The Runaway Taxpayer
Or: Is Prior Audit Effective in Reducing Tax Evasion?[♣]

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Abstract

In this paper we study how "prior audit" affects individual behaviour in terms of tax compliance. We provide a theoretical framework, considering a situation in which an individual has already decided to evade taxes and knows that sooner or later the Tax Authorities are looking for her for notifying the due amount of taxes. We concentrate on the decision to move in order to avoid notification by the collection agency, and derive the optimal number of times an individual should move equalising marginal costs and benefits of the decision. Our empirical analysis is based on real data of an Italian collection agency in the period 2004-2007. Our results show that the previous notification reduces the probability to move, but its cost is not enough to correct the individual incentive to escape notification.

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1. Introduction

Tax evasion is one of the most important problems the Italian Tax Administration needs to tackle: at a macroeconomic level, it is estimated to be 11% of the GDP, whilst the total tax gap is 27% (Reviglio, 2006). These values are considerably higher than those observed in the other EU countries. Consequently, even if the Italian total tax burden is similar to the EU average, the effective tax distribution among taxpayers is very different. In addition, the propensity of the Italian citizens to evade taxes has increased in the last decade (Cannari and D'Alessio, 2007). Several reasons can explain this situation: the production structure of the Italian economic system; a low general reprobation among citizens due to tax evasion; the tax complexity; the inefficiency in the organization of the Tax Authority; the high percentage of court trials that end with the taxpayers' win; the inefficiency of the collection system. With respect to the last of these problems, according to latest estimates, only 0.55% of the total amount on the taxpayer's rolls has been cashed by collection agencies in 2002, even less than the 1.8% cashed in 2000-2001 (Servizio Politiche Fiscali UIL, 2005). These data underlines that, in addition to the inefficiency of the Tax Administration, the collection system plays a crucial role in both the extension and the persistency of the tax evasion in Italy.

The standard theoretical literature on this topic and its extensions focuses on the determinants of tax evasion, as for instance the responsiveness of tax evasion to variations in the income level and tax-enforcement parameters, using a basic one-period expected utility approach. Some recent contributions investigate the dynamics of tax compliance in order to consider the current compliance as a function of past reports and audit experiences, but their findings on the responsiveness of evasion decisions to past audit experiences do not lead to univocal conclusions. Also the empirical works do not find univocal conclusions: the findings of the laboratory experiments, for instance, partially conflict with those obtained by actual evasion data. Moreover, since real data are lacking, there are very few natural experiments.

In this study we focus on individuals who have already decided to evade taxes, and can then decide to runaway changing their address several times in order to escape the notification of previously evaded taxes: according to the data we obtained by a collection agency, this is what happens in the real world for a considerable number of

tax evaders. In order to design our empirical strategy, we provide a simple theoretical framework for this behaviour, considering both costs and benefits associated to the decision to move. As for costs, we consider those borne by taxpayers once they decide to runaway to escape notification, and the additional ones of non-compliance associated with a prior notification experience. Our aim is to identify what is the role of this policy variable in influencing behaviours. While from a theoretical point of view results are undetermined, we find empirically a negative impact on "prior audit" (i.e. prior notification) on the probability to move. However, considering also other variables which can affect this decision (e.g., age, gender, and due amount), the implicit (psychological) costs seem to be not large enough to discourage tax evaders to runaway in order to escape notification.

The structure of the paper is as follows. Section 2 describes the tax collection procedure in Italy, with a particular emphasis on the collection of taxes by taxpayers' roll. Section 3 reviews the economic literature on tax evasion and the role of prior audit. In Section 4 we propose a simple and stylised model of individual choice to study how the taxpayer's decision to move in order to avoid notification by the collection agency is affected by prior notifications. Section 5 presents the data and our empirical models. Section 6 concludes.

2. The collection of taxes by taxpayers' roll

In this section we briefly describe the institutional features characterising the notification procedure in Italy. The collection of taxes is the final step in taxpayer's obligation, when the taxpayer's payment accrues to the Tax Administration. There are three possible ways for this to happen: (a) the direct withholding taxation by the Tax Administration (e.g., in the case of direct payment of earnings to public employees); (b) the self-taxation, which represents the normal way of tax payment: like almost all the jurisdictions, the Italian tax system is based on voluntary compliance, so that taxpayers are expected to understand and comply with their tax obligations; finally, (c) the collection of taxes by taxpayers' roll, which represents the extraordinary way of tax payment. When - for some individuals - the self-taxation did not (properly) occurred, the tax authorities that should have received the payments needs first to ascertain the

amount of taxes that these individuals should have paid; then the tax authority issues a tax roll, that is a list of taxpayers and of their tax due amounts including fees, interests and collection agency's premium. The tax roll becomes a document of execution with the sign of the legal ownership of the tax authority that issued that tax roll. Notice also that the tax roll clearly includes all payments to be due to a Public Administration, e.g. income taxes and local taxes as well as other revenue receipts, like royalty rents, licence fees and administrative sanctions.

All the tax rolls issued by all the tax authorities are periodically sent to a collection agency in charge of collecting taxes in a specific area on the basis of the taxpayers' residence. It is up to the collection agency to *notify* to each individual included in a tax roll the amount of taxes that are requested. The notification must happen within the set time limit that lie between one and three years according to the kind of audit.

The notification plays a crucial role, because only *notified* tax debts allow the tax authorities to legally expropriate taxpayer assets whenever the taxpayer did not paid her due amount within the set time limit (two months starting from the day of the notification). The most important problem of the collection agencies is that in many cases the address is unknown. This underlines the importance of the issue we approach in this paper: if the collection agency is not able to discover the unknown residence address, then the notification will not take place in the set time limit. This means that the individual will not be affected by her illegal behaviour. Hence, hiding her own address to tax authorities (e.g., by frequently changing it) is a way to avoid fiscal obligation.

On the contrary, the individual to whom a tax return form has been notified has two opportunities: he can pay or not the due amount to the collection agency within two months. If the taxpayer pays, then his obligation comes to an end. Otherwise he can appeal against the tax return form to the tax court, or can simply decide not to pay. If he decides not to pay, then the collection agency starts the enforcement within a year from the day of return notification, by expropriating taxpayer assets. Therefore, receiving a notification bears several monetary and psychological costs that are likely to influence future taxpayer's compliance, as found in some studies on prior audit experience surveyed in the next section.

3. The economic literature on tax evasion and the role of prior audit

In the benchmark economic approach of modelling tax compliance, individual reporting decisions are the result of a process of expected utility maximization, and the taxpayer merely behaves like a gambler. The pioneering models were proposed over thirty years ago in the studies by Allingham and Sandmo (1972), Srinivasan (1973) and Yitzhaki (1974), which were primarily interested in analysing the responsiveness of tax evasion with respect to variations in the (exogenous) income level and standard tax-enforcement parameters (i.e., audit probability, fine and tax rate).[1] This basic paradigm was followed by a large number of theoretical contributions which generalized the original model in several directions, as well as by a variety of empirical research (based on actual evasion data, surveys on taxpayer attitudes and laboratory experiments) aiming at testing their resulting predictions, especially the ones that are inconclusive or appear conflicting with the common sense.[2] A first important generalization considered the taxpayer's income endogenous by adding labour supply to the model, making more ambiguous the effects of enforcement variables on reporting decisions.[3] Another important extension was the development of models where the audit probability is not constant, but is a function of reported income and is determined jointly with tax compliance as part of an equilibrium within a standard game-theory framework.[4] Hinging on the argument that the traditional paradigm, based on rational and selfish agents, tends to predict too much evasion (for given values of fine-audit parameters) compared to the levels actually observed, in the last decades both theoretical and empirical literature on tax compliance has increasingly

[1] Under fairly general assumptions about individual risk preferences, the standard expected utility model supports the propositions that people with higher personal income tend to evade more, and that increasing any of the tax-enforcement parameters will reduce the amount of concealed income. For an exhaustive and critical discussion of main findings deriving from the basic tax compliance model refer to Cowell (2003) and Sandmo (2006).

[2] For a comprehensive review of the literature on tax compliance see the recent surveys by Andreoni *et al.* (1998), Slemrod and Yitzhaki (2002) and Cowell (2003).

[3] Such an extension was proposed, among the others, by Pencavel (1979), Cowell (1981) and Sandmo (1981).

[4] These models allowing for strategic interaction between taxpayers and Tax Authority were conceived not only to generate predictions about compliance level, bat also to have some useful insights about a tax agency's optimal audit procedure. See, e.g., the pioneering analyses by Greenberg (1984), Reinganum and Wilde (1985, 1986) and Graetz, Reinganum and Wilde (1986) and the later developments by Mookherjee and P'ng (1989), Sansing (1993), Erard and Feinstein (1994) and Cronshaw and Alm (1995).

accounted for social and ethics considerations[5]. Main findings suggest that factors such as, for instance, moral obligations to be honest, the social consequences of being a known cheater (social stigma), or the taxpayers' perception of the fairness of her tax burden with respect to others, play a major role in explaining individual evasion decisions and significantly improve the adequacy of the basic paradigm in modelling tax compliance behaviour.[6]

As remarked in Andreoni *et al.* (1998) and Cowell (2003), ignoring the dynamic nature of the reporting problem represents another relevant shortcoming of the basic one-period expected utility approach. Indeed, this approach assumes that each year basically the same gamble takes place, without considering any "memory" in taxpayer reporting decision. However, in practice taxpayers are likely to condition their current compliance on past reports and audit experiences. Individuals that were audited and caught evading incurred several costs. The first is the burden of repaying with interest past due taxes plus penalties charged by the Tax Administration on unreported income. Other relevant costs include pecuniary and psychological costs of enduring audits and court trials, as well as other potential sanctions imposed on individuals found guilty of major crimes. One would expect that all these costs implied by a prior audit somehow affect subsequent tax compliance behaviour. Therefore, accounting for the *repeated* nature of the reporting decision, by allowing the taxpayer to exploit information from multiple time periods, represents an interesting generalization of the basic expected utility model. Nevertheless, there currently exists a very restricted number of theoretical contributions analysing the dynamics of tax compliance, and their findings on the responsiveness of evasion decisions to past audit experiences do not lead to univocal conclusions.

[5] Feld and Frey (2002, 2006) mention this issue as a major empirical problem with the standard expected utility framework. On the basis of data for Switzerland (1970-1995), they assert that it is impossible to account for observed compliance only in terms of expected punishment, whereas tax morale, that is the intrinsic motivation of taxpayers to comply with their fiscal obligations, assumes a central role. Indeed, given the average probability of audit, the penalties typically assessed for non-compliance and what one knows about the degree of risk aversion from other contexts, tax evasion should be much higher than it actually is.

[6] Among the theoretical contributions going towards the direction to incorporate ethics and social norms into the basic gamble paradigm, see Gordon (1989), Bordignon (1993) and Myles and Naylor (1996). On the empirical side, recent studies discussing the relevance of social and moral dimensions of tax evasion, on the basis of both survey and experimental data, include Evans and Kelly (2001), Torgler (2001, 2003), Cummings *et al.* (2005), Wenzel (2005a,b), Fiorio and Zanardi (2006) and Cannari and D'Alessio (2007).

Building within the alternative "prospect theory" framework[7], Kahneman *et al.* (1982) have highlighted the importance of the so-called "possibility effect", a particular heuristic rule used by decision-makers according to which individuals tend to assess the probability of a certain event by bringing to mind the number of times that similar events happened in the past. This leads to assume that the taxpayers audited in the past attribute a higher value to the probability to be audited in the future, and then exhibit more compliance in comparison with taxpayer without prior audits, even in the presence of a totally random audit procedure. More recently, Engel and Hines (1999) derive a dynamic tax evasion model including retrospective audits, and find that the cumulative compliance incentives are quite complex and, in general, simulation analysis is required to make predictions. As for, in particular, the taxpayers' response after an audit, their results reveal that there is an incentive to evade a significant amount in the year immediately following the prior audit, in such a way overshooting the steady-state level of tax evasion. However, in the second year after the audit, taxpayers become conscious of their excessive evasion in the year before, and therefore increase their compliance to a level above the steady-state. After a short period of dampening oscillation, the process converges to a steady-state where a taxpayer who is no more audited evades the same fraction of income in succeeding years. Finally, Snow and Warren (2007) have extended the standard expected utility one-period model of tax evasion to an inter-temporal framework where taxpayers face uncertainty about the probability of being audited and update their beliefs taking prior audit experience as relevant information. They show that tax compliance significantly reacts to the Bayesian updating of beliefs about the probability of being audited in the future based on prior audit, in a way which depends on the specific risk aversion characteristics of taxpayers. In particular, for a large variety of risk preferences, Bayesian updating increases present and expected future tax evasion.

[7] Recognizing that expected utility paradigm may miss out important features of people's preferences in face of uncertainty, several researchers (mainly working in the field of economic psychology and sociology) have examined tax compliance in the light of the "prospect theory" originally proposed by Kahneman and Tversky (1979). The key issue is that the response to a particular economic incentive (e.g. a change in tax enforcement) would differ according to the context in which it was perceived (framing hypothesis). Cowell (2003) points out that, in spite of the increasing support received by prospect theory with respect to the standard expected utility paradigm, direct empirical tests of conformity of real behaviour with prospect theory have been inconclusive.

On the empirical side too, the limited evidence on tax compliance effect implied by a prior audit experience is not conclusive. Spicer and Hero (1985) have been the first to directly test the "possibility effect" proposed by Kahneman *et al.* (1982) trough a ten-rounds laboratory experiment. Their results reveal a statistically significant negative relationship between tax evasion in the final round of the number of prior audits. The succeeding experiments by Benjamini and Maital (1985) and Webley (1987) also find that being audited in earlier rounds significantly increase subsequent tax compliance. However, studies based on actual evasion data partially conflict with these experimental findings. Long and Schwarz (1987), analysing panel data on the outcomes of audits carried out by the U.S. Internal Revenue Service (IRS) in 1969 and 1971 on the same taxpayers, conclude that the 1969 audit was only marginally effective in reducing the frequency of evasion in 1971, and was not effective at all as for the average magnitude of non-compliance among those taxpayers who continued to cheat. Erard (1992) studies the deterrent effect of an ordinary prior audit experience using 1982 information from the U.S. Taxpayer Compliance Measurement Program (TCMP), and finds a small and statistically insignificant coefficient for the prior audit variable, revealing a negligible impact of earlier audit experiences on future tax evasion behaviour. Hence, econometric results so far indicate that resorting to the "stick" to increase tax compliance may not have any long-run effect. As Andreoni *et al.* (1998) emphasize, further research is then needed to confirm whether there is any specific deterrent impact associated with a prior audit and to understand the reasons underlying the presence or the absence of such an effect. This is just the aim we try to pursue in the analysis that follows.

4. A simple theoretical model

In order to provide a theoretical framework for our empirical analysis, we develop here a very simple and stylised model of individual choice based on the expected utility paradigm (e.g., Sandmo, 2006), which includes also the costs borne by taxpayers once they decide to runaway to escape notification, and the additional costs of non-compliance associated with a prior notification experience. More precisely, the reference context is that of an individual who has already decided to evade taxes, and knows that the tax authorities are (sooner or later) looking for her for notifying the due

amount of taxes. In particular, according to Italian Law (but the same is true for other countries), and starting from institutional details outlined in previous section, the tax authorities need first to ascertain the amount of taxes that the individual should have paid, and then to *notify* to the individual the amount of taxes that are requested. The notification is important, for only notified tax debts allow tax authorities to legally expropriate taxpayer assets. Hence, individuals might choose to escape notification. There are several ways to do so. In the light of the following empirical analysis, here we concentrate on the decision to move, i.e. change address in order to avoid notification. We assume that moving allows tax evaders to reduce the probability to be caught by tax authorities. We study how the decision to move is affected by prior notifications a given individual might have experienced.

Let W be the taxpayer income, F the amount of taxes evaded plus additional fees imposed once tax evasion has been ascertained by tax authorities, τ the additional costs borne by the taxpayer once she decides to move, κ the additional costs of non compliance (for instance because of a previous notification), T the total burden (both monetary and psychological costs) following tax evasion, s the number of times the individual decides to runaway to escape notification.

The expected total burden after tax evasion can be written as:

$$E(T) = p(s)(F+\kappa) + [1-p(s)]0 = p(s)(F+\kappa) \qquad (1)$$

where p is the probability of being detected as a function of the number of times the taxpayer moved; we clearly assume that $\frac{\partial p(s)}{\partial s} < 0$, so that the probability of being notified decreases with the number of address changes.

The expected taxpayer income, once she evaded taxes, can then be written as:

$$E(W) = W - E(T) - [\tau_1 s + \tau_2(s)] = W - p(s)(F+\kappa) - [\tau_1 s + \tau_2(s)] \qquad (2)$$

where $\tau_1 s$ and $\tau_2(s)$ are respectively the fixed and variable costs of moving and changing address. For instance, fixed costs of moving are related to all the basic items the taxpayer needs to bring to her new address each time she moves, whereas variable costs of moving are related to the difficulties in finding a new address. We assume that

the variable costs of moving increase with the decision to move (i.e., $\frac{\partial \tau_2(s)}{\partial s} > 0$), for example because it is more difficult to hide once a taxpayer have already done so.

The problem of each individual once she has evaded taxes, is to choose s in order to maximize the expected income W. F.O.C. for the problem is:

$$\frac{\Delta E(W)}{\Delta s} = -\frac{\partial p(s)}{\partial s}(F+\kappa) - \tau_1 - \frac{\partial \tau_2(s)}{\partial s} = 0 \qquad (3)$$

from which we obtain:

$$-\frac{\partial p(s)}{\partial s}(F+\kappa) = \tau_1 + \frac{\partial \tau_2(s)}{\partial s} \qquad (4)$$

Eq. (4) clearly shows that the taxpayer will decide to move in order to equate at the margin costs $\tau_1 + \frac{\partial \tau_2(s)}{\partial s}$ and benefits $-\frac{\partial p(s)}{\partial s}(F+\kappa)$ of this decision. Costs are both fixed and variable, and they are related to changing address; benefits are given by the reduction in the expected tax burden stemming from the reduction in the probability to be notified. It is immediate to notice from Eq. (4) that a corner solution emerges (i.e., $s^* = 0$), whenever marginal costs of moving are higher than marginal benefits for any $s > 0$; we will take into account this possibility in the empirical part of the paper. Notice also that, if marginal benefits are higher than marginal costs for any $s > 0$, then the individual optimal strategy is to keep moving away indefinitely.

Apart from these two extreme cases, the above condition (4) implicitly define s^* (the optimal number of times for an individual to move), that is:

$$\frac{\Delta E(W)}{\Delta s} = f(s^*, F, \kappa, \tau) = -\frac{\partial p(s)}{\partial s}(F+\kappa) - \tau_1 - \frac{\partial \tau_2(s)}{\partial s} = 0 \qquad (4 \text{ bis})$$

We can then exploit the implicit function theorem to study how s^* changes with respect to changes in exogenous parameters F, κ, and τ. Consider for instance κ; we have:

$$\frac{\partial s^*}{\partial \kappa} = -\frac{\frac{\partial f(s^*, F, \kappa, \tau)}{\partial \kappa}}{\frac{\partial f(s^*, F, \kappa, \tau)}{\partial s^*}} = \frac{-\frac{\partial p(s)}{\partial s}}{\frac{\partial^2 p(s)}{\partial s^2}(F+\kappa) + \frac{\partial^2 \tau_2(s)}{\partial s^2}} \qquad (5)$$

Since $\left(-\frac{\partial p(s)}{\partial s}\right) > 0$, the sign of Eq. (5) hinges upon the sign of the second derivatives $\frac{\partial^2 p(s)}{\partial s^2}$ and $\frac{\partial \tau^2(s)}{\partial s^2}$. We can distinguish two polar cases, which we may dub (a) the "predictability effect of moving" and (b) the "learning effect of moving". Intuitively, running away and frequently changing her own address can have two potential effects: on the one hand, it can make individual behaviour more "predictable" for collection agencies and tax authorities, with increasing marginal costs $\frac{\partial^2 \tau_2(s)}{\partial s^2} > 0$ and decreasing marginal benefits $\frac{\partial^2 p(s)}{\partial s^2} > 0$. If this is true, then an increase in the additional costs of non compliance - stemming from a prior notification - will imply a higher s^* (i.e., $\frac{\partial s^*}{\partial \kappa} > 0$), for the individual will obtain a marginal benefit on the increase in κ only at a cost of moving more. On the other hand, running away can imply a "learning effect" for the individual, who will escape more easily Tax Authorities once she starts running away. If this is the case, then marginal benefits will be increasing with respect to the number of times an individual moves (i.e., the probability of being detected decreases at decreasing rates, $\frac{\partial^2 p(s)}{\partial s^2} < 0$), whilst marginal costs of moving are decreasing (because individual learns how to escape notification, hence $\frac{\partial \tau^2(s)}{\partial s^2} < 0$). In this case, the marginal benefit of an increase in κ can be obtained by reducing the optimal number of times s^* an individual moves (i.e., $\frac{\partial s^*}{\partial \kappa} < 0$).

In other words, our simple analysis suggests that increasing the total fee F imposed by tax authorities once evasion has been discovered, or increasing the additional (psychological) costs of non compliance (for instance through a previous notification) induces a change in the optimal s^* which is a priori undetermined in sign. It is then an empirical matter to ascertain which of these two effects will prevail. This is our attempt in the empirical part of the paper to which now we turn.

5. The econometric analysis

5.1. Empirical strategy

Starting from the simple theoretical model described in the previous section, we study here the choice of moving by using an array of different discrete choice models proposed in the literature. Our dependent variable is clearly s^*, which we consider in a first group of models as the probability of moving to escape notification, and then as the number of times an individual has moved (exactly like in our theoretical model). We assume s^* to be idiosyncratic to each individual (here tax evader), and take into account in some models unobserved heterogeneity across individuals. Moreover, in all the models we also provide a rough control for heterogeneity across individual groups, by looking at common cultural factors that the literature deems to be important in influencing tax evasion (like age, gender, the area where an individual was borne).

Our baseline specification for the first group of models is:

$$\Pr(s_i^* > 0 | x_i) = \Pr(s_i = 1 | x_i) = F(x_i, \beta) \qquad (6)$$

where the LHS variable is defined as the probability an individual moves, which is clearly equal to 1 when the *i-th* individual has moved at least once (i.e. $s_i^* > 0$), and 0 when she never moved; $F(\cdot)$ is alternatively assumed to be the standard normal CDF and the Logistic CDF (resulting respectively in probit and logit models); x is a vector of regressors, and β a vector of corresponding parameters to be estimated. The vector x includes proxy measures for F (the amount of taxes evaded plus fee imposed once tax evasion has been ascertained by tax authorities), and κ (the additional costs of non compliance). We also add controls for heterogeneity across individuals, like age, gender, and a set of dummy variables for the different geographical areas where an individual can be borne (which can proxy for cultural differences with respect to tax compliance). We finally explicitly allow for a treatment of unobserved individual heterogeneity by considering – whenever technically feasible – both random and fixed effects specification of our Eq. (6)[8].

[8] Recall that a fixed effects specification is not feasible in probit models. See e.g. Greene (2008), for details.

In the second group of models, we study directly s^* (i.e., the number of times an individual has moved) by considering standard tobit models. The baseline specification is:

$$s_i = F(x_i, \beta);\ s_i = s_i^*\ if\ s_i^* > 0;\ s_i = 0\ if\ s_i^* \leq 0 \qquad (7)$$

where $F(\cdot)$ is based on the standard normal CDF, x and β are defined as before, and the observability rule allows us to take into account the corner solution obtained in the theoretical model, which – from Eq. (4) – occurs whenever marginal costs of moving are higher than marginal benefits (implying $s_i^* \leq 0$). Also in this second group of models, we allow for a treatment of unobserved heterogeneity by considering random effects tobit models.

5.2. Data and variables

In this section we describe the data on which our empirical test is based, as well as the construction of some key variables used in the estimated models. Our data comprise two distinct datasets: one refers to the province of Trento, and the other one to the province of Modena, two well-developed provinces located in the North of Italy, similar in term of inhabitants and per-capita income, but different in terms of political orientation. Data include information on individuals that (at least once) decided not to regularly pay their taxes or other revenue receipts in the period march 2004 - march 2007.

The original data unit is the tax return form. As described in Section 2, the rolls issued in every set time period by the tax authorities are sent to the collection agencies, so that every collection agency registers the total amount of each individual's due sum in that period: this is the tax return form. We have information on 63,211 individual tax return forms accrued to 34,645 individuals (69.6% male and 30.4% female) in the province of Trento; and 170,500 tax return forms accrued to 78,281 individuals (68.4% male and 31.6% female) in the province of Modena. Within each dataset, we selected the sub samples containing tax return forms accrued to inhabitants in the province of Trento and Modena, independently from their birth place, i.e. accrued only to residents in the two

provinces[9]. In the Trento dataset, we remained with 13,779 inhabitants (39.8% of all individuals in the dataset) and 28,159 tax return forms (44.5% of all tax return forms in the dataset); in the Modena dataset, these figures amount respectively to 41,453 inhabitants (53.0% of all individuals in the dataset) and 94,268 tax return forms (55.3% of all tax return forms in the dataset).

For each individual's tax return form our data include information on: the day in which the collection agency received the mandate to cash the amount from tax authorities; age and gender of the individual to whom each tax return form refers to; the Municipality in which the individual was resident at the time the tax return form was received by the collection agency; the Municipality (if the individual is Italian) or the State (for foreigners) in which the individual was born; the total due amount (a proxy for F); the existence of a prior notification (i.e. *prior audit*, a proxy for κ) for the same individual to which the form is referred for some (unspecified) previous tax form. Unfortunately, we have information only on the total amount of each tax return form, which corresponds to the sum of all revenue taxes, local taxes, fines, royalty rents, and licence fees accrued to each individual in the period which the tax return form refers to. This clearly represents a limitation of the present sample, as we are not able to differentiate individuals who are (true) tax evaders, from those who simply have not paid fines. We provide a rough control for this data limitation by grouping the total due amount into different classes, and by defining dummy variables referred to each class. Fines will mostly fall in the lowest classes, hence we are able to "isolate" their role in influencing individual decision to move in order to escape notification. For the estimation of the tobit models, we also build additional variables from the original ones; we defined in particular: the number of address changes at time t (*cumulative address change*) as the total number of times s^* an individual has moved up to t; the number of prior notifications at time t (*cumulative prior audit*) as the total number of times an individual has received a notification up to t (a proxy for the total psychological costs κ); the total due amount at time t (*cumulative due amount*) as the total amount an individual should

[9] Notice that we eliminated from the original sample all individuals for which place of residence is unknown The main findings presented in the following section are not affected by these choices. Regressions based on the whole sample are available upon request to the authors.

have paid up to t (a proxy for total F), on the hypothesis that the individual will never pay her obligation[10].

Some descriptive statistics for our sample are reported in Tables 1-5. Table 1 shows the composition of the samples by gender and age class. The age distribution is similar for both sub samples. Male represents 72.6% in the Trento sub sample and the 70.1% in the Modena one. The distribution by age class indicates that more than 80% of the observations are aged 25-65, with a half in the class 35-50. The age distribution by gender indicates that the compositions are similar but for the classes 35-50 (more male than female) and >65 (more female than male). Table 2 shows the composition of the tax return forms by total due amount and gender of the individual to whom they refer to. About one fourth of the tax return forms is less than 100 euro; a half has an amount bigger than 100 euro and less than 1,000 euro. Only a small percentage of the tax return forms has an amount bigger than 10,000 euro. Table 3 shows the composition of the samples by gender and number of tax return forms accrued to each individual. About 40% of the individuals has only one tax return form, while 35% has two or three of them and 12-13% four or five. People collecting more than five tax return forms are 10-13%. Table 4 shows the number of address changes by gender. About a half of the individuals have not changed the address in the period: this is due to the fact that on average they have only one tax return form. About 30% of the individual changed once the address: they have on average three tax return forms. Small percentages of individuals changed more than once the address, because they have a considerable number of tax return forms. Similar conclusions appear considering the number of prior notifications: no prior audit occurred if the number of tax return forms is very low, but the number of prior audits increase when the number of tax return forms for individual increases (Table 5).

[10] We also estimate a model without imposing this extreme hypothesis, by considering an alternative (but not less extreme) solution in which the individual will always pay her due amount each time she receives the tax form. These hypothesis are driven by the fact that we do not know if the individual has paid the amount charged in each form.

5.3. Results

Estimates of Eq. (6) and (7) are reported in Tables 6-7 and 8, respectively, and offer a fairly consistent picture of the behaviour of tax evaders in terms of the decision to runaway in order to escape notification. Looking first at probit models (Tables 6a and 6b), prior notification (a proxy for additional costs of non compliance) decreases the probability of changing address, supporting the deterrent role of prior audit proposed in Kahneman *et al.* (1982), and confirmed also by the empirical literature based on laboratory experiments discussed in the literature review section (e.g., Spicer and Hero, 1985; Benjamini and Maital, 1985; Webley, 1987). In other words, prior notification goes in the right direction, by increasing for instance psychological costs, hence reducing the incentive to move and escape notification. Coefficient estimates are very close in the two sub-sample, suggesting that the behaviour of tax evaders across provinces is quite similar. Moreover, coefficient estimates are very close also across different models, i.e. also considering individual heterogeneity with random effects models (MODEL PROBIT 2). Also for other regressors, estimates appear to be consistent across the two provinces. In particular, we observe a non linear effect of the due amount *F*, which impact is first increasing with respect to the lowest class (up to 100 euros), and then decreasing; but coefficient estimates are not always significant at the usual confidence levels. There is on the contrary a linearly increasing effect of age, statistically significant, with people older than 65 characterised by a higher probability of moving than younger individuals. Moreover, we observe also a gender effect, with females showing a higher probability of moving than males. Logit models (Tables 7a and 7b) confirm these findings: prior notification still shows a negative impact on the probability of moving, with estimated coefficient greater in magnitude with respect to probit estimates as expected[11], and consistent across different specifications and alternative treatments of the unobserved heterogeneity (i.e. random effects, MODEL LOGIT 2, and fixed effects, MODEL LOGIT 3). The non linear relationship observed for the amount classes still holds, and the same is true for the linear relationship in age, which is increasing with respect to the reference class of individuals aged less than 25. Also

[11] As reported by Amemiya (1981), and discussed also e.g. in Greene (2008), there is a widely observed relationship between logit and probit models; in particular, $\beta^{logit} = 1.6 \times \beta^{probit}$.

the gender effect is confirmed, with females characterised by a higher probability of moving. Overall, estimates of Eq. (6) suggest that – after controlling for a set of regressors including age, gender, proxies for *F* and for cultural factors – there is a sizeable impact of prior notification on the probability of moving.

Tables 8a and 8b report estimates for tobit models separately for the two provinces, Trento and Modena. Again, as for probit models, results are fairly consistent across the two areas, suggesting that the behaviour of tax evaders is quite similar across geographical districts. Surprisingly, cumulative prior notification has a positive and statistically significant impact on the number of times an individual changes address. In other words, individuals that received an higher number of notification are also the individuals that are characterised by a higher number of s^*, i.e. of address changes. This finding is consistent also across different models, with magnitude increasing once controlling for unobserved heterogeneity with random effects (MODELS TOBIT 2 and 3). In order to reconcile the impact of previous notification on the probability of moving with the present result on s^*, we need to look deeper in coefficient magnitudes in probit/logit estimates. Consider for instance probit results for Trento (Table 6a, MODEL PROBIT 1): prior notification reduces the probability of moving by -0.278, while being aged more than 65 increase this same probability by 0.373. The combined impact of prior notification and age on the probability of moving is then *positive*. In other words, our estimates suggest that penalties stemming from prior notification goes in the right direction in reducing the probability of moving, but are too "weak" in preventing such a behaviour. Hence, most people – even feeling the psychological burden of their non compliance – prefer to change address and avoid future notification. There is then an hysteresis in the illegal behaviour of tax evaders, with notification ineffective in reducing non compliance, a result that can also help explain the ineffectiveness of tax collection agencies in cashing the amount of tax forms. According to latest estimates, only 0.55% of the total amount on the taxpayer's rolls has been cashed by collection agencies in 2002, even less than the 1.8% cashed in 2000-2001 (e.g. Servizio Politiche Fiscali UIL, 2005). A policy implication of this results is that the negative impact of notification should be strengthened, if the government want to reduce the illegal behaviour of running away to escape notification. According to our simple theoretical

model, at present there seems to prevail a "predictability effect of moving" with increasing marginal costs and decreasing marginal benefits associated to the decision to change address.

As for the role of the other variables, age is a significant determinant of s^* also in tobit models. There is an increasing positive relationship, which however disappears when considering the hypothesis according to which the individual will always pay her due amount each time she receives the tax form (MODEL TOBIT 3). In the latter case, indeed, s^* linearly increases up to the age class 50-65, then starts dropping.[12] Also for the due amount, there is an increasing positive and significant relationship for the first two models, which again disappears for MODEL TOBIT 3 specification. Finally, there is now a negative gender effect, with females moving less than males.

6. Conclusions

In this paper we study whether prior audit affects individual behaviour in terms of tax compliance. We consider a particular definition of audit, i.e. the notification of evaded taxes by a tax collection agency. We then concentrate on the decision to move, and consider the costs borne by taxpayers once they decide to runaway to escape notification and the additional costs of non-compliance associated with a prior notification experience. The problem is substantial for at least two reasons: only a small percentage of the total amount on the taxpayers' rolls is cashed by collection agencies every year; actual data by collection agencies indicates that in many cases the taxpayers' address is unknown, and a considerable percentage of taxpayers change address several times in order to avoid notification.

In order to provide a framework for our empirical analysis, we propose a very simple and stylised theoretical model for the individual decision to move. As for the impact of prior audit on this decision, we identify two polar cases: a predictability effect of moving arises whenever changing address several times makes individual more

[12] This evidence is consistent with previous econometric studies using U.S. TCMP data, which highlighted that non-compliance is significantly less common and of lower magnitude among households where the head is over age 65, and for the audit classes where the proportion over age 65 is greater. For more details see Andreoni *et al.* (1998, p. 840). A negative relationship between propensity towards non-compliance and age is found in a recent study by Cannari and D'Alessio (2007) using data from the 2004 Survey of Household Income and Wealth collected by the Bank of Italy.

predictable for collection agencies, so that the number of times an individual decides to runaway to escape notification will increase; a learning effect of moving arises whenever the taxpayer is able to escape more easily to the collection agency, so that the number of times an individual decides to runaway will decrease.

Our empirical analysis (based on real data provided by a tax collection agency) shows that prior notification decreases the probability of changing address; this result is consistent among tax evaders resident in the two provinces we analysed. On the other hand, we find that individuals with a higher number of prior notifications are also the individuals characterised by a higher number of address' changes. This implies that the previous notification is able to reduce the probability to move, but its cost is not enough to correct the individual incentive to escape notification. Our conclusions can help to draw some policy recommendations in order to increase the percentage of the total amount on the taxpayers' rolls cashed by collection agencies. Prior notification seems to be ineffective in most cases in reducing non compliance, so that costs associated with this administrative action should be strengthened.

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Table 1. Sample structure (inhabitants) by gender and age class

Province of Trento						
	Total		Male		Female	
Age class	Number	%	Number	%	Number	%
≥18 and ≤25	503	3.7	376	3.8	127	3.4
>25 and ≤35	3,302	24.0	2,428	24.3	874	23.2
>35 and ≤50	5,583	40.5	4,203	42.0	1,380	36.6
>50 and ≤65	2,670	19.4	2,006	20.0	664	17.6
>65	1,721	12.5	995	9.9	726	19.3
Total	13,779	100.0	10,008	100.0	3,771	100.0

Source: Own elaborations on Defendini data.

Province of Modena						
	Total		Male		Female	
Age class	Number	%	Number	%	Number	%
≥18 and ≤25	1,525	3.7	1,131	3.9	394	3.2
>25 and ≤35	10,691	25.8	7,538	25.9	3,153	25.5
>35 and ≤50	17,251	41.6	12,471	42.9	4,780	38.6
>50 and ≤65	6,962	16.8	4,991	17.2	1,971	15.9
>65	5,024	12.1	2,943	10.1	2,081	16.8
Total	41,453	100.0	29,074	100.0	12,379	100.0

Source: Own elaborations on Defendini data.

Table 2. Sample structure (tax return forms) by gender and class of total due amount

Province of Trento								
			Total		Accrued to male		Accrued to female	
Class of due amount (€)			Number	%	Number	%	Number	%
>0	and	≤50	2,982	10.6	2,012	9.2	970	15.3
>50	and	≤100	4,756	16.9	3,491	16.0	1,265	19.9
>100	and	≤200	6,117	21.7	4,560	20.9	1,557	24.5
>200	and	≤500	5,849	20.8	4,614	21.2	1,235	19.4
>500	and	≤1,000	3,040	10.8	2,580	11.8	460	7.2
>1,000	and	≤2,000	1,856	6.6	1,531	7.0	325	5.1
>2,000	and	≤5,000	2,409	8.6	2,035	9.3	374	5.9
>5,000	and	≤10,000	566	2.0	498	2.3	68	1.1
>10,000	and	≤50,000	497	1.8	412	1.9	85	1.3
>50,000			87	0.3	74	0.3	13	0.2
Total			28,159	100.0	21,807	100.0	6,352	100.0

Source: Own elaborations on Defendini data.

Province of Modena								
			Total		Accrued to male		Accrued to female	
Class of due amount (€)			Number	%	Number	%	Number	%
>0	and	≤50	9,160	9.7	6,318	8.9	2,842	12.4
>50	and	≤100	14,269	15.1	10,463	14.7	3,806	16.6
>100	and	≤200	23,212	24.6	16,591	23.3	6,621	28.8
>200	and	≤500	20,955	22.2	16,191	22.7	4,764	20.7
>500	and	≤1,000	9,674	10.3	7,952	11.2	1,722	7.5
>1,000	and	≤2,000	5,810	6.2	4,737	6.6	1,073	4.7
>2,000	and	≤5,000	7,931	8.4	6,443	9.0	1,488	6.5
>5,000	and	≤10,000	1,653	1.8	1,325	1.9	328	1.4
>10,000	and	≤50,000	1,398	1.5	1,120	1.6	278	1.2
>50,000			206	0.2	162	0.2	44	0.2
Total			94,268	100.0	71,302	100.0	22,966	100.0

Source: Own elaborations on Defendini data.

Table 3. Sample structure (inhabitants) by gender and number of tax return forms per individual

Province of Trento						
	Total		Male		Female	
Tax return forms per individual	Number	%	Number	%	Number	%
1	5,887	42.7	3,933	39.3	1,954	51.8
>1 and ≤3	4,734	34.4	3,459	34.6	1,275	33.8
>3 and ≤5	1,724	12.5	1,386	13.8	338	9.0
>5 and ≤10	1,149	8.3	973	9.7	176	4.7
>10 and ≤20	275	2.0	248	2.5	27	0.7
>20	10	0.1	9	0.1	1	0.0
Total	13,779	100.0	10,008	100.0	3,771	100.0

Source: Own elaborations on Defendini data.

Province of Modena						
	Total		Male		Female	
Tax return forms per individual	Number	%	Number	%	Number	%
1	16,249	39.2	10,499	36.1	5,750	46.4
>1 and ≤3	14,439	34.8	9,930	34.2	4,509	36.4
>3 and ≤5	5,446	13.1	4,202	14.5	1,244	10.0
>5 and ≤10	4,233	10.2	3,491	12.0	742	6.0
>10 and ≤20	1,058	2.6	926	3.2	132	1.1
>20	28	0.1	26	0.1	2	0.0
Total	41,453	100.0	29,074	100.0	12,379	100.0

Source: Own elaborations on Defendini data.

Table 4. Sample structure (inhabitants) by gender and number of address changes

Province of Trento									
	Total			Male			Female		
Address changes per individual	Number	%	Average tax return forms	Number	%	Average tax return forms	Number	%	Average tax return forms
0	7,157	51.94	1.28	4,853	48.49	1.32	2,304	61.10	1.22
1	4,359	31.64	3.04	3,314	33.11	3.14	1,045	27.71	2.71
>1 and ≤3	1,898	13.77	5.61	1,517	15.16	5.71	381	10.10	5.19
>3 and ≤5	301	2.18	9.51	268	2.68	9.69	33	0.88	8.09
>5 and ≤10	62	0.45	13.10	54	0.54	13.24	8	0.21	12.13
>10	2	0.01	15.50	2	0.02	15.50	0	0.00	0.00
Total	13,779	100.00	2.67	10,008	100.00	2.88	3,771	100.00	2.11

Source: Own elaborations on Defendini data.

Province of Modena									
	Total			Male			Female		
Address changes per individual	Number	%	Average tax return forms	Number	%	Average tax return forms	Number	%	Average tax return forms
0	20,099	48.49	1.32	13,222	45.48	1.36	6,877	55.55	1.24
1	13,242	31.94	3.12	9,417	32.39	3.24	3,825	30.90	2.82
>1 and ≤3	6,882	16.60	5.78	5,371	18.47	5.94	1,511	12.21	5.20
>3 and ≤5	997	2.41	9.63	856	2.94	9.76	141	1.14	8.87
>5 and ≤10	228	0.55	13.19	204	0.70	13.23	24	0.19	12.88
>10	5	0.01	27.00	4	0.01	26.00	1	0.01	31.00
Total	41,453	100.00	2.9	29,074	100.00	3.15	12,379	100.00	2.32

Source: Own elaborations on Defendini data.

Table 5. Sample structure (inhabitants) by gender and number of prior audits

Province of Trento									
	Total			Male			Female		
Prior audits per individual	Number	%	Average tax return forms	Number	%	Average tax return forms	Number	%	Average tax return forms
0	12,390	89.92	2.37	8,962	89.55	2.55	3,428	90.90	1.87
1	839	6.09	4.17	615	6.15	4.38	224	5.94	3.57
>1 and ≤3	411	2.98	6.24	310	3.10	6.39	101	2.68	5.78
>3 and ≤5	93	0.67	8.90	79	0.79	8.99	14	0.37	8.43
>5 and ≤10	44	0.32	12.27	40	0.40	12.35	4	0.11	11.50
>10	2	0.01	19.50	2	0.02	19.50	0	0.00	0.00
Total	13,779	100.00	2.67	10,008	100.00	2.88	3,771	100.00	2.11

Source: Own elaborations on Defendini data.

Province of Modena									
	Total			Male			Female		
Prior audits per individual	Number	%	Average tax return forms	Number	%	Average tax return forms	Number	%	Average tax return forms
0	35,279	85.11	2.47	24,549	84.44	2.68	10,730	86.68	1.99
1	4,092	9.87	4.30	2,908	10.00	4.55	1,184	9.56	3.70
>1 and ≤3	1,669	4.03	6.60	1,272	4.38	6.82	397	3.21	5.89
>3 and ≤5	285	0.69	9.63	231	0.79	9.81	54	0.44	8.85
>5 and ≤10	123	0.30	12.67	109	0.37	12.80	14	0.11	11.64
>10	5	0.01	20.40	5	0.02	20.40	0	0.00	0.00
Total	41,453	100.00	2.9	29,074	100.00	3.15	12,379	100.00	2.32

Source: Own elaborations on Defendini data.

Table 6a. Probit estimates for Province of Trento

Regressors[a,b]	MODEL PROBIT 1[§] coefficient[d]	st. error		MODEL PROBIT 2[§] coefficient[d]	st. error	
prior audit	-0.278	0.027	***	-0.292	0.031	***
female	0.057	0.024	**	0.047	0.029	
100 < due amount < 2,000 €	0.048	0.022	**	0.071	0.024	***
2,000 < due amount < 50,000 €	0.048	0.030		0.083	0.033	**
due amount > 50,000 €	-0.106	0.145		0.020	0.157	
25 < age < 35	0.093	0.061		0.123	0.073	*
35 < age < 50	0.105	0.060	*	0.134	0.072	*
50 < age < 65	0.174	0.062	***	0.218	0.074	***
age > 65	0.373	0.070	***	0.386	0.083	***
born_NW Italy	-0.071	0.039	*	-0.096	0.048	**
born_Center Italy	-0.087	0.041	**	-0.116	0.051	**
born_South Italy	-0.053	0.029	*	-0.085	0.036	**
born_world zone 5[c]	0.209	0.086	**	0.201	0.105	*
born_world zone 6	-0.044	0.071		-0.096	0.085	
born_world zone 7	-0.085	0.036	**	-0.139	0.044	***
born_world zone 8	-0.156	0.032	***	-0.199	0.041	***
born_world zone 9	0.210	0.104	**	0.176	0.124	
born_world zone 10	-0.140	0.093		-0.199	0.118	*
born_world zone 11	-0.382	0.207	*	-0.449	0.244	*
born_world zone 12	-0.081	0.066		-0.147	0.082	*
constant	0.008	0.061		0.076	0.073	
nr. observations	19,105			19,105		
Log-likelihood	-13,049.06			-12,895.82		
LR test [p-value]	245.91 [0.000]			-		
Wald test [p-value]	-			209.39 [0.000]		
Pseudo R^2	0.01			-		

[§] MODEL 1: probit on pooled data, MODEL 2: probit with individual random effects.

[a] Dependent variable is *Prob*[*address change*].

[b] Reference individual: male, due amount < 100 €, age < 25, born in NE Italy, no prior audit.

[c] World zone: 1 = NW Italy, 2 = NE Italy, 3 = Center Italy, 4 = South Italy, 5 = North Europe, 6 = Continental Europe, 7 = East and SE Europe, 8 = Nort Africa, 9 = Center and South Africa, 10 = Asia, 11 = North America, England and Australia, 12 = Center and South America.

[d] Significance level: *** 1%, ** 5%, *10%.

Table 6b. Probit estimates for Province of Modena

Regressors[a,b]	MODEL PROBIT 1[§] coefficient[d]	st. error		MODEL PROBIT 2[§] coefficient[d]	st. error	
prior audit	-0.280	0.014	***	-0.303	0.015	***
female	0.114	0.012	***	0.111	0.014	***
100 < due amount < 2,000 €	0.010	0.012		0.027	0.013	**
2,000 < due amount < 50,000 €	-0.083	0.017	***	-0.042	0.018	**
due amount > 50,000 €	-0.276	0.098	***	-0.201	0.104	*
25 < age < 35	0.103	0.036	***	0.130	0.041	***
35 < age < 50	0.141	0.035	***	0.176	0.040	***
50 < age < 65	0.215	0.036	***	0.263	0.042	***
age > 65	0.452	0.040	***	0.495	0.046	***
born_NW Italy	-0.040	0.025		-0.041	0.030	
born_NE Italy	-0.103	0.042	**	-0.122	0.050	**
born_South Italy	-0.061	0.012	***	-0.073	0.015	***
born_world zone 5[c]	0.084	0.060		0.040	0.071	
born_world zone 6	-0.009	0.045		-0.025	0.053	
born_world zone 7	-0.098	0.028	***	-0.137	0.034	***
born_world zone 8	-0.124	0.016	***	-0.159	0.019	***
born_world zone 9	0.036	0.029		0.020	0.034	
born_world zone 10	-0.102	0.028	***	-0.132	0.034	***
born_world zone 11	0.144	0.105		0.119	0.122	
born_world zone 12	-0.126	0.044	***	-0.148	0.053	***
born_world zone 13	0.400	0.363		0.382	0.405	
constant	-0.051	0.036		-0.013	0.041	
nr. observations	66,772			66,772		
Log-likelihood	-45,701.62			-45,335.11		
LR test [p-value]	1,083.31 [0.000]			-		
Wald test [p-value]	-			954.17 [0.000]		
Pseudo R^2	0.01			-		

[§] MODEL 1: probit on pooled data, MODEL 2: probit with individual random effects.

[a] Dependent variable is *Prob*[*address change*].

[b] Reference individual: male, due amount < 100 €, age < 25, born in Center Italy, no prior audit.

[c] World zone: 1 = NW Italy, 2 = NE Italy, 3 = Center Italy, 4 = South Italy, 5 = North Europe, 6 = Continental Europe, 7 = East and SE Europe, 8 = Nort Africa, 9 = Center and South Africa, 10 = Asia, 11 = North America, England and Australia, 12 = Center and South America, 13 = Arabia.

[d] Significance level: *** 1%, ** 5%, *10%.

Table 7a. Logit estimates for Province of Trento

Regressors[a,b]	MODEL LOGIT 1[§] coefficient[d]	st. error		MODEL LOGIT 2[§] coefficient[d]	st. error		MODEL LOGIT 3[§] coefficient[d]	st. error	
prior audit	-0.445	0.043	***	-0.478	0.050	***	-0.311	0.069	***
female	0.091	0.038	**	0.077	0.047		-	-	
100 < due amount < 2,000 €	0.076	0.036	**	0.116	0.040	***	0.194	0.052	***
2,000 < due amount < 50,000 €	0.076	0.048		0.135	0.054	**	0.276	0.068	***
due amount > 50,000 €	-0.171	0.233		0.028	0.257		0.605	0.295	**
25 < age < 35	0.149	0.098		0.201	0.120	*	0.262	0.368	
35 < age < 50	0.167	0.096	*	0.219	0.117	*	0.324	0.403	
50 < age < 65	0.279	0.099	***	0.357	0.121	***	0.304	0.455	
age > 65	0.601	0.112	***	0.634	0.136	***	0.265	0.607	
born_NW Italy	-0.113	0.062	*	-0.157	0.079	*	-	-	
born_Center Italy	-0.140	0.065	**	-0.190	0.084	**	-	-	
born_South Italy	-0.085	0.046	*	-0.138	0.059	**	-	-	
born_world zone 5[c]	0.337	0.140	**	0.331	0.174	*	-	-	
born_world zone 6	-0.071	0.114		-0.156	0.139		-	-	
born_world zone 7	-0.136	0.057	**	-0.228	0.072	***	-	-	
born_world zone 8	-0.250	0.051	***	-0.325	0.066	***	-	-	
born_world zone 9	0.338	0.169	**	0.289	0.204		-	-	
born_world zone 10	-0.224	0.149		-0.326	0.192	*	-	-	
born_world zone 11	-0.613	0.334	*	-0.732	0.399	*	-	-	
born_world zone 12	-0.129	0.106		-0.237	0.134	*	-	-	
constant	0.012	0.098		0.124	0.120		-	-	
nr. observations	19,105			19,105			12,332		
Log-likelihood	-13,049.06			-12,895.62			-5,073.06		
LR test [p-value]	245.90	[0.000]		-			42.57	[0.000]	
Wald test [p-value]	-			207.27	[0.000]		-		
Pseudo R^2	0.01			-			-		

[§] MODEL 1: logit on pooled data, MODEL 2: logit with individual random effects, MODEL 3: logit with individual fixed effects.

[a] Dependent variable is *Prob*[*address change*].

[b] Reference individual: male, due amount < 100 €, age < 25, born in NE Italy, no prior audit.

[c] World zone: 1 = NW Italy, 2 = NE Italy, 3 = Center Italy, 4 = South Italy, 5 = North Europe, 6 = Continental Europe, 7 = East and SE Europe, 8 = Nort Africa, 9 = Center and South Africa, 10 = Asia, 11 = North America, England and Australia, 12 = Center and South America.

[d] Significance level: *** 1%, ** 5%, *10%.

Table 7b. Logit estimates for Province of Modena

Regressors[a,b]	MODEL LOGIT 1[§] coefficient[d]	st. error		MODEL LOGIT 2[§] coefficient[d]	st. error		MODEL LOGIT 3[§] coefficient[d]	st. error	
prior audit	-0.448	0.022	***	-0.494	0.024	***	-0.434	0.032	***
female	0.182	0.020	***	0.180	0.023	***	-	-	
100 < due amount < 2,000 €	0.017	0.020		0.043	0.021	**	0.113	0.028	***
2,000 < due amount < 50,000 €	-0.132	0.027	***	-0.068	0.030	**	0.155	0.037	***
due amount > 50,000 €	-0.446	0.158	***	-0.329	0.171	*	-0.035	0.195	
25 < age < 35	0.165	0.057	***	0.212	0.066	***	0.332	0.191	*
35 < age < 50	0.226	0.056	***	0.286	0.065	***	0.233	0.208	
50 < age < 65	0.343	0.058	***	0.428	0.068	***	0.038	0.233	
age > 65	0.727	0.065	***	0.805	0.075	***	-0.462	0.335	
born_NW Italy	-0.064	0.041		-0.067	0.049		-	-	
born_NE Italy	-0.165	0.067	**	-0.199	0.082	**	-	-	
born_South Italy	-0.097	0.019	***	-0.119	0.024	***	-	-	
born_world zone 5[c]	0.134	0.096		0.066	0.115		-	-	
born_world zone 6	-0.014	0.072		-0.040	0.087		-	-	
born_world zone 7	-0.157	0.045	***	-0.223	0.055	***	-	-	
born_world zone 8	-0.198	0.026	***	-0.258	0.031	***	-	-	
born_world zone 9	0.058	0.047		0.033	0.056		-	-	
born_world zone 10	-0.162	0.045	***	-0.214	0.056	***	-	-	
born_world zone 11	0.233	0.170		0.196	0.200		-	-	
born_world zone 12	-0.202	0.071	***	-0.240	0.086	***	-	-	
born_world zone 13	0.651	0.601		0.642	0.677		-	-	
constant	-0.081	0.058		-0.022	0.067		-	-	
nr. observations	66,772			66,772			46,828		
Log-likelihood	-45,701.84			-45,334.94			-19,304.29		
LR test [p-value]	1,082.86	[0.000]		-			220.52	[0.000]	
Wald test [p-value]	-			938.17	[0.000]		-		
Pseudo R^2	0.01			-			-		

[§] MODEL 1: logit on pooled data, MODEL 2: logit with individual random effects, MODEL 3: logit with individual fixed effects.

[a] Dependent variable is *Prob*[*address change*].

[b] Reference individual: male, due amount < 100 €, age < 25, born in Center Italy, no prior audit.

[c] World zone: 1 = NW Italy, 2 = NE Italy, 3 = Center Italy, 4 = South Italy, 5 = North Europe, 6 = Continental Europe, 7 = East and SE Europe, 8 = Nort Africa, 9 = Center and South Africa, 10 = Asia, 11 = North America, England and Australia, 12 = Center and South America, 13 = Arabia.

[d] Significance level: *** 1%, ** 5%, *10%.

Table 8a. Tobit estimates for Province of Trento

Regressors[a,b]	MODEL TOBIT 1[§] coefficient	st. error		MODEL TOBIT 2[§] Coefficient	st. error		MODEL TOBIT 3[§] coefficient	st. error	
cumulative prior audit	0.146	0.009	***	0.266	0.008	***	0.444	0.010	***
female	-0.089	0.025	***	-0.034	0.032		-0.261	0.034	***
cumulative due amount < 50 €	0.059	0.283		-0.068	0.243		-0.350	0.127	***
100 < cumulative due amount < 200 €	0.205	0.094	**	0.198	0.082	**	-0.395	0.125	***
200 < cumulative due amount < 500 €	0.392	0.087	***	0.371	0.078	***	-0.319	0.124	***
500 < cumulative due amount < 1,000 €	0.657	0.088	***	0.582	0.079	***	-0.338	0.124	***
1,000 < cumulative due amount < 2,000 €	0.862	0.088	***	0.793	0.079	***	-0.366	0.125	***
2,000 < cumulative due amount < 5,000 €	1.152	0.087	***	1.090	0.078	***	-0.372	0.126	***
5,000 < cumulative due amount < 10,000 €	1.736	0.088	***	1.702	0.080	***	-0.201	0.125	
10,000 < cumulative due amount < 50,000 €	2.419	0.089	***	2.555	0.083	***	-0.182	0.132	
cumulative due amount > 50,000 €	2.520	0.103	***	3.398	0.103	***	0.067	0.134	
25 < age < 35	0.299	0.065	***	0.269	0.076	***	0.396	0.082	***
35 < age < 50	0.253	0.064	***	0.357	0.076	***	0.563	0.081	***
50 < age < 65	0.223	0.066	***	0.370	0.079	***	0.602	0.084	***
age > 65	0.288	0.075	***	0.481	0.087	***	0.427	0.093	***
born_NW Italy	-0.009	0.041		-0.029	0.050		0.028	0.058	
born_Center Italy	0.161	0.043	***	0.022	0.051		-0.024	0.060	
born_South Italy	0.109	0.030	***	0.002	0.039		0.053	0.047	
born_world zone 5	0.461	0.088	***	0.033	0.033		0.164	0.103	
born_world zone 6	-0.021	0.075		-0.099	0.095		-0.221	0.089	**
born_world zone 7	-0.045	0.038		-0.092	0.052	*	-0.172	0.057	***
born_world zone 8	-0.003	0.034		-0.106	0.042	**	-0.074	0.053	
born_world zone 9	0.182	0.107	*	0.179	0.146		0.027	0.126	
born_world zone 10	-0.127	0.100		-0.017	0.126		-0.192	0.119	
born_world zone 11	-0.589	0.231	**	-0.392	0.263		-0.563	0.304	*
born_world zone 12	0.051	0.070		-0.079	0.080		-0.099	0.102	
constant	0.007	0.105		-0.193	0.106	*	0.885	0.147	***
nr. observations	19,105			19,105			19,105		
Log-likelihood	-30,254.18			-25,878.40			-28,027.97		
LR test [p-value]	5,545.99	[0.000]		-			-		
Wald test [p-value]	-			8,053.63	[0.000]		2,361.88	[0.000]	
Pseudo R^2	0.08			-			-		

[§] MODEL 1: tobit on pooled data, MODEL 2: random effects tobit with *cumulative* due amount, MODEL 3: random effects tobit with due amount.

[a] Dependent variable is *cumulative address change*. [b] Reference individual: male, 50 < due amount < 100 €, age < 25, born in NE Italy, no prior audit.

Table 8b. Tobit estimates for Province of Modena

Regressors[a,b]	MODEL TOBIT 1[§] coefficient	st. error		MODEL TOBIT 2[§] Coefficient	st. error		MODEL TOBIT 3[§] coefficient	st. error	
cumulative prior audit	0.149	0.005	***	0.2437098	0.005	***	0.446	0.006	***
female	-0.107	0.014	***	-0.0162391	0.017		-0.216	0.019	***
cumulative due amount < 50 €	-0.049	0.088		-0.0717302	0.076		-0.058	0.087	
100 < cumulative due amount < 200 €	-0.155	0.080	*	-0.1862124	0.071	***	0.050	0.086	
200 < cumulative due amount < 500 €	-0.009	0.076		-0.0303084	0.068		-0.018	0.086	
500 < cumulative due amount < 1,000 €	0.304	0.076	***	0.2693548	0.068	***	-0.009	0.086	
1,000 < cumulative due amount < 2,000 €	0.580	0.076	***	0.6067095	0.069	***	-0.021	0.086	
2,000 < cumulative due amount < 5,000 €	0.867	0.076	***	0.9785425	0.069	***	0.013	0.087	
5,000 < cumulative due amount < 10,000 €	1.414	0.076	***	1.598406	0.069	***	0.055	0.086	
10,000 < cumulative due amount < 50,000 €	2.075	0.077	***	2.389163	0.070	***	0.282	0.090	***
cumulative due amount > 50,000 €	2.382	0.083	***	3.057489	0.077	***	0.288	0.090	***
25 < age < 35	0.437	0.041	***	0.400954	0.042	***	0.567	0.053	***
35 < age < 50	0.545	0.041	***	0.5850847	0.042	***	0.887	0.053	***
50 < age < 65	0.526	0.042	***	0.6890275	0.044	***	1.031	0.055	***
age > 65	0.609	0.046	***	0.8433378	0.049	***	0.814	0.059	***
born_NW Italy	-0.015	0.029		-0.0293151	0.035		-0.062	0.038	
born_NE Italy	-0.100	0.047	**	-0.1426451	0.059	**	-0.091	0.069	
born_South Italy	0.003	0.014		-0.0121505	0.018		-0.017	0.021	
born_world zone 5	0.163	0.067	**	0.1919785	0.088	**	0.070	0.088	
born_world zone 6	-0.085	0.051	*	0.0165552	0.106		-0.053	0.072	
born_world zone 7	-0.113	0.032	***	-0.022506	0.043		-0.139	0.046	***
born_world zone 8	-0.067	0.018	***	-0.0295352	0.025		-0.126	0.028	***
born_world zone 9	0.016	0.033		0.1332826	0.039	***	-0.187	0.047	***
born_world zone 10	-0.124	0.032	***	-0.259615	0.043	***	-0.030	0.052	
born_world zone 11	0.164	0.117		0.0804445	0.155		0.048	0.156	
born_world zone 12	-0.268	0.050	***	-0.1665558	0.062	***	-0.118	0.065	*
born_world zone 13	0.117	0.390		0.4395351	0.546		0.010	0.531	
constant	0.172	0.085	**	-0.1365362	0.080	*	0.270	0.101	***
nr. observations	66,772			66,772			66,772		
Log-likelihood	-109,345.31			-92,491.76			-99,860.57		
LR test [p-value]	17,743.12	[0.000]		-			-		
Wald test [p-value]	-			25,882.29	[0.000]		6,153.11	[0.000]	
Pseudo R^2	0.08			-			-		

[§] MODEL 1: tobit on pooled data, MODEL 2: random effects tobit with *cumulative* due amount, MODEL 3: random effects tobit with due amount.

[a] Dependent variable is *cumulative address change*. [b] Reference individual: male, 50 < due amount < 100 €, age < 25, born in Center Italy, no prior audit.