Psychological Factors, the Choice of a Tax Preparer, and Tax Compliance*

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Abstract:
We use laboratory experiments to examine factors influencing taxpayer choice of a tax preparer and the subsequent reporting behavior. We find that individuals in this environment simultaneously choose a preparer and their compliance based in part on factors predicted by rational choice theory. However, we also find that psychological factors play a central role in this setting: participants prefer tax preparers who are "credentialed," even when the cost is high or the credential has no impact on outcomes; participants fear an audit, regardless of its likelihood; participants often choose high-cost preparers even when they are fully compliant; and many participants forego substantial expected earnings rather than underreport income.

Key Words: tax compliance; tax preparer; experimental economics; rational choice theory; behavioral economics.

JEL Classifications: H2, H26, C91.

I. INTRODUCTION

The tax preparation process can be quite complicated, and many taxpayers find it worthwhile to hire a tax professional to complete the tax-filing process on their behalf. The U.S. Internal Revenue Service (IRS) estimates that the vast majority of all individual tax returns filed were prepared either using automated software/web applications or with the assistance of a professional tax preparation service.[1] As discussed in detail later, there is some research that has examined the demographic characteristics and life events associated with choosing to use a tax preparer, and there is also some work on the subsequent impact on taxpayer compliance of the decision to use a tax preparer. However, despite the many insights from this work, it is plagued by data problems, especially the inability to quantify both the specific factors that determine tax preparer choice and to identify the impact of this decision on taxpayer compliance.

In this paper, we present evidence from laboratory experiments that examines two basic questions.[2] First, what tax preparer characteristics are most important to taxpayers in their decision to use a tax preparer? Second, how does this choice affect taxpayer compliance? For both questions, we focus on the possible impact of psychological factors (or behavioral economics considerations), as well as rational choice considerations, on these decisions.

[1] The most recent data from the IRS Statistics of Income for 2018 indicates that 56.3 percent of all individual tax returns were prepared with the help of a paid tax preparer, while another 36 percent were completed using tax preparation software. See https://www.irs.gov/statistics/soi-tax-stats-individual-tax-statistics. These percentages have stayed roughly constant for the last decade. See also the IRS webpage devoted to various types of information about, and for, tax preparers, at https://www.irs.gov/tax-professionals. Additional background information on taxpayer use of tax preparers is provided by U.S. Government Accountability Office (2003).

[2] There is a long tradition of using laboratory experiments to examine tax compliance behavior. As discussed later, laboratory experiments seem particularly well-suited for the study of many aspects of the taxpayer reporting decision, despite potential concerns about their external validity. For some early experimental studies, see Friedland, Maital, and Rutenberg (1978), Spicer and Becker (1980), and Beck, Davis, and Jung (1991); for more recent examples, see Austin, Bobek, and LaMothe (2019), Young (2020), and Kasper and Alm (2022). For a detailed discussion of the methodology of laboratory tax compliance experiments, along with a survey of many of the results, see Alm (2019).

Answers to these questions have implications not only for tax compliance scenarios but also for financial and even medical decision-making. There are many situations in which consumers must make choices with uncertain outcomes and in which these choices are moderated by experts (e.g., tax preparers, financial advisors, or medical doctors).[3] Some components of risk are inherent to the decision itself, but risk and cost also vary based on attributes and actions of the service provider, and individuals often choose a provider with imperfect information about his or her performance. As a result, the decision to use a specific service provider involves beliefs about the provider's performance and the ways in which this performance relate to the expected outcome.

In the specific tax compliance context that we examine in the laboratory, taxpayers may hire a tax preparer for several possible reasons, including a desire to save time, minimize the amount of taxes owed, or ensure that their tax return is completed correctly in order to avoid an audit. Our experiment presents detailed information to the taxpayer about potential tradeoffs between these reasons in an environment in which individuals choose their level of audit risk by selecting a specific automated tax preparer and also by choosing the amount of income to report (or to underreport).

By presenting participants in the experiments with detailed information about preparer characteristics and observing their choices, we are therefore able to make inferences about taxpayer preferences on the roles of psychological factors (e.g., emotion) versus rational choice considerations (e.g., reason) in the choice of tax preparers, and we are also able to make inferences about the roles of emotion versus reason in participants' subsequent reporting

[3] For example, see Giacobbe and Segal (1996), Grable and Joo (2001), Bechwati (2011), Hanna (2011), Robb, Babiarz, and Woodyard (2012), and Cummings and James (2014).

decisions. These choices thereby provide insights into how taxpayers evaluate potential tax preparers and also how taxpayers make their reporting decision. This information also provides important practical guidance that informs how much and what kind of information should be provided to taxpayers about tax preparers while simultaneously improving compliance.

To design our experiment, we first used focus groups to determine which tax preparer characteristics were relevant in taxpayer choice of tax preparers. We then took these focus groups results into the laboratory. Our experimental design required subjects facing a complicated tax compliance decision to select from various types of tax preparers, where the possible tax preparer types incorporated those preparer characteristics that our focus groups revealed were most relevant in the taxpayer choice. Along with the subject's choice of tax preparer, each subject also made his or her tax reporting decision over multiple and independent rounds. After the completion of these rounds, we administered an online questionnaire to solicit information on real-world tax experiences, demographic characteristics, risk aversion, and social-value orientation.

We find that individuals simultaneously choose their tax preparer type and their compliance level based on the expected tax savings generated by the tax preparer, the expected tax savings generated by underreporting income, the expected penalties, and the cost of preparation, just as rational choice theory would suggest. However, our results also suggest that psychological factors play an important role in taxpayer decisions: taxpayers prefer tax preparers who are “credentialed”, even though a tax preparer’s credentials had no impact on actual outcomes and even when the cost of a credentialed tax preparer is high; taxpayers are very risk averse and they fear the mere possibility of an audit, regardless of its likelihood; taxpayers often choose high-cost preparers with low or zero probabilities of audit even when they report all of

their income; and many participants are willing to forego substantial expected earnings rather than underreport income. The possibility of avoiding any kind of an audit seems especially important to taxpayers in their choice of a tax preparer, perhaps because of the fear of an audit or the guilt associated with an audit that uncovers less than full compliance. In short, both psychological and rational choice factors seem to play important roles in taxpayer decisions when choosing tax preparers and reporting income.

II. SOME RELEVANT LITERATURE

There are several strands of literature that are relevant to our analysis. One strand examines what factors affect a taxpayer 's choice of a tax preparer. Another strand – and in some sense a prior, strand examines what motivates a taxpayer to pay (or not to pay) his or her legally due tax liabilities. We discuss both strands, starting with the taxpayer's compliance decision.

The Taxpayer's Compliance Decision

The standard theoretical model used in nearly all research on tax compliance is based on the rational choice model of Allingham and Sandmo (1972), as derived from the economics-of-crime model of Becker (1968). Here a rational individual is viewed as maximizing the expected utility of the tax evasion gamble, weighing the benefits of successful cheating against the risky prospect of detection and punishment, and the individual pays taxes because he or she is afraid of getting caught and penalized if he or she does not report all income. This "portfolio" approach gives the plausible and productive result that compliance depends upon audit rates and fine rates, with reported income increasing with an increase in either the audit rate or the penalty rate.

Indeed, the central point of this approach is that an individual pays taxes because – and *only* because – of this fear of detection and punishment.[4]

However, it seems clear to many observers that compliance cannot be explained entirely by such purely financial considerations, especially those generated by the level of enforcement.[5] 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 based on rational choice models suggests that most rational individuals should either underreport income not subject to source-withholding or overclaim deductions not subject to independent verification because it is extremely 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 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 low levels of compliance predicted by the economics-of-crime approach are simply not observed. Indeed, the puzzle of tax compliance behavior may well be why people pay taxes, not why they evade them.[6]

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[4] For useful recent surveys of the compliance literature, see Sandmo (2012), Alm (2012, 2019), and Slemrod (2019).
[5] For example, see Andreoni, Erard, and Feinstein (1998), Torgler (2007), and Kirchler (2007), among many others.
[6] There are reasons why this analysis somewhat overstates the problem with the standard rational choice model, given the presence of such factors as third-party information, source-withholding, targeted audits, and various "audit-type activities" (e.g., line matching and information requests). Even so, there is little doubt that in many settings the chances of detection and punishment are slight. Especially in circumstances in which third-party sources of information and employer source-withholding are limited, the chances that an individual who does not report truthfully will be caught and penalized are quite limited.

In sum, the standard rational choice model of tax compliance has generated important, plausible, and relevant insights. Even so, the model has some well-recognized deficiencies, especially its conclusion that enforcement is the sole factor that motivates compliance. In addition, some of its predictions are counterintuitive and in fact inconsistent with actual evidence, such as the prediction that an increase in the tax rate will actually increase reported income. These concerns suggest that either the compliance decision must be affected by other factors or it must be affected in ways not captured by the standard approach.

In large part because of these concerns, there have been numerous efforts to extend the basic rational choice model of tax compliance. These efforts have taken two basic forms. Some of these theoretical extensions have occurred within the basic economics-of-crime approach, thereby keeping a reliance on rational choice considerations but adding elements that make the model more realistic. These extensions include adding such factors as: source-withholding; an individual labor supply decision; multiple individual strategies for reporting; alternative penalty, tax, and tax withholding functions; complexity and the associated uncertainty about tax liability; the receipt of government services; positive (individual) rewards for honesty (e.g. eligibility for a lottery if found to be compliant); audit selection rules that utilize information from tax returns to determine whom to audit; and, importantly for our purposes, the use of paid preparers.[7]

These extensions add necessary realism to the basic model. Even so, they leave enforcement as the main factor that motivates compliance, and they also often yield counterintuitive predictions, especially low levels of predicted compliance that are seldom observed.

[7] Again, see Sandmo (2012), Alm (2012, 2019), and Slemrod (2019) for detailed discussions.

Importantly, there has also been much work to expand the basic rational choice model of tax compliance by introducing aspects of behavior considered by psychology, as discussed under the broad rubric of "behavioral economics". These extensions recognize that individuals do not always behave according to the standard assumptions of the neoclassical model of human behavior: that individuals are rational, that they are motivated only by their self-interested desire to maximize their own individual welfare, and that they have unlimited willpower. Instead, as emphasized by Rabin (1998), Kahneman (2011), and Congdon, Kling, and Mullainathan (2011), individuals often deviate from these assumptions in two broad (and sometimes overlapping) dimensions: imperfect individual optimization (stemming from, say, limited computation abilities or bounded self-control) and non-standard preferences (like other-regarding preferences). The former area emphasizes individual behavior; the latter focusses more on group considerations.

For example, much of the *individual behavior* that diverges from neoclassical predictions involve some form of frame dependence, in which an individual's decision depends upon how the choice is presented. Frame dependence is typically related to some psychological predisposition or some cognitive limitation of the individual. Many individuals react much differently to gains than to equal-but-opposite valued losses; they often misperceive the true costs and benefits of their actions; they may not be able to make all of the computations implied by standard optimization given, say, limits on time or cognitive abilities; and they may be motivated by a wide range of factors, including self-interest (narrowly defined) but also by notions that arise more from group considerations, as discussed later. Also important here is individual behavior under uncertainty, and there are now various formalizations of non-expected utility theory that have been applied to individual choices, especially those based upon the work

of Kahneman and Tversky (1979, 1984) and Tversky and Kahneman (1974, 1981) via their prospect theory.

The other strand of behavioral economics focusses more on *group considerations*, often summarized as social interactions theory. There is abundant evidence that individuals are influenced by the social context in which, and the process by which, decisions are made. There is also much evidence that they are motivated not simply by self-interest but also by group notions like social norms, social capital, social customs, appeals to patriotism or conscience, or feelings of fairness, altruism, reciprocity, empathy, sympathy, trust, guilt, shame, morality, and alienation, all of which depend upon the individual's interactions with a larger group. These group considerations also affect individual behavior in significant ways.

For some specific applications of non-expected utility theory to tax evasion, see the detailed discussions in Hashimzade, Myles, and Tran-Nam (2013), and Alm (2019). There are also many applications of social interactions theory to tax evasion, as surveyed by Torgler (2007), Kirchler (2007), and Alm (2019). All of these models considerably complicate the analysis of taxpayer behavior. However, they also often generate predicted levels of compliance that far better approximate observed levels.

Our theoretical models of taxpayer compliance (and of taxpayer choice of a tax preparer) use many elements of the rational choice model. Importantly, our models also use many elements suggested by psychology via behavioral economics. These models are discussed in detail later.

The Taxpayer's Choice of a Tax Preparer

As for the taxpayer's decision to use a tax preparer, there is a large, and largely descriptive, literature on what factors are associated with taxpayer choice of tax preparers.[8] This work finds that there are specific demographic groups that are more likely to use tax preparer services. People who are older, female, married, self-employed, have children, or identify as Black or white are more likely to use a tax preparer or a financial planner. In addition, taxpayers with higher incomes, more wealth, higher financial risk tolerance, and more financial knowledge are also more likely to use a tax preparer or a financial planner. Taxpayers who have experienced specific life events (e.g., losing a spouse or experiencing a drastic change in income) are also more likely to use a tax preparer. Finally, taxpayers who have more tax forms to complete, who need to file specific types of non-traditional tax forms, who face a higher risk of audit or exposure to penalties, or who have greater uncertainty about their tax liability are more likely to use a tax preparer or financial planner.

This literature also examines the motivation for choosing a tax preparer. Taxpayers choose to use a tax preparer for several reasons, including a desire to obtain the maximum refund, to properly comply with all tax regulations, and to save time. Time constraints and shifts in the economy can also change people's willingness to pay for any type of professional service, including a paid tax preparer. A desire to saving money or a desire for increased leisure time are positively associated with a greater general willingness to pay for professional services.

[8] See especially Long and Caudill (1987), Shavell (1988), Scotchmer (1989), Dubin et al. (1992), Christian, Gupta, and Lin (1993), Ashley and Segal (1997), Erard (1997), Cloyd and Spilker (1999), Frischmann and Frees (1999), Tan (1999), Guyton et al. (2005), Urban Institute (2005), Stephenson (2010), and Fleischman and Stephenson (2012).

The decision to use a tax preparer is also related to the taxpayer's tax refund status and the desire for aggressive or conservative tax reporting.[9] Taxpayers typically overpay to reduce anxiety about being audited and to compensate for uncertainty about their true tax liability. They also withhold more of their earnings so they can obtain the positive feeling of receiving a refund check, which is more satisfying than retaining their original funds. Researchers call this propensity to overpay taxes and avoid underpayments a "conservative framing stance" compared to an "aggressive framing stance", in which taxpayers prefer to pay as few taxes as possible and risk underpayment. More experience with the tax process, higher tax liabilities, smaller refunds, additional funds owed at filing, and more uncertainty are all negatively associated with overpaying taxes and thus positively associated with taking an aggressive framing stance. Overly conservative tax-reporting frames create a market for tax preparers, and people with overly conservative tax-reporting frames are more likely to desire instantaneous refunds, to want to reduce their overpayments from the previous year, and to seek out tax advice to reduce or confirm their uncertainty.

Finally, there is work on the impact of tax preparer usage on subsequent taxpayer compliance.[10] Theory suggests, and empirical work largely confirms, that the use of tax preparers will tend to reduce many "unintentional" reporting errors, or those associated with tax issues that are ambiguous and unclear. On these issues, the expertise of tax preparers seems to reduce reporting errors that would otherwise lead to less compliance. However, empirical work also finds that the use of tax preparers is associated with more noncompliance on tax issues

[9] See Christian et al. (1994), Dusenbury (1994), Ayers, Kachelmeier, and Robinson (1999), Jackson et al. (2005), Bobek, Hatfield, and Wentzel (2007), and Jackson and White (2008),

[10] For theoretical analyses of some of the effects of tax preparers on compliance, see Shavell (1988), Scotchmer (1989), and Klepper and Nagin (1991). For empirical analyses of these effects, see Long and Caudill (1987), Klepper, Mazur, and Nagin (1991), Erard (1993, 1997), and Battaglini et al. (2020).

where the law is largely clear; that is, tax preparers tend to worsen the problem of deliberate noncompliance.[11]

All of this work is insightful and valuable. However, much of it is based on settings in which it difficult to identify clearly both the causal impact of specific tax preparer characteristics on taxpayer choices and the impact of tax preparer usage on compliance. The following sections present our framework for examining these issues and then our experimental results.[12]

III. EXPERIMENTAL DESIGN

Pre-experiment Focus Group Findings

In order to gather qualitative insights into the process of choosing a tax preparer and also to determine which tax preparer characteristics should be included in the experiment, we first conducted a series of four focus groups in which we recruited focus group participants and then asked them to discuss their most desired characteristics of a tax preparer and their general process of seeking out a tax preparer. Participants also completed specific decision-making tasks, in which they were asked to choose between several hypothetical tax preparers. Four focus groups with eight participants each were conducted: two took place in the Washington, D.C., metro area, and two took place in Ithaca, N.Y. All participants were members of the general adult population who had previously used a paid tax preparer on at least one occasion.

[11] There is also work that examines other issues, such as optimal enforcement policies in a world in which taxpayers can choose tax preparers. For example, see Reinganum and Wilde (1991).

[12] Note that one implication of taxpayer use of tax preparers is the likelihood that the probability that the taxpayer is selected for audit becomes endogenous, dependent upon the information that the tax preparer conveys to the tax authority on the tax return. For analyses of these "endogenous audit rules", see Alm, Cronshaw, and McKee (1993), Alm and McKee (2004), Clark, Friesen, and Muller (2004), Cason and Gangadharan (2006), and Gilpatric, Vossler, and McKee (2011).

From the focus groups, we learned that many individuals choose a tax preparer based on recommendations from friends, on the personal characteristics of the tax preparer, and on performance-related variables. The focus groups determined that the tax preparer's audit rate, credentials, level of customer satisfaction, form and schedule expertise, passing a compliance check, passing an IRS background check, percent of errors on tax returns, cost, years of experience, and location were the most useful pieces of information when selecting a paid tax preparer. Overwhelmingly, the most important qualities that participants sought in tax preparers were competency and trustworthiness. The desire to hire someone who would "get it right" was mentioned often. Participants made linkages between the tax preparers' audit rate, Automated Under Reporter (AUR) notices, percent errors, and compliance checks, expecting these attributes to be consistent with each other. Indeed, many of the variables discussed in the focus groups were based on variables contained in the IRS preparer registration database.

Consistent with findings from the field, many focus group participants originally began using a tax preparer because of a change in tax circumstances or in anticipation of a particularly complex tax year compared to previous years. Most participants found a tax preparer through their social networks, either by hiring someone they knew or by asking for recommendations. This familiarity helped them feel that they could trust the person with their financial information. Most said that they did not use resources such as newspapers, websites, advertisements, or other media, to help them choose a tax preparer. Participants expressed a preference for having more information when working through the tax preparer choice task. Some participants expressed a desire to do more research when choosing a tax preparer in the future, based on the variables presented in the focus group.

Experimental Protocol and Design Features

We then designed the experiment to represent the elements of the tax preparer choice that our focus groups revealed were the most relevant to their decisions. Specifically, our focus groups indicated clearly that taxpayers mainly compare a more aggressive preparer who will help them obtain a higher tax refund but possibly expose them to a higher audit risk, to a less aggressive preparer who will help them obtain a lower tax refund but also will expose them to a lower audit risk.

One of the potentially useful implications of this research is to suggest opportunities for the IRS to provide additional information to aid taxpayers in their selection of a tax preparer. This work can help inform the IRS in its consideration of balancing of taxpayers' desire for information on preparer quality and the need to protect preparer privacy.

The experiment consisted of several steps designed to mimic the tax-filing process of a typical U.S. taxpayer. Participants were recruited using standard and accepted procedures. Upon arriving at the computerized laboratory, participants earned income, they were faced with a complicated tax reporting decision, and they chose a tax preparer to help them with this decision. Throughout, participants interacted with the experiment through private computer terminals, and all participants proceeded through the experiment choices concurrently. [13]

At the beginning of the experiment, participants earned income by guessing the number of gumballs in a jar. This guess determined each participant's "certain" income in each round of the experiment, which ranged from 5,000 to 10,000 experimental dollars. In each round, the participants were allocated an additional amount of "random" income, which ranged from 0 to

[13] Demographic and other descriptive statistics on participants are available upon request.

5,000 experimental dollars. Each participant also received information about the number of credits and deductions for which he or she was eligible, ranging from 0 to 5 credits and deductions, which were randomly assigned in each round. The amount of income, credits, and deductions was designed to vary from round to round, imitating the changes in individual circumstances and also any changes in the tax code that affect tax liability from year to year. The scenarios were designed to be somewhat more complex than those in a typical tax experiment, so that participants would feel the need to use a tax preparer. A self-prepare option was not presented to the participants in order to keep the focus on the choice of a tax preparer.

The experiment then proceeded in several steps:

1) In the first stage of each round, participants were presented with their specific tax information. Their certain income was given along with the amount of taxes withheld. Tax payments are automatically withheld from this income at a rate of 30 percent, similar to the payroll taxes that are automatically deducted for most U.S. workers' income. Participants were also presented with their random income for the round (0–5,000 experimental dollars) and their number of credits (0–5) and deductions (0–5).
2) In the second stage of each round, participants were presented with a choice of four tax preparers with varying attributes. Participants are informed that these tax preparers are automated rather than controlled by other participants. For each tax preparer, participants knew whether the tax preparer had credentials (defined in the experiment as having passed a background check and being a licensed Certified Public Accountant), the audit rate associated with the preparer, the average tax savings (defined as the expected reduction in taxes due to credits and deductions) for the preparer's clients, and the tax preparer's fee. Each of these terms was defined in a glossary that was appended to the experiment instructions for the participants' reference. The credentials were irrelevant to the tax preparer's performance, but the average tax savings and audit rate directly affected the experiment outcome. Participants who chose a preparer with a higher value of average tax savings (referred to hereafter as high-refund preparers) had their deductions randomly valued between 500 and 900 experimental dollars and their credits valued between 150 and 250 experimental dollars, while those who chose a preparer with a lower value of average tax savings (referred to hereafter as low-refund preparers) had their deductions randomly valued between 100 and 500 experimental dollars and their credits valued between 50 and 150 experimental dollars. The participants' probability of being audited was based on the audit probability of the tax preparer they chose. The participants were informed of the ways in which their choice of tax preparer would affect their tax return and audit outcomes.

3) In the third stage of each round, participants reported their tax information to their tax preparer. A text box was available for participants to enter their random income for that period. They could enter any amount from zero to the full amount of their random income (i.e., the program did not allow them to over-report income). Fields for certain income, deductions, and credits were prefilled and could not be changed, in order to represent real-world scenarios in which wage income and many types of credits and deductions are usually well-documented, whereas other types of income (e.g., tips, freelance income, or contract work) are often self-reported with little documentation required. Participants were informed at the start of the experiment that, if they are audited in any round, all unpaid taxes will be collected and a 100 percent penalty on unpaid taxes will be assessed.
4) In the fourth and final stage of each round, participants received their tax refund information and found out their audit result. Any audit penalties were assessed, and participants viewed their final net income for the round.

The experiment continued for ten rounds, comparable to tax periods. Upon completion of the final round, an online questionnaire was administered in which participants answered several questions about their real-world tax experiences, demographic characteristics, risk aversion, and social-value orientation (the degree to which a person values the welfare of others relative to their own welfare). After completing the questionnaire, participants collected their earnings in cash. Earnings were based on a predefined exchange rate of experimental dollars to U.S. dollars.

The experimental instructions are included in Appendix (1), selected screen shots of the decision screens are presented in Appendix (2), and the post-experiment questionnaire is included in Appendix (3). The experiment was programmed using z-Tree software. In total, 22 sessions were conducted. Ten of these were conducted in the Fors Marsh Group Experimental Economics Laboratory in Arlington, VA, and 12 were conducted in Cornell University's Lab for Experimental Economics and Decision Research in Ithaca, NY. All participants were members of the general adult population, who either had used a paid tax preparer or had prepared their own taxes at least once.

Experimental Treatments

The experimental design and procedures remained the same across all 22 sessions, as summarized in Table 1. Four different treatments were implemented to explore the choice tradeoffs. The values of the parameters across the four treatments included the choice of tax preparers who were credentialed or not; tax preparers with audit probabilities of 0.00, 0.05, 0.20, 0.35, or 0.40; and tax preparers with tax preparation costs of $150, $200, $300, $400, $500, $1200, or $1500. The average tax savings for each preparer was either $437.50 for low-refund preparers or $937.50 for high-refund preparers. The parameter values used for each treatment are given in the charts below. Note that Treatment 1 is designed to explore the impact of credentials for higher and lower audit probabilities, and for high and low tax savings, with believable preparation prices. Treatment 2 explores the impact of a zero audit rate in order to examine the impact on cheating while varying the other parameters in a sensible way. Treatment 3 incorporates a dominated alternative (e.g., Option C dominates Option A) to test the attention of the participants; Option C also is designed to make underreporting income more attractive and so to test the degree to which respondents resist temptation and are willing to forgo earnings to be honest. Options A and B in Treatment 4 are designed to further encourage underreporting income by setting prices above tax savings while providing a zero audit rate, and participants with preferences for honest reporting should choose either Option C or Option D.[14]

IV. THEORETICAL CONSIDERATIONS

[14] Note that we are not misleading participants by assuming that tax preparer credentials are irrelevant to tax preparer performance. Although credentials do not affect tax preparer performance, the average tax savings and audit rate directly affect the experimental outcome, and these aspects are affected by tax preparer credentials. This assumption is consistent with real-world evidence. Indeed, there is substantial evidence that many tax preparers are more likely to cheat than taxpayers would prefer, and there is no evidence that credentialed preparers are more or less likely to cheat than those who are not credentialed.

Rational Choice Theory Predictions (I): The Taxpayer's Choice of a Tax Preparer

Our initial theory proceeds from the assumption that the participant is rational and maximizes the expected value of the net earnings during the experiment session. For small laboratory payoffs, risk aversion is inconsistent with rational choice, and deviations from the predictions of expected value likely indicate the presence of one or more of the many behavioral anomalies that have been demonstrated in controlled experiments (Rabin, 2000). Since there were only two levels of tax savings used to describe tax preparers in the experiment, we simplified the theoretical analysis by considering only a high- and low-refund tax preparer choice; this assumption can be easily extended to the general case where additional tax preparers are added (e.g., four possible tax preparers in each treatment), who vary by the probability of audit, their cost of preparation, and their credentials. Recall that each participant's certain income in each round was subject to automatic tax withholding and reporting, and their random income in each round was self-reported, meaning that each subject chose what portion of the additional random income to report in each round.

Using the following notation

$t = round$	
$y = certain\ income$	
$R_t = random\ income,$	$0 \le R_t \le 5000$
$C_t = random\ credits,$	$0 \le C_t \le 5$
$D_t = random\ deductions,$	$0 \le D_t \le 5$
$V_{Ct}^{H} = value\ of\ high - refund\ preparer\ credit,$	$V_{Cmin}^{H} \le V_{Ct}^{H} \le V_{Cmax}^{H}$
$V_{Ct}^{L} = value\ of\ low - refund\ preparer\ credit,$	$V_{Cmin}^{L} \le V_{Ct}^{L} \le V_{Cmax}^{L}$
$V_{Dt}^{H} = value\ of\ high - refund\ preparer\ deduction,$	$V_{Dmin}^{H} \le V_{Dt}^{H} \le V_{Dmax}^{H}$
$V_{Dt}^{L} = value\ of\ low - refund\ preparer\ deduction,$	$V_{Dmin}^{L} \le V_{Dt}^{L} \le V_{Dmax}^{L}$
$\mu = under\ payment\ penalty\ rate = 2,$	(tax owed + 100% penalty)

$P_H = probability\ of\ audit\ for\ H$

$P_L = probability\ of\ audit\ for\ L$

$B_H = Bill\ (cost)\ for\ preparer\ H$

$B_L = Bill\ (cost)\ for\ preparer\ L$

$I_t = declared\ random\ income, \qquad 0 \le I_t \le R_t$

$W = withholding\ rate$

$\tau = tax\ rate,$

the choice variables for each participant in each round of the experiment are how much of the random income to declare (I_t) and which tax preparer to use (H or L). Using a bar above a variable to indicate the mean (or expected value EV) of the variable and ignoring for now any possible costs to obtain deductions or credits, the expected values of choosing the high- and low-refund tax preparer in a given round are:

(1) $EV_{Ht} = y + R_t - \tau(y + I_t) + [\tau * D_t * \overline{V_D^H} + C_t * \overline{V_C^H} - P_H\{\mu * \tau(R_t - I_t)\}] - B_H$

(2) $EV_{Lt} = y + R_t - \tau(y + I_t) + [\tau * D_t * \overline{V_D^L} + C_t * \overline{V_C^L} - P_L\{\mu * \tau(R_t - I_t)\}] - B_L$

where equation (1) shows the expected value if a high-refund tax preparer is chosen and equation (2) shows the expected value for low-refund tax preparer. The first order conditions for I_t for each choice of tax preparer are:

(3) $\frac{\partial EV_{Ht}}{\partial I_t} = -\tau + P_H * \mu * \tau \begin{cases} >0 \rightarrow I_t = R_t \\ \le 0 \rightarrow I_t = 0 \end{cases}$

(4) $\frac{\partial EV_{Lt}}{\partial I_t} = -\tau + P_L * \mu * \tau \begin{cases} > 0 \rightarrow I_t = R_t \\ \le 0 \rightarrow I_t = 0 \end{cases}$

Substituting the decisions from equations (3) and (4) regarding I_t into equations (1) and (2), the high-refund tax preparer will be chosen if $EV_{Ht} > EV_{Lt}$, and the low-refund tax preparer will be chosen if the reverse is true.

Using the following parameter values

$$\tau = .25\ P_H = .2\ P_L = .05\ \mu = 2$$
$$\overline{V}_D^L = 300\ \overline{V}_D^H = 700\ \overline{V}_C^L = 100\ \overline{V}_C^H = 200$$
$$B_H = 300\ B_L = 200\ ,$$

the predicted choices for, say, Treatment 1 can be found by substituting these parameters into the first-order conditions to calculate the optimal level of random income reported for each choice of tax preparer, which yields:

(3)' $\frac{\partial EV_{Ht}}{\partial I_t} = -.25 + .2 * 2 * .25 = -.15 < 0$

(4)' $\frac{\partial EV_{Lt}}{\partial I_t} = -.25 + .05 * 2 * .25 = -.225 < 0.$

Equations (3)' and (4)' imply that random income should, rationally, never be reported in Treatment 1 (or $I_t = 0$).[15] Thus, for Treatment 1, the choice between tax preparers should theoretically assume $I_t = 0$, regardless of which tax preparer is chosen. To determine which tax preparer will be chosen, we simply compare the expected value of each tax preparer using equations (1) and (2). Since the first parts of (1) and (2) are identical, we need only to examine the difference in the square bracketed portion of each equation; if $[\,]_{Ht} - [\,]_{Lt} > (B_H - B_L)$, tax preparer H will be chosen, and otherwise, preparer L will be chosen. Because $[\,]_{Ht} = .25 * D_t * 700 + C_t * 200 - .2\,\{2 * .25 * R_t\}$ and $[\,]_{Lt} = .25 * D_t * 300 + C_t * 100 - .05\,\{2 * .25 * R_t\}$, then $[\,]_{Ht} - [\,]_{Lt} = .25 * D_t * 400 + C_t * 100 - .15\,\{2 * .25 * R_t\}$. So, if $[100(D_t + C_t)] - .075 * R_t > (B_H - B_L)$, then the prediction is to choose preparer H; if $[100(D_t + C_t)] - .075 * R_t < (B_H - B_L)$, then the prediction is to choose preparer L.

[15] The same result holds for other treatments because the highest audit probability in any treatment is 0.40.

Thus, more deductions and credits and a lower random income increase the likelihood that the participant will choose tax preparer H. This prediction makes intuitive sense. Since it is always rational to declare zero random income, a high draw on random income and a low draw on deductions and credits imply that the participant should select preparer L. Such a participant would have more to lose from being audited compared to an individual with a lower amount of random income. Higher random income creates a larger incentive to avoid being audited, while higher credits and deductions create a larger incentive to choose the tax preparer with higher tax savings for these items. Note that the expected or "average" rational choice outcome (for $D_t + C_t = 5$ and Rt $= 2{,}500$) yields a tax preparer choice condition for Treatment 1 of: $100(5) - .075(2{,}500) = 312.50 > 100$. This implies that the average participant will choose H, the high-audit, high-refund tax preparer. However, it is also possible for participants to choose L in the rational choice model. For example, if a participant draws $D_t + C_t = 2$ and $R_t = 4{,}500$, the optimal choice is L because $100(2) - .075(4{,}500) = -137.50 < 100$. Other treatments can be analyzed in a similar manner.

Rational Choice Theory Predictions (II): The Taxpayer's Compliance Decision

It is clear that the compliance decision (i.e., how much random income to report) and the tax preparer decision (i.e., which preparer to choose) are interrelated. Maximizing behavior dictates that maximum noncompliance is the optimal behavior; that is, participants should report zero random income for any audit rate less than or equal to 50 percent. Since each tax preparer in this experiment has an audit rate below 50 percent, the rational choice theory would predict full noncompliance (i.e., zero random income reported), regardless of the tax preparer choice. Given that complete noncompliance is optimal, the rational taxpayer would then choose the tax preparer

whose combination of expected refund (which is related to the average tax savings, but varies depending on the individual's specific number of credits and deductions) and audit rate maximizes the expected value, depending on particular circumstances of random income, deductions, and credits. Note, however, that much previous literature finds that taxpayers often choose to pay taxes even when it violates rational choice theory (Alm, McClelland, and Schulze, 1992, 1999; Davis, Hecht, and Perkins, 2003; Young, 2020). Factors such as social norms, fairness, loss aversion, and patriotism can contribute to a desire to pay taxes, even though the likelihood of an audit is low. If an individual decides to voluntarily comply with tax regulations for reasons other than avoiding penalties, this will affect the optimal tax preparer choice.

Consider a taxpayer who will be completely compliant regardless of audit penalties (or lack thereof). The only cost incurred by an audit in the experimental setting is that any unpaid taxes are collected along with a 100 percent penalty. Thus, for a taxpayer who reports all income correctly, an audit is costless. For fully compliant taxpayers, the audit probability should have no effect on their tax preparer decision. Furthermore, a high audit probability poses no threat to these taxpayers, so they should always choose the preparer who will allow them to claim the highest expected net refund, even if this tax preparer also has a high audit probability. Also, the potential gains from noncompliance are limited by the amount of random income because this is the only value that can be misreported to the tax preparer. A taxpayer who has a relatively high amount of random income and a relatively low number of credits and deductions has an incentive to misreport this income (i.e., claiming zero random income) and to choose a preparer with a low audit rate, to decrease the probability of an audit penalty. Likewise, a taxpayer who has a relatively low amount of random income and a relatively high number of credits and deductions still has an incentive to misreport his or her random income but also has less to lose

from an audit and much more to gain from a tax preparer who will get a higher value for each credit and deduction.

Overall, a taxpayer who intends to report all income should always choose the tax preparer with the highest average net refund, but a taxpayer who intends to report zero or only a portion of random income may find it beneficial to choose a tax preparer with lower average tax savings with an associated lower audit probability. Also, the lower-audit-rate tax preparer is the EV-maximizing choice for some amounts of noncompliance and some draws of random income, deductions, and credits. However, full noncompliance is always EV-maximizing regardless of a participant's financial situation. Given that a taxpayer chooses full compliance, the tax preparer with the higher audit rate and higher expected refund is the EV-maximizing choice.

Modifying the Rational Choice Model to Account for Psychological Factors

Results from pilot experiments at each location showed findings that were inconsistent with the predictions of the rational choice model. Many participants reported all of their random income, and a minority reported zero random income. Reporting all random income is consistent with a linear objective function that produces a corner solution, but it is inconsistent with the prediction that the rational decision is to declare zero random income. Also, many of the participants chose the credentialed tax preparer, despite the fact that the credentialed preparer had no impact on the outcome. Finally, very few individuals chose the high-refund tax preparers in spite of the prediction that the high-refund tax preparer should be the dominant choice for most draws of random income, credits, and deductions.

These findings suggest that there are specific factors relating to the tax context that may affect behavior, outside of the rational choice model. For example, fear of being audited might

affect the taxpayer's choice of tax preparer. Although audits only impose a financial cost in the experimental setting, audits in the real world are likely to be stressful and time-consuming, regardless of the individual's actual tax compliance status. Thus, the desire to avoid an audit in the real world might influence behavior in this experiment and lead to a behavioral anomaly due to heuristic thinking. Also, individuals might be mistaken in their mental calculations regarding the probability of an audit and the associated penalties, so that participants may fully report their income yet still choose a low-refund, low-audit probability tax preparer. These participants were clearly not maximizing their expected payout, regardless of their compliance choice.

Accordingly, we modify the rational choice model, allowing for the possibility of these types of behavioral anomalies. Specifically, we incorporate variables for guilt from underreporting income as well as fear of audit into the behavioral model, Additionally, we include a variable indicating whether a tax preparer is credentialed to determine whether this influenced taxpayer choices.[16]

1. Guilt. The observed response pattern was consistent with the conjecture that many participants did not underreport their random income because doing so would make them feel dishonest. In most rounds, participants chose not to underreport their random income, even though doing so was clearly the utility maximizing course of action when taking-into-account only the financial incentives. Therefore, we infer that participants viewed underreporting as a dishonest action and felt some guilt associated with it. We incorporate this conjecture into the objective function by adding a term $-gL_t$, where $L_t = 0$ if $R_t - I_t = 0$ and $L_t = 1$, if $R_t - I_t > 0$, so L_t denotes lying and g denotes the psychological cost of guilt associated with

[16] Many of these modifications are based on the work of Kahneman and Tversky (1979, 1984) and Tversky and Kahneman (1974, 1981).

misrepresenting one's income, expressed in terms of monetary value for the purposes of the model. If participants do not have any aversion to misreporting their income other than the financial cost of an audit, then the value of g

Summary

In summary, we add the following psychological variables to the original list of rational choice variables:

$$g = the\ psychlogical\ cost\ of\ guilt\ associated\ with\ lying$$
$$L_t = an\ indicator\ variable\ for\ underreporting$$
$$f = the\ psychological\ cost\ of\ fear\ associated\ with\ being\ audited$$
$$A_i = an\ indicator\ variable\ for\ a\ nonzero\ audit\ probability$$
$$V_{cred} = the\ psychological\ value\ of\ choosing\ a\ credentialed\ tax\ preparer$$
$$D_{cred,i} = an\ indicator\ variable\ for\ whether\ the\ preparer\ is\ credentialed$$

As discussed later, the random utility theoretical model that incorporates these psychological on/off responses recognizes that there are actually eight possible choices that combine the choice of declaring all random income or none with the choice of one of the four preparers, since the choice of cheating on declared income is essentially a binary choice.[17] Including these anomalies, the expected value or linear utility for a taxpayer choosing tax preparer i and reporting random income I_t takes the form

$$(5)\quad EV_{it} = y + R_t - \tau(y + I_t) + \left[\tau * D_t * \overline{V_D^H} + C_t * \overline{V_C^H} - P_i\{\mu * \tau(R_t - I_t)\}\right] + V_{cred}D_{cred,i} - g(L_t) - f(A_i) - B_i$$

or equivalently

$$(6)\quad EV_{it} = [y + R_t - \tau(y + R_t)] + \tau(R_t - I_t) + \left(\tau * D_t * \overline{V_D^i} + C_t * \overline{V_C^i}\right) - \mu * \tau(P_i(R_t - I_t)) - g(L_t) - f(A_i) + V_{cred}(D_{cred,i}) - B_i$$

[17] For further discussion, see Schulze and Wansink (2012). In a small percentage of rounds (14 percent), participants declared only a portion of their random income. Our empirical analysis includes only those who reported 5 percent or less (coded as noncompliant) and those who reported more than 95 percent (coded as compliant). One observation was dropped because the participant received a random income draw of 0 experimental dollars for that round (making the compliance choice moot), and 655 observations were dropped because the participant reported an amount between 5 percent and 95 percent of random income.

We can therefore decompose the expected value of a given tax preparer and reporting decision into the following relevant terms:

(a) $[y + R_t - \tau(y + R_t)] = income\ minus\ taxes\ owed$

(b) $\tau(R_t - I_t) = tax\ savings\ from\ underreporting\ of\ income$

(c) $\left(\tau * D_t * \overline{V_D^i} + C_t * \overline{V_C^i}\right) = expected\ savings\ of\ using\ a\ given\ preparer$

(d) $-\mu * \tau(P_i(R_t - I_t)) = expected\ penalty\ for\ any\ underreporting$

(e) $-g(L_t) = the\ cost\ of\ guilt\ associated\ with\ underreporting$

(f) $-f(A_i) = the\ cost\ of\ fear\ associated\ with\ the\ possibility\ of\ being\ audited$

(g) $V_{cred}(D_{cred,i}) = the\ value\ of\ using\ a\ preparer\ who\ is\ credentialed$

(h) $- B_i = the\ price\ of\ preparer\ i$

In the conditional logit analysis that follows, the probability of choosing each tax preparer is based on the attributes defined above. There are two ways to organize the explanatory variables. First, terms b, c, d, and h can be combined to create a net tax savings variable, which corresponds to the rational choice economic incentives. The behavioral variables e, f, and g can then also be included separately to test rational versus emotional factors in the choice of a tax preparer. Second, psychologists argue that some rational choice factors might be more prominent than others, so the factors b, c, d, and h can also be incorporated individually to see if they have statistically different coefficients, reflecting the prominence of some factors over others in the decision process. We employ both approaches in our analysis.

It should be noted that the expected tax savings for each preparer in a round are equal to $(175D_t + 200C_t)$ for the high-refund tax preparer and $(75D_t + 100C_t)$ for the low-refund tax preparer. These formulas are kept constant across treatments. This expression is a close approximation to the average refund amount that the IRS could calculate based on its records of returns filed by each tax preparer. Presenting such a figure to taxpayers would likely have a

similar effect in the real world as in the experiment; that is, a taxpayer's eligibility for certain credits and deductions will affect the tax outcome in ways that may differ from the average refund amount. The expected penalty—a function of the probability of audit multiplied by penalty multiplied by random income—takes on values of $P_i * \ 2 * .25(R_t - I_t)$, and this formula is also consistent across treatments (i.e., participants in all treatments have the same tax rate and the same penalty for unpaid taxes).

Hypotheses

Based on results from previous literature, our focus group findings, and our theoretical models, we suggest several main testable hypotheses:

Hypothesis 1: Individuals will be willing to "overpay" to avoid being audited, and they will tend to choose preparers with a zero or low probability of audit even when it results in a strictly higher cost to them.

Hypothesis 2: Most individuals will report all or most of their random income even though it is not rational to do so.

Hypothesis 3: Individuals are influenced in their choice of a tax preparer by the tax preparer's credentials.

The hypothesis of most interest is Hypothesis 1. The common perception of tax preparer choice is that taxpayers want a tax preparer who will utilize every possible tax reduction strategy, even if it is somewhat questionable. An alternative perception is that people want to do everything correctly in order to avoid an audit. Hypothesis 2 is also of interest, and it forms the basis for the role of guilt and fear in our analysis. Hypothesis 3 tests the role of tax preparer credentials in tax preparer choice, as suggested by the results of our focus groups.

V. EXPERIMENTAL RESULTS

Descriptive Statistics

Table 2 gives the average values of several participant characteristics, including experiment earnings and reported earnings, demographic characteristics (e.g., gender, age, and race), and information about past tax experiences.

Main Results

In all treatments, participants typically reported all of their random income, and the majority also chose a tax preparer with a low probability of audit, even if that tax preparer had a lower level of tax savings or a higher price. In spite of the fact that these participants did not misreport their income and would not be subject to any penalties if audited, they showed an overwhelming preference for tax preparers with low audit rates. In other words, even though audits are completely painless, private, automatic, and instantaneous in the computerized lab experiment, participants were still strongly motivated to avoid audits. This phenomenon is inconsistent with the predictions of the rational choice model but in line with Hypothesis 1. In particular, most participants reported all their random income, whereas only a few reported zero random income, which is consistent with a linear objective function that produces a corner solution but inconsistent with the prediction that the maximizing solution is to declare zero random income. Finally, relatively few individuals chose the high-refund tax preparer, even though the rational choice prediction is that the high-refund tax preparer should be the dominant choice contingent on reporting all income.

The initial data collection sessions use the parameter values for the first treatment. These data allow a check on the prediction that participants should choose either to report all of their

random income or none of their random income (e.g., a corner solution), as well the prediction that all participants should declare zero income. Figure 1 shows the fraction of random income reported in Treatment 1 (or the "compliance percentage"). These results are inconsistent with the rational choice prediction that no random income should be reported. Indeed, a majority of participants reported all of their random income in Treatment 1. Similarly, subjects in Treatments 2-4 also showed a tendency toward reporting all random income. Figure 2 shows the fraction of random income reported across all four treatments, again supporting a corner solution and suggesting a strong inclination to report all income and to not cheat on their reported income. All of these results are consistent with past studies showing that participants in tax experiments comply more than rational choice would suggest (Alm, McClelland, and Schulze, 1992, 1999), as suggested by Hypothesis 2.

These results are also consistent with a corner solution that characterizes linearity in the participants' objective functions with respect to declared income. The vast majority of subjects chose either to report 100 percent of their random income or to report 0 percent of their random income.[18] This is consistent with Rabin's (2000) arguments that risk aversion as proposed in expected utility theory is impossible for the small stakes used in laboratory experiments. Therefore, for the purposes of analyzing the choice between tax preparers, we model the decision problem as a choice between eight different options in all treatments of the experiment: the choice of tax preparer and, for each tax preparer choice, whether to report or not to report their random income for that round. Although only four options were explicitly displayed on their

[18] Participants reported either less than 5 percent or more than 95 percent of their random income in 85 percent of decisions. In the remaining decisions, the percentages reported were nearly uniformly distributed among possible percentages. Thus, these decisions were treated as random and were dropped for the purposes of our econometric analysis.

computer screen, participants were actually choosing among the eight options shown in Table 3. The eight different options in the econometric analysis are generated by creating an indicator variable for the reporting decision and combining this with the preparer choice. Participants who reported 95 percent or more of their random income in a given period were coded as reporting 100 percent, whereas participants who reported 5 percent or less of their random income in a given period were coded as reporting 0 percent. All other choices were dropped from the analysis because the declared income for these individuals was essentially uniformly distributed between 5 percent and 95 percent, suggesting that these individuals were randomly selecting the amount to declare.

The distributions of options that were chosen in each treatment are shown in Figures 3 to 6, which clearly demonstrate that subjects respond to the different parameter values in each treatment specification. An interesting pattern that emerged is that, in all treatments except Treatment 4, most participants chose to truthfully report random income regardless of the chosen tax preparer. Even in Treatments 3 and 4, which incorporated tax preparer options with a zero probability audit rate, many participants who chose the zero probability option still reported all of their random income. If a subject only maximizes income from the experiment, he or she should never report any random income if he or she knows there is zero probability of being audited.[19] This further confirms the argument we made in the theoretical section; that is, people consider other factors in addition to monetary payoffs when they choose a tax preparer and decide the amount of random income to report.

[19] This argument is a "lower bound" on rationality defined in the rational choice theory section. Based on our theoretical model, taxpayers should not report any of their random income if the expected value of not reporting it exceeds the expected value of reporting it.

Treatment 3 is of particular interest for two reasons. First, participants were apparently paying careful attention to the options since Option C was deliberately designed to dominate Option A, and only 3 percent of the choices were for Option A while around 74 percent were for Option C. Second, the rational choice incentives strongly support choice Option C0, or declaring nothing, since this choice had zero probability of audit. However, slightly more than half of the participants who chose Option C chose C1 rather than C0, deciding to report all their income. This result suggests that the emotion of guilt or the desire to be honest almost perfectly offset the financial incentive to cheat. In this situation, the random utility model would predict that roughly half of the participants choosing Option C would choose C0 and half would choose C1.

Estimation Results

To investigate how different tax preparer characteristics affected the subjects' tax preparer choices, we conducted a regression analysis of tax preparer choice, using the conditional logit model.[20] The conditional logit model allows us to incorporate characteristics of the choice alternatives instead of or in addition to the characteristics of the individual making the choice. This differs from a multinomial logit model, which only considers the characteristics of the individual making the choice. The conditional logit model estimates the probability P_{ij} that an individual i chooses tax preparer j (or in this case the combined preparer-compliance options) as a function of the characteristics of the individual, represented by X_i, and the characteristics of the preparer, represented by Z_{ij}, or:

[20] For a more complete discussion of the conditional logit model and examples of its application, see Duncan and Hoffman (1988).

$$P_{ij} = \sum_{k=1}^{J} exp(X_i\beta_j + Z_{ij}\alpha)/exp(X_i\beta_k + Z_{ik}\alpha)$$

It is important to note that, by using a conditional logit model, we specify our econometric model as if there were one representative agent from whom we could make repeated observations. Individual heterogeneity is, of course, a concern for all discrete choice modeling. However, the sampling across different treatments is not relevant to this assumption. The purpose of the estimation is not to detect any treatment effect but to estimate how people responded to different characteristics of the tax preparer options.

We estimated several conditional logit models for the choice of tax preparer. The first model is directly derived from the theoretical model in which we assume subjects considered the total monetary benefit of each choice and the emotional costs and benefits associated with the behavioral variables. Thus, in the first regression, we included one variable named *Net Saving*, which is the sum of all benefits from the chosen tax preparer net of the cost (price) of the tax preparer. We also included three dummy variables (*Fear*, *Guilt*, and *Credential*) to study whether and how people responded to nonmonetary emotional factors. *Fear* takes the value of 1 whenever the probability of being audited is any positive amount; otherwise, it is 0. *Guilt* takes the value of 1 whenever a subject chooses to underreport the random income (by reporting less than 5 percent of it); otherwise, it is 0. One can think of *Guilt* as an additional cost incurred for choosing noncompliance, and, although it is a psychological cost, it is represented by a monetary equivalent. This cost is only incurred when the subject is noncompliant, regardless of the tax preparer chosen. *Credential* takes the value of 1 if the preparer was certified as passing a background check and as passing a CPA examination; otherwise, it is 0.

These regression results are reported in Column 1 of Table 4.[21] Signs of all coefficients are intuitive and expected. Increasing the *Net Saving* of a tax preparer increases the likelihood that a taxpayer would choose the option. The coefficient on *Fear* is negative and significant, showing that people were less likely to choose a tax preparer with a positive audit probability because they were averse to being audited. *Guilt* has a similar effect and decreases the likelihood that taxpayers would underreport their random income. Having *Credential* increases the likelihood of a particular tax preparer being chosen. All of these coefficients are significant at the 0.1 percent level. The last result is consistent with Hypothesis 3 on the role of credentials in the choice of a tax preparer.

To account for possible heterogeneity in the effects between men and women, we included an interaction term for gender (or a dummy variable equal to 1 if the subject is *Female* and 0 otherwise) with both the *Fear* and *Guilt* variables (Column 2).[22] The coefficients and their significance levels are quite similar to the first regression, but we can infer from the second regression that females are more influenced by *Guilt* than males, with the effect of *Guilt* on women negative and significant at the 1 percent level. The effect of *Fear* on women's probability of choosing a given preparer is negative but not statistically significant.

In additional regressions, we deviated from our theoretical model by treating monetary benefits and costs associated with each tax preparer as characteristics that might be given

[21] Given the large number of variables included in our regression analysis, one may worry about the possible issue of multicollinearity. Because the consequence of multicollinearity is usually inflated standard errors, we are not particularly concerned because most of our estimates from the conditional logit models have high precision levels (small standard errors and highly significant coefficients). Nonetheless, we provide the variance inflation factor (VIF) for all estimated standard errors and the regression models in the brackets below the standard errors in all tables of estimation results. Note that the VIF is meant to detect possible multicollinearity issues in linear models, so the reported VIF numbers are indicative of little multicollinearity.

[22] *Female* was not available for eight participants, so observations associated with these participants were dropped for the second set of regressions.

different weights by taxpayers, even though they are all directly comparable financial gains or losses. There are then four different explanatory variables: *Expected Tax Saving*, *Underreporting Saving*, *Expected Penalty*, and *Price*. Theoretically, subjects could have calculated all of these values using the information that was given in their experimental instructions. We no longer use the average savings presented in the table of tax preparer characteristics shown to participants because subjects still need to calculate their expected return based on their own credits and deductions.[23]

Regression results with the disaggregated elements of economic expected value included are shown in Columns 3 and 4 of Table 4. The effects of *Fear* of audit and *Guilt* from cheating, as well as their corresponding gender heterogeneous effects, are largely unaffected. An *F*-test for the joint hypothesis that the four disaggregated explanatory variables share the same coefficient is rejected ($p = 0.00$), which suggests that participants treat different types of tax savings and costs differently, as implied by the possibility of prominence effects and of mental accounting (or thinking of different types of monetary gain or loss as having different value) (Thaler, 1999).

For the monetary incentive variables (*Expected Tax Saving*, *Underreporting Saving*, *Expected Penalty*, *Price*), all have the expected sign, and all are highly significant, with the largest impact coming from Price. Thus, using one net saving variable to represent all monetary incentives might be inappropriate. This also suggests that individuals engage in mental accounting. Again, these results are consistent with Hypothesis 3.

To explore the effects of time and repeated decisions, we then divided the data into decisions made in periods 1–5 and decisions made in periods 1–10. These results are shown in

[23] One can also think of this as interacting personal financial characteristics (e.g., random income, credits, and deductions) with tax preparer types. It is only in this case that the interaction term is what matters; that is, it would be meaningless for one to choose a preparer without considering his or her own tax situation.

Table 5, where Columns 1 and 3 show regression results for decisions in periods 1–5, and Columns 2 and 4 show regression results for decisions in periods 6–10.[24] These results show that the coefficients on *Fear*, *Guilt*, and *Credential* all decrease substantially between the beginning and end of the experiment, which suggests that psychological influences on decision-making lose potency over time and repeated exposure.

In additional regressions, we explored the relationship between *Fear* and *Guilt*. Although we already incorporated the expected penalty as part of the net savings calculation, it might be that these emotional responses interact with each other. Participants might have felt more afraid of an audit if they had failed to report income, in which case they knew that an audit would have had a bad outcome. Alternatively, they might have felt guiltier if there was a positive probability of an audit because it meant their guilt could be revealed, albeit by a computerized audit. In short, *Guilt* and *Fear* may magnify each other and make each one more salient than they would be on their own. These results are shown in Table 6. Indeed, as shown there, including an interaction term shows that *Guilt* and *Fear* together influence the tax preparer decision in addition to the effect that each one has separately.

VI. CONCLUSIONS: IMPLICATIONS FOR POLICY

Our results suggest that standard monetary incentives influence an individual's choice of a tax preparer and the individual's choice of reported income, as suggested by rational choice theory (e.g., reason). Even so, we also find many results that are consistent with the important

[24] The number of observations differs between rounds 1–5 and rounds 6–10 because we dropped observations in which the participant reported more than 5 percent but less than 95 percent of random income. Such observations accounted for less than 15 percent of total decisions. Since they are not distributed equally across rounds, there were an unequal number of included observations for each round.

role of psychological factors (e.g., emotion). For example, individuals tend to report either all or none of their random income, often reporting all of their income even when the probability of an audit is low or zero. Individuals choosing a tax preparer strongly prefer a preparer who will help them avoid being audited, which holds even when the cost of the tax preparer is high and when there is a low chance of an audit and a low penalty even if there is an audit. In fact, individuals often choose a tax preparer who is competent and qualified, even if it comes at a higher cost. The presence of a positive audit probability has a negative effect on the probability of a preparer being chosen, an effect that is in addition to the expected penalty resulting from an audit. Individuals are especially eager to avoid any kind of an audit, even when an audit is unlikely or nonpunitive: the fear of being audited and the guilt associated with failing to report income are both strong motivators in tax preparer and compliance decisions, and these psychological factors actually seem to dominate rational decision-making in tax preparer and compliance choices. Overall, we conclude that the taxpayers prefer to fully report their income and to avoid being audited, and these preferences appear to play a large role in the choice of a tax preparer.

Of course, one must remember that our results stem largely from laboratory experiments. The lab seems particularly well-suited for the study of many aspects of compliance. In particular, the lab is able to generate direct measures of evasion under different settings in which there is control over extraneous influences, it is relatively inexpensive, its results can be easily replicated, and it has a high degree of "internal validity" (or identification of "cause and effect"). However, laboratory experiments are sometimes viewed with suspicion. The most common criticism is that the student subjects typically used in experiments may not be representative of taxpayers. As a result, there is a concern that experimental results on policy innovations that rely upon student subjects cannot generalize to the population; that is, the "external validity" of laboratory

experiments is sometimes questioned.[25] Given that our subject pool consisted of adults with previous experiences in paying taxes and often using tax preparers, we believe that the concern about subject pool effects is of lesser importance in our study.

Our results have several practical implications. From the prospective of the tax administration, one potentially useful implication of this research is to suggest opportunities for the IRS to provide additional information to aid taxpayers in their selection of a tax preparer. This work can help inform the IRS in its consideration of balancing of the taxpayer's desire for information on preparer quality and the need to protect tax preparer privacy.

From the perspective of tax preparers, tax preparers would do well to advertise their strict compliance standards and low average audit rates when marketing to new clients. Our results show that the presence of an audit risk and the aversion to underreporting income are both strong motivators in the choice of a tax preparer and in the compliance decision. In particular, many participants in our study were willing to forgo monetary benefit to avoid an audit, even though they correctly and fully reported their tax liability. Of course, audits in the real world are not costless, as they were in the experiment; even individuals who have correctly reported all of their taxes must still pay the cost of time and effort involved in complying with the auditor's requests. Even so, for individuals who are inclined toward compliance, information about a tax preparer's performance would help them choose a tax preparer who is most likely to follow the tax code properly and help them minimize the probability of being audited, and drawing attention to the fact that a tax preparer's performance has an impact on audit probability will encourage

[25] See Levitt and List (2007) for a general critique of laboratory experiments. For robust responses to this critique, see especially Falk and Heckman (2009) and many of the papers in the volume edited by Frechette and Schotter (2015). Also, see Alm, Bloomquist, and McKee (2015) for specific evidence on the external validity of tax compliance experiments, who find that student and non-student behaviors are similar; see Choo, Fonseca, and Myles (2016) for an alternative view on student versus non-student behaviors.

taxpayers to be more diligent in their choice of tax preparer. From the perspective of policymakers, the IRS can certainly encourage the provision of this type of information.

Indeed, our experimental results suggest that individuals are willing to pay a premium for a tax preparer with credentials (i.e., had passed an IRS background check and was a Certified Public Accountant). This is particularly noteworthy because these credentials had no bearing on financial outcomes in the experiment. The fact that participants are willing to pay more for a tax preparer with credentials underscores the findings from the focus group that credentials are an important characteristic in the tax preparer choice.

In fact, if it is the case that tax preparers generally facilitate the filing of noncompliant tax returns, then our results suggest that this is not due to taxpayer demand. Future research by the IRS and others should explore the reasons for noncompliance on the part of the tax preparer and examine the interaction between taxpayer compliance and tax preparer compliance. The tax preparer faces different incentives than the taxpayer and might experience guilt and fear differently when performing a service on behalf of someone else. A secondary line of inquiry could investigate whether noncompliance is related to cognitive load (i.e., is a result of mistakes on the part of the taxpayer or tax preparer) or intentional misreporting.

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Table 1: Experimental Design and Procedures

Treatment 1				
Tax Preparer Type	A	B	C	D
Credentials?	No	Yes	Yes	No
Audit Rate	0.20	0.05	0.20	0.05
Average Tax Savings	$937.50	$437.50	$937.50	$437.50
Price	$200	$200	$300	$150

Treatment 2				
Tax Preparer Type	A	B	C	D
Credentials?	Yes	Yes	Yes	Yes
Audit Rate	0.00	0.00	0.40	0.40
Average Tax Savings	$937.50	$437.50	$937.50	$437.50
Price	$500	$200	$200	$150

Treatment 3				
Tax Preparer Type	A	B	C	D
Credentials?	Yes	Yes	Yes	Yes
Audit Rate	0.00	0.35	0.00	0.40
Average Tax Savings	$937.50	$437.50	$937.50	$437.50
Price	$500	$200	$400	$150

Treatment 4				
Tax Preparer Type	A	B	C	D
Credentials?	Yes	Yes	Yes	Yes
Audit Rate	0.00	0.00	0.35	0.40
Average Tax Savings	$937.50	$437.50	$937.50	$437.50
Price	$1,500	$1,200	$500	$150

Table 2: Participant Characteristics

Summary Statistics			
Location	All	Cornell	Fors Marsh
Experiment Variables			
Fixed Income	9225.35	9260.99	9185.82
Variable Income	2499.86	2483.80	2517.68
Reported Variable Income	1651.28	1298.16	2043.04
Demographic Characteristics			
Female	63.4%	69.1%	57.2%
Age	37.6	34.3	40.5
Hispanic	9.2%	7.6%	11.0%
White	62.6%	70.0%	54.5%
Black	21.5%	8.5%	36.0%
Asian/Pacific Islander	20.3%	26.5%	13.5%
HS Graduate	6.6%	6.7%	6.5%
Some College	22.2%	30.0%	13.5%
College Graduate	39.7%	35.4%	44.5%
Postgraduate degree	31.2%	27.4%	35.5%
Income less than $25,000	15.6%	20.6%	10.0%
Income $25,000–$49,999	17.5%	17.5%	17.5%
Income $50,000–$74,999	24.8%	22.9%	27.0%
Income $75,000–$99,999	12.8%	13.5%	12.0%
Income $100,000–$149,999	20.1%	17.5%	23.0%
Income Over $150,000	9.2%	8.1%	10.5%
Employed	84.4%	77.6%	92.0%
Married	30.7%	30.0%	31.5%
Average Number of Children	0.66	0.57	0.77
Tax Experiences			
Used National Tax Company	30.0%	27.4%	32.8%
Used Local Tax Company	15.3%	18.4%	11.9%
Used Individual Tax Preparer	27.8%	23.3%	32.8%
Never Used Tax Preparer	26.9%	30.9%	22.4%
Has Been Audited	12.5%	9.9%	15.4%

Table 3: Preparer–Compliance Choices

Analysis Variable	Tax Preparer Choice	Income Percentage Reported
A0	Preparer A	0%
A1		100%
B0	Preparer B	0%
B1		100%
C0	Preparer C	0%
C1		100%
D0	Preparer D	0%
D1		100%

Table 4: Conditional Logit Regression Coefficients: Determinants of Preparer Choice

Regression specification	**(1)**	**(2)**	**(3)**	**(4)**
Net Saving	0.000994***	0.000998***		
	(9.42e-05)	(9.43e-05)		
	[1.07]	[1.07]		
Fear	-0.642***	-0.505***	-0.903***	-0.751***
	(0.101)	(0.172)	(0.142)	(0.196)
	[2.00]	[4.65]	[2.61]	[5.26]
Guilt	-1.082***	-0.765***	-1.121***	-0.804***
	(0.0972)	(0.157)	(0.118)	(0.167)
	[1.82]	[4.44]	[4.73]	[7.31]
Credential	0.814***	0.815***	0.861***	0.862***
	(0.124)	(0.124)	(0.125)	(0.125)
	[2.15]	[2.15]	[3.65]	[3.64]
Female X Fear		-0.238		-0.272
		(0.212)		(0.218)
		[4.21]		[4.21]
Female X Guilt		-0.521**		-0.529***
		(0.202)		(0.205)
		[4.19]		[4.19]
Expected Tax Saving			0.000662***	0.000656***
			(0.000142)	(0.000142)
			[3.24]	[3.24]
Underreporting Saving			0.00111***	0.00113***
			(0.000119)	(0.000120)
			[5.03]	[5.04]
Expected Penalty			-0.00118***	-0.00119***
			(0.000198)	(0.000197)
			[2.38]	[2.38]
Price (Cost)			-0.00166***	-0.00168***
			(0.000248)	(0.000249)
			[2.97]	[2.97]
N	29,176	29,096	29,176	29,096
Mean VIF	[1.76]	[3.45]	[3.52]	[4.25]

Notes: Robust standard errors clustered at subject level are reported in parentheses. *** denotes significance at 1% level; ** denotes significance at 5% level. The variance inflation factors (VIF) are reported in brackets.

Table 5: Conditional Logit Regression Coefficients of Preparer Choice: Rounds 1-5 versus Rounds 6-10

Regression specification	(1)	(2)	(3)	(4)
Net Saving	0.000943***	0.00105***		
	(0.000104)	(0.000103)		
	[1.07]	[1.07]		
Fear	-0.757***	-0.525***	-1.020***	-0.782***
	(0.108)	(0.112)	(0.149)	(0.163)
	[2.01]	[2.00]	[2.61]	[2.61]
Guilt	-1.254***	-0.923***	-1.271***	-0.988***
	(0.105)	(0.0995)	(0.140)	(0.135)
	[1.82]	[1.82]	[4.66]	[4.81]
Credential	0.899***	0.734***	0.946***	0.779***
	(0.131)	(0.132)	(0.132)	(0.133)
	[2.14]	[2.15]	[3.63]	[3.66]
Expected Tax Saving			0.000698***	0.000632***
			(0.000155)	(0.000156)
			[3.23]	[3.25]
Underreporting Saving			0.00101***	0.00123***
			(0.000152)	(0.000162)
			[4.94]	[5.13]
Expected Penalty			-0.00107***	-0.00128***
			(0.000202)	(0.000217)
			[2.38]	[2.38]
Price (Cost)			-0.00160***	-0.00171***
			(0.000277)	(0.000254)
			[2.97]	[2.97]
N	14,392	14,784	14,392	14,784
Mean VIF	[1.76]	[1.76]	[3.49]	[3.55]

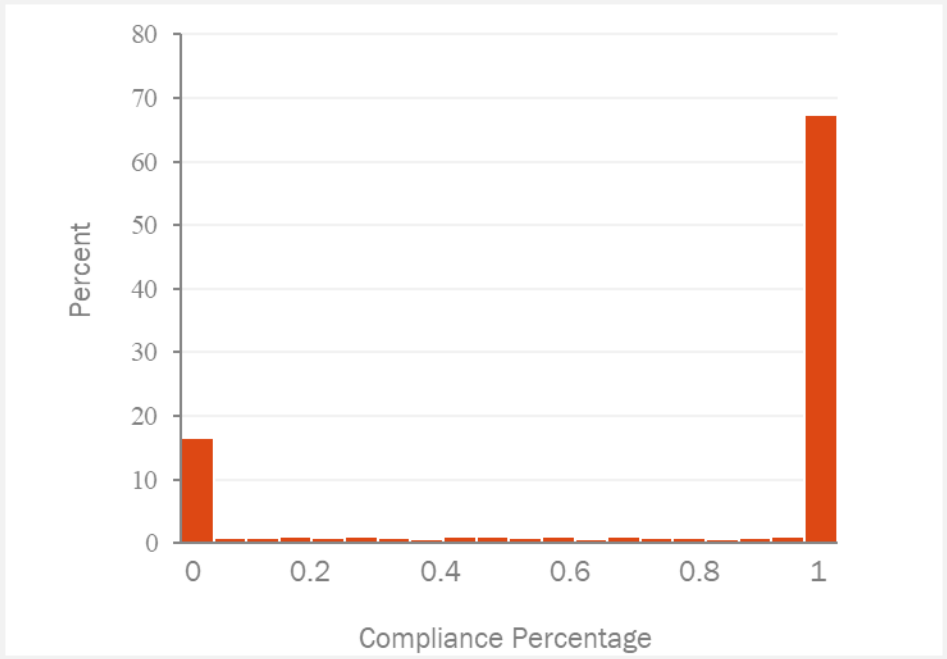
Notes: Robust standard errors clustered at subject level are reported in parentheses. *** denotes significance at 1% level. The variance inflation factors (VIF) are reported in brackets.

Table 6: Conditional Logit Regression Coefficients of Preparer Choice: Including Fear and Guilt

Regression specification	**(1)**	**(2)**	**(3)**	**(4)**
Net Saving	0.000994***	0.000792***		
	(9.42e-05)	(0.000102)		
	[1.07]	[1.37]		
Fear	-0.642***	-0.471***	-0.903***	-0.815***
	(0.101)	(0.119)	(0.142)	(0.151)
	[2.00]	[3.63]	[2.61]	[3.84]
Guilt	-1.082***	-1.365***	-1.121***	-1.458***
	(0.0972)	(0.143)	(0.118)	(0.168)
	[1.82]	[3.06]	[4.73]	[5.79]
Fear x Guilt		0.682***		0.681***
		(0.223)		(0.241)
		[2.92]		[3.29]
Credential	0.814***	0.799***	0.861***	0.861***
	(0.124)	(0.123)	(0.125)	(0.125)
	[2.15]	[2.70]	[3.65]	[3.99]
Expected Tax Saving			0.000662***	0.000592***
			(0.000142)	(0.000142)
			[3.24]	[3.28]
Underreporting Saving			0.00111***	0.000933***
			(0.000119)	(0.000131)
			[5.03]	[5.45]
Expected Penalty			-0.00118***	-0.000811***
			(0.000198)	(0.000187)
			[2.38]	[3.17]
Price (Cost)			-0.00166***	-0.00164***
			(0.000248)	(0.000247)
			[2.97]	[3.00]
N	29,176	29,176	29,176	29,176
Mean VIF	[1.76]	[2.73]	[3.52]	[3.98]

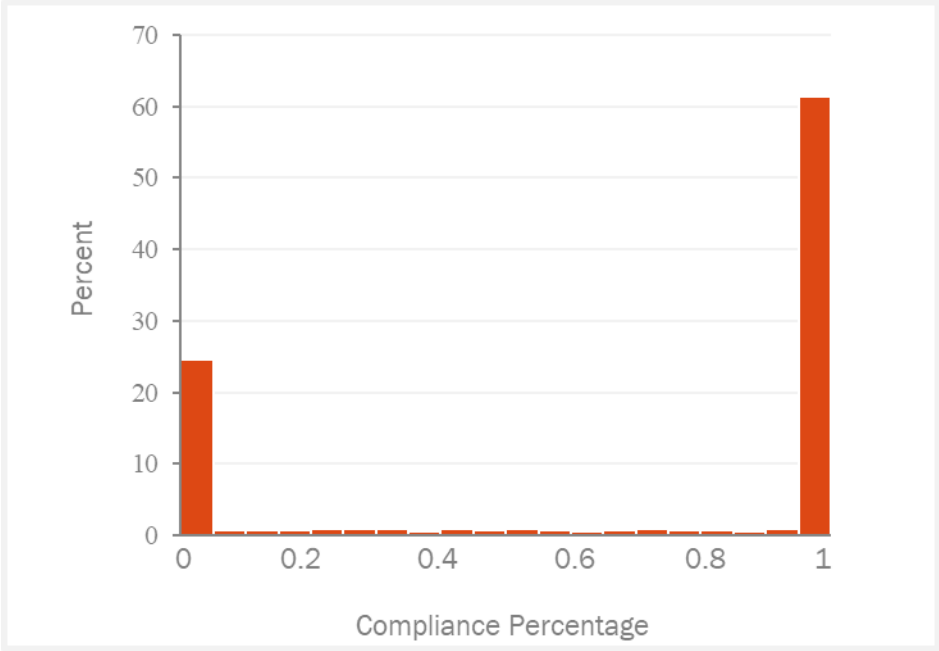
Notes: Robust standard errors clustered at subject level are reported in parentheses. *** denotes significance at 1% level. The variance inflation factors (VIF) are reported in brackets.

Figure 1: Fraction of Random Income Reported in Treatment 1



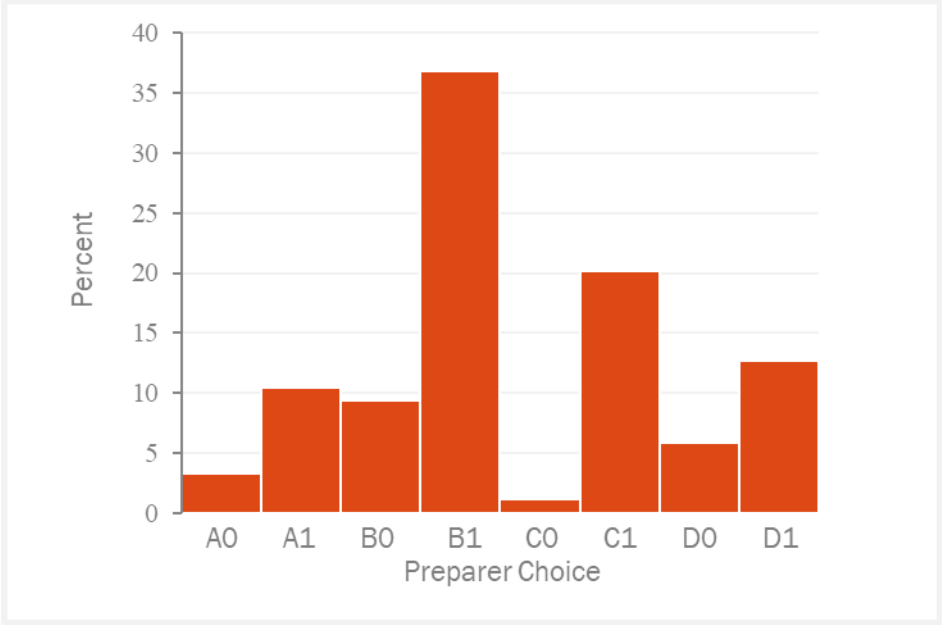
Notes: The horizontal axis presents the reported income divided by true random income (the "compliance percentage"); the vertical axis represents the percent of subjects with the relevant compliance percentage.

Figure 2: Fraction of Random Income Reported Across All Treatments



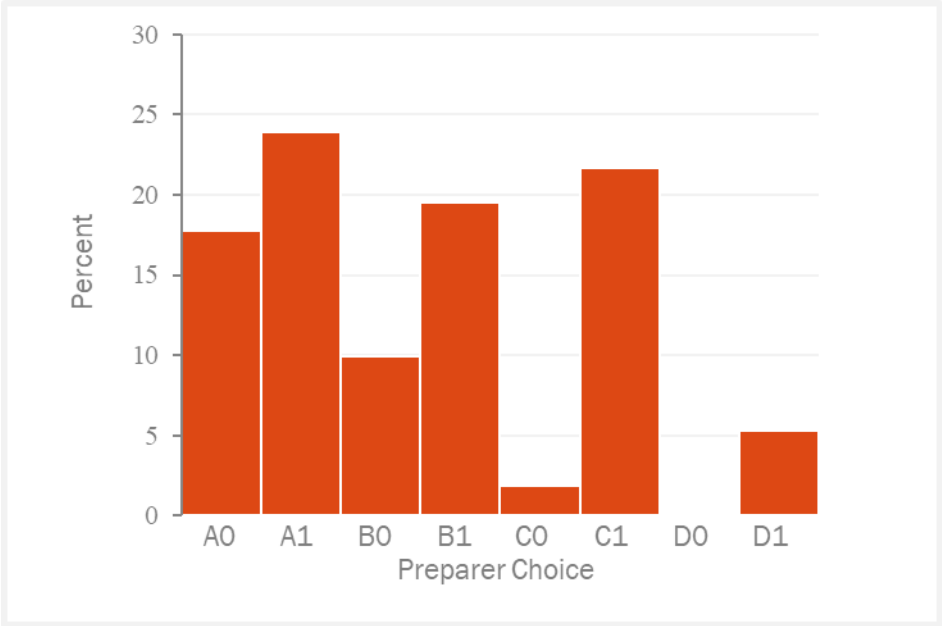
Notes: The horizontal axis presents the reported income divided by true random income (the "compliance percentage"); the vertical axis represents the percent of subjects with the relevant compliance percentage.

Figure 3: Distribution of Chosen Extended Options, Treatment 1



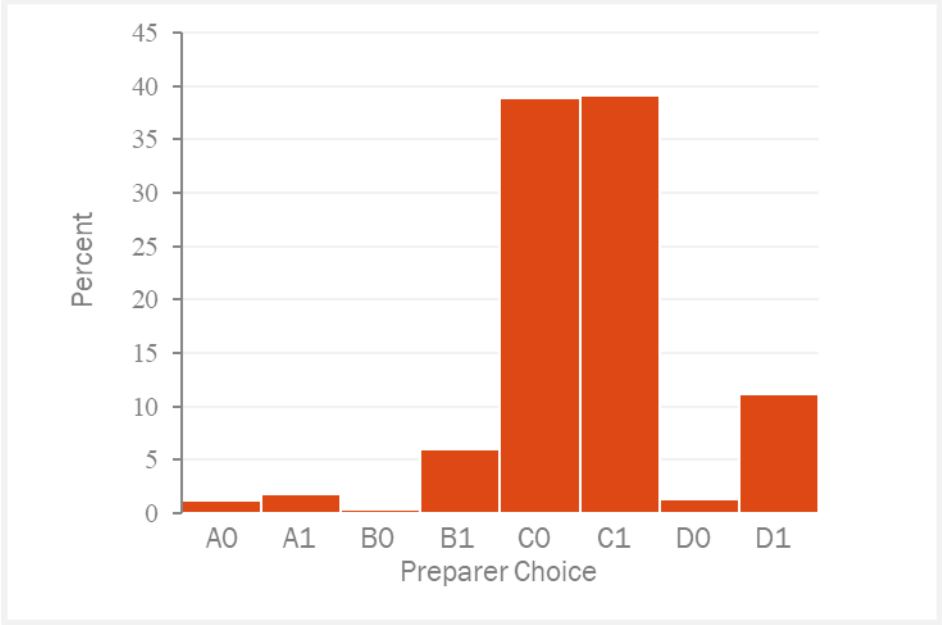
Notes: The horizontal axis presents the possible tax preparer choices as defined in Table 3; the vertical axis represents the percent of subjects who made the relevant tax preparer choice.

Figure 4: Distribution of Chosen Extended Options, Treatment 2



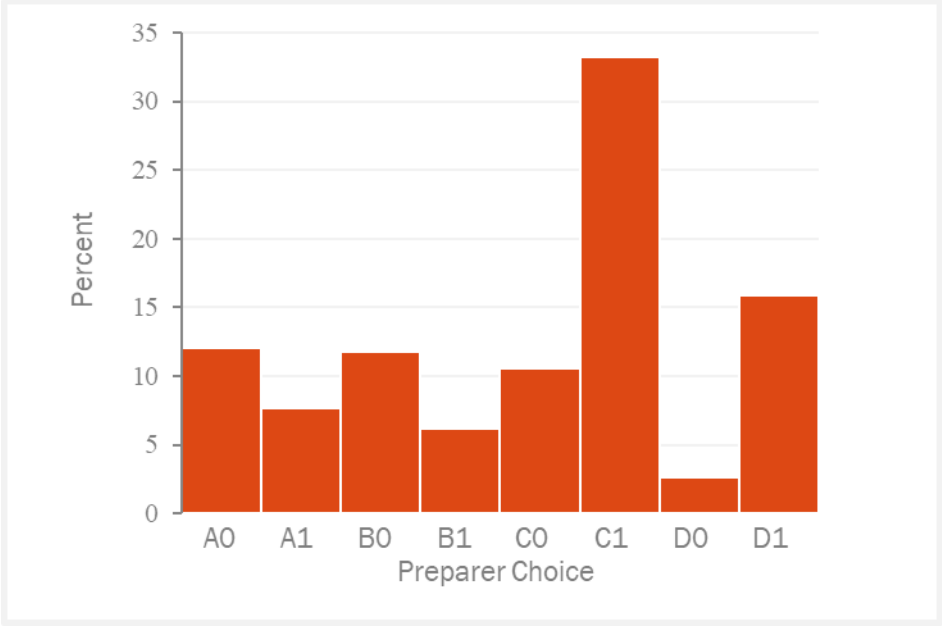
Notes: The horizontal axis presents the possible tax preparer choices as defined in Table 3; the vertical axis represents the percent of subjects who made the relevant tax preparer choice.

Figure 5: Distribution of Chosen Extended Options, Treatment 3



Notes: The horizontal axis presents the possible tax preparer choices as defined in Table 3; the vertical axis represents the percent of subjects who made the relevant tax preparer choice.

Figure 6: Distribution of Chosen Extended Options, Treatment 4



Notes: The horizontal axis presents the possible tax preparer choices as defined in Table 3; the vertical axis represents the percent of subjects who made the relevant tax preparer choice.

APPENDIX (1): EXPERIMENTAL INSTRUCTIONS

Welcome to the Laboratory for Experimental Economics and Decision Research (Fors Marsh Group Experimental Economics Laboratory). Note that deception is NOT allowed in economics experiments. You will be compensated in cash for your participation at the end of the experiment. The amount you receive is based on choices you make during the experiment. If you have any questions during the experiment, please raise your hand and someone will come to assist you. Please do not speak out loud or speak to the other participants.

In this experiment, you will be given the opportunity to earn money, and you will make choices that will determine the amount of taxes collected on this money. Given the complexity of calculating your taxes, you will be asked to choose a tax preparer to complete the filing process on your behalf. These tax preparers are automated; however, they have characteristics of actual tax preparers and will affect the amount of your tax refund and the probability of being audited as specified. Although this is only a simulation of the tax reporting and preparation process, your actual earnings will be based on your decisions. At the end of these instructions, we have included a glossary of tax-related terminology that you are free to consult throughout the experiment.

You will receive income in each round, and the amount will be determined in two ways. First, your certain income in all of the rounds will be determined by estimating the number of gumballs in the one-quart jar at the front of the lab. If you estimate the number correctly, you will receive 10,000 experimental dollars of certain income in each round. If you do not exactly estimate the number of gumballs, your certain income will be reduced by 50 times your error in the number of gumballs in the jar. So, for example, if your estimate is off by 10 gumballs, your certain income in EACH round would be 10,000 – 10x50 = 9,500 experimental dollars. You are guaranteed a minimum certain income of 5,000 experimental dollars even if your error is more than 100 gumballs. This income is similar to wage income received from an employer, and taxes will be automatically withheld from this portion of your income at the rate of 30 percent. The second component of your income is determined randomly at the beginning of each round. This portion of your income will be between 0 and 5,000 experimental dollars, and any dollar amount in this range is equally likely. Each person in the experiment will get a different random draw from the computer in each round. This random component is meant to simulate the uncertainty most people face in estimating their annual total income due to uncertainty over the size of possible income from tips, freelance work, or other sources of income that are not reported to the tax agency by third-parties or subject to withholding but are supposed to be reported as part of taxable income. The highest income that you could make in a round is the sum of 10,000 experimental dollars in certain income, if you exactly estimated the number of gumballs, plus an additional 5,000 in random income if you receive the highest random income in a round.

In each round you will also be presented with other information regarding your particular tax situation. You will be eligible for 0-5 tax deductions and 0-5 tax credits in each round. Deductions and credits are randomly determined, and you have an equal chance of each possibility. A tax credit is an amount that is subtracted from your total taxes owed, meaning that your tax liability is reduced by the amount of the credit. Examples of tax credits are the American Opportunity Tax Credit for post-secondary tuition or the Residential Renewable Energy Tax Credit for certain types of home energy systems. A tax deduction is an amount that is subtracted from your taxable income, meaning that you do not owe taxes on that portion of your income. Examples of tax deductions are interest paid on a home mortgage, charitable contributions, or casualty and theft losses. Eligibility for tax deductions and credits varies by year depending on changes in your life circumstances and changes in the tax code. To simulate the variation in tax deductions and credits for which you may be eligible in a single year, the *number* of deductions and

credits will be randomly given in each round as described above. Additionally, the *value* of each credit and deduction will be randomly determined within a certain range, which will depend on your choice of tax preparer.

The tax rate in this experiment is 25 percent, and this will apply to all income earned minus the value of any deductions. Any tax credits will reduce your total tax liability amount dollar for dollar. The experiment involves four stages in each round. In Stage 1, you will be provided with your earnings and tax information: amount of income subject to withholding, amount of taxes withheld, amount of other income, and the number of actual deductions and tax credits you are eligible for in that round.

In Stage 2, because the required tax calculations for deductions and tax credits are complex and time consuming, you are asked to choose a tax preparer from a list of four possible preparers. To help make that choice, you will be provided with information about each tax preparer, including whether or not the preparer is credentialed (if the preparer has passed a background check and is a Certified Public Accountant (CPA)), what the audit rate is for tax returns completed by the preparer, the range of values of credits and deductions for tax returns completed by the preparer, and the price charged by the tax preparer. The audit rate gives the probability of being audited if you choose that preparer. If you are audited, any unpaid taxes must be paid, along with a penalty equal to the amount of unpaid taxes. The value of credits and deductions will vary based on your tax preparer. If you choose a tax preparer who has a high value of credits and deductions, each deduction subtracts 500-900 from taxable income and each credit subtracts 150-250 from taxes owed. If you choose a tax preparer who has a low value of credits and deductions, each deduction subtracts 100-500 from taxable income and each credit subtracts 50-150 from taxes owed. Each preparer has a given price which will be subtracted from your earnings for the round.

In Stage 3 you will provide information for your tax filing to the tax preparer you have chosen. Since the IRS knows your certain income subject to withholding, that amount will be automatically entered. However, you may report any amount of random income.

In Stage 4, after your tax return has been filed you will receive your earnings (certain plus random experimental dollars) plus the refund amount as calculated by your chosen tax preparer. The price of the tax preparer will be subtracted from your total earnings for the round. You will also find out whether you have been audited. Your probability of audit will be based upon the audit rate of your chosen tax preparer – for example, if you choose a tax preparer with a 5 percent audit rate, you will be randomly selected for an audit with a probability of 5 percent. If you have been audited, your actual tax obligation will be calculated and any unpaid taxes will be deducted from your earnings along with a 100 percent penalty on unpaid taxes. What this means is that, if you are audited, for every lab dollar in unpaid taxes, you will have to pay back the one lab dollar you owe in taxes and one additional lab dollar in penalty.

The first round of the experiment will be a practice round so you can see how the experiment works. The number of gumballs used to calculate your practice earnings will be different than the actual number of gumballs in the jar. Your choices in this practice round will not go toward your total earnings for the experiment. After the practice round is completed, you will guess the number of gumballs again, and this time your earnings will be based on the actual number of gumballs in the jar. The experiment will continue for several rounds, and your earnings for the experiment will be based on your total earnings for all the rounds after the practice round. At the end of the experiment, you will be given cash equal to $1 for every 2,700 (1,100 at Fors Marsh Group) experimental dollars you earn. Please raise your hand if you have a question at any point.

Term	Definition
Audit	An examination by the tax authority of the financial information reported on a person's tax return to ensure that it is accurate.
Audit Penalty	The extra money owed due to any unpaid taxes discovered as a result of an audit. In this experiment, the audit penalty is equal to 100% of any unpaid taxes.
Audit Rate	The probability of being audited. In this experiment, it ranges from 5% to 20% depending on the tax preparer chosen.
Credentials	A person's official qualifications. In this experiment, a tax preparer with credentials represents an individual who has passed an IRS background check and is a Certified Public Accountant.
Credit	An amount of money that is subtracted from a person's tax liability, meaning that his or her taxes are reduced by this amount.
Deduction	An amount of money that is subtracted from a person's taxable income, meaning that he or she does not have to pay taxes on this portion of income.
Tax Preparer	A person who helps to calculate your income tax obligation and to file an income tax return with the tax authority on another person's behalf in exchange for a fee.
Tax Rate	The percentage of taxable income that is owed in taxes, not including any tax credits which will reduce the total tax liability. In this experiment, the tax rate is 25%.
Taxable Income	The portion of income on which the amount of income tax is based. It is calculated by taking total income minus deductions.
Withholding Rate	The percentage of income that is retained from a person's earnings and applied toward his or her taxes. In this experiment, the withholding rate is 30%.

APPENDIX (2): SELECTED SCREEN SHOTS

Taxpayer Screens, Baseline Treatment

Tax Preparation Market Experiment

Introduction

Welcome to the Tax Preparation Market Experiment!

Participant ID: P6
Role: Tax Payer
Group: Group 2

Please wait until the administrator instructs you to begin.

Start the Experiment

Tax Preparation Market Experiment

Your Gumball Estimate

Remember, your base income in **ALL** of the rounds will be determined by estimating the number of gumballs in the one-quart jar at the front of the lab. If you estimate the number correctly, you will receive **$50,000.00** experimental dollars of base income. If you do not exactly estimate the number of gumballs, your base income will be reduced by **250 times** your error in the number of gumballs in the jar.

Your estimate of gumballs in the jar is:

Next

Tax Preparation Market Experiment

Round 1: Your Earnings

In this experiment, you will earn money that is subject to taxes. In order to file a tax return, you will need to hire a tax preparation firm to complete the process for you.

Your financial information for this round:

Base Income	$45,750.00
Income Tax Withheld	$11,437.50
Other Income	$1,742.00
Total Income	$47,492.00

This information will be repeated at the top of the next few screens for your reference.

Click the button below to be matched with a tax preparer for this round.

Match

Tax Preparation Market Experiment

Round 1: Your Tax Preparation Firm

Your financial information for this round:

Tax Preparation Firm	Firm 3
Base Income	$45,750.00
Income Tax Withheld	$11,437.50
Other Income	$1,742.00
Total Income	$47,492.00

You were matched with **Firm 3** in this round.

Click the button below to continue with the tax preparation process.

Next

Tax Preparation Market Experiment

Round 1: Your Tax Filing

Your financial information for this round:

Base Income	$45,750.00
Income Tax Withheld	$11,437.50
Other Income	$1,742.00
Total Income	$47,492.00

You need to report your income to your tax preparer, who will use this information to complete your tax return. (Tax Rate = 20%)

Income Subject to Employer Withholding: $45,750.00
Amount of Income Tax Withheld: $11,437.50

Please select your Other Income to report:

- ○ **$0.00**
- ○ **$1,742.00**

Click the button below to view your tax return and audit results.

Next

Tax Preparation Market Experiment

Round 1: Your Tax Return Results

Your income tax return information:

Total Income	$47,492.00
Income Tax Withheld	$11,437.50
Taxes Paid	$7,998.40
Tax Refund	$3,439.10
Preparation Fee	$600.00
Deductions Claimed	3
Audited	No
Net Income	$38,893.60

Would you like to stay matched with Firm 3 or reenter the market to be matched with another firm?

- ○ **Stay matched with Firm 3**
- ○ **Match with another Firm**

Click the button below to continue to the next round.

Next

Tax Preparation Market Experiment

Final Results

Round History

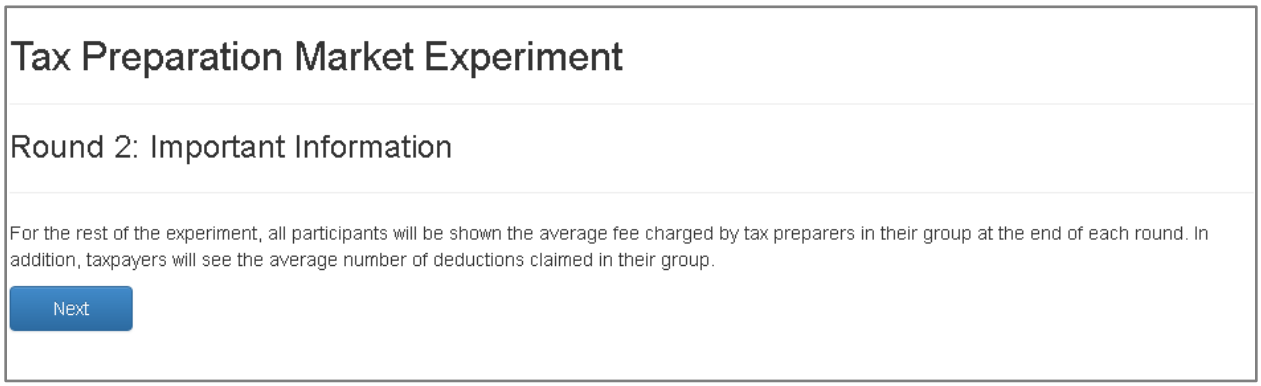
Round	Experimental Dollars
1	$38,893.60
2	$39,184.00
3	$40,548.80

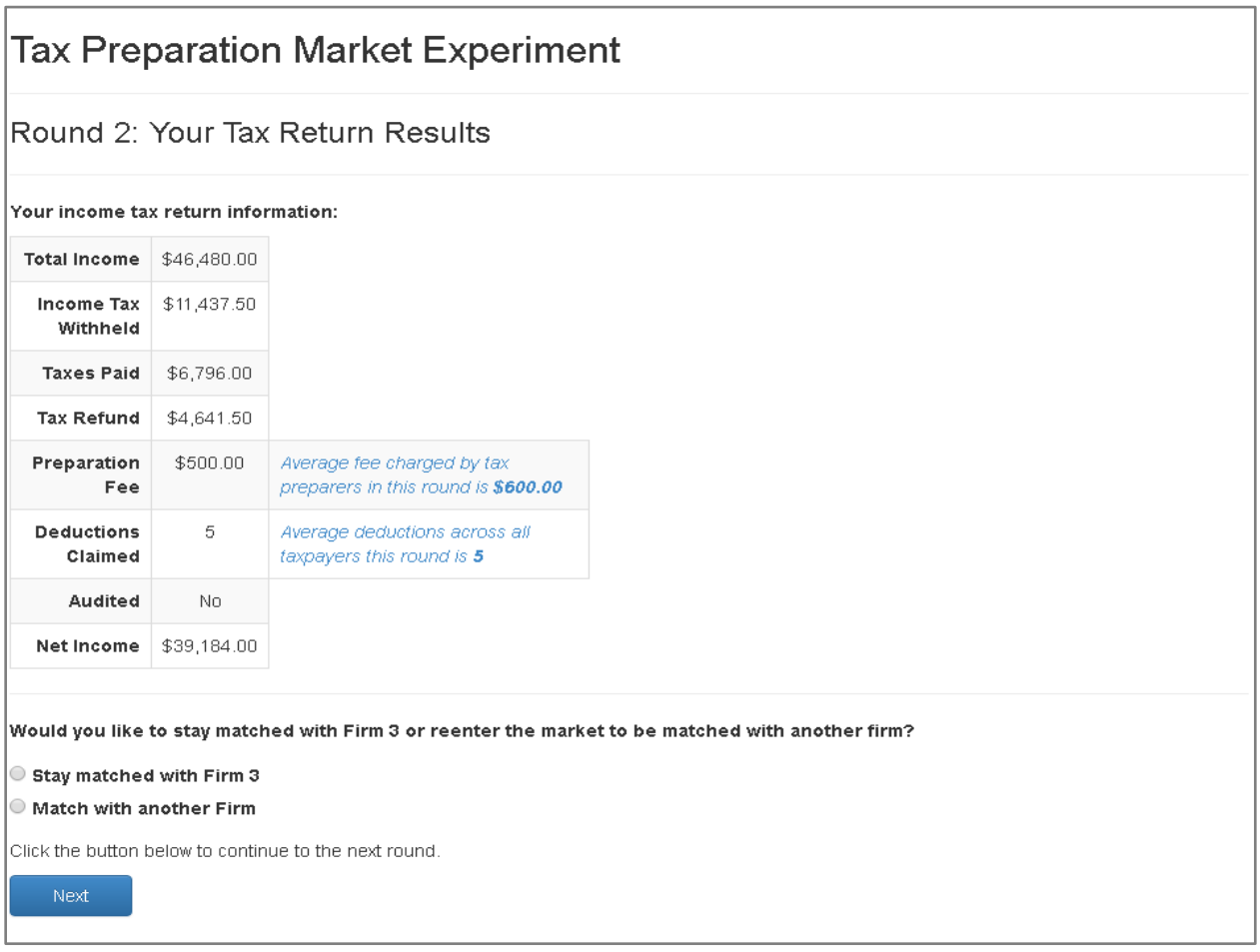
Participant Id: P6
Total Experimental Dollars: $118,626.40
Total US Dollars: $118,626.40

Click the button below to continue to the questionnaire.

Next

Taxpayer Screens, Market Information Treatment





APPENDIX (3): POST-EXPERIMENTAL QUESTIONNAIRE

You will now be asked to complete a short survey that asks about your tax experiences, personal preferences, and some additional background information about yourself. The survey takes 10-20 minutes and your responses will be kept confidential. When you are ready to begin, please click the next button to start the survey.

I. Tax Experiences

The following questions ask about your general tax experiences in the past.

Q1: In 2016 (or the most recent year in which you used a tax preparer), what kind of business did you use to prepare your taxes?

Value	Value Label
1	National tax company (e.g., H&R Block, Jackson Hewitt, etc.)
2	Small business or local tax company
3	Individual tax preparer
4	I have never used a tax preparer

Q2: In 2016 (or the most recent year in which you used a tax preparer), what credentials did your tax preparer hold? (Mark all that apply)

Value	Value Label
1	Attorney
2	Certified Public Accountant (CPA)
3	Enrolled Agent
4	Other
98	I don't know

Q3: How many different tax preparers have you used in the past 5 years?

Value	Value Label
1	One
2	Two
3	Three
4	Four
5	Five

Q4: For the tax preparer you used in 2016 (or the most recent year in which you used a tax preparer), what resource did you primarily use to select this tax preparer?

Value	Value Label

1	Newspapers, yellow pages, magazines, or other print media
2	Online review site (e.g., Yelp, Angie's List, etc.)
3	Friend, family member, or other personal connection
4	IRS.gov website
5	Tax company website

Q5: In the past 10 years, have you prepared income taxes for others? (Mark all that apply)

Value	Value Label
0	I have never prepared taxes for anyone else
1	I have prepared taxes for friends or family as a favor
2	I have prepared taxes for others pro bono, as a volunteer
3	I have prepared taxes for others in exchange for payment as a part-time, freelance, or seasonal job
4	I have prepared taxes for others as part of my full-time job

Q6: Have you ever been formally audited by the Internal Revenue Service (IRS)?

Value	Value Label
0	No
1	Yes

For the following statements, answer whether you strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

Q7. When I pay my taxes as required by the regulations, I do so…
(Mark one answer for each item)

Variable Name	Variable Text
Q7A	Because to me it's obvious that this is what you do.
Q7B	To support the country and other citizens.
Q7C	Because I like to contribute to everyone's good.
Q7D	Because for me it's the natural thing to do.
Q7E	Because I regard it as my duty as a citizen.

Value	Value Label
1	Strongly agree
2	Agree
3	Neither agree nor disagree
4	Disagree
5	Strongly disagree

Q8. When I pay my taxes as required by the regulations, I do so…
(Mark one answer for each item)

Variable Name	Variable Text
Q8A	Because a great many tax audits are carried out.
Q8B	Because the IRS often carries out audits.
Q8C	Because I know that I will be audited.
Q8D	Because the punishments for tax evasion are very severe.
Q8E	Because I do not know how to evade taxes without attracting attention.

Value	Value Label
1	Strongly agree
2	Agree
3	Neither agree nor disagree
4	Disagree
5	Strongly disagree

The following questions ask you about a number of possible scenarios when filing your taxes. Please answer how likely or unlikely you are to complete each scenario.

Q9A: You could take a detailed look at the tax regulations yourself to search for potential savings. How likely would you be to take this detailed look at the tax regulations?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q9B. You could install soundproof windows in your private dwelling and claim the resulting cost as housing space reconstruction on your income tax return. This would have the effect of reducing your tax burden. How likely would you be to carry out the housing space reconstruction?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q9C: You could attend a course that informs you about the current possibilities for making claims against taxes. How likely would you be to attend such a course?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q9D: You could buy low-value assets (e.g., PC, scanner, and other purchased equipment with a value below $500) that you do not currently need for your company, so as to decrease your taxable income. How likely would you be to purchase such equipment?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q9E: You could deduct against taxes the training costs you incurred for your employees as an allowable deduction for education and training. How likely is it that you would use the allowable deduction for education and training?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q10A: A customer paid in cash and did not require an invoice or receipt. You could intentionally omit this income on your income tax return. How likely is it that you would omit this income?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q10B: You bought some of your goods privately. You could resell those goods later to established customers and omit the profit from this sale on your income tax return. How likely would you be to omit the profit from this sale on your income tax return?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q10C: You could intentionally declare restaurant bills for meals you had with your friends as business meals. How likely would you be to declare those restaurant bills as business meals?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q10D: You have been abroad to meet relatives and to have a short meeting with one of your suppliers. Regardless of this, you could declare your expenses for the hotel and for the meals you invited your relatives to as business travel and business meals. How likely would you be to declare your expenses as business travel or business meals?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

Q10E: Recently, you took part in a project in an acquaintance's company. Now you could conceal this taxable additional income on your income tax return. How likely is it that you would conceal this additional income?

Value	Value Label
1	Very likely
2	Likely
3	Neither likely nor unlikely
4	Unlikely
5	Very unlikely

II. Risk Aversion

For each of the following questions, you are asked whether you would prefer to choose lottery A or lottery B.

Q11A: Choose between lottery A and lottery B.

Value	Value Label
1	10% chance to receive $20; 90% chance to receive $16
2	10% chance to receive $40; 90% chance to receive $1

Q11B: Choose between lottery A and lottery B.

Value	Value Label
1	20% chance to receive $20; 80% chance to receive $16
2	20% chance to receive $40; 80% chance to receive $1

Q11C: Choose between lottery A and lottery B.

Value	Value Label
1	30% chance to receive $20; 70% chance to receive $16
2	30% chance to receive $40; 70% chance to receive $1

Q11D: Choose between lottery A and lottery B.

Value	Value Label
1	40% chance to receive $20; 60% chance to receive $16
2	40% chance to receive $40; 60% chance to receive $1

Q11E: Choose between lottery A and lottery B.

Value	Value Label
1	50% chance to receive $20; 50% chance to receive $16
2	50% chance to receive $40; 50% chance to receive $1

Q11F: Choose between lottery A and lottery B.

Value	Value Label
1	60% chance to receive $20; 40% chance to receive $16
2	60% chance to receive $40; 40% chance to receive $1

Q11G: Choose between lottery A and lottery B.

Value	Value Label

1	70% chance to receive $20; 30% chance to receive $16
2	70% chance to receive $40; 30% chance to receive $1

Q11H: Choose between lottery A and lottery B.

Value	Value Label
1	80% chance to receive $20; 20% chance to receive $16
2	80% chance to receive $40; 20% chance to receive $1

Q11I: Choose between lottery A and lottery B.

Value	Value Label
1	90% chance to receive $20; 10% chance to receive $16
2	90% chance to receive $40; 10% chance to receive $1

Q11J: Choose between lottery A and lottery B.

Value	Value Label
1	100% chance to receive $20; 0% chance to receive $16
2	100% chance to receive $40; 0% chance to receive $1

III. Social Value Orientation

For the following questions, imagine that you have been randomly paired with another person, whom we will refer to as **the other**. This other person is someone you do not know and both of you will remain mutually anonymous.

You will be making a hypothetical series of decisions about allocating money between you and this other person. For each of the following questions, **please indicate the distribution of money to yourself and the other you prefer most** by selecting the button below the payoff allocations**.** You can make only one selection for each question. There are no right or wrong answers.

Q12A: Please indicate the distribution of money to yourself and the other you prefer most.

You receive	85	85	85	85	85	85	85	85	85
Other receives	85	76	68	59	50	41	33	24	15

Q12B: Please indicate the distribution of money to yourself and the other you prefer most.

You receive	85	87	89	91	93	94	95	98	100

Other receives	15	19	24	28	33	37	41	46	50

Q12C: Please indicate the distribution of money to yourself and the other you prefer most.

You receive	50	54	59	63	68	72	76	81	85
Other receives	100	98	96	94	93	91	89	87	85

Q12D: Please indicate the distribution of money to yourself and the other you prefer most.

You receive	50	54	59	63	68	72	76	81	85
Other receives	100	89	79	68	58	47	36	26	15

Q12E: Please indicate the distribution of money to yourself and the other you prefer most.

You receive	100	94	88	81	75	69	63	56	50
Other receives	50	56	63	69	75	81	88	94	100

Q12F: Please indicate the distribution of money to yourself and the other you prefer most.

You receive	100	98	96	94	93	91	89	87	85
Other receives	50	54	59	63	68	72	76	81	85

IV. Demographics

The final section of this survey asks you for some additional information about yourself.

Q13. What is your birthday?

Q14. What is your gender?

Value	Value Label
0	Male
1	Female

Q15. Are you of Hispanic, Latino, or Spanish Origin?

Value	Value Label
0	No, not of Hispanic, Latino, or Spanish Origin
1	Yes, Mexican, Mexican American, Chicano
2	Yes, Puerto Rican
3	Yes, Cuban
4	Yes, Other Hispanic, Latino, or Spanish Origin

Q16. Please select all of the following that best describe your race.

Value	Value Label
1	White
2	Black or African American
3	Asian
4	American Indian or Alaska Native
5	Native Hawaiian or Other Pacific Islander

Q17 What is the highest degree or level of school that you have completed?

Value	Value Label
1	12 years or less of school
2	High school graduate — regular diploma
3	High school graduate — GED or alternative credential
4	Some college credit, but less than 1 year
5	1 or more years of college, no degree
6	Associate degree (e.g., AA, AS)
7	Bachelor's degree (e.g., BA, AB, BS)
8	Master's, doctoral, or professional school degree (e.g., MA, PhD, JD)

Q18: What is (or was) your major in college?

Value	Value Label
1	I never attended college
2	Arts and Humanities
3	Business, Accounting, and Economics
4	Health and Medicine
5	Multi-/Interdisciplinary studies
6	Public and Social Services
7	Science, Math, and Technology
8	Social Sciences

Q19: How many business, accounting, and economics college classes have you completed?

Value	Value Label
1	None
2	One or two
3	Three to five
4	More than five

Q20. What is your marital status?

Value	Value Label
1	Married
2	Separated
3	Divorced
4	Widowed
5	Never married

Q21. How many children do you have?

Value	Value Label
0	Zero
1	One
2	Two
3	Three
4	Four
5	Five
6	Six or more

Q22. In 2016, what was your household's total combined income? This includes money from jobs, net income from business, farm or rent, pensions, dividends, interest, social security payments, and any other money received by family members.

Value	Value Label
1	Less than $5,000
2	$5,000 to $7,499
3	$7,500 to $9,999
4	$10,000 to $12,499
5	$12,500 to $14,999
6	$15,000 to $19,999
7	$20,000 to $24,999
8	$25,000 to $29,999
9	$30,000 to $34,999
10	$35,000 to $39,999
11	$40,000 to $49,999
12	$50,000 to $59,999

13	$60,000 to $74,999
14	$75,000 to $99,999
15	$100,000 to $149,999
16	$150,000 or more

Q23. Which of the following best describes your 2016 employment status?

Value	Value Label
1	An employee of a private company or business, or of an individual for wages, salary, or commissions
2	Government employee (local, state, or federal)
3	Self employed
4	Not employed

Q24. [If Q23==4] Which of the following best describes why you were not employed in 2016?

Value	Value Label
1	Retired
2	Student
3	Disabled or unable to work
4	Homemaker
5	Not looking for work

IV. Debriefing

Thank you for completing this survey. This concludes the study. Please wait and you will be given further instructions for receiving your payment for participating in this study.