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ABSTRACT

Each year, the United States Internal Revenue Service identifies taxpayers who may have erroneously claimed Earned Income Tax Credit (EITC) benefits and audits them through a mail correspondence process to verify their claims. This paper exploits the random variation arising from certain aspects of the audit selection process to estimate the impacts of these EITC correspondence audits on taxpayer behaviors. In the years after being audited, taxpayers are less likely to claim EITC benefits, and most of the reduction appears to be in EITC claims that may have been flagged for potential EITC noncompliance. Additionally, qualifying children on audited returns are more likely to be claimed by other taxpayers after the audits. These spillovers indicate that net overpayments may be less than gross overpayments, since ineligible qualifying children on audited returns could potentially be eligible qualifying children on other taxpayers' returns. Lastly, EITC correspondence audits affect real economic activity, as wage earners experience changes in the likelihood of having wage employment in the years after being audited.

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I. Introduction

In countries around the world, tax authorities rely on audits to enforce tax codes and improve tax compliance. This paper presents an analysis of operational audits conducted by the United States Internal Revenue Service (IRS) in the context of administering the Earned Income Tax Credit (EITC), and we examine three central topics for tax enforcement research: deterrence of erroneous or potentially inappropriate behaviors, spillovers to other taxpayers, and impacts on real economic activity as opposed to just tax reporting behaviors. Audits can generally be categorized into two groups: research audits and operational audits. Research audits are designed to verify data integrity and help tax authorities detect areas of noncompliance and assess gaps between revenues owed and taxes collected. Operational audits are tools to execute tax enforcement or complying with program rules and are generally not intended for research purposes. While a significant body of research has studied the impacts of research audits, little is known about the impacts of operational audits on taxpayer outcomes, possibly due to a lack of data on operational audits or insufficient institutional background on randomized variation in operational audits. This analysis aims to overcome these obstacles and provide insights into the impacts of operational audits on low-income earners' behaviors.

The EITC has become the United States' largest wage subsidy anti-poverty program, and the IRS is charged with administering this program. 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, there are also concerns about erroneous claims of EITC benefits.[1] Correspondence audits, conducted via mail, are a key enforcement tool to protect revenue and deter improper claims of EITC benefits. Historically, there are roughly 500,000 EITC correspondence audits each year.

We estimate the causal effects of these EITC correspondence audits on low-income earners' behavior by exploiting random variation within part of the audit selection process. We emphasize that overall audit selection is not random or arbitrary, but there is random selection within a

[1] For evidence on EITC noncompliance and erroneous payments of EITC benefits, see Holtzblatt (1991), McCubbin (2000), Blumenthal, Erard and Ho (2005) and Leibel (2014). Related to this literature, Saez (2010), Chetty Friedman and Saez (2013) and Mortenson and Whitten (2018) present evidence on taxpayers reporting self-employment income to maximize EITC benefits and tax refunds.

subsample of returns that are made available for audit. In particular, random variation conditional on observables arises from the following audit selection process. First, all tax returns are assessed for noncompliance risk. Next, returns with the greatest risk for noncompliance are made available for audit, and there is random selection among the subsample of returns with returns with low and intermediate risk scores. Thus, there is random selection only conditional on having low or intermediate risk scores. By focusing on this subsample of returns with low and intermediate risk scores for this study, we are able to estimate causal effects of EITC correspondence audits by comparing randomly-selected audited taxpayers to taxpayers who had similar risk scores but were randomly not selected for audit. The analysis includes EITC correspondence audits from tax years 2008 through 2015, and the analysis sample of taxpayers with low and intermediate risk scores consists of 432,219 audited self-employed taxpayers and 895,065 audited wage earner taxpayers. This sample is roughly one third of all EITC correspondence audits over this period. The analysis sample also includes 473,938 scored-but-not-audited self-employed taxpayers and 1,170,290 scored-but-not-audited wage earner taxpayers.

The analysis of audit outcomes shows that roughly 76% and 80% of the EITC correspondence audits for the self-employed and wage earner analysis samples have EITC benefits disallowed due to undelivered mail, nonresponse, or insufficient response (for example, this can be due to discontinued communications and not continuing to provide requested documentation). Each of these outcomes mechanically results in a full disallowance, so most audited individuals have EITC benefits mechanically. While a common assumption in tax administration research (and perhaps more broadly in public finance research) is that audits provide insight into "true" incomes for audited taxpayers, this result indicates that this assumption may not apply in the context of operational audits because of undelivered mail, nonresponse or insufficient response. Moreover, the widespread undelivered mail, nonresponse and insufficient response imply that a relatively small share of the EITC correspondences audits have confirmed ineligibility based on information verified with the audited taxpayer. As a result, Type 2 errors, which are cases with confirmed ineligible taxpayers claiming EITC benefits and having benefits fully disallowed, are only about 15% of all EITC correspondences audits.

While Type 2 errors on audited returns are relatively low, Type 1 errors based on potentially EITC-eligible taxpayers not claiming their EITC benefits increase for audited taxpayers after the EITC correspondence audits. For the self-employed and wage earner analysis samples respectively, in the year immediately after the audits, about 30 percent to 40 percent of audited taxpayers who may be potentially eligible for EITC benefits do not claim EITC benefits. In terms of dollars, for every $1 of EITC benefits that audited taxpayers are potentially eligible for in the year immediately after the audits, about $0.45 is unclaimed. These Type 1 errors fade out over subsequent years. However, the fade out is not driven by audited taxpayers resuming EITC claiming. Instead, the fade out is driven by nonaudited taxpayers decreasing their EITC claiming as qualifying children age out beyond EITC qualifying child age thresholds (younger than age 19 or younger than age 24 if a full-time student). Nonetheless, to assess the efficiency costs (deadweight losses) of the EITC correspondence audits, we consider the cumulative impact over years after the audience. The analysis indicates that for every $1 that is audited roughly $0.63 to $0.73 is unclaimed in years after the audits. While models and tax administration research often assume that audited taxpayers do not leave benefits on the table, the results from the analysis indicate that audited taxpayers may leave benefits on the table by not claiming EITC benefits and other refundable credits they may be eligible for and by not claiming excess withholdings.

Next, the results indicate that the EITC correspondence audits have spillover impacts on other taxpayers through qualifying children. In particular, some qualifying children on audited returns are subsequently claimed as dependents on other taxpayers' tax returns. For example, in the year after being audited, the likelihood of qualifying children on the audited return being claimed by the audited taxpayer deceases by about 0.24 and 0.25 for the self-employed and wage earner analysis samples respectively. About 67% (=0.16/0.24) and 52% (=0.13/0.25) of these respective decreases are due to the qualifying children not being claimed by any taxpayers, and the remaining 33% and 48% decreases are due to the qualifying children being claimed as dependents by other taxpayers. Models in tax administration research often assume that only audited taxpayers are affected by audits, but these results indicate that the operational audits have spillover impacts on other nonaudited taxpayers who subsequently claim the qualifying children on audited returns. Additionally, the qualifying child switching between taxpayers highlights a distinction between gross overpayments and net overpayments when trying to assess total dollars

over-spent in the context of the EITC correspondence audits. Gross overpayments will include overpayments to taxpayers incorrectly claiming qualifying children. However, if a different taxpayer should have claimed a qualifying child, then the (under)payment to the other taxpayer should be subtracted off of the gross overpayment to the audited taxpayer in order to assess the total overspending on EITC claims. Qualifying child switching accounts for roughly one third to one half of the qualifying child changes in the current analysis, so net overpayments could be significantly smaller than gross overpayments.

The analysis also indicates that EITC correspondence audits may affect real economic activity as opposed to just tax reporting outcomes. In particular, for audited wage earners who have wage employment (i.e. have a W-2) in the year of selection, there are decreases in the likelihood of having wage employment in the years just after the EITC correspondence audits, and the decreases are larger for taxpayers with younger (ages 0-5) qualifying children. Quantitatively, these estimated changes in wage employment imply a participation elasticity of about 0.28, which is consistent with prior quasi-experimental estimates of participation elasticities (see Chetty et al 2011). However, we note that there are multiple caveats to keep in mind since the EITC correspondence audits may affect several perceptions and factors beyond just labor supply incentives. For audited wage earners without a W-2 in the year of selection, there appear to be gradual increases in the likelihood of having a W-2 in the years after the audits. This may reflect gradual transitions from informal, cash-based employment to formal, W-2-documented employment after the EITC correspondence audits.

The analysis relates to prior tax enforcement research that has examined 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 effects of randomized audits in the United Kingdom, and perhaps most closely, DeBacker et al (2018) examine randomized IRS audits of EITC claimants. However, each of these studies examine impacts of research audits as opposed to operational audits. In particular, the IRS conducts research audits as part of the National Research Program (NRP). In the institutional background below, we discuss differences between the NRP audits and the EITC correspondence audits in detail, but to summarize, these audits

differ in multiple ways. First, in terms of population size, research audits are relatively expensive and therefore involve smaller sample sizes. For example, the IRS conducts roughly 15,000 research audits each year (DeBacker et al 2018) and over 1.5 million operational audits each year (see the annual IRS Data Book). Second, in terms of the nature of the audits, research audits often involve (possibly repeated) personal contact between a tax auditor and taxpayer via a phone call or in-person meeting, and the two parties work together to assess true income and true tax liability. In contrast, operational audits often do not involve personal contact between tax auditors and taxpayers (correspondence audits do not include personal contact, though field audits, which are less frequent, can involve personal contact). Furthermore, the operational audits do not provide taxpayers with tax auditors who assist them through the examination process. Thus, taxpayers may be confused by correspondence audits or may not learn as much as they would from a tax auditor. These factors can lead to nonresponse (which is much lower or negligible with research audits), and as a result, true income and true tax liability may never be observed. Given the widespread use of operational audits to enforce tax policies and policies in other settings, it is important for tax authorities, program administrators, and researchers to understand the impacts of both research audits and operational audits.

The remainder of this paper is organized as follows. Section II describes the institutional background on EITC correspondence audits and the administrative data used in the analysis. Section III describes the empirical analysis and results. Section IV concludes.

II. Institutional Background & Data

A. EITC Correspondence Audit Process

Each year, the IRS audits selected 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.[2] As indicated by the IRS Data Book statistics for fiscal years 2008 to 2016, there are roughly 400,000 to 500,000 correspondence audits of returns where EITC is claimed each year, compared to roughly 30,000 to 50,000 face-to-face audits of returns where EITC is claimed. These numbers have been declining over time due to reductions in the IRS budget. The statistics in Table 1 also highlight that EITC correspondence and field audits make up a large fraction of overall audits, with EITC correspondence audits being roughly 35% to 45% of all correspondence audits and EITC field audits being roughly 10% of all field audits.

The analysis in this paper focuses on comparing returns selected for EITC correspondence audits with similar returns that were not selected for any audits. While the exact criteria used to select tax returns for audit are not made public by the IRS, we 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 comparison to relevant third-party data and past tax filing history. Returns that are flagged with indicators of potential noncompliance are assigned one or more risk scores, depending on the nature of the flagged condition (such as the types of rules potentially broken and the number of rules potentially broken). Returns with greatest risk for noncompliance are made available for audit, and there is random selection among returns with intermediate- or low-risk scores (i.e. there is random selection conditional on observables using the low and intermediate risk scores; audit selection is *not* completely random or arbitrary).

Once an individual income tax return with EITC is assigned for a correspondence audit, a notification letter is automatically generated and sent to the taxpayer. This notice, which is typically a CP-75, informs the recipient that her tax return is being audited and requests the taxpayer submit more information or documentation to support claimed tax benefits, as applicable, which may include EITC, other refundable credits, and dependency exemptions.[3] The

[2] The 2016 IRS Data Book is available online at https://www.irs.gov/pub/irs-soi/16databk.pdf . The IRS Data Books for fiscal years 2010 through 2015 can be found at the same link but with adjustments to the numbers to correspond to the desired fiscal year.

[3] While the CP-75 notice explains that EITC, Additional Child Tax Credit (ACTC) and Premium Tax Credit benefits are on hold until the audit is resolved, CP-75A notices focus only on EITC benefits and do not impose a refund hold, and CP-75D notices specify holding only a portion of EITC benefits. Appendix Figure 1 presents an example of a CP-75 notice, and information on the notice, as well as an example, can be found on the IRS website at

type of supporting documentation requested depends on the issue that the taxpayer must substantiate, and examples of supporting documentation are provided on the notices. For example, recipients may be asked to show that a qualifying child (QC) meets the relationship requirement. In such a case, taxpayers may provide a birth certificate. School records may be used to demonstrate the residency requirement. Information on business income and expenses may be requested to verify self-employment businesses. The CP-75 notice informs the taxpayer that she has 30 days to respond and that her refund is on hold until the audit is resolved. CP-75 notices are typically sent within four to eight weeks after returns are filed. The majority of EITC correspondence audits are pre-refund audits: roughly 75% of correspondence audits that do not involve self-employment income are pre-refund audits, and roughly 90% of correspondence audits involving self-employment income are pre-refund audits.

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 of these cases, EITC is ultimately disallowed in full. If a taxpayer responds to the initial notice, the IRS will send a notice explaining whether more information is needed or if a decision was reached. If the EITC is disallowed, the taxpayer can: (1) respond to the notification and actively agree with the disallowance; (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. 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 tax returns. Prior reports (National Taxpayer Advocate 2007, Schneller Chilton and Bochum 2011 and Government Accountability Office 2014) have highlighted that nonresponse and insufficient response, potentially due to confusion, intimidation of the audit process, or undelivered mail are

https://www.irs.gov/pub/notices/cp75_english.pdf. We acknowledge that this example CP-75 focuses on the Premium Tax Credit rather than the EITC, but notices that focus on the EITC are similar, and we provide this example since it is the example that is published on the IRS website.

factors in some disallowances. We provide more details on the audits outcomes in the summary statistics described below.

In most cases, when EITC benefits are disallowed, taxpayers are notified of the change via Notice CP-79. This notice explains to taxpayers that to claim EITC benefits in the future, they must include Form 8862 with the filed tax return for the year in which they first claim EITC again.[4] Form 8862 includes questions to verify the taxpayer's eligibility for EITC benefits (and other potentially applicable refundable tax credits). Taxpayers may also be banned from claiming the EITC for the next two years (reckless disregard) or the next ten years (willful disregard).

In addition to the operational correspondence and field audits, the IRS also conducts research audits through the IRS National Research Program (NRP). These NRP audits are intended to help the IRS detect possible areas of noncompliance and assess its success and effectiveness in collecting tax revenues. In terms of sample sizes, NRP research audits are relatively expensive, so roughly 15,000 NRP audits are selected each year and the sample is weighted to create a sample that is representative of the national population of tax filers. The population for operational audits is not intended to be representative of the national population of all tax filers since the operational audit population only selects returns that may have potential noncompliance, and there are over 1.5 million operational audits (including all audits, not just EITC audits).

Appendix Figures 4 and 5 provide examples of the letter and notification documents sent to taxpayers who are selected for these research audits, we note multiple differences between these documents and the documents for the EITC correspondence audit documents. First, the letter for research audits explains that the return was selected at random to improve tax compliance and better understand fairness in the tax system. The letter also explains that there will be a telephone conversation between the tax auditor and taxpayer to explain the examination process, and the

[4] Appendix Figures 2 and 3 present examples of a CP-79 notice and a Form 8862 respectively. More information about the CP-79 notice is available on the IRS website at https://www.irs.gov/individuals/understanding-your-cp79-notice.

notice highlights that there may not be any errors on the tax return. Each of these elements are different from the EITC correspondence audit CP-75 notice.

Perhaps more important than the differences in notices, the nature of the research audits is significantly different from the operational audits. Research audits are intended to detect possible areas of noncompliance, but operational audits are conducted because risk factors have been detected. There are efforts made to contact and assist taxpayers through research audits and hence there are explicit goals to minimize nonresponse and confusion, and taxpayers may learn about rules and how to be tax compliant from tax auditors. In contrast, operational audits often involve single contacts to taxpayers with no assistance from a tax auditor. As a result, nonresponse and insufficient response can be important factors since taxpayers must navigate the examination processes themselves (possibly with their tax preparers) without the assistance of a tax auditor. As we document, nonresponse, insufficient response are common outcomes for operational audits, and these can lead to long-term impacts of the EITC correspondence audits.

B. Analysis Data

The data used in the empirical analysis is based on the population of tax returns that claimed EITC benefits and were scored for potential noncompliance from 2008 through 2015. The 2008 restriction is imposed because data for some mailed notices for EITC correspondence audits are only available from 2008 onward. The 2015 restriction is imposed so that outcomes can be observed for at least 1 year after selection for scoring, and outcome data are available through 2016.

The analysis data is constructed from this population of scored returns by imposing two sample restrictions. First, we focus only on single or head-of-household tax returns so that the analysis only requires tracking one individual (the primary taxpayer on the single or head-of-household return) 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 analysis data is determined by creating cells based on audit selection variables for each tax year, such as the

types of rules potentially broken, the number of rules broken, and risk scores. The sample is restricted to observations in cells that have both audited and nonaudited returns. This sample restriction ensures that there is a common support for the audit selection variables between the audited and scored-but-not audited samples. Observations in cells with only audited returns, such as high risk or multiple-issue (potentially breaking multiple rules) returns, are dropped since there are no observationally similar nonaudited returns for comparison. Similarly, observations in cells with only nonaudited returns are dropped since there are no observationally similar audited returns for comparison. After imposing these sample restrictions, we refer to the remaining sample as the "analysis sample," which consists of both audited and scored but not audited tax returns.

The analysis data and empirical analysis below are split into two analysis samples: 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." This split is motivated by 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). Furthermore, the analysis sample of EITC correspondence audits generally consists of single-issue audits as opposed to multiple-issue audits. For the Self-Employed the single issue is verifying the existence of self-employment business income; for the Wage Earners, the single issue is verifying qualifying child eligibility. Tax returns that are considered for multiple-issue audits are generally higher risk returns that are always selected for audit. For such returns, there are no comparable nonaudited returns, so such returns are dropped from the analysis sample based on the common support sample restriction described above. Lastly, we note that the definition of the self-employed and wage earner samples follows definitions from the 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, and some of these individuals may still have income reported as "wages, salaries, and tips" on their tax returns (IRS Form 1040). In the analysis below, we present separate results for wage earners with and without W-2s in the

year of selection. The analysis samples consist of 432,219 audited taxpayers for the self-employed analysis sample and 895,065 audited taxpayers for the wage earner analysis sample. These audits make up roughly one third of all EITC correspondence audits over the analysis time period (2008 through 2015). The analysis samples on returns with low and intermediate risk scores also include 473,938 scored-but-not-audited self-employed taxpayers and 1,170,290 scored-but-not-audited wage earner taxpayers.

C. Summary Statistics and Graphical Analysis

Table 2 presents summary statistics for the analysis samples used in the empirical analysis below.[5] The summary statistics are presented separately for the Self-Employed and Wage Earners, and for each of these groups, statistics are presented for the following subgroups: audited tax returns, scored but not audited returns, and a 1% random sample of EITC returns. For the 1% random sample of EITC returns, we correspondingly draw 1% random samples of single or head-of-household Self-Employed or Wage Earner EITC returns. We focus first on comparing the audited and scored but not audited returns to the random samples of EITC returns. We note that the analysis samples have a higher fraction male head-of-household tax returns, and the primary taxpayers in the analysis samples are slightly younger than those in the general EITC population. About 50% of the taxpayers in the self-employed analysis sample have a W-2, and this is slightly higher than the corresponding 45% figure for the comparable general EITC population. For the analysis sample of wage earners, about 86% and 95% of the audited and nonaudited taxpayers have W-2s, whereas about 97% of the random sample of EITC returns for wage earners have W-2s. Furthermore, the analysis samples have slightly lower incomes and higher refund amounts (and are more likely to be on the maximum credit portion of the EITC benefit schedule) then the random sample of EITC returns. The analysis samples have a higher fraction of returns with one qualifying child while the random sample of EITC returns is more evenly distributed across the numbers of qualifying children. Tax preparation methods appear

[5] We do not present summary statistics for the full EITC correspondence audit population because the IRS does not make these statistics on this population publicly available and because we aim to avoid any possible disclosure of audit selection criteria or risk assessment criteria based on comparisons between the lower-risk analysis samples and the full EITC correspondence audit population.

roughly similar across the analysis samples and the random samples of EITC returns with a majority of returns involving a paid tax preparer and use of software (electronic filing).

The audit characteristics for the self-employed and wage earner analysis samples indicate that, respectively 90% to 75% of the EITC correspondence audits are pre-refund audits. For the self-employed analysis sample, roughly 90% of the audits focus only on verifying Schedule C income and about 10% focus only on verifying qualifying child eligibility. For the wage earners analysis sample, roughly 96% of the correspondence audits focus only on verifying qualifying child eligibility. (Remaining audits could be multiple issue audits or may focus on other aspects of income verification beyond just Schedule C income verification.)

Table 3 presents audit outcomes for the analysis samples. Focusing first on the full sample results, the audit outcomes (which are mutually exclusive groups) highlight that almost 80% of the audits in the analysis samples have undelivered mail, nonresponse, or full disallowance with passive agreement. The full disallowance with passive agreement scenario arises if a taxpayer initially responds to a correspondence audit request for supporting information but then stops responding to additional subsequent requests for supporting information. For the self-employed and wage earner analysis samples respectively, roughly to 13% to 15% of EITC correspondence audits lead to a full disallowance with active agreement, and about 5% to 7% of EITC correspondence audits have a full allowance. Partial allowances constitute less than 2% of audit outcomes in the analysis samples.

Type 2 errors are cases in which ineligibility is confirmed, and in a strict sense, these cases only arise with outcomes of full disallowances with active agreement since the taxpayer's active agreement confirms the ineligibility causing the disallowance. Thus, overall, these audit outcomes indicate relatively low Type 2 error rates. More specifically, the relatively low Type 2 error rates appear driven by widespread undelivered mail, nonresponse and full disallowance with passive agreement. Given that roughly 15% of EITC correspondence audits result in confirmed Type 2 errors, within the analysis sample, in order to identify 100 cases with Type 2 errors, it is necessary to conduct about 667 EITC correspondence audits.

Table 3 also presents statistics on audit outcomes across various subgroups. Across all subgroups, undelivered mail, nonresponse and full disallowance with passive agreement generally account for most outcomes, and when rates of undelivered mail and nonresponse are lower, rates of both full allowances and full disallowances are higher. For both the self-employed and wage earner analysis samples, women have slightly lower rates of undelivered mail and nonresponse than men, and women have slightly higher rates of full allowances than men. Rates of undelivered mail are roughly constant across age groups, and nonresponse decreases slightly with age while full disallowance with active agreement and full allowance rates increase with age. Across income groups, undelivered mail and nonresponse rates decrease with higher income groups, and full allowance and full disallowance rates increase with income. (However, we note that, for wage earners, partial allowances appear to account for an unexpectedly large share (24%) of outcomes for taxpayers with earned income above $40,000.) Audited taxpayers with a paid tax preparer have higher rates of full allowances and full disallowances than audited taxpayers without paid tax preparers. Audited taxpayers with an EITC claim in the prior three years appear less likely to have undelivered mail and nonresponse and more likely to have full disallowances and full allowances than audited taxpayers without an EITC claim in the prior three years. Undelivered mail and nonresponse rates decrease across groups with more qualifying children, and rates of full allowances and full disallowances increase across groups with more qualifying children.

In the empirical analysis below, we examine heterogeneity in the effects of the EITC correspondence audits based on the age of the youngest qualifying child on the selected return, whether or not a taxpayer has a W-2 in the year of selection, and the estimated propensity scores. We discuss the motivations for each of these dimensions in more detail below, but in this section we discuss the differences in audit outcomes across these dimensions. For both the self-employed and wage earner analysis samples, audited taxpayers with younger qualifying children have slightly lower rates of full disallowance due to undelivered mail, nonresponse or insufficient response (passive disagreement) and slightly higher rates of allowances. Audited taxpayers without a W-2 in the year of selection have higher rates of undelivered mail, and among wage earners, this group has a lower rate of full allowance than wage earners with a W-2 in the year of selection (0.016 versus 0.078).

We discuss the propensity score estimation in the empirical analysis below, but the propensity score groups reflect groups with similar observables but different fractions of audited taxpayers. For example, the lowest quintile consists of the twenty percent of each respective analysis sample that has similar observables and the lowest fraction of audited individuals. Similarly, the highest quintile consists of the twenty percent of each analysis sample that has similar observables and the highest fraction of audited individuals. Across the quintile groups, the fractions of audited individuals are 0.006, 0.101, 0.434, 0.852 and 0.992 for the self-employed analysis sample and 0.006, 0.050, 0.226, 0.890 and 0.996 for the wage earner analysis sample. Even though the fractions of audited individuals very significantly across the groups, the audit outcomes for both analysis samples indicate that full disallowances due to undelivered mail, nonresponse, and insufficient response account for at least 70% of the outcomes for audited taxpayers in each group. Nonetheless, audited taxpayers in the lowest quintile do have higher rates of partial and full allowances than audited taxpayers in the highest quintile (0.166 versus 0.061 for the self-employed analysis sample and 0.149 versus 0.078 for the wage earner analysis sample.

Related to audit outcomes, Figure 1 presents plots of EITC claiming, tax filing and qualifying child claiming with separate series for the random sample of EITC returns and different audit outcome groups. Similar to the empirical analysis below, each outcome is examined both before and after the year of selection so that differences across the groups and across the years since selection can be visually inspected. The plots indicate mostly similar trends in the outcomes across the groups in the years prior to selection. In the years immediately after selection, the outcomes appear similar for the random sample of EITC returns, returns that were scored but not audited, and audited returns that ultimately had the EITC allowed. However, there are noticeably different trends after selection for returns that were audited and ultimately had the EITC disallowed. Following the audits, the returns with disallowances show decreases in the likelihood of claiming EITC benefits, decreases in the likelihood of filing tax returns, and increases in the likelihood that the qualifying children claimed on the audited returns are subsequently claimed by other taxpayers.

The graphical patterns suggest multiple insights. First, EITC disallowances due to correspondence audits may reduce subsequent EITC claiming, possibly through reductions in tax filing. Second, given that there do not appear to be sharp, differential changes in outcomes for audited taxpayers who ultimately have the EITC allowed, the effects of EITC correspondence audits on taxpayers may be driven primarily by the disallowances of EITC benefits as opposed to simply being selected for a correspondence audit and being sent a request for supplemental information. Third, EITC correspondence audits may have spillover effects on other nonaudited taxpayers through qualifying children who were previously claimed on an audited return but are subsequently claimed by other taxpayers.

IV. Empirical Analysis

A. Research Design

Our research design exploits the random variation in audit assignment to estimate the causal effects of the EITC correspondence audits on taxpayer outcomes. Because the random assignment of audit status is conditional on observables, we first re-weight the analysis data using inverse probability weighting, and we then estimate a generalized difference-in-difference regression specification using the re-weighted data. The difference-in-difference regression specification with the re-weighted data mimics an RCT (randomized controlled trial) in which the differences between the randomly assigned treatment (audited) and control (nonaudited) groups are estimated for each year before and after random assignment. For each outcome of interest, we present graphical evidence and regression estimates for differences between the audited and scored-but-not-audited (nonaudited) groups for each year before and after the year of selection and random assignment of audit status. The evidence for the years prior to the year of selection helps to confirm comparability of the groups prior to the year of selection. Even though pre-audit selection difference may be small or statistically insignificant, we present difference-in-difference estimates for the impacts of the EITC correspondence audits on outcomes of interest. Rather than just relying on post-audit selection differences, the difference-in-difference estimates explicitly subtract off any pre-selection differences between the audited and nonaudited groups from the post-audit selection differences. This allows us to be more confident that the estimates

reflect causal impacts of the EITC correspondence audits and not any other pre-existing difference between these groups.

We use inverse probability weighting to ensure that observables are balanced between the treatment and control group and eliminate bias due to selection on observables. The weights 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

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

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, $\widehat{\boldsymbol{p_i}} = \widehat{\boldsymbol{Pr}}(\boldsymbol{A_i} = \boldsymbol{1}|\boldsymbol{X_i})$ and use these predicted values to compute weights. We use weights $\widehat{\boldsymbol{w_i}} = \frac{\boldsymbol{1}}{\boldsymbol{1-\widehat{p}_i}}$ for the scored-but-not-audited individuals and $\widehat{\boldsymbol{w_i}} = \frac{\boldsymbol{1}}{\widehat{\boldsymbol{p}}_i}$ 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.

The covariates for estimating the weights include dummies for gender, head-of-household filing status, tax preparation method, year of birth, income percentile (measured in 50 two-percent bins), number of qualifying children claimed on the flagged return, and indicators for filing, claiming EITC and having a W2 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 broken, the number of rules broken, and the tax year of the return. Overall, the R^2 values from these regressions for computing the weights are 0.639 and 0.763 for the self-employed and wage earner analysis samples respectively.

Appendix Figure 6 presents the fraction audited by percentiles of the estimated propensity scores for both the self-employed and wage earner analysis samples. We note two features from these plots. First, for both analysis samples, observations with low and high estimated propensity scores do have respectively low and high fractions of taxpayers that were actually assigned to be audited. Thus, the observables used to predict audit assignment appear to correlate with the actual outcomes as expected. Second, there is a significant portion of the estimated propensity score distribution that has both substantial fractions of both audited and nonaudited taxpayers. These observations that have similar observables but different audit assignment will be "up-weighted", and the observations with observables that closely predict audit assignment (i.e. observations in the low and high ends of estimated propensity score distributions) will be "down-weighted." We also examine heterogeneity across groups with different estimated propensity scores below.

Appendix Table 1 presents summary statistics on the re-weighted samples. For both the self-employed and wage earner analysis samples, the re-weighted data reduce differences between the audited and scored-but-not-audited returns relative to the differences shown in Table 2 with the summary statistics for the un-weighted data. In particular, differences in gender are smaller for the self-employed relative to the difference in Table 2, and for wage earners, differences in gender, age, income and benefits measures are all smaller. We do not present formal statistical tests of these differences because the large sample sizes lead to statistical significance even for non-meaningful differences. Instead, in the empirical analysis below, we present graphical evidence on the re-weighted differences between the audited and nonaudited returns for several outcomes. This graphical evidence indicates that the differences based on the re-weighted data are close to 0 and stable in the years prior to audit assignment so that any difference can be subtracted off from the post-audit differences.

Using the re-weighted data, we use a difference-in-differences strategy to exploit the random variation in audit assignment and estimate the causal effects of the correspondence audits on taxpayer outcomes. First, we define event time as the years since the year of random assignment of audit status. 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 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:

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

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 nonaudited group for each event time. The standard errors for the coefficients are clustered based on tax year, the year of random assignment and the indicator for being audited or not. We plot the estimated $\boldsymbol{\beta^k}$ and $\boldsymbol{\delta^k}$ coefficients from the regressions. Additionally, we estimate difference-in-differences estimates of the impacts of the correspondence audits on outcome *y* at event time $\boldsymbol{k = +1, +2}$, ... by subtracting off the average pre-selection difference from the post-selection difference at event time *k*:

$$\boldsymbol{d^k = \delta^k - 0.333(\delta^{-2} + \delta^{-3} + \delta^{-4})}.$$

We examine a variety of outcomes for primary taxpayers on audited and scored-but-not-audited returns, including claiming EITC benefits, reporting self-employment income, filing a tax return (as either a primary or secondary taxpayer), and tax refund amounts. Additionally, we estimate a similar regression specification based on tracking qualifying children claimed on audited and nonaudited tax returns across tax years before and after being selected for risk assessment. In particular, the regression specification is the same as the regression specification described above, but instead of using the subscript *i* to refer to an individual taxpayer, the subscript *i* refers to a qualifying child claimed on an audited or scored-but-not-audited return. By tracking the qualifying children, we are able to examine the extent to which qualifying children on audited

returns are likely to be claimed as qualifying children by other taxpayers after the audits, as well as the characteristics of the (primary) taxpayers claiming audited qualifying children before and after the EITC correspondence audits.

B. Results

1. Impacts on EITC Claiming & Tax Outcomes

Figure 2 presents the estimated impacts of the EITC correspondence audits on EITC claiming, tax filing, and tax refunds for the self-employed and wage earner analysis samples. For the self-employed taxpayers, there are some differences between audited and nonaudited taxpayers in the pre-audit assignment trends for EITC claiming and tax filing. For the wage earner taxpayers, the pre-audit trends for these outcomes appear more similar for audited and nonaudited taxpayers. For both the self-employed and wage earner samples, the plots highlight that in the year just after audit assignment, there are significant decreases in EITC claiming and tax filing (as either a primary or secondary taxpayer) and tax refunds for the audited group relative to the nonaudited group.

Based on the difference-in-difference estimates in Table 4, the declines in the likelihood of filing are smaller than the declines in the likelihood of EITC claiming. This indicates that, in addition to reducing EITC claiming through decreases in filing, the EITC correspondence audits also appear to cause individuals to subsequently not claim EITC benefits even when they file tax returns. Over subsequent years after the EITC correspondence audits, the impacts on EITC claiming, tax filing and tax refunds fade out. This fade out could be due to qualifying children aging beyond the EITC qualifying child age thresholds (less than age 19 or less than age 24 for full-time students) so that EITC claiming, tax filing and tax refunds for the nonaudited group ultimately converge to the corresponding rates and values for the audited group.

The changes in EITC claiming following the EITC correspondence audits indicate that, for the low- and intermediate risk returns in the analysis samples, audited taxpayers appear to have Type 1 errors (cases of eligible taxpayers not claiming EITC benefits) in years after the audits. Using

the scored-but-not-audited taxpayers as a counterfactual for what EITC claiming would have been for the audited taxpayers had they not been assigned to the EITC correspondence audits, we compute a Type 1 error rate associated with not claiming potentially legitimate EITC benefits for each year after the audits by expressing the change in EITC claiming in each year after the audits as a fraction of baseline EITC claiming for the scored-but-not-audited taxpayers in each corresponding year after the audits. Intuitively, this fraction measures the likelihood of incomplete take-up of EITC benefits for potentially EITC-eligible taxpayers. These Type 1 error rates are presented in Table 4 for both the self-employed and wage earner analysis samples. The decreases in EITC claiming after the audits are significant relative to the baseline mean EITC claiming rates for the scored-but-not-audited groups: in the year just after the audits, the Type 1 error rates are between 0.33 and 0.43 for the self-employed and wage earner analysis samples respectively. Intuitively, among audited taxpayers who may be eligible to claim EITC benefits in the year after audit, about 33% and 43% of the self-employed and wage earner taxpayers respectively do not claim their EITC benefits. Over subsequent years, these effects on Type 1 errors fade out as the impacts on EITC claiming fade out.

We note that, in addition to leaving potential EITC benefits on the table, audited taxpayers may also leave benefits from other refundable tax credits (such as the Additional Child Tax Credit) or their federal income tax withholdings on the table after the EITC correspondence audits either by not claiming refundable credits on their tax returns when they file or by not filing tax returns at all. For example, when low-income earners do not file tax returns, they may leave potential tax refunds based on federal income tax withholdings on the table if they would have been in the 0% tax bracket and had no federal income tax liability. (If some audited individuals anticipate that they will no longer file tax returns after being audited, they may reduce their federal income tax withholdings so that they receive this income through wage earnings payments and not through a tax refund after filing. In separate analyses not shown, we do not observe any evidence of decreases in the likelihood of having withholdings. Instead, the likelihood of having withholdings and not filing increases after the EITC correspondence audits due to the decreases in the likelihood of filing.)

Similar to computing Type 1 errors based on EITC claiming, we also compute Type 1 errors based on dollar amounts by expressing the change in average tax refunds received after the audits (which accounts for changes in not claiming refundable credits and withholdings) as a fraction of the average tax refund received for the nonaudited group. These estimates are also shown in Table 4. Since tax refunds and EITC benefits conditional on tax filing and claiming are similar between the audited and nonaudited taxpayers in the analysis samples, these Type 1 errors based on dollar amounts are similar in magnitude to the Type 1 errors based on EITC claiming. Overall, in the year just after the audits, audited taxpayers appear to receive roughly $0.55 of every dollar of tax refunds that they would have been eligible for in the absence of the EITC correspondence audits.

We have examined heterogeneity in the impacts of EITC correspondence audits along various dimensions. Examining heterogeneity based on gender and the number of qualifying children is motivated by the prior literature on labor supply responses to EITC benefits particularly among single mothers. Examining heterogeneity based on access to a paid tax preparer is motivated by the intuition that paid tax preparers may mitigate any misperceptions and help with any corrections for taxpayers. Appendix Figure 7 presents the effects of the EITC correspondence audits on the likelihood of claiming EITC benefits splits by gender of the selected taxpayer, the number of qualifying children claimed on the selected return, and whether or not the selected taxpayer had a paid tax preparer. Overall, we do not find clear evidence of heterogeneity in the responses to the EITC correspondence audits based on these dimensions.

We also examine heterogeneity in the impacts of the EITC correspondence audits across ages of the youngest qualifying child claimed on the selected return. Intuitively, taxpayers with older qualifying children may not be leaving as much money on the table as taxpayers with younger qualifying children because older qualifying children may age out beyond the EITC qualifying age thresholds (less than age 19 or less than age 24 if a full-time student). Table 5 presents the effects of the EITC correspondence audits on EITC claiming and tax refunds received split by the age of the youngest qualifying child claimed on the selected tax return. For both the self-employed and wage earner analysis samples, these results indicate larger and more persistent decreases in EITC claiming and tax refunds received for taxpayers with younger qualifying

children. For the self-employed, the cumulative decrease in tax refunds over seven years after the audit selection is roughly $5500 for taxpayers with younger (ages 0-5) qualifying children and roughly $1100 for taxpayers with older (ages 13+) qualifying children. For the wage earners, the cumulative decrease in tax refunds over seven years after the audit selection is roughly $6100 for taxpayers with younger (ages 0-5) qualifying children and roughly $3800 for taxpayers with older (ages 13+) qualifying children.

2. Spillovers through Qualifying Children and Net Overpayments

Figure 3 illustrates the impacts of EITC correspondence audits on outcomes related to tracking the qualifying children claimed on audited and nonaudited returns.[6] The first outcome we examine for the qualifying children is an indicator equal to one if the qualifying child is claimed as a dependent by the primary taxpayer on the selected return in any years before or after the year of selection. These results, shown in plots A and B of Figure 3 for the self-employed and wage earner groups respectively, demonstrate that, just after the EITC correspondence audits, there is a sharp decrease in the likelihood that qualifying children on audited tax returns are claimed as dependents on subsequent tax returns by the selected taxpayers. This is consistent with the sharp decreases in the probabilities of claiming EITC benefits and filing tax returns for audited taxpayers in the years just after the audits.

We also examine changes in the likelihood of the qualifying children on selected returns being claimed as a dependent on any tax return (including those filed by other taxpayers). The results are show in plots C and D of Figure 3 for the self-employed and wage earners respectively. These plots show a decrease in the likelihood of being claimed as a dependent on any tax return. Turning to the quantitative results in Table 4, the difference-in-difference estimates indicate that, for the qualifying children in both the self-employed and wage earner groups, the decreases in the likelihood of being claimed as a dependent on any tax return is smaller (in absolute value)

[6] For the analysis of the sample of qualifying children, we include dummies for the ages (in years) of qualifying children when calculating the weights for the qualifying children. (These dummies are in addition to the variables included when calculating the weights for primary taxpayers.) This explicitly ensures that the age distribution is similar across the qualifying children in the audited and nonaudited groups. Thus, any differential patterns in the claiming of the qualifying children are not due to differences in the age distribution of the qualifying children across the audited and nonaudited groups.

than the decrease in the likelihood of being claimed as a dependent by the selected taxpayer. This indicates that while many of the qualifying children claimed on audited tax returns are not subsequently claimed on any tax returns after the EITC correspondence audits, many of the qualifying children also switch to being claimed as dependents by other taxpayers. Thus, the EITC correspondence audits appear to have spillovers to other taxpayers.

For the qualifying children in the self-employed group, in the year after being audited, the likelihood of being claimed by the selected taxpayer decreases by 0.24, and the likelihood of being claimed as a dependent on any tax return decreases by 0.16. Thus, the likelihood of being claimed as a dependent by another taxpayer increases by roughly 0.08. For the qualifying children in the wage earner group, in the year after being audited, the likelihood of being claimed by the selected taxpayer decreases by 0.25, and the likelihood of being claimed as a dependent on any tax return decreases by 0.13. Thus, the likelihood of being claimed as a dependent by another taxpayer increases by roughly 0.12. Over subsequent years after the EITC correspondence audits, the changes in the likelihood of being claimed as a dependent mostly fade out as qualifying children age beyond the age thresholds for being qualifying children (less than age 19 or less than age 24 if a full-time student). Overall, these results indicate that after the EITC correspondence audits, a relatively small share of all qualifying children claimed on audited returns are subsequently induced to not be claimed on any returns after the audits (roughly 0.16 and 0.13 of qualifying children on audited self-employed and wage earner returns respectively). This may indicate that taxpayers may generally be aware of tax benefits associated with claiming dependents and that current enforcement procedures may be effective at verifying the existence of qualifying children. However, the switching of qualifying children on audited returns to being claimed by other taxpayers may indicate that data or documentation for verification of EITC-qualifying relationships between taxpayers and qualifying children may be more difficult for current enforcement procedures or taxpayers to obtain.

Next, we examine EITC amounts associated with the qualifying children on audited and scored-but-not-audited returns. While EITC claiming may decrease for audited taxpayers after the audits, EITC amounts associated with qualifying children on audited returns may not decrease significantly since some of the qualifying children on audited returns are subsequently claimed

as dependents by other taxpayers. Plots E and F of Figure 3 show the changes in EITC amounts associated with the qualifying children, and the corresponding difference-in-difference estimates are presented in Table 4. Overall, the changes in EITC benefits associated with the qualifying children on audited returns are relatively small.

We have examined heterogeneity in the effects of the EITC correspondence audits along multiple dimensions. Similar to the analysis of heterogeneity in the effects on EITC claiming and tax outcomes, we not find much evidence of heterogeneity in the effects of the EITC correspondence audits on qualifying child outcomes along the dimensions of gender of the selected taxpayer, the number of qualifying children claimed on the selected tax return or the use of a paid tax preparer for the selected tax return. However, across ages of the qualifying children we find evidence that older qualifying children are more likely to not be claimed after the EITC correspondence audits, and younger qualifying children are more likely to switch to being claimed as dependents on other taxpayers returns. Table 5 present the effects of the EITC correspondence audits on the likelihood of being claimed by the selected taxpayer and by any taxpayer split by the age of the qualifying children in the year of selection. For both the self-employed and wage earner groups, there are larger decreases in the likelihood of being claimed by the audited taxpayer for the younger qualifying children than the older qualifying children, and there are larger decreases in the likelihood of being claimed as a dependent by any taxpayer for the older qualifying children than the younger qualifying children. We focus on the first year just after the audits, but these patterns continue for the other years after the audits as well. For the self-employed, the decrease in being claimed by any taxpayer accounts for about 83% (=.156/.189) of the decrease in being claimed by the selected taxpayer for older (ages 13+) qualifying children, and about 49% (=.129/.263) for younger (ages 0-5) qualifying children. Thus, the switching to being claimed as dependents by other taxpayers accounts for the remaining 17% for older qualifying children and about 51% for younger qualifying children. For the wage earners, the decrease in being claimed by any taxpayer accounts for about 71% (=.156/.221) of the decrease in being claimed by the selected taxpayer for older (ages 13+) qualifying children, and about 41% (=.109/.269) for younger (ages 0-5) qualifying children. Thus, the switching to being claimed as dependents by other taxpayers accounts for the remaining 29% for older qualifying children and about 59% for younger qualifying children.

These spillovers to other taxpayers claiming qualifying children on audited tax returns and the lack of sharp changes in EITC amounts associated with the qualifying children highlight the distinction between gross overpayments of EITC benefits and net overpayment of EITC benefits. Aggregate gross overpayments of EITC benefits will include any overpayments of EITC benefits arising from taxpayers erroneously claiming qualifying children. However, if some of the erroneously claimed qualifying children should have been claimed as qualifying children by other taxpayers who then would have received EITC benefits, then these underpayments of EITC benefits for these other taxpayers could be net out from the aggregate gross overpayments to determine how many dollars were actually overspent in aggregate. The results based on the current analysis samples indicate that roughly one third to one half of the changes in claiming qualifying children after audits can be accounted for by the qualifying children being claimed by other taxpayers, so aggregate net overpayments could be two-thirds or half as large as aggregate gross overpayments.

3. Impacts on Employment and Earnings

In this section we analyze the impacts of the EITC correspondence audits on real economic activity: specifically, wage employment and wage earnings.[7] Wage employment is measured based on having a Form W-2 reported by an employer to the IRS, and wage earnings are measured as the amounts reported on the W-2s. Before turning to any results, we discuss possible theoretical channels and mechanisms through which EITC correspondence audits may affect the likelihood of having a W-2 for wage employment.

First, a significant body of prior research on labor supply effects of EITC benefits has highlighted how the EITC provides incentives for individuals to participate in the labor force (i.e. extensive margin labor supply incentives) so that they have positive earned income and qualify

[7] We have also examined changes in the likelihood of having 1099-MISC (contractor employment) income. This analysis did not indicate any statistically significant or economically meaningful changes in the likelihood of having contractor employment income. Roughly ten to twenty percent of the taxpayers in the self-employed analysis sample have 1099-MISC income in any tax year, and roughly three to seven percent of taxpayers in the wage earner analysis sample have 1099-MISC income in any tax year.

for EITC benefits. If some audited taxpayers (possibly erroneously) perceive that they are no longer eligible for the EITC, labor force participation (the likelihood of having a W-2) may decrease after the EITC correspondence audits because of the perceived reduction in extensive margin labor supply incentives.

While this first channel is based on perceptions and losses of EITC incentives, a potential second channel through which the EITC correspondence audits may affects labor force participation is through the losses of EITC benefits and reduced tax refunds. The losses of benefits may leave audited taxpayers less able to finance to finance costs associated with employment (such as transportation and childcare costs). Moreover, since individuals with younger children are more likely to have childcare costs, these decreases in labor force participation may be larger for them.

The impacts of the EITC correspondence audits on the likelihood of having a W-2 for wage employment may also vary based on whether or not taxpayers have a W-2 at the time of audit selection. For example, in the year of selection, some wage earners may not have W-2s in the year of selection but may still have earned income from cash-based employment. After the EITC correspondence audits, these taxpayers may seek to obtain formal, W-2-documented employment instead of their informal, cash-based employment.

Based on these possible mechanisms, we present the impacts of the EITC correspondence audits on the likelihood of having a W-2 first for the full self-employed and wage earner analysis samples, and then we examine the impacts for taxpayers with and without a W-2 in the year of selection and based on the age of the youngest qualifying child. Figure 4 presents plots for the likelihoods of having wage employment for these groups, and Table 6 presents the corresponding difference-in-difference estimates. Plot A in Figure 4 for the self-employed analysis sample illustrates that there may be slight increases in the likelihood of having wage employment in the years after the audits, though these results are generally not statistically significant. Plot B of Figure 4 for the wage earner analysis sample shows gradual increases in the likelihood of having wage employment, and the change in the likelihood of having wage employment is statistically significant by seven years after the EITC correspondence audits. Plots C and D of Figure 4 for wage earners with and without W-2s in the year of selection respectively indicate that the

increases in wage employment appear to be driven by increases for wage earners who do not have W-2s in the year of selection. For wage earners who do have a W-2 in the year of selection, the graphical evidence indicates that decreases in the likelihood of having a W-2 for wage employment in the years after the audits relative to the years before. Furthermore, plot E indicates slightly larger decreases in wage employment for wage earners with a W-2 in the year of selection and with younger qualifying children, and plot F indicates slightly larger increases in wage employment for wage earners who do not have a W-2 in the year of selection and had younger qualifying children.

The estimates in Table 6 indicate that wage earners with a W-2 in the year of selection and younger (ages 0-5) qualifying children have a 0.03 decrease in the likelihood of wage employment in the year after the audits. To put the magnitude of this change in wage employment in perspective, we compute the implied extensive margin (labor force participation) elasticity. The numerator of the elasticity expresses the change in wage employment as a fraction of the baseline mean ($\frac{0.03}{0.93} = 0.032$). The denominator of the elasticity is the change in the average marginal net-of-tax rate. Since the marginal tax rates in the EITC phase-in portion of the benefit schedule are 0.34, 0.40 and 0.45 for taxpayers with one, two and three or more qualifying children respectively, we use the phase-in (subsidy) rate of 0.40 as a rough average marginal net-of-tax rate for audited taxpayers. Next, since the Type 1 error rate is EITC claiming is about 40% for wage earners, we assume that about 40% of audited wage earners perceive a loss of labor force participation incentives from losing EITC benefits. The denominator of the elasticity is then $(0.40) * \left(\frac{0.40}{1.40}\right) = (0.40 * .286) = 0.114$. Based on these assumptions, the implied participation elasticity is $\left(\frac{0.032}{0.114}\right) = 0.280$. We note that assuming a higher fraction of audited taxpayers perceiving losses in EITC labor force participation incentives implies a lower elasticity. In the extreme case that all audited taxpayers perceive losses of EITC participation incentives just after the audits, the implied participation elasticity is $\left(\frac{0.032}{0.286}\right) = 0.112$. Chetty et al (2011) survey evidence on extensive margin (labor force participation) elasticities and highlight that quasi-experimental evidence indicates elasticities of roughly 0.25 across a variety of settings. Thus, these estimates are consistent with this prior evidence. However, we note that there are multiple caveats to keep in mind. First, this estimate is based on transitions from being

employed to not having wage employment when losing EITC benefits. In contrast, prior EITC-based estimates of labor supply elasticities are based on transitions into employment when gaining larger EITC benefits. Second, the observed changes in labor force participation following the EITC correspondence audits may be driven by (mis)perceptions, qualifying child changes or other factors affected by the EITC correspondence audits and not just labor supply incentives.

We examine changes in the distributions of W-2 wages over subsequent years after being selected for the audited or nonaudited groups. For this analysis, we follow a distribution regression strategy by creating indicators for having W-2 wage earnings in $5000 wage bins centered around $0, $5000, $10000, … and ≥ $40000 and then estimating the above event time regression specifications separately for each indicator. These estimates are presented in Appendix Tables 2 and 3. Overall, the estimates for the $0 wage earnings bin are consistent with the extensive margin, wage employment results described above. For the other wage earnings bins, the results are frequently small and statistically insignificant, and there are no clear patterns of changes in the distributions of wage earnings emerge.

4. Heterogeneity Based on Estimated Propensity Score

We examine heterogeneity across across groups with different estimated propensity scores (i.e. different estimated probabilities of audit) to examine whether the results are robust to focusing explicitly on observations with similar observables but different audit assignment and to examine heterogeneity across groups with different fractions of observations that were assigned to be audited. As described above, when computing the inverse probability weights, we estimate the propensity score, or probability of being assigned to audit based on covariates that include the types of rules broken, numbers of rules broken and other audit selection variables. While it is not possible to present differences across groups with different types of roles broken or other specific audit selection variables because the IRS does not publicly disclose these variables, we are able to examine differences across groups with different estimated probabilities of being assigned to be audited.

Appendix Figure 6 presents the fraction of individuals that are audited by percentiles of the estimated propensity scores for both the self-employed and wage earner samples. The plots highlight that, while there are audited and nonaudited individuals in each percentile bin due to the common support sample restriction, the lowest percentiles and highest percentiles have relatively low overlapping audited and nonaudited individuals, while the middle percentiles have higher overlapping audited and nonaudited populations. Based on this overlap in the middle of the percentile distribution, we divide each analysis sample into quintiles (20 percentile bins) based on the estimated propensity scores and then focus on observations in the 2nd quintile (20th percentile up to 40th percentile), the 3rd quintile (40th percentile up to the 60th percentile) and the 4th quintile (60th percentile up to the 80th percentile). For the self- employed and wage earner samples respectively, the estimated probabilities of audit across these groups are roughly 0.10, 0.43 and 0.85 and 0.05, 0.23 and 0.89. Thus, observations in the 4th quintile have distinctly higher estimated probabilities of being audited than observations in the other two lower quintiles.

Figure 5 presents results across these different quintiles for the self- employed, wage earners with a W-2 in the year of selection, and wage earners without a W-2 in the year of selection. For each of these three samples, the figure includes plots of two outcomes, EITC claiming and having a W-2 for wage employment, across the three quintile groups based on the estimated probabilities of being audited. The plots for EITC claiming highlight that, for each sample, the groups with lower estimated probabilities of being audited (the 2nd and 3rd quintile) have sharper decreases in EITC claiming in subsequent years after the EITC correspondence audits than the quintile with the higher estimated probability of audit (the 4th quintile). Consistent with these results on EITC claiming across the quintiles, the plots for having a W-2 for wage employment show that the labor force participation patterns discussed above are most pronounced for the quintiles with the lower estimated probabilities of being audited (the 2nd and 3rd quintiles). Specifically, for wage earners with a W-2in the year of selection, the decrease in the likelihood of having a W-2 for wage employment just after the EITC correspondence audits are most pronounced for the 2nd and 3rd quintiles, and for wage earners without a W-2 in the year of selection, the gradual increase in the likelihood of having a W-2 for wage employment is more pronounced for the 2nd end 3rd quintiles. Intuitively, the EITC correspondence audits may be most surprising or unexpected for taxpayers in the lower quintiles, and taxpayers most

surprised by the audits may be most likely to discontinue claiming EITC benefits after the EITC correspondence audits and most likely to have the labor force participation changes described above.

Corresponding to the graphical evidence in Figure 5, Table 7 presents the difference-in-difference estimates across the samples and quintile groups. The decrease in EITC claiming are largest for the lower (2nd) quintile, and it is persistent for the self- employed and wage earners with a W-2 in the year of selection. In terms of dollars, the cumulative decreases in tax refunds received after the EITC correspondence audits are $7635, $8610 and $4926 for the lower (2nd) quintiles of the self- employed, wage earners with a W-2 in the year of selection and wage earners without a W-2 in the year of selection respectively. Turning to the estimates for having a W-2, in the year just after the EITC correspondence audits, the decrease in the likelihood of having a W-2 is 0.08 for the lower quintile of wage earners with a W-2 in the year of selection, and the decrease in the likelihood of having a W-2 appears to persist.

Overall, these results provide insights into possible heterogeneity and mechanisms behind the main impacts described above, and these results indicate that the main results are robust to dropping outliers with low or high estimated probabilities of audit (though this may not be surprising given that these observations would get relatively low weighting based on the inverse probability weighting).

5. Self-Employed EITC Maximizers

Prior analysis has documented widespread EITC maximizing or bunching behavior among EITC recipients with self-employment income (see Saez 2010, Chetty Friedman and Saez 2013 and Mortenson and Whitten 2018). Specifically, this behavior refers to EITC recipients with self-employment income reporting exactly or very close to EITC Kink 1, which is the minimum earned income necessary to receive maximum EITC benefits. Motivated by this prior research, we examine differences in audit outcomes and subsequent behaviors across different levels of earned income relative to EITC Kink 1. These results are presented in Figure 6. Plot A presents the distributions of earnings relative to EITC Kink 1 for the self-employed analysis sample and a

random sample of EITC recipients with self-employment income. The plot highlights that, consistent with the random sample of EITC recipients with self- employment income, there is widespread EITC maximizing behavior in the self-employed analysis sample, and the analysis sample consists of a higher fraction of taxpayers reporting earned income at or just around EITC Kink 1 relative to the random sample.

Plot B in Figure 6 illustrates that audit outcomes do not appear to very much across different levels of earned income relative to EITC Kink 1. The result that the full disallowance rate does not vary substantially around EITC Kink 1 may be striking given the clear spike in the distribution of returns at EITC Kink 1. However, this may be due to EITC correspondence audits verify only the existence of a self-employment business and not verifying specifically whether self-employment income or expenses are over- or under-reported.

Plots C through F of Figure 6 presents plots of EITC claiming across different levels of earnings relative to EITC Kink 1 and across different event times before and after the year of selection. These plots are constructed by categorizing taxpayers into bins of earned income relative to EITC Kink 1 in the year of selection, and then within each bin, we calculate the fraction of taxpayers in each bin who claim the EITC at different years before and after the year of selection. These plots illustrate that audited taxpayers with earned income close to EITC Kink 1 in the year of selection appear to have similar patterns as audited taxpayers with earned incomes further away from EITC Kink 1 in the year of selection. Thus, audited EITC maximizers appear to respond to the EITC correspondence audits similar to the way non-EITC maximizers respond. In each year after selection, the decrease in EITC claiming for audited taxpayers relative to nonaudited taxpayers is similar across different levels of earned income relative to EITC Kink 1. If EITC maximizers had larger (smaller) decreases in EITC claiming rates after the correspondence audits than non-maximizers, we would have expected more of a V-shaped (hump-shaped) pattern in the differences across earned income relative to EITC Kink 1. Based on these results, the factors behind EITC-maximizing or bunching decisions may be independent from the factors behind responses to the EITC correspondence audits. For example, among two EITC claimants with self-employment income, one may be more likely to report earned income

at EITC Kink 1 than the other, but when audited, these taxpayers appear equally likely to not respond (or not provide a sufficient response) and not claim EITC benefits subsequently.

6. Efficiency Costs of EITC Correspondence Audits

We consider two strategies to assess the efficiency costs (deadweight losses) associated with the cumulative effects of the EITC correspondence audits. The first approach is from a longitudinal perspective and the second approach is from a cross-sectional perspective. For the longitudinal perspective, we start by assuming that there are N returns that are audited. In each year k = 1, 2, ... after the audits, the change in the number of subsequent EITC claims is $N * \delta_k$ where δ_k is the estimated change in the probability of claiming EITC benefits k years after selection. The total change in EITC claims across multiple years after the audits is then $\sum_{k=1}^{7} N * \delta_k$, so the ratio of the total change in EITC claims to the number of audited claims is given by

$$\Delta = \frac{\sum_{k=1}^{7} N * \delta_k}{N} = \sum_{k=1}^{7} \delta_k$$

The cumulative difference-in-difference estimates therefore reflect the cumulative impacts of an audit on subsequent EITC claims and tax filing. Similarly, the sum of the difference-in-difference impacts on tax refunds can be divided by the amount of dollars audited in the year of selection to estimate the total (cumulative) change in dollars of tax refunds per dollar audited.

Based on the yearly impacts shown in Table 4, Table 8 presents the estimated cumulative difference-in-difference impacts with standard errors. The cumulative impacts for the self-employed analysis sample imply that, for every 100 EITC correspondence audits of this sample, over subsequent years there are roughly 33 fewer EITC claims, 13 fewer filed tax returns, and cumulative tax refunds decrease by roughly $3200 per audited individual (beyond the amount disallowed on the selected return). In terms of audited dollars, for every $1 dollar of tax refunds that is subject to an EITC correspondence audit, total future tax refunds are lower by roughly $0.72. For the wage earners, the cumulative impacts imply that for every 100 EITC correspondence audits of this sample, over subsequent years there are roughly 68 fewer EITC claims and 14 fewer filed tax returns, and cumulative tax refunds decrease by roughly $3800 per

audited individual. For every $1 of tax refund that is subject to an EITC correspondence audit for the wage earner sample, total future tax refunds are lower by roughly $0.63. Since 15% of audits result in full disallowances with confirm ineligibility, these estimates could be multiplied by 6.67 (=1/0.15) to put the impacts in terms of dollars of EITC benefits disallowed with confirmed ineligibility.

Taking a cross-sectional perspective, we examine the cumulative impacts of the EITC correspondence audits in terms of changes in the annual EITC participation (take-up) rate in each year. We suppose that there are N EITC-eligible individuals in a given year. Within this population, we assume that there is a fraction of individuals who are k=1, 2, … years since they were audited. We denote this fraction by a_k so the fraction of individuals who have never been audited is given by $1 - \sum_{k=1}^{7} a_k$. For the individuals who have never been audited, we assume the baseline EITC participation rate is θ, and for individuals who have been audited, this baseline participation rate is reduced due to the audits to $\theta(1 - d_k)$ where d_k is the estimated percentage reduction in the probability of claiming EITC benefits (i.e. the difference-in-difference estimate at event time k divided by the fraction of the nonaudited group claiming the EITC at event time k; these estimates are presented in Appendix Table 1). The overall EITC participation rate is the given by

$$\Delta part = \frac{N(1 - \sum_{k=1}^{7} a_k)\theta + (\sum_{k=1}^{7} N a_k \theta(1 - d_k)}{N} = \theta[1 - \sum_{k=1}^{7} a_k d_k]$$

Thus, $[1 - \sum_{k=1}^{7} a_k d_k]$ reflects the percent change in the EITC participation rate (i.e. in the absence if the audits, the baseline participation rate would have been θ, but since some EITC eligible individuals have been audited, the participation rate is reduced). For a back-of-the-envelope calculation, we assume that the EITC population is constant each year at 25 million returns, that there are 500,000 audits each year so that $a_k = a = 0.02$, and that the estimated impacts of the audits apply to all audited individuals. This last assumption would be an upper bound on the number of taxpayers that the current estimates could apply, though it is not clear whether or not taxpayers with higher risk returns would respond similarly to taxpayers with lower risk returns. Using the difference-in-difference estimates as a fraction of baseline EITC

claiming for the nonaudited group, we calculate $[1 - \sum_{k=1}^{7} a_k d_k]$ =$[1 - (0.02) \sum_{k=1}^{7} d_k] =$ 0.988 for the self-employed and 0.971 for wage earners. Thus, because of some individuals having previously experienced the EITC correspondence audits, the EITC participation rate may be roughly one to or three percent lower in each year.

V. Conclusions

While prior studies have often focused on randomized research audits, this project exploits random variation inherent in audit processes to estimate how operational audits affect taxpayer behaviors. Research audits typically involve tax auditors making direct contact with audited taxpayers and assisting them through the examination process, whereas operational EITC correspondence audits do not involve such direct contact or assistance. The empirical analysis documents that roughly 80% of EITC correspondence audits in the analysis sample have outcomes of undelivered mail, nonresponse and full disallowance with passive agreement. As a result, true incomes are often never observed in these audits (even though this is often a common assumption in tax enforcement models of audits), and Type 2 error corrections (cases of disallowances with confirmed ineligibility) make up only 15% of EITC correspondence audits in the analysis sample.

The analysis provides insights for three central topics in tax enforcement: deterrence, spillovers and impacts on real economic activity. Regarding deterrence, there are significant decreases in EITC claiming and tax filing following the audits, but some audited taxpayers may leave benefits on the table by foregoing potentially legitimate EITC claims or not claiming tax refunds based on excess withholding. Regarding spillovers, qualifying children on audited tax returns are often claimed by other taxpayers after the audits, so the EITC correspondence audits appear to cause spillovers to these taxpayers. Regarding changes in real economic activity, audited taxpayers have changes in the likelihood of having wage employment in the years after the EITC correspondence audits, and the changes appear larger for taxpayers with younger (ages 0-5) qualifying children than older (ages 13+) qualifying children.

The impacts on many outcomes appear to fade out over subsequent years. This fade out can be drive by qualifying children aging beyond EITC qualifying child age thresholds thereby causing the EITC claiming rate for the nonaudited group to gradually converge to the lower EITC claiming rate of the audited group. Future research may consider the impacts of soft-touch post-audit assignment outreach to audited and nonaudited taxpayers. For example, clarifications on rules may be sent to taxpayers filing intermediate-risk returns but who are not randomly selected for audit. Similar clarifications of rules and reminders to file could be sent to audited taxpayers in the years after audit. Overall, further research can help improve the design and efficiency of operational audits by aiming to reduce undelivered mail and increase appropriate responses and by aiming to decrease potential mistakes by taxpayers in years after the EITC correspondence audits.

References

Advani, A., Elming, W., & Shaw, J. (2017). The dynamic effects of tax audits (No. W17/24). Institute for Fiscal Studies.

Bastian, J., & Michelmore, K. (2018). The Long-Term Impact of the Earned Income Tax Credit on Children's Education and Employment Outcomes. Journal of Labor Economics, forthcoming.

Blumenthal, M., Erard, B., & Ho, C. C. (2005). Participation and compliance with the earned income tax credit. National Tax Journal, 189-213.

Chetty, R., Friedman, J. N., & Saez, E. (2013). Using Differences in Knowledge across Neighborhoods to Uncover the Impacts of the EITC on Earnings. American Economic Review, 103(7), 2683-2721.

Chetty, R., Guren, A., Manoli, D., & Weber, A. (2011). Are micro and macro labor supply elasticities consistent? A review of evidence on the intensive and extensive margins. *American Economic Review, 101*(3), 471-75.

Dahl, G. B., & Lochner, L. (2012). The impact of family income on child achievement: Evidence from the earned income tax credit. American Economic Review, 102(5), 1927-56.

Dahl, Gordon B., and Lance Lochner. 2017. "The Impact of Family Income on Child Achievement: Evidence from the Earned Income Tax Credit: Reply." *American Economic Review*, 107(2): 629-31.

DeBacker, J., Heim, B. T., Tran, A., & Yuskavage, A. (2018). The Effects of IRS Audits on EITC Claimants. *National Tax Journal, 71*(3), 451-484.

Eissa, N., & Liebman, J. B. (1996). Labor supply response to the earned income tax credit. The Quarterly Journal of Economics, 111(2), 605-637.

Evans, W. N., & Garthwaite, C. L. (2014). Giving mom a break: The impact of higher EITC payments on maternal health. American Economic Journal: Economic Policy, 6(2), 258-90.

Government Accountability Office, (2014). "IRS Correspondence Audits: Better Management Could Improve Tax Compliance and Reduce Taxpayer Burden." Report to the Committee on Finance, U.S. Senate. GAO-14-479.

Holtzblatt, J. (1991). Administering Refundable Tax Credits: Lessons from the EITC Experience. In Proceedings of the Annual Conference on Taxation Held under the Auspices of the National Tax Association-Tax Institute of America (Vol. 84, pp. 180-186). National Tax Association.

Hoynes, H., Miller, D., & Simon, D. (2015). Income, the earned income tax credit, and infant health. American Economic Journal: Economic Policy, 7(1), 172-211.

Hoynes, H. W., & Patel, A. J. (2018). Effective policy for reducing poverty and inequality? The Earned Income Tax Credit and the distribution of income. *Journal of Human Resources*, *53*(4), 859-890.

Kleven, H., Knudsen, M., Kreiner, C., Pedersen, S., & Saez, E. (2011). Unwilling or Unable to Cheat? Evidence from a Tax Audit Experiment in Denmark. *Econometrica*, 79(3), 651-692.

Leibel, K. (2014). "Tax Compliance and Sources of Error for the Earned Income Tax Credit Claimed on 2006-2008 Returns." Internal Revenue Service, Technical Paper.

Lundstrom, Samuel. 2017. "The Impact of Family Income on Child Achievement: Evidence from the Earned Income Tax Credit: Comment." *American Economic Review*, 107(2): 623-28.

Manoli, D., & Turner, N. (2018). Cash-on-Hand & College Enrollment: Evidence from Population Tax Data and the Earned Income Tax Credit. American Economic Journal: Economic Policy, forthcoming.

Maxfield, M. (2013). The effects of the Earned Income Tax Credit on child achievement and long-term educational attainment. Michigan State University Job Market Paper. November.

McCubbin, J. (2000). EITC noncompliance: The determinants of the misreporting of children. National Tax Journal, 1135-1164.

Meyer, B. D. (2010). The Effects of the Earned Income Tax Credit and Recent Reforms. *Tax policy and the economy*, *24*(1), 153-180.

Meyer, B. D., & Rosenbaum, D. T. (2001). Welfare, the earned income tax credit, and the labor supply of single mothers. The quarterly journal of economics, 116(3), 1063-1114.

Mortenson, J., & Whitten, A. (2017). "Bunching to Maximize Tax Credits: Evidence from Kinks in the US Tax Schedule." American Economic Journal: Economic Policy, forthcoming.

National Taxpayer Advocate (2007). "2007 Annual Report to Congress" Volume 2.

Saez, E. (2010). Do taxpayers bunch at kink points?. American Economic Journal: Economic Policy, 2(3), 180-212.

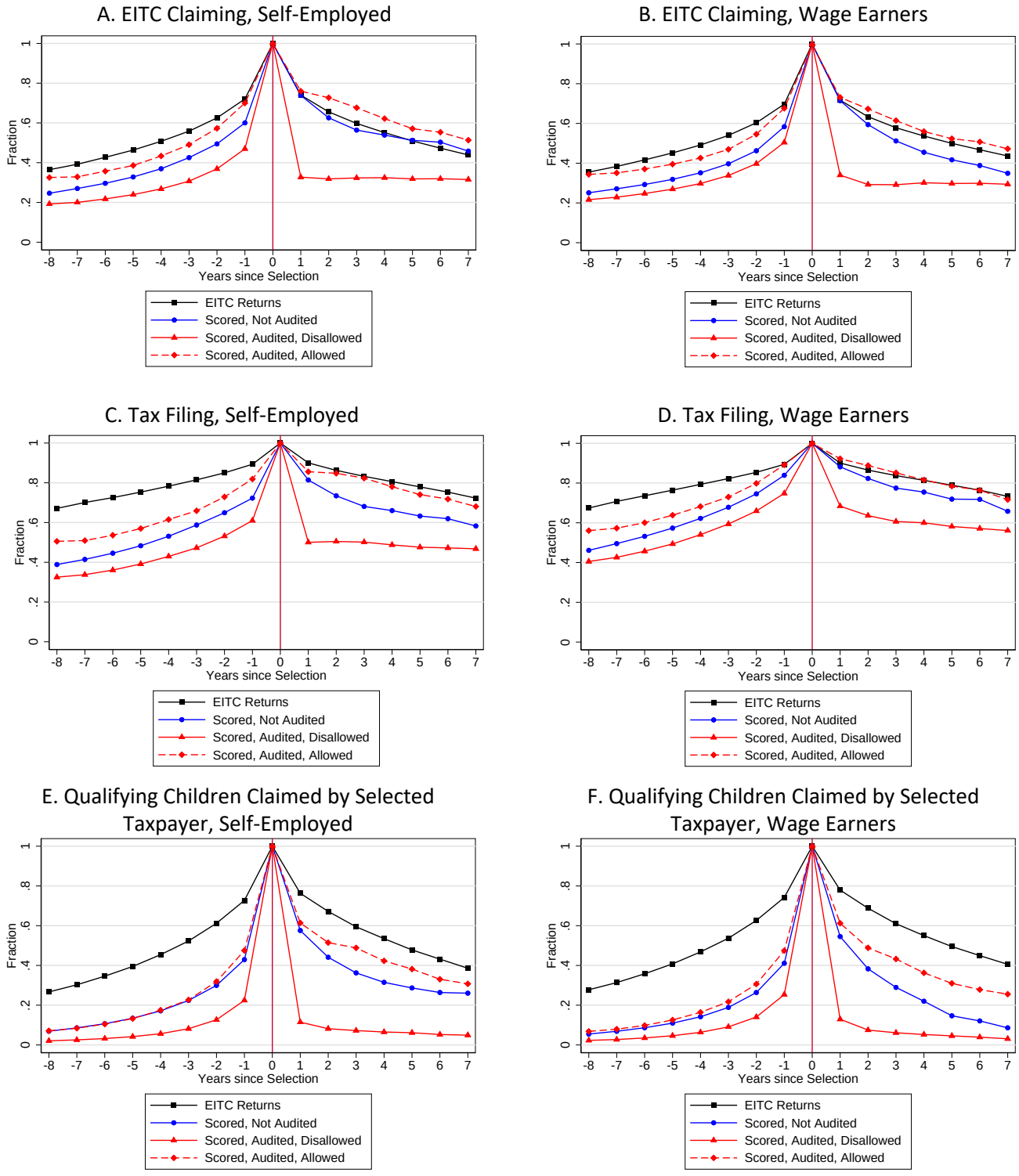
Schneller, J. P., Chilton, A. S., & Boehm, J. L. (2011). The Earned Income Tax Credit, Low-Income Workers, and the Legal Aid Community. Colum. J. Tax L., 3, 176.

Slemrod, J. (2016). "Tax compliance and enforcement: New research and its policy implications." University of Michigan, Ross School of Business working paper 1302.

Slemrod, J., Blumenthal, M., & Christian, C. (2001). Taxpayer response to an increased probability of audit: evidence from a controlled experiment in Minnesota. Journal of public economics, 79(3), 455-483.

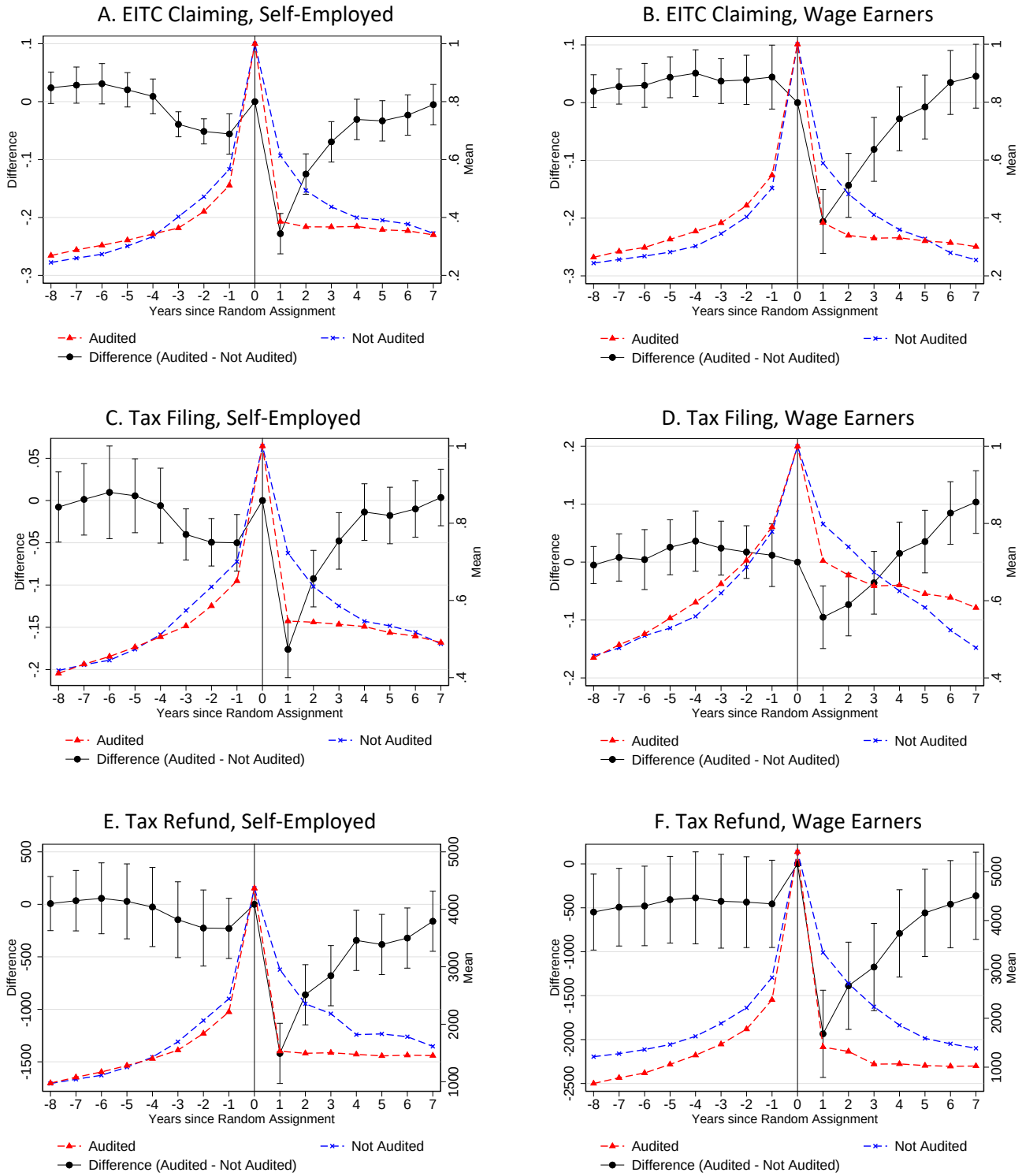
Strully, K. W., Rehkopf, D. H., & Xuan, Z. (2010). Effects of prenatal poverty on infant health: state earned income tax credits and birth weight. American Sociological Review, 75(4), 534-562.

Figure 1.
Background Patterns for Analysis Sample



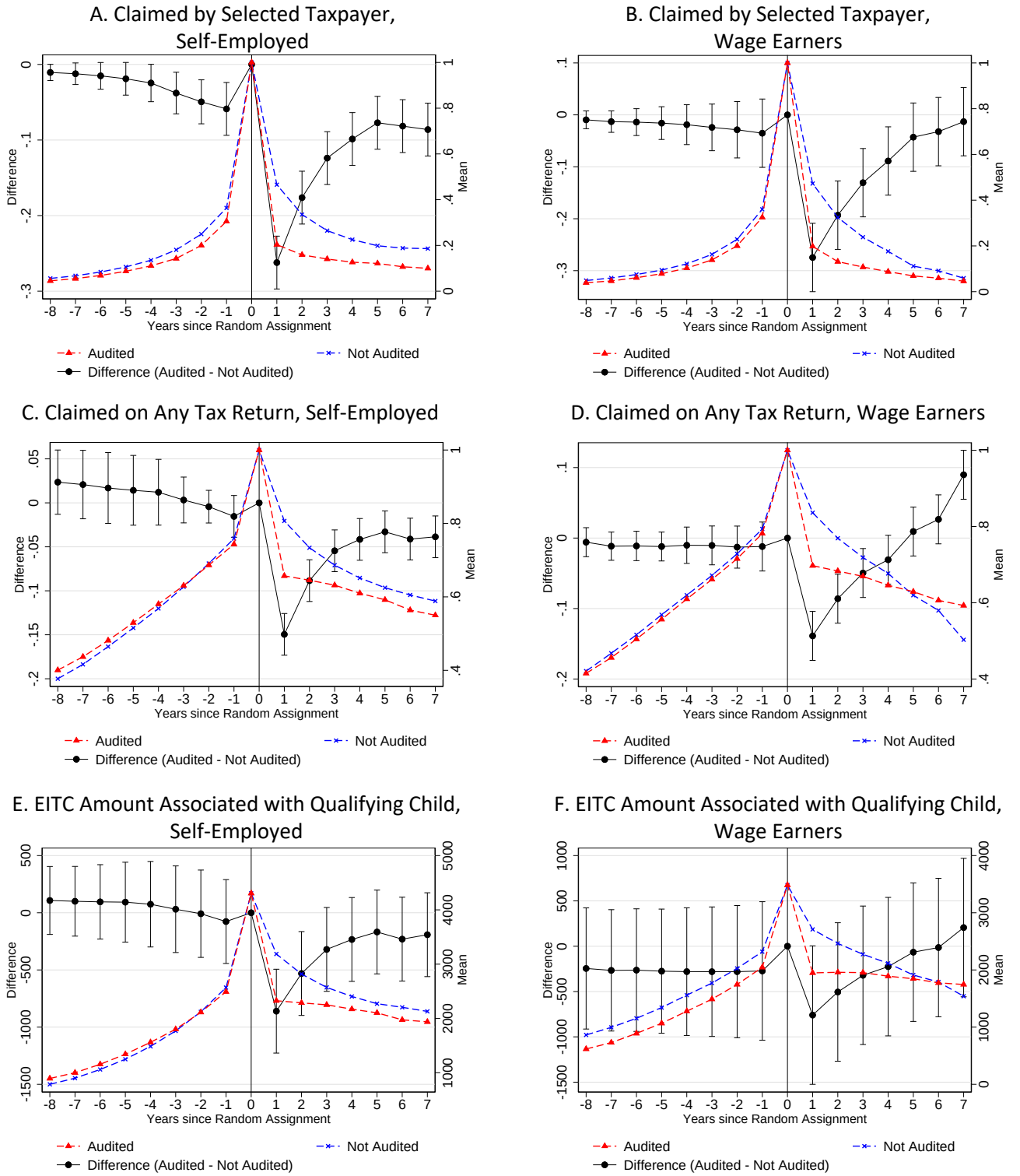
Notes: Each plot is constructed by computing fractions of the specified outcome for each sample by years since selection. The year of selection refers to the year a return is selected for risk scoring and random assignment to audit or non-audit status. The EITC Return sample is a 1% random sample of EITC returns for tax years 2008 through 2015, and the year of selection refers to the year the return is randomly drawn. Data used in creating these plots is unweighted.

Figure 2.
Effects of EITC Correspondence Audits on Tax Outcomes



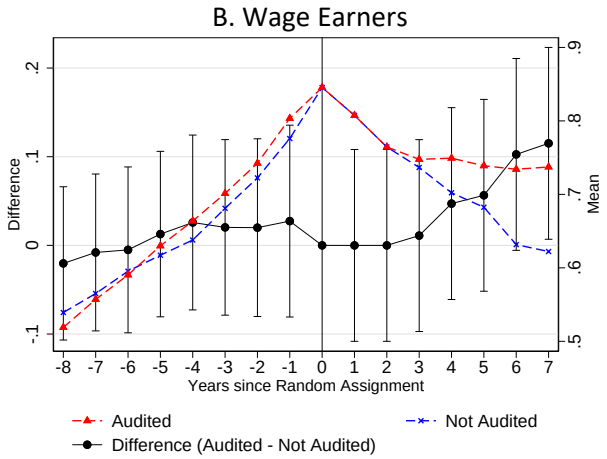
Notes: Each plot illustrates estimated regression coefficients from regressing the outcome variable specified in the plot title on event time dummies, an indicator for being an audited individual, interactions between the event time dummies and the audited indicator. The difference estimates and standard 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 tax year and audit assignment group (audited or non-audited) and the year of selection.

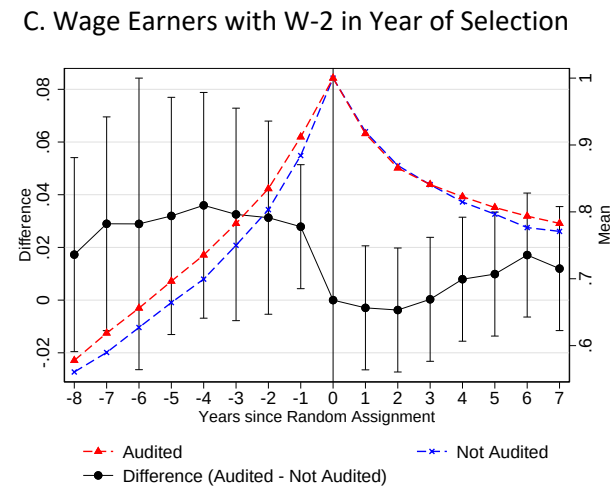
Figure 3.
Effects of EITC Correspondence Audits on Qualifying Child Outcomes

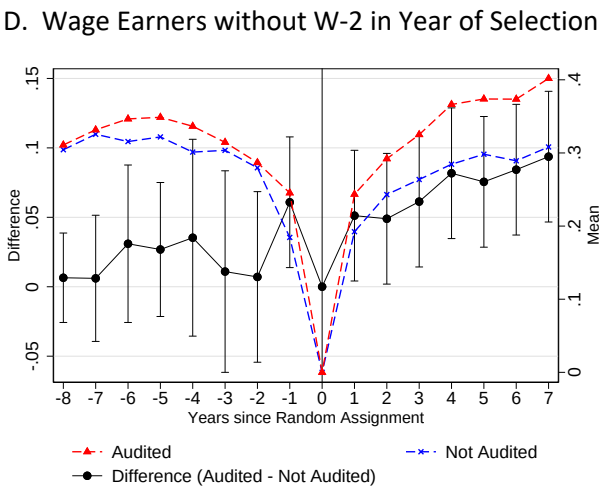


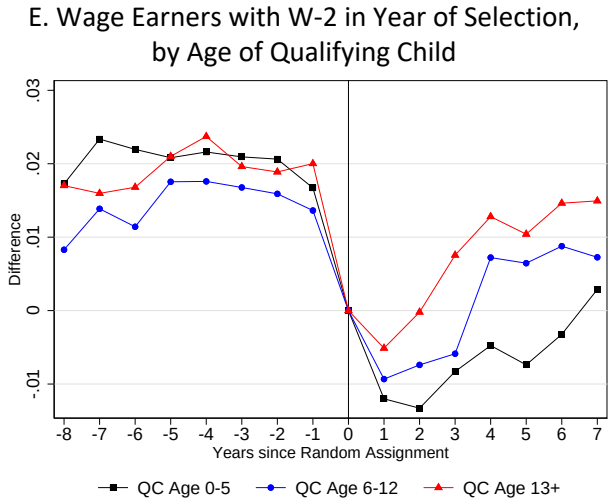
Notes: Each plot illustrates estimated regression coefficients from regressing the outcome variable specified in the plot title on event time dummies, an indicator for being an audited individual, interactions between the event time dummies and the audited indicator. The difference estimates and standard 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 tax year and audit assignment group (audited or non-audited) and the year of selection.

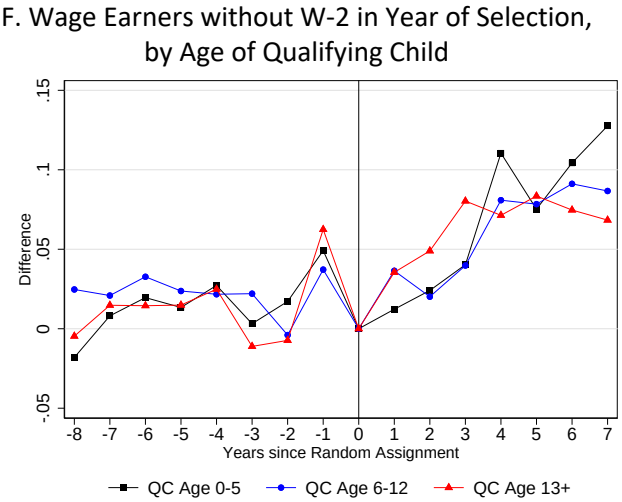
Figure 4.
Effects of EITC Correspondence Audits on Wage Employment





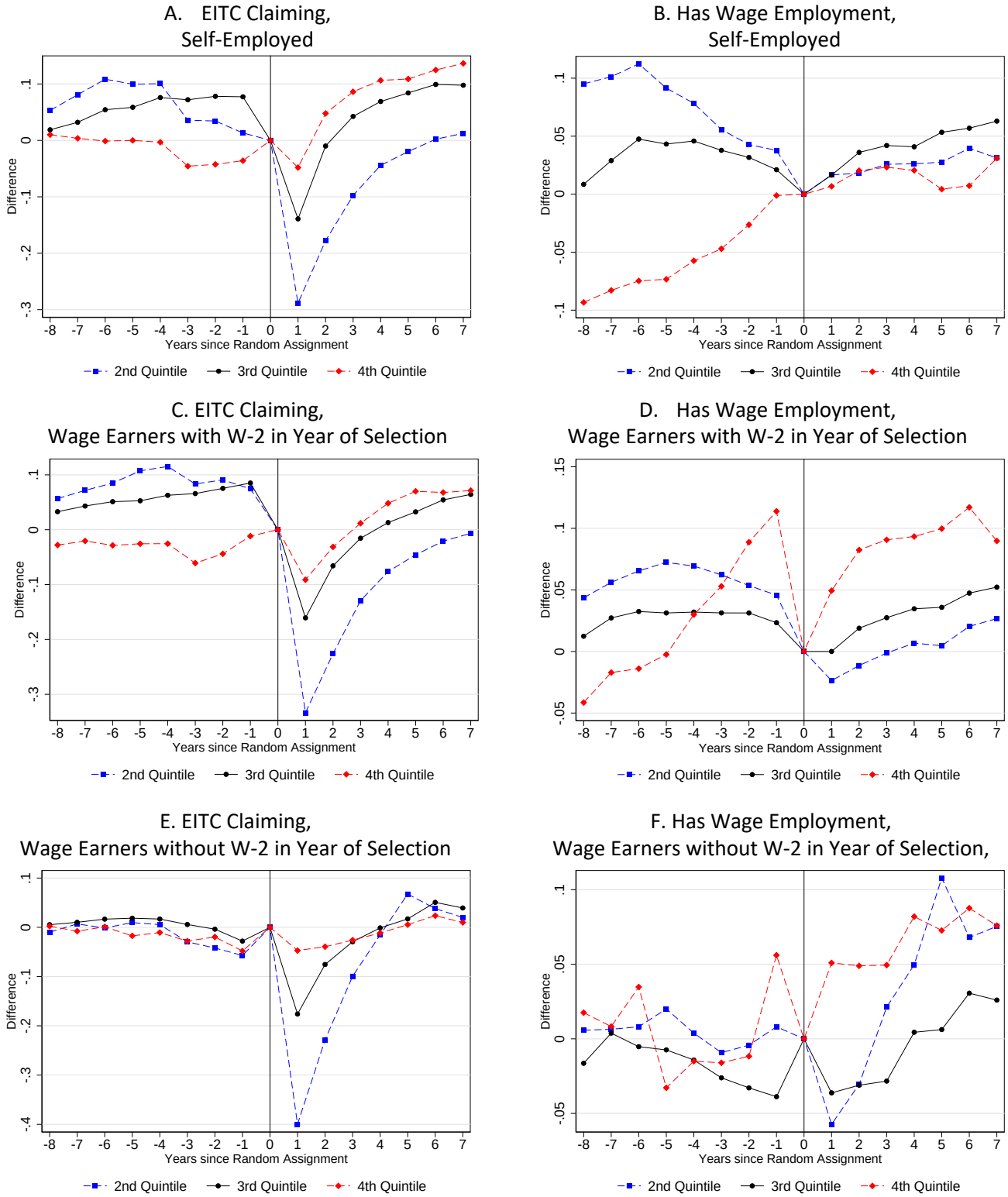






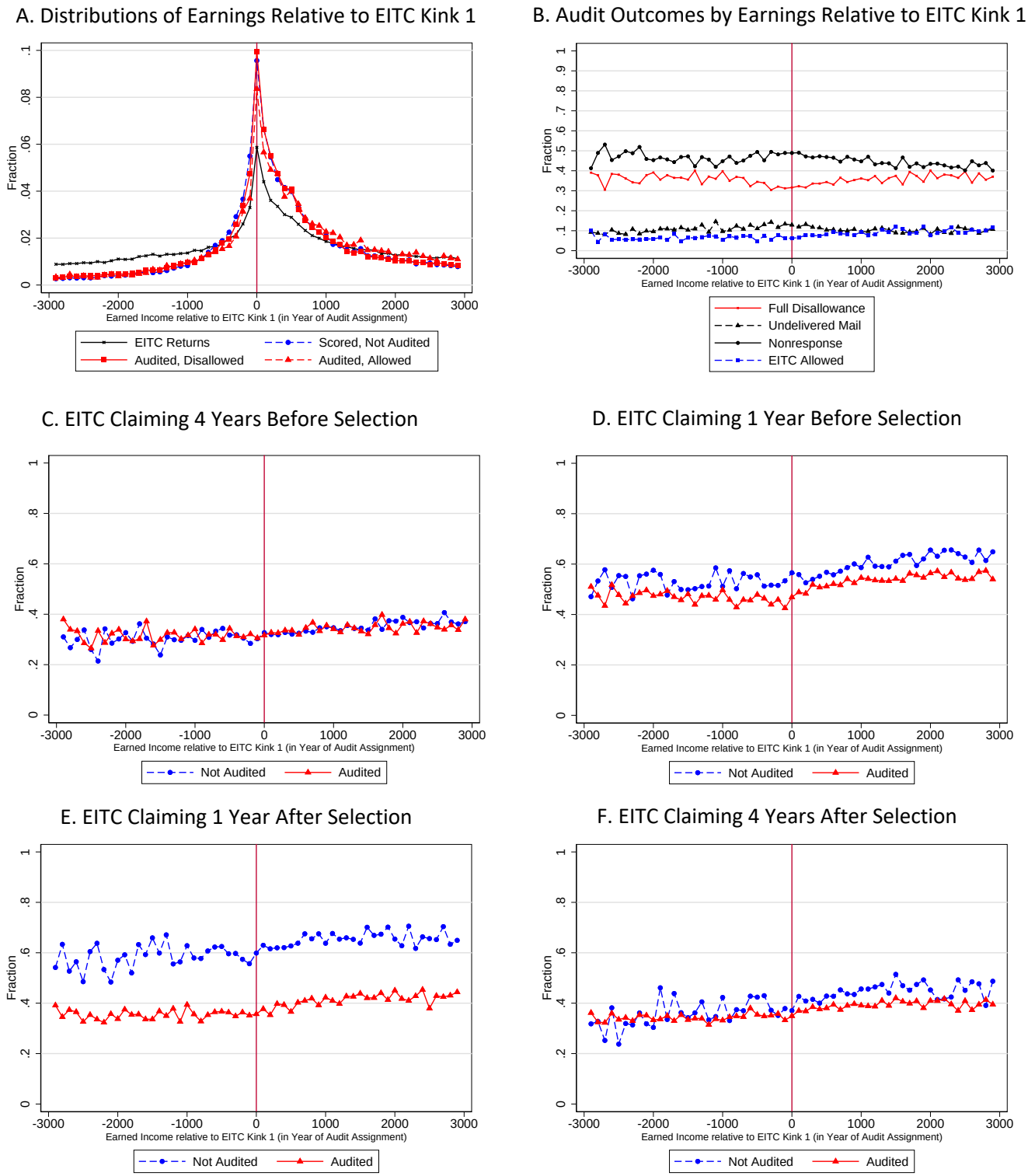
Notes: Each plot illustrates estimated regression coefficients from regressing the outcome variable specified in the plot title on event time dummies, an indicator for being an audited individual, interactions between the event time dummies and the audited indicator. The difference estimates and standard 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 tax year and audit assignment group (audited or non-audited) and the year of selection.

Figure 5.
Heterogeneity based on Propensity Score



Notes: Each plot illustrates estimated regression coefficients from regressing the outcome variable specified in the plot title on event time dummies, an indicator for being an audited individual, interactions between the event time dummies and the audited indicator. The difference estimates refer to the estimated coefficients on the event time dummies interacted with the audited indicator. Data used in the regressions is re-weighted using inverse probability weights.

Figure 6.
Effects of EITC Correspondence Audits for EITC Maximizers



Notes: Plot A is constructed by creating $100 bins of earned income relative to EITC Kink 1 and computing the fraction of each sample within each bin. Values for EITC Kink 1 are determined based on filing status, number of qualifying children and tax year. Plot B is also constructed by creating $100 bins of earned income relative to EITC Kink 1 and then computing the fraction within each bin that has the specified audit outcome. Data used in these plots are unweighted. Plots C through F present the fractions of individuals claiming EITC by earnings relative to EITC Kink 1, which is defined as the lowest earned income level necessary to qualify for maximum EITC benefits. Data used in these plots are re-weighted using inverse probability weights.

Table 1: IRS Audit Frequencies & Outcomes

Year	EITC Correspondence Audits			EITC Field Audits		
	Returns Examined	Returns Examined as Percentage of All Individual Correspondence Audits	Percentage of Returns Examined with No Change	Returns Examined	Returns Examined as Percentage of All Individual Field Audits	Percentage 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					
	Audited N = 432,219		Scored but Not Audited N = 473,938		1% Random Sample of EITC Returns N = 330,116		Audited N = 895,065		Scored but Not Audited N = 1,170,290		1% Random Sample of EITC Returns N = 1,203,713	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Fraction Male	0.657	0.475	0.526	0.499	0.389	0.487	0.669	0.471	0.640	0.480	0.328	0.469
Age	34.431	12.758	33.781	12.138	39.281	11.479	35.250	13.385	34.546	12.907	36.516	11.125
Fraction with Filing Status = HOH	0.757	0.429	0.773	0.419	0.580	0.494	0.812	0.390	0.821	0.384	0.639	0.480
Total Income	14197.920	5249.188	14273.400	4886.133	12141.940	465933.100	16792.110	5557.037	17999.510	7501.304	17674.780	11756.560
Wages on Form 1040	4554.177	8779.902	5033.120	9523.917	5747.565	11845.260	16438.040	5482.780	17479.020	7475.454	16994.870	10678.680
Has Wage Income on Form 1040	0.477	0.499	0.502	0.500	0.454	0.498						
Only Wage Income on Form 1040							0.873	0.333	0.840	0.367	0.720	0.449
Has Form W-2	0.537	0.499	0.563	0.496	0.474	0.499	0.856	0.351	0.948	0.221	0.967	0.178
Schedule C Income	9243.554	7659.331	8781.387	8302.554	6191.168	465750.900						
Adjusted Gross Income	13449.670	5223.848	13541.340	4885.415	11998.150	79464.500	16747.420	5564.786	17952.870	7491.854	17562.530	11770.210
Balance Due (refund if negative)	-4511.418	1839.887	-4701.204	1838.557	-2751.619	3269.059	-6300.041	1930.875	-5679.055	2051.504	-4033.304	3087.181
Earned Income	13192.800	3877.336	13211.820	4140.964	12248.630	7786.941	16410.690	5447.369	17431.410	7419.491	16879.830	10700.600
Fraction with 1 Qualifying Child	0.467	0.499	0.537	0.499	0.331	0.471	0.488	0.500	0.679	0.467	0.396	0.489
Fraction with 2 Qualifying Children	0.465	0.499	0.256	0.436	0.252	0.434	0.449	0.497	0.241	0.428	0.254	0.435
Fraction with 3+ Qualifying Children	0.067	0.250	0.206	0.404	0.076	0.264	0.062	0.240	0.077	0.267	0.074	0.261
EITC Amount	4018.636	1134.660	4030.132	1245.107	2433.629	1937.279	3751.446	1007.645	3212.959	1203.738	2051.956	1650.786
Fraction on Phase-In	0.273	0.445	0.273	0.446	0.480	0.500	0.162	0.368	0.189	0.391	0.387	0.487
Fraction on Maximum Credit	0.630	0.483	0.614	0.487	0.326	0.469	0.487	0.500	0.355	0.479	0.174	0.379
Fraction on Phase-Out	0.097	0.297	0.113	0.317	0.194	0.396	0.351	0.477	0.456	0.498	0.439	0.496
Fraction Filing with Paid Preparer	0.632	0.482	0.640	0.480	0.692	0.462	0.605	0.489	0.569	0.495	0.567	0.495
Fraction Filing with Software	0.989	0.104	0.991	0.097	0.932	0.252	0.989	0.104	0.993	0.084	0.956	0.204
Fraction Filing with VITA or IRS Centers	0.002	0.048	0.003	0.051	0.015	0.121	0.007	0.080	0.010	0.097	0.034	0.181
Fraction Self Prepared Paper Returns	0.009	0.096	0.008	0.087	0.034	0.180	0.010	0.098	0.006	0.078	0.033	0.178
Fraction Incarcerated	0.010	0.101	0.006	0.079	0.003	0.057	0.008	0.090	0.003	0.059	0.005	0.069
Fraction Claimed EITC in prior 3 years	0.596	0.491	0.701	0.458	0.816	0.387	0.628	0.483	0.686	0.464	0.790	0.407
Fraction Filed Return in prior 3 years	0.743	0.437	0.826	0.379	0.942	0.233	0.843	0.364	0.901	0.299	0.947	0.224
Fraction with W-2 in prior 3 years	0.684	0.465	0.726	0.446	0.658	0.474	0.871	0.335	0.933	0.251	0.952	0.213
Fraction Filed Return and Reported Self-Emp Income in prior 3 yea	0.942	0.234	0.946	0.226	0.944	0.229	0.093	0.290	0.091	0.288	0.102	0.303
Fraction Incarcerated at any time in prior 3 years	0.016	0.124	0.014	0.118	0.005	0.071	0.013	0.115	0.013	0.113	0.007	0.083

Notes: Statistics are based on tax returns in 2008 through 2015. Dollar values are CPI-adjusted to 2016.

Table 3: Audit Outcomes

	Self-Employed						Wage Earners					
	Undelivered Mail	Nonresponse	Full Disallowance with Passive Disagreement	Full Disallowance with Active Agreement	Partial Allowance	Full Allowance	Undelivered Mail	Nonresponse	Full Disallowance with Passive Disagreement	Full Disallowance with Active Agreement	Partial Allowance	Full Allowance
Full Sample	0.111	0.472	0.219	0.128	0.011	0.054	0.129	0.433	0.201	0.150	0.013	0.069
Age < 31, Men	0.123	0.541	0.203	0.094	0.007	0.027	0.138	0.499	0.190	0.118	0.009	0.043
Ages 31-40, Men	0.113	0.484	0.230	0.122	0.011	0.036	0.134	0.460	0.212	0.137	0.015	0.037
Ages 41-50, Men	0.117	0.453	0.229	0.142	0.012	0.041	0.138	0.426	0.218	0.157	0.015	0.040
Ages 51+, Men	0.122	0.428	0.222	0.161	0.014	0.046	0.148	0.372	0.217	0.189	0.016	0.052
Age < 31, Women	0.107	0.485	0.216	0.121	0.008	0.058	0.133	0.458	0.179	0.146	0.010	0.070
Ages 31-40, Women	0.098	0.403	0.230	0.139	0.015	0.110	0.127	0.396	0.196	0.156	0.018	0.103
Ages 41-50, Women	0.083	0.364	0.236	0.174	0.017	0.121	0.091	0.331	0.220	0.184	0.018	0.150
Ages 51+, Women	0.073	0.309	0.239	0.216	0.017	0.141	0.081	0.247	0.218	0.233	0.021	0.193
Earned income < $10k	0.125	0.511	0.181	0.131	0.007	0.041	0.151	0.492	0.158	0.135	0.012	0.048
Earned income $10k-$20k	0.110	0.466	0.228	0.123	0.011	0.057	0.139	0.437	0.196	0.140	0.012	0.073
Earned income $20k-$30k	0.060	0.376	0.267	0.197	0.020	0.072	0.091	0.397	0.236	0.186	0.018	0.065
Earned income $30k-$40k	0.046	0.375	0.257	0.226	0.012	0.076	0.068	0.375	0.237	0.214	0.023	0.077
Earned income $40k+	0.000	0.241	0.517	0.138	0.034	0.069	0.016	0.336	0.208	0.096	0.240	0.088
No paid preparer	0.142	0.499	0.188	0.112	0.012	0.042	0.158	0.439	0.190	0.136	0.016	0.056
Has paid preparer	0.093	0.456	0.237	0.138	0.010	0.062	0.110	0.428	0.208	0.159	0.011	0.077
No EITC claim in prior 3 years	0.148	0.525	0.188	0.099	0.006	0.029	0.183	0.469	0.178	0.114	0.009	0.043
Has EITC claim in prior 3 years	0.086	0.436	0.240	0.148	0.014	0.072	0.097	0.411	0.215	0.171	0.016	0.084
1 QC	0.121	0.494	0.188	0.132	0.009	0.050	0.162	0.458	0.161	0.132	0.014	0.068
2 QCs	0.107	0.473	0.238	0.119	0.012	0.046	0.101	0.421	0.234	0.166	0.011	0.062
3+ QCs	0.063	0.309	0.306	0.160	0.014	0.139	0.072	0.311	0.278	0.183	0.023	0.124
QC Age 0-5	0.087	0.442	0.256	0.130	0.010	0.070	0.102	0.412	0.227	0.160	0.011	0.082
QC Age 6-12	0.101	0.456	0.236	0.129	0.013	0.060	0.116	0.420	0.215	0.160	0.014	0.069
QC Age 13+	0.122	0.493	0.190	0.131	0.010	0.050	0.149	0.446	0.176	0.141	0.014	0.070
No W-2 in Year of Selection	0.136	0.491	0.200	0.107	0.009	0.054	0.326	0.490	0.114	0.044	0.008	0.016
Has W-2 in Year of Selection	0.089	0.455	0.236	0.147	0.012	0.055	0.096	0.423	0.216	0.168	0.014	0.078
Propensity Score Quintile 1 (Lowest)	0.095	0.369	0.254	0.114	0.075	0.091	0.098	0.395	0.208	0.147	0.054	0.096
Propensity Score Quintile 2	0.093	0.421	0.235	0.136	0.031	0.079	0.108	0.421	0.191	0.159	0.036	0.082
Propensity Score Quintile 3	0.112	0.454	0.215	0.134	0.009	0.071	0.147	0.427	0.189	0.138	0.016	0.078
Propensity Score Quintile 4	0.124	0.493	0.196	0.127	0.008	0.048	0.122	0.442	0.201	0.149	0.012	0.069
Propensity Score Quintile 5 (Highest)	0.102	0.467	0.240	0.126	0.011	0.050	0.132	0.427	0.205	0.153	0.012	0.066

Notes: Characteristics for heterogeneity are based on characteristics in the year of audit selection.

Table 4: Impacts of EITC Correspondence Audits, Difference-in-Difference Estimates

A. Self-Employed

	EITC Claiming	Filing Tax Return	Tax Refund	Type 1 Error, EITC Claiming	Type 1 Error, Tax Refund	Qualifying Child Claimed by Selected Taxpayer	Qualifying Child Claimed by Any Taxpayer	EITC Associated with Qualifying Child
1 Year After Audit	-0.201	-0.144	-1287.518	0.327	-0.436	-0.236	-0.155	-892.541
	(0.018)	(0.022)	(176.156)	(0.022)	(0.046)	(0.026)	(0.017)	(127.869)
2 Years After Audit	-0.098	-0.061	-728.849	0.199	-0.309	-0.205	-0.135	-563.525
	(0.023)	(0.029)	(200.528)	(0.04)	(0.071)	(0.025)	(0.022)	(126.538)
3 Years After Audit	-0.042	-0.016	-547.136	0.097	-0.251	-0.155	-0.106	-352.885
	(0.023)	(0.026)	(212.439)	(0.05)	(0.082)	(0.027)	(0.028)	(122.149)
4 Years After Audit	-0.004	0.018	-211.126	0.009	-0.116	-0.125	-0.089	-265.851
	(0.029)	(0.028)	(175.696)	(0.073)	(0.089)	(0.034)	(0.034)	(131.580)
5 Years After Audit	-0.006	0.014	-250.083	0.016	-0.137	-0.075	-0.070	-200.377
	(0.030)	(0.030)	(200.271)	(0.076)	(0.099)	(0.038)	(0.033)	(160.462)
6 Years After Audit	0.004	0.022	-188.717	-0.010	-0.106	-0.079	-0.085	-262.983
	(0.033)	(0.038)	(190.325)	(0.087)	(0.098)	(0.040)	(0.036)	(165.948)
7 Years After Audit	0.022	0.035	-28.598	-0.064	-0.018	-0.060	-0.059	-224.115
	(0.035)	(0.032)	(260.809)	(0.108)	(0.159)	(0.048)	(0.043)	(158.042)

B. Wage Earners

	EITC Claiming	Filing Tax Return	Tax Refund	Type 1 Error, EITC Claiming	Type 1 Error, Tax Refund	Qualifying Child Claimed by Selected Taxpayer	Qualifying Child Claimed by Any Taxpayer	EITC Associated with Qualifying Child
1 Year After Audit	-0.248	-0.121	-1519.185	0.422	-0.454	-0.251	-0.133	-479.442
	(0.032)	(0.034)	(202.489)	(0.036)	(0.048)	(0.047)	(0.021)	(212.972)
2 Years After Audit	-0.186	-0.099	-972.350	0.385	-0.359	-0.202	-0.101	-224.720
	(0.031)	(0.034)	(244.702)	(0.045)	(0.083)	(0.045)	(0.023)	(170.241)
3 Years After Audit	-0.123	-0.062	-758.749	0.300	-0.339	-0.149	-0.070	-40.475
	(0.029)	(0.039)	(175.255)	(0.056)	(0.069)	(0.046)	(0.023)	(155.599)
4 Years After Audit	-0.071	-0.011	-375.781	0.196	-0.202	-0.111	-0.059	55.072
	(0.030)	(0.039)	(168.696)	(0.071)	(0.082)	(0.050)	(0.026)	(150.685)
5 Years After Audit	-0.050	0.010	-142.354	0.153	-0.089	-0.048	-0.024	214.593
	(0.026)	(0.038)	(235.925)	(0.073)	(0.138)	(0.027)	(0.029)	(146.281)
6 Years After Audit	-0.008	0.059	-43.645	0.027	-0.030	-0.034	-0.018	265.842
	(0.036)	(0.053)	(183.243)	(0.126)	(0.122)	(0.027)	(0.033)	(164.410)
7 Years After Audit	0.003	0.078	52.545	-0.013	0.038	-0.007	0.017	485.964
	(0.028)	(0.042)	(179.078)	(0.111)	(0.132)	(0.024)	(0.032)	(138.743)

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, interactions between the event time dummies and audited indicator. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on tax year and audit assignment group (audited or non-audited) and the year of selection. The Type 1 Error Rate at each event time is comupted by dividing the difference-in-difference estimate for the change in EITC claiming or tax refunds at the event time by the corresponding mean of the non-audited group at that event time.

Table 5: Impacts of EITC Correspondence Audits, Heterogeneity by Qualifying Child Age

A. Self-Employed

	Dependent Variable = EITC Claiming			Dependent Variable = Tax Refunds			Dependent Variable = Qualifying Child Claimed by Selected Taxpayer			Dependent Variable = Qualifying Child Claimed by Any Taxpayer		
	QC Age 0-5	QC Age 6-12	QC Age 13+	QC Age 0-5	QC Age 6-12	QC Age 13+	QC Age 0-5	QC Age 6-12	QC Age 13+	QC Age 0-5	QC Age 6-12	QC Age 13+
1 Year After Audit	-0.229	-0.211	-0.206	-1707.090	-1368.767	-982.332	-0.263	-0.213	-0.189	-0.129	-0.113	-0.156
	(0.018)	(0.018)	(0.018)	(159.592)	(163.753)	(210.586)	(0.022)	(0.027)	(0.021)	(0.013)	(0.012)	(0.016)
2 Years After Audit	-0.138	-0.117	-0.079	-1114.634	-816.486	-411.332	-0.190	-0.138	-0.086	-0.083	-0.068	-0.074
	(0.023)	(0.025)	(0.023)	(189.615)	(192.57)	(221.746)	(0.023)	(0.027)	(0.019)	(0.015)	(0.015)	(0.018)
3 Years After Audit	-0.080	-0.057	-0.026	-714.882	-1223.954	-112.162	-0.139	-0.082	-0.033	-0.059	-0.034	-0.034
	(0.024)	(0.025)	(0.018)	(164.421)	(748.04)	(170.641)	(0.019)	(0.023)	(0.014)	(0.014)	(0.013)	(0.014)
4 Years After Audit	-0.043	-0.018	0.015	-517.180	-265.773	99.577	-0.114	-0.058	-0.003	-0.049	-0.025	-0.013
	(0.028)	(0.030)	(0.022)	(181.749)	(146.885)	(166.118)	(0.018)	(0.022)	(0.012)	(0.013)	(0.013)	(0.013)
5 Years After Audit	-0.043	-0.014	0.013	-584.917	-237.289	50.710	-0.088	-0.032	0.014	-0.036	-0.020	-0.008
	(0.028)	(0.033)	(0.023)	(204.808)	(205.61)	(158.235)	(0.021)	(0.025)	(0.011)	(0.015)	(0.012)	(0.013)
6 Years After Audit	-0.033	0.004	0.012	-523.441	-93.341	90.854	-0.099	-0.033	0.020	-0.045	-0.021	-0.004
	(0.026)	(0.042)	(0.028)	(164.171)	(222.958)	(172.306)	(0.018)	(0.026)	(0.011)	(0.015)	(0.015)	(0.012)
7 Years After Audit	-0.016	0.025	0.019	-347.463	10.042	163.563	-0.104	-0.034	0.022	-0.038	-0.012	-0.002
	(0.029)	(0.045)	(0.015)	(223.906)	(293.703)	(163.916)	(0.015)	(0.029)	(0.01)	(0.018)	(0.017)	(0.011)

B. Wage Earners

	Dependent Variable = EITC Claiming			Dependent Variable = Tax Refunds			Dependent Variable = Qualifying Child Claimed by Selected Taxpayer			Dependent Variable = Qualifying Child Claimed by Any Taxpayer		
	QC Age 0-5	QC Age 6-12	QC Age 13+	QC Age 0-5	QC Age 6-12	QC Age 13+	QC Age 0-5	QC Age 6-12	QC Age 13+	QC Age 0-5	QC Age 6-12	QC Age 13+
1 Year After Audit	-0.304	-0.301	-0.241	-1940.469	-1854.447	-1441.870	-0.269	-0.276	-0.221	-0.109	-0.127	-0.156
	(0.023)	(0.019)	(0.044)	(213.184)	(175.597)	(194.875)	(0.03)	(0.03)	(0.053)	(0.013)	(0.015)	(0.035)
2 Years After Audit	-0.229	-0.225	-0.170	-1467.025	-702.072	-1124.302	-0.192	-0.196	-0.128	-0.067	-0.080	-0.083
	(0.025)	(0.022)	(0.036)	(205.729)	(643.076)	(154.103)	(0.03)	(0.032)	(0.04)	(0.015)	(0.017)	(0.032)
3 Years After Audit	-0.161	-0.157	-0.097	-1010.878	-919.608	-633.115	-0.134	-0.129	-0.062	-0.043	-0.049	-0.039
	(0.022)	(0.020)	(0.035)	(187.533)	(150.981)	(190.132)	(0.032)	(0.033)	(0.034)	(0.014)	(0.018)	(0.028)
4 Years After Audit	-0.102	-0.097	-0.058	-604.786	-529.195	-344.429	-0.096	-0.083	-0.022	-0.033	-0.037	-0.024
	(0.020)	(0.020)	(0.028)	(135.346)	(126.993)	(172.833)	(0.032)	(0.036)	(0.028)	(0.017)	(0.022)	(0.023)
5 Years After Audit	-0.080	-0.064	-0.036	-491.712	272.054	-232.111	-0.050	-0.026	0.007	-0.022	-0.012	0.000
	(0.019)	(0.022)	(0.023)	(127.761)	(733.004)	(162.344)	(0.017)	(0.021)	(0.022)	(0.01)	(0.013)	(0.020)
6 Years After Audit	-0.055	-0.044	-0.007	-348.238	-264.743	-78.611	-0.041	-0.012	0.014	-0.015	-0.005	0.000
	(0.029)	(0.029)	(0.030)	(161.048)	(147.914)	(167.044)	(0.018)	(0.021)	(0.021)	(0.012)	(0.016)	(0.016)
7 Years After Audit	-0.042	-0.031	0.014	-260.365	-188.655	87.716	-0.021	0.012	0.019	-0.007	0.012	0.013
	(0.024)	(0.023)	(0.024)	(152.361)	(126.352)	(139.126)	(0.009)	(0.017)	(0.021)	(0.012)	(0.014)	(0.012)

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, interactions between the event time dummies and audited indicator. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on tax year and audit assignment group (audited or non-audited) and the year of selection.

Table 6: Impacts of EITC Correspondence Audits on Wage Employment

	Dependent Variable = Has W-2 for Wage Employment							
	Self-Employed	Wage Earners	Wage Earners with W-2 in Year of Selection			Wage Earners without W-2 in Year of Selection		
			QC Age 0-5	QC Age 6-12	QC Age 13+	QC Age 0-5	QC Age 6-12	QC Age 13+
1 Year After Audit	0.005	-0.022	-0.033	-0.026	-0.026	-0.004	0.023	0.033
	(0.026)	(0.043)	(0.013)	(0.015)	(0.019)	(0.039)	(0.034)	(0.027)
2 Years After Audit	0.014	-0.022	-0.034	-0.024	-0.021	0.008	0.007	0.047
	(0.025)	(0.042)	(0.014)	(0.016)	(0.021)	(0.036)	(0.032)	(0.027)
3 Years After Audit	0.020	-0.011	-0.029	-0.023	-0.013	0.024	0.027	0.078
	(0.023)	(0.043)	(0.014)	(0.016)	(0.021)	(0.042)	(0.037)	(0.033)
4 Years After Audit	0.030	0.025	-0.026	-0.010	-0.008	0.095	0.068	0.069
	(0.021)	(0.042)	(0.014)	(0.016)	(0.018)	(0.048)	(0.038)	(0.034)
5 Years After Audit	0.014	0.034	-0.028	-0.010	-0.010	0.059	0.065	0.081
	(0.020)	(0.045)	(0.013)	(0.015)	(0.017)	(0.045)	(0.044)	(0.037)
6 Years After Audit	0.021	0.081	-0.024	-0.008	-0.006	0.088	0.078	0.073
	(0.024)	(0.039)	(0.016)	(0.016)	(0.017)	(0.039)	(0.037)	(0.023)
7 Years After Audit	0.039	0.093	-0.018	-0.009	-0.006	0.112	0.073	0.066
	(0.039)	(0.046)	(0.023)	(0.017)	(0.017)	(0.037)	(0.040)	(0.027)

Notes: Estimates are based on regression coefficients from regressing an indicator for having a W-2 on event time dummies, an indicator for being an audited individual, interactions between the event time dummies and audited indicator. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on tax year and audit assignment group (audited or non-audited) and the year of selection.

Table 7: Impacts of EITC Correspondence Audits, Heterogeneity by Quintile of Probability of Audit

A. Dependent Variable = EITC Claiming

	Self-Employed			Wage Earners with W-2 in Year of Selection			Wage Earners with No W-2 in Year of Selection		
	Lower Quintile	Middle Quintile	Higher Quintile	Lower Quintile	Middle Quintile	Higher Quintile	Lower Quintile	Middle Quintile	Higher Quintile
1 Year After Audit	-0.345	-0.214	-0.018	-0.430	-0.229	-0.048	-0.378	-0.182	-0.028
	(0.039)	(0.055)	(0.036)	(0.03)	(0.02)	(0.018)	(0.031)	(0.052)	(0.053)
2 Years After Audit	-0.235	-0.085	0.078	-0.322	-0.134	0.012	-0.206	-0.082	-0.020
	(0.041)	(0.049)	(0.026)	(0.028)	(0.021)	(0.017)	(0.046)	(0.043)	(0.041)
3 Years After Audit	-0.154	-0.033	0.117	-0.226	-0.083	0.055	-0.077	-0.036	-0.007
	(0.056)	(0.050)	(0.023)	(0.028)	(0.024)	(0.018)	(0.064)	(0.048)	(0.047)
4 Years After Audit	-0.101	-0.006	0.137	-0.173	-0.055	0.092	0.007	-0.007	0.008
	(0.033)	(0.032)	(0.018)	(0.032)	(0.018)	(0.02)	(0.098)	(0.022)	(0.029)
5 Years After Audit	-0.077	0.009	0.139	-0.142	-0.035	0.113	0.089	0.011	0.025
	(0.035)	(0.030)	(0.028)	(0.024)	(0.021)	(0.03)	(0.04)	(0.023)	(0.031)
6 Years After Audit	-0.055	0.024	0.155	-0.117	-0.014	0.111	0.060	0.044	0.043
	(0.027)	(0.028)	(0.034)	(0.02)	(0.023)	(0.021)	(0.049)	(0.017)	(0.018)
7 Years After Audit	-0.044	0.023	0.167	-0.103	-0.004	0.115	0.042	0.033	0.029
	(0.024)	(0.045)	(0.046)	(0.019)	(0.012)	(0.026)	(0.023)	(0.017)	(0.018)

B. Dependent Variable = Tax Refunds

	Self-Employed			Wage Earners with W-2 in Year of Selection			Wage Earners with No W-2 in Year of Selection		
	Lower Quintile	Middle Quintile	Higher Quintile	Lower Quintile	Middle Quintile	Higher Quintile	Lower Quintile	Middle Quintile	Higher Quintile
1 Year After Audit	-2078.250	-1055.569	-271.885	-2645.626	-1320.622	-381.181	-2611.880	-1100.805	-221.832
	(267.156)	(337.670)	(200.745)	(202.042)	(126.879)	(115.973)	(253.829)	(299.288)	(426.813)
2 Years After Audit	-1457.988	-397.967	220.903	-1947.350	93.186	-8.901	-1556.895	-593.298	-543.941
	(265.192)	(291.062)	(201.661)	(171.23)	(952.424)	(115.467)	(252.328)	(263.34)	(543.03)
3 Years After Audit	-1787.536	-78.053	432.985	-1379.648	-538.043	150.580	-810.628	-325.890	-26.492
	(565.722)	(282.142)	(199.546)	(148.137)	(112.886)	(115.915)	(263.524)	(196.729)	(279.87)
4 Years After Audit	-729.290	60.566	568.883	-1055.505	-366.973	365.937	-278.625	-168.159	224.873
	(219.342)	(228.128)	(145.896)	(170.434)	(96.204)	(89.678)	(448.209)	(107.043)	(162.336)
5 Years After Audit	-693.230	138.968	560.500	-117.033	-281.059	433.741	124.214	-46.258	267.517
	(178.254)	(183.457)	(182.606)	(881.468)	(101.235)	(93.788)	(180.947)	(121.263)	(153.873)
6 Years After Audit	-503.400	223.543	656.744	-766.809	-134.585	418.403	64.340	174.737	258.987
	(230.987)	(180.221)	(187.126)	(131.246)	(83.192)	(112.699)	(270.63)	(82.89)	(125.383)
7 Years After Audit	-385.423	214.556	729.021	-697.710	-123.079	382.620	143.264	159.863	349.520
	(122.179)	(235.579)	(207.659)	(118.558)	(70.597)	(118.706)	(146.652)	(69.718)	(109.042)

C. Dependent Variable = Has Wage Employment

	Self-Employed			Wage Earners with W-2 in Year of Selection			Wage Earners with No W-2 in Year of Selection		
	Lower Quintile	Middle Quintile	Higher Quintile	Lower Quintile	Middle Quintile	Higher Quintile	Lower Quintile	Middle Quintile	Higher Quintile
1 Year After Audit	-0.042	-0.022	0.050	-0.085	-0.031	-0.008	-0.054	-0.012	0.065
	(0.030)	(0.029)	(0.024)	(0.02)	(0.023)	(0.019)	(0.038)	(0.032)	(0.057)
2 Years After Audit	-0.041	-0.002	0.064	-0.073	-0.013	0.025	-0.027	-0.007	0.063
	(0.029)	(0.029)	(0.023)	(0.02)	(0.023)	(0.021)	(0.042)	(0.034)	(0.06)
3 Years After Audit	-0.033	0.004	0.067	-0.063	-0.004	0.034	0.024	-0.004	0.064
	(0.025)	(0.027)	(0.024)	(0.021)	(0.023)	(0.023)	(0.055)	(0.034)	(0.061)
4 Years After Audit	-0.033	0.002	0.064	-0.055	0.003	0.036	0.053	0.029	0.096
	(0.027)	(0.029)	(0.025)	(0.021)	(0.024)	(0.023)	(0.058)	(0.029)	(0.052)
5 Years After Audit	-0.031	0.015	0.048	-0.057	0.004	0.043	0.111	0.031	0.087
	(0.024)	(0.023)	(0.018)	(0.021)	(0.024)	(0.018)	(0.031)	(0.029)	(0.053)
6 Years After Audit	-0.019	0.018	0.051	-0.041	0.016	0.060	0.071	0.055	0.102
	(0.025)	(0.025)	(0.021)	(0.021)	(0.025)	(0.017)	(0.034)	(0.041)	(0.05)
7 Years After Audit	-0.028	0.025	0.075	-0.035	0.021	0.033	0.079	0.050	0.090
	(0.020)	(0.020)	(0.022)	(0.02)	(0.021)	(0.017)	(0.03)	(0.026)	(0.048)

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, interactions between the event time dummies and audited indicator. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on tax year and audit assignment group (audited or non-audited) and the year of selection.

Table 8: Cumulative Impacts of EITC Correspondence Audits

	A. Self-Employed	B. Wage Earners
EITC Claiming	-0.325	-0.683
	(0.088)	(0.112)
Tax Filing	-0.131	-0.146
	(0.103)	(0.141)
Tax Refunds (impact per audited return)	-3242.03	-3759.52
	(779.71)	(825.82)
Tax Refunds (impact per audited dollar)	-0.725	-0.628
	(0.174)	(0.138)

Notes: Estimates are based on sums of the difference-in-difference estimates from 1 to 7 years after selection. Data used in the regressions is re-weighted using inverse probability weights. Standard errors are clustered based on tax year and audit assignment group (audited or non-audited) and year of selection.

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. 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 3. 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.

Appendix Figure 4.
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.

Appendix Figure 4 (continued).
Example of IRS Letter 2205-B for Research (NRP) Audits

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 5.
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.

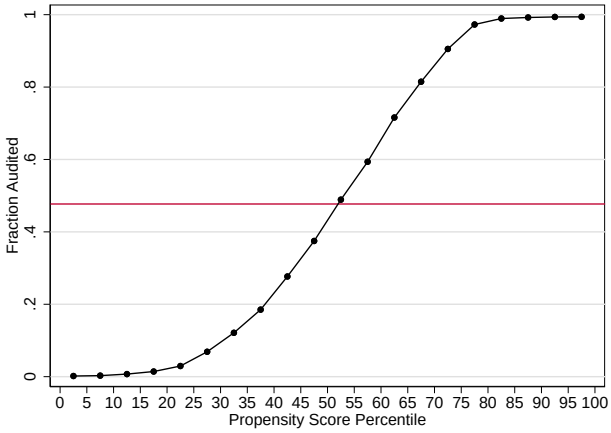
Department of the Treasury
Internal Revenue Service

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

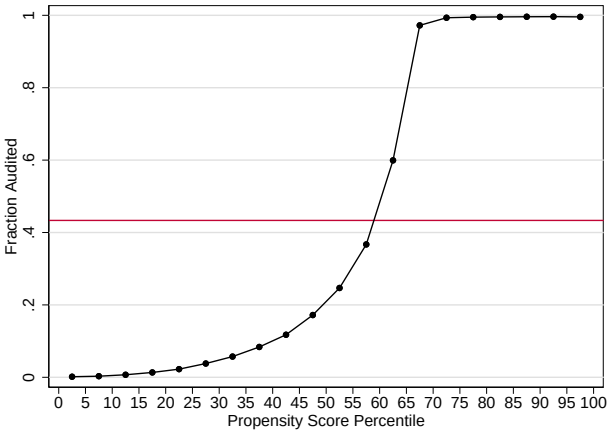
www.irs.gov

Appendix Figure 6.
Effects of EITC Correspondence Audits, Unweighted

A. Fraction Audited by Propensity Score, Self-Employed

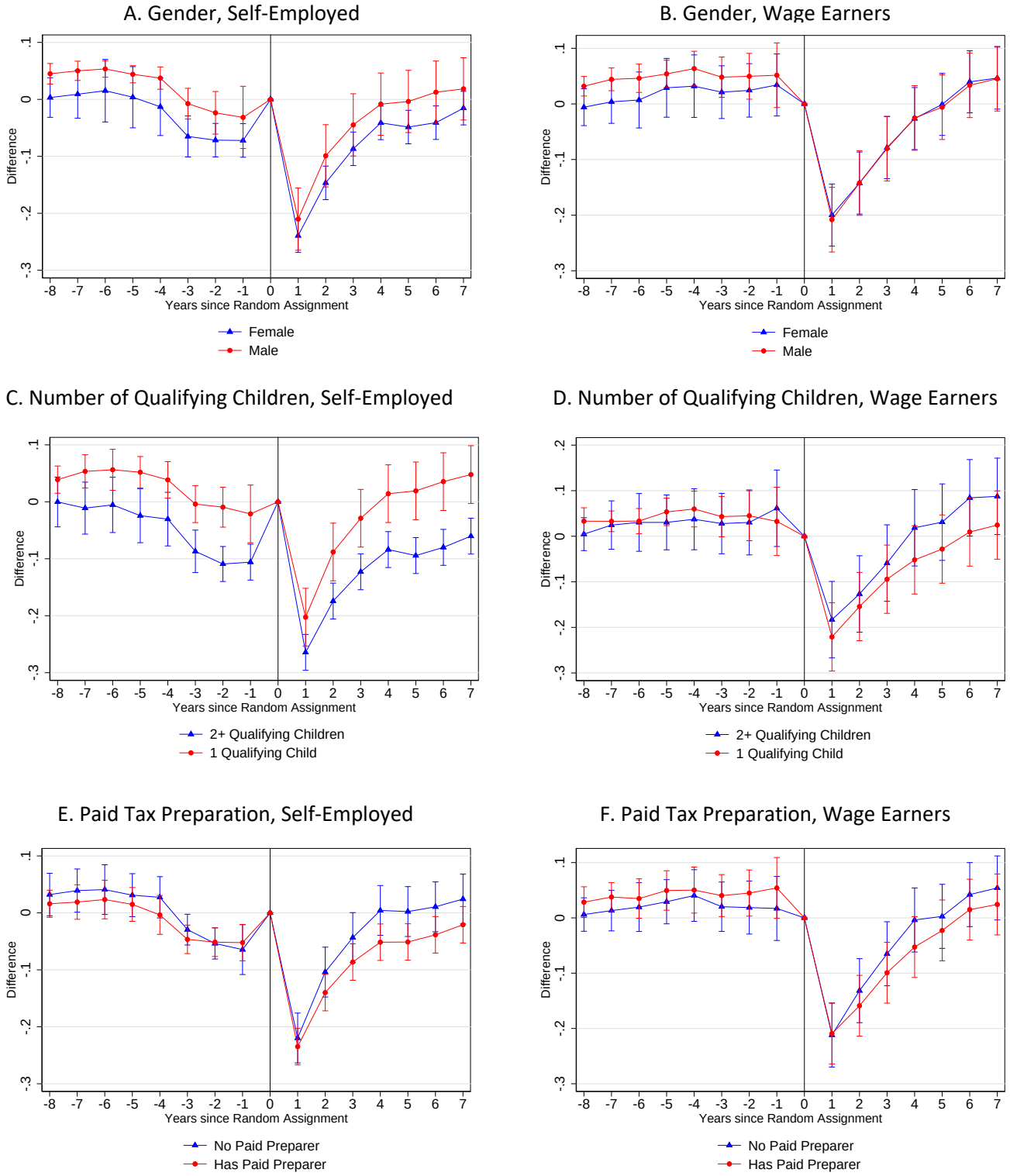


B. Fraction Audited by Propensity Score, Wage Earners



Notes: Each plot is constructed by computing five percentile bins based on the estimated probabilities of audit, and within each bin, each point is the fraction audited. Horizontal lines show the overall fraction audited for each sample.

Appendix Figure 7.
Heterogeneity in Effects on EITC Claiming



Notes: Each plot illustrates estimated regression coefficients from regressing the outcome variable specified in the plot title on event time dummies, an indicator for being an audited individual, 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 not weighted. Standard errors are clustered based on tax year and audit assignment group (audited or non-audited) and the year of selection.

Appendix Table 1: Summary Statistics for Re-weighted Data

	Self-Employed				Wage Earners			
	Audited		Scored but Not Audited		Audited		Scored but Not Audited	
	N = 432,219		N = 473,938		N = 895,065		N = 1,170,290	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Fraction Male	0.613	0.487	0.568	0.495	0.651	0.477	0.643	0.479
Age	35.148	12.695	35.148	12.578	35.329	13.130	35.002	13.083
Fraction with Filing Status = HOH	0.773	0.419	0.745	0.436	0.822	0.382	0.705	0.456
Total Income	14076.100	5177.822	13917.310	8229.068	17287.170	6515.430	18821.320	11271.430
Wages on Form 1040	4783.658	9343.996	4890.495	9860.987	16830.410	6455.795	18146.020	10633.870
Has Wage Income on Form 1040	0.477	0.499	0.463	0.499				
Only Wage Income on Form 1040					0.857	0.350	0.838	0.369
Has Form W-2	0.527	0.499	0.524	0.499	0.862	0.345	0.845	0.361
Schedule C Income	8848.828	8114.515	8579.310	9670.999				
Adjusted Gross Income	13336.290	5065.490	13176.180	8072.444	17240.170	6512.813	18705.180	11186.770
Balance Due (refund if negative)	-4471.062	1861.569	-4365.905	2023.737	-5985.815	1956.106	-5404.987	6896.725
Earned Income	13045.170	3988.967	12741.010	4723.704	16799.050	6417.904	16322.530	8755.102
Fraction with 1 Qualifying Child	0.539	0.498	0.560	0.496	0.603	0.489	0.607	0.488
Fraction with 2 Qualifying Children	0.353	0.478	0.272	0.445	0.336	0.472	0.196	0.397
Fraction with 3+ Qualifying Children	0.106	0.308	0.139	0.346	0.061	0.239	0.054	0.226
EITC Amount	3939.854	1160.742	3781.431	1319.883	3464.698	1108.871	2748.213	1499.244
Fraction on Phase-In	0.267	0.443	0.286	0.452	0.169	0.374	0.161	0.367
Fraction on Maximum Credit	0.631	0.483	0.586	0.492	0.442	0.497	0.344	0.475
Fraction on Phase-Out	0.102	0.303	0.128	0.334	0.389	0.488	0.495	0.500
Fraction Filing with Paid Preparer	0.621	0.485	0.610	0.488	0.588	0.492	0.516	0.500
Fraction Filing with Software	0.987	0.112	0.971	0.169	0.990	0.099	0.977	0.151
Fraction Filing with VITA or IRS Centers	0.002	0.047	0.003	0.054	0.007	0.085	0.009	0.096
Fraction Self Prepared Paper Returns	0.011	0.103	0.021	0.145	0.009	0.093	0.018	0.132
Fraction Incarcerated	0.010	0.099	0.010	0.099	0.007	0.084	0.011	0.105
Fraction Claimed EITC in prior 3 years	0.639	0.480	0.674	0.469	0.671	0.470	0.617	0.486
Fraction Filed Return in prior 3 years	0.775	0.417	0.812	0.390	0.869	0.338	0.860	0.347
Fraction with W-2 in prior 3 years	0.691	0.462	0.686	0.464	0.887	0.317	0.860	0.347
Fraction Filed Return and Reported Self-Emp Income in prior 3 yea	0.941	0.236	0.937	0.243	0.100	0.301	0.115	0.319
Fraction Incarcerated at any time in prior 3 years	0.018	0.132	0.016	0.127	0.016	0.124	0.018	0.133

Notes: Statistics are based on tax returns in 2008 through 2015. Dollar values are CPI-adjusted to 2016. Statistics are based on re-weighted data.

Appendix Table 2: Impacts of EITC Correspondence Audits on Distributions of Wage Earnings
Difference-in-Difference Estimates by Wage Bin (columns) and Event Time (Rows)

	A. Self-Employed								
	$0	$5,000	$10,000	$15,000	$20,000	$25,000	$30,000	$35,000	$40,000
1 Year After Audit	-0.004	0.007	0.002	0.001	-0.001	0.001	-0.001	-0.001	-0.003
	(0.023)	(0.007)	(0.004)	(0.004)	(0.002)	(0.003)	(0.003)	(0.001)	(0.003)
2 Years After Audit	-0.015	0.010	0.008	0.003	0.000	0.000	-0.001	0.000	-0.005
	(0.023)	(0.006)	(0.005)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)
3 Years After Audit	-0.019	0.006	0.008	0.006	0.002	0.001	0.001	0.000	-0.005
	(0.022)	(0.006)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.002)	(0.005)
4 Years After Audit	-0.032	0.007	0.007	0.006	0.005	0.002	0.003	0.003	-0.002
	(0.018)	(0.006)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.005)
5 Years After Audit	-0.020	0.003	0.004	0.003	0.002	0.003	0.003	0.001	0.001
	(0.017)	(0.006)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.005)
6 Years After Audit	-0.028	0.010	0.002	0.003	0.002	0.002	0.003	0.004	0.001
	(0.022)	(0.009)	(0.004)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.005)
7 Years After Audit	-0.038	0.010	0.010	0.004	0.001	0.006	0.007	0.001	-0.001
	(0.033)	(0.007)	(0.008)	(0.004)	(0.006)	(0.004)	(0.003)	(0.002)	(0.006)

	B. Wage Earners								
	0	$5,000	$10,000	$15,000	$20,000	$25,000	$30,000	$35,000	$40,000
1 Year After Audit	0.032	-0.001	-0.002	0.000	-0.005	-0.003	-0.006	-0.006	-0.011
	(0.046)	(0.006)	(0.009)	(0.013)	(0.016)	(0.009)	(0.006)	(0.004)	(0.004)
2 Years After Audit	0.025	0.003	0.001	-0.003	-0.002	-0.002	-0.003	-0.006	-0.013
	(0.045)	(0.005)	(0.007)	(0.012)	(0.013)	(0.009)	(0.006)	(0.004)	(0.006)
3 Years After Audit	0.012	0.003	0.000	-0.002	0.003	0.002	-0.002	-0.002	-0.015
	(0.046)	(0.006)	(0.007)	(0.010)	(0.012)	(0.010)	(0.006)	(0.004)	(0.008)
4 Years After Audit	-0.025	0.000	0.004	0.002	0.013	0.010	0.009	0.000	-0.013
	(0.046)	(0.005)	(0.006)	(0.010)	(0.010)	(0.007)	(0.007)	(0.005)	(0.010)
5 Years After Audit	-0.037	0.002	0.003	0.000	0.013	0.011	0.011	0.002	-0.006
	(0.049)	(0.004)	(0.006)	(0.011)	(0.012)	(0.008)	(0.006)	(0.006)	(0.010)
6 Years After Audit	-0.083	0.002	0.002	0.008	0.023	0.020	0.022	0.006	0.000
	(0.044)	(0.005)	(0.006)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)	(0.015)
7 Years After Audit	-0.104	-0.002	0.002	0.004	0.028	0.026	0.026	0.012	0.008
	(0.049)	(0.005)	(0.004)	(0.005)	(0.007)	(0.012)	(0.009)	(0.009)	(0.014)

Notes: Each coilumn represents a separate regression. Estimates are based on regression coefficients from regressing an indicator variable for having wages in the wage bin specified in the column heading on event time dummies, an indicator for being an audited individual, interactions between the event time dummies and audited indicator. Wage bins are computed as $5000 earnings bins which are centered around the values given in the headings. Data used in the regressions are re-weighted using inverse probability weighting. Standard errors are clustered based on tax year and audit assignment group (audited or non-audited) and the year of selection.

Appendix Table 3: Impacts of EITC Correspondence Audits on Distributions of Wage Earnings
Difference-in-Difference Estimates by Wage Bin (columns) and Event Time (Rows)

A. Wage Earners with W-2 in Year of Selection

	$0	$5,000	$10,000	$15,000	$20,000	$25,000	$30,000	$35,000	$40,000
1 Year After Audit	0.043	-0.003	-0.003	0.000	-0.005	-0.004	-0.007	-0.007	-0.013
	(0.020)	(0.005)	(0.005)	(0.009)	(0.013)	(0.006)	(0.008)	(0.005)	(0.006)
2 Years After Audit	0.039	0.001	-0.001	-0.004	-0.003	-0.004	-0.005	-0.008	-0.016
	(0.022)	(0.005)	(0.004)	(0.008)	(0.010)	(0.006)	(0.006)	(0.005)	(0.007)
3 Years After Audit	0.033	0.002	-0.002	-0.006	0.001	0.000	-0.004	-0.004	-0.020
	(0.022)	(0.005)	(0.004)	(0.007)	(0.009)	(0.007)	(0.005)	(0.004)	(0.008)
4 Years After Audit	0.025	-0.005	0.001	-0.005	0.008	0.004	0.003	-0.006	-0.026
	(0.021)	(0.004)	(0.004)	(0.007)	(0.008)	(0.004)	(0.005)	(0.005)	(0.010)
5 Years After Audit	0.022	0.000	-0.001	-0.006	0.005	0.004	0.003	-0.004	-0.022
	(0.021)	(0.004)	(0.004)	(0.008)	(0.009)	(0.004)	(0.005)	(0.005)	(0.011)
6 Years After Audit	0.014	-0.001	-0.003	0.001	0.013	0.007	0.009	-0.006	-0.033
	(0.025)	(0.005)	(0.004)	(0.006)	(0.007)	(0.005)	(0.007)	(0.006)	(0.014)
7 Years After Audit	0.016	-0.005	-0.003	-0.004	0.014	0.010	0.010	-0.002	-0.035
	(0.028)	(0.004)	(0.004)	(0.003)	(0.005)	(0.010)	(0.008)	(0.008)	(0.012)

B. Wage Earners with No W-2 in Year of Selection

	0	$5,000	$10,000	$15,000	$20,000	$25,000	$30,000	$35,000	$40,000
1 Year After Audit	-0.001	0.009	0.007	-0.002	-0.008	-0.002	-0.001	-0.001	-0.002
	(0.025)	(0.009)	(0.005)	(0.005)	(0.004)	(0.003)	(0.002)	(0.001)	(0.003)
2 Years After Audit	-0.019	0.015	0.008	-0.001	-0.001	0.002	0.000	-0.003	0.000
	(0.024)	(0.007)	(0.005)	(0.005)	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)
3 Years After Audit	-0.033	0.010	0.010	0.008	0.004	0.003	0.000	-0.001	-0.001
	(0.029)	(0.009)	(0.006)	(0.005)	(0.004)	(0.004)	(0.002)	(0.002)	(0.005)
4 Years After Audit	-0.050	0.019	0.007	0.011	0.003	0.004	0.003	0.003	0.001
	(0.034)	(0.010)	(0.006)	(0.007)	(0.005)	(0.004)	(0.004)	(0.001)	(0.005)
5 Years After Audit	-0.049	0.014	0.010	0.002	0.008	0.003	0.007	0.002	0.004
	(0.038)	(0.009)	(0.007)	(0.007)	(0.006)	(0.005)	(0.002)	(0.003)	(0.006)
6 Years After Audit	-0.048	0.014	0.002	0.000	0.005	0.008	0.009	0.002	0.008
	(0.027)	(0.007)	(0.006)	(0.006)	(0.003)	(0.004)	(0.003)	(0.002)	(0.005)
7 Years After Audit	-0.074	0.009	0.003	-0.002	0.020	0.011	0.015	0.002	0.015
	(0.024)	(0.008)	(0.004)	(0.003)	(0.004)	(0.005)	(0.003)	(0.001)	(0.002)

Notes: Each coilumn represents a separate regression. Estimates are based on regression coefficients from regressing an indicator variable for having wages in the wage bin specified in the column heading on event time dummies, an indicator for being an audited individual, interactions between the event time dummies and audited indicator. Wage bins are computed as $5000 earnings bins which are centered around the values given in the headings. Data used in the regressions are re-weighted using inverse probability weighting. Standard errors are clustered based on tax year and audit assignment group (audited or non-audited) and the year of selection.