Structuring Consumption Subsidies: The Impact of Recurrent and One-shot Food Vouchers and Cash Transfers on Grocery Purchases

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Abstract

Policymakers face numerous design choices when structuring income assistance programs, including whether benefits should be paid in-kind or as cash, and how frequently benefits are issued. Yet there is limited empirical evidence on whether households spend in-kind benefits differently than cash or monthly payments differently than one-time transfers. To explore these questions, we examine how grocery expenditures differed across four pandemic-era payments that were issued to low-income families with children. We find that in the month after issuance, households spend a larger share of in-kind benefits than cash benefits of an equivalent value and spend a larger share of monthly benefits than one-time transfers. These patterns are consistent with both mental accounting/"labeling" and forward-looking behaviors.

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*Researchers' own analyses calculated (or derived) based in part on data from Nielsen Consumer LLC and marketing databases provided through the NielsenIQ Datasets at the Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business. The conclusions drawn from the NielsenIQ data are those of the researcher(s) and do not reflect the views of NielsenIQ. NielsenIQ is not responsible for, had no role in, and was not involved in analyzing and preparing the results reported herein.

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1 Introduction

In standard neoclassical models of consumer behavior where individuals are fully rational, inframarginal, and do not face liquidity constraints, in-kind and cash transfer programs will have identical effects on consumption. However, in models of behavioral agents—for example, with time-inconsistent preferences, mental accounting, or heuristics—or in circumstances without full liquidity, households may spend in-kind assistance differently than cash and monthly transfers differently than one-time assistance.

While these neoclassical and behavioral frameworks yield different predictions for how households will spend different types of assistance, empirical evidence on whether individuals respond differently to cash and in-kind transfers and how these responses differ with the frequency of payments is scant. Yet understanding how the design of transfer policies affects household expenditure responses can provide information to help better model and understand households' economic decision-making. These patterns are also of interest to policy makers when determining how to structure programs to maximize social welfare. This paper provides one of the first empirical examinations comparing spending responses to the receipt of several income transfers to a broad population that differ in frequency and fungibility. We examine changes in high-frequency expenditure patterns among low-income families with children following receipt of four different pandemic-era programs in a harmonized empirical framework.

We study how spending at food stores differs across four pandemic-era programs: Pandemic EBT (P-EBT), the Emergency Allotment (EA) provisions of the Supplemental Nutrition Assistance Program (SNAP), the expanded Child Tax Credit (CTC), and Economic Impact Payments (EIP, also called stimulus payments). Each provided benefits to low-income families with school-aged children between 2020 and 2023 but differed in program design. Two programs, SNAP EA payments and the CTC, provided monthly benefits, whereas P-EBT and the EIP were perceived as one-time transfers at the time of initial issuance. In addition, P-EBT and SNAP EA assistance were paid in-kind and could only be redeemed to

purchase groceries, whereas CTC and EIP funds were unrestricted cash that could be used for any purpose. This policy environment provides a compelling set of natural experiments to examine how program design choices matter for spending responses.

We leverage variation in the timing and amount of each payment on grocery expenditure data in difference-in-differences and event study frameworks. Our outcomes are measured using detailed, longitudinal, daily scanner data at the household level from the NielsenIQ Consumer Panel covering 2,473 low-income households' expenditures on groceries and other common retail items. We have five primary findings.

First, we document both that expenditures at food stores increase substantially more when transfers are only redeemable for grocery items than when provided on a cash basis, holding the frequency of payments fixed. This effect is largely driven by greater spending at grocery stores but not discount, convenience or club stores, in response to in-kind transfers, consistent with mental accounting. Further, the increase in spending is larger overall than it is for food products. These greater expenditures generally reflect more spending per trip rather than additional trips in the case of one-time payments, and additional trips with recurrent benefits.

Second, holding the type (in-kind versus cash) of payment constant, households spend more over a 4-week period with monthly payments than one-time payments. These patterns are consistent with forward-looking behavior, where consumers spend more of a benefit that is expected to be replenished in the following month, and saving larger, one-time payments in a "rainy day" fund.

Third, comparing across food product categories, there are no systematic patterns. Households generally increase spending on perishable and non-perishable goods by a similar amount. Households also do not leverage the additional transfers to increase spending on "bulk" items—i.e., taking advantage of quantity discounts—or changing their consumption on "sin goods" such as alcohol and tobacco.

Fourth, we find that low-income families with children generally have a higher marginal propensity to consume than other recipients of the same payments, including moderate-

income households and households without children.

Finally, we find that marginal propensities to consume food out of each of these payments is relatively low, ranging from about 0.03 for lump-sum cash EIPs to about 0.15-0.17 for in-kind food benefits (both monthly and one-time). These rates align with the low end of the range of similar estimates from earlier programs (where comparable estimates exist).

These results complement and extend a literature that shows that consumers treat in-kind benefits differently than cash transfers (Hastings and Shapiro, 2018; Fraker, 1990; Chorniy et al., 2025), though the magnitude of the spending difference is relatively small. The results are also consistent with findings that spending from cash relief payments during COVID-19 generated only a small spending response (Parker et al., 2022), and that spending out of predictable, regular income shocks is larger than it is from unpredictable windfalls (as reviewed in Karger and Rajan (2021)).

2 Conceptual Framework

Policymakers face numerous choices when designing assistance programs. For example, benefit levels and phase-out (or phase-in) rates affect total program costs and labor market incentives. Further, policymakers may impose targeting restrictions—such as conditioning receipt on having earnings from paid employment or having dependent children to screen out certain groups. Conditional on eligibility and benefit levels, there are many additional choices about how to structure assistance programs. For example, a program that provides $600 in assistance per year could be issued to families as cash income or as in-kind assistance that can only be used to purchase certain types of goods or services, such as food or childcare. Payments can be made at different frequencies: for example, families could receive monthly payments of $50 or a single annual payment of $600.

In the benchmark case of perfectly rational, forward-looking consumers with no liquidity constraints, the form (cash versus in-kind) and frequency of assistance does not affect expenditure patterns. However, even in a neoclassical model there are several reasons why the amount and types of expenditures may vary depending on whether transfers are provided as cash income or in-kind support, or on a monthly versus annual or one-time frequency.

For example, while standard theory predicts that food benefits are spent like cash among consumers who are inframarginal, marginal consumers who would prefer to spend less on food than their in-kind benefits are worth may respond by purchasing more food than they would with an equivalent cash transfer. The presence of liquidity constraints may also impact consumption. For example, a consumer may prefer to purchase a large size of a consumable product that costs less per unit but be unable to pay the larger upfront cost to do so.

Behavioral factors may also result in different spending responses by payment type. Mental accounting, labeling effects, or similar influences could result in food benefits being disproportionately spent on groceries or child tax credits on children's goods. Consumers may also use large lump-sum transfers to purchase big-ticket or bulk items, whether due to mental accounting, time-inconsistent preferences that impede saving, or other reasons.

3 Identification Strategy and Policy Variation

We study multiple pandemic-era transfers that were paid to low-income families with children. The programs varied in terms of whether they were paid in cash or as in-kind grocery benefits, and whether they were a lump-sum or recurring monthly payment. We compare (grocery) spending responses to programs falling into each of four categories: in-kind lump-sum, in-kind recurring, cash lump-sum, and cash recurring. While some programs reach broader groups, e.g. low-income families regardless of whether they have children or higher-income families with children, all four programs apply to low-income families with children. Our primary results examine families with school-aged children and income levels at or below approximately 130% of the poverty threshold. Tables 6 and 7 compare outcomes among this group to broader populations, some of whom also receive benefits. We describe the policies in more detail below.

3.1 One-time, In-kind Payments: Pandemic EBT (P-EBT)

Due to widespread school closures during the COVID-19 pandemic, many children lost access to free or reduced-price school meals. The P-EBT program provided grocery vouchers (which could be redeemed to purchase food in retailers that accepted SNAP benefits) for the

value of the missed school meals. The initial disbursement was primarily paid in a lump sum during summer 2020, worth $5.70 per student per missed day of school for the entirety of missed school days in spring 2020.[1] These payments were available to students who usually received free or reduced-price meals at school and averaged about $300 per student ($529 per family). Because school closures were nearly universal in spring 2020, there was relatively little variation in payment amounts within or across states, and what variation existed was driven by school calendars (e.g., when spring break was scheduled relative to the closure, when the school year ended).

To participate in this federally funded program, states were required submit an implementation plan for approval by the U.S. Department of Agriculture. A few states made payments in April 2020, most implemented in May or June, and some implemented as late as August or September (Appendix Figure A1 panel c). Notably, P-EBT payments were quickly automatically loaded onto families' existing EBT cards if they were SNAP participants. In some cases, students from (much) higher-income families were eligible for P-EBT payments because they typically received free school meals through school- or district-wide "community eligibility provisions" for universal free meals. Those who were not SNAP participants received new benefit cards, but the process of issuing new cards took several weeks or months. Following the approach in Bauer et al. (2024), our main sample focuses on families who were income-eligible for SNAP for whom we can identify payment timing for the P-EBT lump-sum in-kind transfer. We identify the impacts of P-EBT payments from variation across states and week in the timing of payments, as illustrated in Appendix Figure A1.

P-EBT benefits per child by state are calculated from information that states reported on the amount issued and number of children served for the 2019-20 school year (available on the USDA website). Amounts are assigned to households in the NielsenIQ data based on

[1] Approximately 84% of students lived in a state that made a single payment for the 2019-20 school year; 16% lived in a state that made multiple, smaller payments in the summer of 2020. Although states had the option to offer P-EBT in the 2021-22 and 2022-23 school years, the program was not reauthorized until October 2020, after the new school year had begun. Therefore, at the time of the first payment, families would have viewed P-EBT as one-time.

state and number of school-age children.

3.2 Monthly, In-kind Payments: SNAP Emergency Allotments (EA)

SNAP provides benefits that can be used to purchase most grocery items at most food stores. Benefits are paid monthly on electronic benefit transfer (EBT) cards that look and function like debit cards. Under normal circumstances, SNAP benefits levels are calculated with a formula similar to a negative income tax: households with no net income receive a "guarantee" equal to the maximum benefit, and as income (net of allowable deductions) increases benefits are reduced at a 30% rate.[2] In 2023, 70% of SNAP participants with school-aged children had a positive net income and thus under typical circumstances would have received benefits lower than the maximum benefit (authors' calculations from USDA Quality Control data).

In March 2020, states were given the option to enact temporary "Emergency Allotment" (EA) payments that increased benefits for all SNAP participants to the maximum benefit for their household size. All states took this option by April 2020. The EAs were later amended so that in April or May 2021 (depending on the state) all participating households would receive at least $95 in EA payments.[3] We begin our sample window in June 2021 so that all EA benefit amounts are measured relative to this second phase of the program. Beginning in May 2021, some states opted to stop issuing EA payments before the supplements were ended nationally in March 2023, after the February payments were made. We use this variation—i.e., the termination of increased monthly benefits between June 2021 and March 2023—to identify the impacts of additional in-kind monthly transfers. Appendix Figure A1 panel d displays the variation across states and months used to identify the program impact. EA benefits averaged $255 per month among families with children, and their termination reduced average SNAP benefits in these families by 33%.

[2]Net income is calculated as a household's monthly income minus deductions including a standard deduction and deductions for expenses such as out-of-pocket childcare costs, a portion of earnings, and housing costs that exceed half of the household's net income.

[3]When EAs were in place, there was a sharp benefits cliff at the SNAP eligibility cutoff.

EA payment amounts vary by a household's monthly net income—a complicated function of total income minus a series of allowable deductions including a portion of earned income, child care expenses, some housing payments, and others. The NielsenIQ data used in our empirical work do not include sufficient information to precisely calculate EA payment amount. Instead, we impute EA payment amounts from SNAP Quality Control administrative data. We calculate average EA payment for households with children by household size and income bin and assign these EA amounts to households in our analysis sample. The identification of impacts of EAs come from variation across states in the availability of EAs over time. Although the "experiment" used to identify the impact is a reduction in the monthly benefit, to ease interpretation and comparison with the other policies we reverse the sign so the coefficient can be interpreted as the impact of a benefit increase.

3.3 One-time, Cash Payments: Economic Impact Payments (EIP)

In each recession since 2001, families have received lump-sum "stimulus" payments issued through the IRS in a policy effort to support incomes and stabilize aggregate demand. During the COVID-19 pandemic, three stimulus payments, called Economic Impact Payments (EIPs), were issued. The first, in April 2020, paid $1,200 to each adult and $500 per child to families with a single head of household earning less than $112,500 a year ($150,000 for married couples). The IRS and Social Security Administration automatically made payments to families based on their previous year's income. Accordingly, take-up was high and most families that would receive payments did so by the end of April 2020 (Office, 2020; IRS, 2020). We focus on the first EIP to identify expenditure responses to one-time cash transfers as this payment was large, unexpected, and subsequent payments were not discussed until months later. Appendix Table A2 panel a shows results for the third EIPs that provided $1,400 per person in March 2021.[4]

[4]We do not separately analyze the second EIP, issued in December 2020/January 2021 as the timing coincided with the holiday season, which may be different than non-pandemic years due to public health guidance on social distancing.

3.4 Monthly, Cash Payments: Refundable Advance Child Tax Credit (CTC)

The federal Child Tax Credit (CTC) normally provides an annual, partially refundable tax credit when families file their federal income taxes. In 2021, the credit was temporarily changed three ways. First, the credit was made fully refundable so that low-income families received the full credit if they had little or no labor market earnings.[5] Second, the maximum credit was increased from $2,000 per child to $3,000 for children 6-17 and $3,600 for younger children. Finally, half of the 2021 CTC was paid in advance with monthly cash transfers of $250-$300 per child (depending on age) from July to December 2021.

We identify the impacts of the monthly cash transfers provided through the refundable advance CTC by comparing outcomes for families with children observed between July and December 2021 with similar families observed between July and December 2019, with payment amounts varying by the number and ages of children in the household.[6]

4 Data

We examine grocery expenditures using data from the NielsenIQ Consumer Panel, a longitudinal panel of over 60,000 households, about 12,000 of which have school-aged children. Households in the panel scan products purchased for personal, in-home use from any retail outlet using an in-home scanner. The data include information on the products purchased, their prices, the date the purchase was made, and the (de-identified) store at which the sale occurred for each shopping trip. Panelists also provide demographic information once per year, including the number and year of birth of household members and the household's (binned) annual income.

We restrict our sample to households that have school-aged children, defined as having at least one child between the ages of 6 and 18 as of December 31 of the given year. In addition, for each calendar year they are in the panel we require households to record at least one

[5] In other years, families with no earnings received no CTC, and the credit phased in at a 15% rate for earnings above $2,500 up to the maximum amount.

[6] We do not compare to the second half of 2020 because that timeframe is potentially contaminated by other COVID-19 relief payments.

grocery purchase each month and have no month in which their reported grocery spending was greater than their monthly income plus estimated SNAP benefits.[7] These additional screens remove households who record their purchases inconsistently or inaccurately. We also restrict the sample to "magnet" households that record all products purchased, including items without UPC codes.

We examine two primary measures of expenditures: weekly spending at food stores, and weekly spending on food products at food stores. Food stores are predominantly grocery, discount, or club stores, but also include more specialized retailers such as bakeries and butchers.[8] We exclude restaurant purchases (including categories such as quick-serve, fast food and delis) from our primary outcomes, and report spending in that category separately. We also disaggregate total spending into food categories, including perishable (dairy, deli, packaged meat, and fresh produce departments) and non-perishable products (dry grocery and frozen foods departments). We include a subcategory of "sweets and soda" that includes candy, cookies, ice cream, frozen desserts, pudding, carbonated beverages, and sugar/sweeteners, and a separate subcategory of "alcohol and tobacco."[9]

A shortcoming of these data is that grocery spending is under-reported if panelists do not record a trip or fail to scan all products purchased from a given trip. Einav et al. (2008) explored the accuracy of the NielsenIQ Consumer Panel data (then known as Nielsen Homescan) and found that on average 53% of trips go unreported. Within each reported trip, however, households appear to scan nearly all products. We mitigate the issue of not reporting trips by dropping households that have no reported grocery purchases in at least one month of the calendar year (i.e., those whose reporting is likely the least accurate); however, among the remaining households, there may still be missing trips or purchases that contribute to lower overall *levels* of spending.

[7] Appendix Table A4 reports robustness to a spending threshold of grocery spending not more than 200% of income plus estimated SNAP benefits.

[8] In our sample, 55% of food spending at food stores occurs at grocery stores, 35% at discount stores, 7% at club stores, and 3% at other types of food stores (bakeries, butchers, etc.). Store types not included in food stores are stores such as apparel, beauty supply, computer, dollar stores, home furnishings, hardware, shoes, sporting goods and toy stores. See Data Appendix for a full list of retailer types.

[9] Alcohol purchases are excluded from the primary food spending measure.

The average household in our sample reports spending $196-$219 per week, roughly 75% of which is spent at food stores ($146-$161) (Appendix Figure A2). These numbers come from the bottom of purchase receipts, and therefore include taxes and fees, but do not rely on households scanning each individual item from the trip. If we instead sum up spending at food stores from individual product-level scans, we observe spending of $99-$124 per week (about 70% of reported trip-level spending). Note that some of the difference between this product-level spending and trip-level spending is likely due to the inclusion of sales taxes in the latter. We separate the data into spending on food products at food stores (averaging $64-$90, or 60-70% of the product-level spending) and non-food spending such as paper goods and cleaning products (averaging $33-$40, 30-40% of the product-level spending). Finally, we limit our spending measure to UPCs that are consistently recorded in NielsenIQ across all years a program is in place, bringing our primary measure of food spending to roughly $47-$90 per household per month. We primarily analyze the data at the weekly level, and detail on sample averages of weekly spending and how it varies by program sample and spending definition is shown in Appendix Figure A2.

Because these measures of spending underestimate total household food spending, the MPCs that we calculate will likely underestimate a household's true marginal propensity to consume out of benefits as we discuss in greater detail below. However, to the extent that underreporting is consistent over time, this measurement error will not affect our comparisons *across programs*, a primary contribution of this paper. These comparisons would be biased if, for example, households are more likely to purchase the types of products that are typically not scanned (e.g., a granola bar that is eaten on the drive home) with cash rather than in-kind benefits or vice-versa. We do not believe this is a major concern but acknowledge that it is a potential limitation.

5 Empirical Approach

An advantage of our setting is that we have precise information on benefit issuance for multiple programs over a relatively narrow time horizon. We leverage this rich policy variation across households and over time in a generalized difference-in-difference framework.

Our most parsimonious approach takes the form:

$$y_{ist} = \beta Benefits_{ist} + X'_{ist}\theta + \delta_s + \phi_t + \varepsilon_{ist} \tag{1}$$

The treatment variable, $Benefits_{ist}$, measures the dollar value of benefits (in hundreds of dollars) that family i living in state s was eligible to receive in period $t \in w, m$. For P-EBT, the expanded CTC, and the first EIP, we know the first date of payment disbursal at a daily level and estimate its impact on expenditures at the weekly level ($t = w$), based on the amount received in the previous 4 weeks. For the EA payments, most states make SNAP payments throughout the month (based on Social Security number, last name, case number, or other information not reported in NielsenIQ); therefore, we only know the *month* in which households received expanded benefits and estimate expenditures at the monthly level ($t = m$).

δ_s and phi_t are state and time fixed effects that account for time-invariant state policies affecting spending and benefit receipt and seasonal factors that may influence consumption, respectively. For programs with daily issuance information (P-EBT, CTC, and EIP), phi_t includes week-of-year and year fixed effects; for SNAP EA that only includes monthly variation, phi_t is week-by-year fixed effects.

X_{ist} is a vector of control variables, including the head of household's age, gender, race/ethnicity, educational attainment, marital status, income, the number of children and adults in the household, the number of children under age 5 (as a proxy for WIC eligibility) and the state unemployment rate and share of monthly SNAP payments disbursed during the reference period. We also control for state-specific policies adopted in response to the pandemic: an active stay-at-home order and mask mandate; restaurant closures; and UI payment processing speed. Finally, we include controls for whether any of the other three programs we study were in effect in state s during period t.

Because the P-EBT treatment timing varies across states, we exclude states that had disbursed benefits prior to the 4-week window so that each comparison compares states that had recently disbursed funds with those that had not yet made payments. In doing so, the

comparison group consists of households living in not yet treated, "clean" control states to avoid comparisons between newly treated and previously treated states (Goodman-Bacon 2021). Since the SNAP-EA analysis is conducted on a monthly level and varies across states, we similarly omit states that ceased paying EA benefits more than 3 months prior.

The timing of EIP and CTC benefits did not vary across states, so for these programs we cannot compare currently treated to not yet treated households. Instead, we construct control groups of households that meet the same sample restrictions (low-income, has school-aged children, etc.) in 2019. We compare to 2019 because it is the most recent "typical" spending year prior to the COVID-19 pandemic.[10] Thus, while the economic and demographic sampling criteria are the same across each program we study, the sample windows vary based on the timing of disbursements and control groups. The sample windows are as follows and displayed in Appendix Figure A1 panel b:

- P-EBT: April 15 – September 1, 2020
- SNAP EA: June 1, 2021 – December 30, 2023
- CTC: April 14 – November 16, 2021 (control: April 11 – November 13, 2019)
- EIP: March 25 – May 19, 2020 (control: March 21 – May 15, 2019)

All analyses use household weights from NielsenIQ. For programs that were implemented at the state level (P-EBT and SNAP EA) we cluster standard errors at the state level, while for those implemented nationally (EIP and CTC) we calculate HC1 robust standard errors.

We also extend Equation 1 to an event-study framework to examine how quickly families spend the benefits and the extent to which immediate effects fade over time. The event study approach also helps assess the plausibility of the parallel trends identifying assumption. Specifically, we estimate the following equations:

$$y_{ist} = \sum_{k \neq -2} \beta_k 1\left[\tau_{st} = k\right] * 1\left[Year_t \neq 2019\right] + X'_{ist}\theta + \delta_s + \phi_t + \varepsilon_{ist} \tag{2}$$

[10] Appendix Table A2 panel b reports robustness to using 2022 as a control year rather than 2019.

$$y_{ism} = \sum_{k \neq -2} \beta_k 1\left[(\tau_{sm} = k)\right] + X'_{ism}\theta + \delta_s + \phi_m + \varepsilon_{ist} \tag{3}$$

Equation 2 is used for P-EBT, EIP, and CTC estimations and Equation 3 is used for EA estimations. We require a slightly different equation for EAs because we cannot observe the exact timing of SNAP disbursement to individual households throughout the benefit month. We therefore estimate event studies for SNAP EAs at the monthly, rather than weekly, level. τ_{st} (τ_{sm}) captures event time relative to the onset (end) of benefits, which varies at the state level for P-EBT and EA benefits and is uniform across states for EIP and CTC payments.

Both the DD and event study approaches in Equations 1-3 should be interpreted as intent-to-treat (ITT) effects, as the NielsenIQ data do not include information on program receipt. For policymakers designing a new safety net program with non-compulsory participation, the ITT is the relevant parameter of interest. In addition, we provide additional information on take-up rates below to provide an estimate for those families that chose to participate in the program (i.e. the treatment on the treated, TOT).

6 Results

6.1 Overall Food Spending

We start by measuring how households' overall food shopping patterns respond to each transfer in Table 1. Program benefits are scaled as the value in hundreds of dollars received over the past 4 weeks. Total weekly spending at food stores increases by approximately \$1.71 for eligibility for each \$100 in lump-sum, in-kind P-EBT benefits within the previous 4 weeks (panel a, column 1). As the sample average weekly spending is \$166.55, this implies a weekly 1% increase in spending for every \$100 received. P-EBT benefits averaged \$638, implying that spending increased about 6.5% in the weeks after P-EBT was paid. We obtain similar results examining spending on food items, with eligibility for \$100 in P-EBT benefits within the previous 4 weeks increasing weekly spending by about \$1.41 (column 2), indicating that households spent most of the additional benefits on food items at these stores. These increases are driven by greater spending per trip (column 4); there is no economically or

statistically significant change in the number of weekly trips to food stores (column 3).

The total spending response is somewhat larger for the monthly benefits through SNAP EA payments. The estimated impact on total spending at food stores is $3.65 per $100 received (column 1, panel b). Note that the mean of the dependent variable is lower among the SNAP EA sample than it is among the P-EBT, with an average of $150 vs. $167 for total spending at food stores and $49 vs. $90 for food spending. This is driven by variation in timing, as P-EBT payments were made when children were universally out of school, stay-at-home orders were in effect, and many people were working exclusively from home, while SNAP EAs were discontinued as late as March 2023 when schooling and the economy had largely returned to normal. In percentage terms, the change in spending with in-kind benefits is larger under recurrent benefits: total spending at food stores increased by 1.0% for every $100 in one-time P-EBT benefits and by 2.4% in response to a $100 change in monthly SNAP EA benefits. As shown in column 2, the spending response is smaller both in dollar and percentage terms when we restrict the outcome to spending on food. In other words, while recipients increase their spending at food stores by $3.65 for every $100 in food benefits they receive, only about $0.96 of the additional spending goes to food products. This is consistent with a mental accounting framework in which consumers spend the in-kind payments at grocery stores, but recognize that the benefits are fungible buy purchasing more goods that cannot be bought directly with SNAP. Changes in shopping behaviors also differ between recurrent and one-time in-kind transfers. With recurrent benefits, households make slightly more trips but do not significantly change how much they spent each trip.

Turning to cash transfers through the lump-sum EIP and the monthly 2021 CTC expansion in panels c and d, respectively, changes in spending are smaller in response to cash payments than to in-kind transfers that are paid on a similar schedule (i.e., one-time or monthly). These patterns are consistent with previous work suggesting mental accounting in SNAP (Hastings and Shapiro, 2018). Comparing lump-sum to recurrent payments shows a similar pattern among the cash programs as it did among the in-kind ones where households spend a higher share of monthly payments than one-time transfers. In particular, food

spending increases by 1.5% for every $100 in monthly CTC benefits, but by less than 0.4% for lump-sum EIPs.[11] Like the in-kind results, recipients make additional shopping trips in response to monthly cash payments but not in response to lump-sum ones (though the coefficient in panel c is marginally statistically significant, it is very small). In both cases, they spend more per trip.

Unlike the results for SNAP EA payments, in response to the cash payments there is little difference in spending increases comparing food spending and total spending at food stores. Further, the increase in food spending in response to monthly SNAP EA ($0.96) is not much different (and is not statistically significantly different) than it is in response to monthly CTC benefits ($0.72).

Appendix Table A3 shows that spending responses are robust to a range of alternative measures of weekly spending. The first 4 columns compare receipt level vs product level expenditures at food stores and all stores. While the dependent variable means change in predictable ways (with receipt level spending greater than product level spending, and less spending at the subset of food stores compared with all stores), the relative magnitudes of spending responses are the same with larger spending increases in response to in-kind transfers than monthly transfers of a similar frequency. Columns 5-8 show that spending responses within transfer type are robust to different cuts of measures of food products. The final 4 columns show spending responses among non-food products. Spending on non-food products increases overall in response to EIPs and increases only at food stores with SNAP EA payments, but does not change in response to CTC or P-EBT receipt.[12]

The point estimates in Table 1 are intent-to-treat (ITT) effects showing the change in spending among income-eligible households. However, take-up varies across programs, from 78% of income-eligible households for SNAP (and P-EBT, Cunnyngham 2023), 92% for the

[11] While our baseline results compare spending in response to the first EIP and compares it to the same weeks in 2019, Appendix Table A1 shows that the results are similar if we compare the first EIP to a control group observed in 2022. Panel B shows that results are not statistically significant for the third EIP compared to a 2019 control group. The lower spending response for later EIPs is consistent with previous work (Parker et al. 2022).

[12] Appendix Table A4 shows that the results in Table 1 are little changed if we relax the exclusion criteria from omitting households that spend more than 100% of their income plus SNAP benefits on food in a 4-week period (as in Table 1) to 200%.

EIP (Becker-Medina et al. 2023), and 83% for the expanded CTC (CRS 2022). Inflating the ITT estimates by participation rates implies that recipient households increased weekly food spending per $100 in benefits by 2.5% for SNAP EA, 2.0% for P-EBT, 1.8% for the refundable CTC, and 0.4% for EIPs. For all spending at food stores, the impacts inflated by participation rates are 3.1%, 1.3%, 1.5% and 0.5%, respectively. As discussed below, while these TOT effects can be compared across programs, further adjustments are needed to translate this into marginal propensities to consume in order to account for our sample restrictions and known limitations to the NielsenIQ coverage.

Households can purchase food at a variety of stores, yet much of the existing work on grocery expenditures and income assistance programs is limited to either one retailer or does not include information on store type. In addition to affecting overall spending, program design can also influence where a household shops. We next disaggregate the total (food plus non-food) spending response across types of stores in Table 2. Changes in spending patterns differ substantially across the four types of transfers. Grocery store spending increases (essentially) across the board but 4-10 times more for in-kind than for cash transfers. There are statistically significant increases in spending at discount stores in response to cash transfers, though the point estimate is also similar but imprecise for P-EBT payments. [13] Greater club store spending is only marginally significant for the monthly, in-kind SNAP EA payments (column 3). Neither cash nor in-kind benefits increase spending at convenience stores, other food stores, or restaurants. (Restaurants are not included in other measures of food spending at food stores).

Table 3 separates food spending by product type. Each type of transfer increases households' spending on both perishable and non-perishable goods and tends to do so in similar shares for both types of goods. An exception is that lump-sum in-kind P-EBT and monthly CTC benefits may increase purchases of non-perishable goods more than perishables (1.7-1.8% increase per $100 benefits, compared to 1.1%). We find no evidence of increases in alcohol and tobacco consumption for any type of transfer, with estimated impacts that are

[13] In general, Target and Wal-Mart are examples of discount stores. We provide these as examples and do not intend to suggest that these are or are not included in the NielsenIQ data.

small and not statistically significant.[14] We generally find no increase in purchase of sweets and sodas, except in response to monthly CTC payments where the estimate is small in magnitude – with 95% confidence we can rule out spending increases larger than 16 cents per $100 in benefits.

Zaki and Todd (2023) find that SNAP households adjust their shopping behavior and obtain better price deals when they receive benefits. We test whether households respond to increased resources by spending a larger share of their budget purchasing larger, bulk-sized products, measured as a product at or above the 80th percentile of the size distribution of its product type, in column 5. About 25% of mean spending goes to bulk-sized products, and there is no change in the purchase of these goods in response to benefit receipt.

6.2 Event Studies

We next turn to event-study analyses, which allow us to transparently display the timing of spending on food both before and after the transfer is made. The event is measured as a binary indicator and is neither scaled by transfer size like it was in Tables 1-3 nor by the takeup rate. In panel a of Figure 1, spending at food stores increases promptly after P-EBT payments are made. This higher spending persists for about 4 weeks after receipt of P-EBT payments, consistent with evidence of lower reported food hardship and the increased EBT redemptions from administrative data over this period documented in previous work (Bauer et al., 2024). Furthermore, there are no meaningful pre-trends in the weeks prior to P-EBT payments being made. Panel c shows similar impacts for the EIP lump-sum cash transfer, with no detectable pre-trend and higher spending for several weeks after payments are made, although the spending impacts in response to the EIP are noisier than those in response to the lump-sum in-kind P-EBT payments.

Panel d shows impacts of monthly cash payments through the expanded CTC, with the event-study window spanning 4 weeks prior to payments to 8 weeks after. Food spending is higher in the week of the first payment and the following two weeks, then falls in week

[14] Chorniy et al. (2025) find that emergency department visits for drug and alcohol use increase after receipt of cash Supplemental Security Income (SSI) benefits, but not after SNAP receipt, suggesting some non-fungibility of benefits.

3 before increasing again in week 4 (when the second monthly payment was made). The pattern looks similar in the second month of benefits, with spending elevated in weeks 4-6 and dropping again in week 7.

Panel b shows spending responses to receipt of SNAP EA payments. Recall that unlike other programs for which we can identify the week of benefit payments, SNAP EAs are identified only on state-specific monthly timing, as most states issue benefits throughout the month. As a result, unlike panels a, c, and d, panel b shows event time in months relative to the last EA payment (times -1). By orienting the graph this way, panel b is otherwise structured like the other panels, so that time periods to the left of the zero point are when EA payments are not made and time periods to the right are when families received additional EA payments. That is, since EA payments occurred each month, households received payments in months 0 to 4 but not in periods -1 to -4. Similar to the other programs, figure c shows that spending is higher in months with EA payments than when it is not.

Figure 2 repeats the series of event studies for food spending and shows generally similar patterns for each program. Appendix Figures A5-A6 partitions each sample into households that receive above- or below-median benefits for each program, following the approach in Callaway et al. (2024) for event studies with a continuous treatment variable. The impacts generally are larger and more persistent among those receiving higher benefit amounts (bottom panels), and lack of pre-trends indicate that each of the quasi-experiments is reasonably "clean."[15]

6.3 Heterogeneity by Income

Our analyses so far have focused on households with school-age children and income below approximately 130% percent of the federal poverty line. However, in some cases, higher-income households with school-age children also received these transfers and it is

[15]Appendix Figures A3 and A4 replicate the event study analyses with a longer pre-period for P-EBT, SNAP EA, and the CTC. Again, we do not find any systematic divergent trends in the weeks leading up to benefit issuance, bolstering confidence in the parallel trends identifying assumption. We do not examine the EIP or weeks more than 6 weeks prior to P-EBT disbursement since this period coincides with the initial stay at home orders, restricted operating hours, and product shortages in March 2020. See for example https://www.npr.org/2020/03/18/817920400/empty-grocery-shelves-are-alarming-but-theyre-not-permanent.

of interest to compare spending responses across higher-income groups for whom there are fewer binding liquidity constraints. In other cases, few or no higher-income households with school-age children received the transfers; in these cases we can impute benefit levels based on their household size, and the results can be interpreted as placebo tests. We show total spending at food stores and spending on food for alternative income groups in Table 4 and 5 respectively, with the first column reproducing the relevant estimate from Table 1.[16]

Panel a reports impacts for P-EBT payments, which were designed to replace missed free or reduced-price school meals. In our sample, 10% of households who are not themselves income-eligible for subsidized school meals live in areas with schools that offer universal free meals through USDA policies such as the Community Eligibility Provision. These students were also eligible for P-EBT, but their payments were delivered later than they were to those who were already on SNAP. We calculate the expected P-EBT amount as the number of school-age children in the family multiplied by the average benefit in their state of residence. We identify the share of higher-income families that are likely to have received P-EBT payments as households living in counties with a (age-appropriate) school providing schoolwide free meals based on data in Ruffini et al. (2025). The vast majority (86%) of school-age children in households with incomes between 130% and 200% of the poverty line were eligible for P-EBT. The point estimate on P-EBT benefits is slightly smaller than for the primary sample of those below 130% of poverty, but it is not statistically significantly different from zero in the higher-income sample. The point estimate is (surprisingly) negative and statistically significant among households between 200% and 300% of poverty – a population with an estimated 12% eligible for the benefits. Overall, as the income categories increase, the share eligible for benefits declines and the estimates become smaller and show no spending response to P-EBT timing.

Panel b shows results across income groups for SNAP EA payments. Under traditional SNAP rules, families with incomes above 130% of the poverty line are not eligible for benefits. Many states, however, implement "broad-based categorical eligibility" that allows higher-

[16] Appendix Figures A3-A4 show that the lack of systematic trends holds over a longer pre-treatment window.

income families to participate as long as they are eligible to receive benefits according to the SNAP benefit formula. When a higher-income family with children is eligible for SNAP benefits under this provision, it is typically because they have high child care or housing costs and their total income is almost always less than 200% of the poverty threshold. These higher-income SNAP participants typically receive only modest benefits, with an average monthly benefit about 25% as large as the overall average benefit (Schanzenbach 2019). There are two important implications of these patterns. First, higher-income families received larger EA payments, since EA raised monthly payments to the maximum SNAP benefit level. Second, participation rates are much lower among this group and as a result the gap between the ITT presented in the table and the TOT will be larger. We calculate the share eligible as the share of families with incomes at or below the 98^{th} percentile of the income-to-poverty rate among SNAP participants with school-age children in their state of residence (to account for differences in categorical eligibility across states).

Families with incomes between 130% and 200% of the poverty line increase their spending at food stores in response to SNAP EA payments. We estimate that just over half of households in this income range are eligible for SNAP. Because their normal SNAP payments are lower, their average EA payment is higher—about $700 per month, compared with $400 per month among the lower-income group. The magnitude of their spending response is also smaller than the lower-income group in both dollars and percentage terms, with food spending increasing about 1% for every $100 in EA received (compared to 2.4% among the lowest-income group).

Essentially no families with incomes above 200% of the poverty line receive SNAP, so these estimates can be interpreted as placebo tests. For these households, we assign a benefit amount equal to the maximum SNAP benefit for their household size. The estimates for higher-income families are small and not statistically significant, showing that our main results are likely not driven by other state-level changes that coincided with SNAP EA termination.

Table 5 repeats the exercise with spending on food products as the dependent variable.

While most results are similar to those found for all spending at food stores, it is worth highlighting that there is no statistically significant increase in food spending in response to SNAP EA for the higher income-eligible group (with incomes 130%-200% of the poverty threshold). Like the lowest-income group, spending increases more at food stores than it does on food products.

While the in-kind payments in panels a and b were targeted to lower-income families, the cash payments in panels c and d were not limited to low-income families but extended much higher up the income distribution. However, since liquidity constraints are likely more pronounced for the lowest-income households, we expect to observe larger spending responses for low-income families. In line with this hypothesis, spending responses, defined as either total spending at food stores or total food spending, is lower for higher-income households, particularly in response to the cash transfers. We estimate that nearly all of households with children were eligible for EIPs. Spending at food stores increases across the board for all income groups but is generally smaller for those with higher incomes. Spending increases in response to monthly CTC payments are only positive and statistically significant among the lowest-income group and are negative and statistically significant in the highest-income groups.

6.4 Heterogeneity by Household Composition

Just as eligibility varied across programs based on income among families with school-age children, eligibility for each program also varied among low-income families with different household compositions. For example, low-income household without children also received SNAP EA payments, low-income households with children younger than school age also received the CTC, and essentially all low-income households were eligible for the EIP.[17] Tables 6-7 presents spending at food stores and food spending responses for other types of low-income households, with column 1 reproducing the results for our primary sample of low-income households with school-age children.

Low-income households received the EIP and those on SNAP received EA payments

[17]The primary exception was some households with immigrant children.

whether or not they had school-age children. As shown in panel b, spending at food stores among childless families increased in response to EA payments, with a 1.5% increase in spending for each additional $100 in benefits, although food spending did not significantly increase (Table 7). The percentage increase in spending as well as food spending is somewhat higher, 1.6-2.4%, among families with children in response to this increase in monthly in-kind benefits. In response to the cash EIP, households without children again increased their spending by slightly less than families with children (panel c).

The two remaining programs were targeted to families with children, so results for childless families should be interpreted as placebo tests. In these cases, benefits are assigned based on overall family size, not on number of school-aged children. As shown in panel a, P-EBT results are attenuated among all families with children because younger children did not receive benefits. By contrast, CTC benefits were larger to pre-school age children, and the estimated spending boost per $100 is similar, 1.2%, across columns 1 and 2. Neither P-EBT nor the CTC was paid to childless families, and in both cases there is no measured increase in spending in response to these placebo tests.

Worth noting, although SNAP EA payments increase spending more overall than for food products among households with children of any age, the same pattern does not hold among childless households. While the estimated coefficient on SNAP EA payments among childless households is not statistically significant in Table 7, the implied percentage change in spending is identical for all spending and food products.

7 Marginal Propensities to Consume

A key advantage of this study is that we can compare spending responses across four different types of transfers in a harmonized framework. We find that households increase spending at food stores more for in-kind transfers that can only be used for groceries than for cash-based transfers of an equivalent value. In addition, within 4 weeks, families spend a greater share of recurrent, monthly benefits than transfers that are perceived to be one time. These patterns are consistent with both mental accounting and forward-looking behaviors.

The estimates in Table 1 are not directly comparable to the previous literature, as we

estimate a *weekly* MPC among income-eligible populations and are only able to observe food items that are scanned by NielsenIQ households. Appendix Table A6 adjusts these ITT weekly MPCs to a monthly MPC for food among recipient households. As shown in column (2), our estimates imply a monthly MPC for food among recipient households ranging from 0.01-0.03 for the cash transfers to 0.04 for the SNAP EA payments and 0.06 for P-EBT. In column 3, we adjust for underreporting due to the restriction we imposed to analyze products with consistent UPCs over the sample window. This restriction reduces our analysis sample to approximately 74-100% of all food purchases at food stores (specific amount varies by program/sample period, see Appendix Figure A2).

A known limitation of the NielsenIQ data is that we only observe products that are recorded in the Consumer Panel. In principle, households are asked to record each item and trip that is used for in-home consumption. However, Einav et al. (2008) estimate that while households scan nearly all products on a given trip, about 53% of trips go unreported. We adjust for trip underreporting, assuming that spending at unreported trips is the same as spending at reported trips, in column (4). Finally, we adjust by estimates of the program participation rates in column (5). The resulting MPCs for food are 0.15-0.17 from in-kind transfers, 0.10 from monthly cash payments, and 0.03 from the cash EIP.

The existing literature has focused on examining a single program in isolation. Most closely related to our analysis, Parker et al. (2022) use the Consumer Expenditure Survey's interview surveys to estimate the MPC from the first EIP. They find a 4.2% MPC on food spending in the three months surrounding EIP arrival, an estimate very similar to ours. Three other facts from the Parker et al. (2022) paper help bridge our MPC estimates to the broader context. First, while our estimates are for low-income families with school-age children and Parker et al.'s are for all consumer units, their paper tests whether MPCs vary by income level and finds small, significantly insignificant differences in spending rates among lower-income households. (On the other hand, they do find significant differences across the distribution of wealth.) Second, in addition to their measure of food spending, their data allow them to also reliably measure consumption responses among all non-durables. They

find an MPC of 10% across all non-durable goods (including food). Third, they find a lower MPC from this COVID-era EIP compared with similar relief payments from prior recessions.[18]

Another closely related estimate comes from Hoynes and Schanzenbach (2009), which finds a MPC on food out of SNAP benefits of 0.17 to 0.30 among populations likely to be eligible for SNAP upon the program's introduction—very similar to our estimate of 0.15. Other estimates of food spending responses to SNAP have found higher MPCs. Using data from one retail chain, Hastings and Shapiro (2018) estimate a monthly MPC of food items of 0.5 to 0.6 among new SNAP recipients. Beatty and Tuttle (2015) also find an MPC of 0.5 to 0.6 using variation from the national SNAP benefit expansion during the Great Recession, while Bruich (2014) finds a somewhat smaller response of 0.3.[19]

Estimates on food spending out of cash income, including the EITC and tax refunds, tend to be smaller than estimates from in-kind transfers, on the order of 0.04 to 0.17 (Aladangady et al., 2023; Castner and Mabli, 2010; Hoynes and Schanzenbach, 2009; Fraker, 1990; Ohls and Beebout, 1993; LaGuardia et al., 2025). Our adjusted estimates of 0.04 (EIP) and 0.10 (CTC) fall within these ranges.

8 Conclusion

Policy design is important in how households respond to transfers. We examine four different programs received by families with children at different points in a narrow time window in the wake of the COVID-19 pandemic. We find that, while the MPC for food in each of these programs is on the low side of the range of existing estimates, the relative MPCs are larger for in-kind food benefits than they are for cash and are larger for monthly payments than they are for one-time transfers. Taken together, these patterns are consistent with frameworks that incorporate mental accounting as well as forward-looking behavior.

[18] As discussed in Parker et al. (2022), their estimates (from self-reported consumption data) are substantially lower than estimates from studies of EIPs using transaction-level data. Karger and Rajan (2021) estimate that nearly half of the EIP is spent within a few weeks, while Baker et al. (2023) estimate that between one-quarter and one-third is.

[19] As noted in Section 3, lump-sum, in-kind payments are rare, and P-EBT was unique in this regard. Accordingly, there is no existing benchmark for P-EBT.

We further demonstrate that MPCs are larger for low-income families with children than they are for low-income childless families or for higher-income families with children. These results can help inform the design, targeting, and analysis of future relief or income assistance policies.

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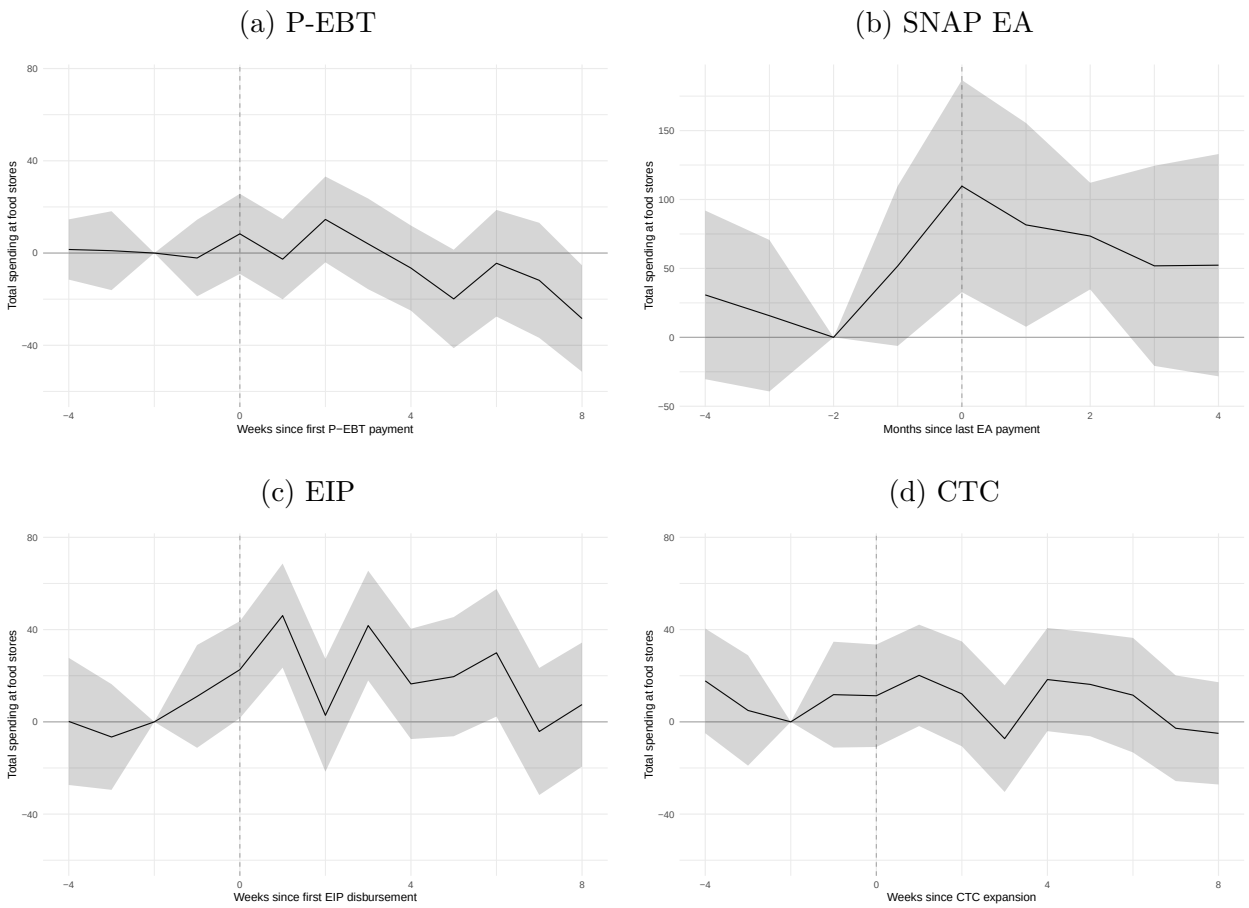
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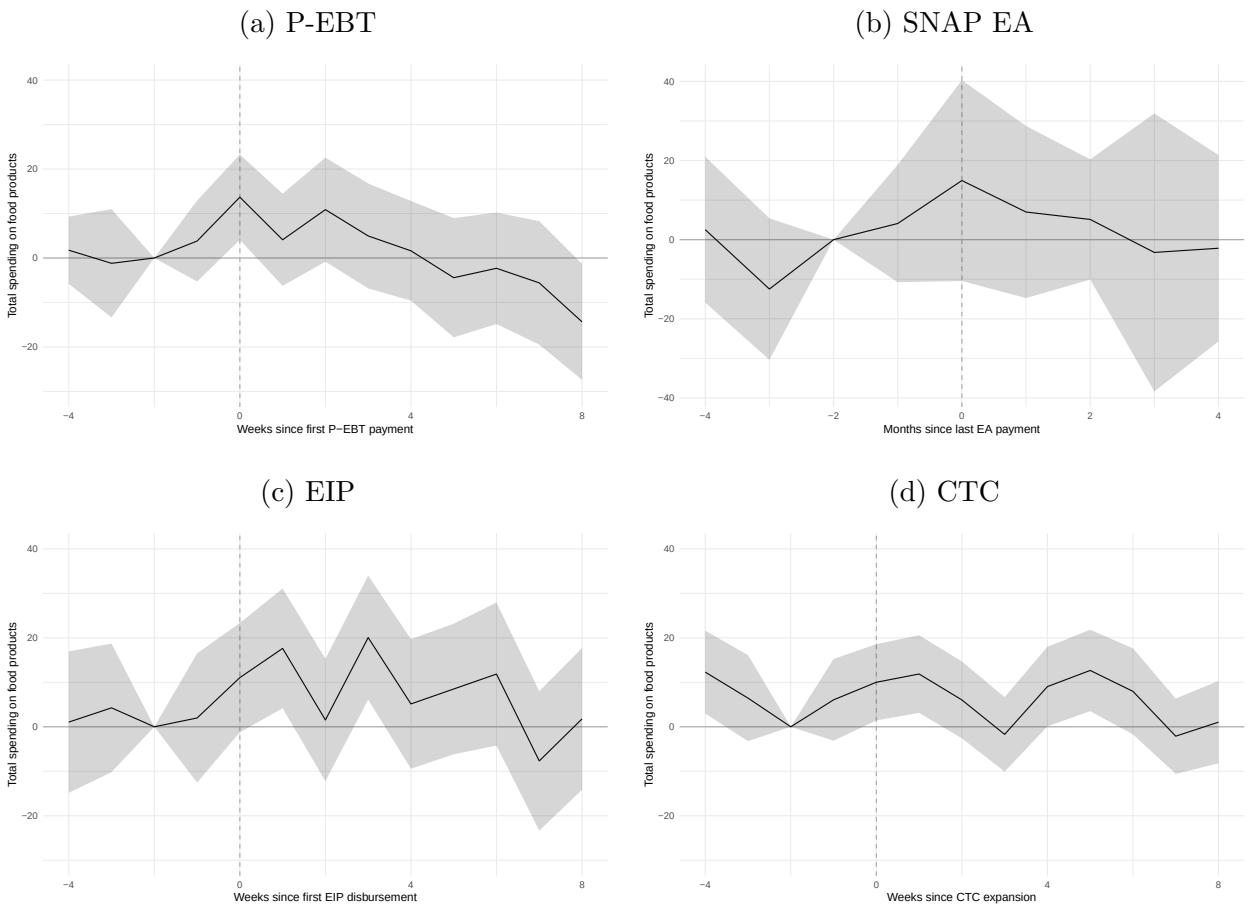
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Figure 1: Event study: Total spending at food stores



Notes: Figure shows event study of average total weekly spending at food stores relative to the period before transfer payments were made. P-EBT, EIP, and CTC impacts are measured at the week level; SNAP EA is measured at the month level. Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Controls included as in figure 1. Shaded gray areas denote 95% confidence intervals.

Figure 2: Event study: Food spending at food stores



Notes: Figure shows event study of average total weekly food spending at food stores relative to the period before transfer payments were made. P-EBT, EIP, and CTC impacts are measured at the week level; SNAP EA is measured at the month level. Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. All equations include controls for head of household's age, gender, race/ethnicity, educational attainment, marital status, income, the number of children and adults in the household, and the number of children under age 5, as well as state-level controls for unemployment rate, share of monthly SNAP payments disbursed during the reference period, delays in UI payment processing, and pandemic policies. Shaded gray areas denote 95% confidence intervals.

Table 1: Food spending and shopping patterns

	(1) Total spending at food stores	(2) Total food spending	(3) Number of trips	(4) Spending per trip
Panel a: P-EBT				
PEBT last 4 weeks ($100s)	1.706** (0.807)	1.411*** (0.432)	0.003 (0.004)	0.908*** (0.326)
N	9956	9956	9956	7789
DV mean	166.549	90.346	1.628	64.920
Avg P-EBT	6.381	6.381	6.381	6.382
% Δ (/$100)	1.02%	1.56%	0.18%	1.40%
Panel b: SNAP EA				
SNAP EA last 4 weeks ($100s)	3.654*** (1.007)	0.960** (0.414)	0.017** (0.008)	0.386 (0.322)
N	18948	18948	18948	18432
DV mean	150.156	48.608	1.389	40.372
Avg SNAP EA	4.000	4.000	4.000	4.010
% Δ (/$100)	2.43%	1.97%	1.22%	0.96%
Panel c: EIP				
EIP last 4 weeks ($100s)	0.672*** (0.164)	0.289*** (0.095)	0.003* (0.001)	0.112** (0.056)
N	15432	15432	15432	12174
DV mean	157.035	88.246	1.679	61.674
Avg EIP	43.730	43.730	43.730	44.070
% Δ (/$100)	0.43%	0.33%	0.18%	0.18%
Panel d: Monthly CTC				
CTC last 4 weeks ($100s)	1.987*** (0.484)	0.720*** (0.181)	0.010*** (0.004)	0.397*** (0.129)
N	58745	58745	58745	44161
DV mean	163.254	48.614	1.418	38.800
Avg CTC	5.560	5.560	5.560	5.570
% Δ (/$100)	1.22%	1.48%	0.71%	1.02%

Notes: Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); SNAP EA ($*-1$) (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. All equations include controls for head of household's age, gender, race/ethnicity, educational attainment, marital status, income, the number of children and adults in the household, and the number of children under age 5, as well as state-level controls for unemployment rate, share of monthly SNAP payments disbursed during the reference period, delays in UI payment processing, and pandemic policies. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Spending by type of store

	(1) Grocery stores	(2) Discount stores	(3) Club stores	(4) Convenience stores	(5) Other food stores	(6) Rest-aurants
Panel a: P-EBT						
P-EBT last 4 weeks	1.312***	0.354	-0.222	-0.027	-0.006	0.061
($100s)	(0.319)	(0.429)	(0.211)	(0.025)	(0.017)	(0.151)
N	9956	9956	9956	9956	9956	9956
DV mean	46.188	32.452	9.291	1.789	0.626	9.052
Avg P-EBT	6.381	6.381	6.381	6.381	6.381	6.381
% Δ (/$100)	2.84%	1.09%	-2.39%	-1.51%	-0.96%	0.67%
Panel b: SNAP EA						
SNAP EA last 4 weeks	1.051***	-0.259	0.162*	0.002	0.004	-0.155
($100s)	(0.285)	(0.257)	(0.085)	(0.017)	(0.003)	(0.203)
N	18948	18948	18948	18948	18948	18948
DV mean	28.141	16.261	3.405	0.745	0.056	8.471
Avg SNAP	4.000	4.000	4.000	4.000	4.000	4.000
% Δ (/$100)	3.73%	-1.59%	4.76%	0.27%	7.14%	-1.83%
Panel c: EIP						
EIP last 4 weeks	0.158**	0.103*	0.031	-0.005	0.001	0.029
($100s)	(0.071)	(0.058)	(0.032)	(0.008)	(0.007)	(0.021)
N	15432	15432	15432	15432	15432	15432
DV mean	47.149	29.687	8.032	2.569	0.809	7.350
Avg credit	43.730	43.730	43.730	43.730	43.730	43.730
% Δ (/$100)	0.34%	0.35%	0.39%	-0.19%	0.12%	0.39%
Panel d: Monthly CTC						
CTC last 4 weeks	0.208	0.418***	0.095	-0.003	0.002	-0.035
($100s)	(0.135)	(0.107)	(0.064)	(0.016)	(0.005)	(0.095)
N	58745	58745	58745	58745	58745	58745
DV mean	26.570	17.614	3.550	0.814	0.066	11.108
Avg CTC	5.560	5.560	5.560	5.560	5.560	5.560
% Δ (/$100)	0.78%	2.37%	2.68%	-0.37%	3.03%	-0.32%

Notes: Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Store type as defined in Appendix **??**. Treatment variable is the amount of P-EBT (panel a); SNAP EA ($*-1$) (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. All equations include controls for head of household's age, gender, race/ethnicity, educational attainment, marital status, income, the number of children and adults in the household, and the number of children under age 5, as well as state-level controls for unemployment rate, share of monthly SNAP payments disbursed during the reference period, delays in UI payment processing, and pandemic policies. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Food spending by food type

	(1) Perish-ables	(2) Non-perish-ables	(3) Alcohol + Tobacco	(4) Sweets + Soda	(5) Bulk purchases
Panel a: P-EBT					
P-EBT last 4 weeks ($100s)	0.283* (0.150)	1.128*** (0.303)	0.006 (0.092)	0.072 (0.108)	-0.000 (0.001)
N	9956	9956	9956	9956	7583
DV mean	25.939	64.407	5.404	13.542	0.240
Avg P-EBT	6.381	6.381	6.381	6.381	6.397
% Δ (/$100)	1.09%	1.75%	0.11%	0.53%	0.00%
Panel b: SNAP EA					
SNAP EA last 4 weeks ($100s)	0.295** (0.145)	0.665** (0.280)	0.156 (0.119)	0.082 (0.075)	-0.001 (0.002)
N	18948	18948	18948	18948	18414
DV mean	13.712	34.896	2.961	7.945	0.251
Avg SNAP	4.000	4.000	4.000	4.000	4.010
% Δ (/$100)	2.15%	1.91%	5.27%	1.03%	-0.40%
Panel c: EIP					
EIP last 4 weeks ($100s)	0.092*** (0.030)	0.196*** (0.070)	0.013 (0.012)	0.018 (0.012)	0.000 (0.000)
N	15432	15432	15432	15432	11898
DV mean	25.207	63.038	3.504	9.183	0.228
Avg credit	43.730	43.730	43.730	43.730	44.120
% Δ (/$100)	0.36%	0.31%	0.37%	0.20%	0.00%
Panel d: Monthly CTC					
CTC last 4 weeks ($100s)	0.167*** (0.062)	0.553*** (0.134)	-0.003 (0.027)	0.094*** (0.035)	0.000 (0.001)
N	58745	58745	58745	58745	43558
DV mean	15.033	33.580	2.817	7.592	0.244
Avg CTC	5.560	5.560	5.560	5.560	5.570
% Δ (/$100)	1.11%	1.65%	-0.11%	1.24%	0.00%

Notes: Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); SNAP EA $(* - 1)$ (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. Bulk purchases are products that are in the 80th percentile or higher of the size distribution of products within its product module (defined for product modules with at least 50 UPCs); perishables include bakery, meat, seafood, deli, dairy, produce, and miscellaneous fresh departments (non-perishables are products in frozen or dry grocery good departments). Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Spending at food stores, alternative income cutoffs, households with school-aged children

	(1) <130% FPL	(2) 130-200% FPL	(3) 200-300% FPL	(4) <300% FPL	(5) >300% FPL	(6) >500% FPL
Panel a: P-EBT						
P-EBT last 4 weeks	1.706**	1.231	-1.328***	0.489	0.168	-0.231
($100s)	(0.807)	(0.930)	(0.487)	(0.557)	(0.500)	(0.698)
N	9956	12763	17327	40046	45581	20455
DV mean	166.549	170.176	185.695	174.718	184.521	180.660
Avg P-EBT	6.381	6.000	6.210	6.202	5.521	4.926
Share eligible	1.000	0.860	0.121	0.633	0.081	0.062
Avg P-EBT if eligible	6.381	5.980	5.046	6.108	5.158	4.618
% Δ (/$100)	1.02%	0.72%	-0.72%	0.28%	0.09%	-0.13%
Panel b: SNAP EA						
SNAP EA last 4 weeks	3.654***	1.659*	0.399	0.978***	0.518	1.055
($100s)	(1.007)	(0.929)	(0.689)	(0.335)	(0.386)	(0.661)
N	18948	22678	34184	75810	89277	40564
DV mean	150.156	159.479	167.002	159.591	169.138	168.620
Avg SNAP EA	4.000	7.090	8.010	6.480	7.430	6.830
Share eligible	1.000	0.565	0.002	0.475	0.000	0.000
Avg SNAP EA if eligible	4.000	7.050	9.330	4.980	.	.
% Δ (/$100)	2.43%	1.04%	0.24%	0.61%	0.31%	0.63%
Panel c: EIP						
EIP last 4 weeks	0.672***	0.307**	0.406***	0.431***	0.191**	0.330**
($100s)	(0.164)	(0.141)	(0.144)	(0.088)	(0.089)	(0.136)
N	15432	23336	30752	69104	84720	37792
DV mean	157.035	162.802	178.397	166.739	182.267	179.157
Avg EIP	43.730	43.680	45.150	44.240	42.810	39.480
Share eligible	0.997	0.998	0.988	0.994	0.863	0.821
Avg EIP if eligible	43.730	43.680	45.150	44.240	42.810	39.480
% Δ (/$100)	0.43%	0.19%	0.23%	0.26%	0.10%	0.18%
Panel d: Monthly CTC						
CTC last 4 weeks	1.987***	0.382	0.457	0.961***	-1.213***	-1.805***
($100s)	(0.484)	(0.457)	(0.421)	(0.264)	(0.274)	(0.457)
N	58745	87978	118265	263376	313379	138446
DV mean	163.254	167.819	175.517	169.263	175.018	173.476
Avg CTC	5.560	5.170	5.260	5.330	4.300	3.490
Share eligible	1.000	1.000	0.995	0.998	0.471	0.300
Avg CTC if eligible	5.560	5.170	5.260	5.330	4.300	3.490
% Δ (/$100)	1.22%	0.23%	0.26%	0.57%	-0.69%	-1.04%

Notes: Sample includes families with school-aged children and household income no more than a given threshold of the federal poverty line in the previous year and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); SNAP EA ($*-1$) (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Food spending at food stores, alternative income cutoffs, households with school-aged children

	(1) <130% FPL	(2) 130-200% FPL	(3) 200-300% FPL	(4) <300% FPL	(5) >300% FPL	(6) >500% FPL
Panel a: P-EBT						
P-EBT last 4 weeks	1.411***	0.582	-0.559**	0.486	0.189	-0.195
($100s)	(0.432)	(0.512)	(0.263)	(0.307)	(0.261)	(0.259)
N	9956	12763	17327	40046	45581	20455
DV mean	90.346	94.722	101.537	95.815	103.595	100.464
Avg P-EBT	6.381	6.000	6.210	6.202	5.521	4.926
Share eligible	1.000	0.860	0.121	0.633	0.081	0.062
Avg P-EBT if eligible	6.381	5.980	5.046	6.108	5.158	4.618
% Δ (/$100)	1.56%	0.61%	-0.55%	0.51%	0.18%	-0.19%
Panel b: SNAP EA						
SNAP EA last 4 weeks	0.960**	0.287	0.013	0.217	0.126	0.188
($100s)	(0.414)	(0.273)	(0.253)	(0.136)	(0.128)	(0.177)
N	18948	22678	34184	75810	89277	40564
DV mean	48.608	51.151	52.534	50.916	50.230	49.488
Avg SNAP EA	4.000	7.090	8.010	6.480	7.430	6.830
Share eligible	1.000	0.565	0.002	0.475	0.000	0.000
Avg SNAP EA if eligible	4.000	7.050	9.330	4.980	.	.
% Δ (/$100)	1.97%	0.56%	0.02%	0.43%	0.25%	0.38%
Panel c: EIP						
EIP last 4 weeks	0.289***	0.043	0.104	0.129***	0.065	0.055
($100s)	(0.095)	(0.080)	(0.075)	(0.048)	(0.049)	(0.072)
N	15432	23336	30752	69104	84720	37792
DV mean	88.246	91.656	98.040	92.926	103.428	102.280
Avg EIP	43.730	43.680	45.150	44.240	42.810	39.480
Share eligible	0.997	0.998	0.988	0.994	0.863	0.821
Avg EIP if eligible	43.730	43.680	45.150	44.240	42.810	39.480
% Δ (/$100)	0.33%	0.05%	0.11%	0.14%	0.06%	0.05%
Panel d: Monthly CTC						
CTC last 4 weeks	0.720***	0.084	-0.296**	0.141	-0.622***	-0.822***
($100s)	(0.181)	(0.156)	(0.140)	(0.093)	(0.084)	(0.145)
N	58745	87978	118265	263376	313379	138446
DV mean	48.614	47.641	50.262	48.935	47.478	46.348
Avg CTC	5.560	5.170	5.260	5.330	4.300	3.490
Share eligible	1.000	1.000	0.995	0.998	0.471	0.300
Avg CTC if eligible	5.560	5.170	5.260	5.330	4.300	3.490
% Δ (/$100)	1.48%	0.18%	-0.59%	0.29%	-1.31%	-1.77%

Notes: Sample includes families with school-aged children and household income no more than a given threshold of the federal poverty line in the previous year and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); SNAP EA ($*-1$) (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Spending at food stores, different types of low-income households

	(1) HH w/ school-aged children	(2) HH w/ any children	(3) All HH w/o children	(4) All HH
Panel a: P-EBT				
P-EBT last 4 weeks	1.706**	1.211	-0.268	1.411
($100s)	(0.807)	(0.934)	(0.360)	(0.856)
N	9956	10932	22212	33144
DV mean	166.549	162.490	113.433	133.285
Avg P-EBT	6.381	5.781	6.104	2.261
Share eligible	1.000	0.892	0.000	0.361
Avg P-EBT if eligible	6.381	6.381	.	6.381
% Δ (/$100)	1.02%	0.75%	-0.24%	1.06%
Panel b: SNAP EA				
SNAP EA last 4 weeks	3.654***	3.353***	1.911*	2.910***
($100s)	(1.007)	(0.887)	(0.950)	(0.905)
N	18948	20336	23871	44207
DV mean	150.156	148.524	128.367	140.234
Avg SNAP EA	4.000	3.960	2.720	3.410
Share eligible	1.000	1.000	1.000	1.000
Avg SNAP EA if eligible	4.000	3.960	2.720	3.410
% Δ (/$100)	2.43%	2.26%	1.49%	2.08%
Panel c: EIP				
EIP last 4 weeks	0.672***	0.651***	0.366***	0.536***
($100s)	(0.164)	(0.157)	(0.118)	(0.092)
N	15432	17080	36272	53352
DV mean	157.035	156.257	107.802	126.880
Avg EIP	43.730	43.330	25.020	32.230
Share eligible	1.000	1.000	1.000	1.000
Avg EIP if eligible	43.730	43.330	25.020	32.230
% Δ (/$100)	0.43%	0.42%	0.34%	0.42%
Panel d: Monthly CTC				
CTC last 4 weeks	1.987***	1.998***	-0.079	1.698***
($100s)	(0.484)	(0.470)	(0.279)	(0.339)
N	58745	64728	133362	198090
DV mean	163.254	160.690	104.276	127.379
Avg CTC	5.560	5.470	5.100	2.240
Share eligible	0.937	0.943	0.000	0.386
Avg CTC if eligible	5.940	5.800	.	5.800
% Δ (/$100)	1.22%	1.24%	-0.08%	1.33%

Notes: Sample includes families with school-aged children (column 1); any children (column 2); households without children (column 3); or all households (column 4) with income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); SNAP EA ($*-1$) (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. Child-only benefits (CTC, P-EBT) for households without children calculated based on per-child amount and household size. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Food spending, at food stores different types of low-income households

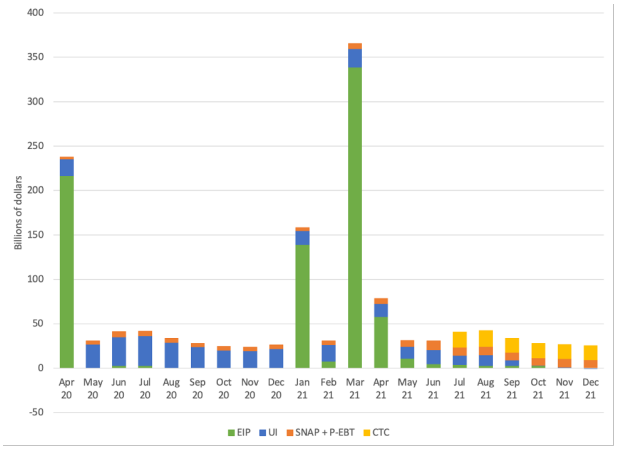
	(1) HH w/ school-aged children	(2) HH w/ any children	(3) All HH w/o children	(4) All HH
Panel a: P-EBT				
P-EBT last 4 weeks	1.411***	1.037*	-0.238	1.209**
($100s)	(0.432)	(0.527)	(0.203)	(0.450)
N	9956	10932	22212	33144
DV mean	90.346	88.494	62.324	72.914
Avg P-EBT	6.381	5.781	6.104	2.261
Share eligible	1.000	0.892	0.000	0.361
Avg P-EBT if eligible	6.381	6.381	.	6.381
% Δ (/$100)	1.56%	1.17%	-0.38%	1.66%
Panel b: SNAP EA				
SNAP EA last 4 weeks	0.960**	0.769**	0.606	0.618*
($100s)	(0.414)	(0.368)	(0.413)	(0.320)
N	18948	20336	23871	44207
DV mean	48.608	48.021	40.626	44.980
Avg SNAP EA	4.000	3.960	2.720	3.410
Share eligible	1.000	1.000	1.000	1.000
Avg SNAP EA if eligible	4.000	3.960	2.720	3.410
% Δ (/$100)	1.97%	1.60%	1.49%	1.37%
Panel c: EIP				
EIP last 4 weeks	0.289***	0.250***	0.107	0.182***
($100s)	(0.095)	(0.090)	(0.065)	(0.052)
N	15432	17080	36272	53352
DV mean	88.246	88.141	60.375	71.308
Avg EIP	43.730	43.330	25.020	32.230
Share eligible	1.000	1.000	1.000	1.000
Avg EIP if eligible	43.730	43.330	25.020	32.230
% Δ (/$100)	0.33%	0.28%	0.18%	0.26%
Panel d: Monthly CTC				
CTC last 4 weeks	0.720***	0.718***	-0.518***	0.275**
($100s)	(0.181)	(0.175)	(0.099)	(0.125)
N	58745	64728	133362	198090
DV mean	48.614	48.114	30.959	37.985
Avg CTC	5.560	5.470	5.100	2.240
Share eligible	0.937	0.943	0.000	0.386
Avg CTC if eligible	5.940	5.800	.	5.800
% Δ (/$100)	1.48%	1.49%	-1.67%	0.72%

Notes: Sample includes families with school-aged children (column 1); any children (column 2); households without children (column 3); or all households (column 4) with income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); SNAP EA ($*-1$) (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. Child-only benefits (CTC, P-EBT) for households without children calculated based on per-child amount and household size. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

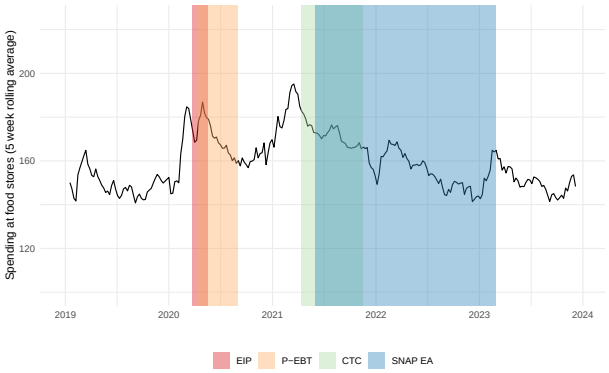
9 Appendix

Appendix Figure A1: Transfer payment timing

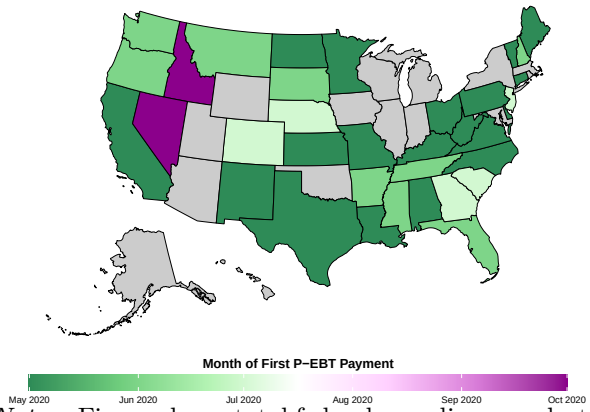
(a) Federal spending, select programs



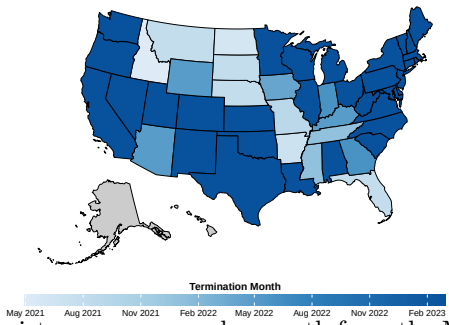
(b) Spending at food stores by program analysis period



(c) Cross-state variation in P-EBT payments



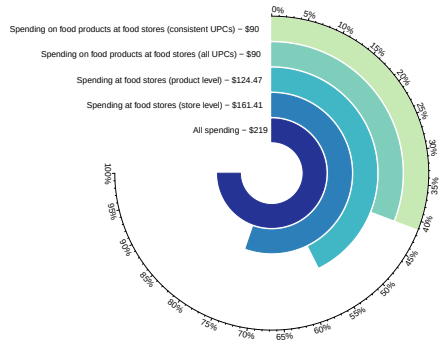
(d) Cross-state variation in SNAP EA payments



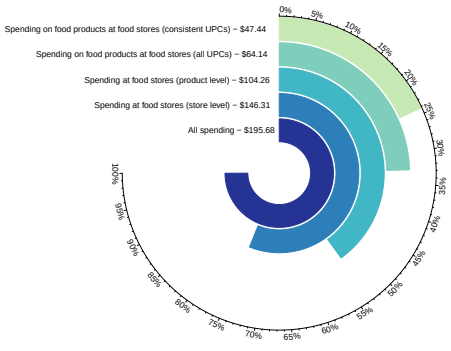
Notes: Figure shows total federal spending on select income assistance programs by month from the Monthly Treasury Statement (panel a); 5-week average of total spending at food stores among low-income families with children during the analysis period of each program (panel b); the month when states first issued P-EBT to SNAP households (panel c); and the month that SNAP EA payments ended (panel d).

Appendix Figure A2: NielsenIQ spending coverage

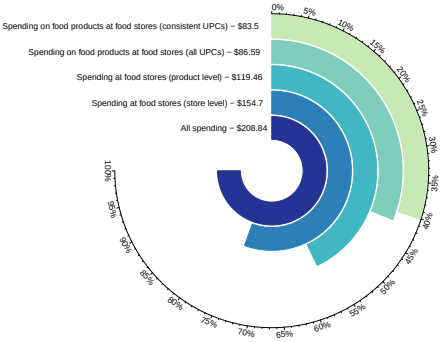
(a) P-EBT



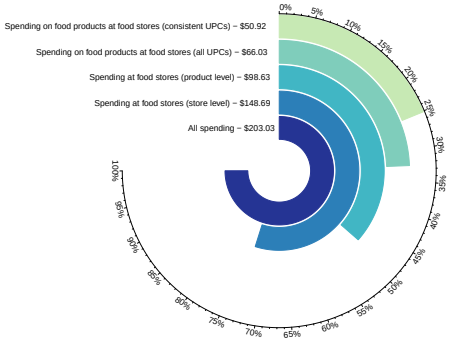
(b) SNAP EA



(c) EIP



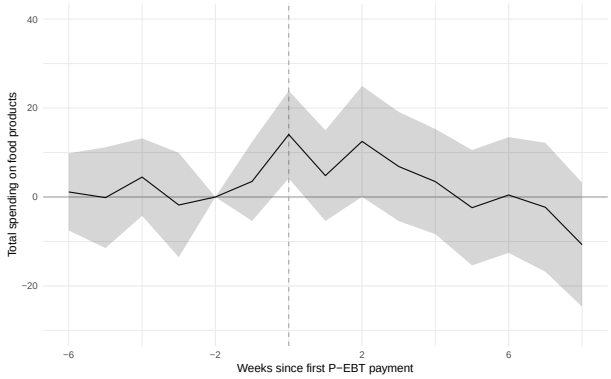
(d) CTC



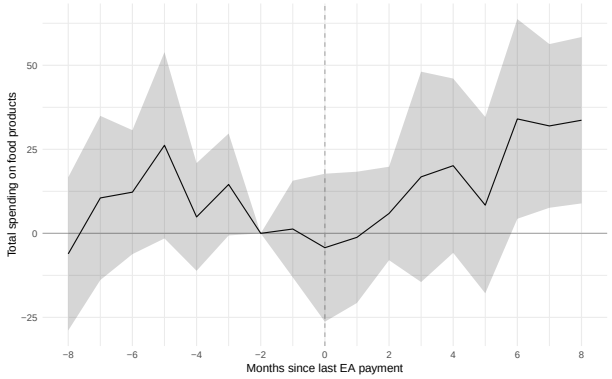
Notes: Figure shows weekly spending on several measures of spending. The innermost circle captures all purchases at all stores recorded by households in our samples. We then limit this to spending at food stores and spending measured at the product level (which does not include taxes or fees). The two outermost circles further limit to spending on food products and food products that appear at least once in the NielsenIQ data each in each year of the analysis period, respectively. This final restriction ensures that our results are not impacted by the types of products that are scanned over time.

Appendix Figure A3: Event study, longer pre-period

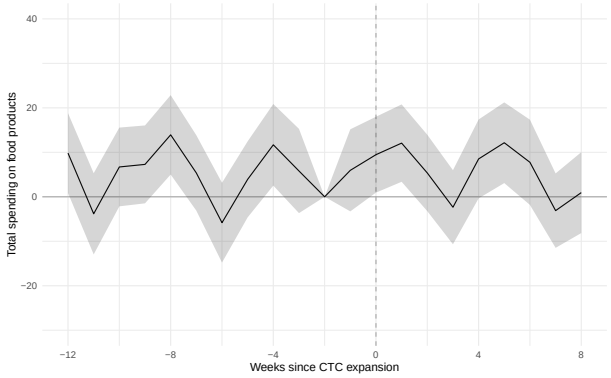
(a) P-EBT



(b) SNAP EA



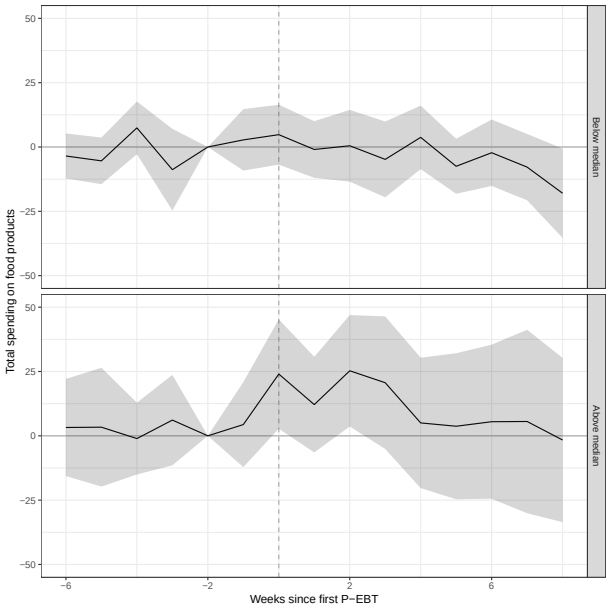
(c) CTC



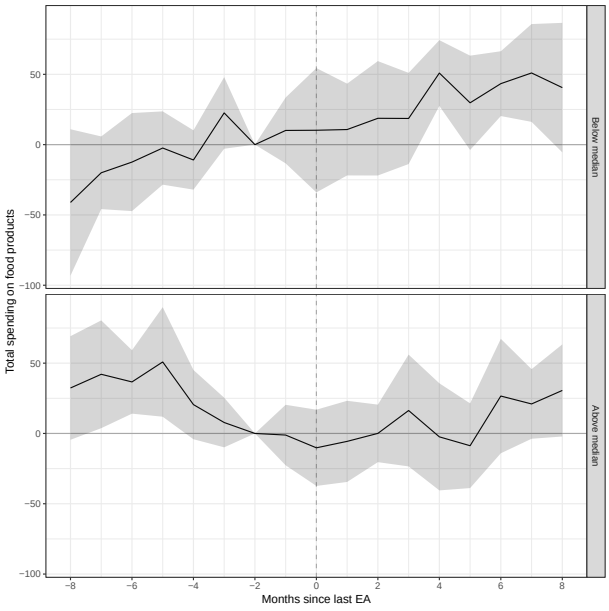
Notes: Figure shows event study of average total weekly food spending at food stores relative to the period before transfer payments were made. P-EBT, EIP, and CTC impacts are measured at the week level; SNAP EA is measured at the month level. Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. All equations include controls for head of household's age, gender, race/ethnicity, educational attainment, marital status, income, the number of children and adults in the household, and the number of children under age 5, as well as state-level controls for unemployment rate, share of monthly SNAP payments disbursed during the reference period, delays in UI payment processing, and pandemic policies. Shaded gray areas denote 95% confidence intervals.

Appendix Figure A4: Event study, longer pre-period by low and high benefit amounts

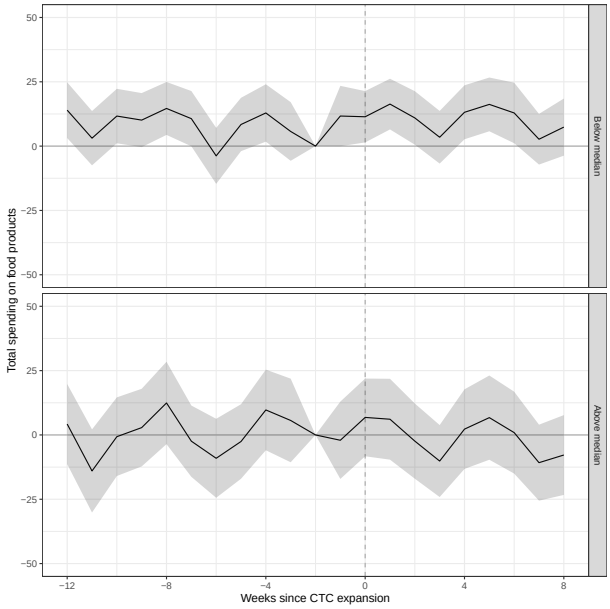
(a) P-EBT



(b) SNAP EA

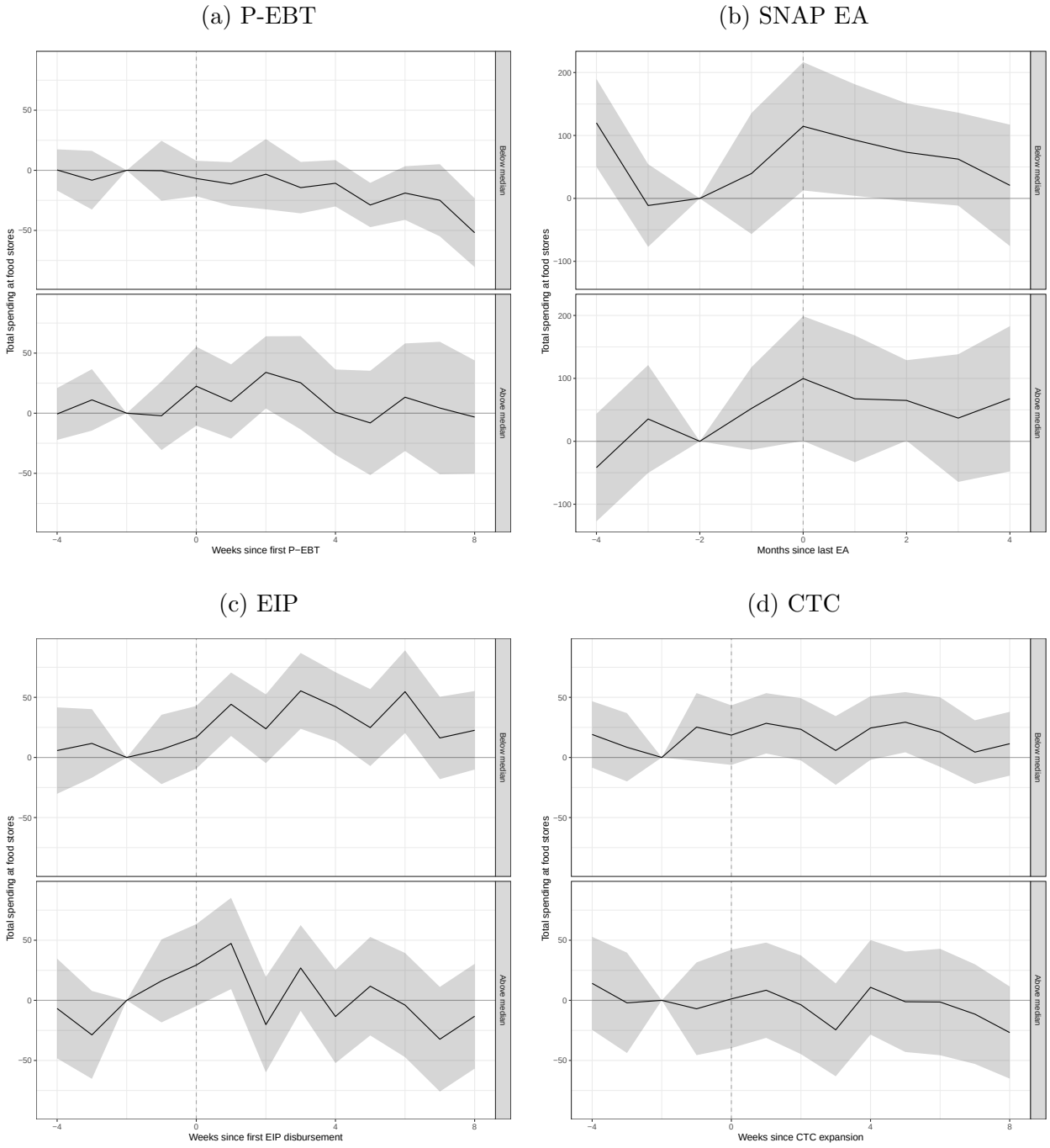


(c) CTC



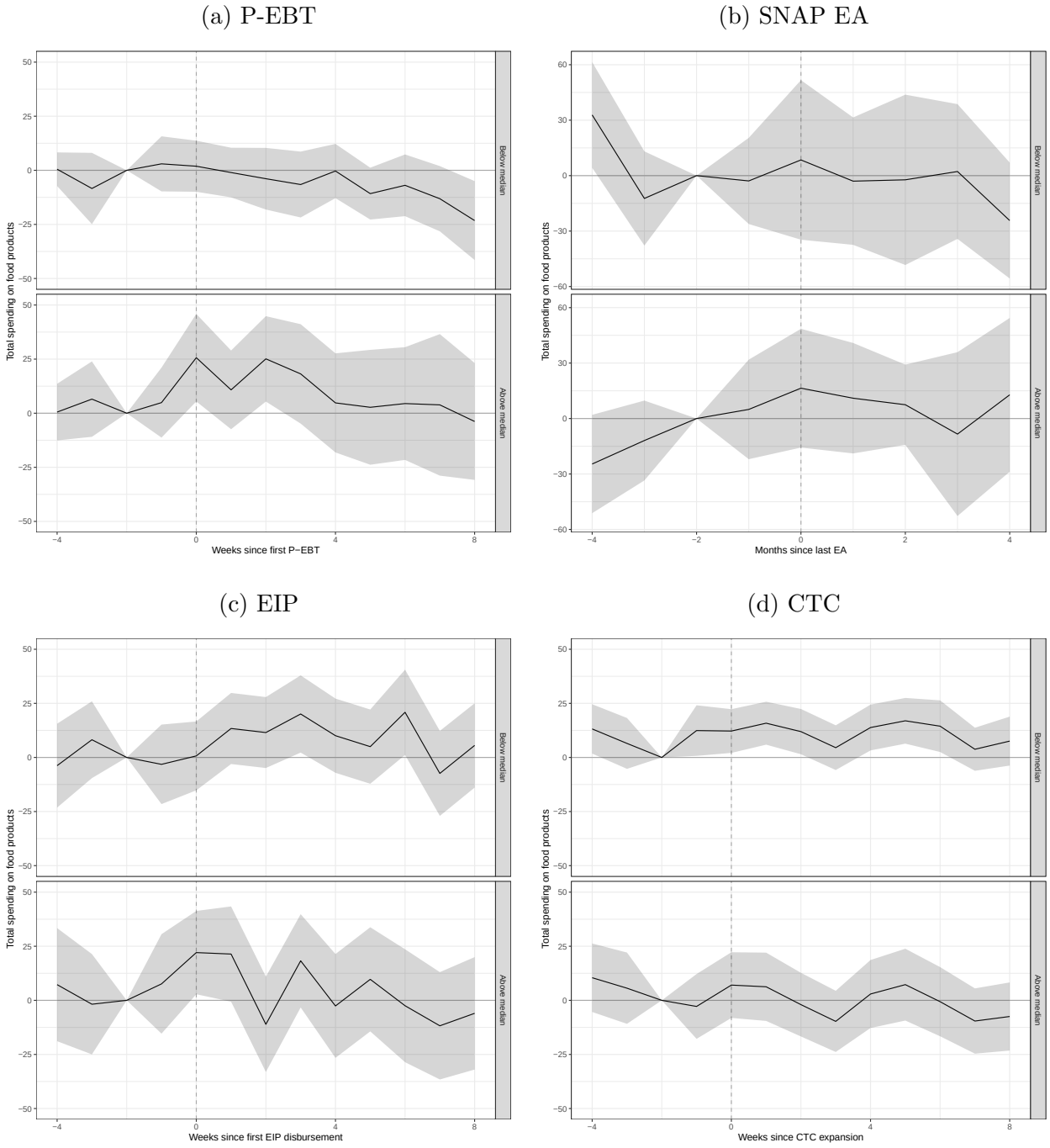
Notes: Figure shows event study of average weekly total food spending at food stores relative to the period before transfer payments were made. P-EBT, EIP, and CTC impacts are measured at the week level; SNAP EA is measured at the month level. Each panel partitions the sample into households receiving less than (top) or more than (bottom) the median transfer value. Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Controls included as in figure 1. Shaded gray areas denote 95% confidence intervals.

Appendix Figure A5: Event study total spending at food stores by low and high benefit amounts



Notes: Figure shows event study of average weekly total spending at food stores relative to the period before transfer payments were made. P-EBT, EIP, and CTC impacts are measured at the week level; SNAP EA is measured at the month level. Each panel partitions the sample into households receiving less than (top) or more than (bottom) the median transfer value. Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Controls included as in figure 1. Shaded gray areas denote 95% confidence intervals.

Appendix Figure A6: Event study food spending at food stores, by low and high benefit amounts



Notes: Figure shows event study of average weekly total food spending at food stores relative to the period before transfer payments were made. P-EBT, EIP, and CTC impacts are measured at the week level; SNAP EA is measured at the month level. Each panel partitions the sample into households receiving less than (top) or more than (bottom) the median transfer value. Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Controls included as in figure 1. Shaded gray areas denote 95% confidence intervals.

Appendix Table A1: Summary statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	P-EBT		EA		EIP				CTC			
					2019		2020		2019		2021	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Outcomes of interest (weekly)												
Total spending at food stores	166.55	177.24	150.16	101.21	144.68	154.74	157.04	169.79	136.97	151.10	163.25	168.90
Total food spending	90.35	100.95	48.61	38.91	79.33	93.10	88.25	100.44	54.21	67.61	48.61	57.47
Number of trips	1.63	1.53	1.39	1.03	1.78	1.66	1.68	1.58	1.61	1.52	1.42	1.34
Spending/trip	64.92	61.63	40.37	31.60	52.20	50.61	61.67	58.47	38.45	38.17	38.80	35.85
Perishable spend	25.94	32.72	13.71	12.68	23.09	30.28	25.21	32.77	16.71	23.76	15.03	19.90
Non-perishable spend	64.41	74.95	34.90	29.32	56.24	69.47	63.04	74.23	37.50	50.16	33.58	42.77
Benefit amount												
Benefit amount	604.08	369.30	373.74	207.60	0.00	0.00	4418.44	1418.13	0.00	0.00	635.03	323.91
Demographics												
Married	0.550	0.498	0.497	0.500	0.526	0.499	0.513	0.500	0.526	0.499	0.499	0.500
< HS	0.055	0.228	0.041	0.197	0.045	0.207	0.047	0.212	0.045	0.207	0.039	0.195
HS diploma	0.329	0.470	0.355	0.479	0.352	0.478	0.340	0.474	0.352	0.478	0.355	0.478
Some college	0.401	0.490	0.382	0.486	0.393	0.488	0.404	0.491	0.393	0.488	0.376	0.484
College degree +	0.216	0.411	0.222	0.415	0.210	0.407	0.209	0.407	0.210	0.407	0.230	0.421
Black	0.166	0.372	0.163	0.369	0.169	0.375	0.154	0.361	0.169	0.375	0.159	0.366
Hispanic	0.211	0.408	0.217	0.412	0.182	0.386	0.218	0.413	0.182	0.386	0.201	0.401
White	0.558	0.497	0.552	0.497	0.595	0.491	0.568	0.495	0.595	0.491	0.571	0.495
Other race	0.065	0.247	0.068	0.251	0.054	0.227	0.060	0.237	0.054	0.227	0.068	0.252
Two heads of household	0.547	0.498	0.470	0.499	0.486	0.500	0.493	0.500	0.486	0.500	0.464	0.499
Female head only	0.416	0.493	0.470	0.499	0.454	0.498	0.458	0.498	0.454	0.498	0.484	0.500
Male head only	0.037	0.189	0.060	0.238	0.060	0.237	0.050	0.217	0.060	0.237	0.052	0.222
Age of HoH	43.8	10.7	45.0	11.1	44.7	11.0	44.1	10.9	44.7	11.0	44.9	11.0
# adults	2.18	0.86	2.26	1.01	2.19	0.97	2.18	0.92	2.19	0.97	2.22	0.93
# children	2.12	1.11	2.07	1.06	2.21	1.15	2.10	1.09	2.21	1.15	2.10	1.04
# children under 5	0.23	0.46	0.20	0.48	0.23	0.47	0.22	0.46	0.23	0.47	0.22	0.51
HH income	27138	19509	26637	18261	21144	9845	27278	19346	21144	9845	24084	9972
Covid policies and other benefits												
Stay-at-home active	0.503	0.500	0.000	0.000	0.000	0.000	0.770	0.421	0.000	0.000	0.000	0.000
Restaurant closure active	0.569	0.495	0.000	0.000	0.000	0.000	0.914	0.281	0.000	0.000	0.005	0.071
Mask mandate active	0.070	0.255	0.152	0.359	0.000	0.000	0.008	0.092	0.000	0.000	0.497	0.500
Any P-EBT disbursement			0.586	0.493	0.000	0.000	0.000	0.000	0.000	0.000	0.742	0.437
SNAP EAs active	1.000	0.000			0.000	0.000	1.000	0.000	0.000	0.000	0.991	0.093
Unemployment rate	0.126	0.048	0.013	0.008	0.011	0.006	0.090	0.052	0.010	0.005	0.023	0.010
UI processed wi/ 1 week	0.343	0.232	0.365	0.191	0.545	0.179	0.461	0.277	0.558	0.180	0.336	0.208
UI processed 1-2 weeks	0.622	0.211	0.583	0.181	0.815	0.114	0.813	0.148	0.829	0.108	0.564	0.167
UI processed > 10 weeks	0.969	0.078	0.838	0.143	0.984	0.018	0.998	0.003	0.988	0.014	0.866	0.088
# HH	873		1479		910		1019		910		985	

Notes: Table shows means and standard deviations of analysis sample for each transfer. Educational attainment, race/ethnicity, and marital status refer to the head of household.

Appendix Table A2: Later EIPs and alternative control groups

	(1) Total spending at food stores	(2) Food spending	(3) Number of trips	(4) Spending/ trip	(5) Grocery stores	(6) Discount stores	(7) Club stores	(8) Conven- ience stores	(9) Other food stores	(10) Rest- aurants	(11) Perish- ables	(12) Non-perish ables	(13) Alcohol + Tobacco	(14) Sweets + Soda	(15) Bulk purchases
Panel a: EIP 3 (2019 control group)															
EIP last 4 weeks	0.038	-0.033	-0.001	-0.028	-0.016	-0.015	0.001	-0.001	-0.003	0.024	-0.015	-0.018	-0.008	-0.002	-0.000
($100s)	(0.094)	(0.031)	(0.001)	(0.021)	(0.024)	(0.019)	(0.011)	(0.003)	(0.002)	(0.018)	(0.011)	(0.023)	(0.006)	(0.007)	(0.000)
N	15160	15160	15160	11763	15160	15160	15160	15160	15160	15160	15160	15160	15160	15160	11645
DV mean	178.648	51.134	1.497	39.346	26.874	19.519	3.763	0.855	0.122	11.374	15.648	35.486	2.890	7.677	0.243
Avg EIP	71.530	71.530	71.530	71.490	71.530	71.530	71.530	71.530	71.530	71.530	71.530	71.530	71.530	71.530	71.510
% Δ (/$100)	0.02%	-0.06%	-0.07%	-0.07%	-0.06%	-0.08%	0.03%	-0.12%	-2.46%	0.21%	-0.10%	-0.05%	-0.28%	-0.03%	0.00%
Panel b: EIP 1 (2022 control group)															
EIP last 4 weeks	0.421***	0.137*	0.000	0.082	0.018	0.100**	0.023	-0.004	0.000	0.071***	0.045*	0.091	0.005	0.016	0.000
($100s)	(0.162)	(0.082)	(0.001)	(0.053)	(0.065)	(0.049)	(0.023)	(0.006)	(0.004)	(0.023)	(0.025)	(0.061)	(0.013)	(0.014)	(0.000)
N	16400	16400	16400	12628	16400	16400	16400	16400	16400	16400	16400	16400	16400	16400	12450
DV mean	157.035	80.449	1.656	56.848	43.710	27.220	6.377	2.358	0.784	7.350	21.955	58.494	3.949	11.203	0.218
Avg EIP	43.730	43.730	43.730	44.100	43.730	43.730	43.730	43.730	43.730	43.730	43.730	43.730	43.730	43.730	44.160
% Δ (/$100)	0.27%	0.17%	0.00%	0.14%	0.04%	0.37%	0.36%	-0.17%	0.00%	0.97%	0.20%	0.16%	0.13%	0.14%	0.00%

Notes: Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of the third (panel a) or the first EIP (panel b) issued to households in the previous four weeks, based on household composition and date. Panel b includes families in 2022, rather than 2019, as the control group. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A3: Food and non-food spending, by store type

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	All products				**Food products**				**Non-food products**			
	All stores, receipt	Food stores, receipt	All stores, product	Food stores, product	All stores, product	Food stores, product	All stores, clean UPCs	Food stores, clean UPCs	All stores, product	Food stores, product	All stores, clean UPCs	Food stores, clean UPCs
Panel a: P-EBT												
P-EBT last	1.608	1.706**	1.877**	1.678***	1.515***	1.411***	1.515***	1.411***	0.362	0.267	0.362	0.267
4 weeks ($100s)	(1.248)	(0.807)	(0.771)	(0.576)	(0.431)	(0.432)	(0.431)	(0.432)	(0.513)	(0.265)	(0.513)	(0.265)
N	9956	9956	9956	9956	9956	9956	9956	9956	9956	9956	9956	9956
DV mean	224.894	166.549	158.471	126.339	106.230	90.346	106.230	90.346	52.241	35.993	52.241	35.993
Avg P-EBT	6.381	6.381	6.381	6.381	6.381	6.381	6.381	6.381	6.381	6.381	6.381	6.381
% Δ (/$100)	0.72%	1.02%	1.18%	1.33%	1.43%	1.56%	1.43%	1.56%	0.69%	0.74%	0.69%	0.74%
Panel b: SNAP EA												
SNAP EA last	2.604**	3.654***	1.727**	2.044***	1.112**	1.084**	0.980**	0.960**	0.615	0.959***	0.692	1.017***
4 weeks ($100s)	(1.251)	(1.007)	(0.780)	(0.698)	(0.538)	(0.527)	(0.413)	(0.414)	(0.446)	(0.289)	(0.424)	(0.249)
N	18948	18948	18948	18948	18948	18948	18948	18948	18948	18948	18948	18948
DV mean	200.761	150.156	127.843	100.964	66.525	61.700	52.439	48.608	61.318	39.264	52.250	31.983
Avg SNAP	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
% Δ (/$100)	1.30%	2.43%	1.35%	2.02%	1.67%	1.76%	1.87%	1.97%	1.00%	2.44%	1.32%	3.18%
Panel c: EIP												
EIP last	0.837***	0.672***	0.598***	0.472***	0.322***	0.305***	0.306***	0.289***	0.277***	0.167***	0.204***	0.121**
4 weeks ($100s)	(0.228)	(0.164)	(0.147)	(0.124)	(0.103)	(0.098)	(0.100)	(0.095)	(0.084)	(0.056)	(0.074)	(0.052)
N	15432	15432	15432	15432	15432	15432	15432	15432	15432	15432	15432	15432
DV mean	205.230	157.035	153.512	123.860	108.123	92.073	103.692	88.246	45.389	31.787	41.904	29.153
Avg credit	43.730	43.730	43.730	43.730	43.730	43.730	43.730	43.730	43.730	43.730	43.730	43.730
% Δ (/$100)	0.41%	0.43%	0.39%	0.38%	0.30%	0.33%	0.30%	0.33%	0.61%	0.53%	0.49%	0.42%
Panel d: Monthly CTC												
CTC last	1.950***	1.987***	1.046***	1.232***	1.216***	0.955***	0.897***	0.720***	-0.170	0.278*	-0.306	0.184
4 weeks ($100s)	(0.674)	(0.484)	(0.369)	(0.300)	(0.235)	(0.223)	(0.189)	(0.181)	(0.229)	(0.143)	(0.211)	(0.125)
N	58745	58745	58745	58745	58745	58745	58745	58745	58745	58745	58745	58745
DV mean	226.929	163.254	124.188	93.424	61.658	57.081	52.362	48.614	62.530	36.343	55.508	31.081
Avg CTC	5.560	5.560	5.560	5.560	5.560	5.560	5.560	5.560	5.560	5.560	5.560	5.560
% Δ (/$100)	0.86%	1.22%	0.84%	1.32%	1.97%	1.67%	1.71%	1.48%	-0.27%	0.76%	-0.55%	0.59%

Notes: Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); SNAP EA ($*-1$) (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

Appendix Table A4: Food spending and shopping patterns, spend no more than 200% income on food

	(1) Total spend at food stores	(2) Total food spending	(3) Number of trips	(4) Spending per trip
Panel a: P-EBT				
P-EBT last 4 weeks ($100s)	1.023	1.341***	0.001	0.831**
	(0.779)	(0.429)	(0.004)	(0.309)
N	10819	10819	10819	8541
DV mean	181.251	95.259	1.716	65.036
Avg P-EBT	6.311	6.311	6.311	6.320
% Δ (/$100)	0.56%	1.41%	0.06%	1.28%
Panel b: SNAP EA				
SNAP EA last 4 weeks ($100s)	2.915**	0.865*	0.012	0.293
	(1.172)	(0.471)	(0.009)	(0.303)
N	21266	21266	21266	20723
DV mean	163.612	52.239	1.467	41.163
Avg SNAP EA	3.700	3.700	3.700	3.700
% Δ (/$100)	1.78%	1.66%	0.82%	0.71%
Panel c: EIP				
EIP last 4 weeks ($100s)	0.762***	0.342***	0.003*	0.124**
	(0.173)	(0.094)	(0.001)	(0.054)
N	16816	16816	16816	13384
DV mean	168.099	91.668	1.732	62.002
Avg credit	43.170	43.170	43.170	43.430
% Δ (/$100)	0.45%	0.37%	0.17%	0.20%
Panel d: Monthly CTC				
CTC last 4 weeks ($100s)	1.713***	0.668***	0.011***	0.356***
	(0.505)	(0.176)	(0.004)	(0.119)
N	65472	65472	65472	49705
DV mean	176.724	51.188	1.482	39.367
Avg CTC	5.440	5.440	5.440	5.460
% Δ (/$100)	0.97%	1.30%	0.74%	0.90%

Notes: Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 200% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); SNAP EA ($*-1$) (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A5: Food spending, different timing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Total spending at food stores	Food spending	Number of trips	Spending/ trip	Grocery stores	Discount stores	Club stores	Conven- ience stores	Other food stores	Rest- aurants	Perish- ables	Non-perish ables	Alcohol + Tobacco	Sweets + Soda	Bulk purchases
Panel a: P-EBT															
P-EBT last	1.564*	1.414***	0.002	0.964**	1.441***	0.310	-0.292	-0.048	0.003	-0.027	0.253	1.161***	-0.018	0.067	-0.000
2 weeks ($100s)	(0.807)	(0.505)	(0.005)	(0.422)	(0.376)	(0.470)	(0.198)	(0.033)	(0.024)	(0.121)	(0.182)	(0.344)	(0.057)	(0.095)	(0.001)
N	8276	8276	8276	6488	8276	8276	8276	8276	8276	8276	8276	8276	8276	8276	6322
DV mean	166.549	90.346	1.628	64.922	46.188	32.452	9.291	1.789	0.626	9.052	25.939	64.407	5.404	13.542	0.240
Avg P-EBT	6.373	6.373	6.373	6.369	6.373	6.373	6.373	6.373	6.373	6.373	6.373	6.373	6.373	6.373	6.387
% Δ (/$100)	0.94%	1.57%	0.12%	1.48%	3.12%	0.96%	-3.14%	-2.68%	0.48%	-0.30%	0.98%	1.80%	-0.33%	0.49%	0.00%
Panel b: SNAP EA															
SNAP EA last 2 weeks ($100s)															
N															
DV mean															
Avg SNAP EA															
% Δ (/$100)															
Panel c: EIP															
EIP last	0.702***	0.329***	0.003	0.091	0.123	0.148**	0.062	-0.002	-0.002	0.033	0.101***	0.228***	-0.008	0.000	0.000
2 weeks ($100s)	(0.213)	(0.115)	(0.002)	(0.069)	(0.085)	(0.071)	(0.041)	(0.010)	(0.007)	(0.027)	(0.038)	(0.084)	(0.019)	(0.026)	(0.000)
N	11574	11574	11574	9105	11574	11574	11574	11574	11574	11574	11574	11574	11574	11574	8894
DV mean	157.035	88.246	1.679	61.674	47.149	29.687	8.032	2.569	0.809	7.350	25.207	63.038	5.336	12.817	0.228
Avg credit	43.920	43.920	43.920	44.220	43.920	43.920	43.920	43.920	43.920	43.920	43.920	43.920	43.920	43.920	44.240
% Δ (/$100)	0.45%	0.37%	0.18%	0.15%	0.26%	0.50%	0.77%	-0.08%	-0.25%	0.45%	0.40%	0.36%	-0.15%	0.00%	0.00%
Panel d: Monthly CTC															
CTC last	1.733**	0.677**	0.010*	0.279	0.290	0.383**	-0.029	0.035	-0.002	-0.106	0.184**	0.492**	-0.020	0.162***	-0.002
2 weeks ($100s)	(0.697)	(0.268)	(0.006)	(0.181)	(0.199)	(0.160)	(0.088)	(0.025)	(0.006)	(0.138)	(0.094)	(0.198)	(0.041)	(0.058)	(0.001)
N	26530	26530	26530	19853	26530	26530	26530	26530	26530	26530	26530	26530	26530	26530	19597
DV mean	162.173	48.485	1.416	38.911	26.673	17.558	3.536	0.675	0.043	11.675	14.899	33.585	2.846	7.641	0.249
Avg CTC	5.580	5.580	5.580	5.590	5.580	5.580	5.580	5.580	5.580	5.580	5.580	5.580	5.580	5.580	5.590
% Δ (/$100)	1.07%	1.40%	0.71%	0.72%	1.09%	2.18%	-0.82%	5.19%	-4.65%	-0.91%	1.23%	1.46%	-0.70%	2.12%	-0.80%

Notes: Sample includes families with school-aged children and household income no more than 130% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Treatment variable is the amount of P-EBT (panel a); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous two weeks, based on household composition, date, and (panel a) state of residence. SNAP EA excluded as SNAP is typically disbursed throughout the month. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A6: Marginal propensity to consume calculations

	(1)	(2)	(3)	(4)	(5)
	Weekly ITT MPC (Table 1)	Monthly ITT MPC	UPC under-reporting adjustment	NielsenIQ under-reporting adjustment	Monthly TOT MPC
P-EBT	0.014	0.061	0.061	0.130	0.167
SNAP EA	0.010	0.042	0.056	0.120	0.153
EIP	0.003	0.013	0.013	0.028	0.030
Monthly CTC	0.007	0.031	0.040	0.086	0.104

Notes: Table shows weekly MPC based on the ITT estimate in Table 1 (column 1), scaled to the monthly level (column 2), adjusted for incomplete take-up (column 3), and the approximate share of food purchases covered in the NielsenIQ data from Appendix Figure A2 (column 4).

Appendix Table A7: Food spending and shopping patterns, higher-income households

	(1) Total spending at food stores	(2) Total food spending	(3) Number of trips	(4) Spending per trip
Panel a: P-EBT				
P-EBT last 4 weeks ($100s)	1.560	1.346	0.008	0.002
	(2.434)	(1.321)	(0.015)	(0.910)
N	3007	3007	3007	2326
DV mean	167.433	90.068	1.496	69.821
Avg P-EBT	4.860	4.860	4.860	4.809
% Δ (/$100)	0.93%	1.49%	0.53%	0.00%
Panel b: SNAP EA				
SNAP EA last 4 weeks ($100s)	0.518	0.126	0.005*	-0.058
	(0.386)	(0.128)	(0.003)	(0.130)
N	89277	89277	89277	87690
DV mean	169.138	50.230	1.449	39.257
Avg SNAP EA	7.430	7.430	7.430	7.430
% Δ (/$100)	0.31%	0.25%	0.35%	-0.15%
Panel c: EIP				
EIP last 4 weeks ($100s)	0.191**	0.065	0.002**	-0.038
	(0.089)	(0.049)	(0.001)	(0.031)
N	84720	84720	84720	68138
DV mean	182.267	103.428	1.625	75.317
Avg credit	42.810	42.810	42.810	42.860
% Δ (/$100)	0.10%	0.06%	0.12%	-0.05%
Panel d: Monthly CTC				
CTC last 4 weeks ($100s)	-1.213***	-0.622***	-0.008***	-0.235***
	(0.274)	(0.084)	(0.002)	(0.064)
N	313379	313379	313379	242968
DV mean	175.018	47.478	1.414	38.499
Avg CTC	4.300	4.300	4.300	4.240
% Δ (/$100)	-0.69%	-1.31%	-0.57%	-0.61%

Notes: Sample includes families with school-aged children and household income more than 300% of the federal poverty line in the previous year (based on the midpoint of binned income) and spend no more than 100% of their income (inclusive of imputed SNAP benefits) on groceries each month. Panel a further limits the sample to households in a county offering free school meals, leveraging state-level timing of P-EBT benefits to non-SNAP households. Treatment variable is the amount of P-EBT (panel a); SNAP EA $(*-1)$ (panel b); monthly CTC (panel c); or the first EIP (panel d) issued to households in the previous four weeks, based on household composition, date, and (panels a and b) state of residence. Controls included as in figure 1. Robust standard errors (clustered by state in panels a and b) in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.