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Culture, Compliance, and Confidentiality: A Study of Taxpayer Behavior in the United States and Italy

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Abstract:

This paper analyzes the impact of confidentiality of taxpayer information on the level of compliance in two countries with very different levels of citizen trust in government – the United States and Italy. In both countries, the payment of the individual income tax relies heavily on voluntary compliance, in which individuals are promised that information will be kept confidential, at least until evasion is proven. Does this promise of confidentiality affect compliance? There is very little empirical evidence of the impact of the confidentiality contract on compliance in any one country and none across countries. Using identical laboratory experiments conducted in the United States and Italy, we analyze the impact on tax compliance of "Full Disclosure" (e.g., release of photos of tax evaders to all subjects, along with information on the extent of their non-compliance) and of "Full Confidentiality" (e.g., no public dissemination of photos or non-compliance). We find that compliance is greater both in the U.S. and in Italy when there is public disclosure of information about individuals found to be tax evaders.

JEL Classifications: H2, H3.

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1. Introduction

Tax administrations are constantly looking for innovative ways to increase tax compliance. Traditional compliance-inducing measures include penalty rates and audit structures. A novel method that has been increasingly discussed is limited disclosure of taxpayer information in cases of tax evasion. The threat of public shaming through disclosure as an additional but non-financial penalty could induce taxpayers to increase compliance to keep their names clean. However, the threat of public disclosure could crowd out the intrinsic motivation for compliance, causing a backlash against an intrusive government and reducing compliance as a retaliatory action; additionally, with increasing sentiment against taxation, disclosure may actually increase the utility for a subset of the population, an effect that may be reinforced if "contagion" effects exist such that observing that others have underreported income may reduce the level of one's own compliance. Therefore, whether public disclosure of taxpayer compliance behavior increases or decreases compliance is largely unknown. This paper uses laboratory experiments to examine the impact of confidentiality of taxpayer information on the level of individual compliance in two countries in which baseline taxpayer compliance is arguably different – Italy and the United States.

The impact of explicit disclosure of evasion has seldom been empirically studied at the individual level due largely to the absence of reliable micro-level taxpayer data. Using field data, Slemrod, Thoresen, and Bø (2012) utilized a natural experiment in Norway, in which after 2001 some tax data were made available on the internet while prior to 2001 such information was available for only a select number of communities. They found on average a slight increase in reported business income after 2002 in communities that previously had limited disclosure. Also, Hasegawa et al. (2013) analyzed disclosure of individual and corporate tax information in Japan,

and found that the existence of a "disclosure threshold" encouraged some underreporting of income.

Several laboratory experiments have looked at the effects of disclosure on taxpayer compliance, with mixed results. Laury and Wallace (2005) conducted a laboratory experiment that implemented a mild form of disclosure, in which the tax reports of a subset of participants were displayed to other participants, as coded by an anonymous ID number, and they found some suggestive evidence that disclosure has a positive effect on compliance. Fortin, Lacroix, Villeval (2007) also studied the effects of feedback on tax reporting decisions. In their design, subjects were told the number of subjects who underreported income in the previous round and the mean level of reported income (but not the level of income reported by any individual). They found that reported income was slightly lower when subjects received information on others' reporting behavior, but also that an increase in the average level of evasion in the group was associated with an increase in individual reported income. Lefebvre et al. (2011) compared tax reporting behavior across three countries (France, Belgium, and the Netherlands), analyzing the effects of providing subjects with a "good" example (e.g., the maximum proportion of subjects who reported truthfully) or a "bad" example (e.g., the minimum proportion). They found that subjects who observed "bad" examples of others' behavior were less likely to fully report income, but that reporting was largely unaffected by observing "good" examples. They also found differences in reporting across countries, with underreporting more common in France and the Netherlands than in Belgium. Also, Coricelli et al. (2010) focused on the emotional impact of cheating and disclosure in a tax-reporting experiment. In a "pictures" treatment, a subject who was audited and found to have unreported income had his or her photo shown to others in the session. They find that the use of photos increased compliance (and also "emotional arousal", as

measured by skin conductance responses); they also found that higher compliance (and higher emotional arousal) after an audit.

Despite these contributions, the impact of confidentiality versus disclosure of taxpayer information on the level of individual compliance remains unknown. We seek to fill this gap by using laboratory experiments to examine the impact of disclosure in two quite different environments – the U.S. and Italy. In our experimental design, an individual is given income, and then must decide how much of the income to report. Taxes are paid on reported income at a preannounced tax rate, and no taxes are paid on unreported income. However, unreported income may be discovered via an audit, and the subject must then pay the unpaid taxes plus a fine based on the unpaid taxes. We introduce two main treatments into this system. In one treatment ("Full Confidentiality"), an individual who is detected evading is penalized, but their reporting information is not shared with the other subjects. In a second treatment ("Full Disclosure"), those who have been caught evading find their non-compliance information shared among the subjects via the display of their pircture on the computer screens of all subjects (along with information on the level of underreporting). Importantly, we conduct separate but identical experiments in the United States and in Italy, thereby providing us with quite different baselines of compliance norms. By performing mirror experiments in these two countries, we believe that we are better able to identify the marginal impact of evasion disclosure on compliance behavior than would be possible by focusing on just one country.

We find strong support for the notion that public shame is an additional deterrent to tax evaders, beyond the traditional enforcement tools of higher audit rates and enhanced penalty rates, an effect that seems equally strong in the U.S. and in Italy, despite what appears to be a different social norm of compliance in the two countries. We also find complicated interaction

effects between disclosure and other policy variables, effects that nonetheless confirm that disclosure encourages compliance.

2. The Institutional Context

The United States and Italy present very different institutional perspectives on the role of confidentiality in tax disclosure. This section discusses the different attitudes toward disclosure – and toward tax compliance – in these two countries.

In the United States, announcing the names of delinquent taxpayers is a departure from the standard of practice for the federal government with respect to individual taxpayer data. Confidentiality of individual taxpayer data is a long-held basic right of the U.S. system of tax administration. Section 6103 of the Internal Revenue Code sets the guidelines for confidentiality and for the limited disclosure of return information to state and local tax officials. As noted by former Internal Revenue Service (IRS) Commissioner Margaret Richardson, "IRS employees are prohibited from accessing information not needed to perform their official tax administration duties" (Testimony, 15 April 1997). Confidentiality of taxpayer data is thereby guaranteed within the system of tax administration, and the IRS imposes strict disclosure rules for individual taxpayer data flowing outside the federal system to state tax administrators, other U.S. government agencies, individuals, and companies. The IRS also imposes penalties for unwarranted disclosure.

While taxpayers may believe that IRS rules ensure that tax information is largely private and held in confidence by the IRS, the confidentiality of taxpayer data and information has not always been a given. Until the mid-1970s, tax returns of publicly traded companies were available to the public at-large. States in the U.S. have sometimes utilized a "wall of shame"

approach to increase voluntary compliance. For example, the revenue code of the state of Georgia allows limited disclosure in certain cases of tax arrears, and in West Virginia disclosure of corporate income tax returns may occur once disputes in liabilities reach the point of the circuit court. Taxpayers themselves have sometimes voluntarily chosen to make their returns public; indeed, many in political office make this choice.

The level of disclosure and taxpayer reaction therefore falls along some continuum from subtle to extremely overt. At one end there is "administrative disclosure" in the form of sharing information about taxpayers among units within government. At a more extreme end is publication and announcement of names of individuals (and companies) who have tax arrears, who fail to file tax returns, or who fail to make timely tax payments.[1]

In contrast, Italy is a country that offers a much more mixed attitude towards tax evasion and tax evaders. On one side, Italy is often described as a country where the problem of tax evasion is particularly acute.[2] Estimates from various sources indicate that evasion in Italy is much higher than in other highly developed countries (Giovannini, 2011), and evasion is often considered at the root of many problems of the Italian economy: revenue losses, equity concerns, and economic inefficiencies (Santoro, 2010). Italians are well aware of these problems. The general sense of alarm has been recently well expressed by former Prime Minister Mario Monti serving in a government supported by a large political coalition, who remarked that "…against tax evasion, Italy is in a state of war" (Mario Monti, Il Sole 24 ore, 17 August 2012). On the other side, notwithstanding the widespread concern, the attitude of Italians towards tax evaders is

[1] Note that some have expressed concern that disclosure in its various forms represents a breach of the taxpayer-tax administration confidentiality that is considered important in tax administration. However, Mazza (2003) argues that disclosure and privacy concerns are not inextricably linked in such a way that all disclosure yields a breach of privacy; see also Lenter, Shackelford, and Slemrod (2003).

[2] As an example, see the recent article from *The Economist Blog*, which starts by noting that "Death may be certain in Italy, but taxes are another matter: an estimated of € 285 billion remained unpaid last year, about 18% of GDP" (http://www.economist.com/blogs/schumpeter/2013/01/tax-evasion-italy).

more tolerant than one might expect. For example, findings from social surveys consistently show that Italians report an index of tax morale significantly lower than in many other countries (Alm and Torgler, 2006).[3] In a recent study of Italians' opinions on tax evasion, Cannari and D'Alessio (2007) find that aversion to tax evasion turns out to be quite low across all social classes, and for this reason they argue that in Italy a mechanism of general reprobation may have only a modest impact in reducing evasion.

The ambivalence of Italians in the attitude towards tax evasion also emerges from the way in which the issue of disclosure of taxpayers' information is treated by the law and perceived by the public. In principle, the Italian law allows for ample disclosure of individual taxpayer data. In particular, the law establishes that every year the tax administration compile lists with the names of all Italian taxpayers, their total income, taxable income, and major source of income. The lists are then made available by the Italian Tax Agency ("Agenzia delle Entrate") and the taxpayers' municipalities to anyone who is interested. The standard practice has for many years been that local and national newspapers occasionally access the lists and publish the names and the incomes of wealthier people. This sometimes occurs for people found to be tax evaders as well. An issue that has raised much concern recently is whether the Agency or the municipalities can by themselves publish this information. The problem exploded in 2008 when the Agency published an internet list of *all* Italian taxpayers for everyone to access directly from his or her computer. The decision of the Agency inflamed public opinion, which was split between privacy advocates and supporters who argued that the publication of the data could finally undermine the prevailing system of tax evasion. The list remained available only for few hours since the Italian Data Protection Authority declared the publication illegitimate, complaining both of the lack of an explicit permission in the Italian law and of a more general

[3] As discussed later, it is of course possible that evasion is high precisely because tax morale is low.

problem of disparity between the need for public transparency on taxpayer data and the ability to make them available in the web.

Following this episode, there have since been other discussions in the media and in politics on the opportunity to make individual taxpayers' data more generally available, but without much effect.[4] As a result, the situation in Italy is that information regarding taxpayers and tax evaders is made only occasionally available by local and national newspapers.

3. Theoretical Background

Following Allingham and Sandmo (1972), tax compliance is typically modeled as a decision of how much income to report to tax authorities given that underreporting may be discovered with some audit probability and penalized with some penalty rate.[5]

To illustrate this approach more precisely, consider a simple version of the standard model. An individual is assumed to receive a fixed amount of income *I*, and must choose how much of this income to declare to the tax authorities and how much to underreport. The individual pays taxes at rate *t* on every dollar *D* of income that is declared, while no taxes are paid on underreported income. However, the individual may be audited with a fixed probability *p*; if audited, then all underreported income is discovered, and the individual must pay a penalty at rate *f* on each dollar that he was supposed to pay in taxes but did not pay. The individual's income I_C if caught underreporting equals

$$(1) \qquad I_C = I - tD - f[t(I-D)],$$

[4] Some recent laws establish that politicians and public managers have to make publicly available their fiscal returns (L. 190/2012 and Dlgs. 33/2012). The laws have however been introduced more as an anti-corruption policy than as way to fight tax evasion. Moreover, it is not clear which sanctions actually apply for those who do not comply and, indeed, the applications of the dispositions have been so far carried out mainly as a voluntary decision.

[5] See Cowell (1990), Andreoni, Erard, and Feinstein (1998), Alm (1999), and Slemrod and Yitzhaki (2002) for comprehensive surveys of the evasion literature. See Alm (2012) and Sandmo (2012) for more recent discussions.

or income less taxes paid on reported income less penalties on unreported taxes. If underreporting is not caught, income I_N is

(2) $I_N=I-tD$,

or income less taxes paid on reported income. The individual is assumed to choose declared income to maximize expected utility, defined as

(3) $EU(I)=pU(I_C)+(1-p)U(I_N)$,

where E is the expectation operator and utility $U(I)$ is a function only of income. This optimization generates a standard first-order condition for an interior solution; given concavity of the utility function, the second-order condition is satisfied. Comparative statics results are easily derived. For example, it is straightforward to show that an increase in the probability of detection p and the penalty rate f unambiguously increase declared income.

This economics-of-crime approach therefore gives the sensible result that compliance depends upon enforcement. This approach also concludes that an individual pays taxes because – and *only* because – of the economic consequences of detection and punishment. This is a plausible insight, with the obvious implication that the government can encourage greater tax compliance by increasing the audit and the penalty rates.

However, it is clear to many observers that compliance cannot be explained entirely by such purely financial considerations, especially those generated by the level of enforcement (Graetz and Wilde, 1985; Elffers, 1991; Kirchler, 2007; Slemrod, 2007; Torgler, 2007). The percentage of individual income tax returns that are subject to a thorough tax audit is generally quite small in most countries, almost always well less than 1 percent of all returns. Similarly, the penalty on even fraudulent evasion seldom exceeds more than the amount of unpaid taxes, and these penalties are infrequently imposed; civil penalties on non-fraudulent evasion are even

smaller. A purely economic analysis of the evasion gamble suggests that most rational individuals should either underreport income not subject to source withholding or over-claim deductions not subject to independent verification because it is unlikely that such cheating will be caught and penalized. However, even in the least compliant countries evasion seldom rises to levels predicted by a purely economic analysis, and in fact there are often substantial numbers of individuals in most countries who apparently pay all (or most) of their taxes all (or most) of the time, regardless of the financial incentives they face from the enforcement regime.

The puzzle of tax compliance behavior may therefore be why people pay taxes, not why they evade them. This observation suggests that the compliance decision must be affected in ways not captured by the basic economics-of-crime approach. Motivations affected by confidentiality may well play a role here.

Indeed, it is possible to extend the basic economics-of-crime approach to incorporate the potential role of confidentiality in the individual compliance decision. Perhaps the simplest extension is to introduce the role of "ethics". There is much evidence of what may be termed a "social norm" of tax compliance. Although difficult to define precisely, a social norm can be distinguished by the feature that it is process-oriented, unlike the outcome-orientation of individual rationality (Elster, 1989). A social norm therefore represents a pattern of behavior that is judged in a similar way by others and that therefore is sustained in part by social approval or disapproval. Consequently, if others behave according to some socially accepted mode of behavior, then the individual will behave appropriately; if others do not so behave, then the individual will respond in kind (Frey and Torgler, 2007). The presence of a social norm is also consistent with a range of approaches, including those that rely upon "social customs", even

appeals to “patriotism” or appeals to “conscience”, or upon individual feelings of “altruism”, “fairness”, “morality”, “guilt”, or “alienation”.

Overall, this factor of taxpayer “ethics”, broadly defined, suggests that an individual will comply as long as she believes that compliance is the “right thing to do”. Conversely, if noncompliance becomes pervasive, then the ethics of compliance disappears. This perspective also suggests that disclosure of one’s compliance choices to others may affect the social norm of compliance and, though this channel, each individual’s compliance decision.

There are several ways in which the role of ethics can be introduced in the model of self-interested individual behavior. Perhaps the simplest way is suggested by Kahneman and Tversky (1979), who incorporate what they term a “reference point” as a form of social norm in prospect theory. They assume that a loss in utility occurs if individuals do not achieve some reference point, a phenomenon they call “loss aversion”. The loss may be avoided by reporting all income and paying all taxes; individuals who declare less than their full income and pay less than their full taxes will suffer a loss in utility.

More formally, assume that each individual maximizes expected utility, where income in the two states of the world is now defined not as in equations (1) and (2) but as

(1)’ $I_C=I-tD-f[t(I-D)]-\gamma t(I-D)$

(2)’ $I_N=I-tD-\gamma t(I-D)$.

Expected utility is still defined by equation (3). The individual now is assumed to suffer a psychological loss in expected income proportional to undisclosed taxes, where the coefficient γ measures as a fraction how much the individual would pay to avoid the loss associated with each dollar of unreported taxes. It is straightforward to show that declared income is higher in this setting than in the basic economics-of-crime model discussed earlier.

Clearly, γ is likely to be sensitive to the disclosure of one's compliance behavior to others; that is, γ is likely to vary with the amount of confidentiality. This effect can work through several channels: social stigma, personal and cultural values (including religion and/or ideology), the influence of peers, the perceived quality of fiscal institutions, and the equity of the fiscal system.

Through social stigma, γ is likely to be sensitive to the public disclosure to others of one's compliance behavior; that is, γ is likely to vary with the amount of confidentiality. The stronger the ethical norm to pay one's taxes fully, the more deviant the behavior of a non-compliant individual becomes, and the more loss the individual feels with disclosure. Cultural and personal values can also affect the strength of the norm under disclosure. For example, the effect of public disclosure could be weaker in societies where private values like family and friendship are more important, while disclosure could be stronger in societies in which civic values like justice and politics are rated higher. Religions that encourage forgiveness (e.g., Catholicism) may reduce the effect of disclosure on compliance, while faiths that put less weight on mercy and more on individual responsibility could enhance the effect of disclosure.

Of course, disclosure could instead lead to a decline in γ if noncompliance is viewed as a legitimate form of government protest. There are several reasons why this may occur. Some work has emphasized that, if taxpayers perceive that services provided by the public sector in return for taxes are not "fair", then taxpayers may respond by increasing evasion as a form of civic protest (Mason and Calvin, 1984; Cowell and Gordon, 1988; Bordignon, 1993; Rablen, 2010). In this case, public disclosure could make taxpayers even more aggressive, which in the context of equations (1)' and (2)' implies a lower value for γ. The intuition is straightforward. If taxpayers do not believe that they are receiving government services commensurate with tax payments, then

public disclosure increases their mistrust/dislike for government and they respond by reducing compliance as a statement against government.

A decline in γ following disclosure could also be due to the interaction with ethics. The impact of taxpayer ethics suggests that an individual will comply as long as he or she believes that compliance is the "right" thing to do; conversely, if noncompliance becomes pervasive, then the ethics of compliance may disappear (Myles and Naylor, 1996; Fortin, Lacroix, and Villeval, 2007; Traxler, 2010). This logic implies that γ decreases with the evasion of others. It also implies that disclosure of one's compliance choices to others may affect the social norm of compliance and, through this channel, each individual's compliance decision. In other words, the social norm may be affected via a "contagion" effect such that observing that others have underreported income may reduce the overall compliance rate.

This discussion illustrates the complexity of the compliance effects of breaking confidentiality. As emphasized earlier, the actual evidence on confidentiality versus disclosure is not clear-cut. The next section presents our experimental design to examine this issue.

4. Experimental Design

We use a laboratory experiment to analyze the impact of announcing tax evasion on the overall level of tax compliance in Italy and in the United States. Experimental methods have long been used to study compliance. They allow many factors suggested by theory to be introduced in experimental settings, they allow these factors to be introduced singly and exogenously in a controlled environment, and they generate precise data on individual compliance behavior. There are also legitimate concerns regarding small sample sizes and the use of student subjects, concerns that relate to the "external validity" validity of laboratory experiments. Still, there is

now much evidence that there is little difference between student and nonstudent responses (Plott, 1987), including evidence that relates directly to compliance behavior (Alm, Bloomquist, and McKee, 2015). Most importantly, there is now a large literature (Smith, 1976, 1982) that argues convincingly that experimental methods can contribute significantly to policy debates, as long as some conditions are met: the payoffs to subjects must be salient, better subject decisions yield higher subject payoffs, decision costs must be commensurate with the payoffs, and the experimental setting must capture the essential properties of the naturally occurring environment that is the subject of investigation. These conditions are met in our experimental design.

Our basic experimental design follows that typically used in previous tax compliance experiments (Alm and Jacobson, 2007, Alm, 2010, Laury and Wallace, 2005).[6] An individual is given income, and then must decide how much of the income to report. Taxes are paid on reported income at a preannounced tax rate of 30 percent, and no taxes are paid on unreported income. Unreported income may be discovered via an audit. If the subject is audited and found to have underreported income, the subject must then pay the unpaid taxes plus a fine based on the unpaid taxes at a preannounced fine rate. Note that the computer interface includes a scroll bar that the subject uses to enter reported income, and, as the subject moves the scroll bar to different levels of reported income, the subject's screen displays the earnings if audited and if not audited. Thus the earnings implications for any possible reporting decision are transparent and easily available to the subject. After the subject submits reported income, the audit outcome is randomly determined according to the pre-announced audit probability, and the subject is told the period earnings. Figure 1 portrays a screenshot of the basic decision.

[6] A copy of the experimental instructions is found in Appendix A.

Each subject makes a reporting decision in 16 rounds. Earnings are revealed at the end of each round. However, the earnings from only one round count for payments, as determined at random at the end of the session by the use of a 16-sided die. Subjects are then paid their earnings from this one round only (plus a fixed participation payment). All decisions are conducted on computers, with each subject assigned to his or her own computer, which is visually isolated from others' computers.

Income was held constant ($25 in the U.S. and €15 in Italy), as was the tax rate (30 percent). The probability of an audit was either 20 percent or 30 percent. The fine on unreported income was either 100 percent (so that the individual pays unpaid taxes plus an additional penalty equal to the amount of unpaid taxes) or 200 percent (or the individual pays unpaid taxes plus a penalty equal to twice the amount of unpaid taxes). Thus there were four different treatment combinations based on the audit probability and fine. Each treatment combination was held fixed for four rounds, before a new treatment combination was presented to subjects. The order of treatments was reversed between sessions. In addition to their earnings from one randomly-selected round, subjects received a fixed participation payment ($10 in the U.S. and €7 in Italy). Experiments lasted about 90 minutes, and earnings ranged from $30 to $55.

The main policy variable is the impact of public disclosure versus confidentiality on tax compliance. We consider two very different levels of confidentiality. In a "Full Confidentiality" treatment, all information is private: subjects who are audited and found to be noncompliant are assessed a penalty; however, none of their compliance information is shared among the other subjects. In a second treatment ("Full Disclosure"), subjects who are audited and caught evading are again assessed a penalty, but their tax-reporting information is no longer kept private. At the end of each round, photos of everyone who was audited and underreported are shown on each

participant's computer screen, along with the amount of income the subject reported. Each subject participated in only one disclosure treatment. Figure 2 provides a screenshot of the post-audit information.

The experiments were conducted at Georgia State University in the United States and at the University of Venice Ca'Foscari in Italy using student subjects from each institution. The subjects also filled out a demographic survey at the end of the experiment, which helps us to capture socioeconomic and demographic data that are used in the empirical analysis.

5. Analysis and Results

In total, there were 2,720 individual observations over the 16 rounds of the various sessions (1,472 observations in U.S. sessions; 1,248 observations in Italy sessions). Table 1 summarizes the descriptive statistics for the subjects in both countries. The average age of the subjects was 23.8 years (22.5 years, U.S.; 25.1 years, Italy), and 43.5 percent of the subjects were male (39.1 percent, U.S.; 48.7 percent, Italy). The racial and religious mix of the subjects varied significantly between the U.S. and the Italy sessions. In the U.S. sessions, 75.0 percent of the subjects were black and 6.5 percent were Catholic; in the Italy sessions, 2.5 percent were black and 62.8 percent were Catholic.

There are several ways in which we can measure the level of compliance of our subjects. One measure is a binary variable that represents whether the subject reported all income or not, equal to 1 if the subject reported all income and 0 otherwise; any underreported income, no matter its size, is considered non-compliance. Across all treatments and experiment parameters, subjects fully reported income 48.2 percent of the time. An alternative measure defines compliance as the proportion of income that is reported, or the average Compliance Rate. On

average, subjects reported 71.3 percent of their income (See Table 2). Unless otherwise stated, we use the average compliance rate as our measure of compliance, although our results are largely robust to either measure.

Table 3 presents summary information on the average compliance rate by treatment and by country. Pooling across sessions, subjects respond in a predictable manner to our experiment parameters (probability of an audit and penalty rate). In both the U.S. and Italy, mean reported income generally increases as the probability of an audit increases and as the penalty on unreported income increases. The only exception to this is in treatments where the mean level of reporting is already high (or over 70 percent of income reported in the U.S., and over 80 percent of income reported in Italy). In these treatments, changes in the experiment parameters had little effect on the amount of income reported.

These simple descriptive statistics in Table 3 allow us to test several hypotheses. Our main interest is in the effect of changes in the level of confidentiality on compliance and on the extent to which reporting behavior differs across countries. We test several hypotheses that explore how confidentiality, culture and related variables affect compliance. We address each in turn.

Of most interest is the effect of Full Confidentiality versus Full Disclosure, and a first hypothesis examines the impact of disclosure, in which photos and underreported income are shown for those subjects found to be noncompliant in an audit, where the variable *Photos* equals 1 in sessions where pictures are shown of noncompliant subjects and 0 otherwise:

Hypothesis 1: Showing photos of subjects who are audited and have underreported income will increase tax compliance.

Overall, our data support this hypothesis. Pooling data across countries (and across experiment parameters), 68.9 percent of income is reported in baseline sessions, and 73.1 percent in sessions where photos are shown of those with underreported income. If we use our binary measure of compliance, 37.7 percent fully report in the baseline condition compared with 56.5 percent in the sessions with photos. These differences are significant at any standard level of confidence and provide support for Hypothesis 1.

A second hypothesis examines the impact of public disclosure in the U.S. versus Italy:

Hypothesis 2: The photo treatment will have a larger effect on compliance in the U.S. than in Italy.

If underreporting income is more acceptable in Italy than in the U.S., then one might expect that lowering the level of confidentiality will have a larger effect in the U.S. than in Italy. Our data support this hypothesis. As seen in Table 3, compliance is significantly higher in Italy than in the U.S. in both the baseline and photos treatments. However, the marginal impact of the photo treatment causes only a modest increase in compliance in Italy (from 73.1 to 74.7 percent) compared to the U.S. (from 64.8 to 71.9 percent).

Another hypothesis pertains to the impact of seeing other individuals who are non-compliant (a contagion effect of sorts):

Hypothesis 3: Observing more subjects underreporting income will lead to lower compliance rates.

We examine this issue by restricting our attention to the photo treatment, and we now estimate various econometric models that permit conditional estimations of the treatment effects at the individual level while holding other factors constant. We estimate variants on the following basic empirical model:

$$CR_{i,t} = \beta_1 + \beta_2 Treatment_t + \beta_3 Low\ Audit_t + \beta_4 Low\ Penalty_t + \beta_5 Italy_t + \beta_6 X_i + \psi_t + u_i + \varepsilon_{i,t} \quad (4)$$

where the dependent variable $CR_{i,t}$ denotes subject *i*'s Compliance Rate in period *t*; $Treatment_t$ is a dummy variable for periods in which there is some policy innovation (e.g., public disclosure via photos, compliance behavior of non-compliant subjects); $Low\ Audit_t$ is a dummy variable for the audit rate, equal to 1 if the audit probability is high and 0 otherwise; $Low\ Penalty_t$ is a dummy variable for the penalty rate, equal to 1 if the penalty rate is high and 0 otherwise; $Italy_t$ is a dummy variable equal to 1 for sessions run in Italy and 0 otherwise; X_i is a vector of demographic variables (e.g., subject sex and religion); ψ_t is a set of T-1 dummies that capture potential non-linear period effects; u_i are random effects that control for unobservable individual characteristics; $\varepsilon_{i,t}$ is the contemporaneous additive error term; and β_k is the coefficient for variable *k*. The model is estimate using Tobit maximum likelihood methods with random effects.

As shown in Table 4, we do not find support for this hypothesis. While being audited and found to have underreported income in the previous round has a significant negative effect on compliance, an increase in the proportion of others in a session that were shown to have underreported income has no significant effect on compliance. Most other variables are significant. For example, note that compliance is significantly higher in Italy than in the U.S. and lower for male subjects.

Several additional hypotheses pertain to the impact of enforcement parameters on compliance:

Hypothesis 4: An increase in the audit rate will increase compliance.

Hypothesis 5: An increase in the penalty rate will increase compliance.

These hypotheses are largely supported by the estimation results in Table 4. For example, compliance is lower with a lower audit probability and a lower penalty for underreported income.

Another hypothesis relates to the interaction effects of disclosure and audit rates:

Hypothesis 6: The effect of photos may be stronger in sessions with a low probability of being audited.

If compliance is subject to crowding-out, there may be less room for reducing confidentiality to increase compliance because baseline compliance rates are already high in sessions with a high audit probability (or a high penalty on underreported income). The simple descriptive statistics in Table 3 lend some support to this hypothesis. The photo treatment has a smaller effect when the audit probability and penalties are high.

We look at this more formally in Table 5, where we modify the basic empirical model to include both penalty-rate controls and audit-probability interacted with photos (equal to 1 in sessions with a photo), again estimated with Tobit maximum likelihood methods with random effects. The baseline estimations in models (1) and (2) confirm that compliance is higher with photos, and lower under low audit probabilities. As we move across the table to examine crowding-out effects, it appears that the effects of the photos depend on the probability of audit as well. In particular, pictures are about half as effective in a high audit environment. This result is robust to demographic controls.

Although showing photos of those who have been audited and discovered to have underreported income increases overall compliance, once a person has been identified to others as a tax evader the stigma of further identification may be diminished. If this is the case, then one

would expect less compliance from those who were previously identified. Table 6 explores this hypothesis:

Hypothesis 7: The effect of photos on compliance is smaller after one has been identified to others as having been non-compliant.

We examine this issue both with Tobit estimation and with an alternative estimation method, a double hurdle model. Tobit estimation assumes that the determinants of tax compliance have the same effect on *whether* a person evades and (conditional on evasion) on *how* compliant the person is; that is, people who choose not to evade are fundamentally the same as those who do. However, if the social costs of evasion have a fixed component, this may be an unreasonable assumption. As such, we follow Cragg (1971) and implement a double-hurdle model to relax the assumption of equivalent effects on the intensive and extensive margins, estimated with probit methods. These estimation results are presented in Table 6. Note that the dependent variable is redefined as [1-*Compliance Rate*].

In the first model, we simply relax the Tobit restrictions, and examine the effect of a photo treatment on compliance. In this model any stigma cost of pictures comes exclusively on the extensive margin. As we move horizontally across Table 6, we add complexity to each specification, by adding dummy variables to control for treatment parameters such as the probability of audit, the size of the penalty, the country in which the sessions were run, and various interaction terms. Regardless, in each specification the result remains on the extensive margin; that is, subjects in a photo treatment are as much as 130 percent less likely to evade at all. However, conditional on evading, being in a photo treatment has no negative deterrent effect. In fact, conditional on evasion, those in photo treatments are less compliant than their baseline counterparts.

While this result seems explanatory, there are some additional factors we must consider. First, following the logic that there exists a fixed stigma cost, one interesting question is what do people do given they have been previously caught evading. In Table 7 we add complexity to the hurdle model (Table 6). Specifically, we re-run the model conditional on how many times the subject has ever been caught, with times caught ranging from ever (*>0*) to at least 4 (*>3*). Given that a subject has been caught at least once, we see a comparable, albeit smaller, effect on tax evasion as above. However, this effect becomes insignificant as a subject is caught additional times and, though still insignificant, we eventually see the sign of the effect reverse (see Table 7).

Additionally, these hurdle models have used a pooled cross-section data structure. However, given the 16 consecutive rounds of the experiment, our data actually exist as a panel. We explore the implications of this design in Table 8. Here we replicate hurdle models 1-4 from Table 6 with the difference that these new models are run in the context of a random-effects panel. Again, we find that the effect of photos comes through in the first hurdle, with a similar magnitude; that is, subjects are about twice as likely to not evade, in photos treatments and in the panel model, and this effect only comes through in the first hurdle. Further, in each specification, the error terms between the first and second hurdles are uncorrelated since the transformed Rho is never significant, suggesting there is no need to use a bootstrap technique.

Finally, we ask why we only observe this effect on the extensive margin. In principle, there are two distinct possibilities. First, conditional on evasion, the evasion rates in the photo treatments are characterized by a right-shift of probability mass with respect to the baseline treatment at all levels of evasion. Second and otherwise, conditional on evasion, the evasion rates in the photo treatments are simply the left-truncated evasion rates in the baseline treatment. Note

that there are different policy implications of the two possibilities. In particular, under the latter, while a policy of disclosure increases the number of those who do not evade at all, it also increases the distance in after-tax incomes between those who evade and are not caught and those who do not evade. The result therefore may increase horizontal inequity due to tax evasion.

Figure 3 presents the cumulative distribution function (CDF) of evasion rates by treatment, conditional on evasion. It appears from Figure 3 that there is indeed a treatment effect of showing pictures in both a shift of probability mass at all levels of evasion *and* a greater mass of people evading fully. We confirm this hypothesis with a two-sample Kolmogorov-Smirnov test for equality of distributions, which suggests smaller levels of evasion in the baseline treatment ($D=0.17$, $p=0.00$).

6. Conclusions

How will individuals react to the public disclosure of their tax evasion? Will they treat public shame as an additional cost of cheating and respond by increasing their compliance? Or will the threat of public shame crowd out an individual's intrinsic motivation to obey the law, leading to a negative reaction against an intrusive government and reducing compliance as a retaliatory action.

This paper uses laboratory methods to examine the impact of disclosure on tax compliance, comparing subject responses in Italy and the United States. Our results provide strong support for the notion that public shame is an additional deterrent to tax evaders, beyond the traditional enforcement tools of higher audit rates and enhanced penalty rates. Relatively low cost disclosure could yield an important increase in compliance, on the order of around 5 percent in each country. This deterrence is equally strong in the U.S. and in Italy, despite what appears to be a different social norm of compliance in the two countries. While deterrence via audits and

fines must remain as basic elements of any sustained government policy to improve compliance, our results suggest that public disclosure of tax evaders represents an additional – and powerful – instrument.

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Table 1: Descriptive Statistics

Variable	US	Italy
Observations	1472	1248
Age	22.5	25.1
Percent Black	75.0	2.5
Percent Catholic	6.5	62.8
Percent Male	39.1	48.7

Table 2: Descriptive Statistics of Decisions

Treatment	Compliance Rate	Standard Deviation	Observations
All Sessions	71.3%	38.5	2720
Full Confidentiality	69.0	37.4	1200
Full Disclosure	73.1	39.2	1520
U.S.	69.0	40.6	1472
Italy	73.9	35.6	1248
Low Audit	66.9	39.9	1360
High Audit	75.6	36.5	1360
Low Penalty	66.4	40.2	1360
High Penalty	76.1	36.1	1360

Table 3: Average Compliance Rate by Treatment

Panel A: Italy			**Panel B: U.S.**		
Penalty: 100%	Baseline	Photos	Penalty: 100%	Baseline	Photos
Audit Probability: 20%	56.1	62.2	Audit Probability: 20%	58.0	62.6
Audit Probability: 30%	76.0	72.0	Audit Probability: 30%	67.4	74.9
Penalty: 200%	Baseline	Photos	Penalty: 200%	Baseline	Photos
Audit Probability: 20%	72.6	82.3	Audit Probability: 20%	60.8	76.9
Audit Probability: 30%	87.6	82.1	Audit Probability: 30%	72.9	73.3

Table 4: Tobit Estimation Results – Disclosure Effects			
	Model		
Explanatory Variables	(1)	(2)	(3)
Identified in Last Period with Photo	-0.571***	-0.563***	-0.526***
	(0.111)	(0.110)	(0.108)
Percent of Others Identified in Last Period	0.107	0.170	0.230
	(0.588)	(0.583)	(0.571)
Low Audit		-0.189***	-0.187***
		(0.0688)	(0.0673)
Low Penalty		-0.227***	-0.223***
		(0.0692)	(0.0676)
Italy			0.180**
			(0.0834)
Male			-0.389***
			(0.0685)
Catholic			-0.279***
			(0.0890)
Constant	1.234***	1.438***	1.595***
	(0.0520)	(0.0728)	(0.0828)
Sigma	1.124***	1.111***	1.081***
	(0.0481)	(0.0474)	(0.0461)
Observations	1,425	1,425	1,425
Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1			

Table 5: Tobit Estimation Results – Interaction Effects				
	Model			
Explanatory Variables	(1)	(2)	(3)	(4)
Identified in Last Period with Photo	0.214***	0.212***	0.123**	0.181***
	(0.0383)	(0.0380)	(0.0540)	(0.0640)
Low Audit Probability		-0.218***	-0.310***	-0.313***
		(0.0377)	(0.0550)	(0.0544)
Photos * Low Audit			0.174**	0.176**
			(0.0751)	(0.0742)
Italy				0.123**
				(0.0542)
Italy * Pictures				-0.124*
				(0.0746)
Low Penalty				-0.233***
				(0.0372)
Constant	0.870***	0.980***	1.027***	1.081***
	(0.0281)	(0.0343)	(0.0400)	(0.0522)
Sigma	0.880***	0.872***	0.871***	0.859***
	(0.0233)	(0.0230)	(0.0230)	(0.0227)
Observations	2,720	2,720	2,720	2,720
Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1				

Table 6: Effect of Photos on Evasion – Hurdle Model								
	Model							
	(1)		(2)		(3)		(4)	
Explanatory Variable	Probit	Tobit	Probit	Tobit	Probit	Tobit	Probit	Tobit
Photos	-1.256***	0.222***	-1.307***	0.225***	-1.865*	0.369***	-0.890***	0.287***
	(0.272)	(0.037)	(0.299)	(0.0366)	(1.075)	(0.057)	(0.165)	(0.0512)
Low Audit			0.105	0.146***	-0.586	0.263***	0.105	0.210***
			(0.0864)	(0.0303)	(1.025)	(0.054)	(0.176)	(0.0333)
Photos * Low Audit					0.79	-0.255***	0.0982	-0.204***
					(1.031)	(0.0725)	(0.195)	(0.0543)
Italy							4.275	-0.259***
							(92.84)	(0.0372)
Italy * Photos							-3.92	0.0358
							(92.84)	(0.0588)
Low Penalty							0.00593	0.189***
							(0.0748)	(0.0262)
Constant	1.323***	0.242***	1.326***	0.161***	1.819*	0.0987*	0.677***	0.207***
	(0.291)	(0.0394)	(0.333)	(0.0455)	(1.091)	(0.0543)	(0.166)	(0.0425)
Sigma		0.496***		0.493***		0.489***		0.455***
		(0.0186)		(0.0185)		(0.018)		(0.0122)
Observations	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720
Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1								

Table 7: Effect of Pictures on Evasion – Hurdle Model 4 at Various Levels of Being Caught								
	Model							
	(1) Ever Caught		(2) Times Caught>1		(3) Times Caught>2		(4) Times Caught>3	
Explanatory Variable	Probit	Tobit	Probit	Tobit	Probit	Tobit	Probit	Tobit
Photos	-0.581***	0.265***	-0.452	0.307***	0.449	0.272**	1.312*	0.0971
	(0.224)	(0.0595)	(0.281)	(0.0866)	(0.371)	(0.137)	(0.691)	(0.207)
Low Audit	0.102	0.240***	0.265	0.237***	5.513	0.0999	0.383	0.121
	(0.231)	(0.0400)	(0.286)	(0.0550)	(272.8)	(0.0836)	(0.523)	(0.164)
Photos * Low Audit	0.232	-0.166**	0.0794	-0.186*	-7.864	0.234	-1.162	0.0699
	(0.275)	(0.0653)	(0.368)	(0.0974)	(272.8)	(0.147)	(0.803)	(0.259)
Italy	4.349	-0.226***	5.132	-0.200***	5.652	-0.104	5.409	-0.345**
	(142.2)	(0.0433)	(811.7)	(0.0601)	(298.6)	(0.0855)	(186.2)	(0.142)
Italy * Photos	-3.992	0.105	-4.823	0.106	-4.586	-0.187	-5.746	0.284
	(142.2)	(0.0665)	(811.7)	(0.0944)	(298.6)	(0.145)	(186.2)	(0.225)
Low Penalty	0.0540	0.161***	0.00986	0.124***	2.278*	0.0579	0.446	0.112
	(0.121)	(0.0332)	(0.173)	(0.0477)	(0.692)	(0.0745)	(0.492)	(0.165)
Constant	0.730***	0.243***	0.572**	0.254***	-0.218	0.296***	-0.238	0.503***
	(0.231)	(0.0512)	(0.275)	(0.0703)	(0.294)	(0.0930)	(0.382)	(0.143)
Sigma		0.424***		0.433***		0.462***		0.402***
		(0.0137)		(0.0191)		(0.0279)		(0.0407)
Observations	1,337	1,337	728	728	312	312	113	113
Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1								

Table 8: Effect of Photos on Evasion – Random Effects Hurdle Model								
	Model 1		Model 2		Model 3		Model 4	
Explanatory Variable	Hurdle	Above	Hurdle	Above	Hurdle	Above	Hurdle	Above
Photos	-	-0.0435	-	-0.0453	-	0.0138	-	0.108
	(0.286)	(0.0810)	(0.285)	(0.0801)	(0.285)	(0.0833)	(0.296)	(0.0843)
Low Audit				0.163***		0.219***		0.221***
				(0.0218)		(0.0305)		(0.0299)
Photos * Low Audit						-		-
						(0.0434)		(0.0425)
Italy								-0.114
								(0.0801)
Italy * Photos								0.0096
								(0.113)
Low Penalty								0.178***
								(0.0213)
Constant	1.642***	0.195***	1.641***	0.114***	1.640***	0.0854*	1.584***	0.0777
	(0.248)	(0.0425)	(0.248)	(0.0439)	(0.247)	(0.0453)	(0.256)	(0.0601)
$Sigma_u$		0.309***		0.309***		0.309***		0.331***
		(0.0261)		(0.0262)		(0.0262)		(0.0278)
$Sigma_e$		0.487***		0.480***		0.478***		0.468***
		(0.0102)		(0.0100)		(0.01000)		(0.00977)
Transformed Rho		0.233		0.247		0.245		-0.533
		(0.473)		(0.474)		(0.475)		(0.473)
Observations	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720
Standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.1								

Figure 1: Tax Filing Decision

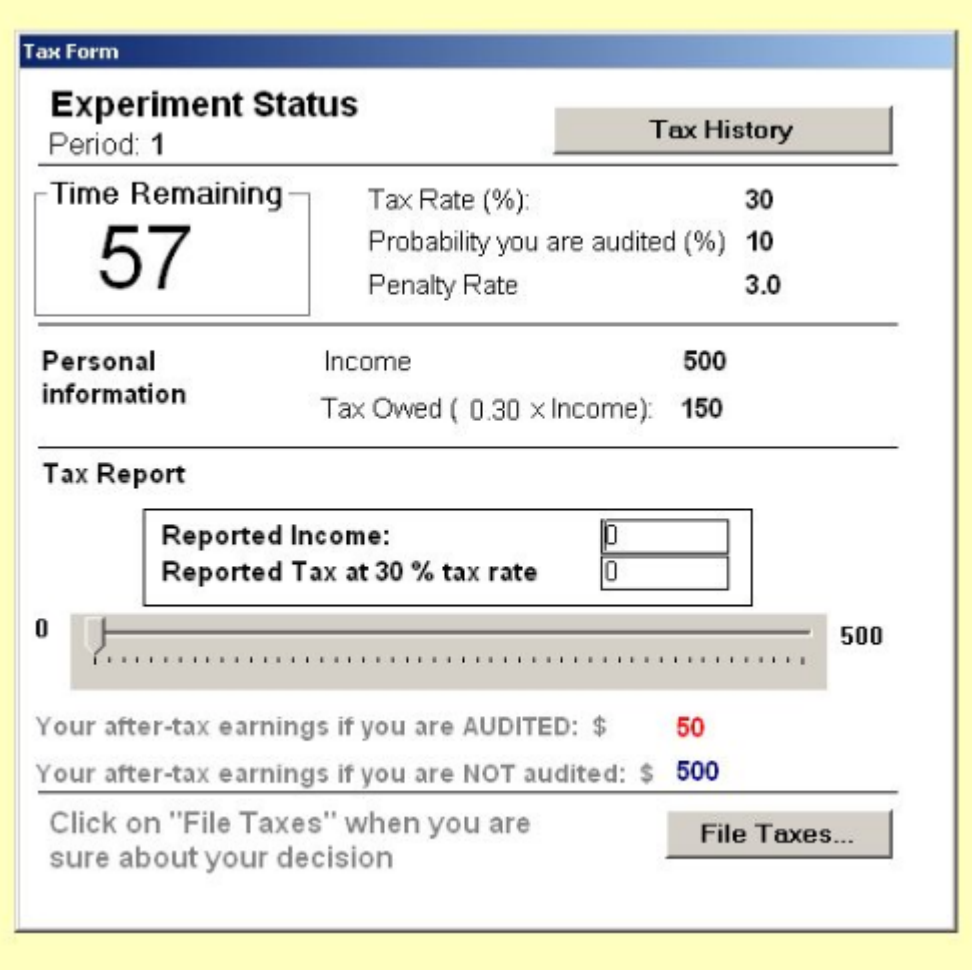
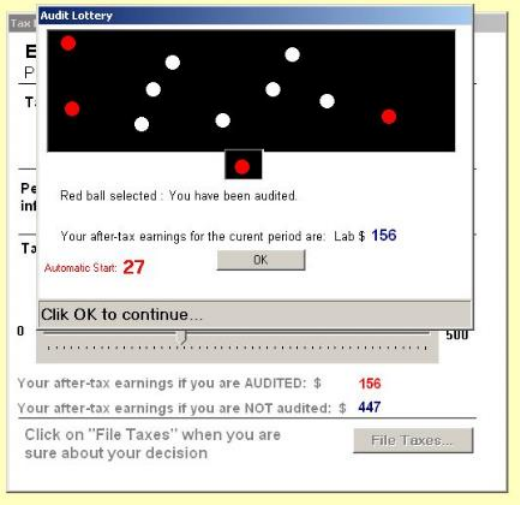


Figure 2: Audit and Post-Audit Information



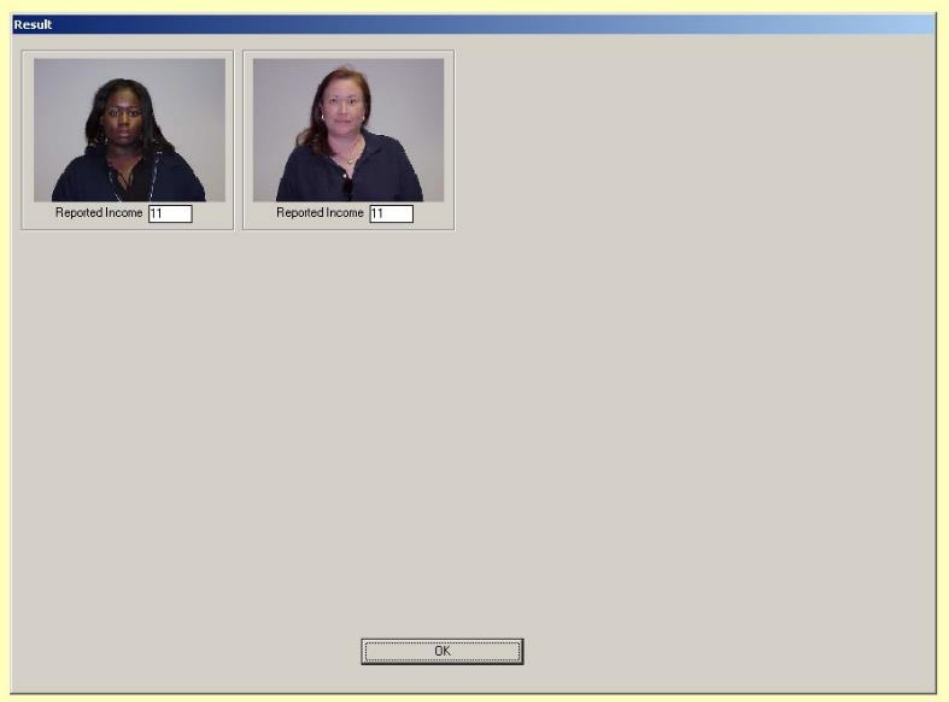
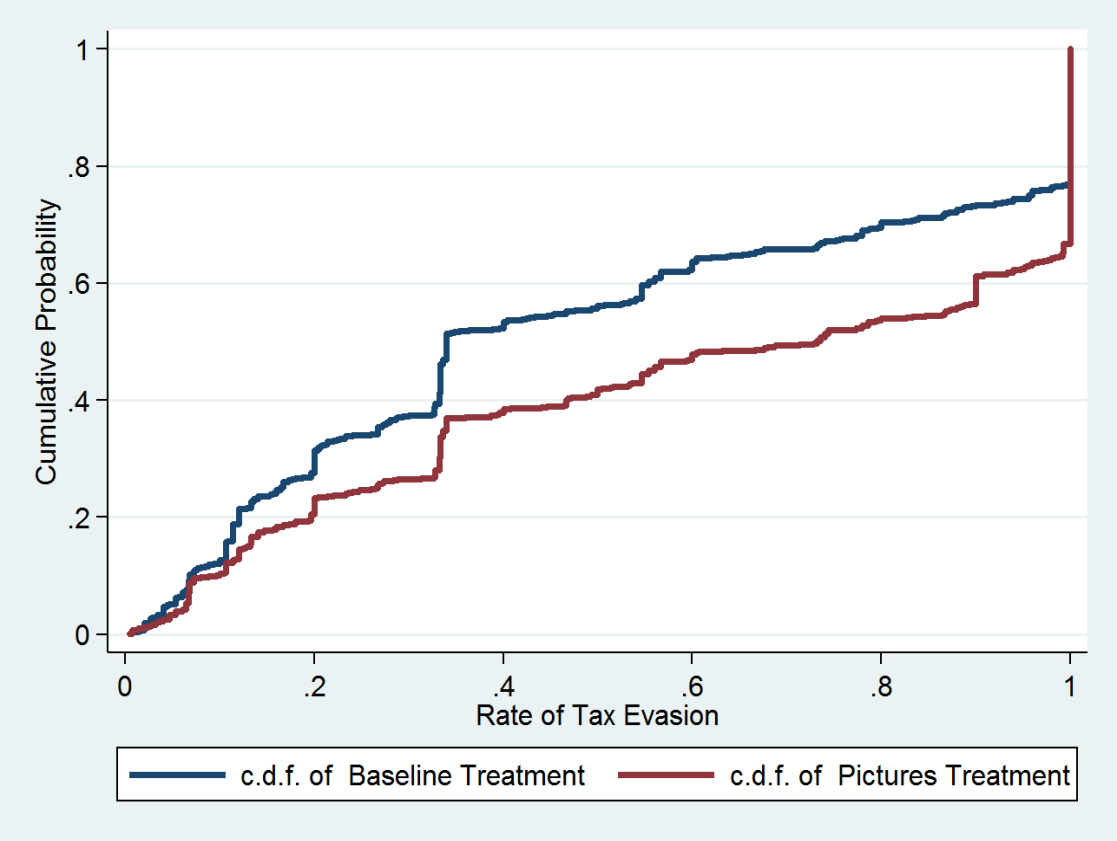


Figure 3: CDF of Evasion Rates by Treatment



APPENDIX A: EXPERIMENT INSTRUCTIONS

Instructions (No Information)

This is an experiment about economic decision making. The study will last no more than 2 hours. You will receive $10 for your participation and will have the opportunity to increase this amount based on the decisions you make. Your earnings will be paid to you in cash at the end of the study. Your decisions and payments will be kept private. How your decisions affect your earnings is explained below.

The decisions made in this experiment are tax reporting decisions. In each round, you will be given an income of $50. You will have to report your income to a tax authority and pay taxes on reported income. The tax rate is 35%. Thus, your taxes will be 0.35* (reported income). After you submit your taxes, there is a chance that you will be audited by the tax authority. The probability of audit is 30%, and the computer will use a random number generator to decide whether the audit will occur. If you are audited and you have reported less than your full income, this will be detected by the audit and you will be required to pay a fine on the unpaid taxes. You will pay two times the unpaid taxes. In other words, if you have unreported income and you are audited, a penalty which equals 2.0*0.35*(actual income - reported income) will be subtracted from your after-tax-income to get your final income for the round.

How your earnings will be determined

If you are not audited, your earnings for the round will be

Actual income – 0.35 (reported income)*

If you are audited, your earnings for the round will be

Actual income-taxes paid-penalty for undisclosed income
=actual income-0.35(reported income)-2*0.35 (actual income-reported income)*

Examples

These examples will demonstrate the type of decision you will be making and how your earnings will be determined.

Example 1. Suppose your income for the round is $50 and that you report $50 as your income. Then you will pay 0.35*$50.00 = $17.50 in taxes.

If not audited, your earnings for the round will be $50 - $17.50 = $32.50

If audited, your earnings for the round will be $50 - $17.50 = $32.50

Example 2. Suppose your income for the round is $50.0 and that you report $30.00 as your income. Then you will pay 0.35*$30 = $10.50 in taxes

If not audited, your earnings for the round will be $50 - $10.50 = $39.50

If audited, the audit will detect unreported income of $20.00 ($50 - $30). You will be required to pay 2 times the tax owed on this unreported income which equals 2*0.35*($20) = $14. Your earnings for the round will be $50 - $10.50 - $14 = 25.50

The experiment will have 10 rounds, but only one of these will count for payment. At the end of the experiment, a 10-sided die will be rolled to determine which round will count for payment. After the round is selected for payment, you will be paid in cash your earnings in that round. Each round is equally likely to be selected, but you will not know in advance which one will be chosen.

If you have any questions, please raise your hand and one of us will come to your desk to answer it.

Instructions (Information)

This is an experiment about economic decision making. The study will last no more than 2 hours. You will receive $10 for your participation and will have the opportunity to increase this amount based on the decisions you make. Your earnings will be paid to you in cash at the end of the study. Your decisions and payments will be kept private. How your decisions affect your earnings is explained below.

The decisions made in this experiment are tax reporting decisions. In each round, you will be given an income of $50. You will have to report your income to a tax authority and pay taxes on reported income. The tax rate is 35%. Thus, your taxes will be 0.35* (reported income). After you submit your taxes, there is a chance that you will be audited by the tax authority. The probability of audit is 30%, and the computer will use a random number generator to decide whether the audit will occur. If you are audited and you have reported less than your full income, this will be detected by the audit and you will be required to pay a fine on the unpaid taxes. You will pay two times the unpaid taxes. In other words, if you have unreported income and you are audited, a penalty which equals 2.0*0.35*(actual income - reported income) will be subtracted from your after-tax-income to get your final income for the round.

How your earnings will be determined

If you are not audited, your earnings for the round will be

Actual income – 0.35 (reported income)*

If you are audited, your earnings for the round will be

Actual income-taxes paid-penalty for undisclosed income
=actual income-0.35(reported income)-2*0.35 (actual income-reported income)*

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If not audited, your earnings for the round will be $50 - $17.50 = $32.50

If audited, your earnings for the round will be $50 - $17.50 = $32.50

Example 2. Suppose your income for the round is $50.0 and that you report $30.00 as your income. Then you will pay 0.35*$30 = $10.50 in taxes

If not audited, your earnings for the round will be $50 - $10.50 = $39.50

If audited, the audit will detect unreported income of $20.00 ($50 - $30). You will be required to pay 2 times the tax owed on this unreported income which equals 2*0.35*($20) = $14. Your earnings for the round will be $50 - $10.50 - $14 = 25.50

The experiment will have 10 rounds, but only one of these will count for payment. At the end of the experiment, a 10-sided die will be rolled to determine which round will count for payment. After the round is selected for payment, you will be paid in cash your earnings in that round. Each round is equally likely to be selected, but you will not know in advance which one will be chosen.

In each round, you will be shown the income reported by 25 percent of the subjects in this experiment. After you have viewed your earnings information from the current round, you will be shown a table showing the level of reported income by 25 percent of the people in this session. You will see a 3-digit ID code of a subject and the income reported by this subject. You will NOT be told which ID code belongs to which person in this room.

Every round 25 percent of your returns will be randomly chosen to be shown to the others, thus the returns you see may be for different subjects in different rounds.

If you have any questions, please raise your hand and one of us will come to your desk to answer it.