure	Dummy = 1 if 'normal' procedure by first calling a taxpayer on the phone, then sending a written reminder, and finally inviting the taxpayer to pay a visit to the tax administration; 0 otherwise.	Own calculations based on questionnaire data (Appendix A, Q. 39).
'Authoritarian' Procedure	Dummy=1 if 'authoritarian' procedure by first inviting taxpayers directly to pay a visit to the tax administration and additionally threaten them with potential fines; 0 otherwise.	Own calculations based on questionnaire data (Appendix A, Q. 39).

*Appendix C: Descriptive Statistics***Table A2: Descriptive Statistics**

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Std. Dev.</i>
Tax Evasion (in %)	23.48	24.54	43.27	0.76	9.27
Probability of Detection (in %)	55.23	44.99	188.98	3.14	35.61
Fine for Tax Evasion(in %)	96.97	100.00	200.00	0.00	36.82
Marginal Tax Rate (in %)	24.35	23.60	34.80	12.90	5.19
Tax Indexation	0.50	0.50	1.00	0.00	0.50
Income (in 1000 Sfr per Capita)	25.32	25.86	47.96	8.41	10.48
Population (in 1000)	256.06	192.12	1175.46	12.77	271.31
Older Population (in %)	18.96	18.90	26.82	12.30	2.74
Share of Self-Employment	11.30	10.07	35.09	2.22	4.39
Share of Agricultural Employment	14.34	11.77	71.32	0.06	12.00
Index of Direct Democracy	4.05	4.17	6.00	1.67	1.26
Dummy for French and Italian Speaking Cantons	0.26	0.00	1.00	0.00	0.44
Typical Procedure if No Tax Declaration	1.69	2.00	3.00	0.00	0.67
Respectful Procedure	0.55	1.00	1.00	0.00	0.50
‘Authoritarian’ Procedure	0.30	0.00	1.00	0.00	0.46

*Note:* For a detailed description of the variables, see Appendix B. All statistics are computed for 128 observations.