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Self-Concept Maintenance and Tax Evasion

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Abstract

I analyze quasi-experimental data on tax evasion reports collected by the Italian webpage evasori.info. I find that a bigger number of reports per unit of irregular activity, which indicates a stronger tax morale, is negatively correlated with the median reported amount. I show that this evidence is consistent with a model of self-concept maintenance, where illegal actions are categorized more easily, in the sense that they are consistent with a positive self image of honesty, if they involve small amounts of money. The data suggest that a stronger individual and social attitude towards evasion makes this categorization more difficult, lowering the threshold below which evasion is acceptable. The result is tax evasion reports of smaller amount. I also propose a Montecarlo exercise to estimate this threshold and its dependence on tax morale.

JEL classification: H26, K34.

Keywords: Tax morale, Categorization, Attention to Standard.

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1 Introduction

Economists typically think about dishonest behavior through the Becker 1968 model, which predicts that a rational agent will break the law if the expected punishment is low enough. Recent experimental evidence, however, is inconsistent with this framework (Mazar, Amir and Ariely 2008). The main explanations hinge on the importance of internal motivations, based on the adherence to an internal moral standard, and on customs and social conformity, since deviant behaviors are often punished socially, over and above any legal punishment. The consequence is that people comply with a moral standard even if they suffer a monetary loss, for instance because they forgo a cheating opportunity with an expected positive net benefit.

One interesting evidence is that dishonest behavior, such as cheating, stealing or evading taxes, is very common, but few dishonest individuals do it to a very large extent. Mazar, Amir and Ariely (2008) propose an explanation based on cognitive flexibility and internal rewards. The main idea is that most decisions reflect a balance between the need to sustain a positive self image and the financial gains of dishonest behavior. In other words, we all want to see ourselves as good, moral, people, but we also want to reap the benefits of cheating when the incentives are right. The result is that many individuals cheat and behave dishonestly, but just up to the point where they don't loose the positive self image.

In greater detail, Mazar, Amir and Ariely (2008) highlight two important and related mechanisms that allow for dishonest behavior while still not forcing the individual to update negatively the self-concept: categorization and attention to standard. Categorization refers to the tendency to rationalize and reinterpret our actions in a self serving way. For instance, taking a 100€ worth bottle of wine from a friend's cellar is more compatible with the category "Friendship" than taking a 100€ bill from his wallet, because the first action can be rationalized in term of sharing, which is typical and acceptable among friends, while the second is more akin to stealing, which is instead not acceptable. Thus categorization encourages dishonest behaviors, although some actions, like stealing a very small amount

of money, are easier to categorize than others.

Attention to standards simply says that individuals update their self-concept less frequently if they are mindless of their own moral standard, in the sense that they rely too much on categories and distinctions made in the past rather than being relevant to the present context (Langer 1992). The more often they are reminded about the standard, the more costly it is to behave differently from it. This mechanism explains, among other things, why students tend to cheat less in exams if they are reminded about moral or religious values while taking it (Mazar, Amir and Ariely 2008). Both categorization and attention to standard imply that individuals behave dishonestly only up to the point where they are not forced to negatively update their self-concept. The result is small dishonest acts.

In this paper I study the relationship between self-concept maintenance and tax evasion. The idea is that, for tax evasion, self-concept maintenance is easier if the amount of the transaction is small. The question is what is really the threshold below which evasion does not trigger an update of the self-concept and, perhaps more importantly, what are the factors that influence the level of threshold.

I show that "Tax morale" (Erard and Feinstein 1994; Frey 1997; Slemrod 2007), or the individual and social motivation to pay taxes based on moral considerations, matters. The reason is that a stronger tax morale implies both more attention to a non evasion standard and a more difficult categorization of evasion. More attention to standard because the anti-evasion norm is more diffused if evasion is individually and socially unacceptable, resulting in more episodes that remind of the moral standard. A more difficult categorization because the social sanction for non conformity is harsher or more frequent. Self concept maintenance for evaders is thus more difficult when tax morale is strong, resulting is a smaller threshold below which evasion is consistent with a positive self-concept and, therefore, acceptable. The consequence is a negative correlation between tax morale and the amount of the transactions with evasion.

I propose an empirical test of this prediction using the data from the Italian website

evasori.info. This site engaged in a very interesting experiment that is useful to measure the strength of individual and social norms against evasion. In particular, it allows the users to report, anonymously, the economic transactions where the seller did not issue a receipt, arguably to evade taxes. Following Russo (2013), I use the number of tax evasion reports per unit of irregular activity as an indicator of tax morale. The number of reports depends on the number of individuals that consider evasion dishonest and on how forcefully and often they manifest their conviction. As such, it is both an indicator of the ease of categorization of evasion and of the frequency of the moral standard reminders.

I regress the median amount of the reported transactions in each province and each economic activity on the number of tax evasion reports per irregular activity in the province. Since the number of reports and the amount reported are jointly determined, I use an exogenous instrument to obtain consistent estimates. In particular, I use variation in population density across provinces to instrument the number of reports. I find that a bigger number of reports per irregular activity, which indicates a stronger individual and social norm against evasion, is negatively correlated with the median reported amount.

The question, then, is if this negative correlation is evidence in favor of self-concept maintenance or if it is just a byproduct of the process that collects the reports. I propose a Montecarlo exercise to show that the empirical results are indeed consistent with the idea that the threshold below which tax evasion is considered acceptable decreases with the strength of the norm against evasion. This procedure allows me also to estimate the value of the threshold and the parameters of the function that governs its dependency on tax morale.

The rest of the paper is organized as follows: section 2 briefly summarizes the related economic literature. Section 3 describes the dataset. Section 4 summarizes the regression results. Section 5 proposes a montecarlo estimation of the threshold below which tax evasion is considered acceptable. Section 6 discusses the robustness of the empirical results. Section 7 concludes.

2 Related Literature

This paper relies on the conceptual framework developed by Mazar, Amir and Ariely (2008), who introduced the notion of self-concept maintenance to explain illegal behavior, showing also experimental evidence to support it. Subsequent experiments confirmed the relevance of their theory. Among others, Chance, Norton, Gino and Ariely (2011) explored the relationship between categorization and self deception, showing the long term consequences of cheating in terms of an unrealistic self perception. Shu, Mazar, Gino, Ariely and Bazerman (2012) find that a signature at the beginning, rather than at the end, of an insurance or business expenses claim, or of a tax return, reduces significantly the amount of cheating. The reason is that it promotes attention to standard, while the end signature facilitates categorization. A similar theory of moral behavior based on identity management is proposed by Benabou and Tirole (2006, 2011), who also suggest that where choices depend on self views.

The paper is closely related to the literature on tax morale. This concept has been used to reconcile the predicted evasion rate by the Allingham and Sandmo (1972) and Yitzhaki (1974) models, based on expected penalties and risk aversion only, with the much smaller observed evasion rate (Andreoni, Erard and Feinstein 1998; Sandmo 2005). Most of the empirical studies of tax morale, like Orviska and Hudson (2002), Torgler (2005a, 2005b and 2006), Alm and Torgler (2006), Cummings et al. (2009) and Lago Peñas and Lago Peñas (2010), are based on survey measures. Following Russo (2013), I use instead a quasi-experimental measure of tax morale, using the reports of tax evasion on the evasori.info webpage. Moreover, these previous works did not study the effect of tax morale on the evaded amount in single transactions, but rather the effect on total evasion and on the total mass of evaders. The data on the website evasori.info allow me to study the single transactions with evasion and to isolate a new result, namely that stronger tax morale is negatively correlated with the amount of the transactions with evasion. I propose an interpretation of this result based on a cognitive process, therefore I also bridge tax morale

literature with the behavioral and experimental literature.

The paper is also related to the literature on customs and social sanctions, since both categorization and attention to standard are easier or more difficult depending on the prevailing social norm. Akerlof (1980) was the first to recognize the importance of inter-dependency in social behavior, although his work did not explicitly consider tax evasion. Gordon (1989) was instead the first to build a model of tax evasion with social sanctions, stressing that the psychic cost of evasion decreases with the fraction of evaders. Other examples include: Falkinger (1995), that studies the effect of a social norm against tax evasion; Myles and Naylor (1996), that proposed a model where the cost of evasion depends on a social custom and on conformity, which in turns depends on the fraction of the population that adheres to the custom; Fortin, Lacroix and Villeval (2007), who propose a model of tax evasion with social interactions and conformity, but that are unable to find supportive evidence for it in experimental data; Gino, Ayal and Ariely (2009) that show, with an experiment, that cheating increases if there is a favorable social norm or if cheating is a salient behavior. Traxler (2010), that talks about conditionally cooperative agents, in the sense that their individual level of tax compliance depends positively on other agents' compliance, in line with the survey evidence discussed by Frey and Torgler (2007). As an addition to this literature, I highlight in this paper the link between social norms and sanctions to attention to standard.

In two related contributions, Gneezy (2005) and Gneezy, Rockenbach and Serra-Garcia (2013) show, with experiments, that the propensity to lie increases with the benefits that the lie creates for the liar, but that it decreases with the harm that the lie creates to others. Similarly, Gino, Ayal and Ariely (2013) find, in an experimental setting, that lying increases if more individuals benefit from it, showing that categorization is not exclusively self-serving, but also altruistic. Framing these works in the tax evasion setting, they imply that evasion on transactions of small amount should be more frequent than evasion on transactions of big amounts, because a bigger evaded sum creates a bigger damage to the society in terms of foregone tax revenue. I find evidence of this relationship.

3 The Sample

The idea of the founder of the webpage evasori.info was to spread awareness about the amount of tax evasion in Italy, allowing all the citizens to report any tax evasion they witnessed. The reports include the amount of the transaction, the type of economic activity and the location of the transaction, which includes the province[1], the longitude and the latitude. The users can also disclose if they reported the same transaction to the tax enforcement authorities. The webpage then assigns automatically a date and time to to each report.

The raw data consist of 63.265 tax evasion reports between 2008 and 2013. The first empirical evidence is that the biggest provinces by number of reports are also the biggest in terms of population: Roma (8114 reports), Milano (6618 reports), Napoli (3723 reports) and Torino (3600 reports). Similarly, the provinces with the smallest number of reports are among the less populated: Isernia (48 reports), Gorizia (72 reports), Enna (82 reports) and Nuoro (85 reports). Overall, there is a positive correlation between province population and the number of tax evasion reports (0.68). There is also a positive correlation between population density in a province and number of signals (0.47), a result that I will exploit in the regression analysis to instrument the number of reports. Importantly, the coefficient of variation of the number of reports per capita in the pooled sample is 84%, which rules out the possibility that the variability of the number of reports is just a straightforward consequence of different population sizes.

I match the information on the webpage evasori.info with data on the size of the irregular sector from the ISTAT database. To construct a measure of the irregular sector at the province level, I employ the procedure in Russo (2013), computing weighted averages of the percentage of irregular activity in agriculture, industry, construction and services with weights equal to the percentage of total value added accounted by these four sectors in the province. Figure (2) gives an idea of the geographic variability of this variable in

[1]I excluded the newly established provinces from the analysis: Monza, Fermo, Barletta-Andria-Trani, Medio Campidano, Ogliastra, Carbonia-Iglesias and Olbia Tempio.

2012, which is the year with the biggest number of observations. The numbers range from less than 0.1 to more than 350, but 99% of the sample is below 154. Therefore I purged the sample from the outlier 1% of province years with an extremely big number of reports per irregular activity- The mean number of reports per irregular activity in the resulting sample is 12.7 while the median 6. The correlation between the number of reports and the size of the irregular sector in the pooled sample is very small, 0.06. Therefore the differences in the number of reports do not simply reflect differences in evasion, and they are informative about the variability individual and social attitude towards evasion. This evidence is also confirmed by the high coefficient of variation of the number of reports per irregular activity, 208%.

The correlation between the number of reports and the surface area of the province is also very small (0.13). In addition, the coefficient of variation of the number of reports per square kimoleter is 243%, which stresses that the signals are also informative about the geographic variability of the attitude towards evasion and, in particular, on the density of tax morale.

There is a total of 114 economic activities in which the transactions can be categorized at the moment of the report. Some of them collect more than 13000 reports (coffee shops), while others less than 10 (software development). To make the sample more homogeneous, I pooled similar activities together, resulting into 31 aggregated economic activities. I then computed the median reported amount of evasion in each aggregated activity in each province, since the conceptual framework discussed in the introduction implies a negative relationship between the number of reports and the reported amount. This left 8960 usable observations. Not all economic activities are reported in each province, so the sample is unbalanced. In section 6, I consider also a different data specifications with zeros in place of the missing reports.

Table 1 lists the aggregated activities, in descending order according to the number of observations, and provides summary statistics of the median reported amount of evasion. The activity with the biggest number of observations (year-province) is coffee shops (531

obs), followed by doctors and dentists (530 obs) and restaurants (523 obs). The activities with the smallest number of observations are instead private clubs (123 obs), culture and recreation (113 obs) and social services (93 obs). The economic activities are very heterogeneous in terms of median reported transaction value. The average ranges from 13 euros for coffee shops to 3163 euros for constructions. Within each category, there is also a huge variability across provinces. Figure 1 is an example of the distributions of the median reported amount for 4 activities, coffee shops, restaurants, doctors and dentists and lawyers. The distributions are positively skewed because transactions of small amount are, in general, more frequent than transactions of big amount, even conditioning on activity. However, the frequency of big transactions is not always small, as the distribution for lawyers shows.

The number of official reports to the authorities is much smaller than the total number of reports. The average of the ratio of official reports to total reports is 0.05, which means that, on average, 5% of the reports on the webpage are followed by official reports. In 25% of the province-years, there is actually less than 1 official report, and in more than 10% of the province years there is no report at all. Conversely, there are also province-years with a very high number of official reports, above 100. The mean number of official reports in the pooled sample is 8.9, with a standard deviation of 19. Since the individuals that reports the transaction to the authorities are arguably more committed to their own anti-evasion conviction, I consider the number of official reports per irregular activity as an indicator of stronger tax morale. However, since there very few official reports in the data, and since there are no data for 2008, I will focus attention, in the following analysis, on the total number of reports, and then discuss the additional (weaker) results for this indicator of a stronger attitude in section 6.

4 Empirical Results

The empirical model that I estimate is the following:

$$m_{ijt} = \beta_0 + \beta_1 r_{it} + \Gamma X_{it} + \sum_{j=1}^{J} \lambda_j D_j + \eta_i + \delta_t + \varepsilon_{ijt}$$

where m_{ijt} is the median amount of the reported transactions with tax evasion for the economic activity j in province i and year t, r_{it} is the number of tax evasion reports per irregular activity, X_{it} are control variables, D_j are dummies for the $J = 31$ economic activities in which the data are aggregated, η_i are province fixed effects, δ_t time effects and ε_{ijt} is the error term.

As main control variables, I use total consumption expenditure and the percentage of internet users (more control variables are discussed in section 6). It is important to control for total expenditures because the median reported evaded amount might be bigger in a province just because the value of all transactions is bigger. In this section I discuss the results for total expenditures, while in section 6 I discuss the results for different types of expenditures, such as food and housing. It is important to control for internet use because a bigger number of reported transactions in a province might actually be the by-product of a more frequent internet use and not of a stronger tax morale. In fact the percentage of frequent internet users explains the number of reports per irregular activity (positive and significant coefficient in the first stage regression of the IV estimator, see infra). Moreover, there is also a direct effect of internet use on the evaded sums because internet use predicts the amount of e-commerce. The reason is that on line shops typically sell at lower prices than traditional shops and, at the same time, find it more difficult to evade because most of the online transactions are settled with traceable payments.

The problem with this empirical specification is the endogeneity of the number of reports, that makes it difficult to interpret the regression coefficient of interest. The first cause of endogeneity is a simple mechanic of the experiment on the webpage and of the conceptual framework: if prices grow while the threshold remains fixed, there will be both a bigger number of reports and a bigger median reported amount. Therefore differences in the number of reports might only be the effect of increased transaction prices. To partially control for this channel, I included total consumption expenditure in the regression, but

this is actually insufficient to account for all effects. The second cause of endogeneity hinges instead on the formation and diffusion of tax morale. Higher evaded amounts might in fact trigger a stronger public response, which in turn could lead to more reports of evasion.

To control for the possible endogeneity, I use exogenous variation in population density across province-years to instrument the number of reports per irregular acitivity. First, because population size is positively correlated with the number of reports and so is population density. Second because the popularity of a webpage hinges, although not exclusively, on word of mouth and it is easier to spread the word in more densely populated areas, where there is the possibility to interact more frequently with more individuals. Moreover, tax morale is a social phenomenon, being closely related to a notion of social sanction, and more densely populated areas might boost its diffusion because of the bigger number of social interactions. Obviously traditional media, social networks and new communication technologies play an important, perhaps decisive, role in the diffusion of knowledge, ideas and fads, so probably the word of mouth channel is just a residual diffusion mechanism. But if it does explain at least some variation, even if it is a very small fraction, it can still be useful to identify the model. Importantly, I don't have to assume that social interactions are more frequent in more densely populated areas, because this might not be true, for instance, if we think of big cities, where human interactions are often scarce. I just need to assume that, in more densely populated areas, there is a higher probability to receive information about the webpage evasori.info that can help spread awareness about its existence and about the extent tax evasion.

What I need for the consistency of the estimator is that changes in the populations density do not depend on changes of the amount of the transactions with evasion. This might actually be problematic if there is a significant geographical mobility of the population driven by changes in prices, which predict changes in the transaction value and, therefore, of the reported transactions with evasion. I think this is not a huge concern in the data because I'm considering a relatively short period of time and because geographical mobility in Italy is very small. Moreover, the results are robust when controlling for

consumption expenditure in several different categories of goods, among which there is also housing (see section 6 for details). Importantly, I am considering a regression with fixed province effects, so the number of tax evasion reports does not just track population size and density. In other words, I am not just saying that tax morale is higher in bigger or more densely populated provinces.

For consistency, I also need that changes in the value of the reported transactions with evasion is not directly influenced by changes in population density over and above the effect that goes through the number of reports. This assumption is problematic if there is a systematic inflation differential between provinces due to population density, for instance because big cities are in more densely populated provinces. However this is not the case in the data, where population density does not predict the presence of a big city. For instance, the population density of the provinces of Torino and Roma, two very big cities, is, respectively, 328 and 735, while the density of the province of Varese and Trieste, which are much smaller, is 731 and Trieste 1102.

Importantly, this instrumental variables strategy it is not enough to identify a causal effect, so I will refrain from a strict causal interpretation of the regression. All the empirical results that follow must be interpreted as evidence of a well defined partial correlation between the number of reports per irregular activity and the median reported amount. This partial correlation, in turn, is what the conceptual framework implies, so it is indeed evidence in its favor.

The left panel of table 2 reports the fixed effects panel results for the signals per capita, while the right panel the IV results. The standard errors are always clustered at the province level. The estimated coefficient is around -2 in the least squares regression and -4.7 in the instrumental variable regression. In both cases it is significant at the 5% level. The instrument is itself very strong, as stressed by the high F statistic in the first stage regression. (details on the first stage regression available upon request). Table 2 also shows that controlling for expenditures and for the number of frequent internet users does not matter for the main result.

Overall, there is a negative and significant correlation between the number of reports per irregular activity and the median reported value of the transactions with evasion. In the next section, I show that this result is indeed compatible with the conceptual framework describe above. Section 6 discusses instead the robustness of this empirical results.

5 Threshold Determination

Stronger tax morale means more attention to standard and a more difficult categorization and, therefore, more tax evasion reports and a lower threshold above which tax evasion is condemned and reported. In the previous sections I reported evidence that suggests that this mechanism is at work. In this section I try to further explore the mechanism, proposing a montecarlo simulation to quantify this threshold. This exercise also shows that the data are indeed compatible with the conceptual framework that I proposed to rationalize the results, therefore validating the analysis.

In a nutshell, the montecarlo exercise is a simulation of the data generating process which, according to the conceptual framework developed in the paper, should have generated the observed reports of tax evasion.

The first step entails the estimation of the empirical distribution of the reports, which will be the starting point of the simulations. I start from the raw data, pooling the observations for all provinces, years and economic activities. I proceed with a parametric estimation using the Gamma distribution, because it is the most flexible distribution on a positive support. I estimate the two parameters with maximum likelihood, since it produces consistent estimates. The fit to the data is actually very good and the resulting estimated distribution is not very different from the one obtained with a non parametric, kernel, estimation.

Next I draw randomly a set of $N = 20000$ observations from this estimated distribution of tax evasion reports. This set represents the universe of all economic transactions with tax evasion. I then sort the sample from low to high and denote the observations X_i, where X_1 is the smallest and X_N the biggest. Then I extract several samples of different

sizes from this set, and compute the median value in each sample. This procedure delivers a set of couples with sample sizes and median values of evasion that resembles the data, where a number of tax evasion reports (per irregular activity) is coupled with the median reported amount of evasion. The question then, is what selection criterion of the montecarlo samples delivers a regression result which is similar to the empirical results. Clearly a simple random extraction of the samples will result in a regression coefficient which is not statistically different from zero.

To chose the criterion, I come back to the conceptual framework. In particular, I postulated that the transactions are reported only if they are above a threshold. This threshold is, in turn, a function of tax morale, with stronger morale associated with a lower threshold. Since tax morale predicts also a bigger number of reports, I need, for the conceptual framework to be correct, a threshold that shifts down as the sample size increases.

More formally, suppose that there exists a threshold $T < X_N$ such that a transaction t with tax evasion is reported only if $t > T$ and suppose also that this threshold is a function of tax morale. This threshold T must therefore depend negatively on the sample size n, since the sample size is the proxy for tax morale in the montecarlo. To simplify the simulation, and to make it similar to the empirical analysis, I consider a linear function, and I look the the pooled sample to set its parameters. The first useful information is the range of the number of reports per irregular activity, which is between 0.1 and 156. So I consider montecarlo sample sizes between 1 and 150. Then I consider the median reported amount in the provinces with less than one report, or with a very low tax morale, to set the starting point for the threshold, which I call $\hat{T}$. The result is 850 euros, on the basis of which I set $\hat{T} = 276$ euros. By construction, $\hat{T}$ is such that, if I extract random samples between $\hat{T}$ and X_N and then compute the median, I obtain, on average, 850 euros.

I can now fully specify the selection criterion of the montecarlo samples. In particular, I draw samples of $n = \hat{n} + \gamma$ observations from $[\, T(n,k)\,;\, X_N]$ where $T(n,k) = \hat{T} - \gamma\, k$. $\hat{n}$ is the baseline number of observations that I use to compute the starting level of T,

but it does not really affect the simulation results, which are based on several montecarlo repetitions of this sampling process. $\gamma \in [1; 150]$ is the number of observations in each sample and it mimics the empirical range of the number of signals per irregular activity. k is the parameter of interest, since it controls how the threshold shifts with the sample size.

Using the selection criterion, I draw the 150 samples and I compute the median on each one, which I denote $m(n)$. At this point I have 150 couples $(n_i, m(n_i))$ with $i = \{1, \ldots, 150\}$ which resembles the data. To make the simulation more similar to the empirical regression, I then extract a random subsample of 75 couples from this set and run a regression of $m(n)$ on n. The resulting coefficient is the montecarlo counterpart of the regression coefficient of the median reported amount on the number of signals per irregular activity. I call this coefficient $\beta(k)$ since it is a function of k only. The montecarlo estimation entails running this procedure a large number of times for different values of k, and then choosing the value of k such that the average $\beta(k)$ is as close as possible to the empirically estimated β.

For the baseline least squares estimate $\beta = -2.0$, the result is $k = 1.2$ euros. For the baseline IV estimate $\beta = -4.7$, the result is instead $k = 1.9$ euros. Thus 10 more signals of tax evasion shift the threshold below which tax evasion is tolerated between 12 and 19 euros.

This montecarlo exercise is also useful to show that the empirical results are not spurious. The concern arises because the distribution of economic transactions is, broadly speaking, positively skewed, since transactions of small amount are more frequent than transactions of big amount. Thus it is possible to find a negative correlation between the number of reports and the median reported amount just because of sampling if the sample size is not big enough. To test if this concern is real, I repeated the montecarlo simulations setting $k = 0$, which is random sampling with a fixed threshold. The result is that it is nearly impossible to find a β as small as the estimated value. For the negative correlation between number of reports and median amount to be as negative as in the data, it is necessary to have a decreasing threshold.

6 Robustness and Extensions

The sample that I used in the previous analysis in unbalanced, since not all economic activities are reported in each province. The problem is that, as already noted in Russo (2013), the absence of a report can be interpreted either as evidence of low tax morale or as evidence of no tax evasion. In either case, the zeros must be included in the regression to have consistent estimates. Therefore, to check for robustness, included a zero if there is no report of evasion for a given economic activity in the province. The sample consists now of 19159 observations, of which 10198 are zeros (53% of the sample). I excluded from the regression analysis the small provinces, with less than 200(k) inhabitants[2], where most of the observations are zeros. The results are reported in table 3. Overall, the result still highlight a negative correlation between the number of reports per irregular activity and the median reported amount. The coefficients are, in absolute value, smaller than in table 2, as a consequence of the inclusion of the zeros. Moreover, the standard errors are also smaller, most likely because of the much bigger number of observations.

I tried using alternative proxies for tax morale based on different standardizations of the number of reports. The rationale for this exercise is that the variation in the number of signals per irregular activity might mostly reflect variations in the size of the irregular sector, making it difficult to interpret the results. Specifically, I used the number of reports per capita and the number of reports per square km. In both cases the least squares, fixed effects, results are very similar to the benchmark. The problem with these alternative specifications is that the instrumental variable strategy is more problematic to implement and interpret, since the denominators of the number of reports are either in the numerator or denominator of the instrument. This is an additional reason why the analysis is focused on the number of reports per irregular activity.

To further test the robustness of the results, I tried including in the set of regressors several other control variables from the ISTAT database. The results do not change after

[2]Aosta, Biella, Enna, Gorizia, Isernia, Crotone, Massa-Carrara, Nuoro, Oristano, Rieti, Sondrio, Verbania, Vercelli, Vibo Valenzia

including the fraction of women, which is itself positively and significantly associated with the number of reports per irregular activity in the first stage regression. Similarly, including average age and education (primary, secondary and college level) does not change the results. I also controlled for different expenditures: in food, clothes, housing, appliances, health(significant), leisure and services (significant), without any change in the results. I also tried including value added instead of consumption expenditure, which was not significant. The results do not change when controlling for the fraction of self employed individuals, which should be, on average, more prone to tax evasion (Pissarides and Weber 1989; Slemrod 2007; Russo 2013) and should therefore have a more lenient attitude.

I also tried regressing the total reported amount, equal to the sum of all reports, on the number of reports per irregular activity, finding a positive and strongly significant coefficient. This result confirms that there is nothing spurious about the main result highlighted in the paper: the provinces where there are more reports are indeed the provinces that report a bigger total evaded amount.

To further test for robustness, I also grouped the reports every 6 months instead of every year. The results are very similar, with smaller standard errors due to the bigger number of observations.

The website evasori.info reports also the number of reports on the webpage that are followed by official reports to the authorities. As I stressed in section 3, the number of official reports per irregular activity is an indicator of a very strong attitude towards evasion, so I tried using it as an explanatory variable of the median reported value of the transactions with evasion. The resulting regression coefficients are very big, much more than in the previous regressions, but they are significant only in the balanced sample with zeros. The most likely explanation of the high standard errors in the unbalanced sample is the absence of data for 2008. In greater detail, the OLS coefficient in the balanced panel regressions is -28, while the IV, obtained with the same strategy as the above regressions, is -57. Therefore one more signals per irregular activity predicts a reduction in the median reported amount between 28 and 57 euros, which is a sensible amount. The results is

robust to the inclusion of control variables.

7 Conclusion

The paper shows evidence in favor of the theory of self-concept maintenance in the context of tax evasion. More tax morale implies more attention to an anti-evasion standard and a more difficult categorization of evasion, both of which lower the monetary threshold below which tax evasion is considered acceptable. The result is a negative correlation between tax morale and the amount of the transaction with evasion. Using data on tax evasion reports from the webpage evasoti.info, I provided both regression evidence that confirms this result and a montecarlo exercise that shows how the threshold moves with tax morale.

The most important limitation of the analysis is that, given the empirical strategy that does not allow a causal interpretation of the regression coefficient, I cannot discuss the policy implications of the results. In other words, the analysis establishes that the theory of self-concept maintenance is relevant for tax evasion, but it does not establishes that making self-concept maintenance more difficult will actually reduce evasion. To establish a causal relationship, it would be ideal to have a controlled experiment that fosters attention to standard for a randomly selected subsample of firms, sending, for instance, a letter that reminds about the importance of paying taxes, similarly to what Pomeranz (2015) did for value added taxes.

A further limitation of the regression analysis is that I cannot control for the use of credit and debit cards. To illustrate the issue, suppose that the amount of the transactions in a given province is small. Typically credit and debit cards are seldom used to settle these transactions, which are mostly paid in cash, even by the individuals with strong tax morale. But evasion is arguably easier in case of a cash payment, since there is no paper trail of the transactions, so that there will be more transactions with evasion. Part of these transactions will then be reported on the webpage, which will record a lot of reports of transactions of small amount, but just as an effect of differences in the payment method and not as a consequence of differences in tax morale. In the regression analysis, I controlled

for internet use to partially account for differences in e-commerce, which heavily relies on card payments, but this is not enough to account for differences in card use. Unfortunately, there are no reliable and systematic data that can help controlling for card use.

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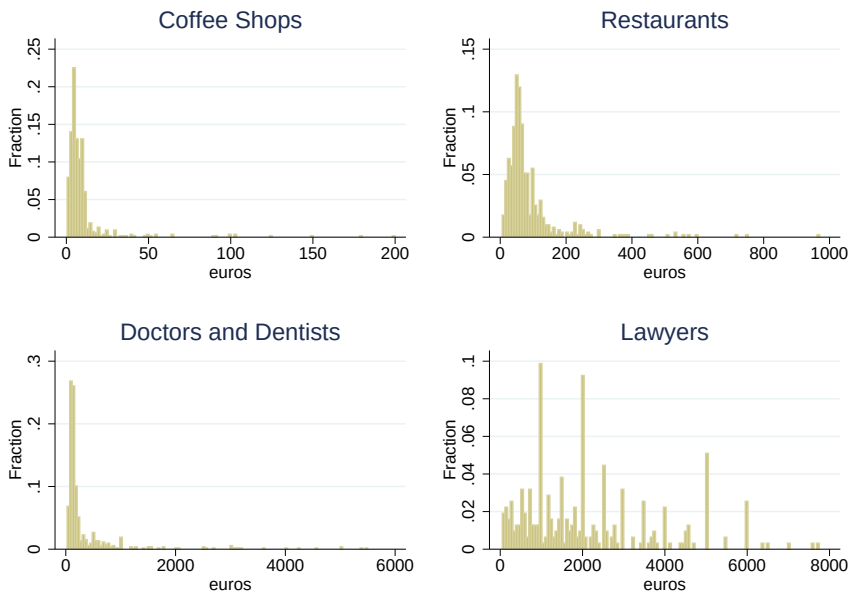
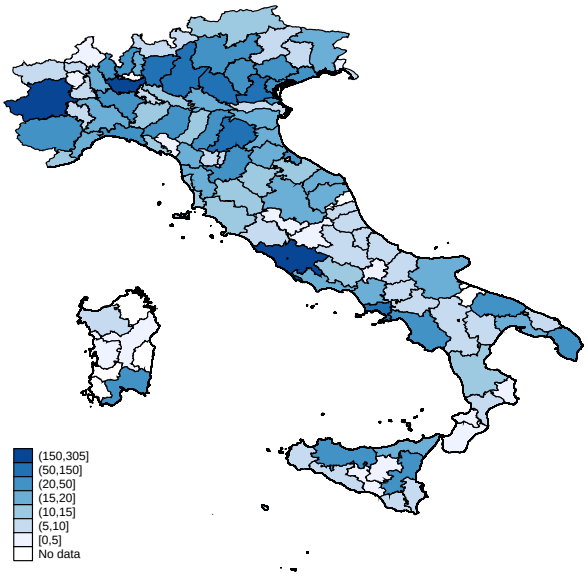
Figure 1: **Median reported amount, selected activities**



Notes: Distribution of the median reported amount of the transactions with tax evasion. Pooled data from 2008 to 2013.

Figure 2: **Reports per Irregular Activity**



Notes: Number of reports of transactions with tax evasion from the Evasori.info webpage divided by the size of the irregular sector from ISTA. Data from 2012 for all economic activities.

Table 1: **Tax Evasion Reports, Summary Statistics by Economic Activity**

	obs	mean	std	1^{st} quart	median	3^{rd} quart
Coffee shops	531	13	38	4	6	10
Doctors and dentists	530	438	996	100	150	270
Restaurants	523	162	559	45	61	100
Services for the individual	487	195	718	20	34	65
Retail shops (excluding food)	444	352	822	35	82	276
Auto repair	443	516	968	100	200	400
Food shops	409	69	324	7	12	24
Plumbers, electricians and contractors	390	1042	1396	190	500	1175
Catering and take away	373	60	468	9	14	20
Lawyers	323	2282	1965	1000	1800	3000
Rents	312	1202	1706	300	530	1000
Sport and entertainment	312	419	1033	48	86	309
Vacation rentals	291	1039	1531	176	450	1000
Nurses and health services	284	395	974	60	110	216
Professionals	280	609	1160	58	142	511
Real estate	278	1998	1840	520	1200	3000
Household products	262	507	1200	20	66	400
Open markets and peddlers	259	83	133	11	22	90
Services	230	1071	1768	140	400	1000
Hotels	227	636	1030	110	250	673
Repairs	216	377	976	34	95	250
Artists	198	874	1454	85	300	1100
Agriculture	187	940	1561	38	177	1000
Accountants and tax professionals	181	1440	1729	300	700	1925
Computers sale, repair and web services	179	496	918	54	120	500
Constructions	169	3163	2700	1000	2300	5000
Architects and engineers	167	2445	2245	750	1500	4000
Tutoring	146	1179	1948	60	187	1500
Private clubs	123	1810	2437	100	650	2500
Culture and recreation	113	370	990	15	55	150
Social services	93	886	1531	50	150	1200
median	278	609	1160	60	150	511

Notes: Summary statistics of the distribution over provinces of the median reported transaction on the website evasori.info by economic activity. Pooled data from 2008 to 2013. All values are in euros. 8960 observations.

Table 2: **Explaining the Amount of Tax Evasion Reported**

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
signpi	-2.013**	-2.025**	-1.871**	-4.685**	-4.657**	-5.011**
	(0.969)	(0.975)	(0.942)	(2.181)	(2.176)	(2.127)
exp		0.063			0.082	
		(0.212)			(0.212)	
intuse			-1.549			-1.324
			(1.352)			(1.369)
R^2	0.255	0.255	0.259	0.258	0.258	0.259
F				85.4	85.1	79.3

Notes: Dependent variable is the median reported amount of the transactions with tax evasion for each economic activity and each year in the province from the website evasori.info. The sample does not include zeros for the activity for which there are no reports. signpi is the number of reports of tax evasion from evasori.info divided by the size of the irregular sector from the ISTAT database. exp is the total family expenditure from the ISTAT database. intuse is percentage of the population that used the internet from the ISTAT database. In columns (4) to (6) signpi is instruments with the number of inhabitants per square km from the ISTAT database. F is the first stage F-statistic. All regression include province fixed effects, time dummies and 31 dummies that correspond to the economic activities in which the transactions are categorized. 8898 total observations. Standard errors clustered at the activity level are reported in brackets. ** significant at the 5% level

Table 3: **Explaining the Amount of Tax Evasion Reported-Sample With Zeros**

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
signpi	-1.956***	-1.955***	-1.943***	-2.742***	-2.734***	-2.781***
	(0.391)	(0.389)	(0.389)	(1.036)	(1.039)	(1.015)
exp		0.098			0.098	
		(0.104)			(0.103)	
intuse			-0.304			-0.260
			(0.653)			(0.660)
R^2	0.09	0.09	0.09	0.014	0.014	0.014
F				31.1	31.0	31.1

Notes: Dependent variable is the median reported amount of the transactions with tax evasion for each economic activity and each year in the province from the website evasori.info. The sample include zeros for the activities for which there is no report. signpi is the number of reports of tax evasion from evasori.info divided by the size of the irregular sector from the ISTAT database. exp is the total family expenditure from the ISTAT database. intuse is percentage of the population that used the internet from the ISTAT database. In columns (4) to (6) signpi is instruments with the number of inhabitants per square km from the ISTAT database. F is the first stage F-statistic. All regression include province fixed effects, time dummies and 31 dummies that correspond to the economic activities in which the transactions are categorized. 16585 total observations. Standard errors clustered at the activity level are reported in brackets. *** significant at the 1% level