

Teaching the Tax Code: Earnings Responses to an Experiment with EITC Recipients*

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Abstract

This paper tests whether providing information about the Earned Income Tax Credit (EITC) affects EITC recipients' labor supply and earnings decisions. We conducted a randomized experiment with 43,000 EITC recipients at H&R Block in which tax preparers gave simple, personalized information about the EITC schedule to half of their clients. Tracking subsequent earnings, we find no significant effects in the full sample, except for the sub-sample of those self-employed in base year. However, there is substantial heterogeneity in treatment effects across the 1,461 tax professionals who assisted the clients involved in the experiment. Half of the tax professionals, whom we term "compliers," induce treated clients to increase their EITC refunds by choosing an earnings level closer to the peak of the EITC schedule. The remaining tax preparers generate insignificant changes in EITC amounts but increase the probability that their clients have incomes high enough to reach the phase-out region. Treatment effects are larger for the self-employed, but are also substantial among wage earners, suggesting that information provision induced real labor supply responses.

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1 Introduction

A central assumption in the literature on tax and transfer policy is that individuals are fully informed about government policies relevant for their choices. In this paper, we test this assumption using a field experiment with Earned Income Tax Credit (EITC) clients at H&R Block. The EITC is the largest cash transfer program for low income families in the United States and it generates large marginal subsidies or taxes on the earnings of recipients. Survey evidence indicates, however, that the marginal incentive structure of the EITC is not well understood by eligible tax filers. Most low-income families have heard about the EITC and know that working is associated with getting a tax refund check when they file their taxes. But very few recipients know whether working more would increase or reduce their EITC amount (Liebman 1998, Romich and Weisner 2002), perhaps because of the program’s complexity.

The lack of information could potentially explain why the EITC induces very small responses along the intensive margin (hours worked and earnings), despite generating substantial increases in labor force participation (Hotz and Scholz 2003). To test this hypothesis, we conducted a randomized experiment that provided simple information about the EITC to eligible tax filers and tracked the effect of this intervention on their subsequent earnings. The experiment was implemented at 119 H&R Block tax preparation offices in the Chicago metro area in 2007. The experimental population comprised approximately 43,000 tax filers who (a) received EITC payments at one of the 119 H&R Block offices when filing taxes in 2007 and (b) had one or more dependents. Half of these clients were randomly selected to receive a two minute explanation about how the EITC works from their “tax professional,” the H&R Block employee assisting them with their tax returns. Tax professionals were trained to use three tools to explain the EITC to their clients: a verbal description, a graph showing the shape of the EITC as a function of earnings, and a table listing the key EITC parameters. Each client was also given tailored advice emphasizing the implications of his marginal incentives conditional on his location in the EITC schedule. For example, clients in the phase-in region were told, “It pays to work more!”

We view our treatment as changing perceptions of marginal incentives around the tax filer’s current location. Existing survey evidence indicates that most EITC recipients know the size of their current EITC refund, but underestimate the extent to which the EITC varies with their earnings. If the information treatment updates perceptions toward the true EITC schedule and informed tax filers are responsive along the intensive margin, tax filers should change their

behavior to increase their EITC refunds. Such behavioral responses should generate a more concentrated earnings distribution around the peak of the EITC schedule.

We evaluate the effects of the intervention using data from tax returns filed in 2007 (“year 1”) and 2008 (“year 2”). 72% of the clients in the treatment and control groups returned to H&R Block to file their taxes in the post-treatment year, allowing us to conduct a panel study of the effects of the information treatment on earnings. We begin with a simple analysis of treatment effects in the full sample. We find weak evidence ($p < 0.1$) changes in EITC amounts from year 1 to year 2 are higher among treated clients relative to control clients. However, those with self-employment income in base year (about 11% of the sample) are significantly more likely to report income in year 2 that is close to the first EITC kink point. The information treatment thus appears to have induced responses among the self employed, but had only at best a marginal effect on wage earners overall. Recognizing that these comparisons in the full sample could mask heterogeneous responses, we then examine the heterogeneity of treatment effects across tax professionals. Treatment effects could vary substantially by tax professional for two reasons. First, the 1,461 tax professionals who implemented the experiment were trained in a decentralized manner by senior H&R Block employees, leading to variations in training. Second, a number of tax professionals felt that it was in their clients’ best interest to work and earn more irrespective of the EITC’s incentive effects. These tax professionals framed the phase-out message as an encouragement to work more because the loss in EITC benefits is relatively small.¹

We first document that there is significant heterogeneity across tax professionals in mean treatment effects on EITC amounts using a non-parametric F test. The hypothesis that treatment effects are constant across tax professionals is rejected with $p < 0.01$. To characterize the nature of the heterogeneity, we follow the methodology of Duflo et al. (2006). We divide tax professionals into two groups: “complying” and “non-complying.” To construct these groups, we first define a simple measure of the concentration of the earnings distribution in year 2 – the fraction of returning clients with “middle” incomes (between \$7,000 and \$15,400).² For

¹During focus groups prior to the experiment, several tax professionals argued that clients should always be encouraged to work more because, “you lose \$2 of EITC benefits for every \$10 you earn, but come out ahead by \$8 and possibly become eligible for other credits, so it still pays to work.”

²The upper threshold of \$15,400 is the start of the EITC phase-out range; the lower threshold of \$7000 is chosen to divide the remaining interval into two equal-sized bins. As we describe in detail in Section 4.5, alternative measures of the concentration of the earnings distribution yield similar results.

each tax filer i , we define his tax professional as a “complier” if she has a higher fraction of other clients (*excluding* client i) with middle income in the treatment group than the control group. Intuitively, from the perspective of client i , complying tax professionals are those who increase the concentration of the earnings distribution for other clients. Critically, because we exclude client i when defining his tax professional’s compliance, there is no correlation between client i ’s outcome and his tax professional’s compliance under the null hypothesis that all tax professionals have zero treatment effects.

For clients of complying tax professionals, who account for half of the sample, the information treatment increases EITC amounts and the concentration of the earnings distribution significantly. Complying tax professionals raise their treated clients’ EITC refund by \$68 on average ($p < 0.01$), relative to a mean of approximately \$2,400. Information provision leads to an especially dramatic accentuation of bunching around the first kink in the EITC schedule among the self-employed. The larger treatment effects for the self-employed are likely due to greater flexibility and reporting effects (as there is no third-party reporting of self-employment income). Importantly, however, we also find a significant increase in the concentration of the distribution of wage earnings. Since it is difficult to manipulate wage and salary income (as it is reported on W-2 forms by employers), this finding suggests that the informational intervention induced “real” changes in labor supply behavior. These changes in the distributions of earnings and EITC amounts for clients of complying tax professionals are visually evident in density plots, and are statistically significant under non-parametric Kolmogorov-Smirnov tests. In summary, the evidence for the compliers supports the hypothesis that intensive-margin labor supply responses to the EITC are attenuated by a lack of information.

For clients of non-complying tax professionals, the information treatment does not lead to significant changes in EITC amounts. However, non-complying tax professionals increase their treated client’s incomes by \$250 (1.5%) on average ($p < 0.05$). Based on our discussions with tax professionals, we speculate that non-compliers may have used the information to simply encourage clients to aim for a high level of earnings rather than maximize their EITC refunds. Consistent with this interpretation, we find that non-complying tax professionals do not have a significant effect on reported self-employment income and only affect wage earnings.

In addition to the literature on the EITC, which we discuss in greater detail in section 2, our analysis builds on and relates to a rapidly growing literature on the importance of information

and salience for choices in other contexts. Most of these studies show that providing information has substantial effects on immediate decisions such as enrollment in pension or health plans, school choices, or grocery purchases (Duflo and Saez 2003, Hastings and Weinstein 2008, Chetty, Looney, and Kroft 2009, Kling et al. 2009). A few recent studies have shown that providing information can also generate changes in behavior in the longer run. Jensen (2010) shows that providing information to students in the Dominican Republic on the returns to schooling reduced dropout rates in subsequent years among some subgroups. Nguyen (2008) conducts a similar experiment in Madagascar and shows that information on returns to education increases subsequent test scores.

Our analysis contributes to this literature by showing that information affects labor supply, which is one of the most important long-term decisions made by households and is central to the design of tax and transfer policy. Our findings reject the common view that intensive margin labor supply behavior is completely inelastic because of institutional constraints. Our results also suggest that advice about how one should respond to incentives has an important influence on behavior beyond just the information effects. Unfortunately, we are unable to quantify the relative importance of the information and advice channels because we do not have data on how the treatment affected individuals' priors about the structure of the EITC.³ Therefore, we view our contribution as an initial exploration showing that the impacts of tax policies depend on the way in which individuals are taught about the tax system. In this sense, our results mirror studies of teacher effects (e.g., Rockoff 2004): we show that “teachers” of the tax code affect behavior, but leave the important question of what makes some people teach and interpret the tax code differently from others to future research.

The remainder of the paper is organized as follows. Section 2 provides background on the EITC and the literature on the effects of the program. Section 3 describes the experimental design and data. Results are presented in Section 4. We conclude in section 5 by discussing the implications of our results for future research.

³We had originally planned to measure perceptions of marginal incentives using base-year and followup surveys of the clients involved the experiment, but this component unfortunately was not implemented.

2 Background on the EITC

2.1 Program Structure

The EITC is a refundable tax credit administered through the income tax system. In 2006, the latest year for which statistics are available, 23 million tax filers received a total of \$44.4 billion in EITC payments (Internal Revenue Service 2008, Table 2.5). Eligibility for the EITC depends on earnings – defined as wage and salary income and self-employment income – and the number of qualifying children. Qualifying dependents for EITC purposes are relatives who are under age 19 (24 for full time students) or permanently disabled, and reside with the tax filer for at least half the year.⁴

Figure 1A displays the EITC amount as a function of earnings for single and joint tax filers with zero, one, or two or more qualifying dependents in 2007. EITC amounts increase substantially with the number of dependents, but the shape of the schedule as a function of earnings is the same in all three cases. EITC amounts first increase linearly with earnings, then plateau over a short income range, and are then reduced linearly and eventually phased out completely. Since the EITC amounts for tax filers with no children dependents are very small (maximum of \$428), we excluded them from our experiment, focusing only on tax filers with one or more children.

In the phase-in region, the subsidy rate is 34 percent for taxpayers with one child and 40 percent for taxpayers with two or more children. In the plateau (or peak) region, the EITC is constant and equal to a maximum value of \$2,853 and \$4,716 for tax filers with 1 and 2+ children, respectively. In the phase-out region, the EITC amount decreases at a rate of 15.98% for filers with 1 child, and 21.06% for those with 2+ children. The EITC is entirely phased-out at earnings equal to \$33,241 and \$37,783 for single filers with 1 and 2+ children, respectively.⁵ See IRS Publication 596 (Internal Revenue Service 2007) for complete details on program eligibility and rules.

⁴Only one tax filer can claim an eligible child; for example, in the case of non-married parents, only one parent can claim the child.

⁵For those who are married and file jointly, the plateau and phase-out regions of the EITC are extended by \$2,000.

2.2 Claiming the EITC: Administrative Procedures

To claim the EITC, families file an income tax return that includes an EITC schedule between January 1 and April 15 of the following calendar year. The EITC is received in a single payment as part of the tax refund shortly after filing.⁶

According to the 2004 public use microdata on tax returns, 74% of families with children receiving the EITC use paid tax preparers to file their returns. The largest company in the market for paid tax preparation in the United States is H&R Block. H&R Block has about 13,000 offices located throughout the United States and employs over 100,000 tax professionals during the tax filing season. H&R Block currently prepares about 12% of all individual tax returns in the U.S. A substantial fraction of these returns are for EITC claimants, as over half of H&R Block’s individual clients have an adjusted gross income (AGI) below \$35,000.

To file their tax returns, clients come to an H&R Block office with relevant documents such as their W-2 wage income forms. The client sits with a “tax professional” – the term used to refer to H&R Block employees who prepare tax returns – in front of a computer running the H&R Block Tax Preparation Software (TPS). TPS consists of a series of screens corresponding to the various steps in tax return preparation. At each screen, the tax professional asks questions or inputs information from the forms brought in by the client. The tax preparation process takes about 30 to 45 minutes to complete for a typical EITC client.

2.3 Existing Evidence and Perceptions of EITC

There is a large empirical literature estimating the effects of the EITC on labor supply and earnings. Hotz and Scholz (2003) and Eissa and Hoynes (2006) provide comprehensive surveys. A number of studies have found strong evidence that the EITC increases labor force participation – the extensive margin response.⁷ However, there is little evidence that the EITC leads to a change in labor supply for those already in the labor market – the intensive margin. Most studies find no effects of the EITC on hours of work (see e.g., Meyer and Rosenbaum 1999 and Rothstein 2010). Using tax return data, Saez (2010) finds clear evidence of bunching of EITC

⁶There is an option to receive the EITC in advance during the year through the paycheck, but take-up of this option is extremely low (less than 2%). See Government Accountability Office (2007) and Jones (2010).

⁷See e.g., Eissa and Liebman (1996), Meyer and Rosenbaum (2001). Eissa and Hoynes (2004) present complementary evidence of extensive-margin responses in the opposite direction: the labor force participation rate of married women in the phase-out region of the schedule fell slightly when the EITC was expanded. We expect that this extensive-margin response has a small impact on our results because 91% of the tax filers in our sample are single.

recipients at the first kink of the EITC schedule – where the phase-in ends and the plateau starts – for recipients reporting self-employment income. However, there is no bunching for recipients who do not report any self-employment income, who account for 89% of the individuals in our dataset.

The contrast between the strong responses along the extensive margin and small or zero responses along the intensive margin could be explained by a lack of information about the structure of the EITC (Liebman 1998, Hotz and Scholz 2003, p. 182). To respond along the extensive margin, families only need to know that working is associated with a large tax refund. In contrast, responding along the intensive margin requires knowledge about the non-linear marginal incentives created by the three ranges of the EITC displayed in Figure 1A. Surveys of low income families and in-depth interviews of EITC claimants show that there is widespread knowledge about the EITC’s existence, but little knowledge about the structure of the EITC (Ross Phillips 2001, Olson and Davis 1994, Romich and Weisner 2002, Smeeding, Ross Phillips, and O’Connor 2002, Maag 2005). These interviews indicate that 60-90% of low income families have heard about the EITC and know that it is a tax refund for working. However, less than 5% of these families know about the non-linear pyramid shape of the EITC as a function of earnings and the location of the kink points.⁸

The lack of knowledge about the EITC’s structure is striking given that the program parameters have been quite stable for over a decade. However, it is not surprising in view of the information currently available about the program. To our knowledge, prior to our experiment, the graphical depiction of the EITC schedule shown in Figure 1A could only be found in academic papers. Official Internal Revenue Service publications provide tables that show exact EITC amounts as a function of income and other characteristics, but do not summarize the EITC phase-in, peak, and phase-out structure in a transparent way. For legal reasons, the IRS only distributes comprehensive documents that cover all possible contingencies, making it impossible to highlight the features of the tax code most relevant for a given taxpayer.⁹ In addition, none of the existing commercial tax preparation software describes the EITC structure

⁸Among the 42 families interviewed by Romich and Weisner (2002), 90% had heard of the EITC, but only two families knew that they needed to earn a certain amount to maximize their credit. One of those two families aimed at reporting self employment earnings in order to maximize the credit (p. 378).

⁹For example, the official IRS publication on the EITC intended for the public (Internal Revenue Service, 2007, Publication 596) is 57 pages long and never explicitly mentions the slope parameters of the credit. The publication simply states the EITC amounts in the form of a 7 page table that has 4,770 entries.

or marginal incentives explicitly.

We conclude from the existing literature that most EITC recipients know the value of their current EITC refund amount, but do not think about the slope of the EITC schedule when making marginal earnings decisions. For such EITC recipients, the local slope created by the EITC is therefore irrelevant in their labor supply decision. It is natural to assume that EITC recipients who do take into account the EITC when choosing their labor supply have unbiased beliefs about the relevant slope. In this case, the average EITC recipient's perception of the EITC schedule is flatter than the actual schedule. More precisely, let $EITC^p(z)$ denote the individual's perceived EITC refund at an earnings level of z and $EITC(z)$ the actual EITC refund at that level of earnings. Let $s^p(z)$ denote the perceived local slope of the EITC schedule and $s(z)$ the actual slope. The existing survey evidence suggests that the representative individual with initial earnings z_0 perceives the relationship between earnings z and his EITC refund to be

$$EITC^p(z) = EITC(z_0) + (1 + s^p(z))(z - z_0) \quad (1)$$

where $|s^p(z)| < |s(z)|$. Figure 1B illustrates the perceived budget constraint in (1) for two tax filers, one in the phase-in range and one in the phase-out range. Such misperceptions about marginal incentives motivate our question of whether improving knowledge (updating $s^p(z)$) could amplify the impacts of the EITC on intensive-margin labor supply.¹⁰

3 Experimental Design

We implemented the information-provision experiment in 119 H&R Block offices in the Chicago metropolitan area during the 2007 tax filing season (January 1 to April 15). Clients at these offices who received an EITC with at least one eligible child were randomly assigned into the treatment or control group. Assignment was based on the last 2 digits of the Social Security Number of the primary filer. The probability of treatment assignment was 50 percent. The control group followed the standard tax preparation procedure using the TPS software described above. In the standard preparation procedure, a screen notifies the tax filer of his EITC amount if he is eligible for the EITC. This screen does not explain the structure of the EITC.

¹⁰There is similar evidence that people are not fully informed about many other aspects of income tax schedules. See Fujii and Hawley (1988) for evidence from the United States, Brown (1968) for the United Kingdom, Bises (1990) for Italy, and Brannas and Karlsson (1996) for Sweden.

The new EITC information materials delivered by tax professionals to clients in the treatment group were developed in a series of steps. We began by interviewing 12 single mothers with recent work experience in the welfare office of San Francisco county in early October 2006. All 12 single mothers had filed tax returns in the past and almost all had heard about the EITC, but none knew about or had seen the graphical depiction of how the EITC varies with earnings. The interviewees found the graphical presentation of the EITC reasonably easy to understand and felt that it made the key features of the EITC very salient. Furthermore, most of the individuals recognized the value of this information for their work decisions and found the take-home messages sensible.¹¹

We refined the information materials in a focus group with 15 experienced H&R Block tax professionals and local managers in the Chicago area in late October 2006. Finally, H&R Block’s internal staff and legal team edited and approved all the materials used in the experiment. The process described below is the final procedure that resulted from the collaborative effort between the researchers and H&R Block. Note that in all official tax forms as well as in H&R Block materials, the EITC is referred to as the EIC (Earned Income Credit). We follow this convention in the information treatment materials described below.

3.1 Information Treatment Procedure

For the treatment group, two special “EIC information” screens are displayed automatically in TPS at the end of the tax preparation process.¹² The first screen prompts the tax professional to begin the EIC explanation they were trained to provide and introduces the client to the information outreach program. This introductory screen is shown in Appendix Exhibit I(a) for the case of a single filer with two or more dependents, the case on which we focus below for concreteness. The screen displays the EIC amount the tax filer is getting and describes the goal of the outreach effort, namely to help the client understand how the EIC depends on earnings. The second EIC information screen is displayed in Appendix Exhibit I(b) for a tax filer in the increasing range of the EIC. This screen provides the key EIC information relevant

¹¹For example, one of the interviewees suggested that we visit her housing complex to distribute this information more widely, because her neighbors and friends would find it useful in making overtime and part-time work decisions.

¹²This screen appears *after* all the client’s tax information has been entered and the tax refund and liability have been calculated. We show below that there is no difference in base year earnings across control and treatments groups, implying that treated tax filers did not go back and change their reported earnings in the base year after getting the EIC information.

to the tax filer's case, which the tax professional uses to explain the program to the client.

The central element of the explanation procedure is an "EIC handout" paper form that the tax professional fills out with the client and uses as a visual aid to explain the program. There are four EIC handouts based on the tax filer's marital status and dependents: single vs. joint filer and one vs. two or more dependents. Exhibit I shows the EIC handout for the case of a single filer with two or more dependents. The tax professional uses the information on the computer screen to fill in the blanks on the form in the following four steps.

First, the tax professional fills in the income that the client earned in 2006 and the corresponding EIC amount the client is receiving. Second, the tax professional draws a dot on the graph illustrating the client's location on the schedule. He then uses the graph to explain the link between earnings and the EIC amount.

In the third step, the tax professional circles the range of the schedule that the client is in – increasing, peak, or decreasing – and provides some advice corresponding to that range. In the increasing range, the take-home message is "Suppose you earn \$10 an hour, then you are really making \$14 an hour. It pays to work more!" In the peak range, the message is "Your earnings are maxing-out the EIC amount." In the decreasing range, the message is "If you earn \$10 more, your EIC is reduced by \$2.10. Earning more reduces your EIC, but you may qualify for additional tax credits."

The decreasing range message deliberately downplays the work disincentive created by the EITC in the phaseout region. The advice took this form because many managers and tax professionals at H&R Block felt strongly that it was in the best interest of tax filers to work and earn more. Indeed, many tax professionals pitched the message verbally as "You lose \$2 of your EIC credit when you earn \$10 more, but you still come out ahead by \$8 and potentially become eligible for other credits, so working more pays off."¹³ The fact that some tax professionals advised clients to aim for a high level of earnings – irrespective of the EITC's effect on incentives – appears to have important effects on the results, as we will see below.

In the fourth step, the tax professional circles the relevant range in the table which displays the exact parameters for the EITC. This table provides an alternative method of showing exactly how much the client can change his earnings before crossing the threshold for the next

¹³In some cases, other credits such as the non-refundable portion of the child tax credit do indeed increase with earnings in the EITC phaseout range, mitigating the implicit tax on work. We chose not to explain all aspects of the tax system in our information handout in the interest of simplicity.

range. Tax professionals were trained to spend the most time on whichever of the three methods the client appeared to understand best – the verbal, graphical, or tabular descriptions.

After this information explanation is provided and the tax return process is completed, TPS automatically prints an “EIC printout” page that reproduces the information filled out in the handout. Appendix Exhibit II displays an example of the EIC printout. This page is printed at the same time as the tax return and inserted at the top of the packet given to the client to take home. The client is reminded by the tax professional that this information may prove useful when making earnings-related decisions later in the year. The purpose of the printout is to present the EITC information in a clean, accurate format. The temporary handout used to explain the program is kept by the tax professional.

Finally, to reinforce the treatment, H&R Block sent a letter summarizing the EITC information to all treatment-eligible clients in August 2007. Appendix Exhibit III displays an example of this letter.

As with most provisions of the tax code, EITC ranges are mechanically indexed for inflation and therefore differ slightly across the base year and subsequent year. Since our goal was to inform tax filers about the EITC parameters relevant for their subsequent labor supply decisions, the table and graph display the EITC parameters for 2007 earnings and the corresponding EITC that would be received when filing in 2008 (the post-treatment year). The classification of tax filers into the 3 groups – increasing, peak, and decreasing – was also based on the 2007 EITC parameters. As a result, a tax filer who was at the very beginning of the peak range would actually be presented with the increasing scenario that would apply were he to have the same nominal income in 2007. Similarly, a tax filer at the very beginning of the decreasing range would be presented with the peak scenario. Since the IRS inflation rate applied from tax year 2006 to 2007 was relatively small (3.9%), only 4% of taxpayers were located at a point where their current range differed from their predicted range for the following year. Note that the phase-in and phase-out *rates* were unchanged across the years.

3.2 Tax Professional Behavior

The effects of the experiment depend critically on the knowledge and behavior of the tax professionals. There were 1,461 tax professionals involved in the experiment, each of whom had 29 clients in our sample on average (including treatment and control). We trained approximately

100 “office leaders” (senior tax professionals) in November 2006 ourselves, who then trained the rest of the tax professionals during December 2006. The training described the general goal of the outreach effort, why the experimental design required giving information to only half the clients, and explained the changes to the TPS system that would be introduced. A series of case studies with hypothetical clients were used to illustrate various scenarios and how standardized explanations should be provided in the four steps.¹⁴ Field observations in January 2007 confirmed that the EIC information screens and printouts were working as planned and that tax professionals were implementing the experiment as trained.

In pilot sessions, we found that a minimum time of two minutes was required for a coherent explanation of the EITC. To give tax professionals an incentive to administer the information treatment carefully to eligible clients, each tax professional was offered \$5 for each eligible client with whom they spent at least two minutes on the EIC information screens (with time tracked by the software). If the tax professional attempted to exit the information screens before two minutes elapsed, the TPS system displayed a warning, “Does your client understand the explanation of how the EIC impacts their tax return?” The system then allowed the tax professional to go back and continue his explanation, resuming the two minute clock. Tax professionals who spent less than two minutes on the information screens did not receive any compensation for that client. Figure 2 displays a histogram of seconds spent by tax professionals on the EITC screens and shows that there is clear spike at 120 seconds, implying that most tax professionals understood and responded to the compensation structure. The average time spent on the information screens conditional on reaching 120 seconds is 3.5 minutes.

Overall, 73% of tax filers whom we intended to treat were treated for at least two minutes. A substantial fraction of the variance in compliance rates is explained by office fixed effects, presumably due to variations in training. Most offices had very high compliance. However, one large office had a two-minute treatment rate of 6%, 11 percentage points below the next lowest office. We believe this exceptionally low treatment rate arose from a failure to hold the planned training sessions. Since the treatment was effectively not implemented at this office, we exclude it from the analysis below.¹⁵

The decision to offer a 2+ minute EITC explanation to eligible clients may have depended on

¹⁴The powerpoint slides and case studies used for training are available from the authors upon request.

¹⁵Including the office does not change our qualitative results but, unsurprisingly, slightly reduces the magnitude and precision of the estimates.

the client’s interest in the information. Since a client’s interest is not random, we follow standard practice in the experimental literature and estimate “intent-to-treat” effects – comparing outcomes of those eligible and ineligible to receive the information explanation.

To supplement the statistics on compliance rates, we directly assessed the tax professionals’ reactions to the experiment using a survey of the tax professionals at the end of the tax season. See Appendix Exhibit IV for the survey instrument. To obtain candid responses, the surveys identified offices but not individual tax professionals within those offices. 78% of the 119 offices sent back completed surveys, yielding a total of 785 survey responses. 88% of the tax professionals who responded to the survey thought that the EITC information should be offered again in the future. 81% of surveyed tax professionals thought that the EITC experiment pilot helped their own understanding of how the EITC credit works. This shows that our outreach effort did provide new information about the structure of the EITC beyond what is normally provided in the tax preparation procedure at H&R Block.¹⁶ When asked about client interest, 37% of tax professionals said that “most” (>75%) of their clients were interested in the information explanation. 38% of the tax professionals said that “many” (25 to 75%) clients were interested, while 25% of tax professionals felt that few (<25%) of their clients were interested. We conclude from these surveys that most tax professionals were enthusiastic about the experiment and thought it was a valuable service for their clients, suggesting that the information treatment was implemented satisfactorily.

3.3 Hypothesis

Our general hypothesis is that the provision of information and advice by tax professionals induces clients to change their earnings behavior. More specifically, tax professionals who implement our information treatment as intended should update their clients’ perceptions toward the true EITC schedule, shifting s^p toward s in equation (1).¹⁷ This change in perceptions of marginal incentives rotates the perceived budget set as shown in Figure 1B, generating substi-

¹⁶Tax professionals who went through our training process may have offered better explanations on the EITC to tax filers in the control group as well. To minimize such contamination effects, we emphasized repeatedly in training that it was critical not to give any extra information to the clients who were not selected for treatment for the purpose of the study. Any remaining contamination effects would attenuate our treatment effect estimates.

¹⁷A key limitation of the present study is that we can only speculate about how our treatment changed baseline perceptions because we were unable to collect data on prior beliefs. As a result, we are only able to test the broad null hypothesis that information and advice do not affect behavior. Testing sharper hypotheses about the link between changes in priors and changes in behavior would be a valuable direction for future work.

tution effects but no income effects. Such substitution effects should increase earnings for tax filers who would have been in the phase-in range absent the treatment, leave earnings unchanged for those in the peak, and decrease earnings for tax filers in the phase-out.

One natural method of testing this prediction is to ask whether incomes rise for tax filers who were in the phase-in region in the base year and fall for those in the phase-out in the base year. This strategy effectively uses base-year income as a proxy for the (counterfactual) level of year 2 income absent the treatment. The problem with this approach is that incomes are very unstable across years for low-income individuals. The standard deviation of residual income growth in our sample is 62% after controlling for a cubic in base-year income, self-employment status, and number of dependents. Because of this high level of income volatility, 46% of tax filers who are initially in the phase-in region move to the peak or phase-out regions (or even beyond the phase-out) in the next year even in the control group. 58% of tax filers initially in the EITC plateau move away from the plateau in the next year. The inability to predict tax filers' locations in the EITC schedule in the post-treatment year makes it difficult to sign the direction in which earnings should change for a given tax filer, and drastically reduces the precision of our estimates. In view of the instability problem, we always focus on samples including all ranges of earnings in base year and we compare the unconditional density distributions of post-treatment earnings in the treatment and control groups or analyze whether treated clients get larger increases in EITC refunds in year 2 on average than control clients.

4 Results

Our analysis of the experimental results is based on anonymous statistical compilations prepared by H&R Block in accordance with applicable laws. These compilations were constructed from data extracted from tax returns filed in 2007 and 2008 and from supplemental information collected by H&R Block during the implementation of the experiment in 2007.

4.1 Descriptive Statistics

Table 1 presents descriptive statistics for the treatment and control groups. The means of all of the base year variables are similar in the treatment and control groups. None of the mean differences are significant at the 5 percent level, confirming that randomization was successful. The mean income in the base year (year 1) in the full sample is \$16,600. Income is the sum

of wage earnings and self-employment income. Average wage earnings are \$15,900. Average self-employment income is \$700, and 11% of tax filers report positive self-employment income.¹⁸ The mean EITC amount in the base year is \$2,470. About 59% of the claimants have two or more dependents in the base year, and 64% report two or more dependents in the post-treatment year. There is no differential change in the number of dependents in the control and treatment groups, indicating that the treatment did not induce tax filers to change the number of dependents they claim.¹⁹ The vast majority of the individuals in the sample are single.

In order to examine distributional outcomes, throughout the paper we divide the income distribution into three bins: low incomes (below \$7000), middle incomes (\$7000 to \$15,400), and high incomes (above \$15400). The upper threshold of \$15,400 is the start of the EITC phase-out range for single earners; the lower threshold of \$7000 is chosen to divide the remaining interval into two equal-sized bins. By this classification, 14% of the sample is “low income”, 34% is “middle income”, and 51% is “high income.”

The bottom row of Table 1 shows the fraction of clients who returned to H&R Block in year 2. The average return rate is around 72%. The return rate is 0.85% lower in the treatment group, a small but marginally significant difference. We explore the pattern of return rates further in Figure 3, which plots mean return rates by \$1,000 base-year earnings bins in the treatment and control groups. The average return rates track each other very closely, showing that there are no systematic patterns of differential attrition by base year income. In addition, there are no significant differences between the treatment and control groups in the base-year variables in Table 1 for the subsample of clients who return. In view of this evidence, we believe that the comparisons between the treatment and control groups which follow are unlikely to be contaminated by selective attrition.

4.2 Full Sample Results

We begin our empirical analysis by comparing changes in EITC amounts (from year 1 to year 2) in the treatment and control groups. Row 1 of Table 2 reports p values from non-parametric Kolmogorov-Smirnov (KS) tests for differences in the empirical distributions of several variables

¹⁸More precisely, positive self-employment income was measured as having positive self-employment taxes. No self-employment taxes are due if self-employment income is below \$400. 11% of tax filers have self-employment income above \$400.

¹⁹This is consistent with the fact that information on how the EITC varies with the number of children was not provided.

in the full sample. Column 1 shows that there is a no significant difference in the distribution of the change in EITC amounts between the treatment and control group ($p = 0.074$).²⁰ Figure 4 plots the density of post-treatment income. The dashed blue line is for clients in the control group and the solid red line is for clients in the treatment group. Panel A considers clients with 1 dependent and Panel B those with 2+ dependents. The red vertical lines mark the cutoffs for the phase-in and phase-out regions for each case, and the EITC schedule is shown in orange. Both panels show no discernible effect of the treatment on the earnings density distribution in year 2 confirming the results from the KS test that the treatment had no significant effect on EITC amounts.

Next, we estimate treatment effects using OLS regressions of the form

$$y_i = \alpha + \beta \text{treat}_i + \gamma X_i + \varepsilon_i \quad (2)$$

where y_i is a year 2 outcome, treat_i is defined as an indicator for being eligible for the treatment, and X_i is a vector of year 1 covariates. The coefficient of interest, β , can be interpreted as an intent-to-treat estimate. Table 3 presents estimates of β for various outcomes. The columns of Table 3 consider different outcomes or sets of covariates, while the rows consider different subsamples. Each coefficient listed in the table is from a separate regression. We report standard errors clustered by tax professional in parentheses and t-statistics in square brackets.²¹

The dependent variable in columns 1 and 2 is the difference between the client’s EITC amount in the post-treatment and pre-treatment years. Columns 3 and 4 consider the mean change in earnings from year 1 to year 2. In columns 2 and 4, we include the following vector of base year covariates (X): earnings, earnings squared, wage earnings, indicator for married filing jointly, and number of children (1 vs. 2 or more).

Row 1 of Table 3 shows treatment effect estimates for the full sample (rows 2-5 are discussed in the next section). Consistent with the non-parametric tests above, we do not detect robust differences in EITC amounts or earnings distribution across the treatment and control groups. Most of the coefficients are small and statistically insignificant. There is weak evidence of a treatment effect on the change in EITC amounts (\$24 higher on average in the treatment group) but the effect is only marginally significant ($p < 0.1$). Overall, we conclude that the full sample does not exhibit sharp differences between the treatment and control groups.

²⁰We discuss column 2 of this table in section 4.4.

²¹The number of observations is the same for all regressions in each row and is reported only once per row in square brackets.

4.3 Heterogeneity in Treatment Effects Across Tax Professionals

As described above, we expect substantial heterogeneity in treatment effects across the 1,461 tax professionals involved in the experiment because of variations in training and willingness to convey the take-home messages we proposed. Such heterogeneity across tax professionals could potentially be masked in the full sample. We begin our analysis of treatment effect heterogeneity across tax professionals using an F test. Let $i = 1, \dots, N$ index clients and $p = 1, \dots, P$ index tax professionals. Let $\Delta EITC_i$ denote the change in the EITC amount (from year 1 to year 2) for client i . Let $tp_{i,p}$ denote an indicator variable for whether client i is served by tax professional p and $treat_i$ denote an indicator for whether the client is in the treatment group. We implement the F test using a regression of the following form:

$$\Delta EITC_i = \sum_{p=1}^P \theta_p tp_{i,p} + \sum_{p=1}^P \beta_p treat_i \times tp_{i,p} + \varepsilon_i$$

In this specification, β_p is tax professional p 's treatment effect.²² The null hypothesis that $\beta_p = 0$ for all p is rejected with $p = 0.0083$, indicating that some tax professionals generate significant differences in EITC amounts between their treatment and control clients. The hypothesis of constant treatment effects ($\beta_p = \beta_{p'}$ for all p, p') is rejected with $p = 0.0088$, showing the importance of heterogeneity across tax professionals.

The remainder of this section characterizes the magnitudes and patterns of heterogeneity in treatment effects. We begin by developing a method of identifying “complying” tax professionals who implemented the treatment as planned and thereby induced changes in behavior as we hypothesized, namely increasing the concentration of earnings and EITC amounts. Note that the term “complier” simply refers to compliance with our ex-ante intentions for the experiment, and should not be interpreted as a normative judgment about a tax professional.

Definition of Compliers. Because we do not observe how tax professionals explained the information to clients, we use an indirect outcome-based method to identify “complying” tax professionals. For each tax filer i , we define his tax professional as a complier if the tax professional has a higher fraction of other clients (*excluding* client i) with middle income in the treatment group than the control group. Intuitively, from the perspective of a given client i , his tax professional complies with the intention of the experiment if the tax professional increases

²²Note that $treat_i$ is randomized *within* each tax professional's client group because treatment was randomized at the individual client level.

the concentration of the earnings distribution for her other clients. We define the remaining clients as having “non-complying” tax professionals.

Three important points should be noted about this definition of compliance. First, because client i himself is excluded when defining his tax professional’s compliance, there is no correlation between client i ’s outcome and his tax professional’s compliance under the null hypothesis that all tax professionals had zero treatment effects. A proof of this simple result is given in the appendix A.1. To see the intuition, suppose a placebo treatment is randomly assigned to individuals, with no information provided to anyone. Define “complying” and “non-complying” tax professionals for each client as above. In this case, “complying” and “non-complying” are effectively randomly assigned, as the placebo treatment has no impact on year 2 earnings. Therefore, the sample of clients with a “complying” tax professional is simply a random subsample of the initial sample. Within that subsample, individual treatment status remains randomly assigned and hence should have no impact on outcomes. Hence, we would detect zero treatment effects within the subsample of clients served by complying (or non-complying) tax professionals if all tax professionals have zero treatment effects.²³

Second, the definition of complying tax professionals is client-specific, as excluding a particular client might shift a given tax professional from the complying to the non-complying category (and vice-versa). This creates a correlation in the error terms for clients served by the same tax professional, as similar clients will tend to either all be excluded or included in the “complying” group. We account for this problem by clustering all standard errors by tax professional. To check this method of computing standard errors, we also calculate p values for each regression we run using the following permutation method. We first generate a placebo treatment randomly (with 50% probability) and recompute complying vs. non-complying tax professional status for each tax filer using this placebo treatment variable. We then estimate the regression specification using the placebo treatment in lieu of the actual treatment to obtain a placebo coefficient. This process is repeated 2000 times to generate an empirical distribution of placebo coefficients. Finally, the permutation-based p value is computed using the location of the actual treatment effect in the empirical cdf of the placebo coefficients. We find that the difference between the permutation-based p values and the p values from regressions with

²³The differences between the means of the base year variables in the treatment and control groups are insignificant within the subsamples of clients served by complying and non-complying tax professionals, as in Table 1.

clustered standard errors is less than 0.02 for every regression coefficient reported below.²⁴ This placebo analysis also confirms that our method of identifying complying tax professionals does not induce any artificial correlations between treatment and outcomes.

Third, the definition of compliance above is one of many possible definitions. In our baseline analysis, we define compliance based on the middle income indicator because it provides a simple, non-parametric way of measuring changes in the concentration of the earnings distribution. In section 4.5, we show that similar results are obtained when compliance is defined based on treatment effects on EITC amounts, which is effectively a smoother measure of changes in the concentration of the income distribution. We also show that controlling for base year characteristics of clients when classifying tax professionals and using continuous measures of the degree of compliance instead of a binary classification yields similar results.

Graphical Evidence and Non-Parametric Tests. Figure 5 plots the density of post-treatment income for clients with complying tax professionals. In both panels, there is greater mass in the treated group near the first kink point of the EITC schedule than there is in the control group. Conversely, there are fewer treated clients in the phase-out range.

The increased concentration in the earnings distribution increases EITC amounts for treated clients. This result is confirmed by the KS test reported in the second row of Column 1 of Table 2. The null hypothesis that there are no differences in EITC amounts between treated and control clients is rejected with $p < 0.01$ for complying tax professionals. We show below that parametric estimators do show highly significant differences between the income distributions in Figure 5.

Figure 6 plots the density of post-treatment income for clients with non-complying tax professionals. The earnings distribution for clients treated by non-compliers is shifted toward the right, placing more clients in the phase-out range and thereby reducing their EITC refunds. This shift in earnings distributions, and hence of the EITC amounts in the non-complying treatment group relative to the control group is borne out by the KS tests reported in row 3 of Table 2.

Figures 5 and 6 explain why we detect no treatment effects in the full sample: the compliers and non-compliers shift the earnings distribution in opposite directions, generating little change

²⁴Since there is no natural counterpart to clustering for the Kolmogorov-Smirnov tests in Table 2, we report the permutation-based p values in that table.

in the full sample. The complying tax professionals induce behavioral responses consistent with the two specific hypotheses described in section 3.3. Non-complying tax professionals did not generate a behavioral response consistent with EITC incentives, instead pushing more of their clients into the phase-out range. One potential explanation for this response is that the non-compliers are tax professionals who framed the EITC incentive effects as being small relative to the benefits of earning a higher income, which we anticipated might occur based on feedback prior to the experiment. Irrespective of the reason that non-compliers fail to induce the expected response, it is clear that tax professionals are able to influence their clients' earnings behavior by providing information and advice.

Treatment Effect Estimates. To quantify the size of the behavioral responses, we estimate treatment effects within the complier and non-complier subgroups using the OLS specification in (2). Row 2 of Table 3 shows estimates for the subsample of clients served by complying tax professionals. Column 1 shows that clients treated by complying tax professionals increase their EITC amounts by \$67 more than control group clients of the same tax professionals. Column 2 shows that controlling for base year observables does not affect this coefficient significantly, as expected in a randomized experiment. Columns 3 and 4 show that the treatment does not induce a significant change in mean earnings from year 1 to year 2. The finding is consistent with an increase in concentration rather than a shift of the earnings distribution and underscores the importance of investigating moments beyond means when budget sets are non-linear (Bitler, Gelbach, and Hoynes 2006).

Row 3 considers the non-complying tax professionals. Clients given the information treatment by these tax professionals experience a statistically insignificant *reduction* of \$32 (column 2) in their EITC amounts relative to their peers in the control group. This is because non-complying tax professionals shift clients away from the region of the EITC schedule where refunds are maximized (Figure 6). Columns 3 and 4 show that the earnings of treated clients of non-compliers rise by \$190 more (\$250 more with controls) on average than control clients. These results are consistent with the density plots in Figure 6: non-compliers shift the earnings distribution to the right and increase the likelihood of high incomes. The mean of the coefficients in rows 2 and 3 roughly corresponds to the coefficients in row 1, explaining why we do not detect clear treatment effects in the full sample.

Finally, in rows 4 and 5, we compare the treatment effects for complying and non-complying

tax professionals to test whether the estimates reported in rows 2 and 3 are statistically distinguishable. We estimate a model analogous to (2) on the full sample, interacting all the variables with an indicator for having a complying tax professional. Row 4 reports the coefficient on the interaction of the treatment and complier indicators, which is simply the difference in the coefficients reported in rows 3 and 4. Under the null hypothesis of zero treatment effects for all tax professionals, this “difference in difference” estimate would be zero. Contrary to the null, all of the coefficients reported in row 4 are statistically significant. Clients treated by complying tax professionals experience approximately a \$95 larger increase (\$90 with controls) in their EITC refund on average relative to clients treated by non-complying tax professionals. Furthermore, clients treated by compliers have on average \$340 lower growth (\$420 lower growth with controls) in earnings than clients treated by non-compliers. These results highlight the substantial amount of treatment effect heterogeneity across tax professionals.

The heterogeneity in treatment effects that we have documented could come from two potential sources. One natural interpretation – which is the one we have suggested thus far – is that tax professionals implemented the information treatment in different ways, leading to different outcomes. An alternative view is that the variation in treatment effects is not caused by differences in tax professionals’ behavior but instead by variations in the set of clients that different types of tax professionals served. Our experiment randomized the information treatment within tax professional but did not randomize clients across tax professionals.

In row 5 of Table 3, we explore the source of the treatment effect heterogeneity by adding interactions of the vector of base year controls with the treatment dummy to the specifications in row 4. In this specification, the coefficient on the interaction of the treatment and complier indicators can be interpreted as the effect of having a complying tax professional, holding fixed observable base year characteristics. We find that all coefficients in row 5 are very similar to the corresponding coefficients in row 4, indicating that the heterogeneity in treatment effects is not driven by observable heterogeneity in client characteristics. The heterogeneity in treatment effects could, however, be driven by *unobservable* heterogeneity in treatment effects across clients. For instance, suppose clients sort across tax professionals in a way that is correlated with their knowledge of the EITC. Then the heterogeneity in treatment effects across tax professionals could be driven by heterogeneity in clients’ knowledge. Complying tax professionals could be those who serve clients with “flat” priors as in Figure 1B, while

non-complying tax professionals could be those whose clients think that the phase-out rate is higher than it actually is. Note that such client heterogeneity explanations require substantial sorting of clients purely on unobserved characteristics. While we cannot rule out such sorting, we believe that the sharp differences in treatment effects across complying and non-complying tax professionals are more likely to be driven by the tax professionals themselves.

Importantly, regardless of the source of heterogeneity, the results in Table 3 show that the intervention did induce significant changes in clients' earnings. Hence, the evidence supports our general hypothesis that information and advice affect earnings behavior.

4.4 Self-Employment vs. Wage Income Responses

We now explore the extent to which the treatment effects documented above are driven by changes in self-employment income vs. wage earnings. This distinction is crucial to determine whether the experiment had “real” effects on labor supply behavior or simply led to changes in reported income in order to maximize EITC refunds.

Self-Employment Income. We examine the self-employment income response by focusing on the subsample of tax filers with positive self-employment income in base year. Note that these tax filers may also have additional wage earnings beyond their self-employment income. Figure 7 shows the effect of the treatment on the distribution of year 2 earnings for self-employed clients of complying tax professionals. Panel A is for clients with 1 dependent and Panel B is for those with 2+ dependents.

The control group exhibits clear bunching at the first kink point of the EITC schedule, the lowest earnings level at which one obtains the maximum refund. This is consistent with the finding of Saez (2010), who documents bunching at the first kink point among EITC recipients with self-employment income in IRS microdata. The degree of bunching is substantially amplified in the treatment group, showing that the information induced tax filers to target the peak as predicted. Note that the EITC schedules differ across the 1 and 2+ dependent cases: the peak region begins at \$8,390 in Panel A and \$11,790 in Panel B. The movement of the point of amplified bunching precisely with the first kink point constitutes particularly sharp evidence that complying tax professionals induced treatment effects among self-employed clients. In contrast, the earnings distributions for self-employed clients of non-complying tax professionals (not reported) do not show more bunching at the first kink in the treatment group relative to

the control group.²⁵

Columns 1 and 2 of Table 4 quantify the treatment effects for tax filers with positive self-employment income in the base year. This table has the same structure as Table 3. Column 1 focuses on the change in EITC amounts while column 2 focuses on the likelihood of reporting year 2 earnings in the middle income range, which is a proxy for having earnings close to the first kink point of the EITC. Row 1 shows that there is some evidence of an increase in EITC amounts, and stronger evidence of an increase in the concentration of the earnings distribution (measured by having year 2 earnings in the middle income range), in the sample of self-employed individuals even without cutting the sample by tax professional complying status. The estimates in row 2 for clients of complying tax professionals confirm the sharp results in Figure 7. Complying tax professionals increase their treated clients' EITC amounts by almost \$130 relative to the control group, and increase the probability that they have middle income by 7 percentage points. These treatment effects for the self-employed are twice as large as those reported in the full sample (Table 3, row 2). In contrast, row 3 shows that non-complying tax professionals induce no significant treatment effects on their self-employed clients' EITC amounts or fraction with middle income. Rows 4 and 5 corroborate the substantial differences in year 2 outcomes between clients treated by compliers and non-compliers, even after controlling for observed client heterogeneity.

Wage Earnings. We now study the effect of the treatment on the distribution of wage earnings (excluding self employment income).²⁶ Figure 8 plots year 2 wage earnings distributions for clients of complying tax professionals (analogous to Figure 5 for total income). Panel A is for clients with 1 dependent; Panel B is for clients with 2+ dependents. Both panels show an increase in mass around the first kink point for treated clients. This increase in mass is not as large as the change in the distribution of total income (Figure 5), confirming that part of the treatment effect is driven by the self-employment margin.

As in our analysis of total income, we conduct non-parametric Kolmogorov-Smirnov tests for

²⁵In Figure 7, the effect appears stronger for the 1 dependent case than for the 2+ dependent case. This is in part due to the fact that in the base year, the treatment group in the 1 dependent case exhibit slightly higher bunching than the control group while the reverse is observed in the 2+ dependents case. Those base year differences however are not significant.

²⁶We did not examine the effect of the treatment on the distribution of self-employment income because self-employment income constitutes too small a fraction ($< 5\%$) of total income. This is why we instead analyzed total earnings in a subsample of individuals with positive self-employment income in the base year to understand the self-employment response.

changes in the distribution of wage earnings. The increased concentration in the wage earnings distribution acts to increase the EITC amounts due to the wage component of income. Column 2 of Table 2 reports the results of KS tests for a difference between treatment and control groups in the distribution of *wage-based* EITC amounts – that is, the EITC refund clients would get if they had only their reported wage income and zero self-employment income. In the full sample (row 1), we detect no differences between the wage-based EITC amounts in the treatment and control groups. However, in the subsample of clients with complying tax professionals (row 2), the KS test rejects the null of identical distributions across treatment and control clients with $p < 0.01$.

Figure 9 plots year 2 wage earnings distributions for clients of non-complying tax professionals (analogous to Figure 6 for total income). Clients given the information treatment by non-complying tax professionals are more likely to have wage earnings that place them in the phase-out range. The KS tests in row 3 of Table 2 confirm that the information treatment shifts the wage earnings distribution for clients of non-complying tax professionals as there is a significant difference ($p < 0.01$) between treatment and control in the distribution of wage-based EITC amounts.

We quantify the changes in wage earnings behavior by estimating treatment effects in columns 3 and 4 of Table 4. In column 3, the dependent variable is the change in the wage-based EITC amount from year 1 to year 2. In column 4, the dependent variable is an indicator for “middle wage earnings” in year 2, defined as having wage earnings between \$7,000 and \$15,400 in year 2 (the analogous counterpart of middle income analyzed in column 2 for the self-employed). Row 1 shows that there is no significant difference between the treatment and control groups in either of these measures in the full sample. Row 2 shows that clients treated by complying tax professionals have a \$48 increase in their wage-based EITC amounts relative to control clients ($p < 0.05$). These treated clients are also 1.9 percentage points more likely to have middle wage earnings, relative to a base of 25% ($p < 0.05$). Non-complying tax professionals, in contrast, reduce their treated clients’ probabilities of having middle wage earnings by 2.45 percentage points because they push their clients into the phase-out range. As a result, they reduce their treated clients’ wage-based EITC amounts by \$55 ($p < 0.05$). Finally, rows 4 and 5 confirm that there are highly significant ($p < 0.01$) differences in year 2 outcomes between clients treated by compliers and non-compliers, even after controlling for observed client

heterogeneity.

The results from the decomposition of income into self-employment and wage earnings support the view that compliers used the treatment to encourage clients to maximize their EITC refunds, while non-compliers used it to motivate clients to maximize true earnings. The finding that non-compliers increase wage earnings but induce no change in reported self-employment income suggests that they did not explain how to maximize EITC refunds. Conversely, the fact that compliers induce stronger responses in self-employment income – which is easier to manipulate via reporting effects – than wage income suggests that they emphasized the behaviors relevant for maximizing the EITC refund.

Because self-employment income accounts for less than 5% of total income, the patterns of treatment effects on the wage earnings distribution are very similar to those for the total income distribution. For complying tax professionals, the treatment effect on wage-based EITC amounts accounts for 83% (48.48/58.05) of the treatment effect on total EITC amounts. Likewise, the changes in income for treated clients of non-complying tax professionals can be entirely accounted for by changes in the wage earnings distribution.

Wage earnings are generally difficult to manipulate because of double-reporting by employers. The most recent official compliance study by the Internal Revenue Service (1996, Table 3, page 8) found that less than 1% of wage earnings is misreported on individual income tax returns. Moreover, the finding that clients treated by non-compliers are *more* likely to report wage earnings that place them in the phase-out region and thereby reduce their EITC amounts cannot be due to manipulation, as such manipulation would only make the client lose money. Hence, although we cannot definitively rule out reporting effects (e.g., through collusion between employees and employers on W-2 forms), the evidence suggests that the intervention induced “real” labor supply responses and not merely accounting changes.

4.5 Sensitivity Analysis: Definition of Compliance

Our results rely critically on the distinction between complying and non-complying tax professionals. In this section, we assess the robustness of the results to the definition of “compliance.” We focus on two key dependent variables: changes in EITC amounts and changes in wage-based EITC amounts.

In Table 5, we use EITC amounts instead of the middle income indicator to define tax

professional compliance. For each tax filer i , we define his tax professional as a complier if the average year 2 EITC amount of her other treated clients (excluding client i) is higher than the average year 2 EITC amount of her other control clients. From the perspective of client i , his tax professional is a complier under this definition if she uses the information treatment to increase EITC amounts among her other clients. Columns 1 and 2 of Table 5 report mean treatment effects for the change in the EITC amount (from year 1 to year 2), analogous to columns 1 and 2 of Table 3. Columns 3 and 4 report mean treatment effects for the change in the wage-based EITC amount, analogous to column 3 of Table 4. Columns 1 and 3 do not include any controls, while columns 2 and 4 include the standard vector of base year controls used above.

Row (1) of Table 5 replicates the results for the full sample. Row (2) considers individuals served by tax professionals who are “compliers” based on the EITC amount definition. Clients given the information treatment by these tax professionals increase their total EITC amounts by about \$64 more than control group clients of the same tax professionals. Approximately \$55 of this increase in the EITC amount comes from changes in wage earnings. These estimates are statistically significant with $p < 0.05$.

Row (3) shows that clients given the information treatment by non-complying tax professionals experience *reductions* in their EITC amounts relative to their peers in the control group. The treatment is estimated to reduce the wage-based EITC by \$58 in the specification with controls (column 4). These reductions in EITC amounts – driven largely by the wage-based component – are consistent with our earlier findings that non-compliers induce their treated clients to increase their wage earnings. Finally, rows (4) and (5) confirm that there are significant differences in year 2 outcomes between clients treated by compliers and non-compliers, even after controlling for observed client heterogeneity. Overall, the results in Table 5 show that the “middle income” and EITC-based definitions of compliance – two different ways of quantifying changes in the concentration of the income distribution – generate treatment effects with similar magnitudes.²⁷

Thus far, we have divided tax professionals into two distinct categories – compliers and non-

²⁷We chose to use the middle income indicator in our baseline analysis because the estimates with the EITC amount definitions of compliance are less precise, for two reasons. First, the substantial variance in EITC amounts across clients creates noise in the compliance variable. Second, the “middle income” indicator more directly identifies increased bunching around the first kink.

compliers. We now explore the robustness of the results to the use of continuous measures of tax professional compliance. For client i , define the continuous compliance measure tpcompliance_i as the tax professional’s treatment effect on a year 2 outcome excluding client i himself. For instance, with the middle income outcome, tpcompliance_i is the fraction of treated clients who have middle income minus the fraction of control clients who have middle income, excluding client i . Since each tax professional has only 15 treated and 15 control clients on average, there are outliers in the tpcompliance_i variable. For example, some tax professionals who have a small number of clients happen to have 100% of their treated clients with middle income and 0% of their control clients with middle income, generating an extreme compliance measure of 100%. To reduce the influence of these outliers, we drop observations that have tpcompliance_i below the 1st or above the 99th percentile of the tpcompliance_i distribution.

Using the continuous tpcompliance_i measure, we estimate variants of the interaction specifications in row 4 of Table 3:

$$y_i = \alpha + \beta_1 \text{treat}_i + \beta_2 \text{tpcompliance}_i + \beta_3 \text{treat}_i \times \text{tpcompliance}_i + \varepsilon_i. \quad (3)$$

The coefficient of interest is β_3 , which measures how treatment effects vary with the degree of the tax professional’s compliance. Table 6 reports estimates of β_3 for changes in EITC amounts (row 1) and changes in wage-based EITC amounts (row 2). In column 1, tpcompliance_i is defined using the year 2 middle income indicator. In column 2, tpcompliance_i is defined using the year 2 EITC amount, providing a continuous analogue to the binary compliance measure used in Table 5. The estimates in columns 1 and 2 show that more compliant tax professionals generate larger increases in their treated clients’ total and wage-based EITC amounts. In interpreting the magnitudes of these coefficients, it is useful to note that the standard deviation of the continuous middle income compliance variable is 18% (after trimming outliers). The corresponding standard deviation for the EITC amount compliance variable is \$600. Hence, a one standard deviation increase in the degree of compliance is estimated to increase the treatment effect on the EITC amount by \$31 for the middle income measure and by \$26 for the EITC amount measure of compliance. The considerable loss of precision in the continuous specification relative to the binary specifications appears to be driven by outliers. Further trimming – e.g. removing or winsorizing the observations with values of tpcompliance_i below the 5th or above the 95th percentile – increases the precision of the estimates.

In columns 3 and 4 of Table 6, we control for base year characteristics of clients when defining

the tpcompliance_i measure. In these specifications, tpcompliance_i is effectively defined based on the tax professional's effects on *changes* in behavior rather than levels of year 2 outcomes. We define tpcompliance_i by estimating a regression analogous to (2) using all clients of client i 's tax professional except client i himself. The regression includes the standard set of base year controls: income, income squared, wage earnings, marital status, and dependents. The tpcompliance_i measure is the estimated treatment effect from this regression.

Column 3 reports estimates using the continuous version of the middle income outcome with base year controls, and column 4 reports the same for the EITC outcome. These specifications include the base year controls and their interactions with the tpcompliance_i variable, as in column 2 of Table 3. As above, we trim outliers by dropping observations with the 1% largest and smallest values of tpcompliance_i . The estimates imply that a one standard deviation increase in tpcompliance_i increases the treatment effect on the EITC amount by \$21 for the middle income measure and by \$49 for the EITC amount measure of compliance. Although there is some variation in the magnitude of the estimates with the continuous measures of compliance, the qualitative pattern is robust: more compliant tax professionals induce larger treatment effects on total and wage-based EITC amounts.

5 Conclusion

This paper has reported the results of an experiment with 43,000 EITC claimants that tested the effects of providing information about the structure of the EITC on the labor supply behavior of low income individuals. We find no significant responses in the overall sample except for the self-employed. However, we find evidence of significant but heterogeneous responses to the information treatment across the H&R Block tax professionals who implemented the experiment. Half of the tax professionals increase their treated clients' EITC amounts and the concentration of their wage earnings distribution around the first kink point of the EITC schedule. The remaining tax professionals do not induce a significant change in EITC amounts, but increase their clients' probabilities of having high wage earnings that place them in the phase-out range. We speculate that this heterogeneity in treatment effects arises from the different ways in which tax professionals used the information to advise their clients.

It may be surprising that a two to three minute information explanation can have substantial effects on labor supply behavior over the subsequent year. We believe that this treatment had

significant effects because it combined simple information with advice from an expert precisely at a time when individuals are thinking about taxes. The treatment effects we observe are modest in absolute terms but are fairly large in comparison with intensive margin responses to other policies. Previous studies suggest an upper bound on the intensive margin elasticity of earnings with respect to the net-of-tax rate of 0.25. Using this elasticity, a simple calibration presented in appendix section A.2 shows that complying tax professionals generate the same labor supply response along the intensive margin as a 33% expansion of the EITC. Non-complying tax professionals increase earnings by an amount equivalent to the response to a 5 percentage point tax rate cut. These calibrations suggest that information and advice are inexpensive ways to influence behavior, as the cost of the treatment was only \$5 per EITC claimant in our study.

We conclude by discussing the implications of our results for future work on tax and transfer policies. From a positive perspective, the results suggest that the effects of policies will vary substantially depending on their information and salience characteristics. Such factors should be included as an explanatory variable in empirical estimation of behavioral responses or explicitly accounted for as nuisance parameters (Chetty 2009). Responses to government policies cannot be used to recover structural parameters of individuals' preferences without modeling perceptions. For example, it may be very misleading to use an elasticity estimate from one program to predict responses to changes to another program with different information characteristics. Similarly, the long-run effects of policies could be very different from the effects of short-run changes in policy parameters since information about small changes may diffuse slowly.

Recent studies in behavioral public economics have begun to characterize optimal policies when agents do not have full information and optimize imperfectly relative to government policies (Chetty, Looney, and Kroft 2009). These studies take the level of information as exogenous rather than endogenously determined by policy. The present study shows that information provision can be a powerful policy tool because perceptions can be modified at low cost. The results suggest, for instance, that high phase-in rates coupled with low phaseout rates over a long range could maximize the impact of the EITC on work effort. Such a structure would make the benefits of working in the phase-in region most salient, and may permit the work disincentives in the phaseout region to be framed as negligible.

The main limitation of the present study is that we are not able to characterize the mecha-

nisms through which information and advice affect behavior. The decentralized implementation of our experiment makes it difficult to define the “treatment” that was provided by each of the tax professionals. Moreover, we are unable to determine how the treatment affected each client’s perceptions about the structure of the EITC. This paper should therefore be viewed a first step that calls for a re-evaluation of the “full information” assumption underlying the existing literature in public finance.

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Table 1
Means of Base-Year Variables by Treatment Eligibility

Variable:	Control [N=21,193] (1)	Treatment [N=20,809] (2)	Difference (2) - (1) (3)
Income (\$)	16,586.97 (59.63)	16,623.97 (60.58)	37.28 [0.45]
Wage Earnings (\$)	15,872.49 (65.38)	15,912.74 (66.08)	40.25 [0.43]
EITC amount (\$)	2,478.34 (8.52)	2,465.31 (8.62)	-13.03 [-1.06]
Percent Self Employed	11.40% (0.218)	11.18% (0.218)	-0.22% [-0.67]
Percent Low Income	14.30% (0.240)	14.69% (0.245)	0.39% [1.12]
Percent Middle Income	34.28% (0.326)	33.97% (0.328)	-0.31% [-0.71]
Percent Upper Income	51.41% (0.343)	51.34% (0.347)	-0.07% [-0.15]
Percent Married	9.53% (0.202)	9.40% (0.202)	-0.13% [-0.49]
Percent with 2 or more dependents in Year 1	59.29% (0.3370)	59.29% (0.3406)	0.00% [-0.00]
Percent with 2 or more dependents in Year 2	63.68% (0.4082)	64.11% (0.4137)	0.43% [0.45]
Percent Return in Year 2	72.57% (0.306)	71.72% (0.312)	-0.85% [-1.95]

Notes: All variables are base year (year 1) values except last two rows. Standard errors clustered by tax professional reported in parentheses; t-statistics in square brackets. Income is defined as the sum of wage income and self-employment income. Self employed is a binary variable defined as having positive self-employment income (irrespective of other wage earnings). Low income is defined as income below \$7,000; middle income is defined as income between \$7,000 and \$15,400; and upper income is defined as income above \$15,400. Treatment group includes all tax filers we intended to treat.

Table 2
Kolmogorov-Smirnov Tests of Treatment Effects on Distributions

Distribution:	Δ EITC Amount	Δ Wage-Based EITC Amount
	(1)	(2)
(1) Full Sample [N = 30,303]	0.074	0.273
(2) Complying Tax Professionals [N = 15,395]	0.005	0.005
(3) Non-Complying Tax Professionals [N=14,534]	0.045	0.010

Notes: This table reports p values from Two-sample Kolmogorov-Smirnov (KS) tests for equality of various distributions across treated and control group clients. In column 1, the variable considered is the change in EITC amount from year 1 to year 2; column 2: the change in EITC amount computed based solely on wage earnings. The first row is for the full sample. The second row considers clients served by "complying" tax professionals, while the third row considers those served by "non-complying" tax professionals. A given tax filer *i*'s tax professional is defined as a "complier" if she has a higher fraction of other clients (excluding client *i*) with middle income (between \$7,000 and \$15,400) in the treatment group than the control group.

The p values are computed using a permutation algorithm as follows. We generate a placebo treatment randomly (50% probability) and recompute the KS test statistic based on this placebo treatment. This exercise is repeated 2000 times to generate a distribution of KS statistics. The p-values reported in the table are the percentile where the original KS statistics (for the true treatment) fall within the empirical distribution of the 2000 placebo KS statistics.

Table 3
Treatment Effects on EITC Amounts and Earnings Distributions

Dep. Var.:	Δ EITC amt.	Δ EITC amt. with controls	Δ Earnings	Δ Earnings with controls
	(1)	(2)	(3)	(4)
(1) Full Sample [N=30,303]	24.02 (14.77) [1.63]	17.17 (14.06) [1.22]	17.66 (84.27) [0.21]	29.35 (83.46) [0.35]
(2) Complying Tax Professionals [N=15,395]	67.26 (21.09) [3.19]	58.05 (20.46) [2.84]	-146.46 (123.90) [-1.18]	-172.94 (123.66) [-1.4]
(3) Non-Complying Tax Professionals [N=14,534]	-27.96 (21.83) [-1.28]	-32.28 (20.40) [-1.58]	192.00 (117.69) [1.63]	247.26 (119.87) [2.06]
(4) Compliers vs Non- Compliers: (2) - (3) [N=29,929]	95.21 (31.74) [3.00]	90.33 (30.20) [2.99]	-338.47 (174.89) [-1.94]	-420.20 (180.20) [-2.33]
(5) Compliers vs Non- Compliers w/ Cntrls for Heterogeneity [N=29,929]	89.74 (30.21) [2.97]	89.78 (30.27) [2.97]	-420.86 (180.66) [-2.33]	-421.74 (180.68) [-2.33]

Notes: Standard errors clustered by tax professional reported in parentheses; t-statistics in square brackets; number of observations is reported for each row. Each coefficient is from a separate regression. Columns show treatment effects on various outcomes -- cols. 1,2: change in EITC amount from year 1 to year 2; cols. 3-4: change in earnings from year 1 to year 2. Columns 2 and 4 include the following base year controls: earnings, earnings squared, wage earnings, married filing jointly dummy, and number of qualifying children (1 vs. 2 or more).

Row (1) reports coefficients on the treatment indicator from OLS regressions of the form shown in equation (2) in the text for the full sample of tax filers who returned in year 2. Row (2) limits the sample to complying tax professionals, and row (3) limits the sample to non-complying tax professionals. See notes to Table 2 for definition of complying tax professionals. Row (4) reports the difference in treatment effects between complying and non-complying tax professionals, which equals the difference in coefficients between rows (2) and (3). In row (4), we regress each outcome variable on the treatment indicator, an indicator for having a complying tax professional, and the interaction of the two indicators.

The coefficient on the interaction is reported. In columns 2 and 4, we also include interactions of the base year control variables with the complying tax professional indicator. Row (5) reports the difference in treatment effects between complying and non-complying tax professionals controlling for heterogeneity in treatment effects by client observables. This specification adds interactions of the base year controls with the treatment indicator to the specifications in row (4). The coefficient on the treatment x complying tax professional interaction is reported.

Table 4
Self Employment vs. Wage Earnings Responses

Dependent Variable:	Response for Self-Employed		Response of Wage Earnings	
	Δ EITC Amt. w/ Controls	Middle Inc. w/ Controls	Δ Wage-Based EITC Amt. w/ Controls	Mid Wage w/ Controls
	(\$)	(%)	(\$)	(%)
	(1)	(2)	(3)	(4)
(1) Full Sample	66.10 (43.21) [1.53] [N=3,150]	3.93 (1.57) [2.51] [N=3,150]	1.75 (14.96) [0.12] [N=30,303]	-0.14 (0.47) [-0.29] [N=30,303]
(2) Complying Tax Professionals	128.92 (59.69) [2.16] [N=1,630]	6.98 (2.40) [2.91] [N=1,630]	48.48 (21.07) [2.30] [N=15,395]	1.88 (0.78) [2.41] [N=15,395]
(3) Non-Complying Tax Professionals	-27.47 (64.87) [-0.42] [N=1,495]	0.18 (2.23) [0.08] [N=1,495]	-54.55 (21.69) [-2.51] [N=14,534]	-2.45 (0.85) [-2.88] [N=14,534]
(4) Compliers vs. Non-Compliers: (2) - (3)	156.40 (89.25) [1.75] [N=3,125]	6.80 (3.50) [1.94] [N=3,125]	103.03 (31.09) [3.31] [N=29,929]	4.33 (1.38) [3.13] [N=29,929]
(5) Compliers vs. Non-Compliers Controlling for Heterogeneity in Treatment Effects by Client Observables	161.44 (89.22) [1.81] [N=3,125]	6.64 (3.50) [1.90] [N=3,125]	102.98 (31.12) [3.31] [N=29,929]	4.33 (1.38) [3.13] [N=29,929]

Notes: Standard errors clustered by tax professional reported in parentheses; t-statistics in square brackets; number of observations is reported for each regression in square brackets. Units in columns 2 and 4 are percentage points. Columns show treatment effects on various outcomes -- col. 1: change in EITC amount from year 1 to year 2; col. 2: indicator for middle income (between \$7,000 and \$15,400) in year 2; col. 3: change in wage-based EITC amount (EITC computed based solely on wage earnings) from year 1 to year 2; col. 4: middle wage income (wage earnings between \$7,000 and \$15,400) in year 2. Estimates in cols. 1 and 2 are for tax filers with positive self-employment income in year 1. Estimates in cols. 3 and 4 are for the full sample. As in Table 3, row (1) reports the treatment effects in the full sample, row (2) restricts the sample to clients of complying tax professionals, and row (3) to non-complying tax professionals. Row (4) estimates the difference in treatment effects between complying and non-complying tax professionals. Row (5) estimates the difference in treatment effects between complying and non-complying tax professionals, controlling for heterogeneity in treatment effects by base year characteristics of clients. All regressions control for base year earnings, earnings squared, wage earnings, marital status, and number of children. See notes to Table 3 for details of regression specifications. See notes to Table 2 for definition of complying tax professionals.

Table 5
Compliance Defined By Treatment Effects on EITC Amount

Dependent Variable:	Δ EITC Amt.	Δ EITC Amt. w/ Controls	Δ Wage Based EITC Amt.	Δ Wage Based EITC Amt. w/ Controls
	(\$)	(\$)	(\$)	(\$)
	(1)	(2)	(3)	(4)
(1) Full Sample [N=30,303]	24.02 (14.77) [1.63]	17.17 (14.06) [1.22]	8.393 (15.57) [0.54]	1.75 (14.96) [0.12]
(2) Complying Tax Professionals [N=14,973]	64.98 (24.91) [2.61]	63.24 (25.42) [2.49]	54.77 (24.86) [2.20]	54.91 (24.95) [2.20]
(3) Non-Complying Tax Professionals [N=14,956]	-22.97 (24.89) [-0.92]	-34.80 (24.67) [-1.41]	-44.81 (25.27) [-1.77]	-58.00 (25.46) [-2.28]
(4) Compliers vs. Non-Compliers: (2) - (3) [N=29,929]	87.94 (40.93) [2.15]	97.53 (42.60) [2.29]	99.58 (40.32) [2.47]	113.07 (41.89) [2.70]
(5) Compliers vs. Non-Compliers Controlling for Heterogeneity in Treatment Effects by Client Observables [N=29,929]	96.50 (42.64) [2.26]	96.70 (42.67) [2.27]	111.01 (41.89) [2.65]	111.98 (41.90) [2.67]

Notes: Standard errors clustered by tax professional reported in parentheses; t-statistics in square brackets. Each coefficient is from a separate regression. A given tax filer i 's tax professional is defined as a "complier" if her other treated clients have higher average EITC amounts in year 2 than her other control clients (excluding client i). The dependent variable in columns 1 and 2 is the change in EITC amount from year 1 to year 2; in columns 3 and 4, it is the change in the wage-based EITC amount (EITC computed based solely on wage earnings). Columns 2 and 4 include the following base year controls: earnings, earnings squared, wage earnings, marital status, and number of children. Row (1) reports the treatment effects in the full sample, row (2) restricts the sample to clients of complying tax professionals, and row (3) to non-complying tax professionals. Row (4) reports the difference in treatment effects between complying and non-complying tax professionals. Row (5) reports the difference in treatment effects between complying and non-complying tax professionals, controlling for heterogeneity in treatment effects by base year characteristics of clients. See notes to Table 3 for details of regression specifications.

Table 6
Continuous Measures of Compliance

Year 2 variable for compliance def.	Middle Income	EITC Amount	Middle Income	EITC Amount
Base year controls in compliance def.	No	No	Yes	Yes
	(1)	(2)	(3)	(4)
(1) Δ EITC Amt. (\$)	173.92 (87.68) [1.98] [N=29,351]	0.044 (0.029) [1.52] [N=29,362]	127.94 (92.61) [1.38] [N=29,346]	0.101 (0.038) [2.64] [N=29,353]
(2) Δ Wage-Based EITC Amt (\$)	227.58 (88.04) [2.58] [N=29,351]	0.050 (0.029) [1.72] [N=29,362]	182.88 (91.47) [2.00] [N=29,346]	0.091 (0.038) [2.42] [N= 29,353]

Notes: Standard errors clustered by tax professional reported in parentheses; t-statistics in square brackets. This table uses continuous measures of compliance instead of binary definitions. Each coefficient listed is from a separate regression of the form shown in equation (3) in the text, which includes the treatment indicator, a continuous measure of tax professional compliance, and the interaction of these two variables. Each column of the table reports the coefficient on the interaction between different tax professional compliance variables and the treatment indicator. The dependent variable is the change in EITC amount from year 1 to year 2 in row (1), and the change in the wage-based EITC amount in row (2). In all columns, the complying tax professional variable is defined for each client by excluding that client himself. In column 1, the complying tax professional variable is defined as a continuous variable equal to the fraction of other clients treated in year 1 who have middle income in year 2 (between \$7,000 and \$15,400) minus the fraction of other control clients in year 1 who have middle income in year 2. In column 2, the complying tax professional variable is defined as a continuous variable equal to the average EITC amount in year 2 of other clients treated in year 1 minus the average EITC amount in year 2 of other clients in the control group in year 1. Columns 3 and 4 replicate the definitions in 1 and 2, but define the continuous measure of treatment effects on other clients using a regression that controls for the following base year observables: earnings, earnings squared, wage earnings, marital status, and number of children. We also control for the same base year variables and their interaction with the compliance variable when estimating the regressions in columns 3 and 4.

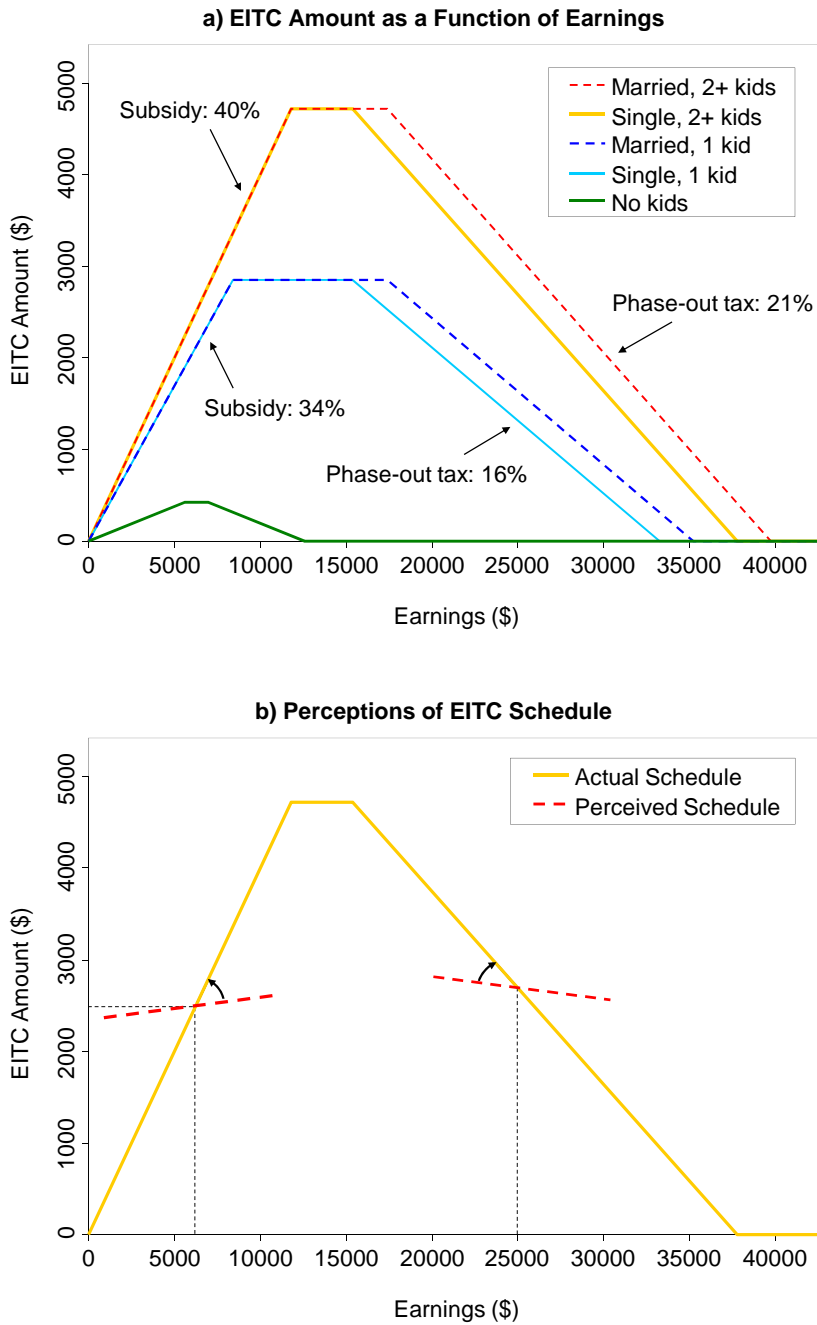


Figure 1. The Earned Income Tax Credit Schedule and Perceptions

NOTE—Panel A depicts the EITC amount as a function of annual earnings in 2007. The EITC amount varies by marital status and number of qualifying children as shown. Panel B contrasts the actual EITC schedule for a single tax filer with 2 or more children with our model of the perceived schedule based on existing survey evidence. The perceived schedules are drawn for individuals with two levels of earnings, one in the phase-in and one in the phase-out range. Each individual accurately perceives the level of his EITC refund, but underestimates the extent to which variations in earnings affect the size of his EITC. If implemented as intended, the information treatment should rotate the perceived EITC schedules (dashed red lines) toward the actual EITC schedule (solid yellow line) by clarifying the actual linkage between EITC amounts and earnings.

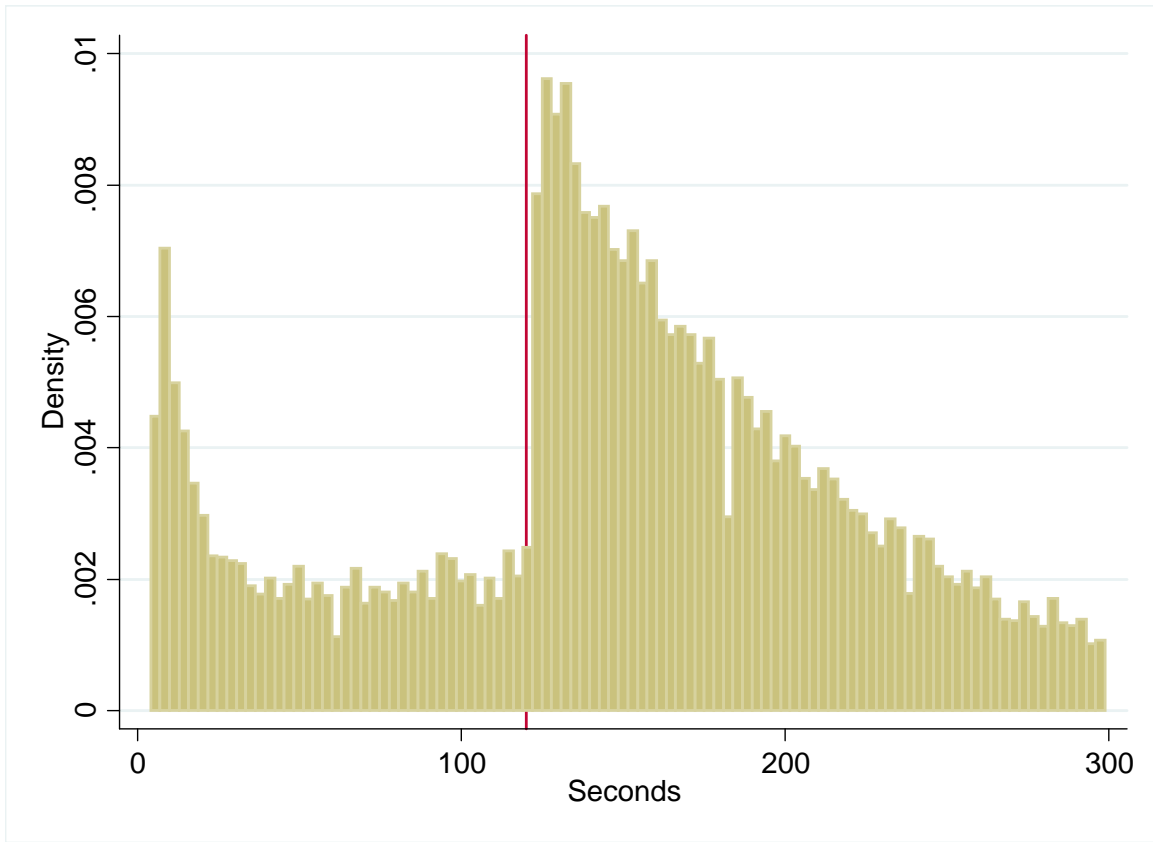


Figure 2. Time Spent Explaining the EITC to Clients Eligible for Treatment

NOTE—This figure is a histogram of the time spent (in seconds) by tax professionals on explaining the EITC to clients eligible for the information treatment. Time spent was recorded by the tax preparation software. The vertical line at 120 seconds depicts the threshold above which tax professionals received \$5 of compensation (per client) for explaining the EITC. The histogram is based on 20,809 observations. Each bin represents an interval of 3 seconds.

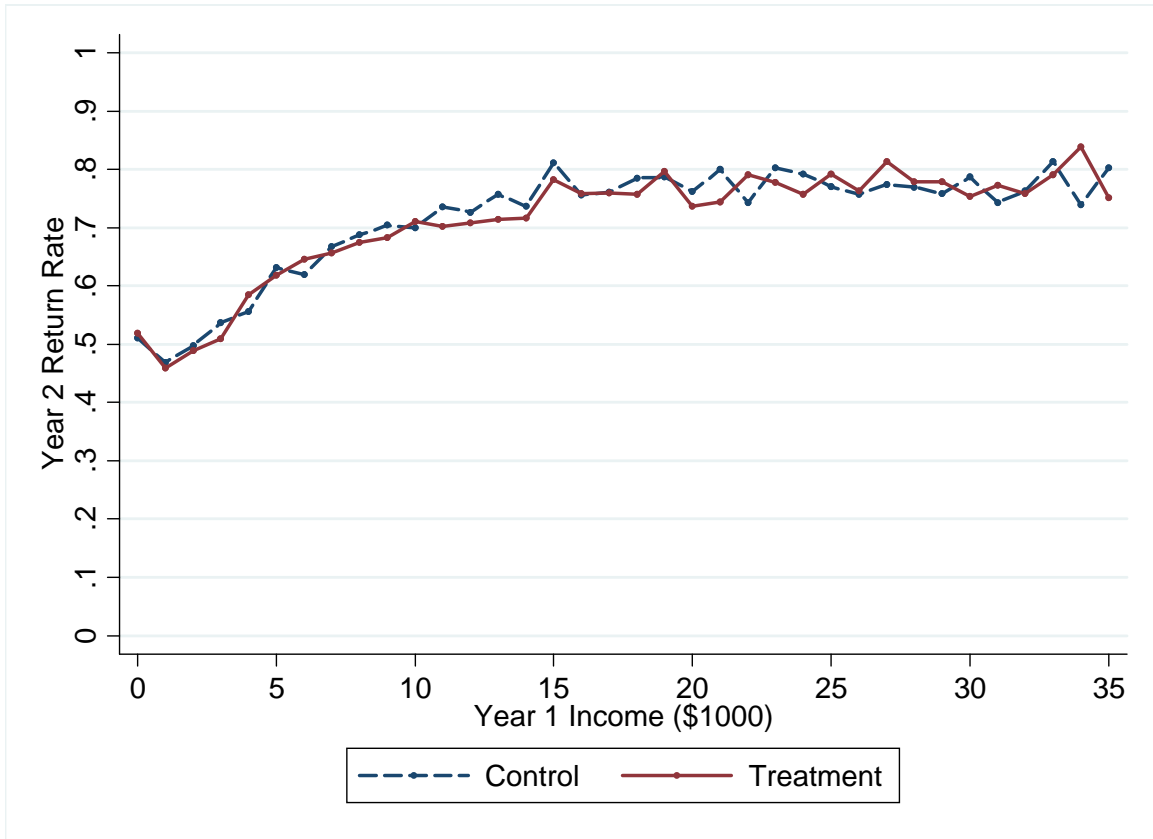


Figure 3. Return Rates by Base-Year Income

NOTE—This figure plots the fraction of base year clients who returned to H&R Block to file their taxes in year 2. Each point represents the average return rate in a \$1000 bin. The return rates are plotted separately for the treatment (solid red line) and control groups (dashed blue line).

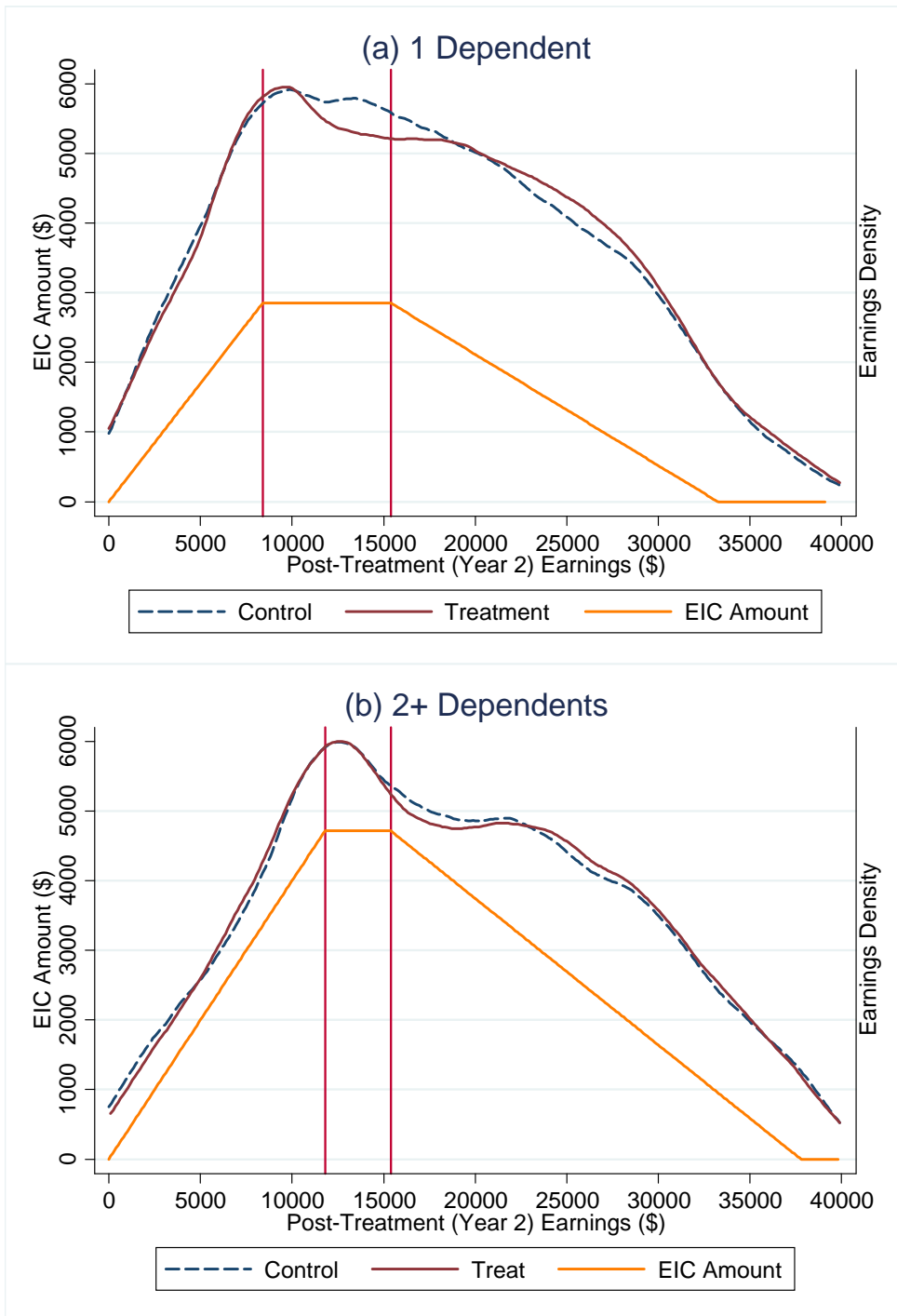


Figure 4. Year 2 Earnings Distributions: Full Sample

NOTE—These figures plot kernel densities of year 2 (post-treatment) income (sum of wage earnings and self-employment income) for the full sample of individuals filing with a tax professional. The solid red curve shows the income distribution for the treatment group; the dashed blue curve shows the income distribution for the control group. Panel A is for tax filers with 1 qualifying dependent for EITC purposes in the base year, while panel B is for tax filers with 2 or more qualifying dependents. Each panel also shows the relevant EITC schedule (on the left y-axis). The vertical lines mark the boundaries between the phase-in, peak, and phase-out ranges of the EITC. Note that the EITC schedule shown in the Figure and all subsequent Figures is for single filers (91% of our sample). The EITC plateau for married filers is extended by \$2000 (see Figure 1a).

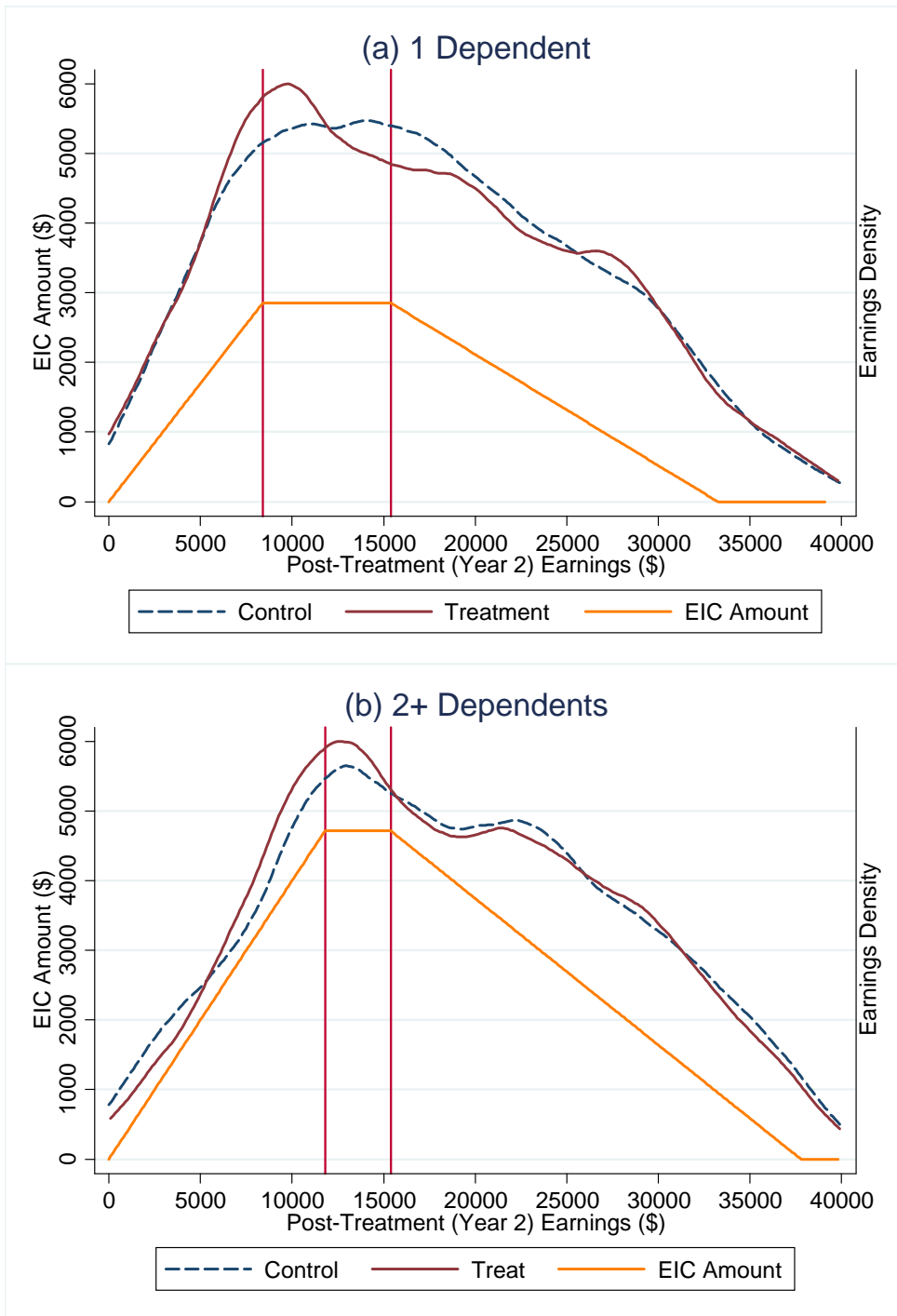


Figure 5. Year 2 Earnings Distributions: Complying Tax Professionals

NOTE—These figures plot kernel densities of year 2 (post-treatment) income (sum of wage earnings and self-employment income) for the sample of individuals filing with a “complying” tax professional. A given tax filer i ’s tax professional is defined as a “complier” if she has a higher fraction of other clients (excluding client i) with middle income (between \$7,000 and \$15,400) in the treatment group than the control group. The solid red curve shows the income distribution for the treatment group; the dashed blue curve shows the income distribution for the control group. Panel A is for tax filers with 1 qualifying dependent for EITC purposes in the base year, while panel B is for tax filers with 2 or more qualifying dependents. Each panel also shows the relevant EITC schedule for singles (on the left y-axis). The vertical lines mark the boundaries between the phase-in, peak, and phase-out ranges of the EITC.

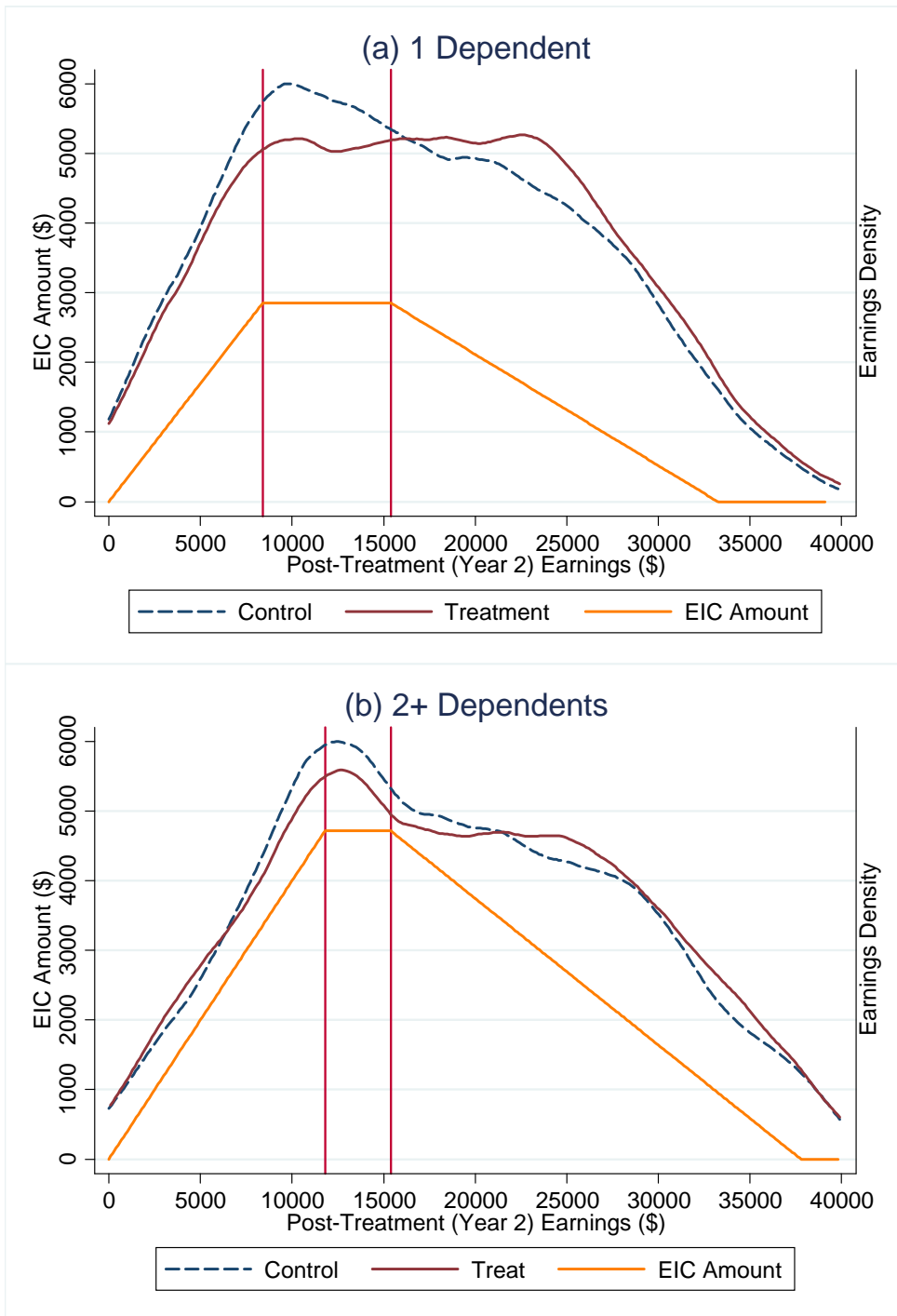


Figure 6. Year 2 Earnings Distributions: Non-Complying Tax Professionals

NOTE—These figures plot kernel densities of year 2 (post-treatment) income (sum of wage earnings and self-employment income) for the sample of individuals filing with a “non-complying” tax professional. A given tax filer i 's tax professional is defined as a “non-complier” if she has a lower fraction of other clients (excluding client i) with middle income (between \$7,000 and \$15,400) in the treatment group than the control group. The solid red curve shows the income distribution for the treatment group; the dashed blue curve shows the income distribution for the control group. Panel A is for tax filers with 1 qualifying dependent for EITC purposes in the base year, while panel B is for tax filers with 2 or more qualifying dependents. Each panel also shows the relevant EITC schedule for singles (on the left y-axis). The vertical lines mark the boundaries between the phase-in, peak, and phase-out ranges of the EITC.

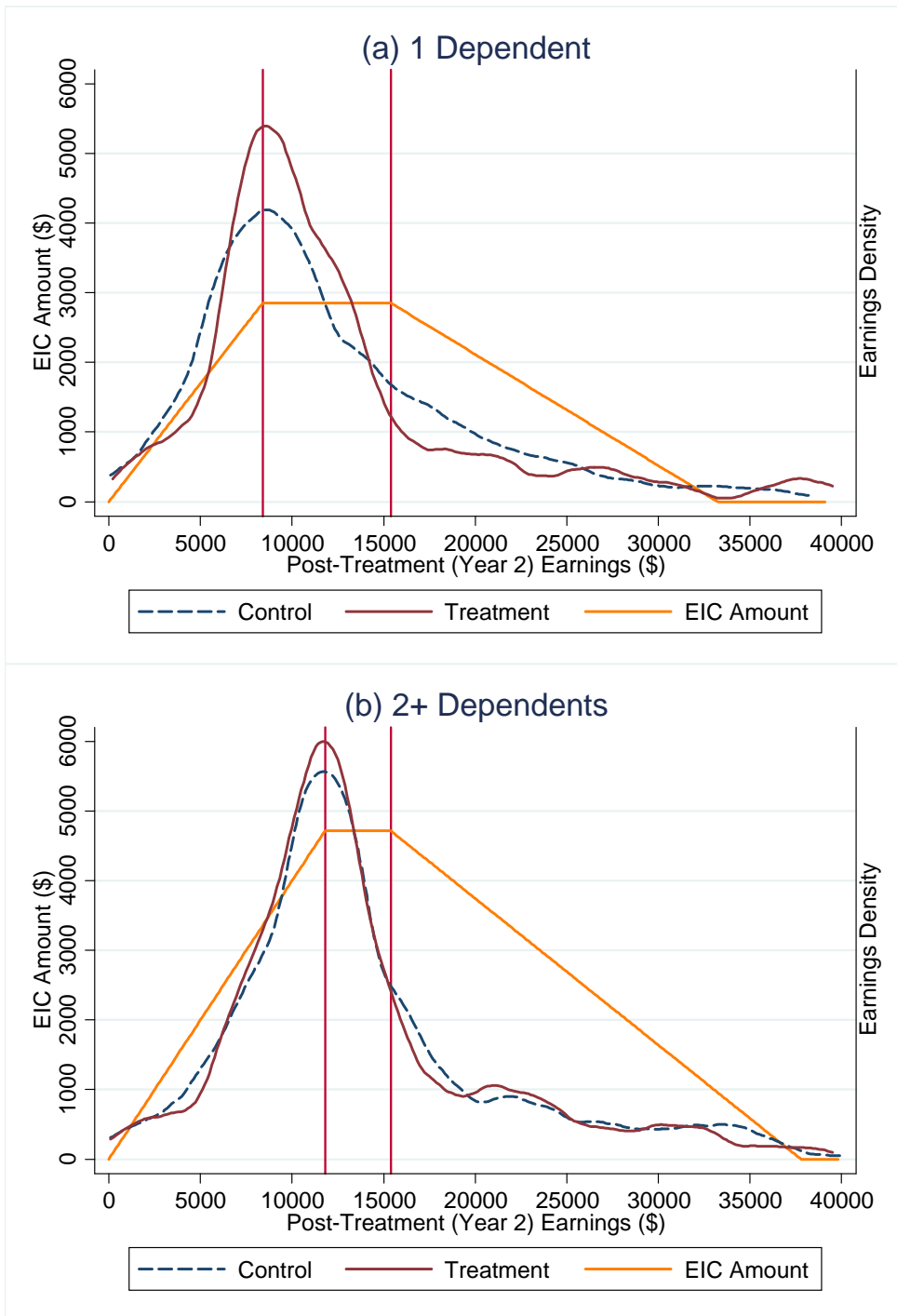


Figure 7. Year 2 Earnings Distributions for Self-Employed Clients of Complying Tax Pros

NOTE—These figures plot kernel densities of year 2 (post-treatment) income (sum of wage income and self-employment income) for tax filers who (a) had positive self-employment earnings in the base year and (b) filed with a “complying” tax professional. See notes to Figure 5 for the definition of “complying” tax professionals. The solid red curve shows the income distribution for the treatment group; the dashed blue curve shows the income distribution for the control group. Panel A is for the sample of individuals with one dependent, while panel B is for the sample of individuals with two or more dependents. Each panel also shows the relevant EITC schedule for singles (on the left y-axis). The vertical lines mark the boundaries between the phase-in, peak, and phase-out ranges of the EITC.

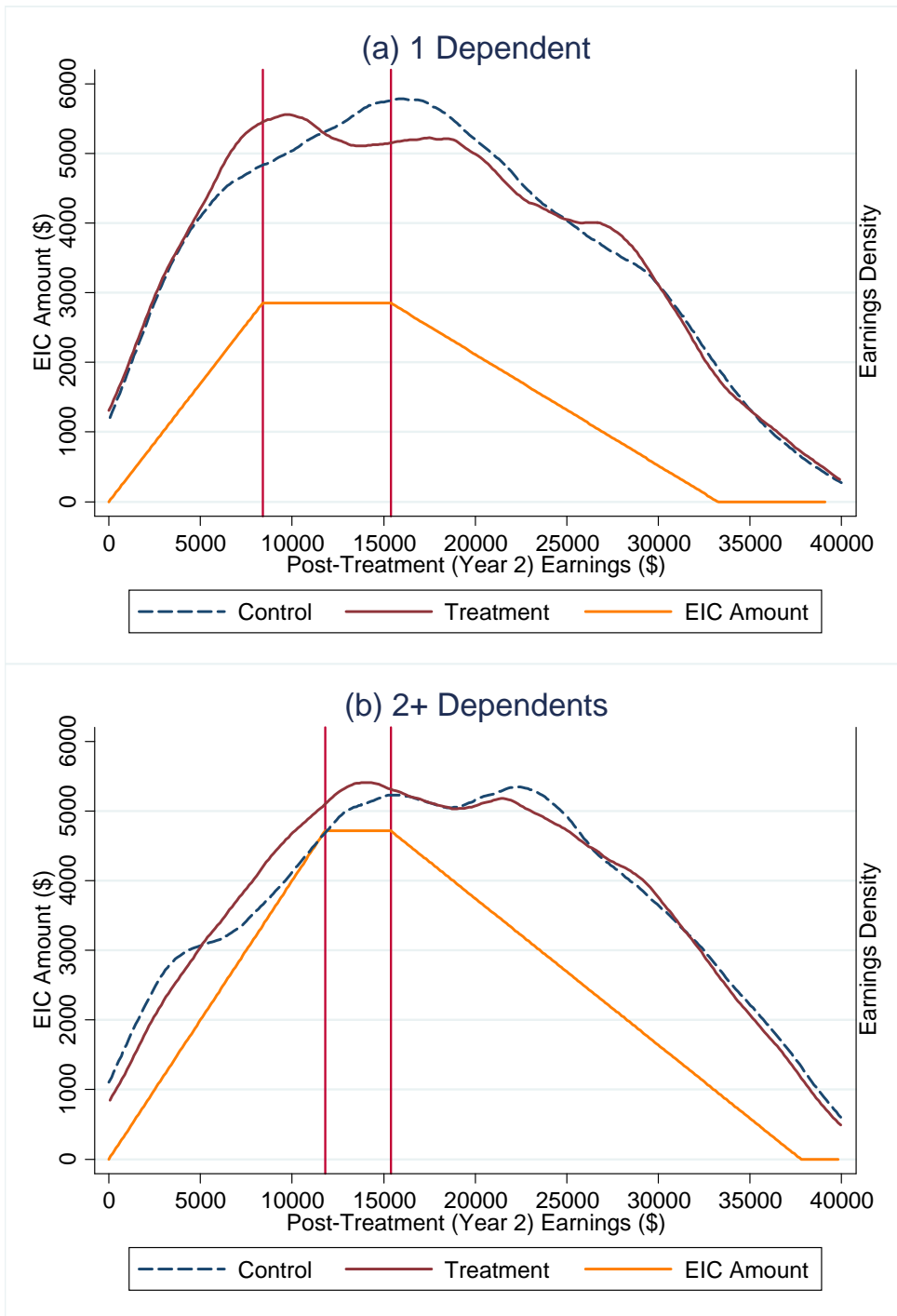


Figure 8. Year 2 Wage Earnings Distributions: Complying Tax Professionals

NOTE—These figures plot kernel densities of year 2 (post-treatment) of wage earnings for tax filers who filed with a “complying” tax professional. See notes to Figure 5 for the definition of “complying” tax professionals. The solid red curve shows the income distribution for the treatment group; the dashed blue curve shows the income distribution for the control group. Panel A is for the sample of individuals with one dependent, while panel B is for the sample of individuals with two or more dependents. Each panel also shows the relevant EITC schedule for singles (on the left y-axis). The vertical lines mark the boundaries between the phase-in, peak, and phase-out ranges of the EITC.

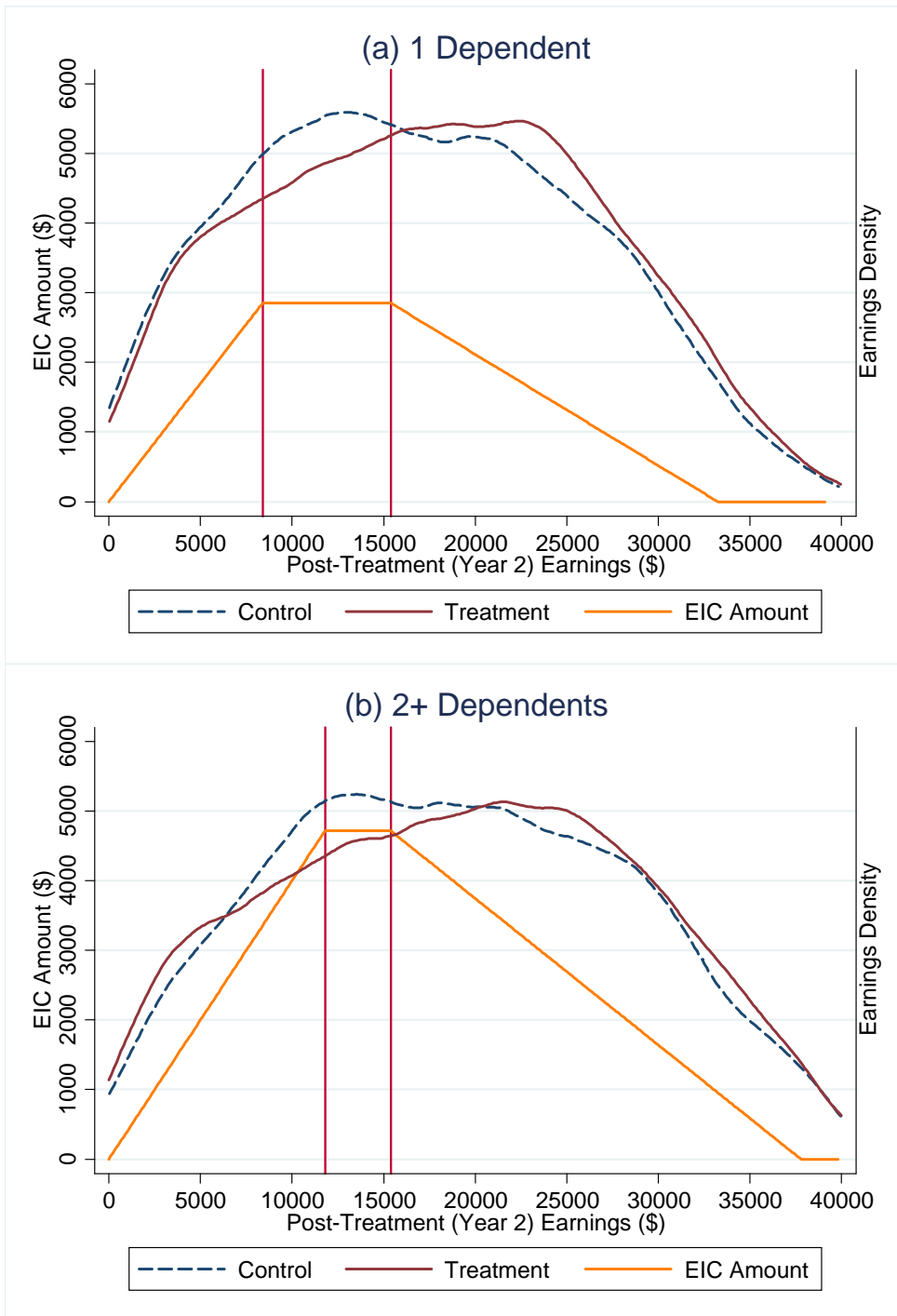


Figure 9. Year 2 Wage Earnings Distributions: Non-Complying Tax Professionals

NOTE—These figures plot kernel densities of year 2 (post-treatment) wage earnings for tax filers who filed with a “non-complying” tax professional. See notes to Figure 6 for the definition of “non-complying” tax professionals. The solid red curve shows the income distribution for the treatment group; the dashed blue curve shows the income distribution for the control group. Panel A is for the sample of individuals with one dependent, while panel B is for the sample of individuals with two or more dependents. Each panel also shows the relevant EITC schedule for singles (on the left y-axis). The vertical lines mark the boundaries between the phase-in, peak, and phase-out ranges of the EITC.

EXHIBIT I

EITC Handout: 4 Step Explanation

Single With Two or More Children

The EIC (Earned Income Credit) is a tax refund that gives families as much as \$4,500 per year.

We want to explain how the EIC works to help you decide how much to work and earn this year.

In 2006, you made \$ **10,000** → you are getting an EIC of \$ **4,000** in your refund.

- Your earnings this year (in 2007) will determine the size of your EIC refund next year
- The EIC has 3 ranges: 1) Increasing, 2) Peak, 3) Decreasing



1. Fill in earnings, EIC amount

2. Explain and dot graph

3. Take-home Message

You are in the **increasing** range of the EIC. Think about it like this:

- (increasing) Suppose you earn \$10 an hour, then you are really making \$14.00 an hour.
- (peak) Your earnings are maxing-out the EIC amount
- (decreasing) If you earn \$10 more, your EIC is reduced by \$2.10

4. Table

EIC Range	If you earn between	EIC refund will be	If you earn \$10 more, the EIC...
Increasing	\$0-\$11,790	\$0 up to \$4,716	Increases by \$4
Peak	\$11,790-\$15,390	\$4,716	Stays the same
Decreasing	\$15,390-\$37,780	\$4,716 down to \$0	Decreases by \$2.10

A Appendix (not for publication)

A.1 Derivation of Compliers vs. Non-Compliers Estimator

This appendix proves that we would detect zero treatment effects within the group of clients served by “complying” (or “non-complying”) tax professionals if all tax professionals have zero treatment effects. To begin, index tax professionals by $p = 1, \dots, P$ and clients by $i = 1, \dots, I$. Each tax professional p serves a set I_p of clients. For a client i served by tax professional p , denote by $I_{p,-i}$ the set of other clients (excluding i) served by tax professional p . Let $T_i = 0, 1$ denote the intent-to-treat status of client i . The set $I_{p,-i}$ is partitioned into two sets of clients: those who were treated ($T_j = 1$) and those not treated ($T_j = 0$). Denote these two sets by $I_{p,-i}^1$ and by $I_{p,-i}^0$. Formally, for $t = 0, 1$, $I_{p,-i}^t = \{j \in I_{p,-i} | T_j = t\}$. Denote by $y_{i,p}$ an outcome such as earnings reported in year 2. Let $m_{i,p}$ denote an indicator for whether client i of tax professional p has “middle income” (earnings between \$7,000 and \$15,400) in year 2.

For a given outcome y , there are two potential outcomes: $y_{i,p}^0$ if the client is in the control group $T_i = 0$ and $y_{i,p}^1$ if the client is in the treatment group $T_i = 1$. We only observe $y_{i,p}^{T_i}$. For a given client i served by tax professional p , we define complying status $C_{i,p}$ as follows: $C_{i,p} = 1$ if $\sum_{j \in I_{p,-i}^1} m_{j,p} / |I_{p,-i}^1| > \sum_{j \in I_{p,-i}^0} m_{j,p} / |I_{p,-i}^0|$ and $C_{i,p} = 0$ otherwise.

Definition 1 *There are no treatment effects along outcome y iff $y_{i,p}^1 = y_{i,p}^0$ for all (i, p) .*

Theorem 1 *Suppose there are no treatment effects on outcomes y and m . Then*

(1) *C and y are independent variables.*

(2) *$E[y_{ip} | C = 1, T = 1] = E[y_{ip} | C = 1, T = 0]$ and $E[y_{ip} | C = 0, T = 1] = E[y_{ip} | C = 0, T = 0]$, i.e., the average outcome y is the same in expectation across treatment and control clients within the sample of compliers and within the sample of non-compliers.*

(3) *$E[y_{ip} | C = 1, T = 1] = E[y_{ip} | C = 0, T = 1]$ and $E[y_{ip} | C = 1, T = 0] = E[y_{ip} | C = 0, T = 0]$, i.e., the average outcome y is the same in expectation across complying and non-complying cases within the sample of treated clients and within the sample of non-treated clients.*

Proof:

(1): Suppose there are no treatment effects on outcome m . Then $m_{i,p}^1 = m_{i,p}^0$ for all (i, p) . By definition, $C_{i,p} = 1$ if $\sum_{j \in I_{p,-i}^1} m_{j,p}^1 / |I_{p,-i}^1| > \sum_{j \in I_{p,-i}^0} m_{j,p}^0 / |I_{p,-i}^0|$. Therefore, $C_{i,p} = 1$ if $\sum_{j \in I_{p,-i}^1} m_{j,p}^0 / |I_{p,-i}^1| - \sum_{j \in I_{p,-i}^0} m_{j,p}^0 / |I_{p,-i}^0| > 0$.

The partition $I_{p,-i}^1, I_{p,-i}^0$ depends solely on T_j for $j \in I_{p,-i}^0 \cup I_{p,-i}^1$. Because treatment T is randomly assigned, any outcome of individual i such as $m_{i,p}$ or $y_{i,p}$ must be independent of T_j for $j \neq i$. Hence, outcomes $m_{i,p}$ or $y_{i,p}$ are also independent of $I_{p,-i}^1$ and $I_{p,-i}^0$. Therefore outcomes $m_{i,p}$ or $y_{i,p}$ are independent of $C_{i,p}$.

(2) Recognizing that y_{ip}^1 is independent of $C_{i,p}$, we have

$$E[y_{ip} | C = 1, T = 1] = E[y_{ip}^1 | C = 1, T = 1] = E[y_{ip}^1 | T = 1]$$

We then have $E[y_{ip}^1 | T = 1] = E[y_{ip}^1 | T = 0]$ because T is randomly assigned and $E[y_{ip}^1 | T = 0] = E[y_{ip}^0 | T = 0]$ because there are no treatment effects. Finally, because C is independent of y_{ip}^0 ,

$$E[y_{ip}^0 | T = 0] = E[y_{ip}^0 | C = 1, T = 0] = E[y_{ip} | C = 1, T = 0].$$

The proof for the case of $C = 0$ is identical.

(3) This follows from the following set of equalities:

$$\begin{aligned} E[y_{ip}|C = 1, T = 1] &= E[y_{ip}^1|C = 1, T = 1] = E[y_{ip}^1|T = 1] \\ &= E[y_{ip}^1|C = 0, T = 1] = E[y_{ip}|C = 0, T = 1] \end{aligned}$$

where we use the fact that C and y_{ip} are independent in the second and fourth equality. QED

A.2 Calibration of Magnitudes

In this appendix section, we benchmark the magnitudes of the information treatment effects relative to the effects of conventional policy instruments such as an expansion of the EITC program or changes in tax rates. We calibrate the changes in the behavior that would be caused by changes in marginal incentives using estimates of the intensive margin labor supply elasticity from the existing literature. As discussed in section 2, most studies find insignificant effects of EITC expansions on hours of work for those already in the work force. Our reading of the literature suggests that an elasticity of $e = 0.25$ is an upper bound for the intensive elasticity of earnings.²⁸ Since complying and non-complying tax professionals generate qualitatively different behavioral responses, we present separate calibrations for each case.

Complying tax professionals. Clients treated by complying tax professionals respond in a manner consistent with what would be expected to occur when the EITC program is expanded. We therefore calculate the percentage expansion in the EITC that would be required to produce the same change in earnings behavior as the information treatment.

Let t^i denote the EITC phase-in rate ($t^i = .4$ for filers with two or more dependents and $t^i = .34$ for those with one dependent). Let t^d denote the phase-out rate ($t^d = 0.21$ for two or more dependents, $t^d = 0.16$ for one dependent). Expanding the EITC program by Δ percent would increase the net-of-tax rate from $1 + t^i$ to $1 + t^i(1 + \Delta)$ in the phase-in range and decrease the net-of-tax rate from $1 - t^d$ to $1 - t^d(1 + \Delta)$ in the phase-out range. To calibrate how these changes would affect earnings behavior, we use a specification of utility as a function of consumption (c) and labor (l) that produces a constant net-of-tax elasticity:

$$u(c, l) = c - \frac{l^{1+1/e}}{1 + 1/e},$$

where $e = \frac{d \log l}{d \log 1-t}$ denotes the elasticity of labor supply with respect to the net-of-tax rate. Note that there are no income effects with this quasi-linear utility specification, so labor supply is a function purely of the marginal tax rate.

In the phase-in range, if the earnings level under the existing EITC program is z_0 , earnings after the Δ percent EITC expansion would be

$$z_{\Delta}^i = z_0 \cdot [(1 + t^i(1 + \Delta))/(1 + t^i)]^e \simeq z_0 \cdot \left(1 + e \cdot \Delta \cdot \frac{t^i}{1 + t^i}\right)$$

Symmetrically, in the phase-out range, if earnings under the existing EITC are equal to z_0 ,

²⁸Saez's (2009) analysis of bunching at the kink points of the EITC schedule implies an intensive margin elasticity for the EITC population of at most 0.15, with most of this effect driven by the self-employed.

earnings after the Δ percent EITC expansion would be

$$z_{\Delta}^d = z_0 \cdot [(1 - t^d(1 + \Delta))/(1 - t^d)]^e \simeq z_0 \cdot \left(1 - e \cdot \Delta \cdot \frac{t^d}{1 - t^d}\right)$$

To find the Δ that generates responses comparable to those estimated in the data, we focus on our estimate of the change in the EITC amount induced by the information treatment. For complying tax professionals, we estimate that the information treatment increased the average EITC amount by $\Delta EITC = \$58$ (Table III, column 2, row 2). To derive a comparable measure for the effect of a Δ percent EITC expansion, we calculate the increase in the EITC amount under the *initial* (pre-expansion) schedule, which is the relevant measure for comparisons of behavioral responses. The change in earnings behavior in the phase-in range ($z_{\Delta}^i - z_0$) increases the pre-expansion EITC amount by

$$\Delta EITC^i = t^i \cdot (z_{\Delta}^i - z_0) \simeq z_0 \cdot e \cdot \Delta \cdot \frac{(t^i)^2}{1 + t^i}$$

Likewise, in the phase-out range, the change in earnings ($z_{\Delta}^d - z_0$) increases the pre-expansion EITC amount by:

$$\Delta EITC^d = -t^d \cdot (z_{\Delta}^d - z_0) \simeq z_0 \cdot e \cdot \Delta \cdot \frac{(t^d)^2}{1 - t^d}$$

Let λ^i and λ^d denote the fraction of the EITC claimants in the phase-in and phase-out regions respectively. Let \bar{z}^i and \bar{z}^d denote the average earnings in the phase-in and phase-out regions. The mean effect of the EITC expansion on EITC amounts under the initial schedule is:

$$\Delta EITC \simeq \Delta \cdot e \cdot \left[\lambda^i \cdot \bar{z}_i \cdot \frac{(t^i)^2}{1 + t^i} + \lambda^d \cdot \bar{z}_d \cdot \frac{(t^d)^2}{1 - t^d} \right] \quad (4)$$

In our sample, $\lambda^i = .28$, $\lambda^d = .53$, $\bar{z}^i = \$6,600$, $\bar{z}^d = \$23,300$, $t^i = 0.37$ (the average of 40% and 34%), and $t^d = 18.5\%$ (the average of 21% and 16%). With $\Delta EITC = \$58$ and $e = .25$, solving equation (4) yields $\Delta = 33\%$. That is, a 33% expansion in the federal EITC would be required to generate the same labor supply responses along the intensive margin as the information treatment implemented by complying tax professionals.

Non-complying tax professionals. The information treatment as implemented by non-complying tax professionals led to a pure increase in earnings, which is consistent with a reduction in perceived tax rates rather than changes in perceptions of the EITC schedule. We therefore calculate the percentage reduction in tax rates that would produce an increase in earnings equal to the treatment effect estimate of \$247 (Table 3, column 4, row 3).

The EITC claimants in our sample face an average marginal tax rate of approximately $t = 10\%$ and have average earnings of $z = \$16,500$. A reduction in t by Δt would generate a change in earnings Δz of

$$\frac{\Delta z}{z} = e \cdot \frac{\Delta t}{1 - t}. \quad (5)$$

With $\Delta z = \$247$ and $e = .25$, solving equation (5) yields $\Delta t = 5.4\%$. That is, a 5.4 percentage point reduction in marginal tax rates would be required to generate the same labor supply responses along the intensive margin as the information treatment implemented by non-complying tax professionals.

These calculations should be viewed as rough order-of-magnitude estimates given the highly stylized nature of the calibration and the standard errors in the treatment effect estimates. The calibrations simply illustrate that the information treatment effects are substantial in comparison with the responses generated on the intensive margin by standard policy instruments. For example, the information treatment cost \$5 per client, whereas expanding the EITC by 33% would cost \$800 per eligible claimant.

One should be cautious in drawing normative conclusions from this result. Even though information may be a more cost-effective way of changing behavior than changes in incentives, a social planner's limited resources may be better spent on expanding the EITC program rather than providing information, for three reasons. First, transfers have redistributive value independent of their impacts on behavior. Second, the expansion of the EITC would substantially increase labor supply through the participation margin. Finally, the provision of information could increase deadweight costs by increasing the distortions in intensive-margin behavior.²⁹

²⁹See Chetty, Kroft, Looney (2009) for a theoretical analysis of the efficiency costs of taxation when individuals are uninformed about tax policies.

APPENDIX EXHIBIT I(a)
Information Treatment Screen #1 in H&R Block Software

H&R Block Client Assistant - EIC

The EIC is the largest component of the tax refund of American working families. This year, you are getting an EIC of \$4000 as part of your tax refund. As part of a special effort to promote the EIC, H&R Block will offer you some useful and simple information about the EIC to help you take the best advantage of this credit. We want to explain how the EIC works to help you decide how much to work and earn this year.

Let me tell you some more details about the study. We are trying to better understand and increase awareness of EIC among our EIC-eligible clients.

Use Handout SINGLE WITH 2+ CHILDREN

APPENDIX EXHIBIT I(b)
Information Treatment Screen #2 in H&R Block Software

H&R Block Client Assistant - EIC

In 2006, you made **** \$10000 **** and you are getting an EIC of **** \$4000 **** in your tax refund. Your earnings this year (in 2007) determine the size of your EIC refund next year. The EIC has 3 ranges: 1) Increasing, 2) Peak, 3) Decreasing.

You are in the **** increasing **** range of the EIC. Think about it like this: Suppose you earn \$10 an hour. Because of the EIC you are really making \$14 an hour. It pays to work more!

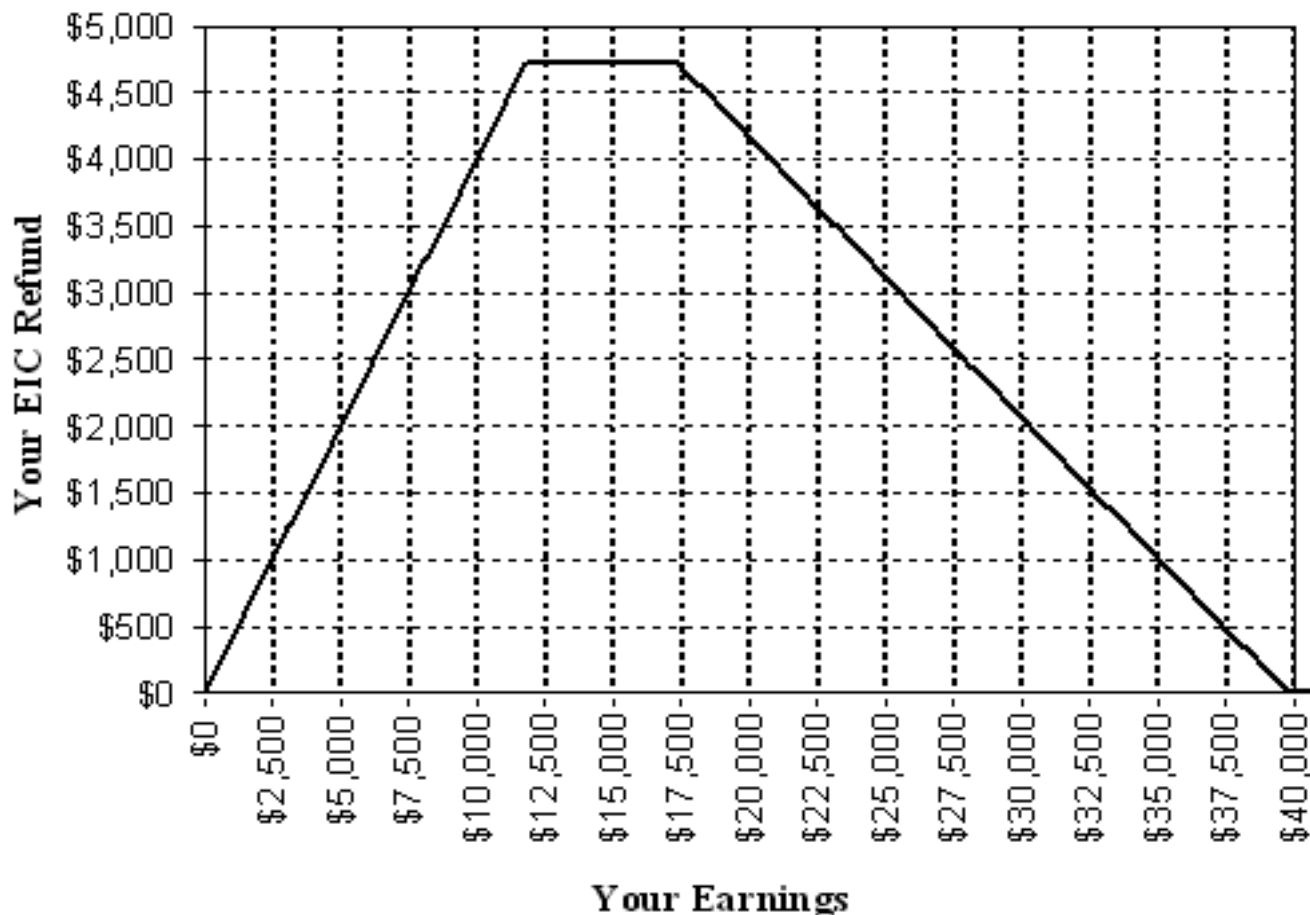
EIC Range	If you earn between	Your EIC refund is	Earn \$10 more, the EIC...
1) Inc	\$0-\$11,790	\$0 up to \$4,716	Increases by \$4.00
2) Peak	\$11,790-\$15,390	\$4,716	Stays the same
3) Decr	\$15,390-\$37,780	\$4,716 down to \$0	Decreases by \$2.10

APPENDIX EXHIBIT II Printout Given to Tax Filer

Dear WARD CLEAVER,

The **EIC** (Earned Income Credit) gives tax refunds to working families. We want to explain how the EIC works to help you decide how much to work and earn this year. In 2006, you made \$10000 and you are getting an **EIC** of \$ 1984 in your tax refund.

Your earnings this year (in 2007) determine the size of your **EIC** refund next year. The EIC has 3 ranges: 1) Increasing, 2) Peak, 3) Decreasing.



EIC Range	In 2007 if you earn between:	Your EIC refund in 2008 will be:	If you earn \$10 more, the EIC:
Increasing	\$0-\$11,790	\$0 up to \$4,716	Increases by \$4
Stays the Same	\$11,790-\$17,390	\$4,716	Stays the same
Decreasing	\$17,390-\$39,780	\$4,716 down to \$0	Decreases by \$2.10

You are in the ** increasing **** range of the EIC. Think about it like this: Suppose you earn \$10 an hour. Because of the EIC you are really making \$14 an hour. It pays to work more!**

Note: The EIC does not affect any other credits or refunds you can get. This table applies to married joint filers with two or more qualifying children. If your family situation changes in 2007, your EIC may also change (see IRS Publication 596). Changes in earnings may also affect other credits you are entitled to or taxes you may owe. Though the printed earnings and EIC amounts are based directly on your current tax return, the indication of your position on the graph is for illustrative purposes only.

APPENDIX EXHIBIT III

Follow Up Letter Mailed to Tax Filer



H&R BLOCK®

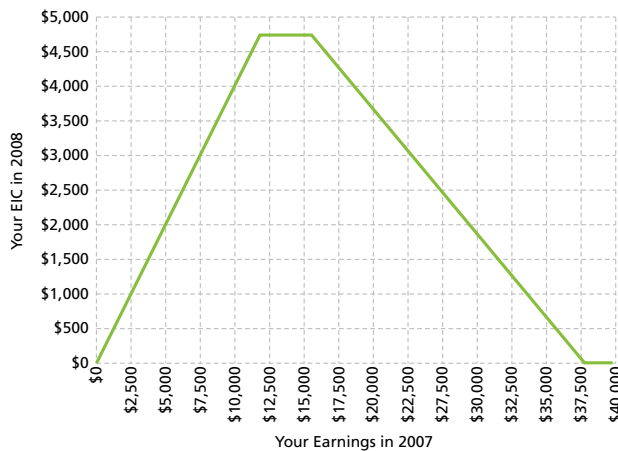
[Date]

[1st Name] and [1st Name] [Last Name]
 [Address Line 1]
 [Address Line 2]
 [City] [State] [Zip]

Dear [1st Name],

Thank you for preparing your taxes with H&R Block this year. Even though it's early, we want to provide important information that you may want to consider as you plan financially for next year. The EIC (Earned Income Credit) gives tax credits to working families. This year, you qualified for the EIC. This letter is a follow up to the EIC information your H&R Block tax professional shared with you when you had your taxes prepared. We want to remind you how the EIC works as you consider how much to work and earn this year.

As pictured on the graph below, the EIC has 3 ranges: 1) Increasing, 2) Peak, 3) Decreasing.



Last year, you were in the **increasing** range of the EIC. Look at the table below. Will you be in the increasing range again this year? If yes, think about it like this: Suppose you earn \$10 an hour. Because of the EIC, for each \$10 you earn you could be eligible to receive an additional \$4 in EIC – so it's like you're making \$14 an hour. **It pays to work more!**

EIC Range	In 2007, if you earn between	Your EIC refund in 2008 could be	If you earn \$10 more, the EIC could
Increasing	\$0 - \$11,790	\$0 up to \$4,716	Increase by \$4.00
Peak	\$11,790 - \$15,390	\$4,716	Stay the same
Decreasing	\$15,390 - \$37,780	\$4,716 down to \$0	Decrease by \$2.10

This table applies to single filers with two or more qualifying children. If your family situation changes in 2007, your EIC may also change (see IRS Publication 596). Many things can affect EIC, including changes in your family situation, other financial changes, or changes in tax laws. These changes may also affect your eligibility for other credits or deductions or taxes you may owe.

We hope you find the EIC information helpful. We look forward to continuing to provide tax and financial planning assistance to you in the future.

Sincerely,

Bernard M. Wilson
 Vice President
 Outreach & Business Development

APPENDIX EXHIBIT IV

Tax Professional Survey about the EIC Outreach Initiative March 2007

Office

Dear Tax Professional,

As you know and thanks to your help, H&R Block has implemented an EIC outreach effort in Chicago where you have explained the Earned Income Tax Credit to our clients. In order to evaluate this initiative, we would like to ask you a few short questions about your experience. Please circle your response to each question below.

- 1) What proportion of your clients was interested in the EIC information?
 - a. Few (less than 25% of your clients)
 - b. Many (25% to 75% of your clients)
 - c. Most (over 75% of your clients)

- 2) Do you think Block should provide this EIC information to clients again in the future?
 - a. Yes
 - b. No

- 3) Is there anything else you would want to tell us about this EIC outreach or about how to make it work better?
 - a. No
 - b. Yes: Please explain below and/or on the back of this survey.

- 4) Did the explanation of EIC help your understanding of how the credit worked?
 - a. Yes
 - b. No

Please return this survey to your office leader who will forward it to Block headquarters in the envelope provided to each office. Thank you for your participation in the EIC Outreach and in this survey.

If you have questions, please contact Eileen McCarthy, at 816.854.4866.