The Impact of Tax Refund Delays on the Experience of Hardship and Unsecured Debt

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The Earned Income Tax Credit (EITC) provides substantial financial support to low-income workers, yet around a quarter of EITC payments are estimated to be erroneous or fraudulent. Beginning in 2017, the Protecting Americans from Tax Hikes Act of 2015 requires the Internal Revenue Service to spend additional time processing early EITC claims, delaying the issuance of tax refunds. Leveraging unique data, we investigate how delayed tax refunds affected the experience of hardship and unsecured debt among EITC recipients. We find that early filers experienced increased food insecurity relative to later filers after the implementation of the refund delay.

Keywords: tax refund delay, PATH Act, Earned Income Tax Credit, material hardship, medical hardship, food insecurity, unsecured debt

JEL codes: D10, G50; H24, I38; M38

I. Introduction

Each year, April 15 rings a familiar bell of dread for many U.S. tax filers, perhaps less because of a fear of missing the deadline to file one's federal income tax return than for its reminder of an impending, unpleasant task. Yet many low- and moderate-income (LMI) households in the U.S. look forward to filing their federal tax returns and receiving their tax refund—which comprises a substantial proportion of their yearly income—so much that they often file as early as possible. This impatience to file taxes is understandable. Tax refunds act as windfalls that LMI filers can use to pay down debt, save, get caught up on bills, make large purchases, and enjoy modest "splurges" like eating out (Sykes et al. 2015). The Earned Income Tax Credit (EITC) comprises a significant proportion of refunds and income for many working low-income tax filers, especially households with children. For example, in the 2019 tax year, the maximum benefit for a Head of Household filer with three or more children and $15,000 in earnings was $6,557, or 44% of their earned income.

Prior to the 2017 tax season, tax filers did not have long to wait to receive their refunds; they could often expect to receive their refunds within seven to ten days if they filed electronically and opted to receive their refund via direct deposit. Refund anticipation loans (RALs) offered by paid tax preparers give filers even quicker access to expected refunds. Yet, starting with the 2017 tax season, a newly implemented tax law—the Protecting Americans from Tax Hikes Act (PATH Act) of 2015—requires the Internal Revenue Service (IRS) to provide more time to review and verify wage income to help detect and reduce fraudulent or erroneous EITC and Additional Child Tax Credit (ACTC) claims. Under the PATH Act rule, the IRS began withholding refunds until at least February 15 for filers claiming the EITC or the ACTC, effectively delaying the receipt of refunds until at least late February.

The EITC enjoys bipartisan support for its low administrative costs (Treasury Inspector General for Tax Administration [TIGTA] 2011) and effectiveness in raising incomes and lifting households out of poverty (Gundersen and Ziliak 2004; Hardy, Smeeding, and Ziliak 2018; Hoynes and Patel 2018). At the same time, around a quarter of EITC payments were made improperly in 2017 and the IRS was found to be out of compliance with the Improper Payments Elimination and Recovery Act (IPERA) of 2010 (TIGTA 2018). Following the implementation of the PATH Act, the IRS had delayed almost $58 billion in refunds from 10.7 million tax returns of filers who claimed the EITC and/or ACTC by February 15 of the most recent tax season. By February 23, 2019, the IRS identified 3,529 returns (0.03% of delayed returns) it determined to contain fraudulent EITC and/or ACTC claims, blocking the allocation of $12.2 million in fraudulent refunds (0.02% of delayed refunds) (TIGTA 2019). To put these fraudulent refund payments in perspective, 16% of federal income tax obligations (an average of over $400 billion a year) go unpaid due to intentional and unintentional evasion (Gale and Krupkin 2019).

Thus, the newly implemented refund delays appear to have effectively interdicted a mere fraction of total improper EITC and ACTC payments. The question, therefore, is to whether a small rate of fraud detection through the IRS' refund delays under the PATH Act are worth the taxpayer burdens and unintended negative consequences for low-income households. Many LMI households may need to find ways to offset a multiple-week delay for a large and expected tax refund, such as through increased borrowing and/or decreased spending, which may amplify risk for material hardship, particularly if tax filers plan to use the refund to make critical payments and purchases.

The purpose of this study is to determine whether refund delays may have unintended consequences with respect to material hardship and the accumulation of unsecured debt among

LMI households. To accomplish this, we leveraged unique administrative and survey data and employed a difference-in-differences approach as an identification strategy. We limited the sample to EITC recipients and relied on the time discontinuity in the new rule's dates to identify early filers (treatment group) and non-early filers (comparison group) in 2016 (pre-treatment period) and 2017 (post-treatment period). We then compared the changes in outcomes over time among EITC recipients in the treatment group relative to those in the comparison group. Several key findings emerged from the analysis. First, tax filing patterns appeared similar in 2016 and 2017, signaling the lack of changes in filing behaviors among tax filers after the new reform. Second, the incidence of food insecurity increased among early EITC filers relative to later EITC filers following the implementation of the PATH Act. The magnitude of these negative effects appeared larger for households with greater financial vulnerability. Moreover, in a few models, we found that the relative incidence of skipped housing bills decreased among early EITC filers relative to later EITC filers after the tax reform. Given the statutory intent of the EITC to boost incomes and lift families out of poverty, our findings can help policymakers assess the tradeoffs between this goal and their aim to eliminate fraud and errors and reduce improper payments.

II.   Background

A. *The Earned Income Tax Credit and Household Financial Security*

Tax filing is an extremely common experience in the U.S.; almost 153 million individual income tax returns were filed in 2018 and almost 80 percent of households receive a tax refund (IRS 2019b). The tax refund is important for LMI tax filers in particular, as it often represents the single largest payment they will receive all year (Roll et al. 2018). These households often use the receipt of the tax refund as an opportunity to build savings and pay down debt (Despard et al. 2015; Sykes et al. 2015; Mendenhall et al. 2012; Grinstein-Weiss et al. 2015), as well as cover

necessary expenses like paying off overdue bills, making home or car repairs, and making large

purchases (Sykes et al. 2015; Shaefer, Song, and Williams Shanks 2013; Mendenhall et al. 2012;

Tach and Greene 2014). Tax refunds can be especially valuable for LMI households due to the

receipt of the federal EITC, a fully refundable tax credit that depends on a household's earned

income in the prior year, their filing status (e.g., single, married filing jointly), and the number of

qualifying children claimed on the tax form. Figure 1 outlines the structure of the credit, which

increases with every additional dollar a qualifying household earns until reaching a maximum

(the "phase-in" range), remains constant over a set income range, and then begins to decline once

a household's income exceeds a given threshold (the "phase-out" range).

[Insert Figure 1 Here]

The actual dollar value of the EITC can be substantial—the average value of the EITC

was $2,476 in the 2018 tax year (IRS 2018a). However, the value of this credit depends heavily

on the income and composition of a household: Those without qualifying children could receive

a maximum EITC of $519, while households with three or more qualifying children could

receive a maximum credit of $6,431 in the 2018 tax year. The generosity of the EITC makes it

one of the most robust antipoverty programs in the U.S.; in 2017, the EITC lifted almost six

million people (including three million children) out of poverty (Center on Budget and Policy

Priorities 2019).

A large body of research has evaluated the relationship between the EITC and household

financial security outcomes. This research demonstrates that the receipt of the credit is integral in

various ways to the lives and finances of LMI households. In terms of financial outcomes, the

EITC has been shown to lead to higher rates of labor force participation and reduced poverty

rates (Eissa and Liebman 1996; Ellwood 2000; Gundersen and Ziliak 2004; Meyer and

Rosenbaum 2001; Hotz, Mullin, and Scholz 2006; Hoynes and Patel 2018; Meyer 2010), as well as improvements in household balance sheet metrics like increased savings and reduced unsecured debt (Shaefer, Song, and Williams Shanks 2013; Jones and Michelmore 2018). At the same time, the receipt of the EITC is also associated with an array of secondary effects on households that have implications for both their short- and long-term well-being, including improved health and nutrition outcomes (Averett and Wang 2013; Evans and Garthwaite 2014; Hoynes, Miller, and Simon 2015; McGranahan and Schanzenbach 2013; Rehkopf, Strully, and Dow 2014), and improved educational outcomes (Manoli and Turner 2018; Dahl and Lochner 2012).

B. Financial Precarity in Low-Income Households

The EITC is particularly valuable for LMI households given the relatively high degree of budgetary constraints, financial precarity, and hardship they experience. As stated above, the receipt of the tax refund is one of the few times during the year that many LMI households can build their savings, particularly when their refund is bolstered through the receipt of large credits like the EITC. Building savings is important for LMI households, as these households typically hold extremely low levels of liquid assets to mitigate financial emergencies. A nationally representative survey found that two-thirds of LMI households (those making under $40,000 a year) could not handle a modest emergency expense using liquid savings or a credit card they could pay off within a month (Board of Governors of the Federal Reserve System 2016). This low level of liquidity is partially explained by the fact that LMI households often lack access to banking services offering affordable credit and short-term savings products (Barr 2007; Blank and Barr 2009; Mullainathan and Shafir 2009) and are often subject to asset limits in public programs like the Supplemental Nutrition Assistance Program (SNAP) that disincentivize

savings (Neuberger, Greenstein, and Orszag 2006; O'Brien 2008; Sherraden and Barr 2005). Yet perhaps the major reason that LMI households struggle to save is due to the fact that their budgets are largely consumed by necessary expenditures (Schanzenbach et al. 2016). LMI households' incomes in a typical month are simply not high enough, relative to their expenses, to save regularly and build a substantial liquidity buffer in the absence of large lump sum payouts like the EITC and, more broadly, the tax refund.

On the other side of the balance sheet, debt burdens are also an issue for many LMI households. Debt ownership is a common experience in the U.S., with roughly 80 percent of adults in 2015 reporting some debt (The Pew Charitable Trusts 2015). However, LMI households have debt-to-income ratios that are substantially greater than those in higher-income households and are more likely to have debts in collections (The Aspen Institute 2018). These relatively high debt burdens in LMI households are likely affected by similar factors underlying the low rates of savings in these households, such as tight budgets and a lack of affordable banking and credit products. However, evidence also indicates that households experiencing persistent economic scarcity tend to both over-borrow and utilize high-cost credit products in order to manage their present financial obligations (Shah, Mullainathan, and Shafir 2012; Mullainathan and Shafir 2013). These debt issues have implications for households beyond the balance sheet, as unsustainable debt burdens can lead to broader financial problems including bankruptcy or the deterioration of credit scores, and can cause physical and mental health problems over the long-term (Clayton, Liñares-Zegarra, and Wilson 2015).

While LMI households struggle to save for emergencies and manage their debts, they also face a relatively high degree of exposure to financial shocks, such as an unexpected decline in income (e.g., from the loss of a job) or increase in expenses (e.g., from a major car repair or

hospitalization). LMI households are more likely to experience these shocks (Acs, Loprest, and Nichols 2009; Chase et al. 2011) which cost an average of between $1,500 and $2,000 (Collins and Gjertson 2013; Searle and Köppe 2014) and consume a higher percentage of an LMI household's budget relative to an equivalent shock in a higher-income household. Experiencing these shocks without an adequate savings or liquidity buffer may result in households experiencing an array of hardships such as housing instability, food insecurity, missing essential bill payments, or skipping necessary medical care (Despard et al. 2018; Heflin 2016; Leete and Bania 2010; McKernan, Ratcliffe, and Vinopal 2009). These hardships, in turn, can have substantial negative implications for downstream household outcomes including child developmental problems (Gershoff, Aber, Raver, & Lennon, 2007; Rauh et al., 2004), the experience of housing insecurity (Desmond and Kimbro 2015), and mental and physical health issues (Heflin and Iceland 2009; Palar et al. 2016; Sullivan, Turner, and Danziger 2008; Whittle et al. 2015).

Given the demonstrated levels of financial precarity in LMI households, the receipt of the EITC and the tax refund more generally represents an infrequent but often predictable windfall (Epley and Gneezy 2007) enabling financial behaviors that may be more difficult through the rest of the year, such as building savings and paying down debts. As such, it provides a means for households to create a financial buffer against future shocks and subsequent hardships, and avoid the debts they have accrued throughout the year from becoming unsustainable.

C. The PATH Act and Tax Refund Delays

The PATH Act made several changes to existing tax law, including expanding the Work Opportunity Tax Credit for employers and updating tax filing regulations for wrongfully-incarcerated individuals and tax filers using Individual Taxpayer Identification Numbers (IRS

2019c). Beginning in 2017, the PATH Act also instituted additional safeguards against fraudulent or erroneous claims of the EITC and ACTC on tax returns (IRS 2018b), which included an additional review period to verify the wages reported on any tax returns claiming the EITC and ACTC. Whereas previously the IRS sent most tax refunds to households seven to ten days after tax filing, the PATH Act resulted in the IRS holding the entirety of the tax refund for EITC and ACTC claimants until at least February 15 of the 2017 tax season. However, even though February 15 was the earliest date by which the IRS would release refunds for EITC and ACTC claimants, tax filers were instructed to not expect their refunds until at least the week of February 27 (IRS 2019a). As the 2017 tax season opened on January 23, this delay meant that early tax filers claiming the EITC or ACTC could potentially expect multiple-week delays in receiving their tax refund, relative to prior years.

There is some evidence of the extent to which tax filers may have experienced these delays. EITC and ACTC filers tend to file their taxes much earlier in the tax season than filers not claiming these credits; 56 percent of LMI online tax filers using free, online tax filing software and claiming the EITC or ACTC filed their taxes before February 15 in 2016 (Maag, Roll, and Oliphant 2016), suggesting that roughly half of this population could be potentially affected by a multiple-week delay. An analysis of IRS data also indicates that the issuance of EITC and ACTC refunds was delayed by an average of two weeks in 2017, relative to prior tax seasons (Aladangady et al. 2018). Additionally, the number of RALs—which allow tax filers to borrow against their anticipated refund amount in order to get immediate access to the funds promised by the refund—almost quadrupled between 2016 and 2017 (Aladangady et al. 2018; see footnote 7). It is possible this increase in RALs was due to households seeking to offset the anticipated delay in refund receipt, though the degree to which this increase in RALs was caused

by the refund delay and not some other unrelated factor (e.g., tax preparation companies' marketing efforts) is unclear.

Two studies have investigated the potential and realized impacts of these refund delays on EITC and ACTC claimants. Maag et al. (2016) used a combination of administrative tax data and survey data to explore the financial circumstances of the households most likely to be affected by the refund delay: EITC and ACTC claimants with children who filed their taxes early in 2016. Their work shows that over 80 percent of these filers experienced extremely high rates of financial hardship such as skipping essential bills or experiencing food insecurity in the months prior to tax filing, about 40 percent relied on often costly alternative financial services such as payday loans, 70 percent experienced a financial shock such as a decline in income or a major expense, and fewer than half reported being able to manage a modest emergency expense. Survey respondents in this study were also asked about the degree to which a hypothetical one, two, three, or four week delay in a tax refund would negatively affect their finances, with the length of delay being shown at random to a given respondent. As the length of the delay randomly shown to filers increased, so too did the anticipated effect of the delay; 31 percent of respondents said that even a one-week delay would negatively affect their finances at least somewhat, while over 50 percent of respondents said a three- or four-week delay would negatively affect their finances to the same degree. Finally, this research also indicates that early filing EITC and ACTC claimants were largely unaware of the coming delays in tax refund delivery, as 91 percent reported not hearing anything about the refund delay in the coming tax season.

In a related study using high-frequency transaction data on credit, debit, and electronic transactions, Aladangady et al. (2018) investigated changes in household consumption spending

as a result of the IRS' delay in issuing tax refunds. Their analysis shows that household

expenditures among EITC claimants spike during the week of tax refund issuance and remain

higher than average over the subsequent two weeks, and they find no evidence that households

shift their purchases forward in time because they anticipate receiving a refund in the future.

They also find that non-trivial portions of EITC expenditures go to grocery stores and

restaurants, as well as at "general merchandise" stores (which are often both grocery and

department stores, e.g., Wal-Mart Superstores), indicating that EITC recipients may be delaying

essential purchases like food in the absence of the tax refund.

Our study builds on these two pieces of research, as well as the broader literatures on the

effects of the tax refund and large tax credits like the EITC. The prior research on tax refunds

and the EITC has typically focused on the impacts of receiving the large lump sum payments,

while prior work on the refund delay specifically has focused on the anticipated impacts of the

delay and household consumption responses to the delay. Our work, by contrast, investigates the

realized impacts of even modest delays in the expected large, lump sum payments offered by the

tax refund on an array of household outcomes, including the experience of financial and medical

hardships, food insecurity, and debt accrual.

III.   Data

This paper leverages a unique dataset combining administrative income and tax records with

longitudinal survey data on LMI households collected in 2016 and 2017, corresponding to tax

years 2015 and 2016.[1] Administrative data come from LMI tax filers who used the free

TurboTax Freedom Edition (TTFE) online tax preparation and filing platform to complete their

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[1] The data were collected through the Refund to Savings (R2S) Initiative, a research collaboration between Washington University in St. Louis, Duke University, and Intuit Inc., the makers of TurboTax.

taxes.[2] While eligibility criteria varies slightly year to year, in 2017 a qualifying tax household

had to earn no more than $33,000 in adjusted gross income (AGI), receive the EITC, or have an

active duty military member in their household while earning no more than $64,000 in AGI.

Almost all TTFE filers (over 98.4 percent in 2017) qualified for the free tax filing software

according to the first two criteria. Administrative tax records include precise information on tax

household's filing status, dependents, household income, the amount of received federal EITC,

federal and state tax refund sizes, and the state of residence. In addition to these administrative

data, the study relies on data from the Household Financial Survey (HFS). The HFS is an annual

national household survey administered immediately after tax filing to a random sample of TTFE

filers who have consented to participate in the survey. Those who complete the first survey wave

are invited to participate in the follow-up survey roughly six months after tax filing. We are thus

able to observe each respondent in two time periods throughout the year. Each wave of the HFS

contains information about tax filers' demographic and financial characteristics that is not

observable through administrative records, which includes the experience of hardships and

financial shocks, asset ownership, debt levels, and additional demographic information.

Administrative tax records were merged with the HFS data to generate the final dataset for the

analysis. While response rates vary marginally year-to-year, 5.7 percent of invited TTFE filers

responded to the first survey in 2017. Though survey response rates were low, research from

prior years generally points to relatively few differences between all TTFE users and those who

opt to complete the survey, even as survey respondents do tend to have slightly higher incomes

(Grinstein-Weiss et al. 2015). Of those who completed the first survey wave in 2017, 34 percent

took part in the second survey.

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[2] The TTFE tax preparation and tax filing software is offered by Intuit, Inc. for free as part of the IRS Free File
Alliance to qualifying LMI households (https://freefilealliance.org/).

IV.   Study Sample

The study sample was limited to EITC-receiving households that participated in both survey waves, received a federal tax refund, completed their taxes before the filing deadline, and had non-missing data on key demographic and financial characteristics. A small share of households (0.49 percent of the LMI sample) that received the Child Tax Credit (CTC) but not the EITC was excluded from the sample. In total, 5,333 households were included in the analytical sample: 3,246 in 2016 and 2,087 in 2017. We used three sample specifications of EITC recipients for the primary analysis. In the full sample, the treatment group consisted of EITC recipients who filed their taxes before February 15th (early filers) and the comparison group included EITC recipients who completed taxes on or after February 15th (non-early filers) (Sample 1, N=5,333). Considering that filing taxes on, for example, February 14th may not result in a substantially longer period of waiting for the refund than filing on February 15th, we constructed a separate treatment group restricted to early filers who completed their taxes before February 1st—and thus were most likely to be affected by the new rules—leaving the comparison group unchanged (Sample 2, N=3,890). Finally, since households filing very late in the tax season may differ from very early filers (Grinstein-Weiss et al. 2015), we constructed a third sample limiting the comparison group to households that prepared their refunds on or soon after February 15th (between February 15th and March 15th), and the treatment group consisted of the earliest tax filers who prepared taxes before February 1st (Sample 3, N=2,564).

Table 1 presents summary statistics for the full sample of EITC recipients (Sample 1) measured at the time of tax filing prior to policy implementation in 2016. Despite limiting the sample to EITC-receiving households, substantial differences are observed between early and non-early filers in terms of demographic and financial characteristics. For example, compared to

late filers, higher proportions of early filers were married (26.8 percent), non-students (79.2 percent), and employed full-time (49 percent), had lower educational attainment (50.2 percent had less than Bachelor's degree), and had dependents in a household (59.8 percent). Both groups reported experiencing unexpected income and expense shocks at similar rates six months prior to tax filing. The median value of liquid assets was lower in the treatment than in the comparison group ($400 and $1,075, respectively). At the same time, on average, early-filing EITC recipients earned higher annual gross incomes, and received larger tax refunds (federal and state) and larger federal tax credits (EITC and combined EITC and CTC). Overall, the federal tax refund provided a substantial financial windfall—accounting for 18.4 percent of the annual gross income among early filers and 14.5 percent among non-early EITC filers—while EITC benefits comprised most of the federal tax refund (nearly 57 percent) in both groups. Finally, the level of material and medical hardship was significantly higher among early filers relative to non-early filers across all hardship indicators. The incidence and the amount of unsecured debt were also higher for early EITC filers.

[Insert Table 1 Here]

The differences between the early and non-early filers are consistent with prior evidence (Grinstein-Weiss et al. 2015). Though early EITC filers have higher incomes and receive larger refunds, they report greater incidence of material hardship in the months prior to tax filing. Early filers are also more likely to have dependents and file as heads of household, a proxy for single-parent households which likely face a more pressing set of consumption needs that motivate early filing compared to non-early filers who are more likely to be single. The EITC also offers a considerably higher credit to filers with dependents, which may act as an incentive to file early. The larger reward coupled with greater needs to meet in the household may help explain the

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pattern reflected in Figure 2, which shows that average refund size was largest in the beginning of the filing season and decreased over time. Refund delays resulting from implementation of the PATH Act may thus more negatively affect relatively more financially vulnerable households.

[Insert Figure 2 Here]

V. Analytical Method

We use a difference-in-differences (DID) approach as an identification strategy to examine the effects of refund delays due to the PATH Act on household hardship experiences and debt levels. Restricting our sample to EITC recipients, we estimated the following ordinary least squares (OLS) regression model:

$$y_{ij} = \alpha + \beta EarlyEITC_{ij} + \gamma Post16_t + \delta\left(EarlyEITC_{ij} \cdot Post16_t\right) + X_{ij}\theta + \tau_j + \varepsilon_{ij} \ (1)$$

where y_{ij} is an outcome variable for household i in census division j; $EarlyEITC_{ij}$ is a dummy variable equal to 1 for an EITC recipient who filed taxes early in the tax season in a given year, and 0 otherwise; $Post16_t$ is an indicator variable equal to 1 for the time period following the implementation of the PATH Act provisions, and 0 otherwise; X_{ij} is a vector of demographic and financial characteristics; τ_j captures census division fixed effects; and ε_{ij} is an unobserved heteroskedasticity-robust error term. The parameter δ identifies the average change in outcomes following the implementation of the PATH Act for EITC recipients who filed their taxes early in the tax season relative to EITC recipients who filed their taxes later in the season.

We relied on the time discontinuity in the new rule's dates to distinguish between early EITC filers (treatment group) and non-early EITC filers (comparison group). Since the PATH Act mandates that the IRS not issue tax refunds to EITC claimants until at least February 15, we consider EITC recipients who filed their taxes before February 15 as treated households and EITC recipients who completed their taxes on or after February 15 as comparison households.

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The ability to observe the exact EITC amounts and the dates of tax filing allows us to precisely

identify treatment and comparison groups. In addition, because the PATH Act did not go into

effect until 2017, we consider 2016 as the pre-treatment period and 2017 as the post-treatment

period. While the composition of our samples differs across survey years, the TTFE eligibility

criteria and the process of sample selection remained stable across the years. We thus expect that

the cohorts of households will be similar over years, even if we do not observe the same

households.[3]

We focused on two types of outcomes measured six months after tax filing: (1) the

experience of material and medical hardships, and (2) the incidence of unsecured debt. Five

hardship measures include a household's reported difficulty in making housing payments,

making regular bill payments, affording adequate food, and postponing necessary medical care

and prescription drugs due to cost.[4] Each hardship variable is represented as a dichotomous

variable equal to 1 if a household experienced a specific hardship in the six months after tax

filing, and 0 otherwise. An additional two variables were used to quantify the accumulation of

unsecured debt, which includes credit card balances, payday loans, and negative balances in

savings and checking accounts. The first unsecured debt variable is a dummy variable indicating

whether a household held any unsecured debt six months post tax filing. The second unsecured

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[3] Around 9 percent of the analytical sample appeared in both 2016 and 2017. There are several reasons why we do not observe the same households across study years: households may not have used TTFE across the years, they may not have been randomly selected to participate in the survey in both years, they may not have qualified for the EITC in both years, or they may not have completed two survey waves in both years.

[4] To measure material hardship, we relied on survey questions administered six months after tax filing that asked respondents whether they "did not pay the full amount of the rent or mortgage because [they] could not afford it," "skipped paying a bill or paid a bill late due to not having enough money," and experienced food insecurity in the past six months. The six-item questionnaire to measure food insecurity was adopted from the U.S. Department of Agriculture (USDA) questionnaire (USDA, 2018) and indicated whether respondents experienced *any* food insecurity. For medical hardship, respondents were asked whether in the past six months they "needed to see a doctor or go to the hospital but did not go because [they] could not afford it" and "could not fill or postponed filling a prescription for drugs when they were needed because [they] could not afford it".

debt variable signifies the intensity of held debt and is measured as a log-transformed unsecured debt balance.[5] Because both variables are self-reported, the amount of unsecured debt was also winsorized at the one percent level—i.e., the highest one percent of variable values were replaced by the value at the 99th percentile.

The vector of covariates includes a large array of demographic and financial characteristics measured at the time of tax filing, such as household's experience of any material or medical hardship six months prior to tax preparation, respondent's gender, age, age squared, race/ethnicity, student status, marital status, the number of dependents in a household, highest educational attainment, employment status, living arrangement, vehicle ownership, the month and the week of tax filing, household's participation in the Temporary Assistance for Needy Families (TANF) and SNAP programs, unsecured debt balance and the value of liquid assets (log transformed), household's annual gross income, and the amount of received federal and state tax refund. We winsorized the values of self-reported values of unsecured debt and liquid assets at the one percent level and used the exact values of the income and federal tax refund, both measured through administrative records. Considering that some states did not have a large number of EITC respondents appearing in our sample, the primary model incorporates census division rather than state fixed effects.

The key identifying assumption of DID estimation is that the treatment and comparison groups, on average, would have experienced the same changes in outcomes had the PATH Act provision not been implemented. There are several reasons why we expect this assumption to hold. First, prior research has shown that the vast majority of EITC and CTC recipients—91 percent of respondents—were unaware of the upcoming changes in the tax law (Maag, Roll, and

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[5] A value of one was added when respondents reported no unsecured debt.

Oliphant 2016). This general lack of knowledge about the new tax refund legislation suggests

that early and non-early EITC recipients were unlikely to have adjusted their financial and tax

filing behaviors in anticipation of the PATH Act rules. A further inspection of basic

characteristics of early and non-early filers across the years showed little difference—with most

differences being statistically or economically insignificant—verifying that the composition of

each group was largely unchanged between 2016 and 2017.[6] Notably, educational attainment

levels among early filers, which could potentially be a proxy for greater familiarity about

upcoming changes in the tax code, did not differ across the years. Second, the new legislation

was put into effect in response to broad concerns around tax errors and tax fraud, and was not

targeted at specific groups of EITC claimants. Since the implementation of the PATH Act was

not linked to household characteristics or financial circumstances, the two groups of early and

non-early filers were unlikely to face any unequal pre-treatment changes in outcomes that would

subsequently influence their exposure to treatment. Third, to our knowledge, there were no

simultaneous changes in other federal policies and programs that targeted early but not later

EITC filers. Any policy change influencing all EITC recipients simultaneously would get

absorbed by inclusion of controls for the time trend. Third, the date of February 15 appears

arbitrary and we expect that EITC recipients just below and just above this date discontinuity

would not differ substantially from each other. As a robustness check, we used a number of

alternative date cut-offs to test the sensitivity of our findings to different classifications of early

and non-early filers. Fourth, we expect that restricting the sample to EITC recipients allows us to

compare the dynamics of households with similar underlying needs. We further address this

question by conducting analyses using alternative comparison groups. Finally, it is possible that

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[6] These results are available upon request.

there existed some state policies that differentially targeted early and non-early EITC filers (though it is unlikely that they would have relied on February 15 as a cut-off to separate early and non-early filers). Controlling for the state tax refund in the main model and including state fixed effects and census division-year interaction terms in the robustness section helps alleviate these concerns. For these reasons, we expect that the parallel trends assumption has been met and our analysis will generate an unbiased estimation of the causal effect of the PACT Act rules on household financial outcomes.

VI. Results

A. *Patterns of Tax Filing over Time (2016 and 2017)*

We begin by illustrating tax filing behaviors over time in 2016 and 2017 for the full sample of EITC recipients. In Panels A and B in Figure 3, the y-axis corresponds to the proportion of EITC recipients filing their taxes on each day of the tax filing season, and the x-axis signifies the date of tax filing. Both panels show that the majority of EITC households filed returns in the first four weeks of the tax filing season (56.3 percent in 2016 and 57.9 percent in 2017) and a large fraction of tax filers completed taxes in the last week of the tax season (9.3 percent in 2016 and 9.2 percent in 2017), with the substantial reduction in the rate of tax filing observed during the intervening weeks.

Considering that the tax filing season dates differed across the years—the filing season ran between January 19 and April 18 in 2016 and between January 23 and April 18 in 2017—we used a common unit of measurement to make a robust comparison of tax filing patterns between the years. That is, in Panel C, the y-axis is defined as above, while the x-axis denotes the number of days since the beginning of the tax filing season as the proportion of the entire filing season. Two important insights emerge from the comparison of tax filing trends in Panel C. First, tax

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filing behaviors appeared remarkably similar across the years. While 51.6 percent of EITC filers completed their taxes before February 15 in 2017, 50.8 percent of EITC recipients filed taxes during the equivalent time period in 2016. This pattern suggests that, on average, EITC filers continued to file similarly across the years and did not adjust the timing of tax filing in substantial ways when the PATH Act went into effect. Second, a non-negligible proportion of EITC recipients filed their tax returns even before the start of the tax filing season. When combined with the fact that the majority of EITC recipients filed returns in the first several weeks of the tax filing season, this finding demonstrates that a considerable share of filers filed their taxes very early in the tax season and were therefore subject to multiple-week delays in receiving tax refunds.

[Insert Figure 3 Here]

B. Difference-in-Differences Estimates: Overall Effects

Table 2 presents the DID estimates of the effects of the delayed refunds on the experience of material hardships, medical hardships, and unsecured debt. Each panel in the table corresponds to a different sample: Panel A includes the full, least restrictive sample of tax filers (Sample 1), Panel B restricts the group of early tax filers to those who filed before February 1 and were most likely to be affected by the PATH Act (Sample 2), and Panel C includes a more limited group of non-early filers who filed before March 15 and would be more similar to the treatment group (Sample 3). The coefficient of interest, δ, describes the average changes in outcomes in the treatment group relative to the comparison group, after the PATH Act provisions took effect in 2017. The table presents estimates on time-invariant differences in baseline outcomes between early and non-early filers (β) and the time trend common to both groups (γ). Each regression includes the full set of control variables. Statistical significance is interpreted at the 0.05 level.

[Insert Table 2 Here]

The key finding in Table 2 is that we consistently observe a positive coefficient on the experience of food insecurity six months post tax filing (Column 5). Specifically, results from the full sample in Panel A indicate that after the policy change, the likelihood of experiencing food insecurity was 6.5 percentage points higher (a 17 percent increase from the base level) among early filers relative to non-early filers. After limiting the treatment group to the very early filers in Panel B, the coefficient on the interaction term increased to 9.5 percentage points (24 percent from the base level). The larger coefficient magnitude is to be expected considering that the treatment group in Panel B consists of very early filers who would be expected to experience disproportionately longer and more consequential refund delays. After excluding very late EITC filers in Panel C, the coefficient on the interaction variable decreased to 8.3 percentage points (21 percent from the base level). This attenuation of the impact estimate is not surprising given that the excluded very late EITC filers were likely more dissimilar to earlier filers across observed and unobserved characteristics. Taken together, these findings demonstrate the increased incidence of food insecurity among early EITC recipients in comparison with non-early EITC recipients following the introduction of policy that delayed the delivery of tax refunds to certain groups of households.

Exploring the coefficients beyond the interaction terms in Column 5 provides a more comprehensive picture of the experience of food insecurity following the tax reform. While the coefficient on the early filer indicator suggests that there were no significant differences in average levels of food insecurity at baseline between the treatment and comparison groups, the coefficient on the time dummy points to a statistically significant downward trend in the rate of food insecurity in the comparison group over time. This pattern is observed for each sample. Our

results therefore seem to indicate that while households that were unaffected by the refund delay saw a reduction in the experience of food insecurity over time, those that experienced delays in receiving their federal tax refunds did not experience the same secular improvements in food insecurity between 2016 and 2017.[7]

Finally, we did not observe statistically significant effects of the PATH Act for other hardships and unsecured debt outcomes for the full sample (Table 2, Panel A). However, a statistically significant negative coefficient was detected for the likelihood of skipping housing payments in the most restrictive sample (Table 2, Panel C, Column 1), indicating that after the introduction of the PATH Act rules, treatment households faced a 7.2 percentage point lower probability of skipping housing payments than comparison households. We explore this finding further in a series of robustness checks below.

C. Difference-in-Differences Estimates: Heterogeneous Effects

While Table 2 reports the average effects of the PATH Act on hardship and debt outcomes, findings in Tables 3 and 4 demonstrate the extent to which these estimates varied by the median size of the federal tax refund and the ability to come up with $2,000 in the event of an emergency. This analysis was conducted for the full sample of EITC households (Sample 1).

Our findings illustrate some heterogeneity in PATH Act impacts and that adverse effects appear more pronounced for financially more vulnerable households. In Table 3, the magnitude of the negative coefficient on food insecurity was larger for EITC recipients who received a federal tax refund above the median amount ($1,493 or more), though both estimates lacked precision. In Table 4, we observe a relative increase in food insecurity following the tax reform for liquidity-constrained EITC filers who could not access $2,000 in an emergency but not for

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[7] It is worth noting that similar—though more muted—trends in the comparison group are observed even when regressions do not include covariate variables.

those with better access to emergency liquidity. Among the EITC recipients who reported that they probably or certainly could not access emergency savings in a short timeframe, the refund delay brought an increase in food insecurity by 11.2 percentage points for early filers relative to non-early filers.

[Insert Table 3 Here]

[Insert Table 4 Here]

D. Patterns in Tax Filing Dates between 2016 and 2018

While households experienced adverse effects of the PATH Act in the short run, it is unclear whether the effects would persist in the future, as EITC recipients in 2018 may have learned about the tax reform from the prior year and have adjusted their financial and tax filing behaviors. For example, after experiencing delays in receiving tax refunds in 2017, early filers in 2018 may have chosen to postpone their tax filing date by a few weeks to avoid the uncertainty around the timing in receiving their tax refunds or they may have changed their consumption in anticipation of refund delays. To examine the degree to which households may be adjusting their behavior in response to the delay, we replicated Figure 3 by plotting the patterns of tax filing over time for EITC recipients between 2016 and 2018. Figure 4 reveals that one year after the introduction of the PATH Act, tax filers have generally not delayed the timing of completing their tax returns and the majority of EITC filers continued to be subject to the PATH Act delays in 2018. In fact, the EITC filers in our sample appeared insensitive to the start of the filing season on January 29th—which came relatively late in comparison to prior years—and a non-negligible fraction of filers completed their refunds before the tax season. A similar conclusion can be drawn when limiting the sample to EITC households that appeared in both 2017 and 2018: the median tax filing date was February 14th in 2017 and February 8th in 2018 for these

households. The likely incidence of delays in receiving the federal tax refund, therefore, was high even one year after the tax reform.

[Insert Figure 4 Here]

E. Robustness Checks

We examine the robustness of our findings to the specification of alternative comparison groups, the incorporation of additional years of data, and the inclusion of additional controls.

The analysis so far has contrasted the average outcomes for early and non-early tax filers that received the EITC. While treated households appeared relatively dissimilar to comparison households (Table 1), these baseline differences will not invalidate the identification strategy if both groups would have experienced identical average changes in outcomes in the absence of the policy, and if EITC filers in 2016 did not systematically adjust their filing behaviors in 2017. We constructed several alternative comparison groups to test the robustness of our main results. The first alternative comparison group includes early filing non-EITC LMI filers who, like early EITC recipients, may have been similarly impatient to receive their federal tax refunds and may have only marginally missed qualifying for the EITC (Table 5, Panel A). The finding on the experience of food insecurity was consistent with prior results, showing the relative increase in the likelihood of food insecurity for early EITC recipients relative to early non-EITC recipients after the tax reform, though the coefficient was not significant at the 0.05 level. This indicates that the food insecurity impacts observed in the main analysis are a function of both receiving the EITC and filing early rather than filing early in general, providing additional evidence that these effects are due to the delay in the tax refund. For the second robustness check, we limited treated households to the earliest EITC filers who completed their taxes before February 1st, and the comparison group was limited to the EITC recipients who filed taxes between February 1st and

February 28th or 29th (Table 5, Panel B). This sample restriction helps isolate early tax filers who have been severely affected by the PATH Act and tax filers who have been less affected or barely unaffected by the refund delay. The findings remain consistent in showing a relative increase in the likelihood of experiencing food insecurity (by 7.2 percentage points). The results also point to a relative drop in the probability of skipping housing payments (by 7.5 percentage points) between the treatment and comparison group after the tax reform.

In Panel C (Table 5) we used Coarsened Exact Matching (CEM) in combination with the DID analysis to estimate the impacts of the refund delay for a sample of more balanced treatment and comparison households (Iacus, King, and Porro 2011). CEM is a matching technique that "coarsens" selected variables into groups and generates different strata based on variable values. Treatment and comparison observations are then matched into strata based on the presence of at least one exact match, so that a single treatment (comparison) observation can be matched to multiple comparison (treatment) observations. Strata that do not contain any matches are dropped from the analysis.[8] We estimated Equation 1 following the matching procedure and employed weights to correct for different numbers of treatment and comparison households within each strata. The positive coefficient from the estimates incorporating CEM is consistent with prior findings, though it was not statistically significant at the conventional level.

[Insert Table 5 Here]

The three analyses using alternative comparison groups support our prior conclusions about the relative increase in the incidence of food insecurity. Interestingly, some evidence also

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[8] The following variables were used to match early and non-early EITC filers: year, census division, filing status, the presence of dependents, employment status, student status, gross annual income, and the EITC value. The continuous income and EITC variables were coarsened into dummy variables describing whether annual gross income and the EITC were above or below the sample median (roughly $13,000 and $500, respectively). Remaining variables were categorical and exact variable values were used for matching.

points to the negative coefficient on the likelihood of skipping housing payments. While the exact mechanism for this result is unclear, one possible explanation is that spending on rent or mortgage is relatively inflexible and carries high costs if households are unable to make timely payments on these items. After experiencing delays in receiving their federal refund, EITC recipients may choose to reduce other more flexible consumption (e.g., food) in favor of meeting meet their obligations on less flexible payments (e.g., housing).

In the second set of robustness tests (Table 6), we incorporated data on EITC recipients from other years. First, we performed a placebo test by using data from multiple pre-treatment years. Using data from 2015 and 2016, we re-estimated the main DID analysis to compare early and non-early EITC filers across the years prior to the introduction of PATH Act rules (Table 6, Panel A).[9] While Panel A reports findings only for the full sample, the analysis was conducted for all three samples of treatment and comparison groups (Samples 1-3). We find that coefficients in each model using data from pre-treatment years were statistically insignificant at the 0.1 level, increasing our confidence that the previously estimated relative differences in hardships between the treatment and comparison households can be attributed to the changes in the tax law. Furthermore, rather than relying on a single post-treatment year, we have included data for both 2017 and 2018 to generate the two-year post-treatment period. The effects of the tax reform on the experience of food insecurity remained robust when we included samples from both 2017 and 2018 in the DID analysis (Table 6, Panels B and C).

[Insert Table 6 Here]

In the final set of analyses (Table 7), we explored how adding state fixed effects to account for time-invariant state-specific factors, clustering standard errors by zip codes to

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[9] Surveys prior to the second wave of 2016 did not use the USDA-based questionnaire to measure food insecurity. The analysis using 2015 and 2016 years relies on the simplified financial insecurity measure.

account for intra-group correlation within smaller geographies, and interacting census division and a year to account for time-varying regional changes affected our results. The positive coefficient on the likelihood of experiencing food insecurity was robust across each of these specifications (Table 7, Panels A-C).

[Insert Table 7 Here]

VII.   Conclusion and Discussion

This study uses a unique dataset combining administrative tax and longitudinal survey data to study the impacts of the recently implemented PATH Act—which delays issuance of federal income tax refunds for EITC and ACTC filers until at least February 15—on household hardship and unsecured debt outcomes in the six months following tax filing. We observe that EITC recipients do not adjust their behavior in response to the delay in receiving their tax refund; the tax filing patterns of EITC recipients are similar in 2016 and 2017, which immediately precede and follow the implementation of the PATH Act rules. Second, our difference-in-differences analysis reveals that the incidence of reported food insecurity six months after tax filing increased among early EITC filers relative to non-early EITC filers after the implementation of the PATH Act. This finding is consistently observed across different analytic samples and model specifications. Additional analyses suggest that these negative effects are disproportionately larger for more economically vulnerable households. Finally, some of our findings also suggest that the relative incidence of skipped housing bills decreased among early EITC filers relative to later EITC filers after the refund delay. However, these results are sensitive to model and sample specifications.

We draw several conclusions from our analysis. First, the sensitivity of household food insecurity to the refund delay indicates that changes to food consumption may be one of the first

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and primary strategies households follow when faced with a liquidity shock. This finding is not surprising given that households can choose from an array of options in adjusting their food consumption, including purchasing less expensive food, reducing the size of meals, or skipping meals. This is consistent with prior evidence showing that food consumption is very sensitive to income fluctuations, and that low-income families respond to food shortages by forgoing desired food items, cutting meal portions, and reducing the frequency of meals to alleviate the experience of food hardship (Heflin, London, and Scott 2011). The sensitivity of food security to changes in liquidity speaks to the possibility that LMI households may prefer to adjust their food consumption rather than skip other necessities like housing or utility payments, as the potential consequences of forgoing those payments may be more severe (e.g., eviction, utility shut-offs). Furthermore, LMI households may be better able to absorb the impact of refund delays with respect to bill payments by shifting those payments to the future (e.g., paying the minimum on credit cards or falling slightly behind on a rent payment) with relatively few consequences, but this is not true for food consumption—a skipped meal remains a skipped meal.

Second, this research provides evidence that even relatively short—though likely unexpected—several week delays in tax refunds caused by the PATH Act may potentially and partially offset the positive impacts on food security attributed to the EITC and other federal programs, such as SNAP (McGranahan and Schanzenbach 2013; Ratcliffe, McKernan, and Zhang 2011). Considering these adverse effects of the PATH Act provision on early filers, policymakers should consider the possibility of developing alternative, more effective methods to detect errors in EITC claims. Since most EITC errors are related to the complexity of tax rules rather than fraud (Greenstein, Wancheck, and Marr 2019), one way to reduce the rate and amount of overpayments would be to adjust the rules of federal withholding. For example,

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assuming that the goal of policymakers is not necessarily to stop issuing erroneous payments, erroneous EITC claims could be addressed after the fact by increasing the amount withheld from paychecks for erroneous claimants over the course of the subsequent year, rather than delaying the tax refunds for the vast majority of tax filers who appropriately claim the credit. Another way to enforce greater compliance with EITC rules and counteract overpayments would be by securing more adequate resources to administer the delivery of tax credits. As the budget for IRS enforcement activities has been decreasing over time (Greenstein, Wancheck, and Marr 2019), an increase in enforcement funding and adoption of more effective auditing strategies may increase tax compliance, reduce tax fraud and errors, and increase the amount of collected taxes across the income spectrum without putting an additional financial strain on low-income households.

Finally, if the PATH Act rules persist into the future, it will be important to provide LMI households with adequate financial and informational resources to counteract the negative effects of refund delays. For example, policymakers could establish some type of presumptive eligibility benefits to offer temporary financial assistance to households likely to be eligible for the EITC, provide interim short-term nutrition assistance benefits, or more generally facilitate access to SNAP for qualifying households. Streamlined and timely delivery of state credits and benefits (e.g., state EITCs) will become increasingly crucial in providing the affected households with liquidity while they wait for a federal refund. Beyond financial assistance, policymakers and practitioners will have to be actively engaged in efforts to raise awareness of PATH Act provisions among LMI households prior to the tax season. Maag et al. (2016) show that over nine-tenths of early filers who received the EITC did not know about the potential for refund delays in advance of the PATH Act. While many LMI households may have experienced the

delay over the course of several years, they may still not understand that this delay is now built into the tax filing process and will persist in future years. Efforts to raise LMI tax filer awareness could take place through companies participating in the IRS' Free File Alliance, community-based organizations, faith communities, companies sponsoring Volunteer Income Tax Assistance (VITA) sites, and local departments of social services. Employers could also include brief informational messages about PATH Act refund delays with their annual communication about W2 form availability prior to tax season.

This study contributes to the literature in several ways. First, to our knowledge, only a single study has investigated the impact of the PATH Act for low-income households, finding that refund delays affect spending on essential purchases, such as groceries and non-durable goods (Aladangady et al., 2018). Besides the unique contribution to the scarce literature on the recent PATH Act reform and on the timing of refund payments in general, an additional advantage of our study is that we use administrative individual-level tax data to precisely estimate which households receive the EITC, the amount of federal tax refund they receive, and the exact date of tax filing. Second, this paper contributes to the broader literature examining the relationship between transitory income shocks and household consumption behaviors and hardships. Our findings are consistent with other studies showing that the experience of shocks is associated with increased food hardship (Leete and Bania 2010; McKernan, Ratcliffe, and Vinopal 2009) and that a temporary withholding of paychecks can result in lower consumption (Gelman et al. 2018; Baker and Yannelis 2017). In comparison to these studies, our research focuses explicitly on the LMI population and, unlike other studies exploring experience of hardship (Leete and Bania 2010; McKernan, Ratcliffe, and Vinopal 2009), we are able to precisely measure an income shock in the form of a delayed large lump sum payment. Lastly, as

other studies on the federal EITC have primarily examined outcomes relating to employment (Hoynes and Patel 2018), poverty (Meyer 2010) or health (Averett and Wang 2013), this study extends the EITC literature by examining previously unexplored household hardships in the months after tax filing.

Despite this study's contributions to the literature, this work is not without its limitations. First, while tax filers claiming the EITC or the ACTC were instructed not to expect their tax refunds until the week of February 27, we cannot precisely determine the actual length of delays in refund liquidity experienced by early filers in our sample, though Alandagady et al. (2018) find that EITC payments after the PATH Act peaked about two weeks later than prior years. Second, this study reports only the immediate effects of the PATH Act in the six months post-filing: it is unclear whether the adverse impact on household hardships would persist in the long run or whether EITC filers would adjust their financial and tax filing behaviors over time to avoid the negative effects of the reform. Third, this analysis focuses only on EITC recipients and does not provide evidence on the impact of the new provision for households that claimed but did not receive the EITC or the ACTC as well as those who received the ACTC but not the EITC. However, since less than one percent of sampled LMI filers received the ACTC without receiving the EITC, the latter issue is unlikely to be a concern in this research. Relatedly, our sample of EITC recipients represents a specific group of tax filers who used TTFE to complete their taxes and does not include EITC recipients that filed taxes in other ways, such as through Volunteer Income Tax Assistance sites or by using tax preparers or non-TTFE online tax software services. In particular, compared to the general population of EITC recipients in 2016, our sample consists of a higher proportion of households without claimed dependents, and the average EITC amount in our sample is substantially lower than the national average (Falk and

Crandall-Hollick 2018). As such, there are limitations to the generalizability of our findings to the full population of EITC recipients.

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Table 1: Baseline Sample Characteristics (Full Sample), 2016

	Early filers (<Feb 15)	Late filers (Feb 15+)	Diff.:
	Mean (S.D.)	Mean (S.D.)	*p*-values
Female	0.578	0.543	0.047
Age (years)	37.7	38.2	0.165
Non-Hispanic White	0.736	0.731	0.073
Non-Hispanic Black	0.108	0.074	0.001
Nin-Hispanic Asian	0.029	0.06	0.000
Hispanic	0.071	0.083	0.195
Other	0.057	0.054	0.749
Married	0.268	0.217	0.001
Unmarried with partner	0.206	0.186	0.149
Unmarried without partner	0.525	0.597	0.000
Non-student	0.792	0.728	0.000
Full-time student	0.06	0.073	0.131
Part-time student	0.148	0.198	0.000
High school degree or less	0.163	0.098	0.000
Some college	0.339	0.275	0.000
Bachelor's degree	0.299	0.311	0.468
Higher than Bachelor's	0.199	0.316	0.000
No. of dependents: 0	0.402	0.646	0.000
No. of dependents: 1	0.254	0.189	0.000
No. of dependents: 2	0.198	0.101	0.000
No. of dependents: 3+	0.145	0.064	0.000
Not employed	0.227	0.249	0.165
Employed part-time	0.281	0.388	0.000
Employed full-time	0.49	0.363	0.000
Lives in owned house/apt	0.233	0.208	0.092
Lives in rented house/apt	0.573	0.529	0.013
Neither owns nor rents	0.195	0.263	0.000
Owns a vehicle	0.762	0.738	0.111
Insured	0.865	0.856	0.455
Receives TANF of SNAP	0.372	0.255	0.000
Unexpected income shock (past 6 mo)	0.324	0.298	0.106
Unexpected expense shock (past 6 mo)	0.536	0.510	0.127
Value of liquid assets[1] (median, $)	400	1,075	n/a
Annual gross income ($)	18,002 (12,320)	13,656 (11,266)	0.000
Federal tax refund ($)	3,320 (2,766)	1,988 (2,260)	0.000
State tax refund ($)	327 (505)	254 (467)	0.000
Federal EITC ($)	1,895 (1,825)	1,120 (1,498)	0.000
Federal EITC and CTC ($)	2,049 (1,841)	1,204 (1,541)	0.000
Outcome Variables (measured at HFS1)			
Skipped housing payment (past 6 mo)	0.234	0.163	0.000
Skipped bills or late bills (past 6 mo)	0.555	0.415	0.000
Skipped medical care (past 6 mo)	0.314	0.285	0.070
Skipped prescription drugs (past 6 mo)	0.246	0.206	0.007
Experienced food insecurity (past 6 mo)[1]	0.381	0.304	0.000
Unsecured debt	0.703	0.627	0.000
Unsecured debt balance[1] ($)	3,053 (128)	2,608 (135)	0.017
Observations	1,784	1,462	

Notes: Comparison of means using *t*-test. [a]Values are topcoded at the one percent level. [b]The measure of food insecurity used in the first wave of the 2016 survey differed from the one used in subsequent survey waves.

Table 2: Difference-in-Differences Estimates

	Skipped housing payments (1)	Skipped bills or late bills (2)	Skipped medical care (3)	Skipped prescription drugs (4)	Experienced food insecurity (5)	Had unsecured debt (6)	Amt. of unsecured debt (7)
Panel A: Sample 1—Early filers=before Feb 15; Non-early filers=Feb 15 and after							
Early filer × Post 2016	0.001	-0.002	0.018	-0.017	0.065	0.008	-0.046
	(0.024)	(0.027)	(0.028)	(0.025)	(0.028)	(0.026)	(0.186)
Early filer	-0.032	-0.041	0.009	0.074	-0.019	-0.056	-0.409
	(0.033)	(0.039)	(0.040)	(0.036)	(0.040)	(0.036)	(0.258)
Post 2016	-0.025	-0.059	-0.014	0.001	-0.091	0.014	0.196
	(0.016)	(0.019)	(0.020)	(0.017)	(0.021)	(0.019)	(0.135)
Observations	5,333	5,333	5,333	5,333	5,333	5,333	5,333
R-squared	0.192	0.370	0.204	0.189	0.310	0.354	0.477
Panel B: Sample 2—Early filers=before Feb 1; Non-early filers=Feb 15 and after							
Early filer × Post 2016	-0.039	-0.014	0.036	-0.054	0.095	0.044	0.233
	(0.031)	(0.033)	(0.033)	(0.030)	(0.033)	(0.030)	(0.218)
Early filer	-0.174	-0.017	-0.119	-0.083	-0.075	-0.030	-0.531
	(0.098)	(0.077)	(0.095)	(0.098)	(0.084)	(0.086)	(0.587)
Post 2016	-0.023	-0.058	-0.015	0.002	-0.092	0.015	0.203
	(0.016)	(0.019)	(0.020)	(0.017)	(0.020)	(0.019)	(0.135)
Observations	3,890	3,890	3,890	3,890	3,890	3,890	3,890
R-squared	0.203	0.377	0.214	0.205	0.324	0.361	0.485
Panel C: Sample 3—Early filers=before Feb 1; Non-early filers=Feb 15–Mar 15							
Early filer × Post 2016	-0.072	0.005	0.032	-0.040	0.083	0.044	0.272
	(0.036)	(0.039)	(0.040)	(0.037)	(0.040)	(0.037)	(0.264)
Early filer	-0.072	0.004	-0.024	-0.172	-0.148	-0.014	0.406
	(0.087)	(0.078)	(0.084)	(0.091)	(0.102)	(0.084)	(0.566)
Post 2016	0.010	-0.075	-0.008	-0.014	-0.080	0.016	0.157
	(0.025)	(0.028)	(0.030)	(0.027)	(0.030)	(0.028)	(0.201)
Observations	2,564	2,564	2,564	2,564	2,564	2,564	2,564
R-squared	0.215	0.386	0.211	0.211	0.327	0.359	0.476

Notes: Robust standard errors in parentheses. Each regression includes the following controls: baseline measure of any material and medical hardship, respondent's gender, age, age squared, race/ethnicity, student status, marital status, number of dependents, educational attainment, employment status, living arrangement, vehicle ownership, the month and the week of tax filing, receipt of TANF and SNAP benefits, unsecured debt balance and the value of liquid assets, household's annual gross income, and the amount of federal and state tax refund.

Table 3: Difference-in-Differences Estimates, By Refund Size (Early filers=before Feb 15; Non-early filers=Feb 15 and after)

	Skipped housing payments (1)	Skipped bills or late bills (2)	Skipped medical care (3)	Skipped prescription drugs (4)	Experienced food insecurity (5)	Had unsecured debt (6)	Amt. of unsecured debt (7)
Panel A: Below Sample Median							
Early filer × Post 2016	-0.026	-0.026	-0.024	-0.007	0.034	-0.009	-0.262
	(0.034)	(0.039)	(0.040)	(0.035)	(0.043)	(0.040)	(0.285)
Early filer	-0.018	-0.035	-0.007	0.032	-0.036	-0.045	-0.207
	(0.044)	(0.055)	(0.056)	(0.049)	(0.056)	(0.050)	(0.352)
Post 2016	-0.012	-0.049	0.004	0.024	-0.092	0.016	0.187
	(0.019)	(0.024)	(0.025)	(0.022)	(0.026)	(0.025)	(0.171)
Observations	2,667	2,667	2,667	2,667	2,667	2,667	2,667
R-squared	0.190	0.375	0.231	0.211	0.323	0.351	0.472
Panel B: Sample Median and Above							
Early filer × Post 2016	0.040	0.020	0.062	0.004	0.081	0.018	0.001
	(0.036)	(0.041)	(0.041)	(0.038)	(0.042)	(0.037)	(0.273)
Early filer	-0.050	-0.053	0.012	0.102	-0.000	-0.074	-0.627
	(0.052)	(0.056)	(0.057)	(0.054)	(0.060)	(0.052)	(0.387)
Post 2016	-0.050	-0.067	-0.042	-0.038	-0.086	0.012	0.265
	(0.029)	(0.032)	(0.033)	(0.030)	(0.034)	(0.030)	(0.223)
Observations	2,666	2,666	2,666	2,666	2,666	2,666	2,666
R-squared	0.203	0.360	0.199	0.186	0.303	0.355	0.474

Notes: Robust standard errors in parentheses. Each regression includes the following controls: baseline measure of any material and medical hardship, respondent's gender, age, age squared, race/ethnicity, student status, marital status, number of dependents, educational attainment, employment status, living arrangement, vehicle ownership, the month and the week of tax filing, receipt of TANF and SNAP benefits, unsecured debt balance and the value of liquid assets, household's annual gross income, and the amount of federal and state tax refund.

Table 4: Difference-in-Differences Estimates, By Access to Liquidity (Early filers=before Feb 15; Non-early filers=Feb 15 and after)

	Skipped housing payments (1)	Skipped bills or late bills (2)	Skipped medical care (3)	Skipped prescription drugs (4)	Experienced food insecurity (5)	Had unsecured debt (6)	Amt. of unsecured debt (7)
Panel A: Could Access $2,000 in an Emergency							
Early filer × Post 2016	-0.023	-0.033	0.012	-0.001	-0.009	0.000	-0.097
	(0.026)	(0.038)	(0.036)	(0.029)	(0.042)	(0.038)	(0.269)
Early filer	-0.021	0.050	0.006	0.083	0.066	-0.033	-0.145
	(0.033)	(0.049)	(0.051)	(0.041)	(0.061)	(0.055)	(0.402)
Post 2016	-0.042	-0.059	-0.011	0.014	-0.062	0.028	0.244
	(0.015)	(0.024)	(0.023)	(0.018)	(0.028)	(0.027)	(0.188)
Observations	2,529	2,529	2,529	2,529	2,529	2,529	2,529
R-squared	0.157	0.288	0.166	0.149	0.252	0.347	0.468
Panel B: Could not Access $2,000 in an Emergency							
Early filer × Post 2016	0.007	-0.005	0.020	-0.024	0.112	0.027	0.048
	(0.040)	(0.040)	(0.043)	(0.041)	(0.038)	(0.036)	(0.258)
Early filer	-0.038	-0.123	0.008	0.066	-0.101	-0.085	-0.734
	(0.057)	(0.058)	(0.061)	(0.058)	(0.053)	(0.045)	(0.322)
Post 2016	-0.007	-0.034	-0.009	-0.017	-0.099	-0.005	0.129
	(0.031)	(0.031)	(0.033)	(0.032)	(0.030)	(0.027)	(0.194)
Observations	2,804	2,804	2,804	2,804	2,804	2,804	2,804
R-squared	0.159	0.257	0.189	0.158	0.190	0.372	0.494

Notes: Robust standard errors in parentheses. Each regression includes the following controls: baseline measure of any material and medical hardship, respondent's gender, age, age squared, race/ethnicity, student status, marital status, number of dependents, educational attainment, employment status, living arrangement, vehicle ownership, the month and the week of tax filing, receipt of TANF and SNAP benefits, unsecured debt balance and the value of liquid assets, household's annual gross income, and the amount of federal and state tax refund.

Table 5: Robustness Checks, Alternative Comparison Groups

	Skipped housing payments (1)	Skipped bills or late bills (2)	Skipped medical care (3)	Skipped prescription drugs (4)	Experienced food insecurity (5)	Had unsecured debt (6)	Amt. of unsecured debt (7)
Panel A: Alternative Comparison Group (Non-EITC Early Filers=before Feb 15)							
Early filer × Post 2016	-0.032	0.004	0.026	-0.023	0.039	0.009	0.056
	(0.017)	(0.020)	(0.020)	(0.018)	(0.021)	(0.020)	(0.141)
Observations	6,409	6,409	6,409	6,409	6,409	6,409	6,409
R-squared	0.192	0.381	0.218	0.199	0.323	0.315	0.439
Panel B: Alternative Comparison Group (Early Filers<Feb 1; Non-Early Filers=Feb 1–Feb 28/29)							
Early filer × Post 2016	-0.075	-0.021	0.065	-0.031	0.072	0.043	0.349
	(0.031)	(0.034)	(0.034)	(0.031)	(0.033)	(0.031)	(0.223)
Observations	3,525	3,525	3,525	3,525	3,525	3,525	3,525
R-squared	0.198	0.368	0.197	0.189	0.307	0.351	0.469
Panel C: Matched Comparison Group (CEM)							
Early filer × Post 2016	0.006	0.009	0.024	-0.008	0.059	0.031	0.074
	(0.028)	(0.031)	(0.033)	(0.030)	(0.033)	(0.030)	(0.220)
Observations	4,999	4,999	4,999	4,999	4,999	4,999	4,999
R-squared	0.202	0.374	0.196	0.186	0.305	0.361	0.477

Notes: Robust standard errors in parentheses. Each regression includes the following controls: baseline measure of any material and medical hardship, respondent's gender, age, age squared, race/ethnicity, student status, marital status, number of dependents, educational attainment, employment status, living arrangement, vehicle ownership, the month and the week of tax filing, receipt of TANF and SNAP benefits, unsecured debt balance and the value of liquid assets, household's annual gross income, and the amount of federal and state tax refund.

Table 6: Robustness Checks, Alternative Years

	Skipped housing payments (1)	Skipped bills or late bills (2)	Skipped medical care (3)	Skipped prescription drugs (4)	Experienced food insecurity (5)	Had unsecured debt (6)	Amt. of unsecured debt (7)
Panel A: Using 2015 and 2016 Samples							
Early filer × Post 2015	-0.005	0.001	0.004	0.015	-0.020	-0.007	-0.051
	(0.019)	(0.022)	(0.023)	(0.021)	(0.023)	(0.021)	(0.152)
Observations	6,135	6,135	6,135	6,135	6,135	6,135	6,135
R-squared	0.175	0.369	0.209	0.191	0.255	0.359	0.471
Panel B: Using 2017 and 2018 as the Post-treatment Period							
Early filer × Post 2016	-0.006	-0.004	0.007	-0.026	0.063	0.013	-0.002
	(0.021)	(0.024)	(0.024)	(0.021)	(0.025)	(0.023)	(0.165)
Observations	6,175	6,175	6,175	6,175	6,175	6,175	6,175
R-squared	0.188	0.368	0.216	0.192	0.321	0.356	0.476
Panel C: Using 2017 and 2018 as the Post-treatment Period (Year Dummy Controls)							
Early filer × Y2017	-0.004	-0.002	0.008	-0.027	0.065	0.004	-0.083
	(0.023)	(0.026)	(0.027)	(0.024)	(0.027)	(0.025)	(0.181)
Early filer × Y2018	-0.009	-0.001	0.004	-0.024	0.069	0.041	0.206
	(0.027)	(0.032)	(0.031)	(0.028)	(0.033)	(0.031)	(0.232)
Observations	6,175	6,175	6,175	6,175	6,175	6,175	6,175
R-squared	0.188	0.369	0.216	0.192	0.323	0.359	0.477

Notes: Robust standard errors in parentheses. Each regression includes the following controls: baseline measure of any material and medical hardship, respondent's gender, age, age squared, race/ethnicity, student status, marital status, number of dependents, educational attainment, employment status, living arrangement, vehicle ownership, the month and the week of tax filing, receipt of TANF and SNAP benefits, unsecured debt balance and the value of liquid assets, household's annual gross income, and the amount of federal and state tax refund.

Table 7: Robustness Checks, Other Specifications

	Skipped housing payments (1)	Skipped bills or late bills (2)	Skipped medical care (3)	Skipped prescription drugs (4)	Experienced food insecurity (5)	Had unsecured debt (6)	Amt. of unsecured debt (7)
Panel A: Including State Dummies							
Early filer × Post 2016	0.002	0.002	0.018	-0.013	0.063	0.008	-0.058
	(0.024)	(0.027)	(0.028)	(0.025)	(0.028)	(0.026)	(0.187)
Observations	5,333	5,333	5,333	5,333	5,333	5,333	5,333
R-squared	0.200	0.376	0.215	0.198	0.315	0.358	0.480
Panel B: Including Clustering by Zip Codes							
Early filer × Post 2016	0.002	-0.001	0.017	-0.015	0.067	0.005	-0.085
	(0.024)	(0.027)	(0.027)	(0.025)	(0.028)	(0.026)	(0.188)
Observations	5,305	5,305	5,305	5,305	5,305	5,305	5,305
R-squared	0.192	0.370	0.204	0.188	0.310	0.353	0.477
Panel C: Including Census Division & Year Interactions							
Early filer × Post 2016	0.002	-0.006	0.013	-0.014	0.066	0.009	-0.036
	(0.024)	(0.027)	(0.028)	(0.025)	(0.028)	(0.026)	(0.188)
Observations	5,333	5,333	5,333	5,333	5,333	5,333	5,333
R-squared	0.193	0.372	0.208	0.192	0.313	0.355	0.478

Notes: Robust standard errors in parentheses. Each regression includes the following controls: baseline measure of any material and medical hardship, respondent's gender, age, age squared, race/ethnicity, student status, marital status, number of dependents, educational attainment, employment status, living arrangement, vehicle ownership, the month and the week of tax filing, receipt of TANF and SNAP benefits, unsecured debt balance and the value of liquid assets, household's annual gross income, and the amount of federal and state tax refund.
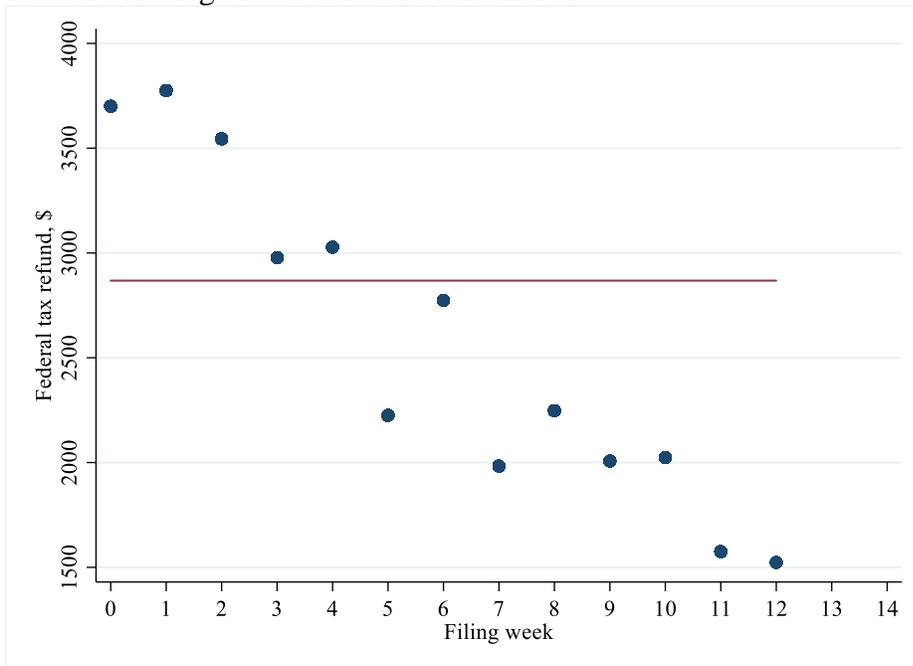
Figure 2: Average Amount of Federal Tax Refund, 2016 and 2017

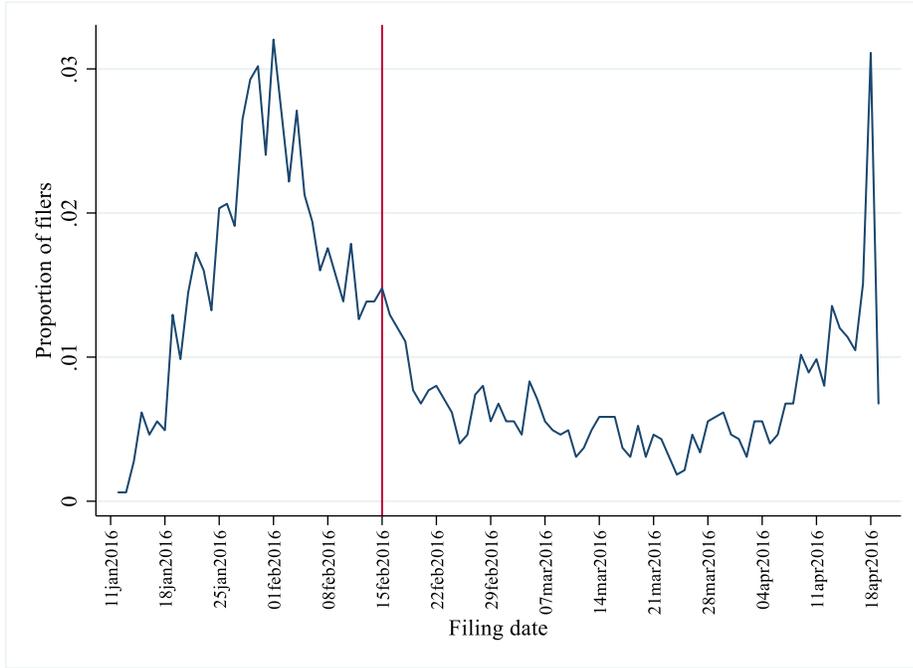Panel A: Average Federal Tax Refund in 2016
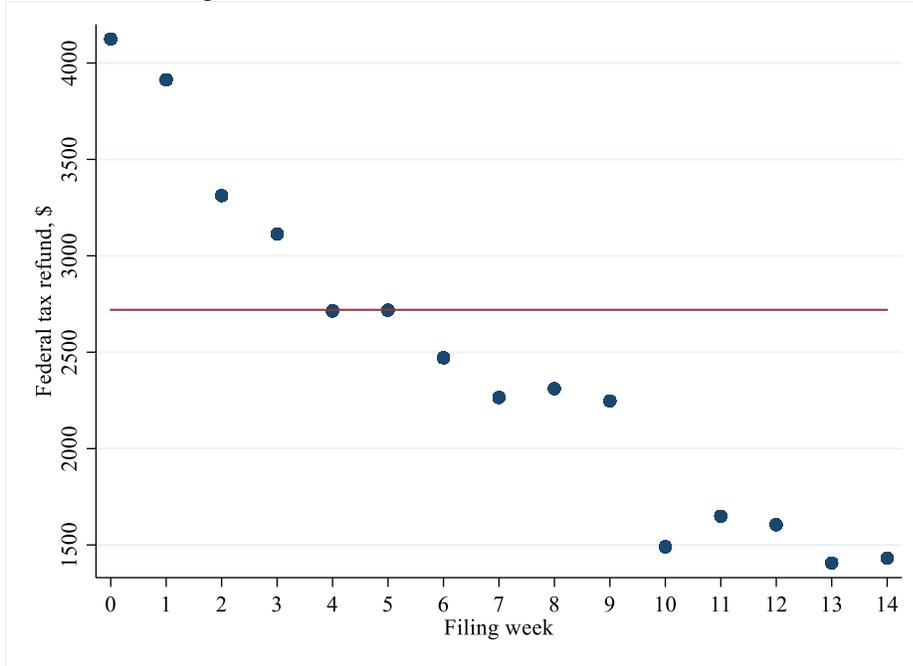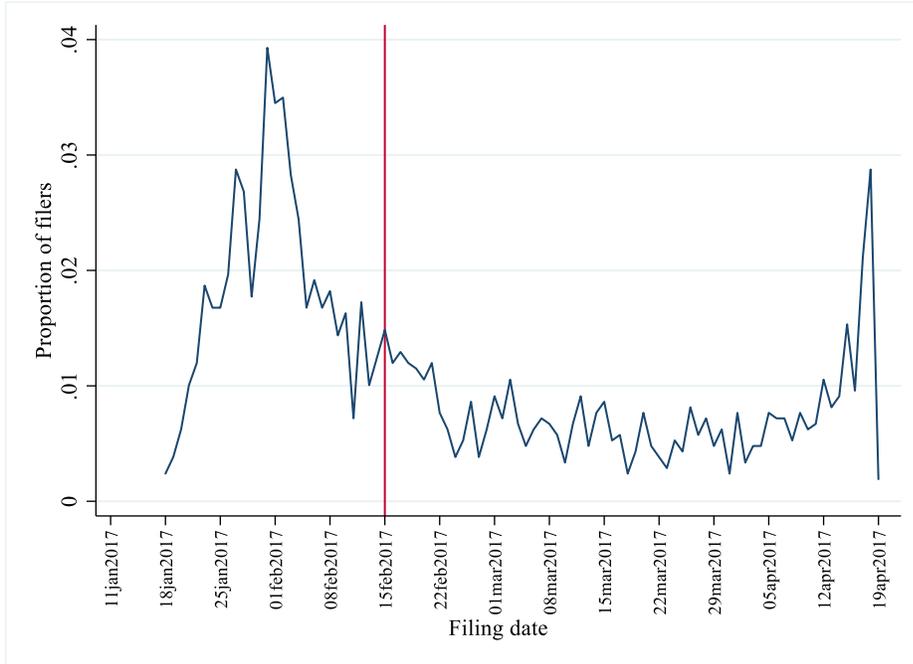

Panel B: Average Federal Tax Refund in 2017

Notes: N=3,246 in 2016 and N=2,087 in 2017. Red horizontal line signifies the average federal tax refund amount for the 2016 tax filing season.
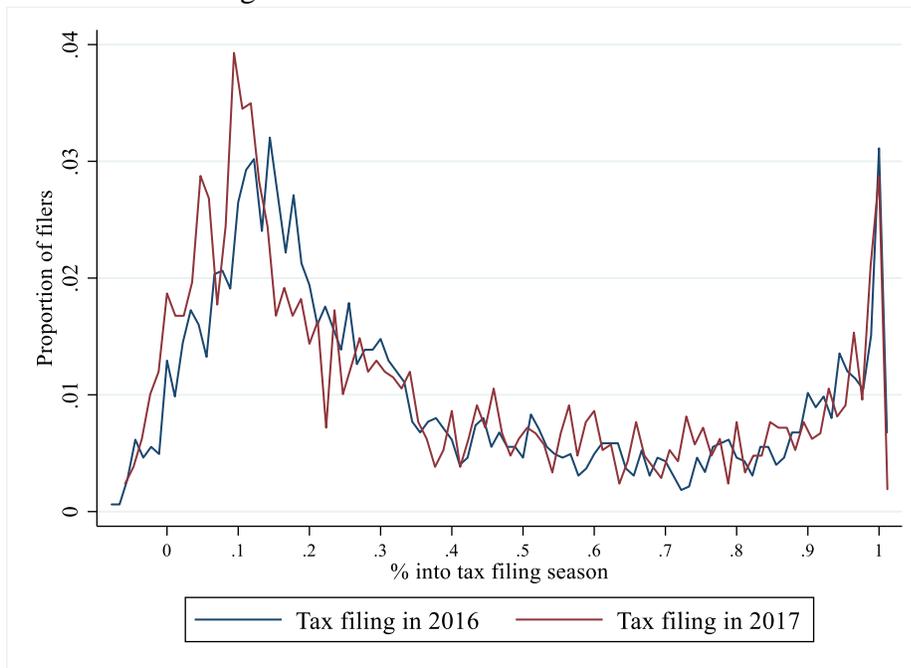
Figure 3: Tax Filing in 2016 and 2017

Panel A: Tax Filing in 2016

Panel B: Tax Filing in 2017

Panel C: Tax Filing in 2016 and 2017

Notes: N=3,246 in 2016 and N=2,087 in 2017.

Figure 4: Tax Filing in 2016–2018