Abstract - Can a simplified United States tax system act as an effective deterrent to individual income tax evasion? Deterrence is usually sought through alternative methods that create fear, for example, increasing the probability of an audit. In contrast, this paper analyzes whether a simple tax system creates comfort and encourages compliance. Using data from the 1990 Taxpayer Opinion Survey, our approach is to estimate an empirical model that explores the connections between (i) taxpayer perceptions of the complexity of the tax system, (ii) taxpayer perceptions of the unfairness of the tax system, and (iii) taxpayer noncompliance. The results suggest that simplifying the tax system may not be an effective deterrent to tax evasion because taxpayers do not necessarily consider a complex tax system to be unfair.

INTRODUCTION

In his thoughtful book, The Decline (and Fall?) of the Income Tax, Michael Graetz (1997) suggests that simplifying the tax system may be the most effective route to increasing taxpayer compliance. In his view, “The Pollyannaish notion that compliance problems will disappear if we lower tax rates or shift from an income to a consumption tax does not withstand even cursory analysis . . . [but] because taxpayer morale is important, tax simplification may be a more promising course” (Graetz, 1997, p. 105). Using survey data, this paper explores the links between perceptions of simplicity of the tax system and compliance.

Much of the existing literature on compliance focuses on the problem of deterrence. The goal of deterring evasion is usually sought through methods that create fear, for example, through increasing the probability of an audit or increasing the magnitude of a fine. The seminal article by Allingham and Sandmo (1972) analyzed the effect of audits and fines on individual utility maximization. The question analyzed in this paper is whether deterrence can also be achieved by positive incentives, as suggested by Smith and Stalans (1991). Positive incentives are actions, other than threats of punishment, intended to increase compliance with laws. For example, a simplified tax system may create comfort (i.e., encourage compliance).1

1 Proposals on exactly how to simplify the tax system are not presented in this paper; for discussions, see Slemrod (1986, 1995).
Several studies have taken alternative approaches to exploring the relationship between complexity, unfairness, and non-compliance. Sheffrin (1994) concluded that a “flat-tax” may or may not be perceived as unfair, depending on the public’s knowledge and understanding of different notions of progressivity. Kaplow (1996) discusses examples of simple tax system scenarios that may be unfair. Smith (1992), using data from the 1987 Taxpayer Opinion Survey (Harris and Associates, 1988), found that complexity and fairness were just two of many factors affecting compliance.

Although our initial hypothesis was that complexity would lead to perceived unfairness, upon further reflection it is clear that there are several other countervailing theoretical factors. Warskett, Winer, and Hettich (1998) develop a theoretical explanation for the complexity of the tax system as an equilibrium outcome in a political economy framework (see also Hettich and Winer, 1988; 1999). Kaplow (1998) raises another justification for a complex tax structure emphasizing the benefits to measuring income accurately (see also Kaplow, 1995). In summary, there is no necessary theoretical link between the complexity of the tax system and its perceived unfairness that will hold over all places and time. Rather it will be an empirical question that needs to be addressed in the context of a specific tax system.

The next section presents our empirical analysis including a description of the data, the econometric model, and the results. We also discuss some caveats. The final part of the paper highlights our findings and suggests an avenue for further research.

EMPIRICAL ANALYSIS

To preview our empirical results, we do not find a consistent link between complexity and noncompliance. We conclude that complexity does not necessarily yield perceptions of an unfair tax system, but perceptions of an unfair tax system (whatever their source) may be a cause of non-compliance. This implies that deterrence of tax evasion may not necessarily be achieved by targeting tax laws for simplification.

Data and Model Specification

Our data set is the 1990 Taxpayer Opinion Survey, sponsored by the United States Internal Revenue Service and based on an in–person interview survey of United States income tax filers, conducted by Schulman, Ronca, & Bucuvalas, Incorporated. Although two versions of the survey were administered, since responses to each version separately reflect a national sample, in certain situations we treat similar (but not identical) questions from each version as though they were the same question. The 1990 Taxpayer Opinion Survey consists of responses collected in the fall of 1990 from 1,784 taxpayers. For various reasons, e.g., a taxpayer responded “not sure” or “refused,” we were forced to re-

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2 The data set was obtained from the National Archives and Records Administration.
3 “The 1990 survey was commissioned as a 30 minute interview, while previous surveys had averaged approximately an hour in length. In order to permit the maximum number of trended questions and new issue areas within the parameters of a 30 minute interview, a split–half design for the sample and the questionnaire was developed. Two versions of the survey instrument (Version 1 and 2) were designed. Approximately 80 percent of the items were identical in the two questionnaires and asked of all survey respondents. However, each version had a subset of unique questions which were asked of half of the total sample. The two versions of the survey instrument were administered in two different, randomly selected areas within each of the 100 primary sampling units. Hence, each version of the survey instrument with its unique questions was administered to a national area probability sample of taxpayers. The completed sample size for the split–half questions would be approximately half the size of the total sample.” Schulman, Ronca, & Bucuvalas (1991, p. V–2).
duce the sample we analyzed to 1,194 observations. Tables 1 and 2 report both our (reduced) sample means and the (original) survey means/frequencies (for most variables). A comparison reveals little difference.

Our econometric analysis is based on a 3–stage partially recursive structure:

Stage 1  Stage 2  Stage 3
Complexity → Unfairness → Evasion

The rationale for the model is that perceptions about complexity are formed at the first stage, which affect perceptions of unfairness formed at the second stage. Finally, perceptions of unfairness affect noncompliance at the third stage.

The foundations for our econometric model are found in the existing literature. Maddala (1983, pp. 108–13) discusses recursive logistic models and develops (Maddala, 1983, Model 6 with equation (5.51)) a model very similar to the one described in this paper, except that his model uses a probit, rather than an ordered probit, regression. Maddala and Lee (1976) discuss an example using a logit regression; Lee and Maddala (1994, 1979) elaborate on how to calculate the correct standard errors.

We estimate an ordered probit model for each stage using maximum likelihood. The ordered probit model, in its general form, is discussed by both Greene (1997, pp. 926–31) and Maddala (1983, pp. 46–9). Since we use a variable for scaled income as a regressor in each stage, we assume that heteroscedasticity exists. Specifically, we assume multiplicative heteroscedasticity, therefore the basic model for each stage is as follows:

\[ y_i^* = \beta' x_i + \epsilon_i \quad \epsilon_i \sim N [0, \sigma_i^2] \]

\[ \sigma_i^2 = (e^{\alpha IC_i})^2, \]

where IC<sub>i</sub> is scaled income for individual <i>i</i>. The µ's or thresholds are unknown parameters to be estimated along with <p> and <i>α</i>. The regression model determines the influence of the vector of variables (x<sub>i</sub>) on the unobserved (latent) continuous variable (y<sub>i</sub>^*). Note that (α = 0) indicates a homoscedastic disturbance; we test whether our heteroscedastic specification is justified, by determining whether we can reject the null hypothesis (H<sub>0</sub>: α = 0).

In the first stage (denoted by the subscript “1”), an ordered probit regression is used to analyze the factors that influence a taxpayer’s determination that the tax system is complex:

\[ y_i = 0 \quad \text{if} \quad y_i^* \leq 0 \]
\[ y_i = 1 \quad \text{if} \quad 0 < y_i^* \leq \mu_i \]
\[ y_i = 2 \quad \text{if} \quad \mu_i < y_i^* \leq \mu_2, \]
\[ \vdots \]
\[ y_i = J \quad \text{if} \quad \mu_{J-1} < y_i^* . \]

The µ’s or thresholds are unknown parameters to be estimated along with β and α. The regression model determines the influence of the vector of variables (x<sub>i</sub>) on the unobserved (latent) continuous variable (y<sub>i</sub>^*). Note that (α = 0) indicates a homoscedastic disturbance; we test whether our heteroscedastic specification is justified, by determining whether we can reject the null hypothesis (H<sub>0</sub>: α = 0).

In the first stage (denoted by the subscript “1”), an ordered probit regression is used to analyze the factors that influence a taxpayer’s determination that the tax system is complex:

\[ y_{1i} = \beta'_{1i} x_{1i} + \epsilon_{1i} . \]

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4 We use the term “partially” recursive to refer to the fact that not all previous stages directly influence all future stages, i.e., Stage 1 does not directly influence Stage 3. For completeness, we also estimate “fully” recursive models, in which all previous stages do directly influence all future stages. These fully recursive model estimates are not reported since they support the key results found with our partially recursive model.

5 Survey participants were asked to specify their total income, plus their spouse’s total income, within a certain range. The mean of the range, divided by 10,000, is used as the scaled income variable.


7 The ordered probit model “allows for nonlinear effects by letting the data determine the partition boundaries” (i.e., the µ’s). Hausman et. al., 1992, p. 363.
The unobserved continuous variable \( (y'_{1i}) \) measures individual \( i \)’s response to 1990 Taxpayer Opinion Survey (Schulman, Ronca, & Bucuvalas, 1991, p. III–8) question no. 10:

version 1 – ”Thinking about how easy or difficult it is to fill out your tax form, how” complicated do you think our federal income tax laws and rules are for your particular income situation? Please answer using this scale of [0] to [5] where [0] is not at all complicated and very easy to understand, and [5] is extremely complicated and very difficult to understand;”

version 2 – ”How complicated do you think our federal income tax laws and rules are for your own particular income situation? Please answer using this scale of [0] to [5] where [0] is not at all complicated and [5] is extremely complicated.”

The key regressor in Stage 1 is a dummy variable indicating the type of tax form used when the taxpayer last filed. The tax form dummy variable is included as a proxy for compliance costs; i.e., higher compliance costs (longer tax forms) are expected to be associated with greater perceived complexity:

\[
(y'_{2i}) = \beta \cdot x_{2i} + \gamma \cdot \bar{y}_{1i} + \epsilon_{2i},
\]

where \( \bar{y}_{1i} \) is an estimated probability that individual \( i \) responds that federal income tax laws and rules are “extremely complicated.”

The omitted categories are: (i) short form, 1040–EZ (for single people, under $50,000 income) and (ii) regular short form, 1040–A.

Slemrod (1989a) hypothesized that complexity increases the cost of complying with tax laws and therefore increases noncompliance. In another article, Slemrod (1989b) discussed simulation results on the likely impact of eliminating itemized deductions and instituting a “flat–rate” income tax system. Slemrod found that a “flat–rate” would not be sufficient to significantly reduce the cost of compliance. We propose a different causal direction than Slemrod, i.e., higher compliance costs cause higher perceived complexity.

In addition to the key regressor (the tax form variable in Stage 1), seven socioeconomic variables are included in each stage: age, education, household income, dummy variables set equal to one if the respondent owed their home, if the respondent was married, if the respondent was male, and a dummy variable set equal to one if the respondent (or respondent’s spouse) was self–employed. These variables all reflect differences in socioeconomic status, which may be correlated with different attitudes towards the tax system.

In the second stage (denoted by the subscript “2”), an ordered probit regression is used to analyze the factors that influence a taxpayer’s determination that the tax system is unfair:

\[
(y'_{3i}) = \beta \cdot x_{3i} + \gamma \cdot \bar{y}_{2i} + \epsilon_{3i},
\]

where \( \bar{y}_{2i} \) is an estimated probability that individual \( i \) responds that federal income tax laws and rules are “extremely complicated.”

The unobserved continuous variable \( (y'_{3i}) \) measures individual \( i \)’s response to 1990 Taxpayer Opinion Survey (Schulman,
Ronca, & Bucuvalas, 1991, p. III–4) question no. 2:

“How do you feel about the federal income tax system as it applies to the 1989 tax return—do you feel it is \textit{quite} fair to most people, or \textit{reasonably} fair, or somewhat \textit{unfair}, or \textit{quite} unfair to most people?”

As a proxy for complexity, we use estimation results from the first stage, i.e., the estimated probability that each individual responds that federal income tax laws and rules are “extremely complicated.”\textsuperscript{10} This complexity proxy is the regressor denoted $y^*_2 = \beta_2 X_2 + \gamma_2 \cdot \bar{Y}_1 + \epsilon_2$, and is used to estimate the influence on perceived unfairness, assuming that perceived complexity of the tax system was evaluated first (and not simultaneously).

We offer the following justification for using a proxy for complexity (an estimated probability from the first stage) in the second stage, rather than actual observed values (see Greene, 1997, pp. 926–7). The observed values for complexity (i.e., 0, 1, …, 5) where “5” is extremely complicated and “0” is not at all complicated, do not convey information regarding the respondents’ intensity of feelings. A respondent chooses the value that most closely represents their own feelings on the survey question, but the difference between, say, a “5” and a “4” is the same as between a “4” and a “3”. The proxy for complexity, which can take on a wide range of values between “0” and “1” for each individual, attempts to better capture the respondents’ intensity of feelings that depend on the regressors ($X_2$). This argument, for using an estimated probability (proxy) in a subsequent stage, also applies in the next step using a proxy for unfairness as a regressor in the final (evasion) stage.

In addition to the proxy for complexity, two key regressors (expected to affect the taxpayer’s perception regarding unfairness of the tax system) are examined in Stage 2: (i) a dummy variable representing perceived inadequate public good supply, and (ii) respondent’s perception of the percentage of cheaters. These additions are based on prior research by Bordignon (1993), citing Spicer and Lundstedt (1976), suggesting that the tax payment that the taxpayer considers fair is a function of (i) public good supply (i.e., is the quantity/quality of government supplied goods adequate relative to the individual tax payment?), and (ii) the tax rate structure and/or perceived tax evasion by others (i.e., are all taxpayers paying their fair share?).

In the third (and final) stage (denoted by the subscript “3”), an ordered probit regression is used to analyze the factors which influence tax evasion:

$$y^*_3 = \beta_3 X_3 + \gamma_3 \cdot \bar{Y}_2 + \epsilon_3$$

where $\bar{Y}_2$ is estimated $\text{Prob}(y^*_2 = \text{“quite unfair”})$ i.e., estimated probability that individual $i$ responds that the federal income tax system is “quite unfair.”

The unobserved continuous variable ($y^*_3$) measures individual $i$’s response to 1990 Taxpayer Opinion Survey (Schulman, Ronca, & Bucuvalas, 1991, pp. III–10, III–11) question nos. 14 and 15:

question no. 14—“By the same token, within the \textit{past five years} or so, do you think you may have \textit{overstated any} deductions or expenses—like medical, charitable or business deductions, and so forth—even by \textit{just a small amount}? Would you say you definitely have, probably have, probably have not, or definitely have not \textit{overstated any}?"

\textsuperscript{10} Since an estimated probability is used as a regressor in the second stage (as well as in the third stage), the standard errors are corrected using the method described by Greene (1997, p. 142). As a practical matter, the correction factor is approximately zero, i.e., the uncorrected standard errors are virtually identical to the corrected standard errors. Therefore our results are reported without mentioning the correction.
question no. 15—“Within the past five years or so, do you think you may have left some reportable income off your federal tax returns—even just a minor amount? Would you say you definitely have, probably have, probably have not, or definitely have not?”

Individual responses to both questions 14 and 15 are combined to form one variable indicating the highest level of admitted evasion. For example, if the response to question no. 14 is “probably have,” but the response to question no. 15 is “definitely have not,” then we infer the fictitious response: “probably have evaded.”

As a proxy for unfairness, we use estimation results from the second stage, i.e., the estimated probability that each individual responds that the federal income tax system is “quite unfair.” This unfairness proxy is the regressor denoted \( \bar{y}_2 \), and is used to estimate the influence on tax evasion, assuming that perceived unfairness of the tax system was evaluated first (and not simultaneously).

In addition to the proxy for unfairness, two key regressors (expected to affect evasion) are included in Stage 3: (i) a dummy variable indicating that the respondent always seeks help to complete his/her tax forms, and (ii) respondent’s perception of the probability of an audit. A higher probability of an audit is commonly thought to deter evasion. On the other hand, the dummy variable indicating that respondent seeks help (e.g., from an accountant) is included based on prior research by Erard (1993) suggesting that such assistance may be associated with increased evasion.

Tax form variables are also included as regressors in Stage 3. Here, rather than acting as proxies for compliance costs in Stage 1, the type of tax form used is intended to proxy for the opportunity to evade; i.e., longer tax forms imply greater opportunity.

**Descriptive Statistics**

Table 1 reports the descriptive statistics for the non–dummy variables. Looking at the sample mean values for the variables, members of our sample tend to perceive the United States income tax system as both complex (\( CX \)) and unfair (\( UR \)), but also respond that they probably have not evaded (\( EV \)) (despite believing on average that 42 percent of Americans do cheat (\( CT \))).

Our average sample participant is 43 years old (\( AE \)), with 1 to 2 years of college education (\( EC \)), and an annual household income (\( IC \)) of $35,000.

The sample mean for our perceived probability of an audit variable (\( PA \)) is 0.15. This is consistent with the observation by Erard and Feinstein (1994) that in response to survey questions, taxpayers, on average, overestimate the probability of an audit; the actual probability of an audit was approximately 0.01 in 1986 (Erard and Feinstein, 1994, p. 78).

Table 2 reports the descriptive statistics for the dummy variables. Our sample participants tend to be married (\( MR \)), own their own home (\( OW \)), and feel that they do not get what they pay for in terms of public good supply from the government (\( IP \)).

The survey frequency for married (\( MR \)) participants is noticeably lower than our sample mean (i.e., 0.51 < 0.67). This implies that when the sample was reduced (mainly due to “not sure” responses) from its original level of 1,784 down to 1,194 participants, many of the nonmarried participants were dropped. This increased the...
homogeneity of the sample towards “married,” and may have contributed to the result in some of our regressions that the married (MR) variable is not statistically significant.

As a preliminary estimation of the data, Table 3 reports the (Jöreskog, 1994, polychoric) correlation matrix for the three primary variables: complexity (CX), unfairness (UR), and evasion (EV). All correlations are positive, which is consistent with our initial hypothesis that complexity leads to perceived unfairness; but none of the correlations are strikingly close to 1. It is noteworthy that the positive correlations between (i) complexity (CX) and unfairness (UR), and (ii) complexity (CX) and evasion (EV), are both stronger (i.e., closer to 1) than the correlation between unfairness (UR) and evasion (EV). However, these are simple correlations and do not include the effects of conditioning variables.

### TABLE 1

<table>
<thead>
<tr>
<th>Variable Description</th>
<th>Sample Mean</th>
<th>Sample S. Dev.</th>
<th>Sample Min.</th>
<th>Sample Max.</th>
<th>Survey Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(CX) tax system complexity</td>
<td>2.92</td>
<td>1.60</td>
<td>0.00</td>
<td>5.00</td>
<td>(1) 2.91</td>
</tr>
<tr>
<td>0 = not complicated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) 3.04</td>
</tr>
<tr>
<td>5 = extremely complicated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(AE) age</td>
<td>43.42</td>
<td>15.04</td>
<td>18.00</td>
<td>87.00</td>
<td>45.60</td>
</tr>
<tr>
<td>(EC) education</td>
<td>13.49</td>
<td>2.61</td>
<td>0.00</td>
<td>20.00</td>
<td>13.34</td>
</tr>
<tr>
<td>(IC) scaled income (including spouse)</td>
<td>3.50</td>
<td>2.28</td>
<td>0.25</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td>(UR) tax system unfairness</td>
<td>1.82</td>
<td>0.86</td>
<td>0.00</td>
<td>3.00</td>
<td>1.78</td>
</tr>
<tr>
<td>0 = quite fair</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 = quite unfair</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(CT) perceived percent of taxpayers cheat</td>
<td>0.42</td>
<td>0.25</td>
<td>0.00</td>
<td>1.00</td>
<td>0.43</td>
</tr>
<tr>
<td>(PC) proxy for complexity</td>
<td>0.21</td>
<td>0.15</td>
<td>0.01</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>(EV) either: overstate deduction, or</td>
<td>0.87</td>
<td>1.02</td>
<td>0.00</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>understate income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = definitely have not</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 = definitely have</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(PA) perceived probability of an audit</td>
<td>0.15</td>
<td>0.16</td>
<td>0.00</td>
<td>1.00</td>
<td>0.16</td>
</tr>
<tr>
<td>(PU) proxy for unfairness</td>
<td>0.25</td>
<td>0.09</td>
<td>0.05</td>
<td>0.55</td>
<td></td>
</tr>
</tbody>
</table>

*Mean reported (from those who answered the question), if any, by Schulman, Ronca, & Bucuvalas (1991) for the entire survey sample of 1,784 taxpayers or, where applicable, for the Version 1 survey sample of 890 taxpayers and for the Version 2 survey sample of 894 taxpayers. For tax system unfairness (UR), where no mean was reported by Schulman, Ronca, & Bucuvalas (1991), we compute a mean using the frequencies reported. Numbers in parentheses refer to the survey version (i.e., 1 or 2). Unless noted otherwise, where our numerical codes differ from those used in the original survey, we report a survey mean that is consistent with the numerical codes used to derive our sample mean.

This variable is the response to the question: “What was the last grade of school you completed?” (Schulman, Ronca & Bucuvalas, 1991, p. III–31). For example, 12 = completed high school, 16 = completed college. We treated a response of “post high school training, but no college” as equivalent to one year of college, i.e., 13 (which differs from the numerical code of 21 used in the original survey).

This variable is the highest value response from two questions: “Looking at this card and considering all sources of income, what was the approximate total income of your own before taxes in 1989?” and “Now look at the card again and tell me … the total amount of your own income plus your spouse’s income in 1989.” (Schulman, Ronca & Bucuvalas, 1991, p. III–33). Survey participants were asked to specify the total income, within a certain range. The mean of the range, divided by 10,000, is used as the scaled income variable. A response of “$100,000 or more” is assigned a numerical code of 10.

This variable is the response to the question: “By the way, about what percent of taxpayers would you say try to cheat on their taxes to some extent?” (Schulman, Ronca, & Bucuvalas, 1991, p. III–13). The response is divided by 100.

Estimated probability that individual i responds that federal income tax laws are “extremely complicated.”

This variable is the response to the question: “As you may know, an audit is when you have to go to an IRS (Internal Revenue Service) office or they come to your house or business or they may correspond with you, and you are asked to prove your deductions or answer questions about your tax return. The question I have is: out of every 100 taxpayers at your income level, how many or what percent do you think were audited last year?” (Schulman, Ronca, & Bucuvalas, 1991, p. III–14). The response is divided by 100.

Estimated probability that individual i responds that the federal income tax system is “quite unfair.”
Econometric Results

We now proceed with a formal econometric model and testable hypotheses to more fully explore the relationships between complexity, unfairness, and evasion. The left–side of Table 4 reports our recursive ordered probit estimation results. The right–side of Table 4 is included for comparison purposes and will be discussed later. In analyzing the results, we focus on the signs of the coefficients and the statistical significance of the regressors. With the ordered probit model, the marginal effects for a change in the value of a regressor can be computed for every dependent variable category (i.e., for all \( J + 1 \) categories) (see Greene, 1997, pp. 927–31, for a discussion). For example, if a taxpayer’s age increases, we can calculate the marginal effect on the probability that an average taxpayer perceives the tax system to be (i) not at all complicated, (ii) extremely
### TABLE 4
3–STAGE ORDERED PROBIT

\[ y_i^* = \beta'x_i + \varepsilon_i \]

| Variable | Coefficients
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Recurrent Structure</strong></td>
<td>Complexity</td>
<td>Unfairness</td>
</tr>
<tr>
<td>( x_i ) constant</td>
<td>1.194</td>
<td>1.289</td>
</tr>
<tr>
<td>(LL) long form</td>
<td>0.286</td>
<td>0.360</td>
</tr>
<tr>
<td>(DR) don’t remember</td>
<td>0.263</td>
<td>0.268</td>
</tr>
<tr>
<td>(IP) inadequate goods</td>
<td>0.438</td>
<td>0.156</td>
</tr>
<tr>
<td>(CT) taxpayers cheat</td>
<td>0.260</td>
<td>0.054</td>
</tr>
<tr>
<td>(HP) tax help</td>
<td>-0.074</td>
<td>0.689</td>
</tr>
<tr>
<td>(PA) probability of audit</td>
<td>-0.170</td>
<td>0.152</td>
</tr>
<tr>
<td>(AE) age</td>
<td>0.007</td>
<td>0.005</td>
</tr>
<tr>
<td>(EC) education</td>
<td>-0.061</td>
<td>-0.016</td>
</tr>
<tr>
<td>(IC) income</td>
<td>0.033</td>
<td>0.027</td>
</tr>
<tr>
<td>(OW) own home</td>
<td>0.153</td>
<td>0.046</td>
</tr>
<tr>
<td>(MR) married</td>
<td>0.049</td>
<td>0.033</td>
</tr>
<tr>
<td>(SF) self-employed</td>
<td>0.316</td>
<td>0.223</td>
</tr>
<tr>
<td>(ME) male</td>
<td>0.002</td>
<td>-0.098</td>
</tr>
<tr>
<td>(PC) proxy complexity</td>
<td>-0.317</td>
<td>-0.317</td>
</tr>
<tr>
<td>(PLI) proxy unfairness</td>
<td>-0.053</td>
<td>-0.035</td>
</tr>
</tbody>
</table>

### Reduced Form

| Variable | Coefficients
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>( x_i ) constant</td>
<td>1.194</td>
<td>1.289</td>
</tr>
<tr>
<td>(LL) long form</td>
<td>0.286</td>
<td>0.360</td>
</tr>
<tr>
<td>(DR) don’t remember</td>
<td>0.263</td>
<td>0.268</td>
</tr>
<tr>
<td>(IP) inadequate goods</td>
<td>0.438</td>
<td>0.156</td>
</tr>
<tr>
<td>(CT) taxpayers cheat</td>
<td>0.260</td>
<td>0.054</td>
</tr>
<tr>
<td>(HP) tax help</td>
<td>-0.074</td>
<td>0.689</td>
</tr>
<tr>
<td>(PA) probability of audit</td>
<td>-0.170</td>
<td>0.152</td>
</tr>
<tr>
<td>(AE) age</td>
<td>0.007</td>
<td>0.005</td>
</tr>
<tr>
<td>(EC) education</td>
<td>-0.061</td>
<td>-0.016</td>
</tr>
<tr>
<td>(IC) income</td>
<td>0.033</td>
<td>0.027</td>
</tr>
<tr>
<td>(OW) own home</td>
<td>0.153</td>
<td>0.046</td>
</tr>
<tr>
<td>(MR) married</td>
<td>0.049</td>
<td>0.033</td>
</tr>
<tr>
<td>(SF) self-employed</td>
<td>0.316</td>
<td>0.223</td>
</tr>
<tr>
<td>(ME) male</td>
<td>0.002</td>
<td>-0.098</td>
</tr>
<tr>
<td>(PC) proxy complexity</td>
<td>-0.317</td>
<td>-0.317</td>
</tr>
<tr>
<td>(PLI) proxy unfairness</td>
<td>-0.053</td>
<td>-0.035</td>
</tr>
</tbody>
</table>

\[ a \text{See Tables 1 and 2 for variable descriptions.} \]

\[ b \text{In parentheses, the } z \text{-statistic is the parameter estimate divided by its asymptotic standard error, i.e., the null hypothesis is that the coefficient equals zero.} \]

\[ c \sigma_i^2 = (e^{i} + k)^2. \]
complicated, and/or (iii) any response category between “not at all” and “extremely” complicated.

As a formal matter, the sign of the marginal effects for the extreme categories (e.g., “not at all complicated” and “extremely complicated”) will be of opposite signs. The marginal effect sign for the category assigned the high numerical code will have the same sign as that of the regression coefficient. To simplify our analysis we discuss marginal effects, with respect to the extreme dependent variable categories, in an informal manner. To capture statistical significance, Table 4 contains “z-statistics (coefficient divided by standard error).

Starting with the key results, in Stage 2 the unexpected sign on the proxy for complexity (PC) indicates that complexity and unfairness are negatively correlated, but the variable is not statistically significant. Therefore we conclude that taxpayers may not necessarily consider a complex tax system to be an unfair tax system. On the other hand, in Stage 3, the proxy for unfairness (PU) is statistically significant. We can conclude that an unfair tax system positively influences tax evasion.

Let’s turn now to a closer examination of the results. First, the variance variable, at the bottom of Table 4, is significant in all three stages, justifying our heteroscedastic specification.

The tax form variable (LL) (any long tax form) has a positive estimated coefficient and is significant in both Stages 1 and 3. In Stage 1, the positive sign makes intuitive sense by indicating that higher compliance costs (with a long form relative to a short form) are associated with higher perceived complexity. In Stage 3, the positive sign indicates that a greater opportunity to evade (with a long form relative to a short form) is associated with greater evasion.

Also in Stage 1, education (EC) is a significant factor in determining whether a taxpayer considers the tax system to be complex. As expected, when education (EC) levels increase, the perception of complexity decreases.

In Stage 2, both inadequate public good supply (IP) and cheating by others (CT) are significant. Both coefficients are positive, indicating that either lower–quantity/poorer–quality of public goods (IP) or increased perceived cheating by taxpayers in general (CT), will tend to increase the probability that the average taxpayer perceives the tax system to be quite unfair.

In Stage 3, several variables are significant. Income (IC), self–employment (SF), and male gender (ME) are all positively correlated with evasion. Age (AE), home ownership (OW), and being married (MR), are negatively correlated with evasion.

With respect to the tax help (HP) variable (in Stage 3), our result is not consistent with Erard’s (1993) finding that assistance from tax professionals may lead to increased evasion. The statistical insignificance of tax help (HP) may be due to two offsetting effects: tax assistance may either promote good faith reporting or promote avoidance as taxpayers gain sophistication.

Self–employment (SF) (included to control for the opportunity to evade) is significant in all three stages, and positively correlated with complexity, unfairness, and evasion. In other words, a change to self–employment (and a greater opportunity to evade) will increase the probability that the average taxpayer perceives the tax system to be extremely complicated and quite unfair, and ultimately increase the probability that the average taxpayer responds that he/she has definitely evaded. This ultimate outcome regarding evasion is consistent with U.S. General Accounting Office (1995, p. 1) testimony that “wage earners report 97 percent of their wages; the self–employed report 36 percent of their income; and ‘informal
suppliers’—self–employed individuals who operate on a cash basis—report just 11 percent of theirs.”

An unexpected result is the insignificance of the probability of an audit (PA) variable on evasion in Stage 3 (although the sign is as anticipated). One explanation may be related to the conclusion by Sheffrin and Triest (1992, p. 214) that “[i]ncreased enforcement efforts might result in a perverse indirect increase in future noncompliance if the enforcement mechanism reveals to the affected taxpayer . . . that it is relatively easy to get away with evasion.” Tittle (1995, p. 216) discusses this same idea for crimes in general, i.e., the effect of experience on lowering the perceived probability of punishment. Slemrod et. al. (2001, p. 482) conclude that high–income taxpayers may not respond because of “a perception that an audit will not automatically detect and punish all evasion . . .” Our result is consistent with Paternoster et. al. (1983, p. 457) who are critical of the “deterrence doctrine” (i.e., critical of the theory that “the perception of certain, swift, and severe sanctions will keep people from committing sanctionable behavior”).

**Caveats**

At this point it is important to note several caveats to our key results. Our first remark relates to the data itself, survey data. Although responses to an in–person survey may be considered reliable relative to, say, mail or telephone surveys, there is still the possibility of misleading responses from individuals. Our position is that, by its very nature, evasion data is hard to acquire, and data from a professionally performed survey may arguably be the best available of individual self–reports.

Second, we have assumed a very specific causal flow, i.e., from (i) perceived complexity, to (ii) perceived unfairness, to (iii) evasion. Smith (1992, pp. 244–5) suggests that taxpayers may first evade, not get caught, and then perceive the tax system to be less unfair. However, his reverse causal relation was suggested to explain his own unexpected estimation results.

Third, as discussed previously regarding Stage 3, the evasion variable (EV) combines responses to questions about overstating deductions and understating income. Although these would be different specifications of the model, we can reestimate the final stage regression with a regressand reflecting only one form of evasion (overstating deductions or understating income). The proxy for unfairness (PU) becomes statistically insignificant with a regressand reflecting only understated income; but stays statistically significant with a regressand reflecting only overstated deductions.13

For a further check on model specification, the right–side of Table 4 reports results from running three ordered probit regressions with the same regressors in each without any recursive structure. The results reported on the right–side give an indication of the statistical significance of each regressor in each stage and can be used as a diagnostic check for omitted regressors. We do find one interesting result from this specification exercise. In this model, increased perceived cheating by taxpayers (CT) is a significant factor affecting evasion. 14 After respecifying the recursive model and including the (CT) variable in Stage 3, the proxy for unfairness (PU) becomes statistically insignificant. One possible explanation for this result may relate to multicollinearity between (CT) and (PLI). This finding underscores the necessity of recognizing that...

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13 Statistical significance is tested at a 5 percent level.
14 In Stage 1, both inadequate public good supply (IP) and tax help (HP) are significant, but respecifying the recursive model to include them as regressors in Stage 1 does not yield any substantive changes in the reported results.
some of our results are sensitive to the specification of the model.

Fourth (and last), complexity does positively and significantly affect both perceived unfairness and evasion if a regressor \((CX)\) representing the actual observed value for complexity (i.e., 0, 1, … , or 5) is used (rather than the proxy \((PC)\)). As explained by Jöreskog (1994, p. 383), “[o]rdinal variables [e.g., \((CX)\)] are not continuous variables and should not be treated as if they are.” Therefore an analysis using \((CX)\) as a regressor is not appropriate, but does indicate the sensitivity of the results to the econometric methods.

CONCLUSION

Our empirical results suggest that simplifying the United States income tax system may not be an effective deterrent to income tax evasion, at least based on taxpayer attitude surveys. We found no systematic links between perceptions of complexity and perceptions of unfairness. We generally found that increased perceptions of fairness led to improved compliance. Although there is an intuitive appeal to the notion that reducing complexity may lead to an increased perception of fairness and subsequent improved compliance, there are plausible contrary viewpoints. Complexity may be necessary to produce fairness, once individual circumstances (e.g., medical conditions) are taken into account. It is also possible that political competition produces an equilibrium level of complexity that maximizes political support.

We should emphasize that our research only focuses on links between complexity, unfairness, and noncompliance within the existing tax structure. A radically new tax structure would pose different issues for both complexity and compliance. Moreover, complexity is only one component of tax equity.

A possible extension of our research would analyze how our results may differ when the contribution by non–filers is considered. Since our data set only included survey responses by filers (i.e., taxpayers that filed a tax return within the previous 2 years) (see Schulman, Ronca, and Bucuvalas, 1991, p. I–2), our conclusions may change if responses by non–filers are added. Non–filers may have an effect on our conclusions because some non–filers may find the tax compliance process too complicated to be understood (see U.S. General Accounting Office, 1979, p. 8). To the extent that a large number of non–filers perceive the tax system to be extremely complicated and quite unfair, simplifying the tax system may be an effective deterrent to income tax evasion.

Finally, we do note that survey instruments may be imprecise and that taxpayers may not always convey their true feelings in these interviews. Nonetheless, our results indicate that we should be extremely cautious in assuming that a movement to reduce complexity will automatically lead to increased compliance.

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