

Marks, Mindy; Prina, Silvia; Tahaj, Redina

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Short-Term Labor Supply Response to the Timing of Transfer Payments: Evidence from the SNAP Program

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JULY 2023

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Mindy Marks

Northeastern University

Silvia Prina

Northeastern University and IZA

Redina Tahaj

Northeastern University

JULY 2023

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Short-Term Labor Supply Response to the Timing of Transfer Payments: Evidence from the SNAP Program

We study the effect of the timing of SNAP payments on weekly labor supply using data from the CPS. We rely on exogenous variation in the fielding of CPS interviews relative to benefit receipt to estimate labor supply of SNAP eligible individuals at the end of their SNAP benefit cycle (i.e. about to receive benefits) compared to individuals at the start of their cycle (i.e. just received benefits). We find that the timing of SNAP benefits impacts labor supply at the intensive margin, while the extensive margin is unaffected. Conditional on being employed, eligible individuals at the end of their SNAP cycle are more likely to be absent from work compared to individuals at the start of their SNAP cycle. They are also less likely to temporarily shift to full time work. Results are more pronounced for individuals with higher predicted benefit amounts. Our findings suggest that a worsening of individuals' status (e.g. health problems, child care issues) at the end of their SNAP cycle adversely impacts short-term work presence.

JEL Classification: J22, I38

Keywords: labor supply, SNAP benefits, consumption cycles

Corresponding author:

Silvia Prina
Department of Economics
Northeastern University
310A Lake Hall
360 Huntington Avenue
Boston, MA 02115
USA
E-mail: s.prina@northeastern.edu

1 Introduction

Transfer payment programs are an important policy tool to support low-income households. The Supplemental Nutrition Assistance Program (SNAP) is the largest federal nutrition assistance program in the United States. In a typical month, SNAP provides assistance to over 40 million low-income individuals by distributing funds that can be used to purchase food. A large literature documents the average effects of SNAP's eligibility and work requirements on labor supply (See [Fraker and Moffitt \(1988\)](#), [Hoynes and Schanzenbach \(2012\)](#), [East \(2018\)](#), [Cook and East \(2023\)](#)) and finds that SNAP causes a reduction in labor supply. Nevertheless, a question that appears to have been overlooked in the literature is whether the timing of SNAP influences beneficiaries' labor market outcomes in the period around transfer receipt.

This paper aims to close this gap by studying whether SNAP eligible individuals alter their labor supply throughout the benefit cycle. Using data from the Current Population Survey (CPS), we leverage exogenous variation in the temporal distance between the SNAP disbursement date in a given state and the start of the CPS reference week, that is the week for which labor market activity questions are answered by the CPS sample in a given month. In all months, except for November and December, the CPS reference week is the period from Sunday to Saturday that contains the 12th of the month. Thus, depending on which day of the week the 12th day falls, the starting and ending points of the reference week vary. Moreover, in some cases in November and December, the reference week is pushed a week earlier than usual. Thus, for those states that distribute SNAP benefits on a fixed day of the month, the CPS reference week will sometimes be at the end of the benefit cycle, while in other time periods it will be the beginning of the benefit cycle.¹

¹For instance, in South Dakota, where benefits are issued to all recipients on the 10th day of the month, in cases when the reference week is the period between the 12th and the 18th day of the month, eligible individuals would have received SNAP benefits prior to the start of the reference week. In some Novembers and Decembers when the reference week is the period between the second and the eighth day of the month, eligible individuals in South Dakota would have last received benefits three weeks prior to the start of the reference week (on the 10th day of the previous month) and be at the end of the benefit cycle during the

The fact that the starting and ending points of the reference week vary across years for the same calendar month coupled with the fact that for a given individual SNAP disbursement occurs on the same date each month, enables us to study whether there exist any transitory effects of SNAP timing on short-term labor supply. Thus, we can uncover the causal effect of SNAP timing on labor supply by comparing the weekly labor supply of SNAP eligible individuals who just received their benefits (i.e. are at the start of their SNAP cycle) to that of SNAP eligible individuals about to receive their benefits (i.e. at the end of their SNAP cycle).

According to the permanent income hypothesis, known temporary changes in income should not alter consumption nor labor supply behavior. However, it is well documented that SNAP recipients' food consumption changes across the SNAP benefit cycle ([Gregory and Todd 2021](#)). Beneficiaries redeem all or nearly all of their monthly benefits in the first two weeks after receiving their transfer ([Cole and Lee \(2005\)](#), [Castner et al. \(2011\)](#)) and are often left with insufficient nutrition before receiving their next benefits ([Wilde and Ranney \(2000\)](#), [Shapiro \(2005\)](#)). Several studies find evidence of a reduction in consumption, calorie intake, and diet quality at the end of the SNAP cycle ([Wilde and Ranney \(2000\)](#), [Shapiro \(2005\)](#), [Hastings and Washington \(2010\)](#), [Todd \(2015\)](#), [Hamrick and Andrews \(2016\)](#), [Whiteman et al. \(2018\)](#), [Kuhn \(2018\)](#)). Overall, the evidence suggests that SNAP households are unable to smooth consumption.

Likewise, it is possible that the timing of benefits could also affect labor supply. The direction of the effect for recipients about to receive their SNAP benefits as well as for recipients who just received them is ambiguous. At the end of the SNAP cycle, beneficiaries could work more in order to smooth consumption, or due to the physical and mental health impacts of reduced food consumption they may reduce their labor supply. Shortly after receiving the transfer, beneficiaries could increase their leisure consumption, as the transfer is a positive income shock ([Yang \(2018\)](#), [Powell \(2020\)](#)), or could work more

reference week.

as they are now more physically and mentally able. Another channel through which SNAP payment timing may impact beneficiaries' labor supply is through its effect on their financial liquidity. If recipients are liquidity constrained, they may face a trade-off between food expenditures and other expenses that affect their ability to work including medical, child care, or transportation costs.² If this were to be the case, we should observe a reduction in beneficiaries' labor supply at the end of the SNAP cycle.

Our study shows that, at the extensive margin, labor supply is unaffected by the timing of SNAP benefits. Nevertheless, conditional on being employed, eligible individuals at the end of their SNAP cycle are more likely to report to be absent from work during the reference week compared to individuals at the start of their SNAP cycle. Additionally, part time workers are less likely to temporarily work full time at the end of the SNAP cycle. These transitory effects of the timing of SNAP disbursement on labor supply are larger for individuals with greater predicted benefit amounts. Our findings are consistent with the hypothesis that SNAP timing affects beneficiaries' short-term labor supply for reasons that have been previously shown to be sensitive to the timing of SNAP, such as recipients' health outcomes.

Our results on labor supply complement existing work on SNAP and health. The longer the time span since the last transfer, the more beneficiaries' food consumption and health deteriorate. Leveraging variation in SNAP timing, previous studies have documented an increase in ER usage ([Cotti et al. \(2020\)](#)) and a negative effect on physical health and sleep quality ([Farbmacher et al. \(2022\)](#)) at the end of the SNAP cycle. Relatedly, [Arteaga et al. \(2018\)](#) shows a decrease in pregnancy-related emergency room claims at the beginning of the SNAP cycle. Additional evidence highlight mental health-related problems by beneficiaries at the end of the SNAP cycle ([Gregory and Todd 2021](#); [Gassman-Pines and Schenck-Fontaine 2019](#)). Poor health decreases individual's labor supply and psychological

²Studies have also shown a notable increase in grocery shopping on SNAP receipt days, which might alter household schedules and lead them to delay other household-related activities, including paid work ([Hastings and Washington 2010](#); [Castellari et al. 2017](#)).

distress and physical health problems predict work absence ([Hardy et al. \(2003\)](#), [Peng et al. \(2016\)](#), [Bryan et al. \(2021\)](#)). Individuals may also make adjustments to their labor supply in response to partner's and children's health ([Charles \(1999\)](#), [Gould \(2004\)](#)).

Our research also contributes to two strands of literature: the literature on the short-term, transitory labor supply effects to the timing of transfer payments and the aforementioned literature on the effects of SNAP timing.³ To the best of our knowledge, [Lee et al. \(2022\)](#) is the only study analyzing the impact of the timing of SNAP benefits on labor supply, by comparing SNAP participants' and non-participants. However, SNAP participation is endogenous to the working decision and may correlate with other factors that determine individuals' working behavior within the month. Our study solves the endogeneity issue by exploiting variation among SNAP eligible individuals only.

In the context of a low-income country, [Fernández and Saldarriaga \(2014\)](#) focuses on beneficiaries' immediate labor supply response to the timing of a conditional cash transfer program in Peru and find that recipients reduce labor supply the week following the transfer date. On the other side, [Angelucci et al. \(2021\)](#) finds that household labor supply before/after receipt of a cash transfer in Mexico is unaffected.⁴

2 The Supplemental Nutrition Assistance Program

SNAP is the largest federal nutrition assistance program in the US, providing access to food to more than 40 million low-income Americans each month in 2021 ([Center on Budget](#)

³[Gennetian et al. \(2016\)](#), [Cotti et al. \(2018\)](#), and [Gassman-Pines and Bellows \(2018\)](#) find an increase in student disciplinary infractions and decreased test scores at the end of the SNAP cycle. [Bond et al. \(2022\)](#) also find decreased test scores at the end of the SNAP benefit cycle. [Carr and Packham \(2019\)](#) show a raise in theft occurrences in the third and fourth week since benefit distribution. While [Carr and Packham \(2021\)](#) find that SNAP cyclicity affects domestic violence.

⁴A few papers study the intra-year labor market outcomes of certain annual transfer payment programs. Among these, [Yang \(2018\)](#) investigates the intra-year labor supply behavior of EITC recipients and finds that receiving a \$1000 EITC payment leads to a reduction in married women who work during the month that the payment is received by 1.6 percentage points. [Bibler et al. \(2019\)](#) study intra-year labor market responses in the context of the Alaska Permanent Fund and find evidence of an immediate positive labor demand and negative labor supply response. Finally, [Powell \(2020\)](#) studies the short-term labor supply response to the 2008 economic stimulus payments and finds a reduction in labor supply at the intensive margin during the month of the rebate receipt and the month after the receipt.

and Policy Priorities 2019). SNAP reciprocity has been shown to lower poverty (Tiehen et al. 2012) and improve food insecurity (Ratcliffe et al. 2011). SNAP eligibility is determined at the federal level and is mostly a function of household size and income. Monthly SNAP benefits can only be used to purchase food and research has shown that there is not perfect fungibility (Smith et al. (2016), Hastings and Shapiro (2018)). Nevertheless, the benefits account for an important part of the household budget (Hoynes and Schanzenbach 2015). For example, for a family of three, with one worker earning \$10 per hour and working 40 hours per week, SNAP benefits increase income by 22% (Center on Budget and Policy Priorities 2017). While SNAP benefits amounts are determined at the federal level, states are given discretion over how and when to distribute benefits to their residents. Column 1 of Table 1 shows the current SNAP distribution schedule by state.⁵ Seven states distribute benefits to all recipients on a single day each month. Among these, five states (Alaska, Nevada, North Dakota, Rhode Island, and Vermont) distribute all benefits on the 1st day of the month, New Hampshire distributes all benefits on the 5th day of the month, and South Dakota distributes all benefits on the 10th day of the month. The remaining states stagger their benefits distribution over numerous days, but within a state each recipient receives benefits on the same day each month. In some states the disbursement window is narrow (e.g. Maine distributes benefits between the 10th and 14th day of the month by social security number), while other states have wide disbursement windows (e.g. Missouri distributes benefits between the 1st and the 22nd day of the month. The exact dates depends on birth month and the first letter of the recipients last name).

3 Data and sample

We use pooled cross-sectional data from the basic monthly Current Population Survey (CPS) starting with fiscal year 2005 (October 2004) until December 2018. We restrict the

⁵While there have been changes in the SNAP distribution schedules in some states, none of the states used in this study underwent any distribution schedule changes during the time period of study.

data to this time window for two reasons. First, we exclude data past 2018 because SNAP disbursement schedules were altered in the first four months of 2019 due to the government shutdown (Marks et al. 2022). Second, it is only from fiscal year 2005 onward that the USDA started providing the income thresholds for SNAP eligibility.

Identifying the effects of the timing of SNAP on labor supply requires information on SNAP reciprocity, as well as variation in the gap between SNAP disbursement and the CPS reference week. A limitation of the CPS is that it does not collect information about SNAP reciprocity or benefit amounts. However, it does contain enough information to construct a measure of SNAP eligibility since SNAP eligibility is mostly a function of household size and income. CPS respondents provide information on annual income of all persons related to the head of household.⁶ The CPS data also provide information on the number of people in the household. Hence, similarly to Castellari et al. (2017) and Marks et al. (2022), we impute eligibility using the USDA gross income thresholds for each family size, adjusted for the cost of living, and published every fiscal year.⁷ As annual family income is reported in bins in the CPS, our SNAP eligibility measure is conservative. For instance, in 2016, the income threshold for a five member family was \$36,936. We classify a CPS respondent in a five member family as eligible only if their reported income was below \$35,000 in 2016. The next income bin is \$35,000 - \$40,000. This implies that individuals with an income above \$35,000 and below \$36,936, who were in fact eligible for SNAP, will not be identified as such.

⁶23.14% of the households included in the sample have an individual or more living in the household who is/are not a member of the household head's family. As the actual annual income of such individuals is unknown, eligibility can not be imputed for them. Hence, we restrict the sample to individuals that are part of the householder's family. When including these individuals (who make up for 8.57% of individuals in the sample), results (available upon request) are mostly unchanged.

⁷Families are generally eligible for SNAP if their gross income is below 130% of the federal poverty level (See <https://www.cbpp.org/sites/default/files/11-18-08fa.pdf>). Some households that we categorize as eligible will be ineligible for benefits due to other details of the SNAP eligibility formula. In addition to being below the gross income limits, household's net income must fall below a threshold. Households are allowed to deduct some expenses from their income to determine net income. There is also an asset threshold that deny benefits to some otherwise eligible individuals. These extra rules will lead us to falsely classify some (small number of) households as eligible who are actually ineligible and will attenuate our findings.

Our analysis considers the sample of US citizens 15-64 years of age because SNAP eligibility rules for immigrants and non-citizens changed over time and eligibility rules are more complex⁸ and to avoid issues regarding the timing of social security benefits and retirement. Moreover, we limit the sample for the main analysis to SNAP eligible respondents that reside in one of the seven states that distribute SNAP benefits to all recipients on a single day each month.⁹ The CPS does not provide information on the date of SNAP issuance and, given the wide disbursement window in the remaining states, we are unable to assign how far from the reference week SNAP allotments were distributed.¹⁰ In a robustness check we extend the sample to include states with narrow disbursement windows and our results hold (see Section 5.1). Table 1 reports the average labor force participation rates, the likelihood of reporting for work during the reference week, if the respondents who normally works part time worked full time, and the hours worked across all jobs for SNAP eligible individuals by state. While the states in our sample have a lower labor force participation rate for SNAP eligible individuals, they are similar to the national averages for the number of hours worked, being present at work during the reference week, and the odds of temporary full time work.

Table 2 reports the summary statistics. Column 1 shows our main sample: SNAP eligible individuals who reside in states that distribute SNAP on a single day every month. Column 2 (extended sample) adds to the main sample in column 1, SNAP eligible individuals who reside in states with narrow disbursement windows (up to five days). Column 3 considers low-income individuals in those states which distribute SNAP on a single day every month whose income exceeds the SNAP income threshold given their family size. As shown in panel A, the main sample and extended sample are very similar in terms of labor market statistics: 53% of the SNAP eligible individuals in both sample report being in the labor

⁸Results, available upon request, are robust to the inclusion of data for non-citizens.

⁹The states are: Alaska, Nevada, New Hampshire, North Dakota, Rhode Island, South Dakota, and Vermont.

¹⁰In states with wide distribution windows, the SNAP disbursement date for a given individual is a function of several individual characteristics (e.g. social security number, last name, and SNAP case ID) which vary by state.

force during the reference period and about 44% reports being employed. Low-income SNAP ineligible individuals (column 3) have higher labor force participation, employment rates, and hours worked, but appear similar to SNAP eligible individuals in terms of the rate of being at work and the rate of temporarily working full time during the reference period. Panel B shows that individuals eligible for SNAP have low education levels on average. As expected, ineligible individuals are more educated, live in smaller families, and are less likely to have a child at home.

4 Empirical strategy

Our identification strategy exploits variation arising from the irregular structure of the calendar year to study the sensitivity of weekly labor market activity at different times during the SNAP benefit cycle.¹¹ In the CPS, each month a random sample of the US population is asked questions about labor market activities for the week prior to the interview week, which is called the reference week. While SNAP disbursement occurs on the same day every month, the start and end dates of the CPS reference week vary due to its design.¹² In particular, according to the Bureau of Labor Statistics “The reference week usually is the 7-day calendar week (Sunday–Saturday) that includes the 12th of the month, with occasional exceptions.” The exceptions occur in November and December where the reference week is sometimes moved one week earlier so that interviews do not occur during major holiday periods. For December, if the calendar week including the 5th is contained entirely within the month of December, the December reference week will be one week earlier than normal. For November, the reference week will be moved one week earlier if Thanksgiving falls during the week that contains the 19th.¹³

¹¹Other papers have used a similar empirical strategy to explore the impact of the timing of social security payments on payday loans use and prescription fills (Leary and Wang 2016; Gross et al. 2022).

¹²The rules governing the timing of the CPS reference week were established with the start of the CPS. See <https://www.bls.gov/cps/definitions.htm>

¹³The November reference week is also moved one week earlier if the Census Bureau determines that there is not enough data processing time before the survey interview week for December.

Figure 1 illustrates the timing of the CPS reference week for each month for the calendar years of 2014 and 2017. The bordered blocks indicate all the different CPS reference weeks that occurred each month during these years. As Figure 1 shows, the reference weeks for January through October vary between the 6th to the 12th day of the month (April 2014 and Aug 2017) and 12th-18th of the month (Oct and Jan 2014 ; March 2017). 2017 is a year in which the November and December reference weeks occurred early due to timing of the holidays. The November reference week goes from the 5th to the 11th while the December reference week goes from the 3rd to the 9th. Our empirical strategy relies upon this variation, which makes it possible to observe weekly labor market activity at different times during the SNAP benefit cycle.

Overlaid on Figure 1 are colored numbers referring to the SNAP disbursement dates for the states in the sample. SNAP disbursement dates are colored differently based on their timing relative to the reference week. Dates in yellow correspond to benefits received 14-21 days prior to the end of the reference week. Dates in green correspond to benefits received seven to fourteen days prior the end of the reference week. Dates in blue indicate that benefits were received in the first four days of the reference week, while dates purple indicates transfer payments arrived during the last three days of the reference week. Finally, dates in red corresponds to SNAP benefits received in the week following the reference week.

Consider a state that distributes SNAP benefits on the 10th day of the month. Within a year we observe movement in the timing of SNAP disbursement relative to the reference week. For instance, in December 2017 the reference week precedes the SNAP disbursement date, while the reference week is after the disbursement date in February, March and June of that year. Additionally, for a given calendar month, we also use variation in the timing of benefit relative to the reference week across years. For instance, the SNAP disbursement in December 2014 occurs early in the reference week, while in December 2017 the reference week precedes the SNAP disbursement date. As the CPS monthly survey collects labor

market data for the reference week, the labor supply response to the timing of SNAP benefit can be identified by comparing labor supply across months. Identification stems from the fact that the time gap between SNAP disbursement and the start of the CPS reference week varies only due to the design of the CPS sample framework.

To explore whether SNAP eligible individuals alter their labor supply in response to the timing of benefit receipt, we estimate the following equation:

$$\begin{aligned}
 Y_{ismy} = & \alpha + \beta_1(14 - 21days)Before_{sm y} + \beta_2(1 - 4days)Into_{sm y} + \beta_3(5 - 7days)Into_{sm y} \\
 & + \beta_4(1 - 7days)After_{sm y} + X_{ismy} + \xi_s + \gamma_m + \zeta_y + \eta_{sm} + \lambda_{sy} + \epsilon_{ismy}
 \end{aligned}
 \tag{1}$$

where Y_{ismy} measures the labor supply for individual i , residing in state s , during the reference week of month m , in year y . We consider five measures of labor supply: two at the extensive margin and three at the intensive margin. At the extensive margin we construct binary indicators for labor force participation and employment. At the intensive margin we consider total hours of work across all jobs. We also use survey questions about work status to construct two binary variables that enable us to detect short-time changes in labor supply. The first dummy variable takes value one if the individual regularly working part time at their main job reports working full time in the reference week. The second dummy takes value 0 if the individual is regularly employed at their main job, but is absent from work at this job during the reference week.

As the CPS sample is asked about their labor supply during the seven days of the reference week, we construct four indicator variables measuring the timing of SNAP disbursement relative to the reference week in a given state, month, and year. In particular, $14 - 21daysBefore_{sm y}$ denotes benefits arrival 14-21 days before the end of the reference week, i.e. 7-14 days prior to the start of the reference week. $1 - 4daysInto_{my}$ and $5 - 7daysInto_{my}$ denote benefits distribution during the first four days and last three days of the reference week, respectively. We consider separately when benefits are distributed

during the first half (i.e. $1 - 4daysInto_{my}$) or the second half (i.e. $5 - 7daysInto_{my}$) of the reference week because, due to the nature of SNAP, receiving benefits earlier or later in the reference week might have a different effect on labor supply during that week. That is because individuals who receive benefits during the latter half of the reference week may have tight budgets for a greater number of days during this week compared to individuals who receive benefits early into the reference week.¹⁴ $1 - 7daysAfter_{my}$ is an indicator for benefit distribution in the week following the reference week. And, the omitted category is receiving benefits within a week prior to the start reference week, i.e. 7-14 days before the end of the reference week. We use this as the omitted category because during this week individuals are at the beginning of their SNAP cycle and should be the least budget constrained.

X_{ismy} includes the following covariates: age, age squared, female dummy, marital status indicators, race indicators, education level indicators, indicators for having children and having children under age 5, an indicator for Hispanic origin, family income and family size dummies, as well as the state-level monthly unemployment rate. ξ_s are state fixed effects which account for any time-invariant differences in labor supply between the different states in the sample. γ_m are calendar month fixed effects which account for fixed differences in labor supply across different months, ζ_y are year fixed effects controlling for any differences in labor supply between different years. Finally, in some specifications, we also include state-by-month fixed effects, η_{sm} , to control for seasonal effects by state, and state-by-year fixed effects (λ_{sy}) to control for year by year changes at the state level.¹⁵ Our identifying assumption is that this variation in the timing of disbursement benefits relative to the reference week is uncorrelated with other determinate of labor supply.

¹⁴The results are robust to defining the first half of the reference week as the first three days and the second half as the last four days.

¹⁵Due the CPS design much of our variation occurs in the months of November and December. Hence, it might be the case that the differences we see in labor supply are not due to the timing of the SNAP benefits distribution, but are due to differences in labor supply/demand in winter month in states that have late distributions compared to states with early distribution schedules. For example, individuals in South Dakota often receive their benefits after the reference week in winter months and in this state there might be lower labor supply/demand due to the weather.

The β coefficients measure the effect SNAP timing on labor supply. Each coefficient should be interpreted as the effect of a given distance between the SNAP disbursement and the CPS reference week relative to having received benefits the week prior to the reference week. If the timing of SNAP disbursements impacts labor supply indirectly through an effect on nutrition, health, or liquidity, then we should see a negative sign on β_3 and β_4 . Previous studies established that SNAP beneficiaries consume more calories, eat more nutritious food, and are less likely to experience an ER visit shortly after receiving benefits compared to the period at the end of the cycle. Thus, individuals may be more able work shortly after benefits distribution relative to the end of the benefit cycle, implying a negative sign for β_3 and β_4 . Moreover, the negative effect on labor supply may be greater for individuals who received their SNAP benefits after the reference week compared to individuals who received them late in the reference week. That is because the benefits' arrival for the latter group may enable them to increase labor supply compared to individuals who are at the end of the SNAP cycle. If this is the case, then we should observe $\beta_4 < \beta_3 < 0$. Conversely, if individuals were to feel more resourceful and able to afford more leisure shortly after receiving their SNAP benefits, then we should observe a positive sign on β_3 and β_4 . These effect should be more pronounced at the end of the benefit cycle implying $0 < \beta_3 < \beta_4$.

5 Results

Table 3 reports the effects SNAP benefits disbursement on short-term labor supply at the extensive margin, while the odd columns exclude state-month fixed effects and state-year fixed effect. The even columns include these fixed effects. There are no statistically significant effect on the probability of being in the labor force or the probability of being employed. This lack of effect of SNAP timing on labor supply is consistent with extensive margin adjustments being costly. Although SNAP benefits are an important part of monthly family income, the amounts are likely not sufficient to move individuals in and out of

employment or the labor force.

Next, Table 4 shows the impact of SNAP timing on labor supply at the intensive margin. Columns 1 and 2 show the likelihood of being at work during the reference week with and without state-month fixed effects and state-year fixed effect. Reassuringly, the results are robust to a rich set of fixed effects. In the full specification (Column 2), conditional on being employed, receiving SNAP benefits during the last three days of the reference week reduces the probability of being at work during that week by 1.2% relative to receiving benefits shortly before the start of the reference week. In line with our predictions the magnitude of the effect is large for those who receive benefits shortly after the reference week has passed as opposed to at the end of the reference week. Receiving benefits in the week after the reference week reduces the probability of being present at work during the reference week by 3.2%. As only around 80% of all SNAP eligible individuals participate in the program (Cunyngham 2021), our results should be considered as intent-to-treat effects.¹⁶ The effects on SNAP recipients would therefore be greater. These findings imply that labor supply is lower at the end of the benefit cycle compared to its start.

Columns 3 and 4 show the impact of SNAP timing on substituting between full and part time work. Consistent with labor supply being lower at the end of the SNAP benefit cycle, we see that individuals who receive SNAP in seven day period following the reference week are less likely to shift to full time work, when regularly working part time. Our results support the hypothesis that being at the end of the SNAP cycle adversely impacts labor supply indirectly through its transitory effects on other outcomes, such as physical and mental health and stress as documented by a large literature.¹⁷ Columns 5 and 6 show

¹⁶Studies have documented that eligible households fail to enroll in SNAP and otherwise eligible recipient households are removed from the program for failure to re-verify eligibility (Gray 2019; Finkelstein and Notowidigdo 2019)

¹⁷Prior research on SNAP recipients' behavior documents additional alcohol consumption associated with distribution of SNAP benefits during weekend days (Castellari et al. (2017), Cotti et al. (2018)). To test the sensitivity of the results to possible altered behavior due to benefit receipt on a weekend, we create an indicator variable equal to one if SNAP distribution occurs on the weekend in month m of year y . Results in Appendix Table A.1 are robust to the inclusion of this indicator for weekend issuance and there are no effects of this variable on the outcomes of interest.

the impact on hours worked. While, the sign is negative at the end of the cycle, there are no statistically significant effects on the number of hours worked. Overall our findings highlight that the timing of SNAP benefits disbursement impacts individuals' labor supply on the intensive margin.

5.1 Robustness checks

The changes in labor supply we observe might not be due to the SNAP cycle, but to unobserved shocks in the labor market that coincide with the state-months when disbursement occurs towards the end of the SNAP cycle. To investigate this, we estimate equation 1 for the sample of SNAP ineligible individuals, i.e. those living in households with annual income above the SNAP eligible threshold for their household size, but below \$40,000. SNAP ineligible individuals are similar to eligible individuals but their labor supply should be unaffected by the timing of SNAP distributions. If our results were to be driven by unobserved factors, we should also observe effects for this group of individuals. If instead the effects are due to the timing of the SNAP cycle, then the distance between SNAP disbursement and the reference week should not affect the labor market outcomes for ineligible individuals. Table 5, column 1, shows no statistically significant effects of the end of the SNAP cycle on our measures of labor supply: the likelihood of being at work, the odds of temporarily working full time, or total hours of work during the reference week for ineligible individuals.¹⁸

Next, the effect of SNAP timing on labor market behavior should be more pronounced for individuals who are eligible for higher benefit amounts. Monthly SNAP benefits are calculated according to a formula under the assumption that families will spend 30% of their net income on food purchases and the rest would be covered by SNAP. Using this formula, the published maximum SNAP benefit for each fiscal year, information on family size, and reported family income as a proxy for net income,¹⁹ we predict SNAP benefit

¹⁸The results hold when using data for ineligible individuals with family income below \$50,000 or \$60,000.

¹⁹To avoid negative predicted benefit amounts, we assume that net income is 70% of CPS's reported family

amounts. Then, we estimate equation 1 separately for eligible respondents with predicted benefit amounts above and below the median predicted allotment. As expected, columns 2 and 3 of Table 5 show that effects on SNAP timing on labor supply are concentrated among individuals with predicted benefits above the median. For these individuals, receiving SNAP benefits in the week following the reference week causes a decrease in the probability of being at work during the reference week by 5.6%. Similarly, there is a 2.6% reduction in the probability of switching from part to full time work for individuals with predicted benefits above the median who receive their benefits shortly after the reference week. We also observe a 1.4% reduction in being at work when individuals receive their benefits 5-7 days into the reference week. When considering hours worked, we do not observe any statistically significant effect, although the sign on hours worked is negative for when benefits are received after the reference week. Conversely, regardless of the measure of labor supply there is no relationship between the timing of SNAP benefits and labor supply for SNAP eligible individuals with predicted benefit amounts below the median.

Next, we exploit the monthly panel design of the CPS. In particular, households are interviewed for four months, exiting the survey in the next eight months, and returning again for four months before being permanently dropped out of the survey. That means that it is possible to observe the survey responses of the majority of individuals in the sample at least twice, making it possible to control for unobserved individual characteristics that do not change over time. Using the subsample of individuals for which we have at least two observations, we estimate equation 1 and include individual fixed effects. Appendix table A.2 shows that even after controlling for time-invariant, unobserved individual characteristics, being at the end of the SNAP cycle reduces the probability of being present at work during the reference week compared to individuals who are at the start of the SNAP cycle.

As discussed above, most of the states distribute SNAP over a wide window of days and

income.

therefore the distance between the SNAP disbursement and the reference week can not be assigned. However, seven states have benefits disbursement windows that are 5 days or less (as shown in Table 1). In these states, SNAP distribution occurs uniformly within the disbursement window according to factors unrelated to labor supply. For instance, New Jersey distributes SNAP between the 1st and 5th day of the month based on the 7th digit of recipient's case number.²⁰ To test the robustness of the main results and increase external validity, we add these states with short disbursement schedules to the main sample. As we lack information on the exact SNAP disbursement date for each recipient, we assign the first day of the disbursement window in each state as the disbursement date to all recipients in that state. Such assignment will introduce some measurement bias, however it is unlikely to be substantial given that the longest disbursement window is five days. Table 6 shows the estimates of this exercise. While the magnitude of the coefficients is slightly smaller, the effect of SNAP timing on being present at work during the reference week holds. In particular, being at the end of the SNAP cycle reduces the probability of being present at work during that week by 2.6% compared to receiving benefits shortly prior to the start of the reference week, while receiving benefits 5-7 days into the reference week is associated with a 1% reduction in the likelihood of being at work.

6 Potential mechanisms

Next, we provide some insights into the potential mechanisms driving the transitory impact of the SNAP cycle on absence from work. As part of the monthly CPS, respondents who report having been absent from work during the reference week are asked about the reason

²⁰Other states with short disbursement windows include Connecticut, Hawaii, Nebraska, Montana, Maine, and Wyoming. SNAP distribution in Connecticut occurs between the 1st-3rd of the month based on the first letter of the head of household's last name. In Hawaii, benefits are made available on the 3rd and the 5th of every month, based on the first letter of the recipient's last name, while deposit cash benefits are distributed on the first day of every month. In Nebraska, SNAP is distributed between the 1st-5th of the month based on the last digit of the head of household's social security number. SNAP issuance in Montana occurs between the 2nd-6th of the month based on the last digit of the SNAP case number. Maine sends out benefits between the 10th-14th of the month based on the last digit of the recipient's birth day. In Wyoming benefits are made available between the 1st-4th of the month based on the first letter of recipient's last name.

behind their absence.²¹ We use this information to explore how the SNAP cycle impacts labor supply.

We start by investigating whether SNAP eligible individuals experience an increase in the probability of being absent from work at the end of the cycle through a health channel. A number of studies documents that people find it difficult to access sufficient food and that when facing a trade-off between food and medication purchases, they are more likely to experience health problems (Gucciardi et al. 2014; Seligman et al. 2014; Basu et al. 2017). In the context of SNAP, there is a relationship between timing of benefits and ER usage (Cotti et al. 2020; Arteaga et al. 2018). This evidence suggests that SNAP recipients might experience health-related problems at the end of the SNAP cycle when their budgets are tighter. Moreover, SNAP beneficiaries might experience mental health-related problems at the end of the cycle given that increased food insecurity (Gregory and Todd 2021; Gassman-Pines and Schenck-Fontaine 2019) and financial difficulties are likely to induce stress. Thus, we create an outcome variable that is equal to one if the employed respondent was out of work during the reference week for reasons related to own illness/injury/medical problems and zero otherwise. Table 7, column 1, shows the relationship between the timing of the SNAP distribution and the likelihood of being absent from work during the reference week for health reasons. Receiving SNAP benefits in the week after the reference week causes a 1.5% increase in health-related work absenteeism. Overall 1.2% of workers report an absence from work due to health reasons. Hence, this is a sizable effect. This finding is consistent with the end of the SNAP cycle leading to a worsening of health.

Second, SNAP beneficiaries at the end of their cycle could face a trade-off between food consumption and covering child care costs. Similarly, the timing of SNAP may impact the health and well-being of family members besides that of the survey respondent. In turn

²¹ Respondents can choose from 14 mutually exclusive categories. The categories are on temporary layoff; on indefinite layoff; slack work/business conditions/waiting for a new job to begin; vacation/personal days; own illness/injury/medical problems; child care problems; other family/personal obligation; maternity/paternity leave; labor dispute; weather affected job; school/training; civic/military duty; does not work in the business; and other.

that may result in adults missing work in order to take care of relatives or children at home. To investigate if this channel might be at play, we construct a binary variable is equal to one if the employed respondent was out of work for reasons related to child care problems or other family obligations and zero otherwise. Table 7, column 2, shows an 0.8% increase in the probability of being absent from work during the reference week due to childcare or family obligations problems. This effect however, is not statistically significant. There is a statistically significant increase in this type of absence when SNAP benefits are received in the second half of the reference week.

Third, at the end of the SNAP cycle, beneficiaries may be facing other trade-offs that impact work absenteeism. For example, previous evidence shows that transfer payment receipt is associated with increased drug or alcohol use, which in turn impacts the ability to work [Dobkin and Puller \(2007\)](#). Thus, if SNAP benefit receipt were to be associated with increased drug or alcohol use, then we might observe a reduced ability to work immediately following benefit receipt. In addition, due to reduced finances, individuals may face a trade-off between food consumption and covering transportation costs. If unable to cover transportation costs, the individual may have to be temporarily absent from work. Alternatively, individuals may need to visit food pantries at the end of the cycle limiting their availability to work. Given that the CPS survey is not granular in terms of the absence reasons in the *other* category, there exists the possibility that the category includes absences due to reasons such as above, which are possibly affected by the SNAP cycle. Column 3 considers being out of work due for reasons in the *other* category. Estimates suggest that there might be other channels through which SNAP timing temporarily impacts work absenteeism. Compared to individuals who received their benefits in the week before the start of the reference week, individuals who receive benefits 5-7 days into the reference week are 0.7% more likely to be absent from work during that week, while individuals who receive benefits in the week after the reference week, i.e. are at the end of the SNAP cycle for the entire duration of the reference week, are 1.4% more likely to be absent from work.

Finally, we run a placebo test: we construct an indicator variable equal to one if the employed respondent is out of work during the reference week for reasons that should not be affected by the SNAP cycle. These include: on temporary layoff; on indefinite layoff; slack work/business conditions/waiting for a new job to begin; vacation/personal days; maternity/paternity leave; labor dispute; weather affected job; school/training; civic/military duty; and does not work in the business. As column 4 shows, there is no relationship between benefit timing on work absence due to business conditions, or short-term leaves. The coefficients are all small and statistically insignificant. The null effect suggests that our results are not an artifact of other factors that happened to be correlated with the SNAP benefit cycle.

Overall, these findings suggest that being at the end of the SNAP cycle and possibly having had exhausted the benefits leads to an increase in the likelihood of being absent from work only for health reasons, family/personal obligations, child care problems, or other. In contrast, the effect of SNAP timing on the probability of being absent from work due to reasons unrelated to the SNAP cycle is zero.

7 Conclusion

We investigate whether the timing of transfer payments impacts the short-term labor supply of SNAP eligible individuals. Exogenous variation in the timing in which CPS respondents are surveyed enables us to estimate weekly labor supply of SNAP eligible individuals who are at various points in the SNAP benefit cycle. We find that timing of SNAP benefits impact labor supply at the intensive margin, while the extensive margin is unaffected. Specifically, individuals at the end of their SNAP benefits cycle are less likely to substitute into full time work from part time work compared to individuals at the start of their benefit cycle. They are also more likely to be absent from work for the entirety of the reference week. Results are more pronounced for individuals with high predicted

benefit amounts. Our findings shed light on an unexplored consequence of SNAP timing and have implications for policy regarding features of the program such as the optimal frequency of benefit distribution.

If SNAP benefits are perceived as temporary positive income shock, theory would predicted higher labor supply at the end of the cycle compared to its beginning. However, the established evidence on the negative impacts of the end of the SNAP cycle on mental and physical health, can help us understand the adverse effects we find on labor supply. We provide evidence that workers are more likely to report absence from work due to own health concerns, childcare problems, or reasons related to beneficiaries' reduced financial liquidity at the end of the SNAP benefit cycle. These findings align with the recent literature on SNAP benefit cycles- especially the work on SNAP cycles and health. Our results are also consistent with the literature showing that scarcity or the uncertainty associated with income fluctuations may impair cognition and decision-making ([Mani et al. 2013](#); [Carvalho et al. 2016](#); [Lichand and Mani 2020](#)).

While the results of the paper have strong internal validity, a limitation of the study is that it provides evidence based on data from the eligible population residing in the set of US states which distribute benefits on a single day each month. While our results extend to states with a short disbursement window, we cannot be certain they they would hold in the remaining states. Finally, our findings suggest that month to month and cross-state estimates of work absence based on the CPS data may be slightly biased if they do not account for the timing of SNAP benefits.²² In particular, estimates of work absences may be artificially high in settings when the reference week happens to fall late in the SNAP benefit cycle.

²²[Gregory and Smith \(2019\)](#) have shown that the year-on-year variation in December's reference week start and end dates coupled with the fact that the majority of SNAP benefits are issued at the start of the calendar month has the potential to bias official food insecurity statistics based on data from the food security supplement to the CPS which is fielded each December.

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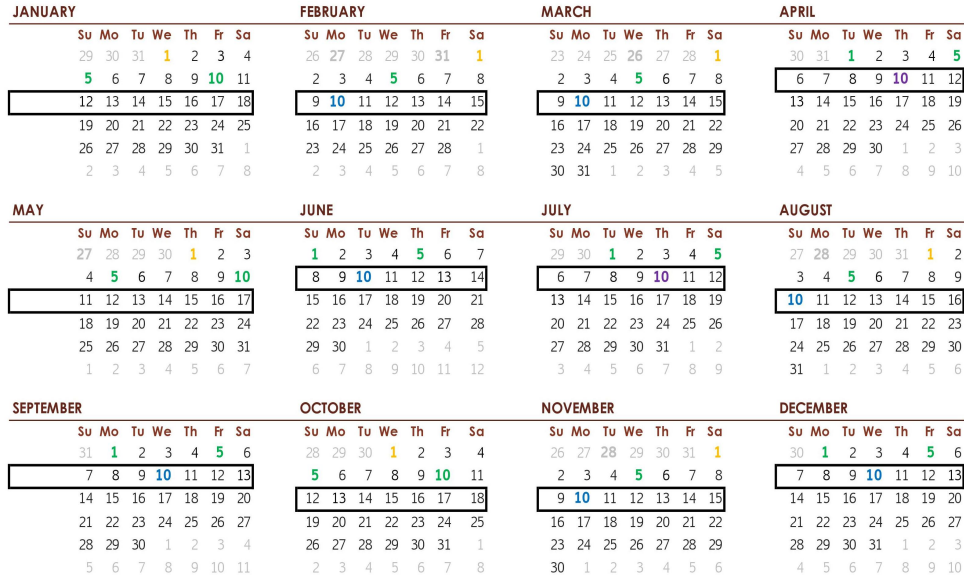
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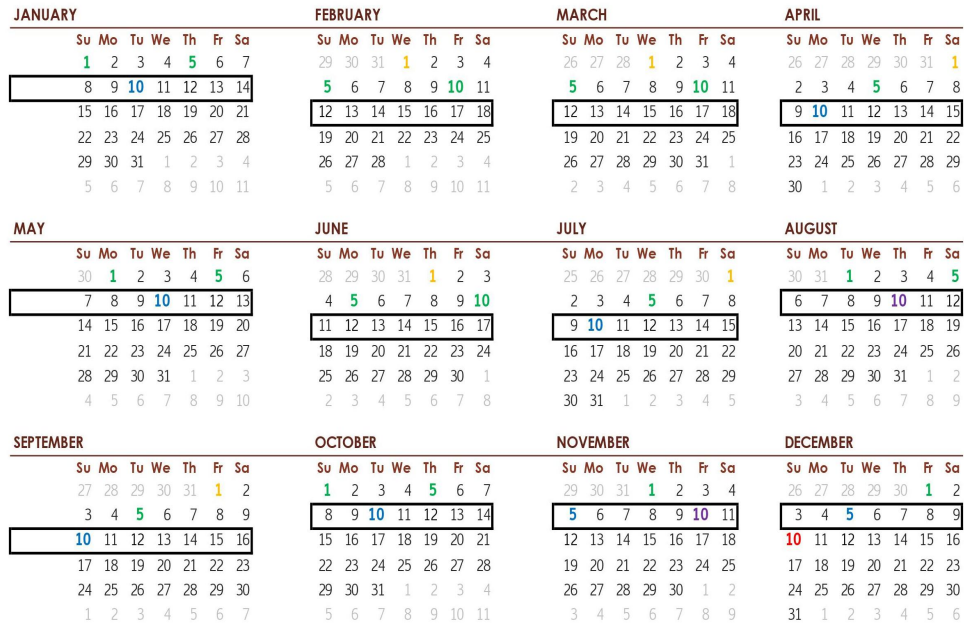
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FIGURE 1: CPS reference weeks and SNAP disbursement dates

2014



2017



Notes: The bordered weeks are the CPS monthly reference weeks. Yellow denotes that disbursement occurred two weeks prior to the start of the reference week (14-21 days before). The green color denotes SNAP disbursement that occurred within a week prior to the start of the reference week. Blue denotes SNAP disbursement that occurred during the first four days of the reference week (1-4 days into). Purple denotes SNAP disbursement that occurred during the last three days of the reference week (5-7 days into). Red indicates SNAP disbursement occurred in the week following the reference week (1-7 days after).

TABLE 1: SNAP distribution schedule and labor market statistics by state

State	Monthly distribution window	Labor supply			Hours worked
		In labor force	At work	Temporarily full time	
Alabama	4-23	0.44	0.97	0.01	33.97
Alaska*	1	0.51	0.93	0.02	32.10
Arizona	1-13	0.46	0.96	0.01	32.74
Arkansas	4-13	0.46	0.96	0.01	33.68
California	1-10	0.46	0.96	0.01	31.57
Colorado	1-10	0.55	0.96	0.01	32.51
Connecticut**	1-3	0.50	0.95	0.01	29.61
Delaware	2-23	0.51	0.96	0.01	32.58
District of Columbia	1-10	0.40	0.95	0.01	31.52
Florida	1-28	0.49	0.97	0.01	33.18
Georgia	5-23	0.49	0.96	0.01	33.62
Hawaii**	1-5	0.49	0.95	0.01	31.54
Idaho	1-10	0.58	0.96	0.01	32.61
Illinois	1-20	0.53	0.96	0.01	31.84
Indiana	5-23	0.50	0.96	0.01	32.93
Iowa	1-10	0.59	0.95	0.01	31.92
Kansas	1-10	0.57	0.97	0.01	33.21
Kentucky	1-19	0.43	0.96	0.01	32.95
Louisiana	1-14	0.46	0.96	0.01	34.21
Maine**	10-14	0.47	0.95	0.02	30.79
Maryland	4-23	0.47	0.95	0.01	32.16
Massachusetts	1-14	0.43	0.96	0.01	30.15
Michigan	3-21	0.49	0.96	0.02	31.71
Minnesota	4-13	0.57	0.95	0.01	31.29
Mississippi	4-21	0.44	0.96	0.01	34.49
Missouri	1-22	0.51	0.96	0.01	33.36
Montana**	2-6	0.56	0.95	0.01	32.36
Nebraska**	1-5	0.60	0.96	0.01	34.13
Nevada*	1	0.50	0.96	0.01	33.00
New Hampshire*	5	0.51	0.95	0.01	31.52
New Jersey**	1-5	0.53	0.96	0.01	31.28
New Mexico	1-20	0.47	0.96	0.01	32.34
New York	1-9	0.42	0.96	0.01	32.08
North Carolina	3-21	0.50	0.96	0.01	32.93
North Dakota*	1	0.58	0.96	0.01	33.83
Ohio	2-20	0.50	0.96	0.02	31.81
Oklahoma	1-10	0.48	0.96	0.01	33.84
Oregon	1-9	0.49	0.96	0.02	31.86
Rhode Island*	1	0.47	0.94	0.01	29.72
South Carolina	1-19	0.49	0.96	0.01	32.69
South Dakota*	10	0.58	0.96	0.01	33.98
Tennessee	1-20	0.46	0.96	0.01	32.65
Texas	1-15	0.51	0.96	0.01	33.97
Utah	5-15	0.58	0.96	0.01	31.96
Vermont*	1	0.51	0.95	0.01	31.26
Virginia	1-9	0.50	0.96	0.01	32.93
Washington	1-10	0.49	0.96	0.02	30.65
West Virginia	1-9	0.38	0.96	0.01	34.04
Wisconsin	2-15	0.57	0.95	0.01	31.39
Wyoming**	1-4	0.59	0.95	0.01	34.04
All states		0.48	0.96	0.01	32.66
States in the main sample		0.53	0.95	0.01	32.57

Notes: Column 1 displays the first and last possible day in which SNAP benefits can be distributed in a given month in each state. * indicates states in the main sample with exact disbursement schedules. ** indicates states in the extended sample with a short disbursement windows. The distribution schedule in Pennsylvania (not shown in the table) changes during the year. Columns 2-5 show labor market statistics for the SNAP eligible population. Columns 3, 4, and 5 further restrict to the employed SNAP eligible population.

TABLE 2: Summary statistics

	Main sample (1)	Extended sample (2)	Ineligible individuals (3)
<i>Panel A: Labor market statistics</i>			
In labor force	0.53 (0.50)	0.53 (0.50)	0.77 (0.42)
Employed	0.43 (0.50)	0.44 (0.50)	0.71 (0.45)
At work	0.95 (0.21)	0.95 (0.21)	0.96 (0.19)
Temporarily full time	0.01 (0.11)	0.01 (0.11)	0.01 (0.09)
Usually part time	0.36 (0.48)	0.36 (0.48)	0.19 (0.40)
Hours worked	32.48 (16.84)	32.34 (16.79)	36.74 (14.87)
<i>Panel B: Demographic characteristics</i>			
Age	37.19 (14.93)	37.39 (14.97)	42.80 (14.72)
Female	0.56 (0.50)	0.56 (0.50)	0.52 (0.50)
White	0.76 (0.43)	0.76 (0.43)	0.91 (0.29)
Hispanic	0.07 (0.30)	0.08 (0.27)	0.03 (0.18)
Married	0.30 (0.49)	0.31 (0.46)	0.29 (0.46)
Presence of children	0.41 (0.49)	0.41 (0.49)	0.18 (0.38)
Family size	3.20 (1.97)	3.21 (1.98)	1.76 (0.79)
Less than high school	0.27 (0.44)	0.25 (0.44)	0.11 (0.31)
High school graduate	0.37 (0.48)	0.37 (0.48)	0.38 (0.48)
Some college	0.27 (0.44)	0.28 (0.45)	0.34 (0.47)
Average predicted benefit amount	300.84 (248.91)	291.55 (238.11)	– –
Observations	119,811	249,211	80,563

Notes: The extended sample adds to the main sample individuals from states with a short disbursement window (at most five days). Ineligible individuals are individuals whose annual income exceeds the SNAP income eligibility threshold given their family size. We restrict to ineligible individuals with annual income up to \$ 40,000. The predicted benefit amounts are in 2019 dollars. At work, temporarily full time, and hours worked are conditional on being employed. Standard deviation in parenthesis.

TABLE 3: Effects of SNAP timing on labor supply at the extensive margin

	In the labor force		Employed	
	(1)	(2)	(3)	(4)
SNAP issuance occurred:				
14-21 days <i>before</i> the end of the reference week	0.004 (0.003)	0.004 (0.004)	0.003 (0.003)	0.004 (0.003)
1-4 days <i>into</i> the reference week	0.002 (0.006)	0.002 (0.007)	-0.003 (0.006)	-0.004 (0.007)
5-7 days <i>into</i> the reference week	-0.000 (0.009)	-0.000 (0.010)	0.000 (0.009)	0.003 (0.010)
1-7 days <i>after</i> the end of the reference week	0.011 (0.019)	-0.006 (0.024)	0.005 (0.019)	0.009 (0.024)
State-month fixed effects	No	Yes	No	Yes
State-year fixed effects	No	Yes	No	Yes
Mean dependent variable	0.528	0.528	0.433	0.433
Observations	119,811	119,811	119,811	119,811
R ²	0.136	0.139	0.138	0.140

Notes: "14-21 days *before*" the end of the reference week is an indicator for benefit distribution two weeks prior to the start of the reference week, "1-4 days *into*" the reference week is an indicator for benefit distribution during the first four days of the reference week. "5-7 days *into*" the reference week is an indicator for benefit distribution during the last three days of the reference week, and "1-7 days *after*" the end of the reference week is an indicator for benefit distribution in the week following the reference week. The omitted category is receiving benefits within a week prior to the start reference week, i.e. 7-14 days *before*. All columns include state, year and month fixed effects. Also included as controls are the following variables: age, age squared, a dummy variable controlling for education below high school level, a dummy for having graduated high school, a dummy for having some college education, 16 family size dummies, 16 family income dummies, four race indicators, an indicator for gender, six marital status dummies, an indicator for Hispanic origin, indicators for presence of children, presence of children under the age of five, and the state monthly unemployment rate. Significance levels: * p<0.10; ** p<0.05; *** p<0.01.

TABLE 4: Effects of SNAP timing on labor supply at the intensive margin

	At work		Temporarily full time		Hours worked	
	(1)	(2)	(3)	(4)	(5)	(6)
SNAP issuance occurred:						
14-21 days <i>before</i> the end of the reference week	0.003 (0.003)	0.002 (0.003)	0.001 (0.001)	0.001 (0.001)	-0.092 (0.184)	-0.111 (0.189)
1-4 days <i>into</i> the reference week	-0.002 (0.004)	-0.005 (0.004)	0.001 (0.002)	0.002 (0.002)	0.184 (0.327)	0.016 (0.348)
5-7 days <i>into</i> the reference week	-0.010* (0.005)	-0.012** (0.006)	0.002 (0.003)	-0.000 (0.003)	0.490 (0.456)	0.419 (0.507)
1-7 days <i>after</i> the end of the reference week	-0.026** (0.013)	-0.032** (0.015)	-0.008* (0.005)	-0.015* (0.008)	-1.163 (0.939)	-0.885 (1.197)
State-month fixed effects	No	Yes	No	Yes	No	Yes
State-year fixed effects	No	Yes	No	Yes	No	Yes
Mean dependent variable	0.951	0.951	0.013	0.013	32.484	32.484
Observations	51,915	51,915	51,915	51,915	51,915	51,915
R ²	0.010	0.014	0.002	0.005	0.094	0.102

Notes: At work is an indicator variable that takes value 0 if the individual is regularly employed at their main job, but is absent from work during the reference week. Temporarily full time is an indicator that takes value one if the individual regularly working part time at their main job reports working full time in the reference week. Observations are limited to SNAP eligible individuals who are employed. "14-21 days *before*" the end of the reference week is an indicator for benefit distribution two weeks prior to the start of the reference week, "1-4 days *into*" the reference week is an indicator for benefit distribution during the first four days of the reference week. "5-7 days *into*" the reference week is an indicator for benefit distribution during the last three days of the reference week, and "1-7 days *after*" the end of the reference week is an indicator for benefit distribution in the week following the reference week. The omitted category is receiving benefits within a week prior to the start reference week, i.e. 7-14 days *before*. All columns include state, year and month fixed effects. Also included as controls are the following variables: age, age squared, a dummy variable controlling for education below high school level, a dummy for having graduated high school, a dummy for having some college education, 16 family size dummies, 16 family income dummies, four race indicators, an indicator for gender, six marital status dummies, an indicator for Hispanic origin, indicators for presence of children, presence of children under the age of five, and the state monthly unemployment rate. Significance levels: * p<0.10; ** p<0.05; *** p<0.01.

TABLE 5: Robustness check: Effects of SNAP timing on labor supply

	Ineligible individuals	Eligible individuals by predicted benefit amounts:	
	(1)	Below median (2)	Above median (3)
<i>Panel A: At work</i>			
SNAP issuance occurred:			
14-21 days <i>before</i> the end of the reference week	-0.004* (0.002)	0.002 (0.004)	0.002 (0.004)
1-4 days <i>into</i> the reference week	0.001 (0.004)	-0.007 (0.006)	-0.003 (0.005)
5-7 days <i>into</i> the reference week	0.007 (0.005)	-0.010 (0.009)	-0.014* (0.008)
1-7 days <i>after</i> the end of the reference week	0.000 (0.011)	0.001 (0.023)	-0.056*** (0.021)
Mean dependent variable	0.964	0.950	0.953
<i>Panel B: Temporarily full time</i>			
SNAP issuance occurred:			
14-21 days <i>before</i> the end of the reference week	0.001 (0.001)	0.001 (0.002)	0.003 (0.002)
1-4 days <i>into</i> the reference week	-0.002 (0.002)	0.000 (0.004)	0.003 (0.003)
5-7 days <i>into</i> the reference week	-0.003 (0.003)	0.002 (0.005)	-0.003 (0.004)
1-7 days <i>after</i> the end of the reference week	-0.008 (0.006)	-0.007 (0.013)	-0.026** (0.010)
Mean dependent variable	0.008	0.013	0.013
<i>Panel C: Hours worked</i>			
SNAP issuance occurred:			
14-21 days <i>before</i> the end of the reference week	-0.130 (0.165)	-0.096 (0.269)	-0.118 (0.265)
1-4 days <i>into</i> the reference week	-0.069 (0.314)	-0.538 (0.523)	0.608 (0.460)
5-7 days <i>into</i> the reference week	0.155 (0.428)	0.305 (0.744)	0.521 (0.687)
1-7 days <i>after</i> the end of the reference week	0.349 (1.028)	0.358 (1.756)	-1.815 (1.663)
Mean dependent variable	36.737	31.969	32.998
Average predicted benefit amounts	–	118.267	467.345
Observations	57,200	25,923	25,992

Notes: Refer to table 3 for variable definitions and controls. In all columns the sample is restricted to employed individuals. At work is an indicator variable that takes value 0 if the individual is regularly employed at their main job, but is absent from work during the reference week. Temporarily full time is an indicator that takes value one if the individual regularly working part time at their main job reports working full time in the reference week. In column 1, the sample is SNAP ineligible individuals with annual income up to \$ 40,000. Columns 2 and 3 split the SNAP eligible sample by predicted SNAP benefits amounts Significance levels: * p<0.10; ** p<0.05; *** p<0.01.

TABLE 6: Effects of SNAP timing on labor supply (Extended sample)

	At work (1)	Temporarily full time (2)	Hours worked (3)
SNAP issuance occurred:			
14-21 days <i>before</i> the start of the reference week	0.000 (0.002)	0.001 (0.001)	-0.055 (0.122)
1-4 days <i>after</i> the start of the reference week	-0.005 (0.003)	0.001 (0.002)	-0.019 (0.255)
5-7 days <i>after</i> the start of the reference week	-0.010** (0.005)	-0.001 (0.003)	-0.006 (0.363)
8-14 days <i>after</i> the start of the reference week	-0.026** (0.011)	-0.010 (0.006)	-0.971 (0.865)
Mean dependent variable	0.953	0.013	32.340
Observations	108,590	108,590	108,590
R^2	0.012	0.005	0.101

Notes: The extended sample adds to the main sample SNAP eligible individuals who reside in CT, HI, ME, MT, NE, NJ, and WY (states with short distribution windows). In all columns the sample is restricted to employed individuals. "14-21 days *before*" the end of the reference week is an indicator for benefit distribution two weeks prior to the start of the reference week, "1-4 days *into*" the reference week is an indicator for benefit distribution during the first four days of the reference week. "5-7 days *into*" the reference week is an indicator for benefit distribution during the last three days of the reference week, and "1-7 days *after*" the end of the reference week is an indicator for benefit distribution in the week following the reference week. The omitted category is receiving benefits within a week prior to the start reference week, i.e. 7-14 days *before*. All columns include state, year and month fixed effects. Also included as controls are the following variables: age, age squared, a dummy variable controlling for education below high school level, a dummy for having graduated high school, a dummy for having some college education, 16 family size dummies, 16 family income dummies, four race indicators, an indicator for gender, six marital status dummies, an indicator for Hispanic origin, indicators for presence of children, presence of children under the age of five, and the state monthly unemployment rate. Significance levels: * p<0.10; ** p<0.05; *** p<0.01.

TABLE 7: Effects of SNAP timing on work absence by absence reasons

	Absent from work during the reference week due to:			
	own health/ illness/injury (1)	childcare problems or other family/ personal obligation (2)	"other" (3)	any reason except those in columns (1), (2), (3) (4)
SNAP issuance occurred:				
7-14 days before the start of the reference week	0.001 (0.001)	-0.000 (0.001)	-0.002 (0.001)	-0.001 (0.002)
1-4 days after the start of the reference week	-0.001 (0.002)	0.001 (0.001)	0.001 (0.002)	0.003 (0.003)
5-7 days after the start of the reference week	0.003 (0.003)	0.004* (0.002)	0.007** (0.003)	-0.001 (0.004)
8-14 days after the start of the reference week	0.015* (0.008)	0.008 (0.006)	0.014* (0.008)	-0.005 (0.008)
Mean dependent variable	0.012	0.004	0.012	0.021
"Ho : $\beta_4 > \beta_3$ " p-value	0.944	0.760	0.815	0.308
Observations	51,915	51,915	51,915	51,915
R^2	0.011	0.006	0.012	0.014

Notes: In all columns the sample is restricted to employed individuals. Reasons for absence in column (4) include: on temporary layoff; on indefinite layoff; slack work/business conditions/waiting for a new job to begin; vacation/personal days; maternity/paternity leave; labor dispute; weather affected job; school/training; civic/military duty; does not work in the business. "14-21 days before" the end of the reference week is an indicator for benefit distribution two weeks prior to the start of the reference week, "1-4 days into" the reference week is an indicator for benefit distribution during the first four days of the reference week. "5-7 days into" the reference week is an indicator for benefit distribution during the last three days of the reference week, and "1-7 days after" the end of the reference week is an indicator for benefit distribution in the week following the reference week. The omitted category is receiving benefits within a week prior to the start reference week, i.e. 7-14 days before. All columns include state, year and month fixed effects. Also included as controls are the following variables: age, age squared, a dummy variable controlling for education below high school level, a dummy for having graduated high school, a dummy for having some college education, 16 family size dummies, 16 family income dummies, four race indicators, an indicator for gender, six marital status dummies, an indicator for Hispanic origin, indicators for presence of children, presence of children under the age of five, and the state monthly unemployment rate. Significance levels: * p<0.10; ** p<0.05; *** p<0.01.

A Appendix

TABLE A.1: Effects of SNAP timing on labor supply controlling for weekend receipt

	At work (1)	Temporarily full time (2)	Hours worked (3)
SNAP issuance occurred:			
14-21 days <i>before</i> the end of the reference week	0.002 (0.003)	0.001 (0.001)	-0.087 (0.189)
1-4 days <i>into</i> the reference week	-0.005 (0.004)	0.002 (0.002)	0.053 (0.348)
5-7 days <i>into</i> the reference week	-0.012* (0.006)	0.000 (0.003)	0.526 (0.509)
1-7 days <i>after</i> the end of the reference week	-0.032** (0.015)	-0.015* (0.008)	-0.848 (1.197)
Weekend receipt	0.002 (0.002)	0.002 (0.001)	0.337** (0.160)
Mean dependent variable	0.953	0.013	32.340
Observations	51,915	51,915	51,915
R^2	0.014	0.005	0.102

Notes: Weekend receipt is a dummy variable equal to one if SNAP disbursement occurred during the weekend in month m of year y . In all columns the sample is restricted to employed individuals. "14-21 days *before*" the end of the reference week is an indicator for benefit distribution two weeks prior to the start of the reference week, "1-4 days *into*" the reference week is an indicator for benefit distribution during the first four days of the reference week. "5-7 days *into*" the reference week is an indicator for benefit distribution during the last three days of the reference week, and "1-7 days *after*" the end of the reference week is an indicator for benefit distribution in the week following the reference week. The omitted category is receiving benefits within a week prior to the start reference week, i.e. 7-14 days *before*. All columns include state, year and month fixed effects. Also included as controls are the following variables: age, age squared, a dummy variable controlling for education below high school level, a dummy for having graduated high school, a dummy for having some college education, 16 family size dummies, 16 family income dummies, four race indicators, an indicator for gender, six marital status dummies, an indicator for Hispanic origin, indicators for presence of children, presence of children under the age of five, and the state monthly unemployment rate. Significance levels: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

TABLE A.2: SNAP timing and labor supply including individual fixed effects

	At work (1)	Temporarily full time (2)	Hours worked (3)
SNAP issuance occurred:			
14-21 days <i>before</i> the end of the reference week	0.003 (0.002)	0.000 (0.001)	-0.038 (0.140)
1-4 days <i>into</i> the reference week	-0.005 (0.005)	0.001 (0.003)	-0.233 (0.261)
5-7 days <i>into</i> the reference week	-0.012* (0.007)	-0.001 (0.004)	-0.192 (0.383)
1-7 days <i>after</i> the end of the reference week	-0.037** (0.018)	-0.013 (0.010)	-1.592 (0.999)
Individual FE	Yes	Yes	Yes
Mean dependent variable	0.953	0.013	32.534
Observations	48,079	48,079	48,079
R ²	0.013	0.006	0.013

Notes: Observations are limited to SNAP eligible individuals who are employed and for whom there exist at least two sample observations. "14-21 days *before*" the end of the reference week is an indicator for benefit distribution two weeks prior to the start of the reference week, "1-4 days *into*" the reference week is an indicator for benefit distribution during the first four days of the reference week. "5-7 days *into*" the reference week is an indicator for benefit distribution during the last three days of the reference week, and "1-7 days *after*" the end of the reference week is an indicator for benefit distribution in the week following the reference week. The omitted category is receiving benefits within a week prior to the start reference week, i.e. 7-14 days *before*. All columns include state, year and month fixed effects. Also included as controls are the following variables: age, age squared, a dummy variable controlling for education below high school level, a dummy for having graduated high school, a dummy for having some college education, 16 family size dummies, 16 family income dummies, four race indicators, an indicator for gender, six marital status dummies, an indicator for Hispanic origin, indicators for presence of children, presence of children under the age of five, and the state monthly unemployment rate. Significance levels: * p<0.10; ** p<0.05; *** p<0.01.