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TAX FILING AND TAKE-UP:
EXPERIMENTAL EVIDENCE ON TAX PREPARATION OUTREACH
AND EITC PARTICIPATION

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Tax Filing and Take-Up: Experimental Evidence on Tax Preparation Outreach and EITC Participation
Jacob Goldin, Tatiana Homonoff, Rizwan Javaid, and Brenda Schafer
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ABSTRACT

Governments and non-profits devote substantial resources to increasing take-up of the Earned Income Tax Credit (EITC) through educational outreach. We study a different approach: policies that encourage tax filing. In a large field experiment, we find that IRS letters about free tax preparation modestly increased filing, with a large share of the new filers claiming the EITC. The results suggest policies that increase filing can be an effective way to increase take-up of tax-administered social benefits, even policies that do not raise awareness or directly target the benefit in other ways.

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1 Introduction

Incomplete take-up of social benefits is an important concern among policy-makers and advocates. For example, an estimated one in five of the individuals who qualify for the Earned Income Tax Credit (EITC) – the largest anti-poverty program in the United States today – fail to claim it (IRS, 2020). A common strategy for increasing take-up is to conduct informational outreach to eligible but non-participating individuals. Along these lines, governments and non-profits spend millions of dollars annually on informational outreach efforts to encourage EITC participation and a number of states require employers to send notifications to their employees each year (Goldin, 2018).

In this paper we consider a different approach to raising benefit take-up that draws on three contemporary features of the United States safety net. First, a large and growing share of income-support programs are administered through the tax code (Tahk, 2013). Second, in recent years the vast majority of taxpayers have prepared their tax returns with software assistance (either purchased themselves or via a professional preparer) (IRS, 2018*a*). Third, approximately two-thirds of individuals who qualify for but fail to claim the EITC do not file a tax return (Census, 2013). Together, these facts suggest a potential way to increase take-up for a tax-administered program is simply to induce individuals who qualify for the program to file a tax return. In particular, tax preparation software prompts taxpayers to provide all information necessary to determine eligibility for these benefits and automatically maps their answers into a completed tax return. As a result, filing a return with these methods should typically result in taxpayers taking up all tax-administered benefits for which they qualify, even benefits of which they are unaware.¹

To shed light on this approach, we analyzed an experimental outreach intervention conducted by the Internal Revenue Service (IRS) directed at individuals who did not file a tax

¹Low-income taxpayers tend not to distinguish the EITC from other tax code provisions that contribute to their refund (Tach and Halpern-Meekin, 2014). Despite the outreach described above, awareness of the EITC is far from universal, and is particularly low among Hispanics and among those who have completed fewer years of schooling (Maag et al., 2005).

return during the prior year. To induce this group to file a tax return using an assisted preparation method, the intervention targeted the perceived financial cost of using these methods – a potentially important barrier to filing. Specifically, the intervention consisted of a one-time letter providing information about free, IRS-sponsored in-person or software-assisted tax preparation methods – filing methods that are available to approximately 70% of taxpayers but that are used by only a small share of that group.

Our analysis of the intervention yields mixed results. On the one hand, we observe statistically significant but fairly modest effects of the intervention on filing rates (an increase of approximately 1 percentage point), suggesting that the intervention did not increase awareness of the free filing methods or that the financial cost of tax preparation is not the primary barrier to filing. On the other hand, we find that among those who filed a tax return because of the intervention, the vast majority (approximately 80%) claimed a tax refund. We also observe a statistically significant increase in EITC claims – approximately 43% of the new filers claimed the credit with an average credit amount of \$861. Thus, although the specific intervention we study was only moderately effective at causing nonfilers to file a return, our results underscore the potential of policies that increase tax filing as a method for raising the take-up of tax-administered social benefits.

We contribute to an established literature in public economics that studies barriers to social benefit take-up and program participation (Currie, 2006). Evaluations of interventions that aim to increase EITC awareness – the most common approach to increasing take-up – have mostly found zero or small effects on EITC claiming (Cranor, Kotb and Goldin, 2019; Chetty and Saez, 2013; Guyton et al., 2016; Jones, 2010; Linos et al., 2020). Bhargava and Manoli (2015) and Manoli and Turner (2014) document substantial effects from IRS notices to filers who appear to have missed the EITC; however, those interventions combined promoting awareness with a simplified process for claiming the credit, making it difficult to distinguish which element led to the increased EITC claiming.² Outside of the EITC

²Relative to our intervention, these studies also focus on a different population – i.e., individuals who have already filed a tax return establishing their likely eligibility for the credit.

context, evaluations of awareness interventions have yielded mixed results, with a few studies showing substantial effects (e.g., Armour, 2018; Finkelstein and Notowidigdo, 2019), but most finding either no effect or effects that are modest in magnitude (e.g., Bettinger et al., 2012; Bergman, Denning and Manoli, 2019; SBST, 2016). In contrast, the indirect approach for increasing EITC take-up that we focus upon does not require instilling awareness of the credit's existence or of its complicated eligibility rules.

Several prior papers have shed light on specific aspects of the link between tax filing with an assisted preparation method and EITC take-up. Kopczuk and Pop-Eleches (2007) exploit the staggered introduction of state electronic filing programs to study how electronic filing shapes EITC claiming. They find a positive effect of these programs on EITC claiming but cannot distinguish whether the increase in take-up is due to an increase in tax filing or to changes in preparation method among current filers. Gunter (2019) also studies the relationship between electronic filing and EITC claiming, drawing on state and time variation in broadband internet access. Gunter finds that broadband access leads to more electronic filing of tax returns, but no positive effect on EITC participation and observes mixed evidence on tax filing rates. Finally, Ramnath and Tong (2017) study the effects of the 2008 Economic Stimulus Act, which provided an additional one-time financial incentive to file a tax return. They find this policy raised both tax filing and EITC claiming. Although this paper relied on a different identification strategy than ours (quasi-experimental versus random variation) and targeted a different element of the tax filing decision (the financial benefits versus perceived costs of filing a return), its findings are consistent with our hypothesis that policies that raise filing rates can be an effective method for increasing EITC take-up, even when the policy itself has no direct connection to the EITC.

2 Background

This section provides background information on the EITC, tax preparation methods, and tax filing.

2.1 Take-Up of the Earned Income Tax Credit

The EITC is the largest anti-poverty program in the United States today. Operating through the tax code, it provides a refundable credit to low-income taxpayers who have positive earnings from employment or other work. Over 25 million taxpayers claimed the credit in 2018; among those who qualify, the credit amount varies by income and by family size, with maximum benefits ranging from \$519 for taxpayers without children to \$6,431 for taxpayers with three or more children. In that year, the average benefit amount among EITC-claimants was approximately \$2,500 (IRS, 2018*b*).

Notwithstanding the financial value of claiming the credit, a significant share of those who appear to qualify for the EITC fail to claim it. In recent years, for example, the EITC take-up rate has been estimated to be between 78 and 80% (IRS, 2020). Among the approximately 5 million low-income individuals who appear to qualify for but not claim the EITC each year, approximately two-thirds do not file a tax return. Among filers, the EITC take-up rate is approximately 92% (Census, 2013). The relatively high take-up rate among filers is likely due to both the widespread use of assisted tax preparation methods (discussed below) as well as the success of automated IRS notices that inform apparently eligible but non-claiming filers of the EITC and provide a simplified process for amending one's return to claim it (Bhargava and Manoli, 2015; Manoli and Turner, 2014).

Incomplete take-up of the EITC has been a persistent policy concern, motivating significant investments in outreach by governments and non-profits, such as flyers, social media campaigns, direct mailings, and "street teams" organized to canvas low-income communities (see Goldin (2018) for a summary of such efforts). In addition, certain states and cities

(and in some cases, the federal government) require employers to mail annual reminders to their employees about the EITC; Cranor, Kotb and Goldin (2019) estimate that in 2016, such requirements covered over 46 million employees. Note that the efforts described in this paragraph aim to increase EITC take-up by increasing awareness of the credit.

2.2 Tax Filing

In the United States, individuals who owe an income tax balance due are required to prepare and file an annual income tax return during the subsequent calendar year. In contrast, individuals who are owed a tax refund – because of refundable tax credits like the EITC or the Child Tax Credit or from over-withholding – generally face no legal consequence from failing to file a return. During the 2018 filing season, approximately 88% of the potential taxpayers appearing on information returns filed a tax return.

Among filers, most taxpayers use one of several methods to file their tax return. First, they may file their tax return by paper, without assistance. The share of individuals preparing their returns in this way has fallen in recent years, to approximately 4% during the 2018 filing season. Second, and much more commonly, taxpayers may file using a professional tax preparer, such as an accountant, lawyer, or other trained professional (e.g., an employee of an HR Block or Liberty Tax). In 2018, approximately 55% percent of taxpayers used paid preparers to help file their returns. Third, taxpayers may file their own returns using commercial software, such as TurboTax (approximately 41% of returns filed during 2018).

Additionally, the IRS facilitates two free assisted tax preparation services: the Volunteer Income Tax Assistance (VITA) program and the Free File program.³ VITA offers free in-person tax preparation services from IRS-certified volunteers to taxpayers whose income for the year is less than or equal to an annually adjusted threshold (\$55,000 for the 2019 filing

³In addition to VITA and Free File, the IRS operates the Tax Counseling for the Elderly (TCE) program, which provides free tax preparation assistance targeted at taxpayers aged 60 and above. Other than the difference in eligibility requirements, TCE sites resemble VITA sites, and there is significant overlap in the administration of the two programs. In our empirical analysis, we treat taxpayers who prepare their return at a TCE site as if they had used a VITA site.

season). VITA is available to the vast majority of taxpayers whose incomes fall below this threshold, although certain complicated but uncommon tax situations are excluded from the program's scope, such as taxpayers who claim a net loss from operating a business.⁴

The Free File program is a partnership between the IRS and a consortium of for-profit firms providing specialized commercial tax software such as HR Block and TurboTax. Through the program, participating companies offer free versions of their online tax preparation software to qualifying individuals. Eligibility for the Free File program is determined based on a taxpayer's income. By agreement, the annual income threshold is set so that 70 percent of the tax filing population will qualify for the program (\$66,000 for the 2019 filing season). In addition, each company sets its own (more restrictive) eligibility conditions concerning which taxpayers qualify for its version of the software based on characteristics such as income, age, military status, and EITC eligibility. Depending on the company and the taxpayer's state, the Free File software may also provide a free state income tax return. Taxpayers participate in the Free File program by initiating their return through the IRS's Free File website.

Despite broad eligibility for Free File and VITA, the share of taxpayers using these services has consistently been quite low. For tax year 2018, among taxpayers whose incomes qualified them to participate in Free File, approximately 2% filed their taxes using the program. In the same year, with respect to VITA, approximately 3% of the taxpayers whose incomes qualified them to participate in VITA prepared their taxes through the program. Because many nonfilers would have qualified for these programs had they chosen to file, the overall take-up rate was even lower than these figures suggest. A potentially important factor driving the low rate of participation in these programs may be a lack of awareness in the programs' existence among qualifying taxpayers (e.g., TIGTA, 2020).

⁴A full list of included services as well as excluded services can be found in IRS Publication 3676-B.

3 Experimental Sample and Design

During early 2019 (i.e., the prescribed time period for filing 2018 tax returns), the IRS conducted an experiment in which certain individuals were mailed informational letters describing the availability of free assisted tax preparation methods.

The experimental population consisted of taxpayers who did not file a tax return for the prior tax year (2017), but who, based upon information returns filed with the IRS, appeared to have 2017 income above zero and below \$55,000 - the maximum threshold to qualify for free assistance through both Free File and VITA. In addition, we restricted the sample to individuals who lived within 30 miles of at least two VITA sites. Finally, because the intervention could not have affected their behavior, we excluded from the sample individuals who filed a 2018 tax return before the experimental letters were sent (i.e., returns posted to the IRS database prior to mid-March, 2019).⁵ After imposing these restrictions, the final experimental sample consisted of 1,804,420 individuals.

The experimental intervention consisted of a one-time letter from IRS addressed to the taxpayer. The letters contained information about free filing programs – either Free File, VITA, or both.⁶ Individuals were randomly assigned across letter variants (collectively, 56,015 letters) or to a control group that did not receive a letter (see Appendix Table A.1 for more details).⁷ A sample letter is contained in Appendix Figure A.1.

Our data come from administrative tax records housed at the IRS. For each individual in our experimental sample, we observe tax filing, return preparation method, filed returns, and third-party information reports for tax years 2017 through 2019. To reduce the influence

⁵Although we intended for the IRS to mail the letters at the start of the 2019 filing season (late-January), the government shutdown that occurred during that time period delayed the mailings until the second week of March, 2019.

⁶Treatment letters containing information on Free File directed taxpayers to either the main Free File website or to an "eligibility wizard" page to assess eligibility; for the most part we pool those variants for purposes of our analyses here. The VITA treatment letters included addresses and contact information for two VITA sites closest to the taxpayer's address.

⁷In conducting random assignment, individuals were stratified based on whether they: lived within 5 miles of at least one VITA site; had withheld income in 2017; were over 30 years old; and had apparent income of at least \$25,000.

of outliers, we winsorized the non-categorical variables used in our analysis at the 1% and 99% levels. We supplemented this administrative data with information about undeliverable letters from the contractor hired by IRS to conduct the mailing.

4 Results

Table 1 provides summary statistics and balance checks for the experimental sample of nonfilers. Column 1 provides characteristics for the full experimental sample. Individuals in the sample tended to be relatively young (with a mean age of 35), disproportionately male (58% of the sample), and low income (approximately \$13,300) during 2017. As shown in Columns 2-4, these characteristics appear balanced across the treatment and control groups.⁸

4.1 Main Filing Outcomes

We next investigate the effect of the intervention on tax filing behaviors. To account for the fact that not all letters were successfully delivered to the intended recipient, and that we do not know which individuals in the control group would have had their letters returned as undeliverable had they (counter-factually) been assigned to the treatment group, we report specifications that instrument for successful delivery with treatment status.⁹ Appendix Table A.3 reports the first stage of this specification; approximately 38% percent of letters were returned to the IRS as undeliverable.

Table 2 reports the effect of the intervention on decisions relating to tax return filing.¹⁰ Column 1 shows the overall effect on tax filing (across all filing methods). Individuals who received the letters were 0.74 percentage points more likely to file a 2018 tax return – a 3.5% relative increase relative to the control group mean. Panel A of Figure 1 investigates

⁸Appendix Table A.2 shows that these characteristics appear balanced across treatment variants as well.

⁹Of course, we do not observe whether the intended recipient of a successful delivery actually opened or read the letter, or whether it reached the intended individual residing at an address.

¹⁰Appendix Table A.4 shows the reduced form effect of the intervention on these outcomes. We observe similar effects when controlling for randomization strata indicators (Appendix Table A.5).

the timing of this effect and shows that it is concentrated in the first few weeks following treatment, and, to a lesser extent, the weeks shortly after the tax filing deadline (when most returns filed around the deadline post to the IRS database).

We next explore the effect of the intervention on filing method. Column 2 shows that the letters increased the share of individuals using a free tax preparation method by 0.39 percentage points – an effect that is modest in absolute magnitude but that represents a 33% increase relative to the control group of mean. Panel B of Figure 1 shows that the increase in free filing methods appears largest in the first few weeks after the treatment was sent. Columns 1 and 2 of Appendix Table A.6 show that the increase in free filing methods was driven by roughly equal increases in Free File and VITA.¹¹

Importantly, the results in Columns 1 and 2 suggest that the effect of the intervention was not limited to increasing the use of free methods – the point estimate on filing was twice as large as the point estimate on the use of free preparation methods. In principle, the letters could reduce the use of other filing methods by prompting individuals to substitute to free methods or, alternatively, could increase the use of other methods by preventing taxpayers from forgetting to file a return or by channelling individuals who intend to use Free File toward commercial software (Elliott, 2019; Elliott and Waldron, 2019). Columns 3 and 4 of Appendix Table A.6 investigate these possibilities; we find positive, but statistically insignificant, effects on the use of commercial software and paid in-person preparers. Similarly, Column 5 of Appendix Table A.6 shows no effect of the letters on the share of individuals who file a tax return without computer or professional assistance.

Column 3 of Table 2 turns to the effect of the letters on EITC claiming. We estimate the letters increased the share of individuals claiming the EITC by 0.32 percentage points, a 7% increase relative to the control group mean. Again, we observe that the increase in EITC claims appears in the first few weeks following the mailing of the letters (Panel C of Figure 1), consistent with the hypothesized link between filing and EITC-claiming. In addition,

¹¹Appendix Table A.7 explores these effects by treatment variant and confirms that treatments focusing on a particular free method were associated with larger increases in use of that method.

apart from EITC claims, filing a return may yield a refund because of other refundable credits or over-withholding, or alternatively, may generate a balance due because of other tax liabilities. To assess the overall effect of the intervention on taxpayer refunds, Column 4 of Table 2 and Panel D of Figure 1 investigate the effect of the intervention on the likelihood of filing a return that generates a refund. We estimate an effect of 0.60 percentage points - a 4% increase relative to the control group mean.

Given that the intervention appears to increase the number of EITC claims and returns filed for refund, we next investigate more formally the characteristics of the returns that were filed because of the intervention. To do so, we use the intervention to instrument for the effect of filing on EITC and refund claiming. As above, our interpretation of this analysis requires that the effect of the intervention on tax filing was monotonic (i.e., that the letters did not cause anyone to choose not to file a return) and that the intervention did not affect EITC or refund claiming among those who would have filed even absent the intervention.¹²

Table 4 contains the results of this analysis. We find that approximately 43% of the individuals who filed a return because of the intervention claimed the EITC (Column 1) and that the average amount of EITC claimed among these marginal filers was \$861 (Column 2). In addition, we estimate that approximately 80% of the returns filed because of the intervention generated an overall refund (Column 3), with an average refund amount of approximately \$2000 (Column 4). The magnitude of this refund is substantial, suggesting that the new filers benefitted by claiming other refundable credits or a refund from over-withholding, although we caution that the point estimate for the overall refund amount is imprecisely estimated.

To the extent that the intervention provided new information about free filing methods,

¹²Although neither of these assumptions is directly testable, both seem likely to hold within our setting. With respect to monotonicity, there is little reason to expect a letter about free tax preparation methods would discourage someone from filing. With respect to the exclusion restriction, the assumption could be violated if the intervention caused current filers to switch to a filing method for which they are more or less likely to claim the EITC or receive a refund, such as by substituting from paid to free methods. However, we observe an absolute increase in the share of individuals using paid methods following the intervention, rather than the reduction one might expect if such substitution was significant.

we may expect to see effects on filing and EITC claiming in subsequent years as well. Similarly, if the intervention served as a reminder to file, that reminder may have had persistent effects. Table 3 investigates the effect of the intervention on tax filing outcomes for 2019, the second year following the intervention. We find positive, but small and statistically significant effects of receiving a letter on subsequent year use of free tax preparation, filing, and EITC claiming. These findings are consistent with Guyton et al. (2016), which finds that increases in EITC claiming due to EITC informational outreach do not persist in subsequent years.¹³

Finally, we report results from several additional analyses to assess the validity and robustness of our results. Appendix Figure A.2 presents results from a permutation test for the reduced form effect of the intervention for our main filing outcomes; the resulting p-values are comparable to those reported in Table 2. Appendix Table A.8 replicates the analyses in Table 2, but uses each treatment variant as a distinct instrument for a successful letter delivery. The results are nearly identical to those in our main specification. Last, as a placebo test, Appendix Table A.9 investigates the effect of the letters on tax returns filed during the early weeks of 2018, prior to the intervention being sent out.¹⁴ As expected, we observe no statistically significant differences in the treatment and control group means for use of free filing, EITC claiming, or refund claiming among this set of individuals.

5 Discussion

We evaluate an informational letter sent by the IRS to nonfilers describing the availability of free tax preparation methods. We estimate that this intervention led to modest increases in tax filing, EITC claiming, and the use of free tax preparation methods. We interpret the

¹³Note that the control group's 2019 filing rate was twice as high in 2019 compared to 2018, likely due to the filing requirement contained in the Coronavirus Aid, Relief, and Economic Security Act. This increase may have swamped any persistence in our intervention's effects.

¹⁴As described above, individuals who filed during this time period were initially assigned to either the treatment or control group but were ultimately excluded from the sample after a government shutdown delayed the mailing.

results as evidence that policies that increase tax filing can be an effective way to increase EITC take-up – even policies that do not increase awareness of the credit or directly target the credit in other ways.

Although our results suggest a strong link between tax filing and EITC take-up, the specific intervention we studied was only modestly successful at increasing filing, and therefore, yielded only a small (absolute) increase in EITC participation.¹⁵ Thus, although interventions like the one we studied do not appear to be a silver bullet for raising EITC take-up, our findings suggest that policies that do succeed at significantly raising filing rates among EITC-eligible individuals would be quite effective at achieving this goal. The challenge of course is identifying which policies those would be. One set of possibilities include policies that would more drastically reduce the financial and non-financial costs of tax filing, such as if the IRS were to mail tax returns that were pre-populated with the taxpayer’s information from administrative records and prior tax years (Bankman, 2008). A different alternative for increasing filing would be to adopt policies that make filing more beneficial, such as by expanding refundable credits, adjusting withholding schedules (Jones, 2012), or administering additional social benefit programs through the tax code (Alm et al., 2012).

¹⁵In this regard, our main conclusion concerning the link between filing and take-up is consistent with the findings of another recent paper, Linos et al. (2020), which studies a similar intervention conducted in parallel with our own, and with prior studies in the literature such as Gunter (2019) and Cranor, Kotb and Goldin (2019), all of which find no positive effects on either filing or, potentially as a result, on EITC take-up.

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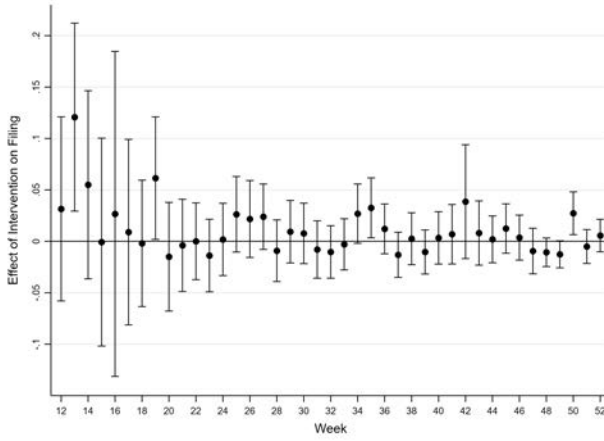
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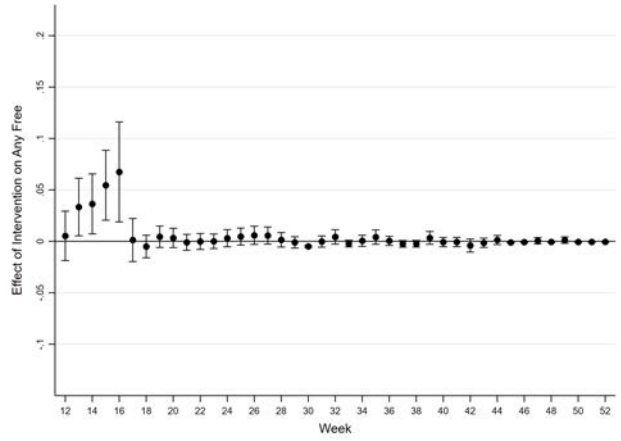
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Figure 1: Effect of Intervention on Tax Filing Outcomes by Week

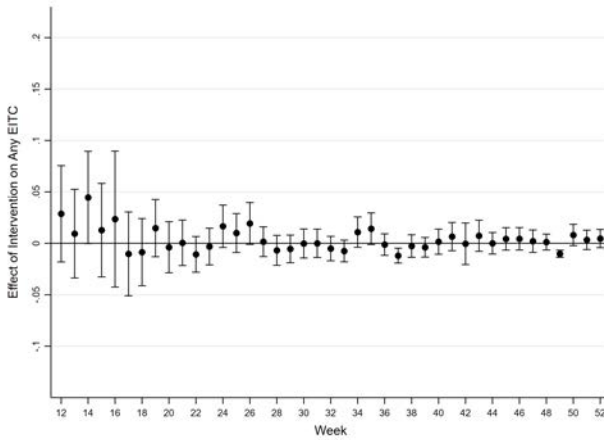
(a) Tax Return Filing



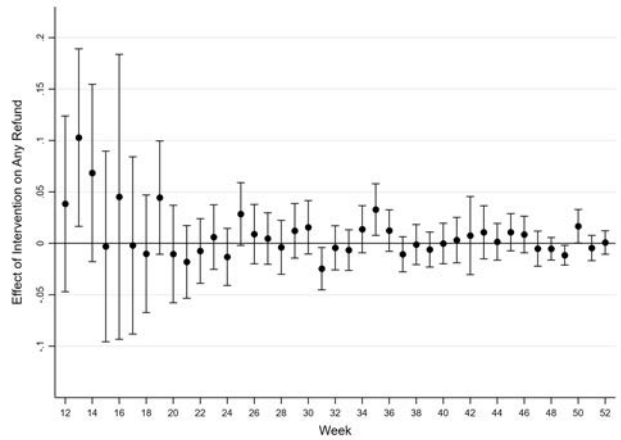
(b) Free Tax Preparation Method



(c) EITC Claiming



(d) Refund Claiming



The Figure displays the estimated effect of receiving one of the experimental letters on tax filing outcomes for tax year 2018 during the specified week following the intervention. The tax filing outcomes shown in each panel are as follows: whether the individual filed a tax return (Panel A); whether the individual filed a tax return through the VITA or Free File program (Panel B); whether the individual claimed the EITC (Panel C); whether the individual filed a return claiming a refund (Panel D). Units are percentage points (0-100). In each panel, week 1 refers to the 12th week of the year, beginning on March 18, 2019. Each estimate is derived from a two-stage least-squares specification in which an indicator for successful letter delivery is instrumented for by an indicator for treatment status. Bars denote the 95% confidence interval derived from heteroskedasticity robust standard errors.

Table 1: Summary Statistics and Balance Checks

	(1)	(2)	(3)	(4)
	Overall Sample	Treatment	Control	Difference p-value
Age	36.2	36.3	36.2	0.231
Female	0.411	0.412	0.411	0.482
Income	13,853	13,843	13,853	0.878
Any Wages	0.899	0.898	0.899	0.424
Any Withholding	0.731	0.731	0.731	0.833
Closest VITA Site (Miles)	3.61	3.61	3.61	0.987
Observations	1,804,420	56,015	1,748,405	
Joint test (<i>p-value</i>)				0.774

The table presents summary statistics for individuals in the full sample of 2017 nonfilers (Column 1), the pooled treatment group (Column 2), and the control group (Column 3). Column 4 presents the p-value for a test of equality between the treatment and control group means. All characteristics are based on data for tax year 2017 (the pre-intervention year). Age and sex are derived from Social Security Administration records housed by the IRS. Income is derived from information returns such as Form W-2 and 1099-Misc. “Any Wages” indicates the presence of income reported on Form W-2. “Any Withholding” indicates the presence of withheld income on one or more of the individual’s information returns. The joint test p-value is derived from a test of the null hypothesis that each characteristic listed in the table is equal between the treatment and control groups.

Table 2: Effect of Intervention on Tax Filing Outcomes

	(1)	(2)	(3)	(4)
	Filed	Free Method	Claimed EITC	Claimed Refund
Received Letter	0.742*** (0.286)	0.385*** (0.081)	0.322** (0.148)	0.595** (0.259)
Control Mean	21.489	1.164	4.611	16.562
Observations	1,804,420	1,804,420	1,804,420	1,804,420

The table reports the estimated effect of receiving one of the experimental letters on tax filing outcomes for tax year 2018. Units are percentage points (0-100). Each column is derived from a two-stage least-squares specification in which an indicator for successful letter delivery is instrumented for by an indicator for treatment status. The outcome variables are as follows: whether the individual filed a tax return (Column 1); whether the individual filed a tax return through the VITA or Free File program (Column 2); whether the individual claimed the Earned Income Tax Credit (Column 3); whether the individual filed a return claiming a refund (Column 4). Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Effect of Intervention on Subsequent Year Tax Filing Outcomes

	(1)	(2)	(3)	(4)
	Filed	Free Method	Claimed EITC	Claimed Refund
Received Letter	0.128 (0.340)	0.165 (0.109)	0.068 (0.181)	0.171 (0.304)
Control Mean	40.501	2.474	7.398	26.003
Observations	1,804,420	1,804,420	1,804,420	1,804,420

The table reports the estimated effect of receiving one of the experimental letters on tax filing outcomes for tax year 2019 (the second tax year following the intervention). Units are percentage points (0-100). Each column is derived from a two-stage least-squares specification in which an indicator for successful letter delivery is instrumented for by an indicator for treatment status. The outcome variables are as follows: whether the individual filed a tax return (Column 1); whether the individual filed a tax return through the VITA or Free File program (Column 2); whether the individual claimed the Earned Income Tax Credit (Column 3); whether the individual filed a return claiming a refund (Column 4). Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Characteristics of Intervention-Induced Tax Returns

	(1)	(2)	(3)	(4)
	Any EITC	EITC Amount (\$)	Any Refund	Refund Amount (\$)
Filed	43.377** (19.859)	861.320* (486.678)	80.181*** (18.366)	2111.779 (1476.177)
Control mean	4.611	68.403	16.562	124.433
Observations	1,804,420	1,804,420	1,804,420	1,804,420

The table reports average characteristics of the tax returns that were filed as a result of the intervention. Each column is derived from a two-stage least-squares specification in which an indicator for filing a 2018 return is instrumented for by an indicator for treatment status. The outcome variables are as follows: whether the return claimed the EITC (Column 1); the average EITC claim in dollars (Column 2); whether the return claimed a refund (Column 3); and the average refund claim in dollars (Column 4). Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A Appendix (for online publication only)

Figure A.1: Sample Treatment Letter (VITA + Free File (Gen))



Department of the Treasury
Internal Revenue Service
c/o Westat
1600 Research Blvd. RW2634
Rockville, MD 20850-3129
RETURN SERVICE REQUESTED

Letter: 6168
Date: [DATE]

[BARCODE] [RECID] [NDC CODE]
[TAXPAYER NAME]
[ADDRESS LINE 1] [ADDRESS LINE 2]
[CITY], [STATE] [ZIP]

According to our records, you may qualify for free tax preparation

What you need to know **Two out of three taxpayers qualify for free in-person or online tax preparation through an IRS-sponsored program.**

Benefits you may receive from assisted tax preparation:

- Getting your refund in as few as three business days.
- Access to free commercial software for federal and state returns.
- Less chance of making a mistake on your tax return or missing a tax benefit.

Read below for information about these free IRS-sponsored programs.

VITA/TCE programs

- The Volunteer Income Tax Assistance (VITA) and Tax Counseling for the Elderly (TCE) programs provide free in-person tax preparation assistance by IRS-certified volunteers, regardless of a taxpayer's age.
- Most taxpayers qualify if they earned \$55,000 or less in 2018.
- Help is available near you. Call for hours of operation:

[VITA SITE NAME #1]
[Address line #1]
[City, State Zip #1]
[Phone #1]

[VITA SITE NAME #2]
[Address line #2]
[City, State Zip #2]
[Phone #2]

- Be sure to bring photo identification, a copy of your last year's return, Social Security cards, and your tax documents (e.g., Forms W-2 and 1099-MISC).
- **For more information, visit www.irs.gov/VITA or call 800-906-9887.**

Free File program

- Free File provides free commercial software to help prepare your return online.
- Most taxpayers qualify if they earned \$66,000 or less in 2018.
- You will need your 2017 tax return, 2018 tax documents, and a valid email address to begin.
- **For more information, visit www.irs.gov/FreeFile.**

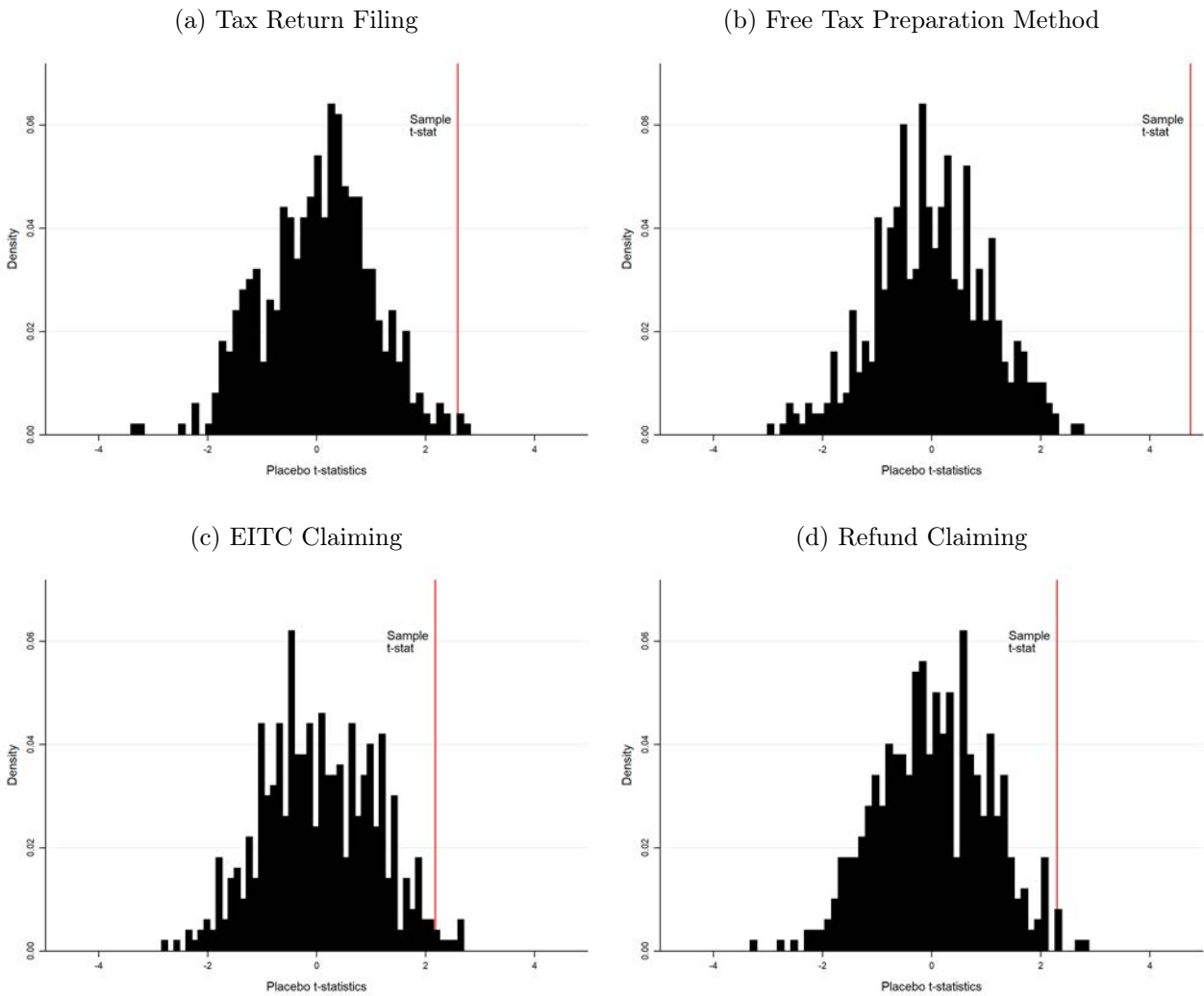
Frequently asked questions

- If you have questions about this letter, you can call 855-421-8641 (toll-free).
- You don't need to respond to this letter.

Letter 6168 (02-2019)
Catalog Number 72135K

Notes:

Figure A.2: Randomization Inference



Each panel of the figure plots the distribution of t-statistics corresponding to the estimated reduced form effect of the intervention on the specified outcome variable, generated from 500 random reassignments of the treatment indicator variable across individuals in the experimental sample. The reassignments were conducted with the "ritest" Stata command (Heß, 2017). The vertical line denotes the t-statistic estimated using the actual treatment assignment. The outcomes specified in panels (a)-(d) correspond to the outcomes evaluated in Columns (1)-(4) of Table 2. The p-values implied by the analyses depicted in panels (a) through (d) are, respectively: 0.008, <0.001 , 0.026, and 0.014.

Table A.1: Treatment Variant Description

	(1)	(2)	(3)	(4)	(5)
	VITA	FreeFile	FreeFile General Website	FreeFile "Wizard" Website	Observations
<i>Treatment</i>					56,015
1	X	X	X		11,182
2	X	X		X	11,179
3	X				11,217
4		X	X		11,242
5		X		X	11,195
<i>Control</i>					1,748,405

Notes: The table summarizes the components of each treatment letter variant as well as the number of individuals in the experimental sample that were randomly assigned to receive it. Treatments 1-3 contain information about VITA. Treatments 1,2, 4, and 5 contain information about Free File. Treatments 1 and 3 provide a link to the general IRS Free File landing website whereas Treatments 2 and 4 provide a link to the IRS Free File "eligibility wizard" website.

Table A.2: Summary Statistics and Balance Checks by Treatment Variant

	(1)	(2)	(3)	(4)	(5)	(6)
	T1	T2	T3	T4	T5	Difference p-value
Age	36.3	36.5	36.2	36.3	36.2	0.656
Female	0.413	0.418	0.407	0.413	0.409	0.586
Income	13,835	13,851	13,837	13,800	13,894	0.998
Any Wages	0.899	0.898	0.898	0.898	0.897	0.976
Any Withholding	0.730	0.731	0.731	0.731	0.731	1.000
Closest VITA Site (Miles)	3.66	3.58	3.57	3.62	3.64	0.853
Observations	11,182	11,179	11,217	11,242	11,195	

Notes: The table contains summary statistics and balance checks relating to the assignment of individuals across treatment variants. Each individual included in the table was assigned to receive one of the treatment variants. Columns (1)-(5) provide summary statistics for individuals assigned to Treatments (1)-(5), respectively. Column 6 presents the p-value for a test of equality across the treatment group means. All characteristics are based on data for tax year 2017 (the pre-intervention year). Age and sex are derived from Social Security Administration records housed by the IRS. Income is derived from information returns such as Form W-2 and 1099-Misc. “Any Wages” indicates the presence of income reported on Form W-2. “Any Withholding” indicates the presence of withheld income on one or more of the individual’s information returns.

Table A.3: Effect of Treatment Assignment on Successful Letter Delivery (First Stage)

	(1)
	Any Postcard
Treated	62.067*** (0.205)
Observations	1,804,420

The table reports the estimated first stage effect of assignment to a treatment group on receipt of a letter. An individual is treated as receiving a letter if (1) the individual is assigned to one of the experimental treatment groups and (2) the letter that is sent to that individual is not returned to the IRS as undeliverable. Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4: Effect of Intervention on Tax Filing Outcomes (Reduced Form)

	(1)	(2)	(3)	(4)
	Filed	Any Free	Any EITC	Any Refund
Treated	0.461*** (0.178)	0.239*** (0.050)	0.200** (0.092)	0.369** (0.161)
Control mean	21.489	1.164	4.611	16.562
Observations	1,804,420	1,804,420	1,804,420	1,804,420

The table reports the estimated reduced form effect of treatment group assignment on tax filing outcomes for tax year 2018. Units are percentage points (0-100). Each column reports the difference in means for the (pooled) treatment groups versus the control group. The outcome variables are as follows: whether the individual filed a tax return (Column 1); whether the individual filed a tax return through the VITA or Free File program (Column 2); whether the individual claimed the EITC (Column 3); whether the individual filed a return claiming a refund (Column 4). Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5: Effect of Intervention on Tax Filing Outcomes Controlling for Randomization Strata Indicators

	(1)	(2)	(3)	(4)
	Filed	Free Method	Claimed EITC	Claimed Refund
Received Letter	0.739*** (0.283)	0.385*** (0.081)	0.321** (0.147)	0.589** (0.255)
Control Mean	21.489	1.164	4.611	16.562
Observations	1,804,420	1,804,420	1,804,420	1,804,420

The table reports the estimated effect of receiving one of the experimental letters on tax filing outcomes for tax year 2018 from specifications that control for randomization strata fixed effects. Units are percentage points (0-100). Each column is derived from a two-stage least-squares specification in which an indicator for successful letter delivery is instrumented for by an indicator for treatment status. The outcome variables are as follows: whether the individual filed a tax return (Column 1); whether the individual filed a tax return through the VITA or Free File program (Column 2); whether the individual claimed the EITC (Column 3); whether the individual filed a return claiming a refund (Column 4). Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.6: Effect of Intervention on Tax Filing Method

	(1)	(2)	(3)	(4)	(5)
	Free-File	VITA	Commercial Software	Professional Tax Preparer	Unassisted Preparation
Received Letter	0.167*** (0.058)	0.218*** (0.057)	0.107 (0.195)	0.174 (0.212)	0.076 (0.080)
Control Mean	0.603	0.561	8.653	10.364	1.308
Observations	1,804,420	1,804,420	1,804,420	1,804,420	1,804,420

The table reports the estimated effect of receiving one of the experimental letters on the use of various tax filing methods for tax year 2018. Units are percentage points (0-100). Each column is derived from a two-stage least-squares specification in which an indicator for successful letter delivery is instrumented for by an indicator for treatment status. The outcome variables are as follows: whether the individual filed a tax return using Free File (Column 1); VITA (Column 2); commercial software (Column 3); professional tax preparer (Column 4); no professional assistance or commercial software (Column 5). Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.7: Effect of Intervention on Tax Filing Method by Letter Variant

	(1)	(2)	(3)	(4)	(5)
	Free-File	VITA	Commercial Software	Paid In-Person	Unassisted Preparation
Letter 1	0.167 (0.128)	0.307** (0.132)	-0.311 (0.426)	-0.129 (0.465)	0.156 (0.180)
Letter 2	0.080 (0.123)	0.019 (0.116)	-0.380 (0.426)	0.468 (0.473)	0.070 (0.177)
Letter 3	0.033 (0.120)	0.575*** (0.145)	0.308 (0.433)	-0.037 (0.464)	-0.010 (0.173)
Letter 4	0.274** (0.133)	0.285** (0.130)	0.775* (0.438)	0.098 (0.464)	0.171 (0.179)
Letter 5	0.280** (0.134)	-0.098 (0.108)	0.134 (0.431)	0.470 (0.471)	-0.006 (0.173)
Control mean	0.603	0.561	8.653	10.364	1.308
Observations	1,804,420	1,804,420	1,804,420	1,804,420	1,804,420

The table reports the estimated effect of receiving the various experimental letters on the use of various tax filing methods for tax year 2018. Units are percentage points (0-100). Each column is derived from a two-stage least-squares specification in which indicators for successful delivery of each letter type is instrumented for by indicators for treatment assignment to receive each letter type. The outcome variables are as follows: whether the individual filed a tax return using Free File (Column 1); VITA (Column 2); commercial software (Column 3); professional tax preparer (Column 4); no professional assistance or commercial software (Column 5). Treatments 1 and 2 contain information about Free File and VITA; treatment 3 contains information about VITA only; treatments 4 and 5 contain information about Free File only. Treatments 1 and 4 contain a link to the general IRS Free File website; treatments 2 and 5 contain a link the IRS Free File Eligibility “Wizard” website. Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.8: Effect of Intervention on Tax Filing Method Using Multiple Instruments

	(1)	(2)	(3)	(4)
	Filed	Free Method	Claimed EITC	Claimed Refund
Received Letter	0.743*** (0.286)	0.385*** (0.081)	0.322** (0.148)	0.596** (0.259)
Control Mean	21.489	1.164	4.611	16.562
Observations	1,804,420	1,804,420	1,804,420	1,804,420

The table reports the estimated effect of receiving one of the experimental letters on tax filing outcomes for tax year 2018. Units are percentage points (0-100). Each column is derived from a two-stage least-squares specification in which an indicator for successful letter delivery is instrumented for by a set of five indicators, each indicating (respectively) whether the individual was assigned to a particular letter variant. The outcome variables are as follows: whether the individual filed a tax return (Column 1); whether the individual filed a tax return through the VITA or Free File program (Column 2); whether the individual claimed the EITC (Column 3); whether the individual filed a return claiming a refund (Column 4). Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.9: Effect of Intervention on Early-Filed Tax Returns (Placebo)

	(1)	(2)	(3)
	Free Method	Claimed EITC	Claimed Refund
Received Letter	-0.447 (0.377)	-1.236 (0.841)	-0.047 (0.404)
Control Mean	4.749	31.561	94.854
Observations	229,521	229,521	229,521

The table reports the estimated effect of receiving one of the experimental letters on tax filing outcomes for tax year 2018 among the subset of the sample that filed a 2018 return during the first 12 weeks of 2019 (i.e., before the IRS letters were mailed). Filing date for a return is proxied by the date that the return is posted to the IRS database. Units are percentage points (0-100). Each column is derived from a two-stage least-squares specification in which an indicator for successful letter delivery is instrumented for by an indicator for treatment status. The outcome variables are as follows: whether the individual filed a tax return through the VITA or Free File program (Column 1); whether the individual claimed the EITC (Column 2); whether the individual filed a return claiming a refund (Column 3). Parentheses contain heteroskedasticity robust standard errors. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.