High-frequency Spending Responses to the Earned Income Tax Credit

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[PRELIMINARY]

Abstract

Many households face large, high-frequency changes in income and have limited financial buffers to smooth their consumption through these income fluctuations. Few studies have quantified the spending responses to such timing shifts in income due to a lack of high-frequency spending data. Using a new dataset of anonymized daily, state-level spending, we study the effect of a two-week delay in federal tax refund issuance to tax filers claiming the earned income tax credit (EITC). The regression results show that spending out of refunds with the EITC is highly sensitive to the timing of refund receipt, suggesting that these households are unable to smooth their spending through an income delay of only a few weeks. Moreover, spending on nondurable necessities, such as groceries, is delayed until refund receipt, along with durable goods. Altogether, these findings suggest many households have limited access to liquidity, such that even a short-lived delay in income of a few weeks leads to notable changes in spending.

Low-income households experience high-frequency income fluctuations with limited means of smoothing consumption (Murdoch and Schneider, 2017; Board of Governors, 2017). To quantify the effects of such disruptions in income requires high-frequency spending data, we use a new dataset of daily, state-level spending to study the spending response to a two-week delay in federal tax refunds with an earned income tax credit (EITC) in 2017. Using time-series and cross-state variation in refund receipt, we estimate that, on average, EITC recipients spend about one quarter of their total refunds at retail stores and restaurants within two weeks of receipt. Thus the two-week delay in 2017—while short lived—led to a noticeable change in the timing of spending in February. Moreover, while previous studies, such as Barrow and McGranahan (2000) and Goodman-Bacon and McGranahan (2008), emphasize the link between the EITC and durable goods purchases, we find that EITC receipt also affects spending on nondurable necessities, such as groceries.

Background on Tax Refunds to EITC Claimants

The EITC is a refundable tax credit claimed by a large share of low- to moderate-income households. In tax year 2016 (calendar year 2017), 27 million households claimed the EITC – 18 percent of all tax returns processed. [1] Moreover, those claiming the EITC tend to be among the earliest tax filers each year, and federal income tax refunds often represent a substantial portion of their annual incomes. Maag et al. (2016) find that of all EITC claimants, 56 percent filed prior to February 15 in 2015 and 2016, receiving an average refund of $4,479 – a sum that translates to roughly two months of pay for a typical EITC claimant.

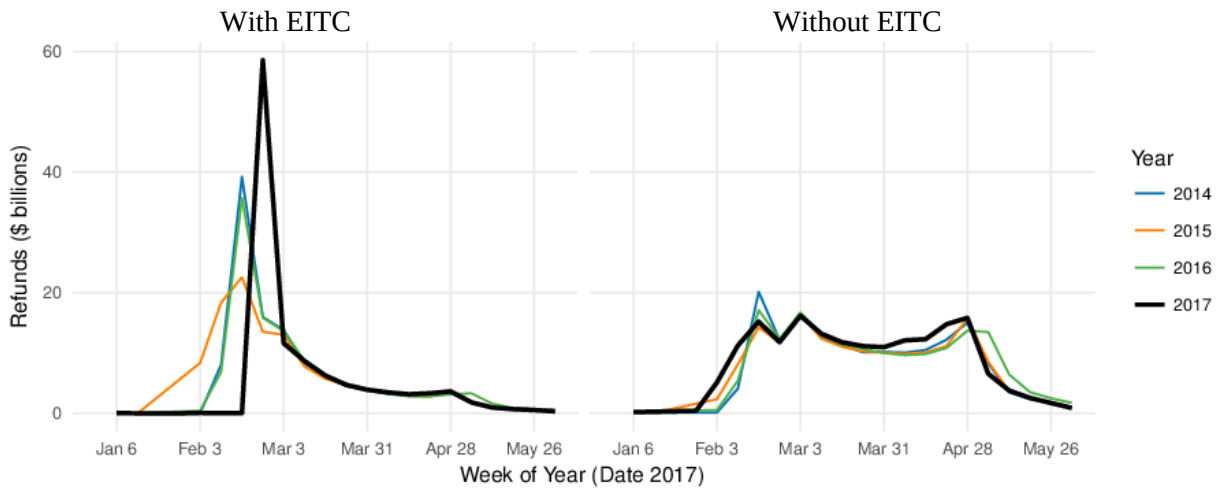
At the time a tax return is filed, tax filers learn the expected amount of their refund, but they do not receive the refund until after the tax return has been processed by the IRS. Prior to 2017, the length of time between the filing date and the date the IRS issued a refund was less than three weeks. About four fifths of individuals file electronically and designate a direct deposit, so any refunds are typically available in their bank accounts a few business days after the IRS issuance. But starting in 2017, legislation that was part of the Protecting Americans from Tax Hikes Act (PATH) prohibited the Internal Revenue Service (IRS) from issuing any federal tax refunds claiming the EITC the before February 15.[2]

[1] Source: Internal Revenue Service (January 2018). Statistics for Tax Returns with EITC. Retrieved from: https://www.eitc.irs.gov/eitc-central/statistics-for-tax-returns-with-eitc/statistics-for-tax-returns-with-eitc

[2] The new IRS provisions were included in the PATH Act which passed in December 2015. The required waiting period before refund issuance, intended to provide the IRS with additional time to detect tax fraud, applies to all tax returns that claim either the EITC or an additional child tax credit (ACTC). The entire refund to the tax filer must be held for processing, even that portion not related to the EITC/ACTC. The analysis and the refund data used in

As a result, EITC claimants faced a longer wait in 2017 than in prior years to receive their tax refund.[3] The left panel in figure 1 shows weekly values of federal tax refunds issued during the 2014 to 2017 filing seasons that included an EITC.[4] Refund issuance in early February 2017 was well below the levels observed in prior years, peaking about two weeks later than usual. Despite the delay, total issuance for the year as a whole was similar to prior years. By adding exogenous variation to the timing of household income receipt, this legislated refund delay allows us to estimate the extent to which low-income households smooth their spending through a large, but short-lived disruption to income.[5]

Figure 1. Weekly Issuance of Federal Tax Refunds with EITC and without EITC



Source: Internal Revenue Service. Note: The first week of the year is the one which has both a Monday and Friday within January. Dates are the Fridays in 2017. Peak issuance occurred in the week of Friday, February 23rd in 2017, two weeks later than the peak in earlier years

Survey evidence in Maag et al. (2016) suggests that at least some of the early EITC claimants were likely to have difficulty smoothing spending through the PATH Act's temporary delay in refund issuance. One-third of survey respondents said that even a one-week delay in their refund would "somewhat negatively" affect their household finances. More than half said that they would be

this note also includes refunds with an ACTC, but we abstract from the ACTC in the text. Many, but not all filers, who receive an ACTC also receive an EITC.

[3] Source: Internal Revenue Service, Refund Timing for Earned Income Tax Credit and Additional Child Tax Credit Filers. Retrieved from: https://www.irs.gov/individuals/refund-timing

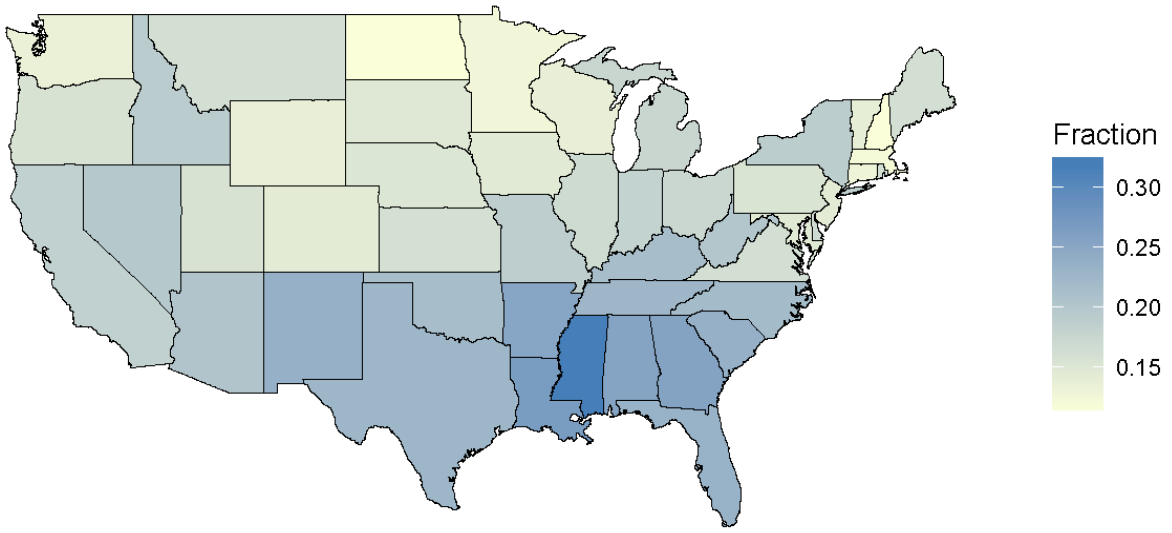
[4] Weekly "issuance" refers to the week in which the Treasury made a withdrawal from its operating cash balance in order to send out a refund. It does not necessarily imply that the refund appeared in a household's bank account during the same week.

[5] Survey evidence from 2016 also suggests that EITC claimants were largely unaware of the delay in refund disbursements due to the PATH Act. Despite the fact that PATH was enacted in December 2015, Maag et al. (2016) document that 91 percent of the 981 respondents to the 2016 Household Financial Survey (HFS) who claimed the EITC (or ACTC) said that they had not heard about the refund delay.

"negatively" affected by a three- to four-week delay. Using tax filing data linked to the Household Financial Survey, Maag et al. (2016) also document that the median family with children affected by the delay reported only $400 in liquid assets and $2,000 in credit card debt at the time of tax filing. Of course from a prospective survey, it is hard to know how many EITC claimants were surprised in February 2017 by the delay. The rise in refund anticipation loans suggest that those using tax preparation services may have been alerted to the delay when they filed. However, news reports in early February suggest that many filers were caught by surprise.

In addition to variation in the timing of refund receipt across tax years, our analysis takes into account the considerable variation across the United States in EITC receipt each year. Figure 2 shows the fraction of federal tax returns in each state with the EITC in 2016. With a range from over 30 percent of all returns in Mississippi to less than 15 percent in North Dakota, EITC take-up rates vary substantially across states.

Figure 2. Fraction of Federal Tax Returns with the EITC by State in 2016



Source: Internal Revenue Service.

Description of the New Spending Data and Summary Statistics

Central to our study of the two-week EITC delay are new daily, state-level indexes of retail spending, as introduced in Aladangady et al. (2017). These indexes were constructed using aggregated and anonymized credit, debit, and electronic transactions from First Data, a large payment processing

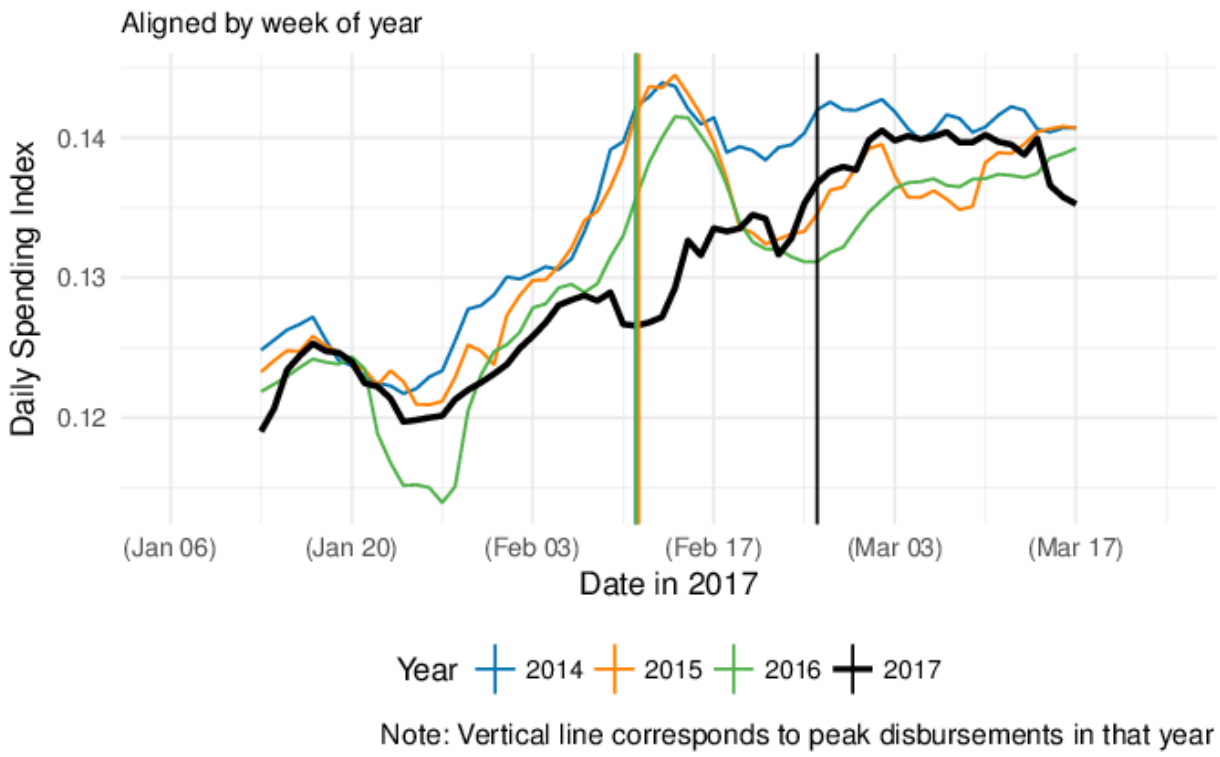
company.[6] Spending is categorized by the type of merchant where the payment transaction occurred (for example, at a restaurant or a department store) and by the location of the merchant. Our analysis here focuses on a spending sub-aggregate that we refer to as the "retail sales group" (RSG).[7] This group covers spending on most durable goods (excluding autos), most nondurable goods (excluding gasoline), and food services, accounting for one-third of total personal consumption expenditures in the National Income and Product Accounts. Given that a large fraction of retail purchases are made via card transactions, this spending is well measured with our data set and is comparable to the Census Bureau's Retail Trade Survey.

To roughly illustrate how the timing of EITC refunds affects consumer spending behavior, Figure 3 plots daily, national spending in recent years. We use a trailing seven-day moving average to smooth out the large, regular day-of-the-week variation in spending. The index of daily spending for each year is expressed relative to the spending in the middle week of January. To the extent that EITC households were unable to smooth spending through the PATH Act's refund delay in 2017, we would expect to observe lower retail spending between late January and late February than in previous years; conversely, spending should be higher at the end of February into early March after the delayed refunds were issued. Indeed, we broadly observe this pattern at the national level: whereas retail sales in 2014 to 2016 peaked in early-to-mid-February – in conjunction with refund issuance (vertical lines) – sales during that period in 2017 were well below the previous years' levels. Similarly, retail sales in 2017 peaked soon after refund issuance and remained somewhat higher than the levels through mid-March in prior years.

[6] These spending indexes are the outcome of an ongoing collaboration between the Federal Reserve Board, Palantir Technologies, and First Data Merchant Services, LLC (First Data).

[7] The "retail sales group" includes all retail sales and food services other than sales at motor vehicle dealers, building material stores, and gasoline stations; it is the portion of the Census retail sales data that the BEA uses to construct its estimate of personal consumer expenditures. While gasoline stations are excluded from this analysis, First Data has good coverage of gasoline stations and some service industries in the national accounts outside of the retail sales group.

Figure 3. Daily Spending at Retail Stores and Restaurants, 2014 to 2017



Source: First Data Merchant Services. Note: Spending is a trailing, seven-day moving average, indexed to the second week of January in each year. Vertical lines correspond to week of peak refund issuance. The peak is the same from 2014 to 2016.

Unlike prior years, spending in 2017 did not exhibit a pronounced hump-shaped pattern around the peak week of refund issuance to EITC recipients. Of course, other factors beyond refund issuance likely affected spending around this period. For example, severe winter weather often disrupts spending early in the year, muddling such summary statistics. While figure 3 suggests that the timing of the refund receipt affects spending, we use state-level regression analysis to remove potentially confounding factors, such as localized winter storms.

Regression Estimates of the Spending Response to the EITC Delay

To quantify the high-frequency spending response to EITC delay, we estimate the following model of retail spending per capita in state *s* on day *t*:

$$\frac{Spend_{s,t}}{Population_{s,t}} = \omega_{s,t}(Week\ of\ Year)_t + \delta_{s,t}(Day\ of\ Week)_t + \Omega_{s,t}(Year)_t + \Psi_t(Holidays)_t + \sum_j \beta_j \frac{EITC\ Refunds_{s,t+j}}{Population_{s,t}}$$

We include a broad set of variables that control for the regular variation in spending across states and over time: ω for week of year, δ for day of week, Ω for year, and Ψ for holidays such as Easter and Valentine's Day. The identification of the EITC spending response relies on the policy-driven, two-week delay in issuance in 2017. Our regressor of interest is a state's per capita weekly federal income tax refund issuance to EITC recipients. In addition to contemporaneous refund issuance, we include one- and two-week leads and lags to capture possible anticipatory spending effects along with any trailing spending effects.[8] Summing over the β_j coefficients yields an estimate of the cumulative increase in spending per dollar of EITC refund in the five weeks surrounding issuance. Of note, we exclude states that were strongly affected by harsh winter storms. [9]

As shown in Table 1, we find that EITC recipients spend 24 cents of every refund dollar within two weeks of receipt at retail stores and restaurants. The largest increase in spending (11 cents per refund dollar) is in the week of issuance, and the second largest (6 cents per refund dollar) is in the following week. We also find a smaller increase (about 3 cents per refund dollar) in the week prior to and two weeks after issuance.[10]

[8] In robustness checks we have included additional leads and lags of weekly disbursements in the regression. Generally, leads of two week or more and lags of three weeks or more are small in magnitude and statistically indistinguishable from zero.

[9] We exclude Alaska, Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, North Dakota, Rhode Island, Vermont, and the District of Columbia from the regression. Adding these states to the analysis and controlling for the winter storms has a minimal effect on our results. We also exclude Hawaii due to data quality issues.

[10] The small increase in spending in the week prior to refund issuance may imply that households can partially smooth some over days, such as the amount of time it takes a personal check to clear, but not weeks. In addition, there may be some measurement error in the IRS refund timing data, as well as refund anticipation loans (RAL) made available to some filers after their payments have been approved by the IRS. See press coverage by Cowley (2017) of the form of RALs introduced in 2017 and the marketing to early filers.

Table 1: Regression Results of Spending Response to EITC Refunds

Lead of Two Weeks	0.004
	(0.005)
Lead of One Week	**0.033**
	(0.006)
Week of Refund Receipt	**0.111**
	(0.007)
Lag of One Week	**0.061**
	(0.006)
Lag of Two Weeks	**0.026**
	(0.005)
Within Two Weeks of Receipt	**0.235**
	(0.013)

Note: Newey-West standard errors in parentheses. Coefficients in bold are statistically different from zero at the 1-percent level. Sample includes Jan 1 to June 30 in years 2014 to 2017.

To interpret the magnitude of this spending increase (and make comparisons to other spending propensities in the literature), we need to highlight a few unique aspects of our study. First, we study the response of low-income consumers to a relatively limited (two-week) shift in income. As such, we focus on spending within a narrow window of only five weeks around income receipt. Second, we only examine the response in a subset of consumption categories that comprise about one-third of aggregate consumption. Thus, our estimate likely misses a sizeable portion of the spending out of refunds to EITC recipients. If we were to scale up our results to total spending, this would imply that EITC recipients spent three-quarters of their refund within two weeks.

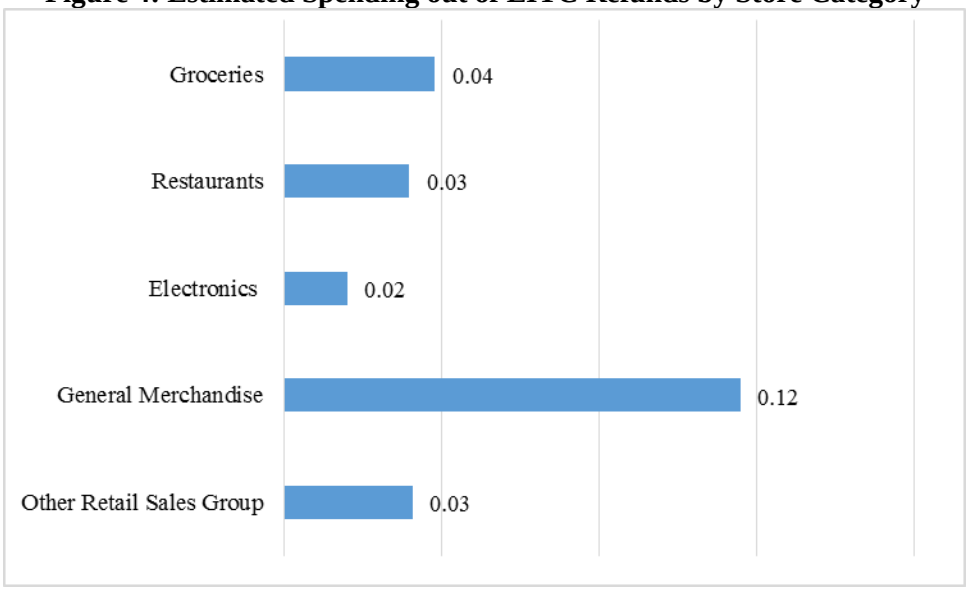
Using weekly spending in the Nielsen Consumer Panel (NCP), Broda and Parker (2014) find that during the four weeks starting with the week of the 2008 economic stimulus payment receipt, spending on NCP-measured goods rose by 3.5 to 5.5 percent of the magnitude of the payment.[11] The NCP captures a narrower subset of goods—only about 10 percent of aggregate consumer expenditures—than our

[11] Other studies are harder to compare due to substantial differences in the time window for the spending response and in the types of spending covered. Bracha and Cooper (2014) find an MPC of 0.6 per additional dollar of tax refund, but examine a larger subset of spending and over a longer time period. Jappelli and Pistafarri (2014) find an average MPC of 0.48 out of an unexpected, transitory income shock, which varies by wealth of household. Finally, Johnson, Parker and Souleles (2006) find an MPC of 0.2 to 0.4 out of income tax rebates, but focus specifically on nondurables spending over a three-month period surrounding rebate receipt.

spending indexes. Even increasing the estimates from Broda and Parker by a factor of three, to roughly match our coverage of spending, we still find a somewhat larger spending response to EITC refunds than to the economic stimulus payments. This difference could reflect the lower liquidity, on average, among EITC claimants than the stimulus recipients.[12] In fact, in a separate study of the Nielsen data Parker (2017) finds that households with persistently low levels of liquidity (possibly due to impatience or poor planning skills) spend more out of the additional income.

Finally, in figure 4 we separate the spending response into finer subcomponents: electronics, groceries, restaurants, general merchandise, and other retail sales group stores. One striking aspect of the figure is that spending on essentials such as groceries and other nondurable necessities is also affected by EITC refund receipt. Our estimates may, in fact, understate the response in grocery spending because general merchandise stores are often both a department and grocery store. While previous studies have found that EITC refund spending is concentrated in vehicle purchases and repair, transportation, household durables, and electronics (Barrow and McGranahan, 2000; Goodman-Bacon and McGranahan, 2008), we find a non-trivial spending response at grocery stores and restaurants.

Figure 4: Estimated Spending out of EITC Refunds by Store Category



Note: Estimate from regressions using the same specification as equation one where spending totals are within each category. Each of the estimates is statistically different from zero at the one-percent level using Newey-West standard errors. The Other Retail Sales Group category is computed as the residual

[12] Other explanations for the different spending responses are possible. For example, the EITC is an annual payment, whereas the stimulus payments were a one-time, less predictable addition to income. The spending response to annual Alaska Permanent Fund payments, as studied by Kueng (2018), might be a better comparison. However, the differences in the frequency and scope of the spending data, as well as the population affected, complicate comparisons.

Conclusion

Our results suggest many households have limited access to liquidity, such that even a short-lived delay in income of a few weeks lead to notable changes in spending. Moreover, it is not only durable good spending that is affected. We find these households do not smooth spending on essentials such as groceries either.

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