The Effects of EITC Correspondence Audits on Low-Income Earners*

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Abstract

This paper studies the impacts of IRS EITC correspondence (mail) audits on taxpayer behaviors. The analysis documents widespread disallowance of EITC benefits due to nonresponse and insufficient response. Relative to similar non-audited taxpayers, audited taxpayers over the years after being audited are less likely to claim EITC benefits and file tax returns, and qualifying children claimed on their returns are more likely to be claimed by other taxpayers. Audited taxpayers also appear less likely to have third-party and self-reported wages, with larger decreases for self-reported wages and for wage levels in the maximum EITC benefit region.

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I. Introduction

Many social benefit programs rely on operational audits to ensure program integrity. Understanding the impacts of operational audits on participants' behaviors is essential for establishing how effective these audits are in terms of improving program integrity. These impacts can also provide insights into individuals' decisions to participate in programs and take-up benefits they are eligible for. However, it is often difficult to establish the impacts of such operational audits on individuals' behaviors because of a lack of necessary data or a lack of random variation in the selection of operational audits. This analysis aims to overcome these obstacles and provide insights into the impacts of operational audits conducted by the United States Internal Revenue Service (IRS) in the context of administering the Earned Income Tax Credit (EITC).

The EITC, which has become the United States' largest wage subsidy anti-poverty program, is administered by the IRS. Tax administration research within the IRS and in academic contexts has demonstrated that each year, while a significant amount of EITC benefits subsidize working low-income households, concerns also arise about erroneous claims of EITC benefits. More specifically, a collection of prior studies has discussed issues of EITC eligibility, noncompliance and erroneous payments relating to qualifying child eligibility (Holtzblatt 1991, Liebman 2000, McCubbin 2000, Blumenthal, Erard, and Ho 2005, Leibel 2014, and Leibel, Lin and McCubbin 2019) and reported self-employment income (Saez, 2010, Chetty Friedman, and Saez 2013, and Mortenson and Whitten 2018). Correspondence audits, which are operational audits conducted via mail, are a key enforcement tool to protect revenue and deter improper claims of EITC benefits. Historically, roughly 500,000 EITC correspondence audits were performed each year, but this figure has declined to around 350,000 in recent years.

We estimate the causal effects of EITC correspondence audits on low-income earners' behavior by exploiting random variation within one part of the audit selection process and focusing on a subpopulation of returns for which this random variation applies. We emphasize that audit selection overall is not random or arbitrary. Specifically, random variation within a

subpopulation of returns made available for audit arises from the following EITC audit selection process. First, all tax returns are assessed for noncompliance risk. Next, returns that break certain rules or have other indicators of potential noncompliance are assigned a risk score and made available for audit. (Returns with no indicators of potential noncompliance are neither assigned a risk score nor made available for audit.) Returns are then selected for audit from this subpopulation using the risk score as one important factor. Although the IRS does not make public the details of the selection process and the role of the risk score in that process, the process incorporates some random variation, particularly among the subsample of returns with low or intermediate risk scores. By focusing on this subsample of returns with low or intermediate risk scores, we are able to estimate the causal effects of EITC correspondence audits within this subpopulation; the research design exploits this random variation in the selection process to compare audited taxpayers to taxpayers who had similar risk scores but were not selected for audit, thereby mimicking a randomized control trial.[1]

Once notified of an EITC correspondence audit, a taxpayer must decide how to respond to the IRS, if at all.[2] Taxpayers who know they are not eligible for EITC benefits, or those who are confused or overwhelmed, may choose not to interact with the IRS by not responding to the audit. Taxpayers who think they may be eligible, and who are able to overcome any perceived barriers in communicating with the IRS, may respond to substantiate their claims. In terms of potential long-term impacts, correspondence audits could result in long-term reductions in EITC claims if individuals learn that they are not actually eligible for EITC benefits currently, or in the future even if they follow EITC rules correctly. Additionally, the potential confusion or scarring caused by the audit process could result in actually eligible individuals neglecting to claim future

[1] The analysis sample differs from the general EITC population and from the full EITC correspondence audit population. First, the analysis sample differs from the general EITC population since returns in the analysis sample have all been flagged for some potential EITC noncompliance, but most returns in the general EITC population are not flagged for such potential noncompliance. Second, the analysis sample differs from the full EITC correspondence audit population since the analysis sample includes only returns with lower and intermediate risk scores, whereas the full EITC correspondence audit population includes returns with the highest risk scores that are almost always audited. We discuss generalizability and external validity in detail below.

[2] The correspondence audits do not specifically distinguish between the amount claimed being incorrect versus the taxpayer being ineligible for a credit. The notices sent to taxpayers state that documentation is needed to verify the credits being claimed, so these elements are conflated. Moreover, our analysis sample focuses on relatively simple correspondence audits where documentation is needed to substantiate EITC qualifying child eligibility and, for some returns, certain aspects of self-employment income.

EITC benefits. Alternatively, there could also be multiple reasons that taxpayers may not alter future behaviors at all. For example, individuals who try to get away with potentially erroneous EITC claims may not be likely to change their behaviors and may continue to claim EITC benefits even after an EITC correspondence audit, and confused individuals may not learn anything about longer-term EITC eligibility from EITC correspondence audits and may continue to claim EITC benefits after the audits. Thus, there are multiple potential short-term and long-term outcomes. However, it is not possible to distinguish between confusion versus actual ineligibility or intentional erroneous EITC claiming based on these data.

The results demonstrate significant nonresponse to EITC correspondence audits and significant decreases in subsequent EITC claiming and tax filing across multiple years. The results also indicate decreases in tax filing conditional on both high and low withholding amounts and high or low W-2 earnings amounts. These results are consistent with some individuals possibly being compliant but maybe leaving benefits on the table and other individuals possibly being noncompliant and maybe not filing tax returns when they should. Furthermore, the results demonstrate spillovers to non-audited taxpayers (in terms of audited qualifying children being claimed by non-audited taxpayers after the audits), decreases in self-reported self-employment income, and decreases in both third-party and self-reported wage earnings. The decreases in wage earnings are larger for self-reported wages on filed tax returns and at wage levels that broadly correspond to the maximum EITC benefit region.

Overall, while EITC correspondence audits are designed to protect revenue by stopping erroneous EITC claims, it is difficult to assess the achievement of this goal because of nonresponse. Distinguishing between fraud and confusion has been a central goal of prior analyses of EITC enforcement. Multiple studies have indicated high overpayment rates for the EITC, but these studies have also indicated that these high overpayment rates are driven by default disallowance rates for taxpayers who do not respond to correspondence audits. Furthermore, studies from the National Taxpayer Advocate (2007, 2012) have indicated that large fractions of taxpayers under correspondence audits may not be aware that they are under audit, may not understand what documentation they are being asked to provide, and may need assistance or representation to respond to correspondence audits. While this suggests that

confusion may be widespread, it is not possible to distinguish between intentional fraud and confusion based on available data. Additionally, changes in future behaviors may indicate some mistaken and noncompliant behaviors, so it is useful to consider the impacts of EITC correspondence audits on overall tax compliance and not just EITC claiming. More broadly, social programs that rely on operational audits that shift the burden of proof or recertification to the program participants as opposed to the program administration may come with ambiguity about eligibility and possible noncompliance along other program dimensions.

Our analysis is related to prior tax enforcement research that examines the impacts of audits on taxpayer behavior. (See Slemrod 2016 for a survey of recent research on tax enforcement.) For example, Kleven et al. (2011) present results based on randomized audits and threat-of-audit notices in Denmark; Advani et al. (2017) examine the effects of randomized audits in the United Kingdom; and perhaps most closely, DeBacker et al. (2018) examine randomized IRS audits of EITC claimants. However, these studies do not examine operational audits. Instead, these studies examine the impact of randomized audits similar to those conducted by the IRS as part of the National Research Program (NRP). In the background section below, we discuss the differences between NRP-style audits and EITC correspondence audits in detail, but to summarize, they differ in multiple ways. First, in terms of samples sizes, between 2008 and 2016, the IRS conducted roughly 15,000 NRP audits each year and between roughly 1 to 1.5 million field and correspondence audits each year (see the annual IRS Data Book). Second, in terms of the nature of the audits, NRP audits often involve (possibly repeated) personal contact between a tax auditor and taxpayer via phone calls or in-person meetings, and the two parties work together to assess true income and true tax liability. In contrast, EITC correspondence audits often do not involve personal contact between tax auditors and taxpayers. Furthermore, EITC correspondence audits do not provide taxpayers with a designated tax auditor to assist them through the examination process. Instead, EITC correspondence audits are designed so that any auditor can assist the taxpayer. This means that the taxpayer can call the IRS at any time and be connected with someone who can help; with a single designated auditor, that may not be possible. However, the lack of a direct relationship with one auditor may mean that taxpayers find correspondence audits confusing or may not learn as much as they would otherwise. These factors can lead to higher nonresponse rates for correspondence audits than NRP-style audits.

Consequently, true income and true tax liability may often never be observed with EITC correspondence audits. Additionally, the characteristics of audited taxpayers differs between NRP audits and EITC correspondence audits since NRP audited taxpayers are not selected based on risk of potential noncompliance whereas taxpayers audited via EITC correspondence audits are selected based on risk of potential noncompliance. Given the widespread use of operational audits to enforce tax policies and policies in other settings and given the potential differences in behavioral responses to different types of audits, it is important for tax authorities, program administrators, and researchers to understand the impacts of operational audits on audited taxpayers.

The analysis is also related to a recent literature on administrative (i.e., taxpayer's compliance cost) burden (Herd and Moynihan 2018). Multiple analyses by the National Taxpayer Advocate (2007, 2012, 2021) have highlighted the administrative burden that correspondence audits have imposed on low-income taxpayers. Additionally, Bhargava and Manoli 2015 and Homonoff and Somerville 2019 highlight the role of "recertification costs" which arise when program participants' have difficulties in recertifying their eligibility for benefits when the burden of proof is placed on them only.

The remainder of the paper is organized as follows. Section II describes the institutional background of EITC correspondence audits, the intuition for plausible impacts of EITC correspondence audits on taxpayer behavior, and the administrative data used in the analysis. Section III describes the empirical analysis and results, and Section IV concludes.

II. Background on EITC Correspondence Audits

II. A. EITC Rules and Administrative Burden

Herd and Moynihan (2018) provide a comprehensive discussion of eligibility rules and administrative burden related to claiming EITC benefits. Generally, individuals who work are eligible for EITC benefits, and benefits can be claimed while filing a federal income tax return.

Take-up of EITC benefits is estimated to be roughly 80% to 85%, and this take-up rate has been stable for the most recent 20 to 30 years (see Plueger 2009).

Taxpayers generally file an additional Schedule EIC (a two-page paper form or additional questions on software) to claim the credit, and there are no case workers used to determine eligibility. The questions on the Schedule EIC may impose significant administrative burden on taxpayers because they need to correctly understand complicated rules and eligibility conditions and have necessary documentation that may be difficult to maintain or track down. IRS Publication 596 contains the official rules and eligibility conditions for claiming the EITC and is 38 pages. The rules for claiming a qualifying child involve assessing relationship, age, and residency conditions that may be particularly challenging for multi-generation households, households with college-age dependents, adopted children, or foster children, and non-married families with children living in multiple households. Calculating the relevant measure of earned income involves understanding whether disability and welfare benefits count as earned income and maintaining documentation for cash-based employment. In addition to administrative burden associated with specific eligibility rules, prior work by Edin, Tach, and Halpern-Meekin (2014), Sykes, Križ, Edin, and Halpern-Meekin (2015), and Bhargava and Manoli (2015) has also highlighted administrative burden related to incomplete program awareness. Each of these complexities may create areas in which taxpayers may make mistakes and erroneously claim EITC benefits, either by claiming incorrect amounts or not satisfying eligibility requirements.

II. B. Audit Selection Process

Each year, the IRS audits selects individual federal income tax returns to verify that income, deductions, or credits are being reported accurately. There are generally two types of operational audits: correspondence audits, which are conducted via mail, and field–or face-to-face audits–that are conducted at the taxpayer's home, place of business, tax preparer's office, or IRS office. Annual statistics on the number of correspondence and field audits are publicly available in the IRS Data Book and shown in Table 1. As indicated by IRS Data Book statistics for fiscal years 2008 to 2016, for returns in which the EITC was claimed, roughly 400,000 to 500,000 correspondence audits were conducted each year, compared to roughly 30,000 to 50,000 face-to-

face audits. However, due to reductions in the IRS budget, the total number of audits have also been reduced. The statistics in Table 1 also highlight that EITC correspondence and field audits make up considerable portions of all audits, with EITC correspondence audits being roughly 35% to 45% of all correspondence audits and EITC field audits roughly 10% of all field audits.

The exact criteria used to select tax returns for audit are not made public by the IRS, but for the purposes of this study, we are able to summarize the process for EITC correspondence audit selection as follows. As part of standard tax return processing, all returns claiming children for the EITC undergo a series of checks and comparisons to relevant third-party data and past tax filing history. Returns that are flagged for potential noncompliance undergo additional analysis and are ultimately assigned a risk score and made available for audit. Returns are then selected for audit using the risk score as one important factor. However, due to within-season variation in return submission volumes and other factors, the audit selection process may be considered quasi-random with respect to the risk score. Thus, the selection of audited returns is conditional on observables; as such, audit selection process is not completely random or arbitrary but can be considered quasi-random. Returns with no indicators of noncompliance are not assigned a risk score; thus, the returns in our analysis, even those with low- or intermediate-risk scores, are among the highest-risk-for-error returns in the population of EITC claimants. Additionally, while the details of the audit selection are not made public by the IRS, we were able to use the exact audit selection variables in our empirical analysis. Thus, we are able to observe which potential errors were identified and the risk score assigned to each tax return. This allows us to use the research design described below.

II. C. Taxpayer Experience

This section describes the EITC correspondence audit process. Once an individual income tax return is assigned for an EITC correspondence audit, a CP 75 notification letter is automatically generated and sent to the taxpayer. (Appendix Figure 1 presents an example CP 75 notification letter. For contrast, Appendix Figure 2 presents example notifications for audits conducted as part of the IRS National Research Program.) The CP 75 notification letter informs the recipient that their tax return is being audited and requests that the taxpayer submit more information or

documentation to support claimed tax benefits, as applicable; these may include EITC, other refundable credits, and dependency exemptions. The type of supporting documentation requested depends on the issue that taxpayer must substantiate, and examples of supporting documentation are provided on the notice. For example, recipients may be asked to show that a qualifying child (QC) meets the relationship requirement by providing a birth certificate. School records may be used to demonstrate the residency requirement, and information on business income and expenses may be requested to verify self-employment. The notification letter informs the taxpayer that they have 30 days to respond and that their refund is on hold until the audit is resolved. The notification letters are typically sent within four to eight weeks after returns are filed. If the taxpayer does not respond within 30 days, the audit remains open and another notice is sent to the taxpayer, giving them more time to respond. If the taxpayer never responds, the audit will last approximately 6 months and will involve multiple notices, each giving the taxpayer the opportunity to respond. An audit may be resolved more quickly if the auditor and taxpayer agree on the outcome sooner, or it may last longer if the taxpayer continues to provide documentation and engage with the IRS.

Once an EITC correspondence audit has been initiated, there are multiple possible outcomes. First, the audit notification may be undeliverable due to a bad or old mailing address, or the taxpayer simply may not respond to the notice. In both cases, EITC is ultimately disallowed in full, although prior to the disallowance additional steps are taken. For cases where the audit letter was undeliverable, the IRS has a process to research various data sources to try to locate a taxpayer's current mailing address, and timelines for the audit may be extended. In both undelivered mail and nonresponse cases, multiple notices are sent and a lengthy timeline is allowed before the audit is closed. If a taxpayer responds to the initial notice, the IRS will send a notice stating that more information is needed and explaining what is required or, if a decision has been reached, the outcome. If the EITC is disallowed, the taxpayer can: (1) respond to the notification and actively agree with the disallowance ("full disallowance with active agreement"); (2) respond to the notification and actively disagree with the disallowance; or (3) not to respond to the notification and passively agree with the decision ("full disallowance with insufficient response"). If the EITC is allowed, it may be allowed or partially disallowed, depending on the information provided by the taxpayer.

As indicated in annual statistics reported in the IRS Data Book, and shown in Table 1, each year roughly 85% to 90% of EITC correspondence audited returns result in changes to the return. Prior reports (National Taxpayer Advocate 2007, Schneller Chilton and Bochum 2011, and Government Accountability Office 2014) have demonstrated that nonresponse and insufficient response—potentially due to confusion, feeling intimidated by the audit process, or undelivered mail—are factors in some disallowances. We provide more details on audit results for our analysis sample in the next section.

In most cases, when EITC benefits are disallowed, taxpayers are notified of the change via a final report, explaining the changes to the taxpayer's account in detail and asking for the taxpayer to sign and return the report. Taxpayers also receive a CP 79 notice (see Appendix Figure 3 for an example CP-79 notice) that explains, to claim EITC benefits in the future, the taxpayer must include Form 8862 (see Appendix Figure 4 for an example Form 8862) to verify the taxpayer's eligibility for EITC benefits and other potentially applicable refundable tax credits. Furthermore, because some electronic tax preparation options may not support filing the Form 8862 electronically, taxpayers may need to file a paper return Taxpayers may also be banned from claiming the EITC for the next two years (reckless disregard) or 10 years (willful disregard).

III. Setup for Empirical Analysis

III. A. Defining the Analysis Sample

Data used in the empirical analysis were based on the population of tax returns that claimed EITC benefits and were scored for potential noncompliance from 2008 through 2017. The 2008 restriction is imposed because data for some mailed notices for EITC correspondence audits are only available from 2008 onward. The 2017 restriction is imposed so that outcomes can be observed for at least 2 years after selection for scoring, and outcome data are available through 2019.

The analysis sample is constructed from this population of scored returns by imposing the following sample restrictions. First, we focus only on single or head-of-household tax returns so that the analysis only required that one individual (the primary taxpayer on the single or head-of-household return) be tracked before and after being flagged for risk scoring. Second, we impose a common support sample restriction. Specifically, given that the research design is based on comparing observationally similar audited and scored-but-not-audited returns, the data for the analysis were identified by creating cells based on audit selection variables for each tax year, such as the types of rules potentially broken, the number of rules potentially broken, and risk scores. The sample is restricted to observations in cells that had both audited and non-audited returns. This sample restriction ensures that there was a common support for the audit selection variables between the audited and scored-but-not audited samples. Observations in cells with only audited returns are dropped since there are no observationally similar non-audited returns for comparison, and observations in cells with only non-audited returns are dropped since there were no observationally similar audited returns for comparison. As a result of this common support sample restriction, the analysis sample generally consists of lower and intermediate risk returns only. However, we note that all tax returns in the analysis sample are returns that have been identified to have some potential risk of noncompliance, and hence they are different from tax returns that are not flagged for risk of noncompliance.

After imposing the common support sample restriction, we make the following additional sample restrictions that exclude a small percentage of the sample but make some interpretations easier. First, since the analysis sample of audited and non-audited returns is based on the first year that a tax return is identified to have any risk for potential noncompliance, we exclude any audited or non-audited returns that are ever assigned to be audited in subsequent years after this first year. This sample restriction excludes less than 1% of the remaining sample after the common support sample restriction is imposed. This sample restriction makes it easier to interpret the audit treatment in the first year of potential noncompliance as a one-time treatment since none of the returns in the audited or non-audited groups are ever selected for audit in future years after the first year of audit assignment. Second, we restrict the sample to pre-refund audits only. This sample restriction also excludes less than 1% of the remaining sample after the common support sample restriction, and the primary motivation for this sample restriction is also ease of

interpretation. With this sample restriction, results can be interpreted as a treatment prior to taxpayers receiving their claimed refunds rather than some taxpayers receiving their refunds and potentially having to pay them back. Third, we restrict the sample to relatively simple audits: audits of returns without self-employment income (i.e., the wage earner analysis sample defined below) that only seek to verify EITC qualifying child eligibility, and audits of returns with self-employment income (i.e., the self-employed analysis sample defined below) that only seek to verify EITC qualifying child eligibility and simple aspects of self-employment (Schedule C) business income that can be addressed through correspondence. This sample restriction excludes only a few observations, but we are not able to disclose the exact number or percentage of audits excluded by this restriction. This sample restriction makes it easier to interpret or understand the context of the EITC correspondence audits in the analysis samples.

We split the analysis sample into two groups: taxpayers who report self-employment (Schedule C) income on their selected tax returns, who are referred to as "Self-Employed," and taxpayers who do not have any self-employment income on their selected tax returns, who are referred to as "Wage Earners." For clarification, we note that taxpayers in the Self-Employed group may have W-2 wage earnings in addition to their self-employment income, but taxpayers in the Wage Earner group do not have any self-employment income but may have other forms of income such as W-2 or 1099MISC earnings. This split is motivated by a couple of factors. First, as mentioned above, for the self-employed analysis sample, these audits seek to verify EITC qualifying child eligibility and certain aspects of self-employment business income, and for the wage earner analysis sample, these audits seek to verify EITC qualifying child eligibility. The EITC correspondence audits in our analysis sample generally address fewer issues than audits of higher risk returns that are excluded from our sample. Second, prior research that has highlighted different responses to audits and threat-of-audit interventions across taxpayers with and without third-party verified income (Slemrod, Blumenthal, and Christian 2001; Kleven, Knudsen, Kreiner, Pedersen, and Saez 2011; Slemrod 2016). We also note that the definition of self-employed and wage earner samples follows definitions from prior literature (for examples, see Saez 2010 and Chetty, Friedman, and Saez 2013). As a result of defining wage earners based on taxpayers without self-employment income, the wage earner sample includes some individuals

who do not have W-2 wage earnings forms despite reporting "wages, salaries, and tips" on their tax returns (IRS Form 1040).

The self-employed analysis sample consists of 219,504 audited returns and 271,733 non-audited returns. The wage earners analysis sample consists of 290,774 audited returns and 708,921 non-audited returns. Over the analysis period, the IRS Databooks document roughly 4.2 million EITC correspondence audits.

In addition to the analysis sample, we also define the "full sample" of EITC correspondence audits. This sample refers to the full sample of EITC correspondence audits that has complete data on notices, audit issues and audit outcomes of roughly 1.3 million returns, or roughly 31% of the EITC correspondence audits reported in the IRS Databooks. The full sample consists of 413,817 self-employed EITC correspondence audits and 860,292 wage earner EITC correspondence audits. Thus, the self-employed analysis sample reflects 53% of the audited returns from the corresponding full sample, and the wage earners analysis sample reflects 34% of the audited returns from the corresponding full sample.

III. B. Inverse Probability Weighting & Summary Statistics

We use inverse probability weighting to ensure that observables are balanced between treatment and control groups and eliminate bias due to selection on observables. For discussions of inverse probability weighting methods, see Angrist and Pischke (2009) and Cameron and Trivedi (2005). Intuitively, since non-audited returns in the analysis sample are generally lower risk returns and audited returns in the analysis sample are generally higher (intermediate) risk returns, this re-weighting ensures comparisons between audited and non-audited returns with similar audit selection criteria or similar risks for noncompliance. Weights for the inverse probability weighting are estimated as follows. First, we define an indicator variable $\boldsymbol{A_i}$ that is equal to 1 if individual *i* was selected for an EITC correspondence audit. Next, we pool the samples of audited and scored-but-not-audited individuals and estimate the propensity score via the following regression specification:

$$\boldsymbol{A_i = \beta X_i + u_i}$$

where $\boldsymbol{X_i}$ denotes a rich set of covariates that we discuss in more detail below. Intuitively, the propensity score captures the (estimated) probability that an observation with observables $\boldsymbol{X}$ is assigned to be audited. We then obtain predicted values from this regression, $\boldsymbol{\hat{p}_i = \widehat{Pr}(A_i = 1|X_i)}$, and use these predicted values to compute weights. We use weights $\boldsymbol{\hat{w}_i = \frac{1}{1-\hat{p}_i}}$ for the scored-but-not-audited individuals and $\boldsymbol{\hat{w}_i = \frac{1}{\hat{p}_i}}$ for the audited individuals. Intuitively, these weights balance observables between the audited and scored-but-not audited returns by "up-weighting" audited returns that have observables similar to scored-but-not audited returns and scored-but-not-audited returns that have observables similar to audited returns, and similarly, by "down-weighting" audited returns that have observables similar to other audited returns and scored-but-not-audited returns that have observables similar to other scored-but-not-audited returns. Weights are estimated separately for the self-employed and wage earner samples.

Covariates for estimating the weights include dummies for gender, head-of-household filing status, tax preparation method, year of birth, income percentile (measured in 5 quantiles), number of qualifying children claimed on the flagged return, and indicators for filing, claiming EITC, and having a W-2 in each of the last 3 calendar years. Most importantly, the covariates also include controls based on audit selection criteria. These variables are not made public by the IRS, so we can only summarize these covariates by mentioning that these audit selection controls include fixed effects for groups based on the types of rules potentially broken, the number of rules potentially broken, and the tax year of the return.

Figure 2 presents the fraction audited and mean predicted audit probabilities by percentiles of the predicted audit selection probabilities. We note the following features of these plots. First, the actual and predicted probabilities of audit selection are between 0 and 1 across all percentiles. This is due to the common support sample restriction. Specifically, the analysis sample is defined so that there are audited and non-audited returns within cells based on audit selection variables. Second, the plots highlight that the predicted probabilities of audit selection accurately track the actual probabilities of audit selection across the percentiles. Because the probabilities of audit

selection are estimated based on audit selection variables that are not made public, we are not able to provide details on which variables are important predictors of audit selection and which are not. Instead, we emphasize that the accuracy of the predicted probabilities of audit selection. Given this accuracy, we can ensure that after accounting for the inverse probability weighting, the empirical analysis is comparing audited and non-audited returns with similar audit selection criteria.

Table 2 presents summary statistics for the analysis sample. We do not provide unweighted summary statistics to avoid disclosing how weighting based on audit selection variables affects the summary statistics. Instead, we present these summary statistics to characterize the analysis samples and demonstrate balance in observables across the audited and non-audited returns after accounting for the inverse probability weighting. For descriptive purposes, the analysis samples are about 65% male, 75% Head-of-Household filing status (the remaining 25% is Single given the sample restrictions), and about 60% use paid tax preparers. For the self-employed analysis sample, all of the taxpayers report self-employment income by construction of the sample, but almost 50% also report some wage income on their tax returns and about 35% have a W-2. For the wage earner analysis sample, none of the tax returns report self-employment income and all of the tax returns report some wage income by construction of the sample. However, only 45% of the wage earner analysis sample had a W-2. In terms of qualifying children, the analysis sample generally consists of taxpayers that have one qualifying child. For the self-employed analysis sample, about 64% have one qualifying child; whereas for the wage earner analysis sample, about 80% have one qualifying child. In terms of EITC amounts, the average EITC amounts are roughly $4200 and $3500 for the self-employed and wage earner analysis samples respectively. The average EITC amount is higher for the self-employed analysis sample than the wage earner analysis sample since the fraction with more than one qualifying child is higher for the self-employed analysis sample. In terms of income amounts, total income is roughly $14000 and $17000 for the self-employed and wage earner analysis samples, respectively. However, refund amounts are slightly higher for the wage earner analysis sample (roughly $5700 versus $4500) since wage earners have withholdings that are added to refundable credits since most taxpayers in the analysis samples are in the zero percent tax bracket. For the purposes of the

research design, the observables demonstrate balance across the audited and non-audited returns once we have taken the inverse probability weighting into account.

IV. Audit Results

This section presents a descriptive analysis of audit results for audited returns in the analysis sample. This analysis sets the stage for potential factors that could cause long-term impacts of EITC correspondence audits. Table 3 presents the audit results for both the self-employed and wage earners analysis samples.[3] These statistics highlight seven possible audit results, but two of the seven possible results (full disallowance with active disagreement and partial allowance) apply to less than one percent of all audits. Thus, the remaining five audit types account for the majority of all audited returns in our designated sample. Next, the statistics indicate that, due to undelivered mail and nonresponse, slightly more than half of audits have mechanical disallowances. This implies that, conditional on responding, about 40% to 50% of cases with some response end up with a disallowance due to some form of insufficient response such as discontinued correspondence by the taxpayer. Roughly 20% to 24% of all audited returns in the analysis sample have "confirmed" outcomes with either an allowance or a disallowance with active agreement. Overall, slightly more than 90% of audited returns in the analysis sample have a full disallowance.

We used multiple strategies to examine how observables correlate with audit selection and audit results. While we cannot disclose what any individual audit selection variables are or how they correlate with audit results, we can illustrate how audit results vary across predicted audit selection probabilities, which are estimated using audit selection variables. Figure 2 illustrates how the fractions of returns with each audit result vary across percentiles of the predicted audit selection probabilities. For the most part, audit results were generally stable across higher and lower predicted probabilities of audit selection. This suggested that factors correlating with audit selection did not have strong correlations with audit results. For the self-employed analysis

[3] We also present statistics for the full sample of EITC correspondence audits for which we have complete data on tracking notification letters, audit selection, and audit outcomes. While the statistics for the analysis sample are reweighted, the statistics for this full sample are unweighted. We present these statistics to highlight that the reweighted audit outcomes do not differ significantly from these unweighted outcomes.

sample, the fraction with nonresponse increased slightly from about 35% to below 50% across the percentiles, and the fractions with disallowance with disagreement and allowance decreased across the percentiles. For the wage earners analysis sample, the audit results appeared mostly stable across the percentiles, though for the middle percentile, there was some increase in the fraction with undelivered mail, and this corresponded to decreases in the fractions with disallowance and allowances.

Moving away from the audit selection criteria, we examine how tax return variables correlate with the audit results. For this analysis, we use the samples of audited returns and random forests to predict audit outcomes using only tax return variables and demographic variables. Appendix Figures 5 and 6 present the actual and predicted audit result probabilities by percentile of the predicted probabilities. Additionally, examining the importance factors from the random forests is useful since they provide a hierarchical representation of which variables are most useful (in terms of the most information gain) in predicting audit results. Appendix Figures 7 and 8 present the importance factors from the random forests for estimating the predicted probabilities. Overall, some observables do appear to correlate with the audit results. For the self-employed analysis sample, returns with higher wage amounts (and W-2s), female primary taxpayers, and paid tax preparers appear slightly more likely to have allowance results and less likely to have undelivered mail and nonresponse results. For the wage earner analysis sample, returns with primary taxpayers who filed and/or claimed EITC benefits in the prior year and returns with female primary taxpayers appear slightly more likely to have allowance or disallowance with active agreement results and less likely to have undelivered mail or nonresponse results.

We further characterize what aspects of the EITC correspondence audits individuals may respond to by examining differences in EITC claiming before and after audit selection across the audit result groups. Figure 3 presents EITC claiming rates by event time and with separate series for each audit result group and for non-audited returns in the analysis sample. The plots highlight that differences in EITC claiming rates across the groups appear relatively stable prior to the year of selection. After being audited, however, the EITC claiming rates for groups that had EITC benefits disallowed are noticeably lower than the EITC claiming rates for the other groups. We quantify these differential changes in EITC claiming rates by computing naive difference-in-

differences statistics for changes in EITC claiming rates. (We refer to these statistics as "naïve" since we acknowledge potential nonrandom selection into the audit result groups.) Let c_e^g denote the EITC claiming rate for audit result group *g* at event time *e* (where event time is years since being flagged and scored for potential noncompliance). We compute a naive difference-in-difference estimate for each audit result group using

$$DD_e^g = \left(c_e^g - c_e^{nonaudited}\right) - 0.25 * \sum_{e=-4}^{-1} \left(c_e^g - c_e^{nonaudited}\right).$$

Intuitively, these statistics capture the change in EITC claiming for audit result group *g* relative to EITC claiming for the non-audited benchmark group. Table 4 presents these naive difference-in-difference statistics for the self-employed and wage earners analysis samples and full samples. Focusing on the analysis samples, the results indicate that, in the year following the audits, EITC claiming falls by roughly 25% for returns with undelivered audits and by roughly 30% for returns that have nonresponse or some form of disallowance. In contrast, EITC claiming falls by roughly 10% for returns with allowances. These differences fade out over subsequent years after the audits as EITC claiming decreases for the non-audited benchmark group.

In summary, the analysis of the audit results indicates the following conclusions. First, there is widespread full disallowance of EITC benefits. Second, predicted audit selection does not appear to correlate strongly with audit results and longer-term EITC claiming. Third, the EITC correspondence audits appear to decrease future EITC claiming. Fourth, the decreases in EITC claiming after being audited appears even for taxpayers who ultimately have allowances, and this suggests that the experience of being audited (separate from the loss of benefits) may decrease future EITC claiming. We note that even taxpayers who have undelivered notices show similar decreases in EITC claiming as other taxpayers that were informed of the audits and had benefits disallowed. This suggests that taxpayers with undelivered notices were affected by having their refunds held at filing, whether or not they eventually became aware that the reason for the disallowance of benefits was an audit. Audited taxpayers who have nonresponse outcomes also have similar decreases in EITC claiming as taxpayers who respond but ultimately also have disallowances.

V. Long-Term Impacts of EITC Correspondence Audits

V. A. Methodology

We employ a difference-in-differences strategy to exploit the random variation in audit assignment and estimate long-term causal effects of EITC correspondence audits on taxpayer outcomes.[4] First, we define event time as the years since the year of random assignment of audit status. For recent discussion of event study methodologies, see Borusyak, Jaravel, and Spiess (2021) and Sun and Abraham (2021). Specifically, for individual *i* in year *t*, event time $\boldsymbol{e_{it}}$ is defined as $\boldsymbol{e_{it} = a_i - t}$ where $\boldsymbol{a_i}$ denotes the year that individual *i*'s tax return is flagged and either randomly assigned for an EITC correspondence audit or not. Next, the impacts of EITC correspondence audits on an outcome *y* are estimated via the following regression specification:

$$\boldsymbol{y_{it} = \sum_{k=-7}^{4} \beta^k 1(e_{it} = k) + \sum_{k=-7}^{4} \delta^k [A_i * 1(e_{it} = k)] + \varepsilon_{it}.}$$

In this estimation, data are reweighted using inverse probability weights described above to ensure that observables are balanced between audited and non-audited groups and eliminate bias due to selection on observables. The coefficients $\boldsymbol{\beta^k}$ reflect the means of the outcome variable at each event time for the scored-but-not-audited group, and the coefficients $\boldsymbol{\delta^k}$ reflect the differences in the means for the audited group relative to the non-audited group for each event time. Standard errors for the coefficients are clustered based on audit selection variables such as the tax year of selection, and the number and types of rules broken. We plot estimated $\boldsymbol{\beta^k}$ and $\boldsymbol{\delta^k}$ coefficients from the regressions. Additionally, we estimate difference-in-differences estimates of the impacts of correspondence audits on outcome *y* at event time $\boldsymbol{k = +1, +2, \ldots}$ by subtracting the average pre-selection difference from the post-selection difference at event time *k*:

$$\boldsymbol{d^k = \delta^k - 0.25(\delta^{-1} + \delta^{-2} + \delta^{-3} + \delta^{-4}).}$$

[4] We note that there is no issue of a staggered difference-in-difference research design in our setting. Returns that are not selected for audits in a given year are not selected for audits in future years, and similarly returns selected for audits in a given year are not selected for audits in future years. This could be driven by multiple issues: first, the overall probability of being selected for audit is very close to 0; second, returns associated with taxpayers that have high risk scores for multiple years may be more complicated audits that are beyond the scope of single issue correspondence audits in our analysis sample.

We examine a variety of outcomes for primary taxpayers on audited and scored-but-not-audited returns, including claiming EITC benefits, filing a tax return (as either a primary or secondary taxpayer), tax refund amounts, reporting self-employment income, and having a W-2. Furthermore, we track qualifying children claimed on audited and non-audited tax returns and define outcomes for whether a taxpayer's qualifying children are claimed by other taxpayers and whether the primary taxpayer or qualifying children appear on returns receiving EITC benefits.

Additionally, we examine changes in the distributions of some outcomes by pooling observations over years before and after audit selection. Specifically, we define event times -4 through -1 as the "Before" period and event times +1 through +4 as the "After" period. For a given outcome y, we define indicator variables for bins *b* covering the distribution of values, and we estimate difference-in-difference distributional impacts using

$$d_b^y = \left(\bar{y}_{b,After}^{Audited} - \bar{y}_{b,Before}^{Audited}\right) - \left(\bar{y}_{b,After}^{Nonaudited} - \bar{y}_{b,Before}^{Nonaudited}\right).$$

where $\bar{y}_{b,t}^{g}$ refers to the mean of an indicator variable for having a value of outcome *y* in bin *b* for group *g* at time *t*. We use this strategy to examine impacts on the distributions of refunds, tax filing conditional on withholding and wage amounts, reported self-employment income, and W-2 wage earnings. We present the event-time regression coefficients first and the results on distributional impacts second. In addition to presenting difference-in-difference estimates, we also present means for the audited and non-audited groups in the figures described below.

For all estimates, standard errors are clustered based on 50 two percentile bins of estimated audit selection probabilities and the year of audit selection.

V. B. Main Results

EITC Claiming, Tax Filing, and Tax Refunds

The results in Table 5 and Figure 4 indicate the EITC correspondence audits cause large and statistically significant declines in post-audit EITC claiming. One year after the EITC correspondence audits, roughly 65% of taxpayers in the non-audited control group claim EITC benefits, and the difference-in-difference estimates indicate a decline of roughly 30% for the

audited group, or roughly 50 percent decline as a percentage of the baseline mean for the non-audited group. This immediate effect fades out over subsequent years after the audits. The graphical evidence highlights that the fade out appears driven by decreases in EITC claiming for non-audited taxpayers, possibly due to qualifying children aging out of eligibility, rather than audited taxpayers resuming pre-audit EITC claiming behaviors.[5]

Next, we consider changes in tax filing. Intuitively, many lower income individuals, may only file tax returns to claim EITC benefits, so if they are not claiming EITC benefits, they may not file tax returns. Figure 4 illustrates sharp decreases in tax filing for the audited group relative to the non-audited group for both the self-employed and wage earner samples. Quantitatively, the difference-in-difference estimates in Table 5 indicate that decreases in tax filing accounts for about two thirds and one half of the decreases in EITC claiming for the self-employed and wage earner analysis samples respectively. Thus, for both analysis samples, after being audited, some individuals continue filing but do not claim EITC benefits.[6]

The changes in tax refunds quantify the impacts of EITC correspondence audits on taxpayers in terms of dollars received by taxpayers. These changes are illustrated in Figure 5. Consistent with the decreases in EITC claiming and tax filing, the difference-in-difference estimates in Table 5 indicate an average decrease of about $1700 to $1800 one-year after the audits, and while the impacts decrease over subsequent years after the audits, the cumulative average impacts over 7 years after the audits is $5200 and $7000 for the self-employed and wage earner analysis samples respectively. The distributional analysis of tax refunds in Figures 5 C and D highlight that the changes in tax refunds are largely driven by increases in the fractions of the samples at $0. This highlights that the decreases in average refunds actually reflect larger decreases of thousands of dollars for some taxpayers.

[5] We have verified that the decreases in EITC claiming and tax filing are more persistent for taxpayers with young children who would not age out of qualifying child eligibility during the post-audit analysis period. These results are not shown but are available on request.

[6] Some of these individuals may meet conditions to be sent CP 09 or CP 27 notices for filing tax returns but not claiming EITC benefits. In separate results not shown, we have verified an increase in the likelihood of receiving such notices for the audited group relative to the non-audited group for wage earners. However, we also note that the baseline rate of receiving such notices is very low because few taxpayers meet the conditions to be in the CP 09 or CP 27 notice population.

Tracking Qualifying Children

Since many audited taxpayers appear to stop filing tax returns, we track qualifying children claimed on audited and non-audited tax returns to see if qualifying children claimed on audited returns are more likely to be claimed on others' tax returns following the audits or if they are not claimed at all. The results in Figure 6 and Table 5 indicate the following. First, Figures 6 A and B highlight that, following the EITC correspondence audits, there is a decrease in the likelihood that qualifying children from audited tax returns are claimed by any taxpayer. Table 5 shows that, in the year immediately after the EITC correspondence audits, the probability of having qualifying children from the audited tax return claimed on a subsequent tax return decreases by roughly 0.13 and 0.10 for the self-employed and wage earner analysis samples. Second, Figures 6 C and D highlight that, following the EITC correspondence audits, there is an increase in the likelihood that qualifying children from audited tax returns are claimed by a different taxpayer. Table 5 shows that, in the year immediately after the EITC correspondence audits, the probability of having qualifying children from the audited tax return claimed by a different taxpayer increases by roughly 0.08 and 0.07 for the self-employed and wage earner analysis samples. Thus, following the EITC correspondence audits, some qualifying children from audited tax returns are not claimed by any taxpayers, and other qualifying children from audited tax returns are claimed by other taxpayers.

Additionally, we examine "net EITC claiming" which captures whether a taxpayer claims EITC benefits or whether the qualifying children from the selected return are claimed on returns with EITC benefits. Intuitively, some of the reduction in EITC claiming by audited taxpayers may be offset by qualifying children switching to other tax returns that then receive EITC benefits. The results in Figures 6 E and F and Table 5 highlight that the decreases in net EITC claiming is indeed smaller than the decrease in audited taxpayers' EITC claiming, but there is still some decrease in net EITC claiming. For the self-employed analysis sample, the decrease in EITC claiming one year after the EITC correspondence audits is 0.30, but net EITC claiming only decreases by 0.19; for the wage earner analysis sample, the decrease in EITC claiming one year after the EITC correspondence audits is 0.29, but net EITC claiming only decreases by 0.20. Thus, while there is some offset, the offset is incomplete since some qualifying children on

audited returns are not claimed on any returns after the audits and some taxpayers do not claim EITC benefits after the audits.

The qualifying child results appear to be consistent across both the self-employed and wage earners analysis samples even though the EITC correspondence audits for the self-employed generally focus on verifying self-employment income while the EITC correspondence audits for the wage earners generally focus on verifying qualifying child eligibility conditions. This suggests that the switching of qualifying children from one primary taxpayer to another may be due to discontinued filing and EITC claiming or common elements across EITC correspondence audits as opposed to learning from the specific issues of the EITC correspondence audits.

Filing Conditional Withholding and W-2 Earnings Amounts

The decreases in EITC claiming and tax filing could lead to leaving benefits on the table and noncompliance. In terms of leaving benefits on the table, taxpayers who do not file tax returns may not receive tax refunds based on withholdings. Furthermore, some taxpayers may make mistakes by not claiming EITC benefits (and potentially even other refundable tax credits) even when they are actually eligible. In terms of noncompliance, taxpayers may not file tax returns even if they have a filing requirement, or they may not report self-employment income that is subject to federal income tax.

Based on the difference-in-difference estimation strategy described above, Figures 7 A and B illustrate significant decreases in filing rates at all wage levels following the audits for both the self-employed and wage earner samples. Relatedly, Figures 7 C and D illustrate significant decreases in filing rates at all withholding levels following the audits for both the self-employed and wage earner analysis samples. Thus, there may be individuals not filing even when they may have a filing requirement and there may be individuals leaving withholdings or other possible benefits on the table. It is not possible to establish exact filing requirements or benefit eligibility since individuals filing status and other necessary data are unknown.

Self-Employment Income and Wage Earnings

We examine each of the following: (a) self-employment income (which is only reported on filed tax returns), (b) wages reported on third-party information report (W-2s), (c) wages reported on filed tax returns, and (d) wages reported on third-party information returns or filed tax returns.

Consistent with the decreases in tax filing, the results in Figure 8 and Table 5 indicate sharp reductions in the likelihood of reporting self-employment income following the audits. Moreover, the results indicate the decreases in reporting self-employment income are larger than the decreases in tax filing. This indicates that some individuals continue filing after the EITC correspondence audits, but they become less likely to report self-employment income on their filed tax returns.

We characterize the missing or unreported self-employment amounts by comparing differences in the distributions of self-employment income between audited and non-audited taxpayers before and after the audits. These results in Figures 8 C and D highlight decreases in the likelihood of reporting self-employment income amounts that could be below and above individuals' filing thresholds. Thus, after being audited, some individuals may not file and report self-employment income that would make them eligible for EITC benefits, and at the same time, some taxpayers may not file and report self-employment income on which they would owe federal income tax liability. We note that the decrease in the likelihood of reporting self-employment income is consistent across the self-employed and wage earner analysis samples. Similar to the qualifying child switching results, this suggests that this behavior may be driven by discontinued filing and EITC claiming or factors common across EITC correspondence audits as opposed to learning from the specific issues of the EITC correspondence audits.

Next, we study the impacts of the EITC correspondence audits on the likelihood of having wages and wage distributions. Figure 9 and Table 5 highlights that after being audited, the audited taxpayers demonstrate decreases in (i) the likelihood of having a W-2, (ii) the likelihood of having wages on a filed tax return, and (iii) the likelihood of having wages on a W-2 or a filed tax return. Thus, after being audited, there appears to be decreases in labor force participation (or wage employment) for audited taxpayers. We turn to the distributional analysis to understand

where in the wage distribution the decreases in labor force participation come from. Figures 10 A and B indicate slight decreases in the fractions of the sample at lower (below $20000) wage amounts. However, Figures 10 C, D, E and F highlight that for both the self-employed and wage earner analysis samples, while there appear to be decreases at all wage levels, the largest decreases appear concentrated in the $10000 to $20000 wage range. These wage amounts generally correspond to the EITC plateau or maximum benefit region, and the distribution of wage earnings for non-audited taxpayers even show slight "spikes" or sharp bunching around EITC Kink 1 (the minimum earned income amount necessary to qualify for maximum EITC benefits) and broad bunching along the EITC plateau. Thus, after being audited, there appears to be less concentration of wage earnings around the EITC maximum benefit region.

As with the results on qualifying child switches and reporting self-employment income, we note that the wage responses are generally consistent across the self-employed and wage earner analysis samples. This further emphasizes that these responses appear driven by discontinued filing and EITC claiming or common elements across all EITC correspondence audits and not learning or other factors related to the specific issue of the EITC correspondence audits.

We assess the magnitudes of the estimated wage responses by considering some back-of-the-envelope (informal) calculations of participation elasticities that can be compared to extensive margin (participation) labor supply elasticities from prior studies. We define the participation elasticity with respect to the average net-of-tax rate as

$$\varepsilon = \frac{\left[\Delta p / p\right]}{\left[\Delta \tau / (1-\tau)\right]}$$

where Δp is the average change in the participation rate (fraction with a given wage outcome) for years 1 through 4 after the year of selection and p is the baseline (counterfactual) average participation rate for the non-audited group. Next, since the decreases in EITC claiming (Figure 4) on year after the audits are about half of the baseline fraction of the non-audited group that claims EITC benefits, we assume $\Delta\tau/(1-\tau) = -0.50$. Using this denominator and changes in the fraction with a W-2, the fraction with wages reported on a file tax return, and the fraction

with a W-2 or wages reported on a filed tax return to compute the numerators of the elasticity, we compute the following participation elasticities:

Participation Elasticities

Wage Measure	Self-Employed	Wage Earners
Fraction with W-2	0.05	0.08
Fraction with Wages on 1040	0.30	0.35
Fraction with W-2 or Wages on 1040	0.15	0.18

Prior studies have indicated extensive margin labor supply elasticities of roughly 0.25 based on quasi-experimental evidence (Chetty et al 2011). The participation elasticities based on the current study are roughly in this range, though responses based only on having a third-party verified W-2 are noticeably smaller. Furthermore, while observed wage responses could reflect some labor supply responses to changes in EITC benefits, we also emphasize that audits may affect multiple factors beyond just perceived marginal tax rates (for example, risk tolerance may change), so we caution against interpreting the estimated changes in third-party and self-reported wage outcomes in terms of only labor supply responses to changes in EITC benefits.

We conclude the following based on the changes in wage outcomes. First, in the years after audit selection, and relative to non-audited taxpayers, audited taxpayers appear less likely to have third-party and self-reported wage earnings. Second, while there are some decreases in the likelihood of having third-party reported wages, the decreases in wage earnings are larger for self-reported wages on filed tax returns than third-party reported wages on W-2s. Third, while the decreases in wage earnings appear at nearly all wage levels, the decreases are particularly large at middle wage levels that broadly correspond to the maximum EITC benefit region. Fourth, similar to changes in other outcomes, these changes in wage earnings are consistent across the self-employed and wage earner analysis samples, and this suggests that these responses are driven by discontinued filing and EITC claiming or other factors common across the EITC correspondence audits as opposed to the specific issues of the EITC correspondence audits.

V. C. Heterogeneity

We aim to understand whether taxpayers with higher estimated audit probabilities respond differently than taxpayers with lower estimated probabilities of audit to gain insights into possible mechanisms behind the estimated treatment effects. For example, taxpayers with lower estimated audit probabilities may be the most surprised by EITC correspondence audits and may be least likely to correct mistakes. We acknowledge that taxpayers may not know their estimated audit selection probabilities based on the current study, but they may have a sense of audit risk based on information from tax preparation software and tax preparers who assisted them. The summary statistics in Table 2 indicate that 60% of taxpayers in the analysis sample used paid tax preparers, and all of the returns were filed electronically using software.

To study this heterogeneity, [7] we estimate treatment effects across percentiles of audit selection probabilities using the following steps:

1. Create percentile bins based on estimated audit probabilities
2. Within each percentile bin p, compute diff-in-diff estimates for a given outcome y

$$\Delta_p^y = [\bar{y}_p^{post,Audited} - \bar{y}_p^{post,Non-Audited}] - [\bar{y}_p^{pre,Audited} - \bar{y}_p^{pre,Non-Audited}]$$

3. Plot Δ_p^y by percentile bin to capture how treatment effects vary across higher and lower percentiles

For these diff-in-diff estimates, we pool time periods before and after the year of audit selection, so "post" refers to years 1 through 4 after the year of audit selection, and "pre" refers to years 1 through 4 before the year of audit selection.

Figure 11 presents the results from this heterogeneity analysis. For the self-employed and wage earner analysis samples, these plots highlight that, while there are decreases in EITC claiming and tax filing across all levels of estimated audit probabilities, taxpayers with higher estimated audit probabilities appear more persistent in claiming EITC benefits and filing tax returns after

[7] We have also studied heterogeneity across different groups of observables. However, we focus on marginal treatment effects that compare individuals with similar estimated audit probabilities since differences across groups with different observables could reflect difference due to different audit probabilities across the different observables. For example, differences across taxpayers who used a paid preparer versus those who did not use a paid preparer may reflect differences in audit probabilities across these two groups. When analyzing differences based on observables, we have not found evidence of significant or notable differences.

being audited. Consistent with these tax filing results, claiming qualifying children from audited returns and reporting self-employment income and wages on filed tax returns also appear more persistent for taxpayers with higher estimated audit probabilities.

VI. Conclusion

This paper presents an empirical analysis of the impacts of EITC correspondence audits on taxpayers. The analysis sample includes high risk returns with relatively low- and intermediate-risk scores and allows for a comparison of outcomes across similar audited and non-audited returns. The results indicate long-term decreases in EITC claiming and tax filing, with changes in qualifying child claiming and changes in wage employment.

While the analysis sample is a subsample of all returns selected for correspondence audits, there are some reasons to have confidence in the external validity of the results for applying them to all returns selected for correspondence audits. First, the analysis sample is similar to the full sample of correspondence audit returns across many observable characteristics other than risk scores, and factors used to assess risk scores may be unknown to taxpayers. Second, at least descriptively, the results on outcomes for the analysis sample are quantitatively similar to changes in outcomes for the full sample of correspondence audits. When considering external validity, it is also important to note that the analysis sample and the full sample of correspondence audits are observably different from the full sample of all EITC returns. Thus, the results may not be externally valid when applying them to evaluate the impacts of correspondence audits on average EITC returns.

The primary goal of EITC correspondence audits is revenue protection by stopping erroneous EITC claims. Do EITC correspondence audits achieve this goal? The current analysis highlights that the difficulty in directly answering this question is in confirming ineligibility. The long-term impacts of EITC correspondence audits documented in this study add to the list of reasons for why it is important to distinguish between ineligibility versus confusion. The difficulty in distinguishing between ineligibility and confusion arises because EITC correspondence audits place the burden of proof on taxpayers, and taxpayers may choose not to substantiate their EITC claims because of confusion, known ineligibility, or other factors.

The current analysis also demonstrates that EITC correspondence audits affect future taxpayer behavior in multiple ways, and this indicates a potential outreach or education opportunity for taxpayers. These impacts on future behaviors could lead to behaviors that are potentially suboptimal (such as possibly leaving benefits on the table) and potentially noncompliant in ways beyond EITC claiming (such as possibly not filing when having a filing requirement, not reporting self-employment or wage income, or not paying taxes owed). Future work may consider strategies to facilitate participant responses when operational audits place the burden of proof on participants and engage with audited individuals with post-disallowance communications to ensure overall program compliance in the future.

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Table 1: IRS Audit Frequencies & Outcomes

Year	EITC Correspondence Audits			EITC Field Audits		
	Returns Examined	Returns Examined as Fraction of All Individual Correspondence Audits	Fraction of Returns Examined with No Change	Returns Examined	Returns Examined as Fraction of All Individual Field Audits	Fraction of Returns Examined with No Change
2008	420,879	0.379	0.074	41,378	0.096	0.100
2009	450,524	0.399	0.072	33,301	0.074	0.105
2010	551,836	0.434	0.083	33,366	0.072	0.100
2011	536,174	0.447	0.105	38,198	0.073	0.101
2012	513,156	0.444	0.083	45,375	0.090	0.086
2013	492,251	0.451	0.091	46,311	0.099	0.076
2014	437,430	0.445	0.102	43,559	0.109	0.066
2015	439,862	0.441	0.092	38,170	0.101	0.101
2016	391,490	0.475	0.072	36,717	0.107	0.094

Notes: Statistics are taken from the IRS Databook for the corresponding years. The table reports data from Table 9a: Examination Coverage. The statistics reported in the table are based on total business and nonbusiness returns with Earned Income Credit benefits. Statistics are based on returns examined by fiscal year.

Table 2: Summary Statistics

	Self-Employed			Wage Earners		
Variable	Audited N=219,504	Nonaudited N=271,733	Difference (Std. Err)	Audited N=290,774	NonAudited N=708,921	Difference (Std. Err)
Fraction Male	0.620	0.612	0.007	0.675	0.673	0.002
			(0.022)			(0.022)
Age	33.910	34.025	-0.115	33.399	33.582	-0.183
			(0.345)			(0.538)
Fraction with Filing Status = HOH	0.757	0.756	0.001	0.771	0.770	0.000
			(0.009)			(0.009)
Total Income	14479.651	14359.810	119.842	17148.824	17343.387	-194.563
			(146.767)			(277.910)
Wages on Form 1040	4878.344	5129.436	-251.092	16777.477	16960.236	-182.759
			(249.440)			(255.253)
Has Wage Income on Form 1040	0.468	0.482	-0.013	1.000	1.000	0.000
			(0.013)			(0.000)
W-2 Wages	1604.89	1620.58	-15.70	3960.73	3921.11	39.62
			(59.910)			(191.642)
Has Form W-2	0.346	0.348	-0.001	0.456	0.451	0.005
			(0.009)			(0.020)
Schedule C Income	9154.017	8743.328	410.688	0.000	0.000	0.000
			(234.765)			(0.000)
Adjusted Gross Income	13711.604	13618.584	93.021	17100.158	17295.537	-195.378
			(143.824)			(276.947)
Balance Due (refund if negative)	-4503.573	-4511.568	7.995	-5678.747	-5771.371	92.623
			(65.631)			(92.714)
Earned Income	13455.919	13368.354	87.564	16766.346	16940.820	-174.475
			(134.544)			(257.084)
Fraction with 1 Qualifying Child	0.630	0.639	-0.009	0.817	0.791	0.026
			(0.028)			(0.022)
Fraction with 2 Qualifying Children	0.297	0.287	0.009	0.152	0.172	-0.020
			(0.030)			(0.019)
Fraction with 3+ Qualifying Children	0.073	0.073	-0.001	0.030	0.037	-0.006
			(0.016)			(0.005)
EITC Amount	4217.431	4137.828	79.603	3531.073	3533.413	-2.340
			(67.069)			(63.134)
Fraction Filing with Paid Preparer	0.612	0.605	0.006	0.600	0.588	0.012
			(0.011)			(0.030)

Notes: Statistics are based on tax returns in 2008 through 2017. Dollar values are CPI-adjusted to 2019. Observations are weighted based on inverse probability weighting.

Table 3: Audit Outcomes

	Analysis Sample		Full Sample	
	Self-Employed	Wage Earners	Self-Employed	Wage Earners
	N=219,504	N=290,774	N=413,817	N=860,292
Undelivered Mail	0.106	0.108	0.115	0.127
Nonresponse	0.432	0.417	0.468	0.438
Full Dislowance with Active Agreement	0.142	0.161	0.134	0.150
Full Disallowance with Active Disagreement	0.002	0.002	0.001	0.002
Full Disallowance with Passive Disagreement	0.238	0.218	0.217	0.206
Partial Allowance	0.006	0.006	0.004	0.004
Full Allowance	0.075	0.089	0.062	0.073

Notes: Statistics for the Analysis Sample and are re-weighted based on inverse probability weighting.

Table 4: Naïve Difference-in-Difference Estimates:
Changes in EITC Claiming by Audit Result Group relative to Nonaudited Group

Panel 1: Analysis Sample

	A. Self-Employed						B. Wage Earners					
	Baseline (Nonaudited)	Undelivered	Nonresponse	Disallowed, Agreed	Disallowed, Disagreed	Allowed	Baseline (Nonaudited)	Undelivered	Nonresponse	Disallowed, Agreed	Disallowed, Disagreed	Allowed
1 Year After Audit	0.656	-0.310	-0.346	-0.328	-0.309	-0.089	0.653	-0.282	-0.311	-0.399	-0.286	-0.068
2 Years After Audit	0.532	-0.212	-0.230	-0.211	-0.211	-0.035	0.525	-0.224	-0.236	-0.301	-0.234	-0.037
3 Years After Audit	0.471	-0.148	-0.160	-0.150	-0.143	-0.028	0.458	-0.175	-0.177	-0.239	-0.179	-0.034
4 Years After Audit	0.437	-0.110	-0.120	-0.130	-0.109	-0.040	0.418	-0.133	-0.136	-0.201	-0.147	-0.050
5 Years After Audit	0.417	-0.091	-0.099	-0.119	-0.090	-0.067	0.391	-0.112	-0.113	-0.183	-0.130	-0.066
6 Years After Audit	0.398	-0.073	-0.082	-0.108	-0.080	-0.078	0.367	-0.089	-0.097	-0.170	-0.114	-0.077
7 Years After Audit	0.391	-0.072	-0.081	-0.118	-0.085	-0.118	0.351	-0.041	-0.075	-0.166	-0.097	-0.091

Panel 2: Full Sample

	A. Self-Employed						B. Wage Earners					
	Baseline (Nonaudited)	Undelivered	Nonresponse	Disallowed, Agreed	Disallowed, Disagreed	Allowed	Baseline (Nonaudited)	Undelivered	Nonresponse	Disallowed, Agreed	Disallowed, Disagreed	Allowed
1 Year After Audit	0.728	-0.213	-0.253	-0.242	-0.223	-0.017	0.724	-0.164	-0.237	-0.320	-0.216	0.049
2 Years After Audit	0.642	-0.148	-0.167	-0.160	-0.152	0.020	0.639	-0.161	-0.192	-0.245	-0.182	0.062
3 Years After Audit	0.586	-0.090	-0.104	-0.107	-0.094	0.022	0.583	-0.112	-0.133	-0.181	-0.129	0.060
4 Years After Audit	0.545	-0.046	-0.059	-0.079	-0.053	0.009	0.542	-0.072	-0.089	-0.140	-0.090	0.051
5 Years After Audit	0.508	-0.009	-0.018	-0.052	-0.015	0.004	0.505	-0.036	-0.052	-0.109	-0.059	0.048
6 Years After Audit	0.475	0.024	0.015	-0.027	0.012	-0.001	0.472	-0.003	-0.023	-0.085	-0.035	0.042
7 Years After Audit	0.442	0.054	0.044	-0.009	0.035	-0.008	0.440	0.041	0.007	-0.067	-0.009	0.041

Notes: Statistics for the Analysis Sample and are re-weighted based on inverse probability weighting.

Table 5: Impacts of EITC Correspondence Audits, Difference-in-Difference Estimates

A. Self-Employed

	EITC Claiming	Filing Tax Return	Tax Refund	Qualifying Child Claimed by Any Taxpayer	Qualifying Child Claimed by Different Taxpayer	Net EITC Claiming (QC or Selected Taxpayer)	Reporting Self-Employment Income	Has W-2	Has Wages Reported on Filed Tax Return	Has W-2 or Wages Reported on Filed Tax Return
1 Year After Audit	-0.305	-0.222	-1681.876	-0.132	0.081	-0.185	-0.250	-0.010	-0.076	-0.037
	(0.007)	(0.007)	(49.208)	(0.012)	(0.010)	(0.008)	(0.004)	(0.008)	(0.006)	(0.008)
2 Years After Audit	-0.188	-0.127	-1081.921	-0.067	0.038	-0.117	-0.142	-0.005	-0.050	-0.024
	(0.007)	(0.007)	(57.765)	(0.014)	(0.012)	(0.009)	(0.005)	(0.009)	(0.006)	(0.007)
3 Years After Audit	-0.126	-0.091	-744.160	-0.042	0.019	-0.081	-0.092	-0.004	-0.044	-0.021
	(0.007)	(0.007)	(60.050)	(0.019)	(0.016)	(0.011)	(0.005)	(0.008)	(0.006)	(0.007)
4 Years After Audit	-0.095	-0.072	-559.939	-0.028	0.009	-0.065	-0.068	-0.005	-0.038	-0.018
	(0.007)	(0.008)	(63.398)	(0.022)	(0.019)	(0.014)	(0.005)	(0.011)	(0.006)	(0.008)
5 Years After Audit	-0.075	-0.055	-494.795	-0.024	0.002	-0.057	-0.052	-0.008	-0.031	-0.016
	(0.008)	(0.009)	(81.171)	(0.028)	(0.025)	(0.017)	(0.005)	(0.010)	(0.006)	(0.008)
6 Years After Audit	-0.059	-0.043	-361.692	-0.026	-0.005	-0.052	-0.040	-0.007	-0.023	-0.012
	(0.008)	(0.011)	(77.594)	(0.030)	(0.027)	(0.018)	(0.005)	(0.014)	(0.006)	(0.009)
7 Years After Audit	-0.053	-0.034	-318.615	-0.023	-0.007	-0.047	-0.035	-0.001	-0.020	-0.008
	(0.009)	(0.010)	(87.760)	(0.027)	(0.024)	(0.017)	(0.006)	(0.010)	(0.007)	(0.008)

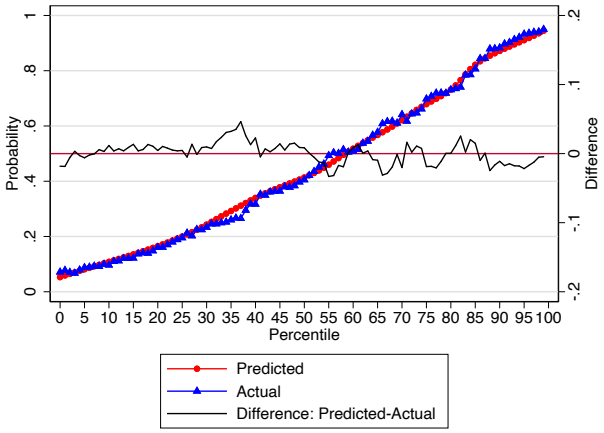
B. Wage Earners

	EITC Claiming	Filing Tax Return	Tax Refund	Qualifying Child Claimed by Any Taxpayer	Qualifying Child Claimed by Different Taxpayer	Net EITC Claiming (QC or Selected Taxpayer)	Reporting Self-Employment Income	Has W-2	Has Wages Reported on Filed Tax Return	Has W-2 or Wages Reported on Filed Tax Return
1 Year After Audit	-0.293	-0.147	-1828.931	-0.095	0.072	-0.201	-0.017	-0.021	-0.143	-0.082
	(0.009)	(0.009)	(45.896)	(0.022)	(0.020)	(0.012)	(0.001)	(0.012)	(0.010)	(0.010)
2 Years After Audit	-0.228	-0.120	-1425.476	-0.058	0.044	-0.159	-0.022	-0.012	-0.116	-0.064
	(0.014)	(0.010)	(48.815)	(0.026)	(0.023)	(0.016)	(0.001)	(0.020)	(0.010)	(0.011)
3 Years After Audit	-0.174	-0.112	-1103.593	-0.035	0.029	-0.122	-0.018	-0.019	-0.108	-0.064
	(0.013)	(0.010)	(46.206)	(0.027)	(0.024)	(0.018)	(0.002)	(0.016)	(0.010)	(0.011)
4 Years After Audit	-0.133	-0.096	-820.042	-0.020	0.019	-0.095	-0.015	-0.015	-0.094	-0.054
	(0.013)	(0.011)	(59.505)	(0.032)	(0.029)	(0.020)	(0.002)	(0.021)	(0.011)	(0.011)
5 Years After Audit	-0.109	-0.086	-698.582	0.014	0.034	-0.070	-0.015	-0.016	-0.085	-0.048
	(0.010)	(0.011)	(47.026)	(0.037)	(0.035)	(0.021)	(0.002)	(0.020)	(0.010)	(0.011)
6 Years After Audit	-0.092	-0.077	-574.542	0.020	0.036	-0.054	-0.014	-0.022	-0.074	-0.036
	(0.009)	(0.011)	(49.592)	(0.036)	(0.035)	(0.021)	(0.003)	(0.024)	(0.010)	(0.012)
7 Years After Audit	-0.069	-0.050	-450.364	0.045	0.049	-0.028	-0.010	0.004	-0.047	-0.013
	(0.011)	(0.015)	(54.318)	(0.046)	(0.044)	(0.026)	(0.002)	(0.018)	(0.015)	(0.015)

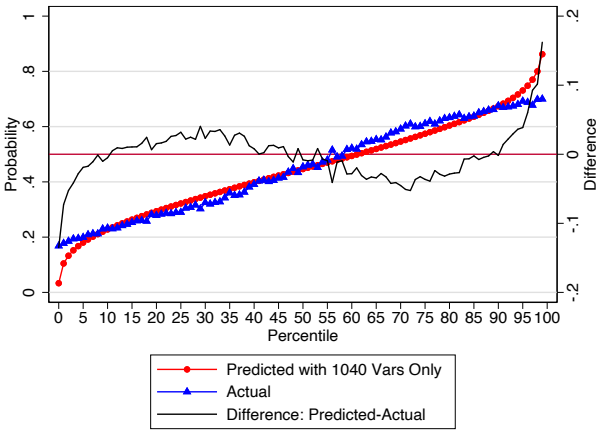
Notes: Estimates are based on regression coefficients from regressing the outcome variable specified in the column heading on event time dummies, an indicator for being an audited individual, and interactions between the event time dummies and the audited indicator. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on year of audit selection and 50 percentile bins of estimated audit selection probabilities.

Figure 1.
Fraction Audited by Percentiles of Predicted Audit Selection
Empirical Content of Audit Characteristics

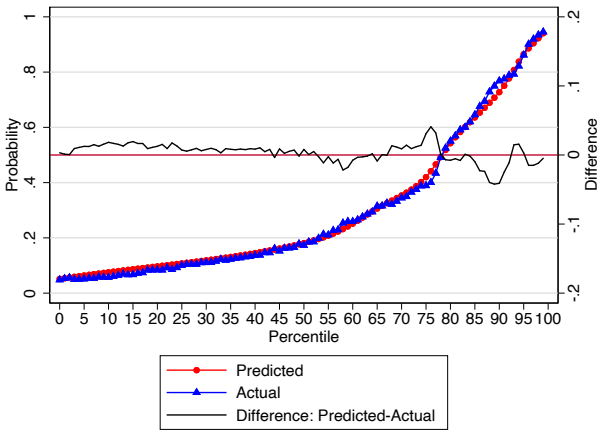
A. Self-Employed, Predicted with Audit Characteristics



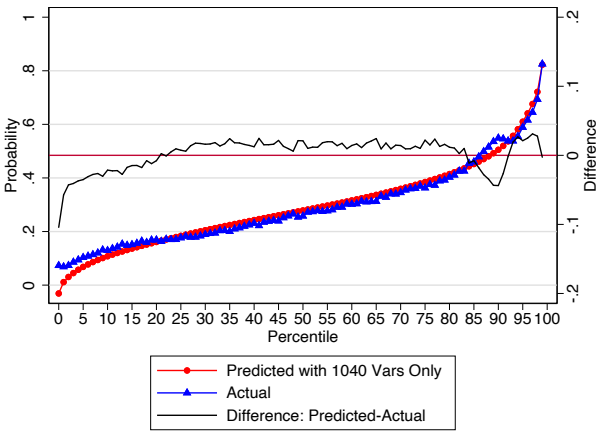
B. Self-Employed, Predicted with 1040 Variables Only



C. Wage Earners, Predicted with Audit Characteristics

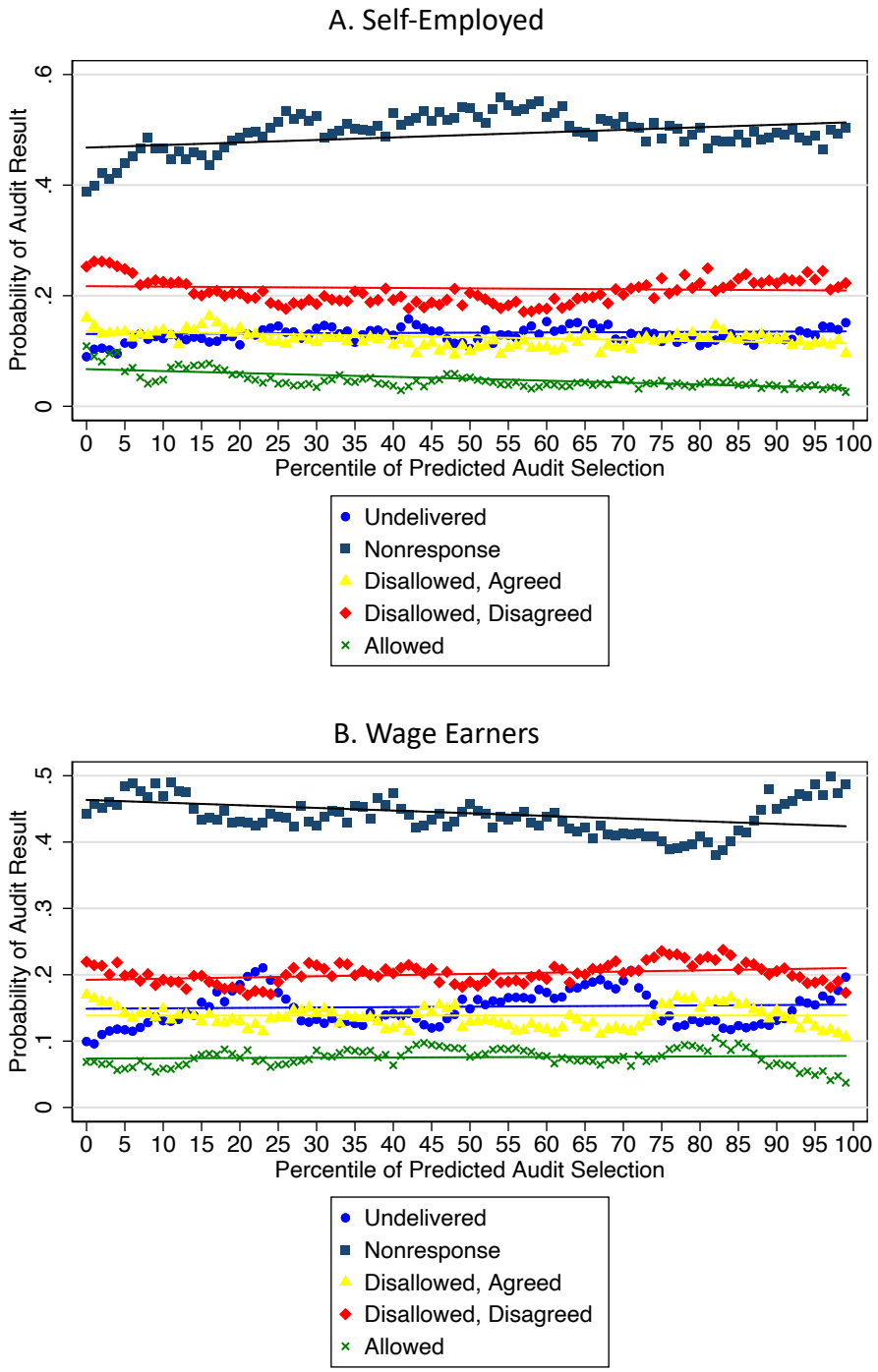


D. Wage Earners, Predicted with 1040 Variables Only



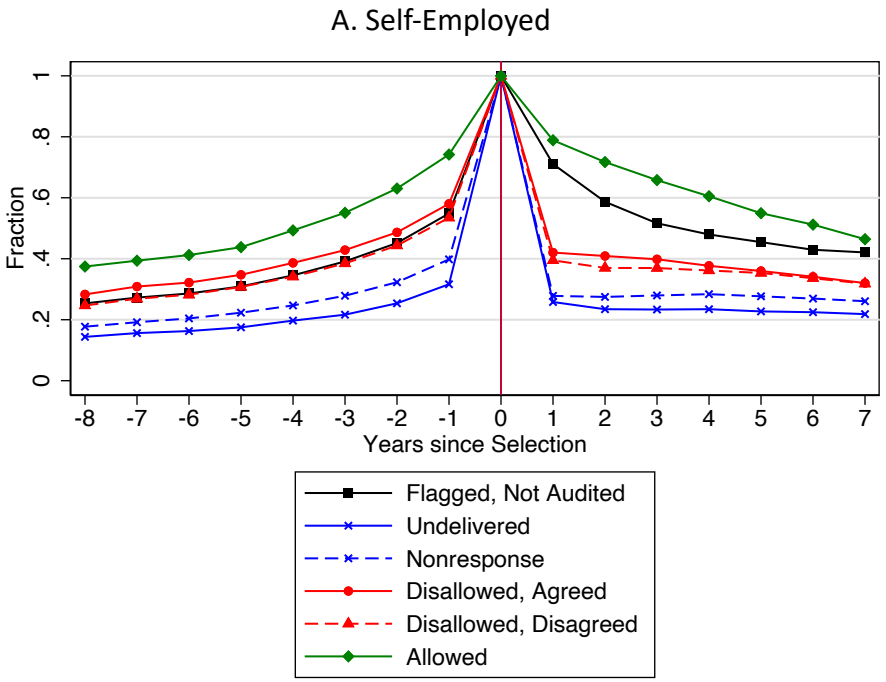
Notes: Each plot is constructed via the following steps. Observations in the analysis sample are grouped into percentile bins based on estimated audit selection probabilities. With each bin, we compute the average estimated audit selection probability and the fraction audited, and then plot these series.

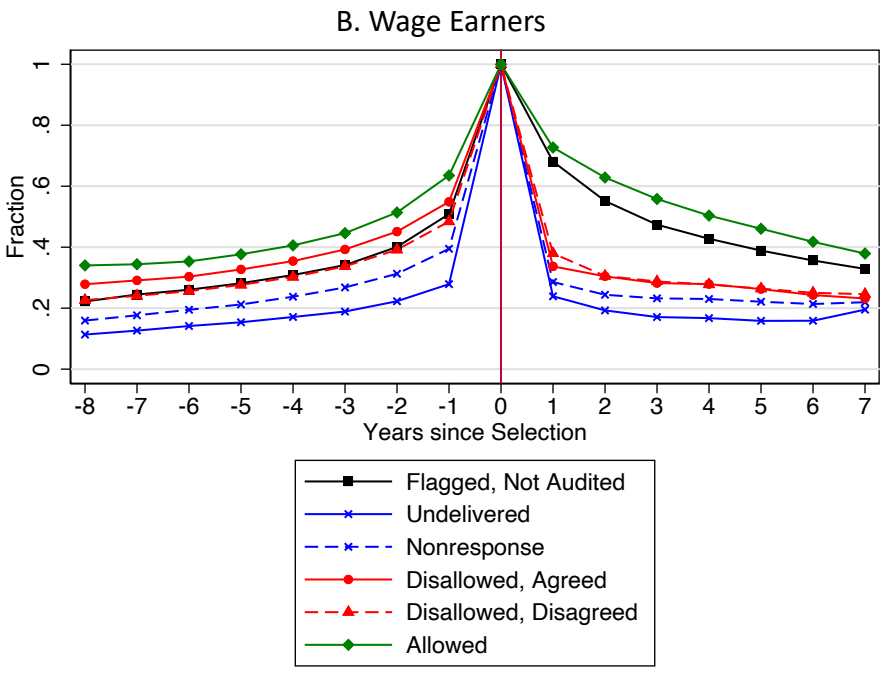
Figure 2.
Probability of Audit Results
by Percentile of Predicted Audit Selection



Notes: Each plot is constructed via the following steps. Observations in the analysis sample are grouped into percentile bins based on estimated audit selection probabilities. With each bin, we compute the fraction with each audit result and then plot these series.

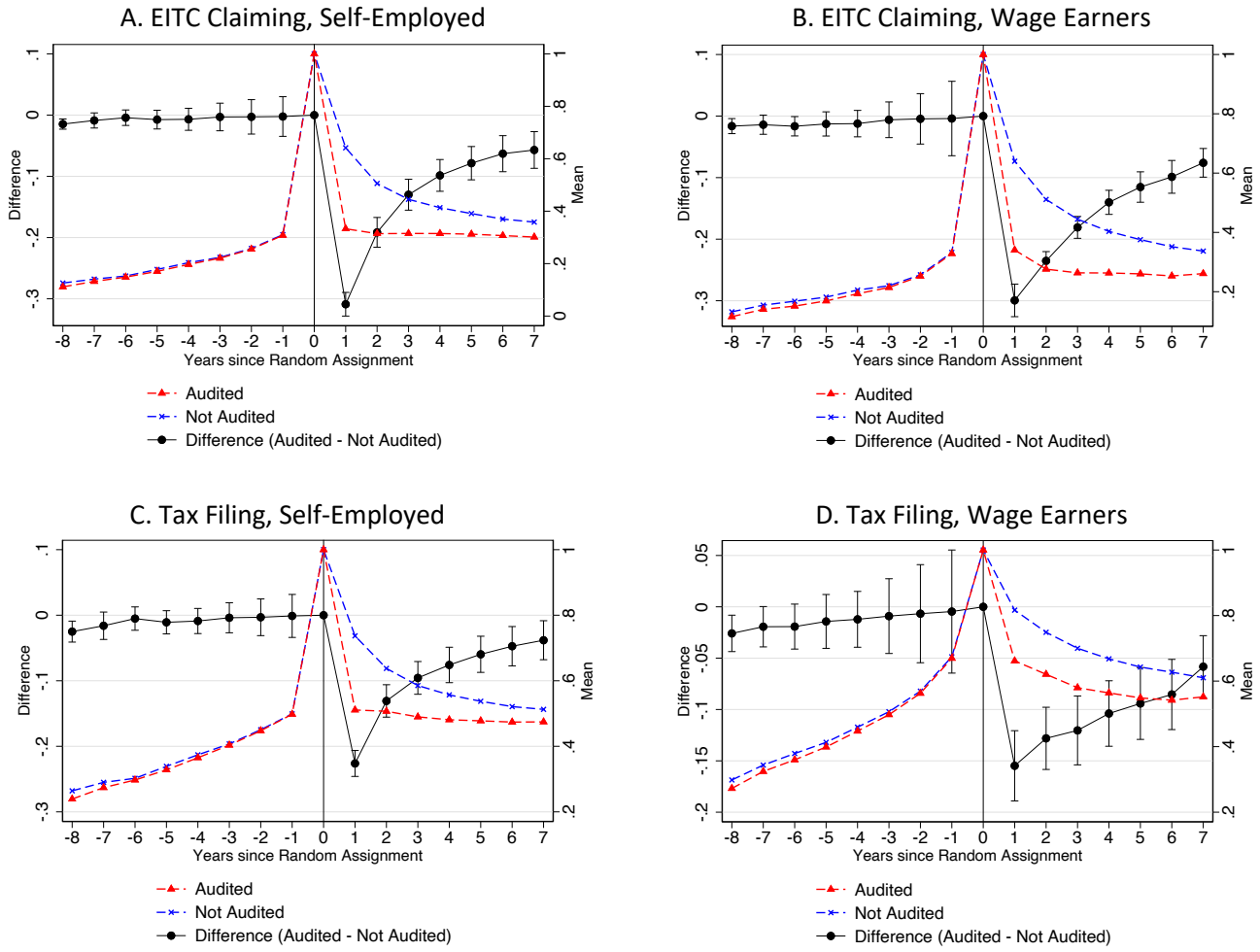
Figure 3.
EITC Claiming Before and After Selection
By Audit Result Group





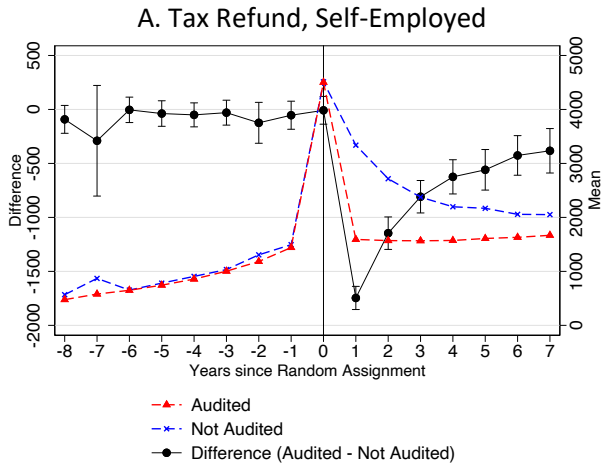
Notes: Each plot is constructed via the following steps. Observations in the analysis sample are grouped based on audit outcomes. For each outcome group, we compute the fraction claiming EITC benefits at each event time using and then plot these series. The fractions are computed using inverse probability weights.

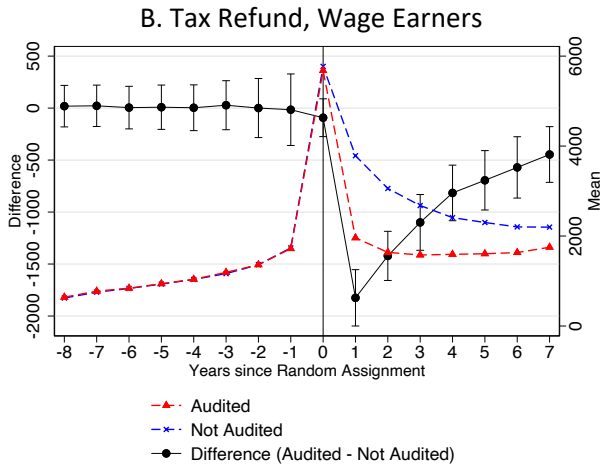
Figure 4.
Effects of EITC Correspondence Audits on EITC Claiming and Tax Filing

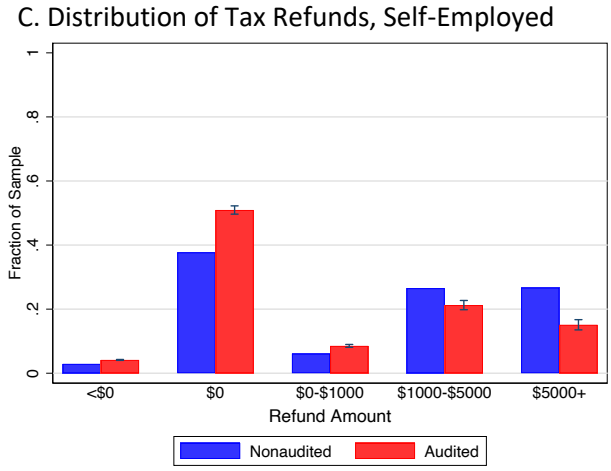


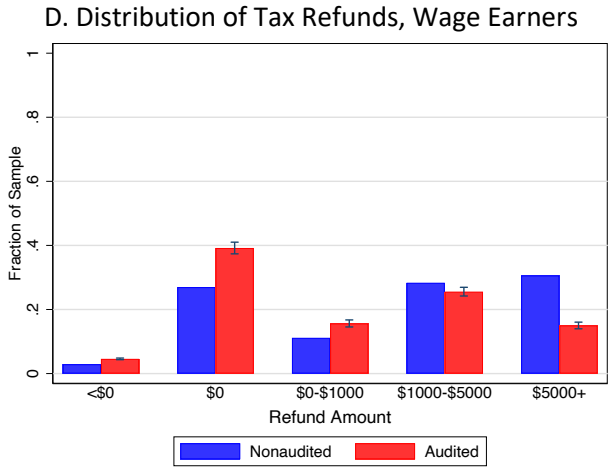
Notes: For each plot, the outcome variable specified in the plot title is regressed on event time dummies, an indicator for being an audited individual, and interactions between the event time dummies and the audited indicator. The difference estimates and standard error bands refer to the estimated coefficients and standard errors on the event time dummies interacted with the audited indicator. Means of the specified outcome variables are computed for each event time for the non-audited group, and means for the audited group are computed as the means for the non-audited group plus the estimated difference for the corresponding event time. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on 50 percentile bins of estimated audit selection probabilities and the year of selection.

Figure 5.
Effects of EITC Correspondence Audits on Tax Refunds



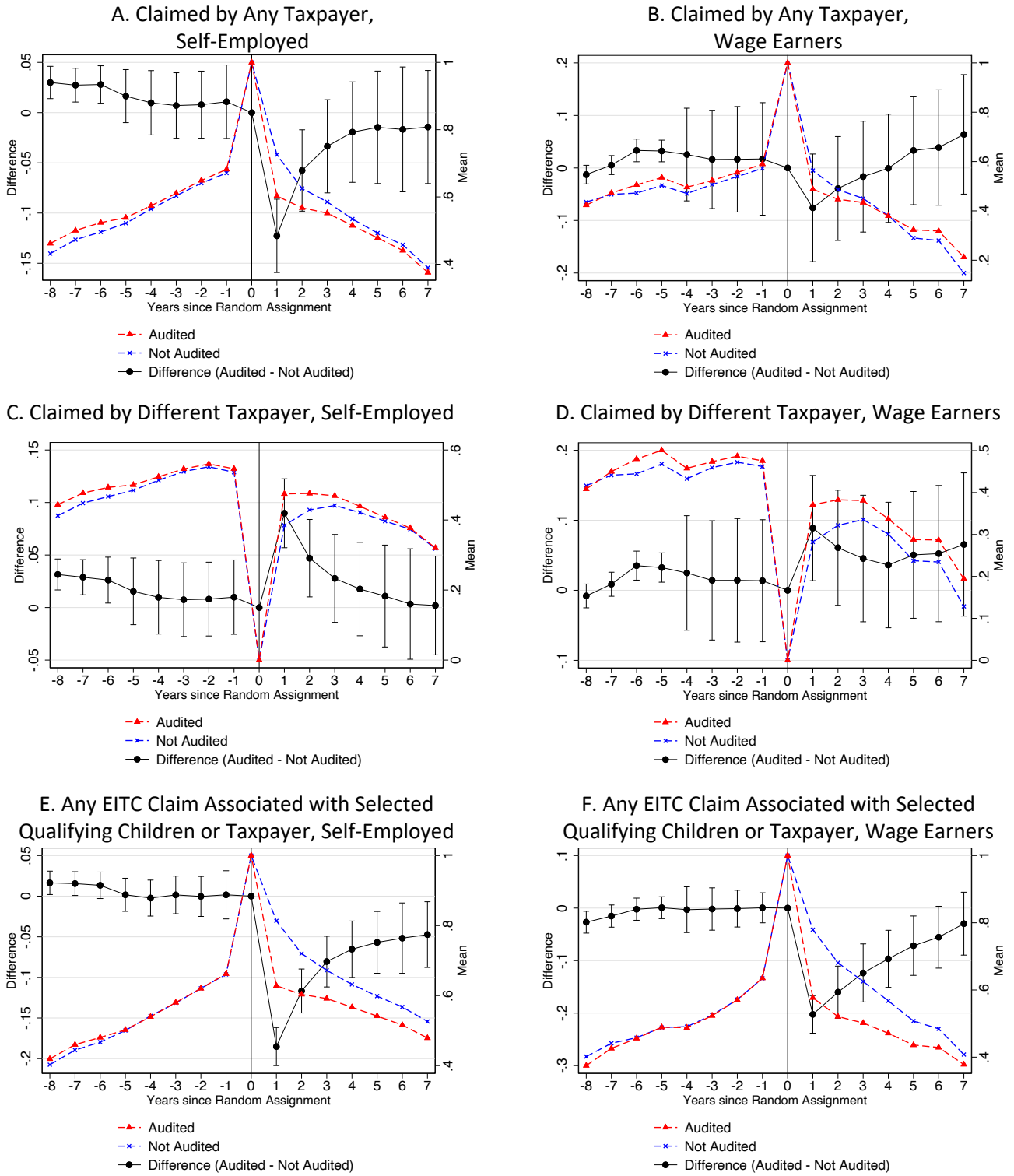






Notes: For each plot, the outcome variable specified in the plot title is regressed on event time dummies, an indicator for being an audited individual, and interactions between the event time dummies and the audited indicator. The difference estimates and standard error bands refer to the estimated coefficients and standard errors on the event time dummies interacted with the audited indicator. Means of the specified outcome variables are computed for each event time for the non-audited group, and means for the audited group are computed as the means for the non-audited group plus the estimated difference for the corresponding event time. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on 50 percentile bins of estimated audit selection probabilities and the year of selection. The distributional estimates are based on using observations in years 1 through 4 before and after the year of audit selection. Using this sample, for each outcome variable, we create indicator variables for values in specified bins and regress the indicator variables on a constant, an indicator for being in the audited sample, a "Post" indicator for being in the years after selection, and interaction between the audited and Post indicators. Standard errors are clustered based on 50 percentile bins of audit selection probabilities and the year of audit selection. The diff-in-diff estimate refers to the coefficient on the interaction term. The mean for the Nonaudited group (red) refers to the estimated constant plus the estimate coefficient on the "Post" indicator, and the mean for the Audited group (blue) refers to this mean plus the diff-in-diff estimate.

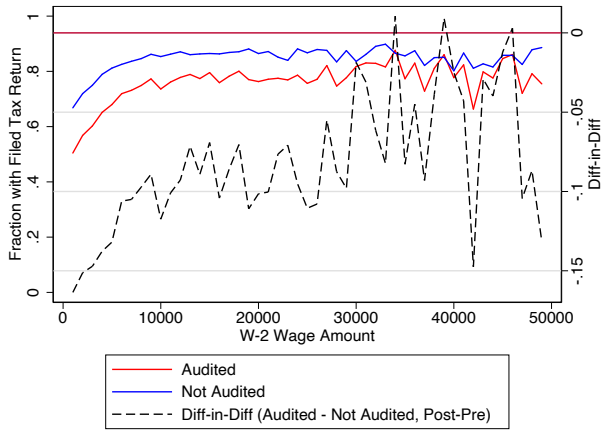
Figure 6.
Effects of EITC Correspondence Audits on Qualifying Child Outcomes



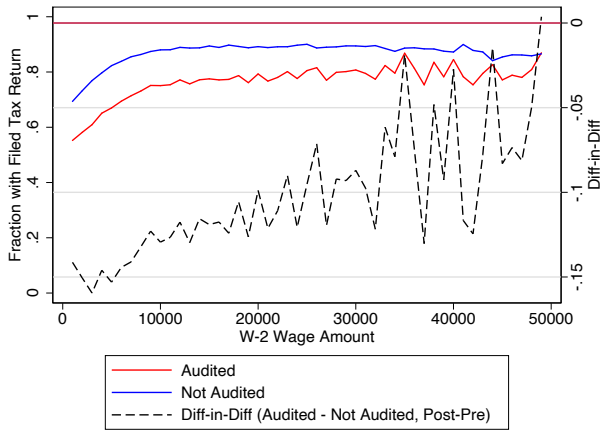
Notes: For each plot, the outcome variable specified in the plot title is regressed on event time dummies, an indicator for being an audited individual, and interactions between the event time dummies and the audited indicator. The difference estimates and standard error bands refer to the estimated coefficients and standard errors on the event time dummies interacted with the audited indicator. Means of the specified outcome variables are computed for each event time for the non-audited group, and means for the audited group are computed as the means for the non-audited group plus the estimated difference for the corresponding event time. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on 50 percentile bins of estimated audit selection probabilities and the year of selection.

Figure 7.
Effects of EITC Correspondence Audits on Tax Filing by Wage and Withholding Amounts

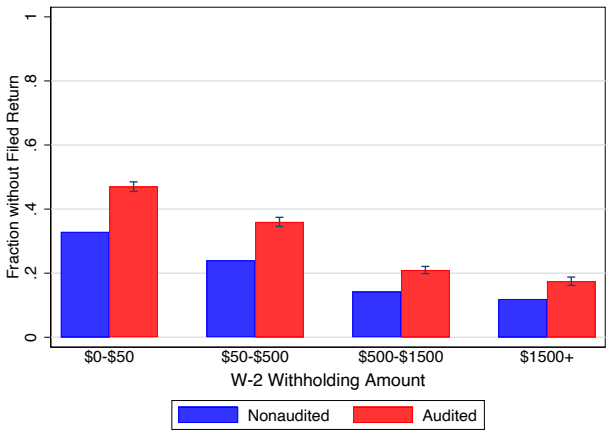
A. Filing Conditional on Having W-2 with Specified Wage Amounts, Self-Employed



B. Filing Conditional on Having W-2 with Specified Wage Amounts, Wage Earners



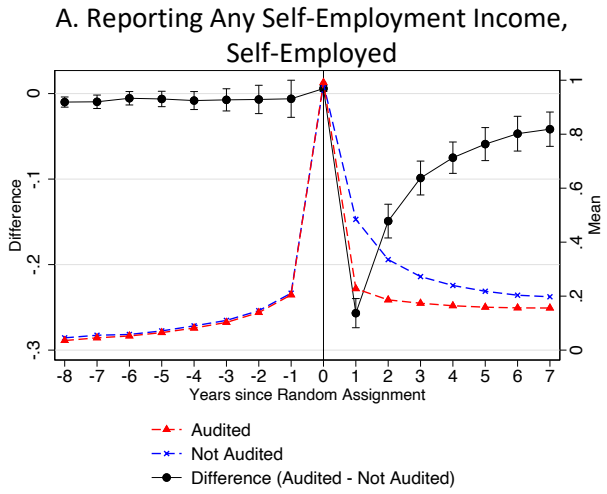
C. Fraction Not Filing Tax Return Conditional on Having Specified W-2 Withholding Amount, Self-Employed

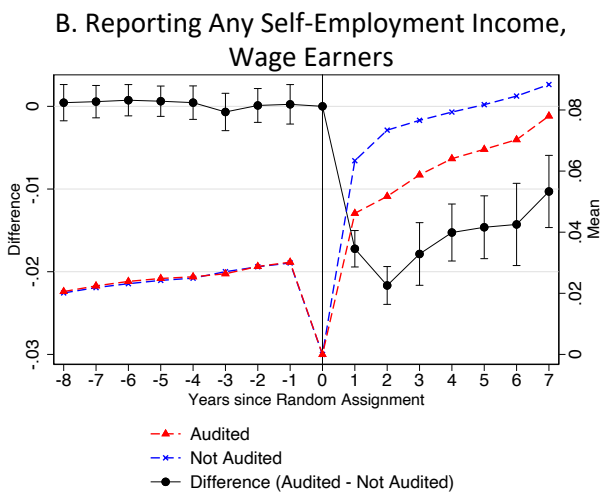


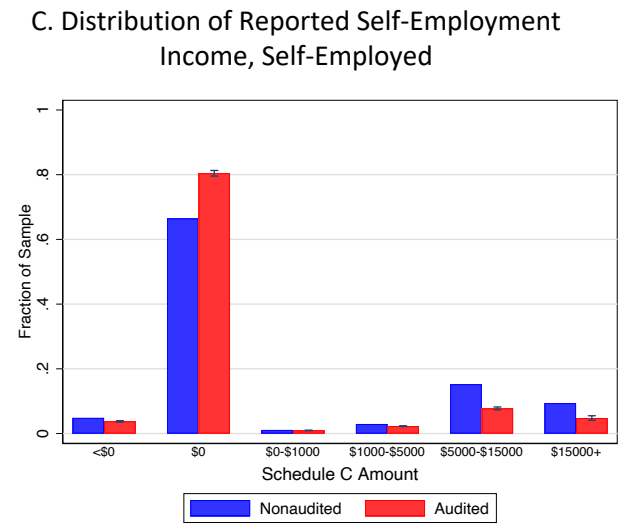
D. Fraction Not Filing Tax Return Conditional on Having Specified W-2 Withholding Amount, Wage Earners

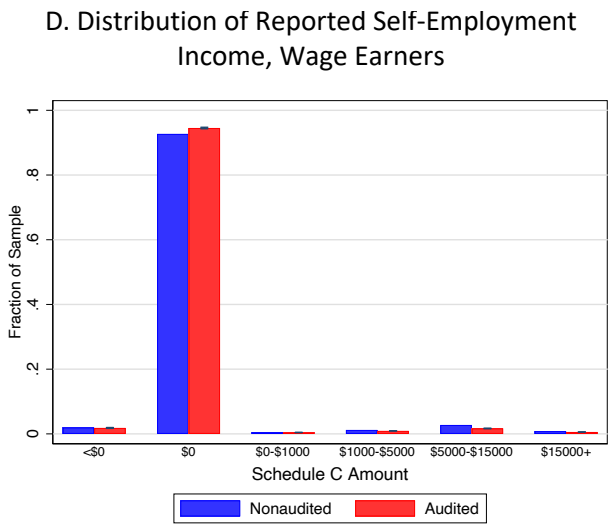
Notes: For each plot, the outcome variable specified in the plot title is regressed on event time dummies, an indicator for being an audited individual, and interactions between the event time dummies and the audited indicator. The difference estimates and standard error bands refer to the estimated coefficients and standard errors on the event time dummies interacted with the audited indicator. Means of the specified outcome variables are computed for each event time for the non-audited group, and means for the audited group are computed as the means for the non-audited group plus the estimated difference for the corresponding event time. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on 50 percentile bins of estimated audit selection probabilities and the year of selection. The distributional estimates are based on using observations in years 1 through 4 before and after the year of audit selection. Using this sample, for each outcome variable, we create indicator variables for values in specified bins and regress the indicator variables on a constant, an indicator for being in the audited sample, a "Post" indicator for being in the years after selection, and interaction between the audited and Post indicators. Standard errors are clustered based on 50 percentile bins of audit selection probabilities and the year of audit selection. The diff-in-diff estimate refers to the coefficient on the interaction term. The mean for the Nonaudited group (red) refers to the estimated constant plus the estimate coefficient on the "Post" indicator, and the mean for the Audited group (blue) refers to this mean plus the diff-in-diff estimate.

Figure 8. Effects of EITC Correspondence Audits on Reported Self-Employment Income





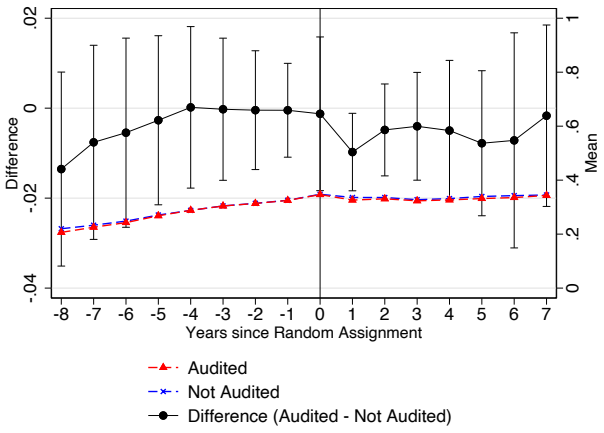




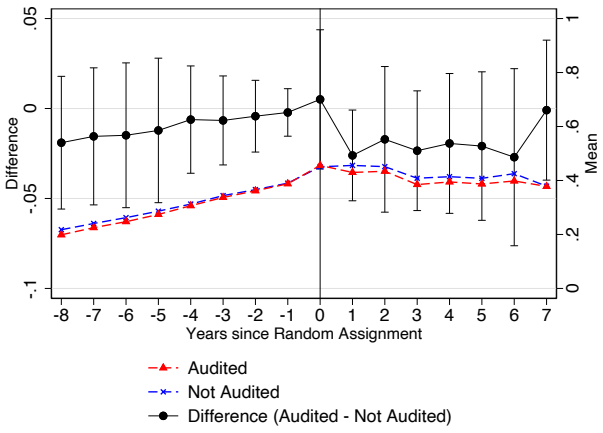
Notes: For each plot, the outcome variable specified in the plot title is regressed on event time dummies, an indicator for being an audited individual, and interactions between the event time dummies and the audited indicator. The difference estimates and standard error bands refer to the estimated coefficients and standard errors on the event time dummies interacted with the audited indicator. Means of the specified outcome variables are computed for each event time for the non-audited group, and means for the audited group are computed as the means for the non-audited group plus the estimated difference for the corresponding event time. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on 50 percentile bins of estimated audit selection probabilities and the year of selection. The distributional estimates are based on using observations in years 1 through 4 before and after the year of audit selection. Using this sample, for each outcome variable, we create indicator variables for values in specified bins and regress the indicator variables on a constant, an indicator for being in the audited sample, a "Post" indicator for being in the years after selection, and interaction between the audited and Post indicators. Standard errors are clustered based on 50 percentile bins of audit selection probabilities and the year of audit selection. The diff-in-diff estimate refers to the coefficient on the interaction term. The mean for the Nonaudited group (red) refers to the estimated constant plus the estimate coefficient on the "Post" indicator, and the mean for the Audited group (blue) refers to this mean plus the diff-in-diff estimate.

Figure 9. Effects of EITC Correspondence Audits on Likelihood of Having Wages

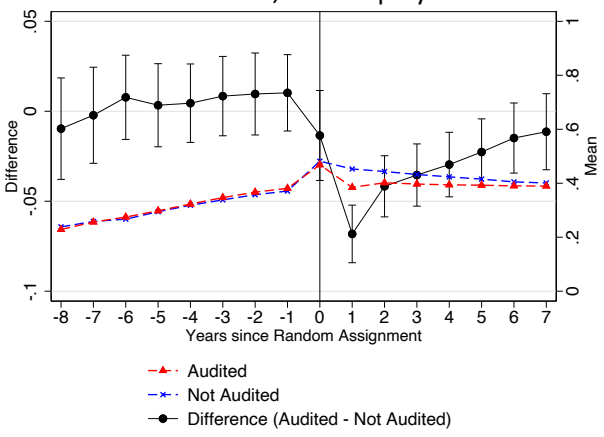
A. Likelihood of Having W-2, Self-Employed



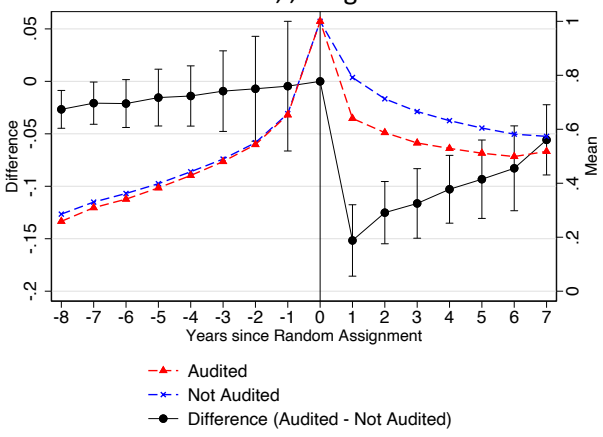
B. Likelihood of Having W-2, Wage Earners



C. Likelihood of Having Wages Reported on Filed Tax Return, Self-Employed

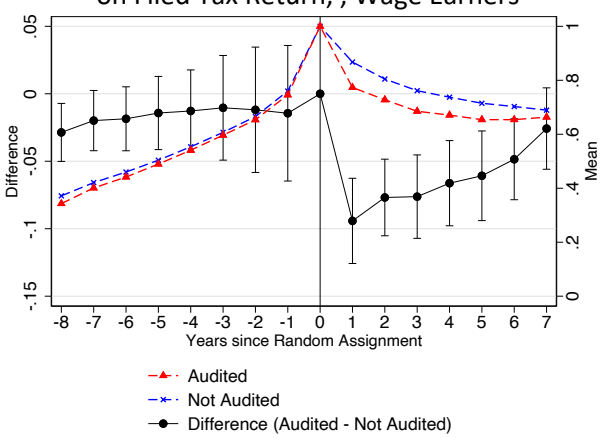


D. Likelihood of Having Wages Reported on Filed Tax Return, , Wage Earners



E. Likelihood of Having W-2 or Wages Reported on Filed Tax Return, Self-Employed

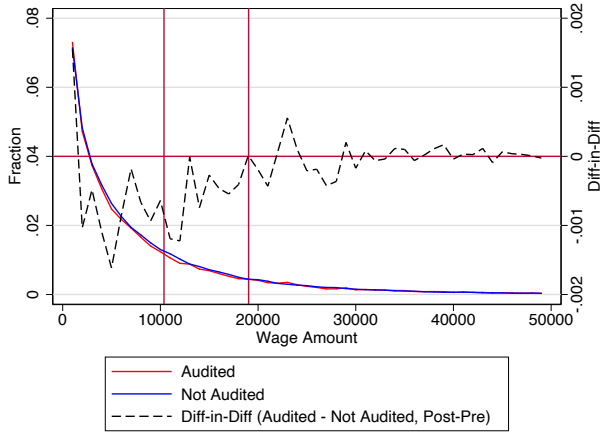
F. Likelihood of Having W-2 or Wages Reported on Filed Tax Return, , Wage Earners



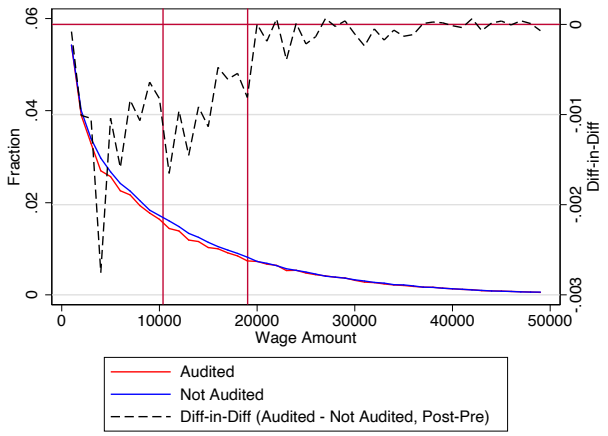
Notes: For each plot, the outcome variable specified in the plot title is regressed on event time dummies, an indicator for being an audited individual, and interactions between the event time dummies and the audited indicator. The difference estimates and standard error bands refer to the estimated coefficients and standard errors on the event time dummies interacted with the audited indicator. Means of the specified outcome variables are computed for each event time for the non-audited group, and means for the audited group are computed as the means for the non-audited group plus the estimated difference for the corresponding event time. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on 50 percentile bins of estimated audit selection probabilities and the year of selection.

Figure 10. Effects of EITC Correspondence Audits on Wage Distributions

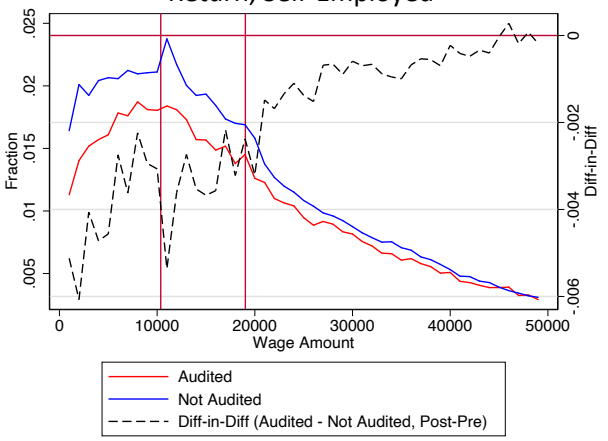
A. Distribution of W-2 Earnings, Self-Employed



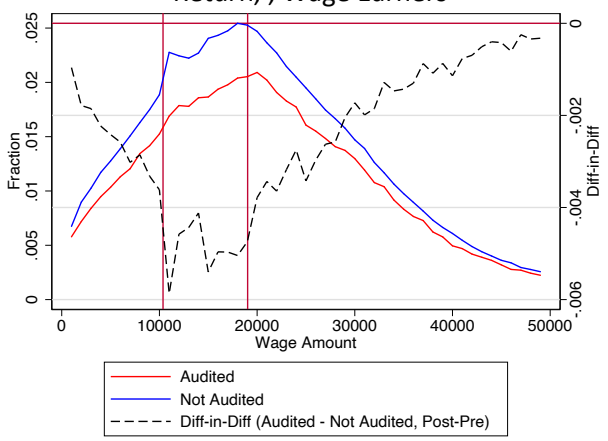
B. Distribution of W-2, Wage Earners



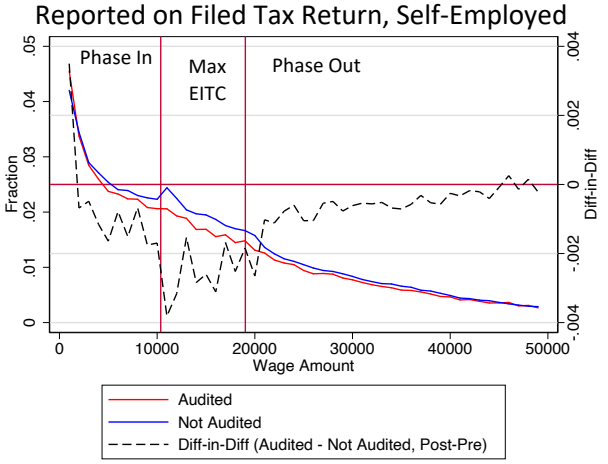
C. Distribution of Wages Reported on Filed Tax Return, Self-Employed



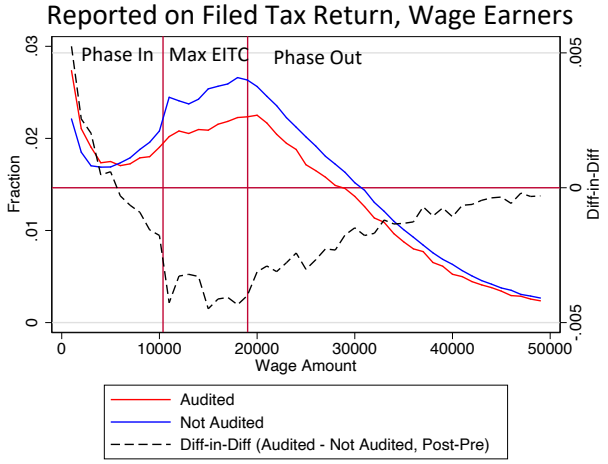
D. Distribution of Wages Reported on Filed Tax Return, , Wage Earners



E. Distribution of (Max) W-2 Wages or Wages Reported on Filed Tax Return, Self-Employed



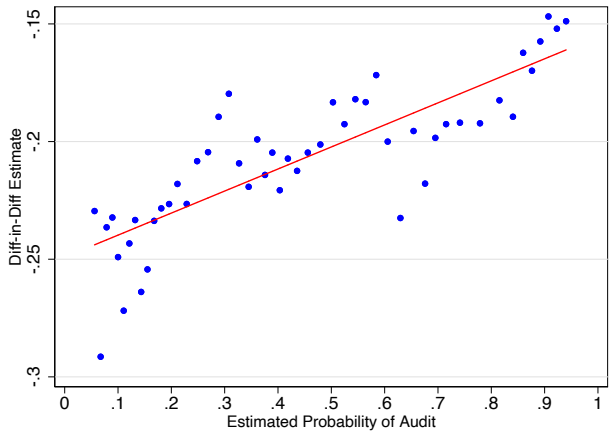
F. Distribution of (Max) W-2 Wages or Wages Reported on Filed Tax Return, Wage Earners



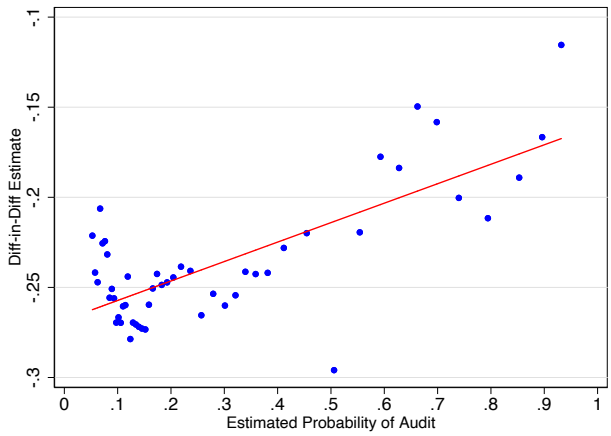
Notes: The distributional estimates are based on using observations in years 1 through 4 before and after the year of audit selection. Using this sample, for each outcome variable, we create indicator variables for values in specified bins and regress the indicator variables on a constant, an indicator for being in the audited sample, a "Post" indicator for being in the years after selection, and interaction between the audited and Post indicators. Standard errors are clustered based on 50 percentile bins of audit selection probabilities and the year of audit selection. The diff-in-diff estimate refers to the coefficient on the interaction term. The mean for the Nonaudited group (red) refers to the estimated constant plus the estimate coefficient on the "Post" indicator, and the mean for the Audited group (blue) refers to this mean plus the diff-in-diff estimate. Dollar values are adjusted to 2019 dollars, and vertical red lines depict 2019 values for EITC Kink 1 (the minimum earned income amount necessary for maximum EITC benefits) and EITC Kink 2 (the maximum earned income amount for maximum EITC benefits) for Head-of-Household 1 qualifying child.

Figure 11. Heterogeneity by Estimated Probability of Audit

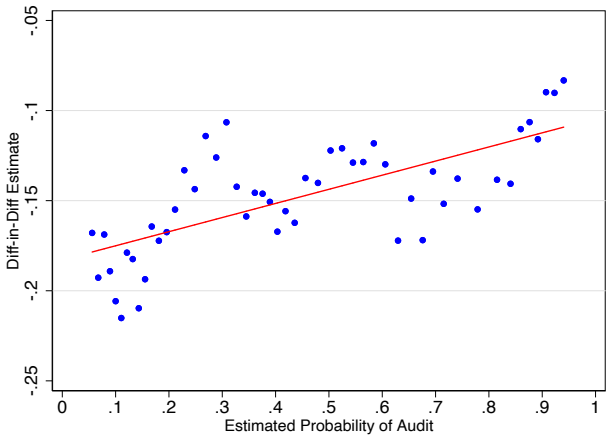
A. EITC Claiming, Self-Employed



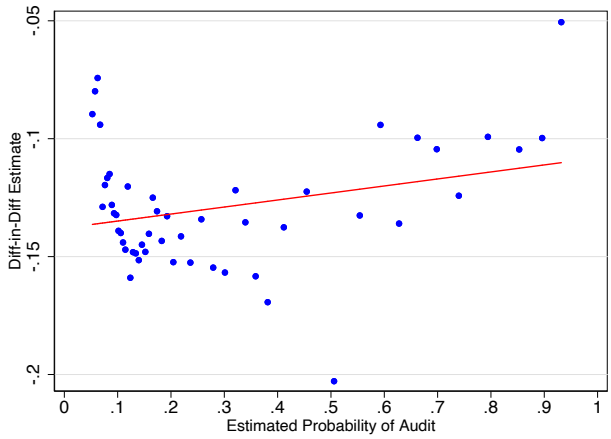
B. EITC Claiming, Wage Earners



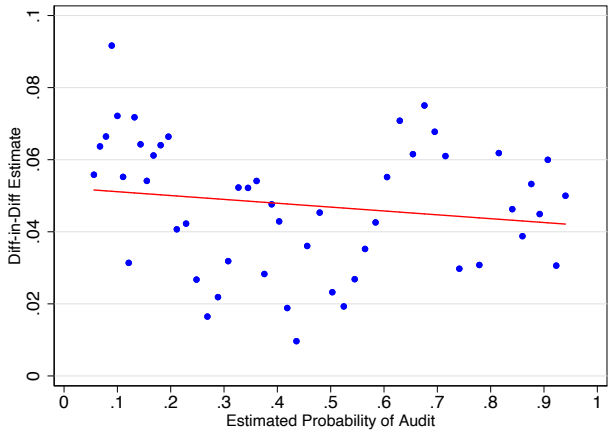
C. Tax Filing, Self-Employed



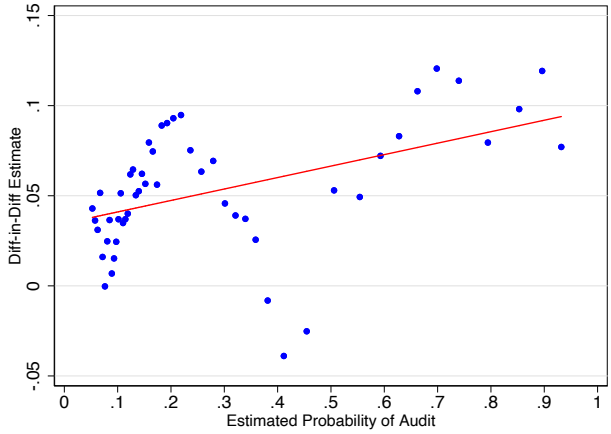
D. Tax Filing, Wage Earners



E. Qualifying Child Claimed by Other Taxpayer, Self-Employed



F. Qualifying Child Claimed by Other Taxpayer, Wage Earners

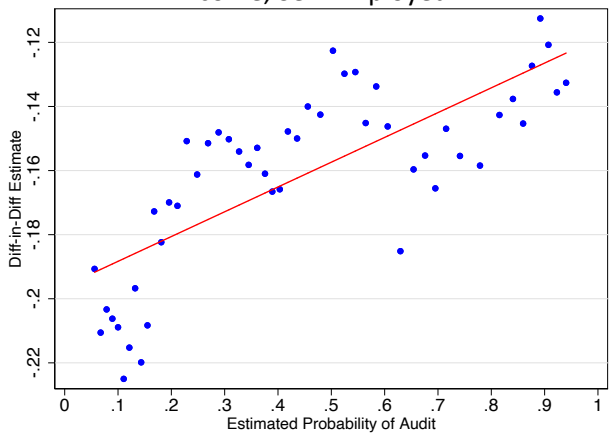


Notes: Each plot is constructed using the following steps. We group observations into percentile bins based on estimated audit selection probabilities. For each bin, we compute difference-in-difference estimates for each specified outcome. The differences are computed across audited and nonaudited observations and across "Before" and "After" the year of audit selection. The "Before" period consists of years 1 through 4 prior to the year of audit selection, and the "After" period consists of years 1 through 4 after the year of selection. Estimates are based on using inverse probability weights. Estimates for each bin are shown in dots, and fitted values across the estimates for each bin are shown in red lines.

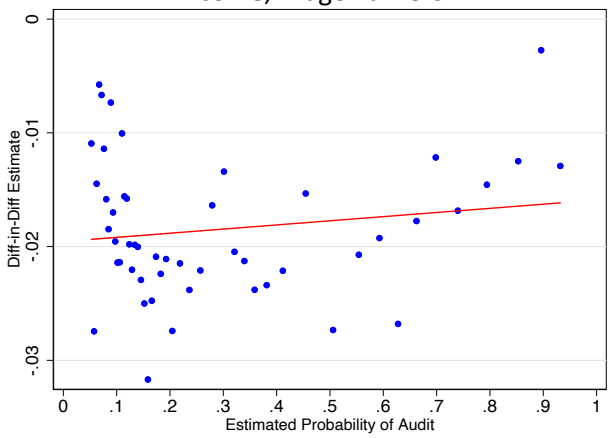
Figure 11. Heterogeneity by Estimated Probability of Audit

(continued)

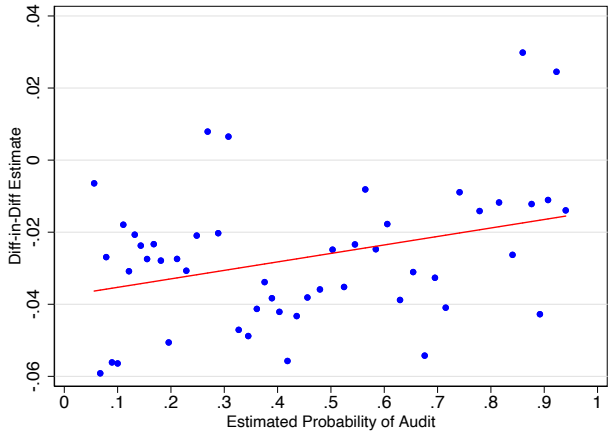
G. Reporting Self-Employment (Schedule C) Income, Self-Employed



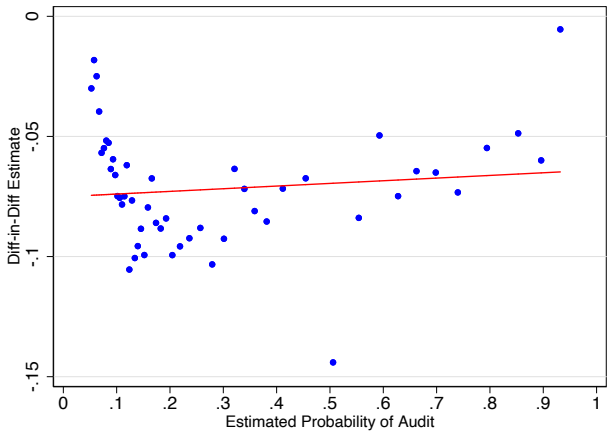
H. Reporting Self-Employment (Schedule C) Income, Wage Earners



I. Having a W-2 or Reporting Wage Income on a Filed Tax Return, Self-Employed



J. Having a W-2 or Reporting Wage Income on a Filed Tax Return, Wage Earners



Notes: Each plot is constructed using the following steps. We group observations into percentile bins based on estimated audit selection probabilities. For each bin, we compute difference-in-difference estimates for each specified outcome. The differences are computed across audited and nonaudited observations and across "Before" and "After" the year of audit selection. The "Before" period consists of years 1 through 4 prior to the year of audit selection, and the "After" period consists of years 1 through 4 after the year of selection. Estimates are based on using inverse probability weights. Estimates for each bin are shown in dots, and fitted values across the estimates for each bin are shown in red lines.

For Online Publication

Appendix Figure 1. Example of CP-75 Notice

Department of Treasury
Internal Revenue Service
5333 Getwell Road Stop 822
Memphis, TN 37501-0111

Notice	CP75
Tax year	2016
Notice date	October 15, 2017
Social Security number	999-99-9999
Your Caller ID	99999
To contact us	Phone 1-866-897-0161

Page 1 of 3

s01899954671s
ERIC D. JOHNSON
123 N HARRIS ST
HARVARD TX 12345

We're auditing your 2016 Form 1040

Supporting documentation requested

We need you to send us information to support items you claimed on your tax return.

We are holding the Earned Income Credit (EIC), and/or the Additional Child Tax Credit (ACTC) portion(s) of your refund pending the results of the audit. If you claimed the Premium Tax Credit (PTC), we may also hold all or a part of your refund due to a discrepancy with your PTC.

Be sure to respond within 30 days from the date of this notice or we'll disallow the items being audited, and you may owe additional tax.

What you need to do immediately

- Review the list of items we're auditing and provide copies of documentation to verify what you claimed on your tax return. See the enclosed forms for complete instructions for what you need to send.
- Complete the Response form at the end of this notice, and mail or fax it to us along with any documentation within 30 days from the date of this notice.
- If you can't get your documentation ready in time, call us at 1-866-897-0161 to discuss your options.

Items that require supporting documentation To qualify for:	The list below summarizes the items that require supporting documentation. For complete instructions on what to send, see the enclosed forms. You should:
Premium Tax Credit Form 1040	• Review the enclosed Form 14950, Premium Tax Credit Verification • Submit documentation to verify what you claimed on your return.

Appendix Figure 2.
A. Example of IRS Notice 1332 for Research (NRP) Audits

Why Your Return is Being Examined

Your return was selected at random for a compliance research examination. We usually select returns for general examinations because there is some indication that the return is incorrect. We also randomly select returns for compliance research examinations in order to gather data for use throughout the Service to improve our tax system. We recognize that taxpayers who consistently meet all of their tax obligations bear their fair share of the overall tax burden. Our mission, however, includes examining enough tax returns to ensure that the federal tax system is administered fairly and that any errors on the examined returns will be corrected.

The random selection of your return does not mean it contains errors, but allows the IRS to collect information in a statistically valid manner about how taxpayers meet their tax responsibilities. This information will help us determine what changes to IRS forms, publications, and tax laws may improve voluntary compliance. It will also be used to guide improvements to how the tax laws are enforced, and to programs designed to help taxpayers understand and comply with the tax laws. All this improves the fairness of the tax system.

There may not be any errors in your return; however, if there are, we will tell you and give you a chance to explain them. If you overpaid your tax, we will send you a refund plus interest. If any tax is due, we will ask you to pay it plus any penalties and interest due as required by law.

It is to the advantage of all taxpayers that everyone pays their fair share of taxes in accordance with the laws enacted by Congress. We appreciate your cooperation with the examination of your return.

Department of the Treasury
Internal Revenue Service

Notice 1332 (Rev. 1-2007)
Catalog Number 38915Y

www.irs.gov

Appendix Figure 2.
B. Example of IRS Letter 2205-B for Research (NRP) Audits

Department of the Treasury
Internal Revenue Service

IRS

Date:

Taxpayer ID number (last 4 digits):

Form:

Tax period ended:

Person to contact:

Contact telephone number:

Contact fax number:

Employee ID number:

Dear [enter Name]:

Your federal income tax return for the year shown above was selected at random for a compliance research examination. We must examine randomly-selected tax returns to better understand tax compliance and improve the fairness of the tax system. We'll give you the opportunity to explain any errors we may find during the examination.

The results of this and other compliance research examinations will improve our efforts to help taxpayers understand and follow the tax law. It will also reduce unnecessary and costly examinations, and reduce burden on taxpayers. Please read the enclosed Notice 1332, *Why Your Return is Being Examined*.

What you need to do
Please call me on or before [insert date]. You may contact me from [insert time] to [insert time] at the telephone number provided above.

What we will discuss
During our telephone conversation, we will discuss:

- Items on your return that I will be examining.
- Types of documents I will ask you to provide.
- The examination process.
- Any concerns or questions you may have.
- The date, time and agenda for our first meeting.

Someone may represent you
You may have someone represent you during any part of this examination. If you decide you want representation, the representative you authorize will need a completed Form(s) 2848, *Power of Attorney and Declaration of Representative*, before we can discuss any of your tax matters.

If you choose to have someone represent you, please provide a completed Form 2848 by our first appointment. You can mail or fax the form to me or have your representative provide it at the first appointment, if you won't be present. You can obtain Form 2848 from our office, from our web site, www.irs.gov or by calling (800) 829-3676.

Letter 2205-B (Rev. 3-2017)
Catalog Number 38759Y

Appendix Figure 2.
B. Example of IRS Letter 2205-B for Research (NRP) Audits (continued)

If you filed a joint return, you and your spouse may attend the examination. If you and/or your spouse choose not to attend with your representative, you must provide completed Form(s) 2848. You should provide a separate Form 2848 for each spouse if you filed jointly even if you use the same representative.

Your rights as a taxpayer
We have enclosed Publication 1, *Your Rights as a Taxpayer* and Notice 609, *Privacy Act Notice*. The Declaration of Taxpayer Rights found in Publication 1 discusses general rules and procedures we follow in examinations. It explains what happens before, during, and after an examination, and provides additional sources of information.

A video presentation, "Your Guide to an IRS Audit," is available at http://www.irsvideos.gov/audit. The video explains the examination process and will assist you in preparing for your audit.

Thank you for your cooperation and I look forward to hearing from you by [insert date].

Sincerely,

[Name]
[Title]

Enclosures:
Publication 1
Publication 4134, Low Income Taxpayer Clinic List
Notice 609
Notice 1332

Appendix Figure 3. Example of CP-79 Notice

Department of the Treasury
Internal Revenue Service
PO Box 149342
Austin, TX 78714-9342

Notice	CP79
Tax year	2016
Notice date	January 26, 2017
Social security number	Nnn-nn-nnnn
To contact us	Phone: nnn-nnn-nnnn
Your caller ID	
Page 1 of 1	

ERIC D. JOHNSON
123 N HARRIS ST
HARVARD, TX 12345

We denied one or more of the credits claimed on your tax return

We recently denied the following credits you claimed on your 2016 income tax return:

- Earned Income Tax Credit (EIC)
- American Opportunity Tax Credit (AOTC)
- Child Tax Credit or Additional Child Tax Credit (CTC or ACTC)

As a result, the next time you claim the credits listed above, you must complete and attach Form 8862, Information To Claim Earned Income Credit, Child Tax Credit, Additional Child Tax Credit or American Opportunity Tax Credit After Disallowance, to your tax return.

What you need to do

- You don't need to take any action at this time.
- If you claim these credits in the future, make sure you meet all the qualifying rules to get every credit for which you're eligible.
- Keep a copy of this notice for your records.

Claiming the credits on future returns

In the future, if you claim the credits you must submit Form 8862 with your tax return. You will not receive the credits until we receive your Form 8862.

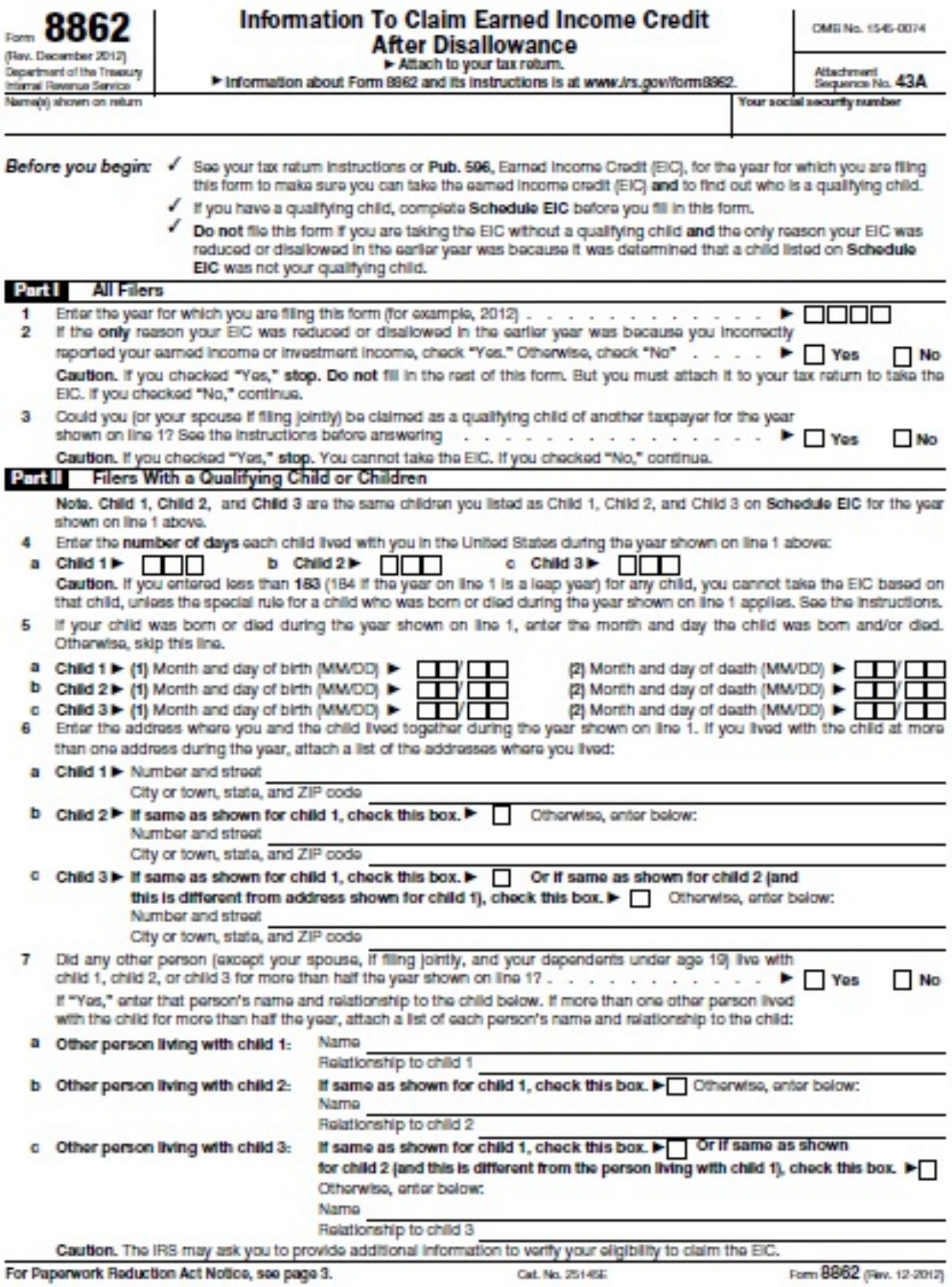
After we receive your Form 8862, we'll review your tax return. We may send you an audit letter asking for additional information to confirm you're eligible for the credits.

If we audit your return and deny the credits, we could impose a two-year ban on your claiming the credits if we find you recklessly or intentionally disregarded the rules. We could impose a ten-year ban if we find you fraudulently claimed the credits.

Additional information

- Visit www.irs.gov/cp79
- For tax forms or publications, visit www.irs.gov/formspubs or call 1-800-TAX-FORM (1-800-829-3676).
- The following publications may be helpful:
  - Publication 596, Earned Income Credit (EIC),
  - Publication 972, Child Tax Credit
  - Publication 970, Tax Benefits for Education

Appendix Figure 4. Example of Form 8862



Form **8862**
(Rev. December 2012)
Department of the Treasury
Internal Revenue Service
Name(s) shown on return

Information To Claim Earned Income Credit After Disallowance
► Attach to your tax return.
► Information about Form 8862 and its instructions is at www.irs.gov/form8862.

OMB No. 1545-0074
Attachment Sequence No. **43A**
Your social security number

Before you begin: ✓ See your tax return instructions or **Pub. 596**, Earned Income Credit (EIC), for the year for which you are filing this form to make sure you can take the earned income credit (EIC) **and** to find out who is a qualifying child.
✓ If you have a qualifying child, complete **Schedule EIC** before you fill in this form.
✓ **Do not** file this form if you are taking the EIC without a qualifying child **and** the only reason your EIC was reduced or disallowed in the earlier year was because it was determined that a child listed on **Schedule EIC** was not your qualifying child.

Part I All Filers

1 Enter the year for which you are filing this form (for example, 2012) . . . . . ► ☐☐☐☐

2 If the **only** reason your EIC was reduced or disallowed in the earlier year was because you incorrectly reported your earned income or investment income, check "Yes." Otherwise, check "No" . . . . ► ☐ Yes ☐ No

Caution. If you checked "Yes," **stop. Do not** fill in the rest of this form. But you must attach it to your tax return to take the EIC. If you checked "No," continue.

3 Could you (or your spouse if filing jointly) be claimed as a qualifying child of another taxpayer for the year shown on line 1? See the instructions before answering . . . . . ► ☐ Yes ☐ No

Caution. If you checked "Yes," **stop.** You cannot take the EIC. If you checked "No," continue.

Part II Filers With a Qualifying Child or Children

Note. Child 1, Child 2, and **Child 3** are the same children you listed as Child 1, Child 2, and Child 3 on **Schedule EIC** for the year shown on line 1 above.

4 Enter the **number of days** each child lived with you in the United States during the year shown on line 1 above:

a **Child 1** ► ☐☐☐ b **Child 2** ► ☐☐☐ c **Child 3** ► ☐☐☐

Caution. If you entered less than **183** (184 if the year on line 1 is a leap year) for any child, you cannot take the EIC based on that child, unless the special rule for a child who was born or died during the year shown on line 1 applies. See the instructions.

5 If your child was born or died during the year shown on line 1, enter the month and day the child was born and/or died. Otherwise, skip this line.

a **Child 1** ► **(1)** Month and day of birth (MM/DD) ► ☐☐/☐☐ **(2)** Month and day of death (MM/DD) ► ☐☐/☐☐
b **Child 2** ► **(1)** Month and day of birth (MM/DD) ► ☐☐/☐☐ **(2)** Month and day of death (MM/DD) ► ☐☐/☐☐
c **Child 3** ► **(1)** Month and day of birth (MM/DD) ► ☐☐/☐☐ **(2)** Month and day of death (MM/DD) ► ☐☐/☐☐

6 Enter the address where you and the child lived together during the year shown on line 1. If you lived with the child at more than one address during the year, attach a list of the addresses where you lived:

a **Child 1** ► Number and street _____
City or town, state, and ZIP code _____

b **Child 2** ► **If same as shown for child 1, check this box.** ► ☐ Otherwise, enter below:
Number and street _____
City or town, state, and ZIP code _____

c **Child 3** ► **If same as shown for child 1, check this box.** ► ☐ **Or if same as shown for child 2 (and this is different from address shown for child 1), check this box.** ► ☐ Otherwise, enter below:
Number and street _____
City or town, state, and ZIP code _____

7 Did any other person (except your spouse, if filing jointly, and your dependents under age 19) live with child 1, child 2, or child 3 for more than half the year shown on line 1? . . . . . ► ☐ Yes ☐ No

If "Yes," enter that person's name and relationship to the child below. If more than one other person lived with the child for more than half the year, attach a list of each person's name and relationship to the child:

a **Other person living with child 1:** Name _____
Relationship to child 1 _____

b **Other person living with child 2:** **If same as shown for child 1, check this box.** ► ☐ Otherwise, enter below:
Name _____
Relationship to child 2 _____

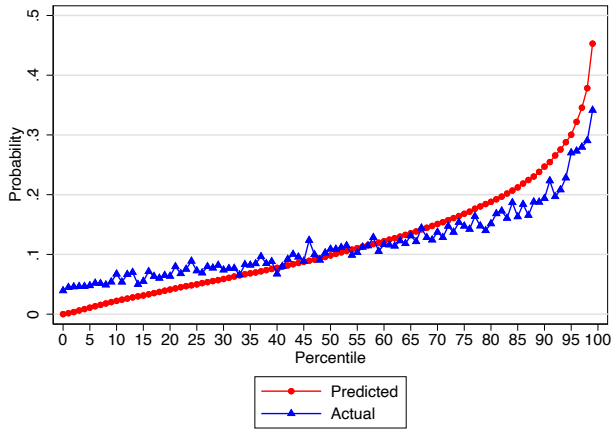
c **Other person living with child 3:** **If same as shown for child 1, check this box.** ► ☐ **Or if same as shown for child 2 (and this is different from the person living with child 1), check this box.** ► ☐
Otherwise, enter below:
Name _____
Relationship to child 3 _____

Caution. The IRS may ask you to provide additional information to verify your eligibility to claim the EIC.

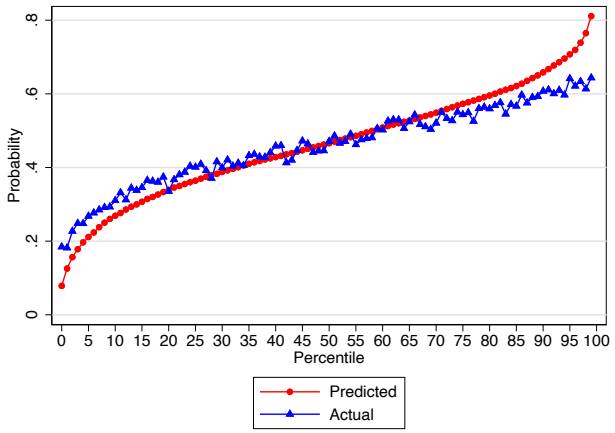
For Paperwork Reduction Act Notice, see page 3. Cat. No. 25145E Form **8862** (Rev. 12-2012)

Appendix Figure 5.
Actual and Predicted Audit Results
by Percentiles of Predicted Audit Results, Self-Employed

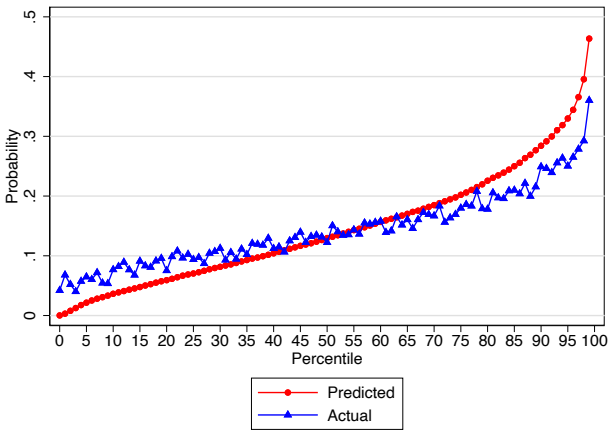
A. Audit Result = Undelivered



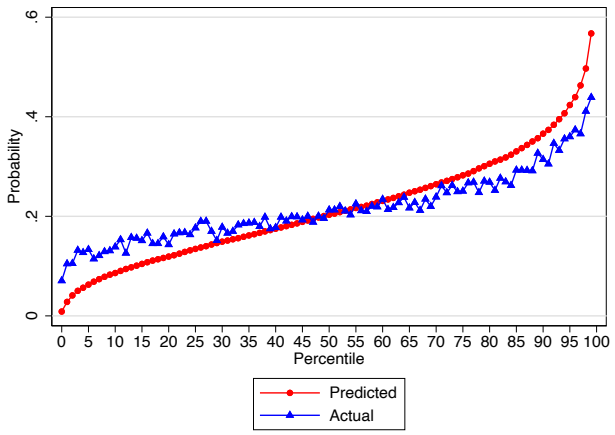
B. Audit Result = Nonresponse



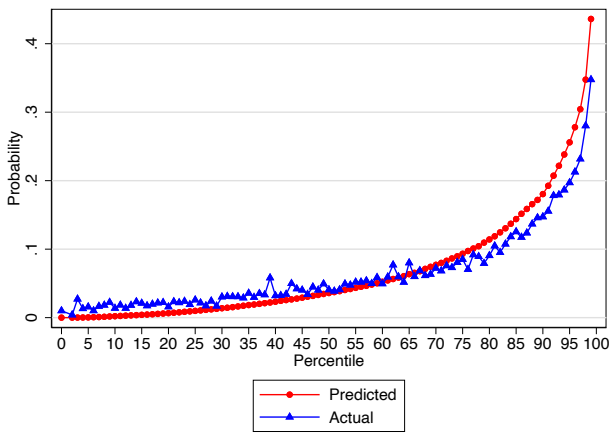
C. Audit Result = Disallowed with Active Agreement



D. Audit Result = Disallowed with Disagreement



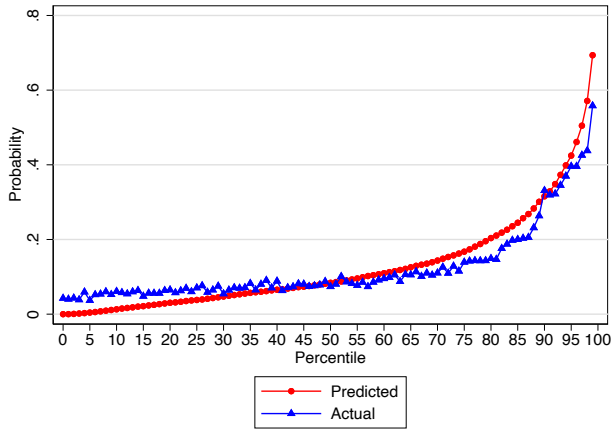
E. Audit Result = Allowed



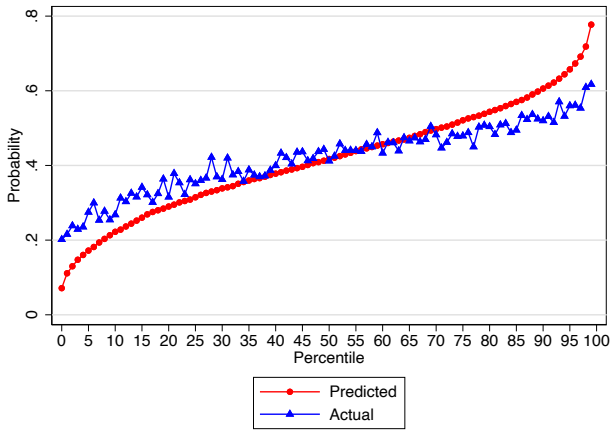
Notes: For each plot, we group observations based on percentile bins of estimated probabilities of each audit result. Within each bin, we compute the average estimated probability of the audit result and the fraction with the specified audit result.

Appendix Figure 6.
Actual and Predicted Audit Results by Percentile of Predicted Audit Results, Wage Earners

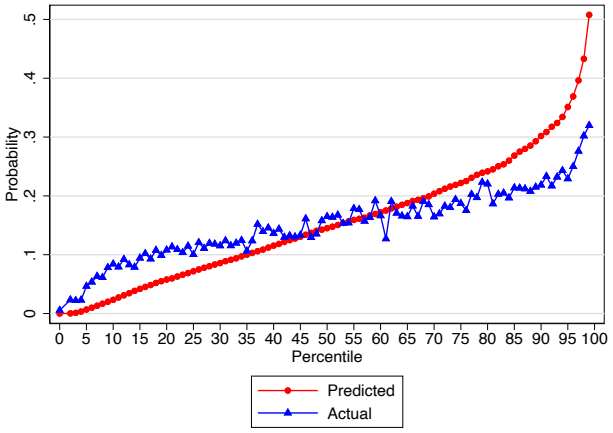
A. Audit Result = Undelivered



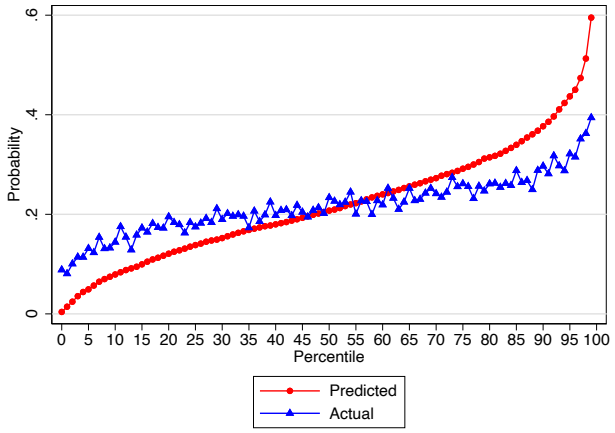
B. Audit Result = Nonresponse



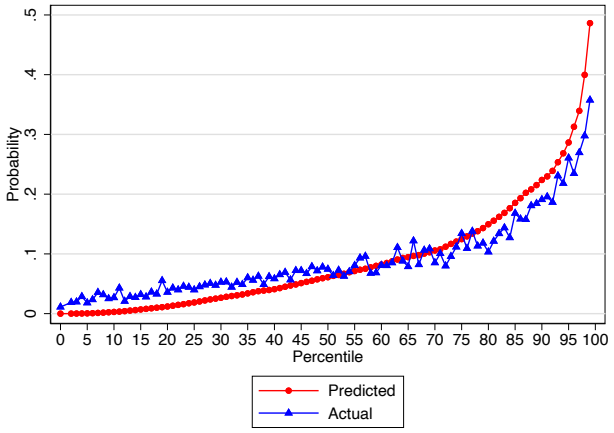
C. Audit Result = Disallowed with Active Agreement



D. Audit Result = Disallowed with Disagreement



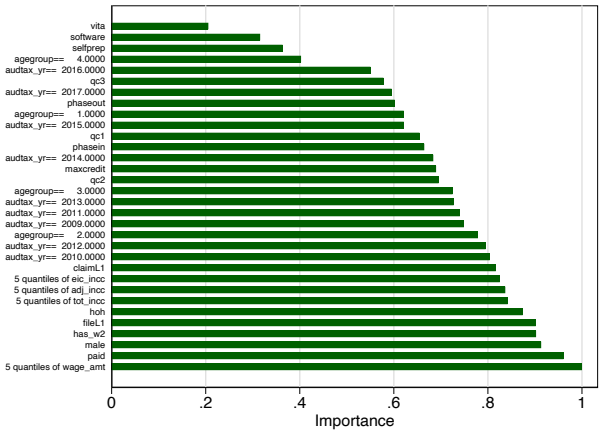
E. Audit Result = Allowed



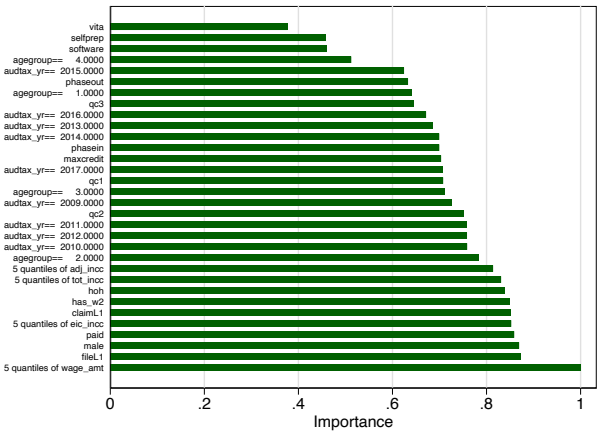
Notes: For each plot, we group observations based on percentile bins of estimated probabilities of each audit result. Within each bin, we compute the average estimated probability of the audit result and the fraction with the specified audit result.

Appendix Figure 7.
Importance Factors for Predicting Audit Outcomes, Self-Employed

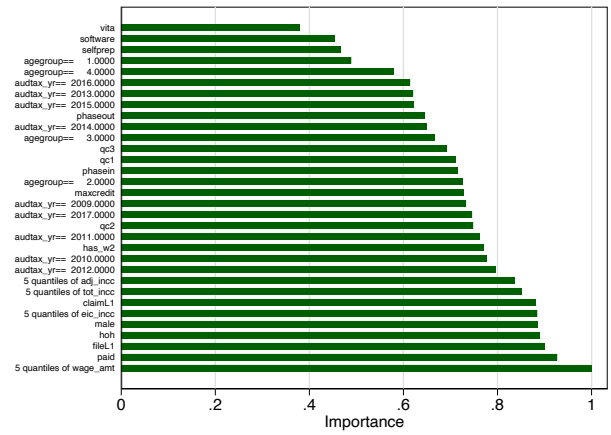
A. Audit Result = Undelivered



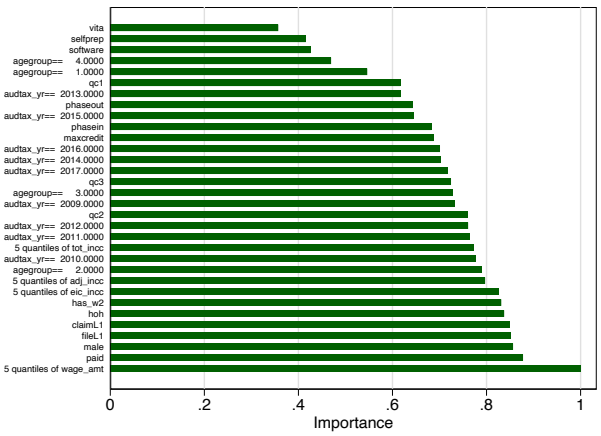
B. Audit Result = Nonresponse



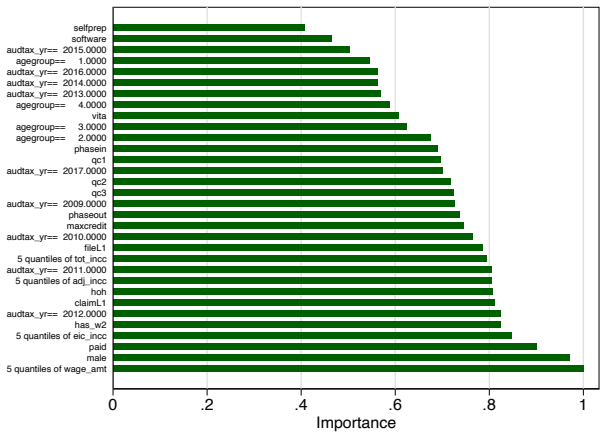
C. Audit Result = Disallowed with Active Agreement



D. Audit Result = Disallowed with Disagreement



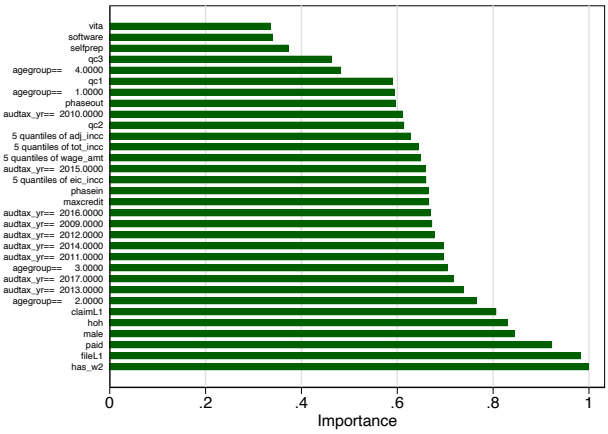
E. Audit Result = Allowed



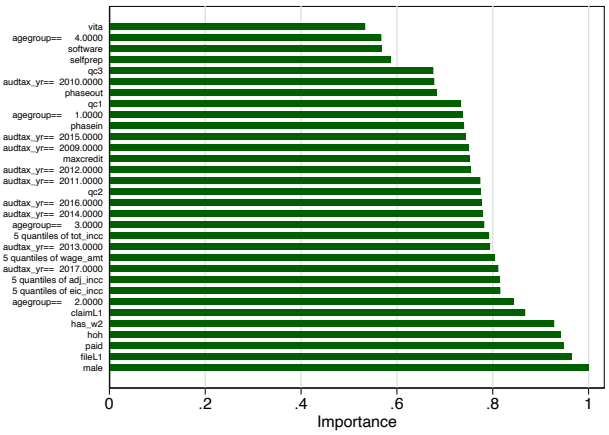
Notes: Importance values are computed based on using random forests to predict the specified audit outcome.

Appendix Figure 8.
Importance Factors for Predicting Audit Outcomes, Wage Earners

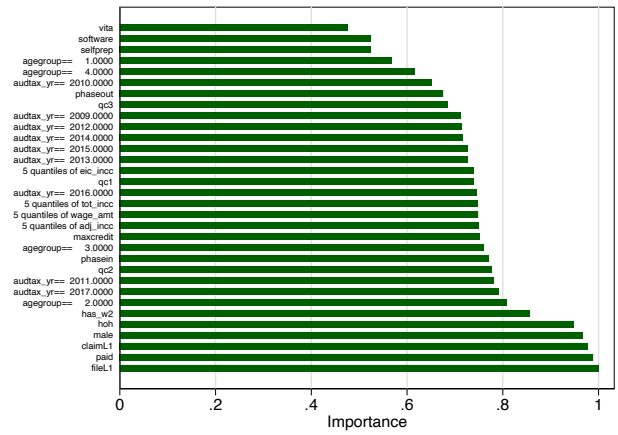
A. Audit Result = Undelivered



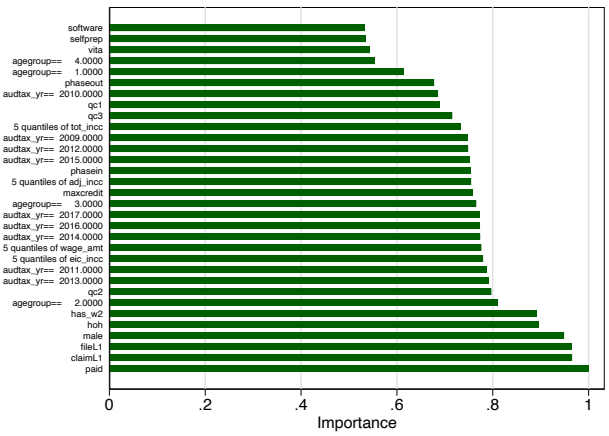
B. Audit Result = Nonresponse



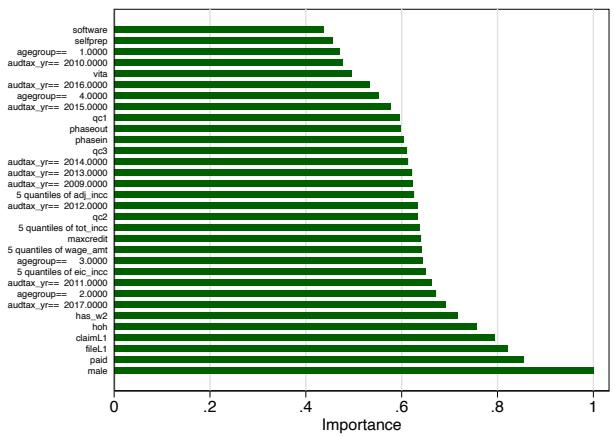
C. Audit Result = Disallowed with Active Agreement



D. Audit Result = Disallowed with Disagreement



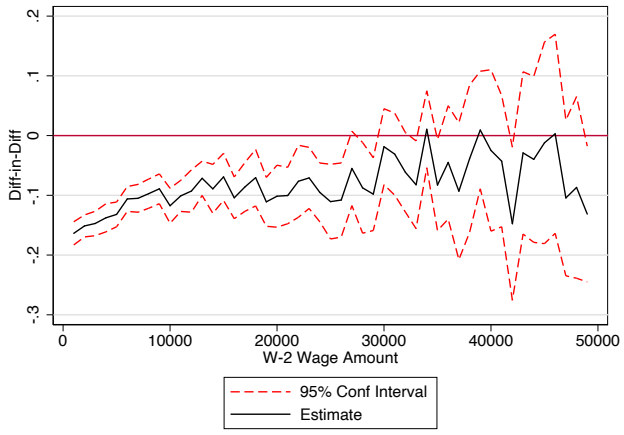
E. Audit Result = Allowed



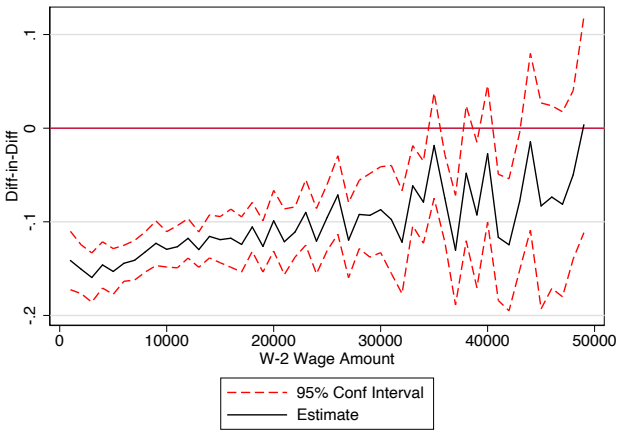
Notes: Importance values are computed based on using random forests to predict the specified audit outcome.

Appendix Figure 10.
Diff-in-Diff Estimates with 95% Confidence Intervals

A. Filing Conditional on Having W-2 with Specified Wage Amounts, Self-Employed



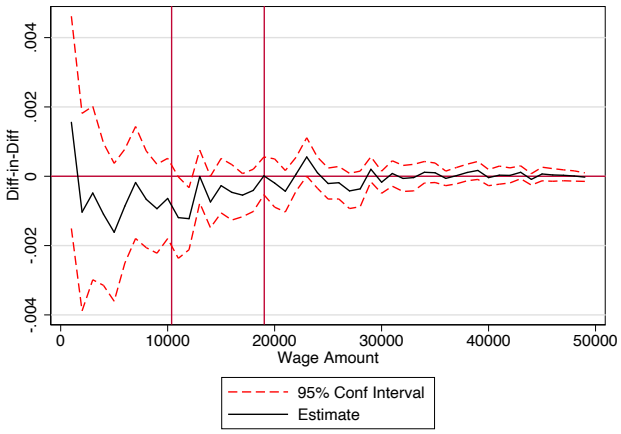
B. Filing Conditional on Having W-2 with Specified Wage Amounts, Wage Earners



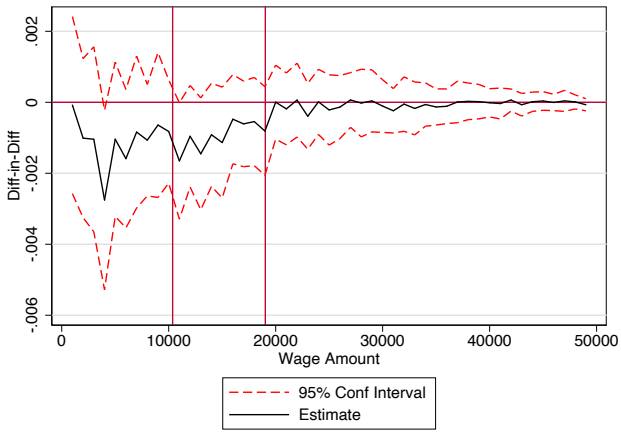
Notes: The distributional estimates are based on using observations in years 1 through 4 before and after the year of audit selection. Using this sample, for each outcome variable, we create indicator variables for values in specified bins and regress the indicator variables on a constant, an indicator for being in the audited sample, a "Post" indicator for being in the years after selection, and interaction between the audited and Post indicators. Standard errors are clustered based on 50 percentile bins of audit selection probabilities and the year of audit selection. The diff-in-diff estimate refers to the coefficient on the interaction term.

Appendix Figure 11.
Effects of EITC Correspondence Audits on Wage Distributions, Diff-in-Diff Estimates with 95% Confidence Intervals

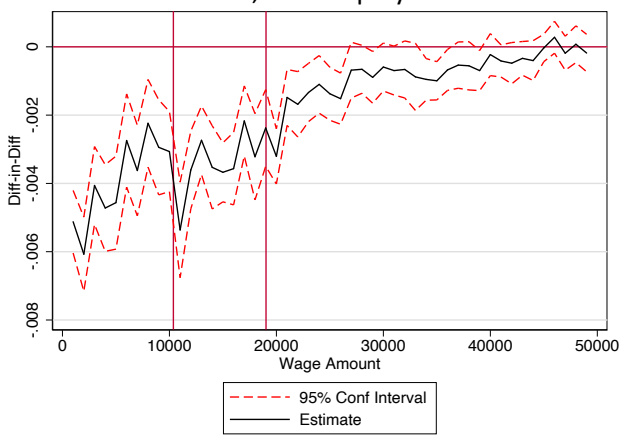
A. Distribution of W-2 Earnings, Self-Employed



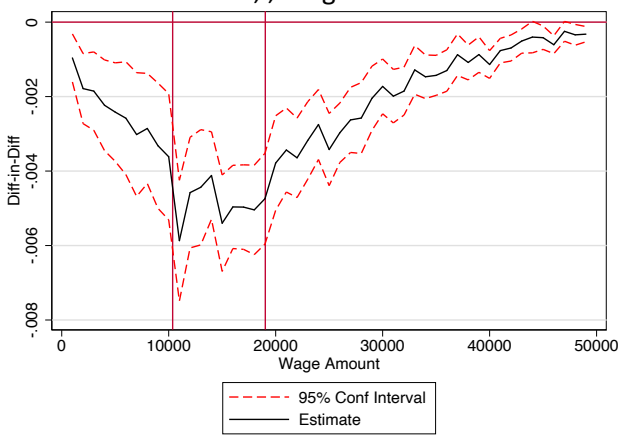
B. Distribution of W-2, Wage Earners



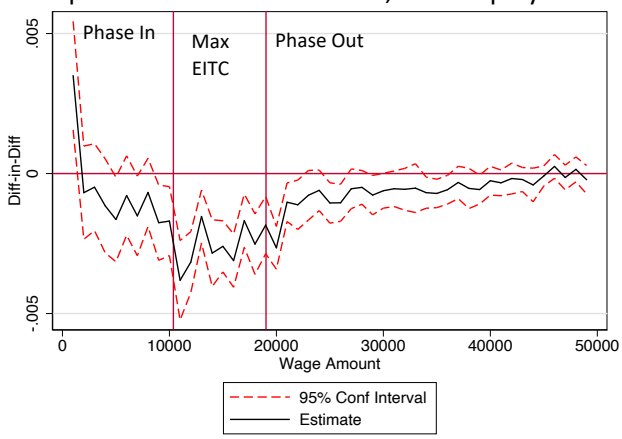
C. Distribution of Wages Reported on Filed Tax Return, Self-Employed



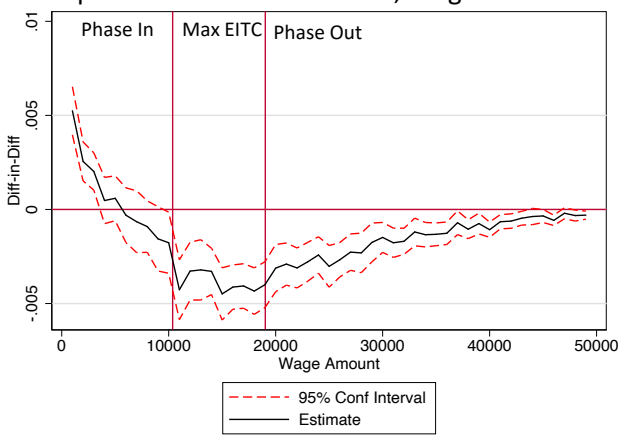
D. Distribution of Wages Reported on Filed Tax Return, , Wage Earners



E. Distribution of (Max) W-2 Wages or Wages Reported on Filed Tax Return, Self-Employed



F. Distribution of (Max) W-2 Wages or Wages Reported on Filed Tax Return, Wage Earners



Notes: The distributional estimates are based on using observations in years 1 through 4 before and after the year of audit selection. Using this sample, for each outcome variable, we create indicator variables for values in specified bins and regress the indicator variables on a constant, an indicator for being in the audited sample, a "Post" indicator for being in the years after selection, and interaction between the audited and Post indicators. Standard errors are clustered based on 50 percentile bins of audit selection probabilities and the year of audit selection. The diff-in-diff estimate refers to the coefficient on the interaction term. Vertical red lines depict 2019 values for EITC Kink 1 (the minimum earned income amount necessary for maximum EITC benefits) and EITC Kink 2 (the maximum earned income amount for maximum EITC benefits) for Head-of-Household 1 qualifying child.