Is There an Nth of the Month Effect?
The Timing of SNAP Issuance, Food Expenditures, and Grocery Prices

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- Many public assistance benefits are delivered to recipients as a monthly lump sum
  - Benefits can be issued on one date or staggered across households throughout the month

- This paper looks at the effect of staggering benefit issuance for the Supplemental Nutritional Assistance Program (SNAP)

- We use high-frequency household and retail scanner data to estimate the effect of staggering SNAP issuance date on:
  1. Food purchasing patterns
  2. Price response of retailers

- Supplemental Nutrition Assistance Program (SNAP)
  - Provides food vouchers to low-income households
  - 47 million participants, total spending of $75B per year

- Benefit issuance
  - Each household receives benefits via an electronic benefit transfer (EBT) card as a <u>monthly lump sum</u>

- Recipients can choose to consume these benefits all at once or steadily throughout the month

- NPR: *Low-income families stock up at Walmart on the first of the month when they have food stamps in hand*
  - Referred to as the "First of the Month Effect"

Midnight Shopping On The Brink Of Poverty
OCTOBER 02, 2010   JAMIE TARABAY

Low-income families stock up at Walmart on the first of the month when they have food stamps in hand.
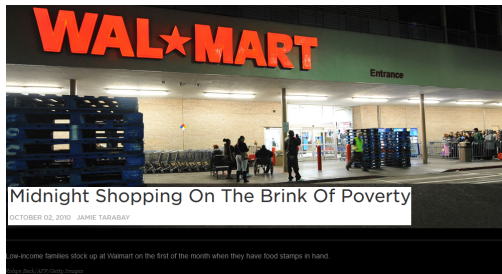
- Researchers have also documented evidence of this effect
  Castner & Henke (2011), Shapiro (2006), Hastings & Washington (2010)

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     - "...issuing SNAP benefits on a single day or over a limited number of days instead of staggering issuance over the course of the month, puts an unnecessary strain on SNAP clients and on participating retailers by causing surges in customer traffic..." (USDA, 2012)

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  2. Reduce SNAP-induced price response
     - If food prices are higher on the first of the month $\implies$ incidence of SNAP benefits go to the *retailer*, not the recipient

- Food APS Dataset
  - Roughly 5,000 households interviewed between April 2012 and January 2013
  - 7-day household food expenditure diary

- Rich demographic information for individuals and households
  - Self-reported and adminstrative SNAP status
  - State of residence
  - Detailed food environment information for each household

Issuance Policy	State Abbreviation
First Day Only	ID, ND, NV, OK, RI, VA, VT
Week 1 Only	CT, MT, NE, NH, NJ, WY
Week 2 Only	ME, SD
Weeks 1 and 2	AR, AZ, CA, CO, DC, DE, FL, GA, IA, IN, KS, KY, LA, MA, MD, MN, NY, OH, OK, OR PA, SC, TN, TX, UT, WA, WI, WV
Spread (3+ Weeks)	AL, IL, MI, MO, MS, NC, NM

Source: USDA Food and Nutrition Services

	Full Sample	SNAP HHs	Poor Non-SNAP HHs	Non-Poor HHs
Number of Households	4,826	1,581	1,195	2,048
Number of Individuals	14,317	5,414	3,335	5,564
Household Demographics				
Female (%)	67.6	73.5	66.2	66.8
Age	49.8	45.9	52.9	49.7
HS Diploma (%)	90.3	74.0	81.5	95.9
Non-white (%)	23.8	40.9	28.2	19.3
Number of Children	0.68	1.03	0.61	0.63
Married (%)	44.2	22.0	29.8	52.3
Hispanic (%)	12.7	24	18.5	9.0
Household size	2.42	2.90	2.17	2.39
Daily Food Expenditure ($)	17.29	13.80	11.29	19.51

Source: Food APS. "Poor" is defined as income below 185% FPL

$$y_{iw} = \sum_{w=2}^{4} [\alpha_w week_w + \beta_w SNAP_i * week_w] + \gamma SNAP_i + \theta_i$$

- Obs-level: household i in calendar week w
- y_{iw} = average daily household food expenditure (\$/log)
- $week_w = 1$ if in the wth week of the month
- $SNAP = 1$ if SNAP recipient
- Controls: HH/respondent demographics (HH size, children, race, education, age)

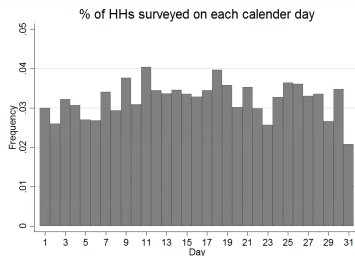# Model

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- Restrict sample to households below 185% FPL

   - α_w: change in daily food expenditure between the first and the wth week of the calendar month for poor, non-SNAP households

   - β_w: *additional* change in daily food expenditure for SNAP recipients relative to poor non-recipients
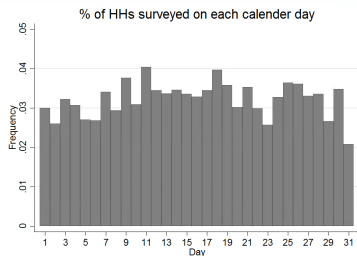
Predictions

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% of HHs surveyed on each calender day

$$y_{iw} = \sum_{w=2}^{4} [\alpha_w \, week_w + \beta_w \, SNAP_i * week_w] + \gamma SNAP_i + \theta_i$$

- If intra-month cyclicality in food expenditure is due to the SNAP program, then we would predict:
  - First-of-the-month states: $0 > \beta_2 > \beta_3 > \beta_4$
  - Staggered issuance states: $0 = \beta_2 = \beta_3 = \beta_4$

	Food Expenditure ($)		
Issue Policy:	1st Week	Week 1-2	3+ Weeks
SNAP*Week 2 (β_2)	-13.10**	0.548	-2.400
	(6.151)	(2.371)	(4.386)
SNAP*Week 3 (β_3)	-16.50**	-3.092**	-2.594
	(6.742)	(1.933)	(4.055)
SNAP*Week 4 (β_4)	-16.68***	-7.878***	-2.265
	(6.042)	(1.902)	(5.668)
Week 2 (α_2)	-3.195	1.995	-1.038
	(2.416)	(1.352)	(2.254)
Week 3 (α_3)	3.524	0.498	-1.773
	(2.828)	(1.204)	(1.930)
Week 4 (α_4)	0.106	1.429	0.199
	(2.895)	(1.280)	(2.509)
SNAP	12.52**	4.556***	5.031
	(5.050)	(1.476)	(3.542)
DV Mean	13.53	14.79	13.30
N	373	3,278	855

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Results: SNAP Recipients vs. Poor, Non-Recipients

	Food Expenditure ($)			Log Expenditure		
Issue Policy:	1st Week	Week 1-2	3+ Weeks	1st Week	Week 1-2	3+ Weeks
SNAP*Week 2 (β_2)	-13.10**	0.548	-2.400	-0.622	0.0176	-0.074
	(6.151)	(2.371)	(4.386)	(0.474)	(0.172)	(0.272)
SNAP*Week 3 (β_3)	-16.50**	-3.092**	-2.594	-1.283***	-0.231	-0.022
	(6.742)	(1.933)	(4.055)	(0.446)	(0.175)	(0.265)
SNAP*Week 4 (β_4)	-16.68***	-7.878***	-2.265	-1.194***	-0.528***	-0.174
	(6.042)	(1.902)	(5.668)	(0.402)	(0.187)	(0.368)
Week 2 (α_2)	-3.195	1.995	-1.038	-0.253	0.105	-0.109
	(2.416)	(1.352)	(2.254)	(0.294)	(0.114)	(0.177)
Week 3 (α_3)	3.524	0.498	-1.773	0.528**	-0.0507	-0.275*
	(2.828)	(1.204)	(1.930)	(0.239)	(0.124)	(0.165)
Week 4 (α_4)	0.106	1.429	0.199	0.236	0.120	-0.0804
	(2.895)	(1.280)	(2.509)	(0.260)	(0.123)	(0.236)
SNAP	12.52**	4.556***	5.031	0.620**	0.276**	0.280
	(5.050)	(1.476)	(3.542)	(0.290)	(0.131)	(0.210)
DV Mean	13.53	14.79	13.30	2.23	2.40	2.32
N	373	3,278	855	299	2,615	652

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Placebo Test

- Placebo test:
  - Repeat analysis restricting sample to non-SNAP households

  - Compare food expenditure patterns of poor ($<$185% FPL) vs. non-poor households

$$y_{iw} = \sum_{w=2}^{4} [\alpha_w week_w + \beta_w Poor_i * week_w] + \gamma Poor_i + \theta_i$$

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Placebo: Poor vs. Non-Poor Non-Recipients

	Expenditure ($)		
SNAP Policy:	1st Week	Week 1-2	3+ Weeks
Poor*Week 2	-3.155	-0.795	2.935
	(3.974)	(2.142)	(3.204)
Poor*Week 3	7.172	1.050	-5.487
	(4.402)	(1.972)	(3.355)
Poor*Week 4	2.104	0.187	-1.199
	(4.075)	(2.144)	(4.337)
Week 2	2.753	2.571	-4.038*
	(3.097)	(1.582)	(2.154)
Week 3	-0.713	-1.026	2.692
	(2.696)	(1.505)	(2.696)
Week 4	-0.420	0.965	0.212
	(2.923)	(1.652)	(3.347)
Poor	-5.396**	-4.332***	-6.151**
	(2.673)	(1.455)	(2.476)
DV Mean	15.49	17.78	15.21
N	557	3,834	906

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Household Expenditure Data: Nielsen Consumer Panel Data
  - Transaction-level expenditure data from 2004-2011
  - 60,000 households per year
  - Average time in panel: 4 years
  - Annual demographic information to estimate SNAP eligibility

Model

$$y_{iwmy} = \sum_{w=2}^{4} [\alpha_w week_w + \beta_w SNAP_{iy} * week_w] + \gamma SNAP_{iy} + \delta_m + \eta_y + \theta_i$$
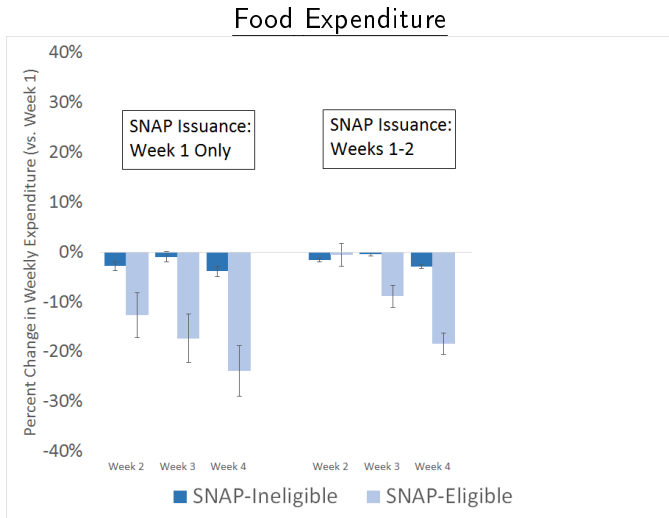
- Obs-level: household i in week wmy
- $y_{iwmy} = \log(\text{expenditure})$
- $week_w = 1$ if in the wth week of the month
- $SNAP = 1$ if SNAP-*eligible*
- Fixed effects: month (δ_m), year (η_y), and household (θ_i)

Food Expenditure

In states that issue all SNAP benefits in the first week of the month...

Food expenditure among SNAP-eligible households declines by **20%** from week 1 to week 4 relative to SNAP-ineligible households
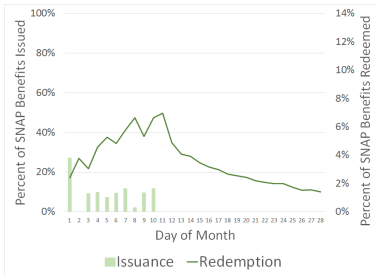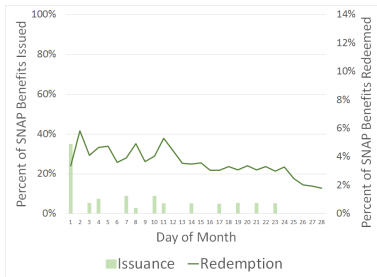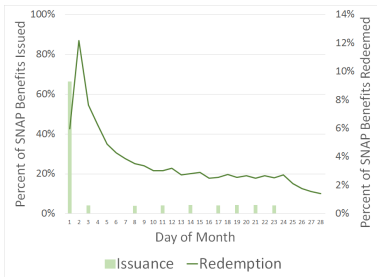
Food Expenditure

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Within-State Variation

- So far relied on cross-sectional variation in policy across states

- Case study: Illinois
  - Before February 2010: (most) benefits issued on the 1st
  - March 2010 to June 2013: issued from the 1st to 23rd
  - July 2013 to February 2014: issued from the 1st to 10th
  - March 2014 to present: issued from the 1st to 23rd

- Administrative data from Illinois, 2008-2014
  - Daily benefit issuance and redemption

- Is there SNAP-induced cyclicality in *total* food sales? If so...
  - Question: Do retailers respond by changing prices in high demand weeks?

Retailer Price Response

- Is there SNAP-induced cyclicality in *total* food sales? If so...
  - <u>Question</u>: Do retailers respond by changing prices in high demand weeks?

- Possible pricing models
  - Cyclical pricing: higher prices during peak demand Hastings & Washington (2010)

  - Counter-cyclical pricing: lower prices during peak demand (e.g., loss-leader) Chevalier, Kashyap, & Rossi (2003)

  - No price response: reputation concerns, price sensitivity of SNAP recipients Kaplan & Menzio (2013)

	Full Sample	SNAP	Poor, Non-SNAP	Non-Poor
Reason for shopping at primary store (%)				
Low Prices	52.7	60.3	56.7	50.1
Close to Home	52.8	46.9	44.3	56.1
Variety	25.4	19.5	22.6	27.2
Quality	21.0	18.0	16.2	22.9

Source: Food APS

- Nielsen Retail Scanner Data
  - Weekly store-level price and volume data by UPC
  - Years: 2006-2012
  - Store characteristics: Retail chain (e.g., Safeway), zip code

	Grocery Stores
Number of Stores	10,070
Average Annual Food Sales ($)	7,941,396
Total Sales Volume (%)	53
Number of retailers	90
% SNAP in Zip Code	10.1

Source: Nielsen Retailer Scanner data, 2006-2012

- Create a share-weighted price index for each store-day:

$$log(P_{st}) = \sum_k \omega_k log(p_{kst})$$

- p_{kst} = price for product (UPC) k on date t in store s
- ω_k = total share spent on product k among SNAP-eligible households in the Consumer Panel

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$$Y_{st} = \beta \, FracIssue_{swmy} + \mu_w + \delta_m + \eta_y + \theta_s$$

- Y_{st} = log(food sales) or log(price)
- $FracIssue$ = fraction of benefits issued in store s's state in week w
- Fixed effects: week (μ_w), month (δ_m), year (η_y), and store (θ_s)
- Interpretation: If 100% of a state's SNAP benefits are issued in a given week, food sales/prices are β% higher in that week

Results

- If 100% of a state's SNAP benefits are issued in a given week...

  - Total food sales are **5.8%** higher in that week (vs. weeks in which no snap benefits are issued)
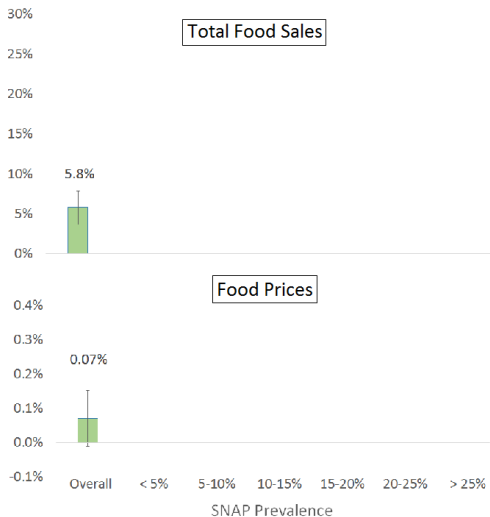
  - Food prices are **0.07%** higher in that week

	log(Food Sales)	log(Price)
	(1)	(2)
FracIssue	0.0580***	0.0007*
	(0.0107)	(0.0004)
N	22,850,351	22,850,351

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
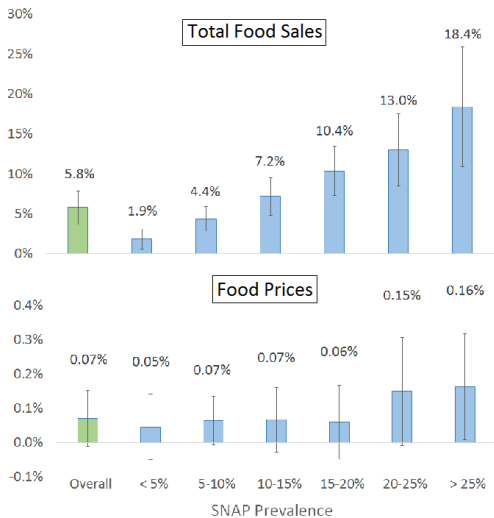
Source: Nielsen Retail Scanner Data, 2006-2012.

If 100% of SNAP benefits issued in a week, how do food sales and prices differ in that week?

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Food Environment: Food APS

	Full Sample	SNAP	Poor, Non-SNAP	Non-Poor
Drives to Store (%)	87.8	65.8	78.0	94.7
Time to Store (min)	10.9	11.5	12.4	10.3
Distance to Store (miles)	5.1	4.4	5.0	5.3
Number of Stores	3.4	3.3	3.2	3.5

Source: Food APS

If 100% of SNAP benefits issued in a week, how much higher are food <u>prices</u> in that week?
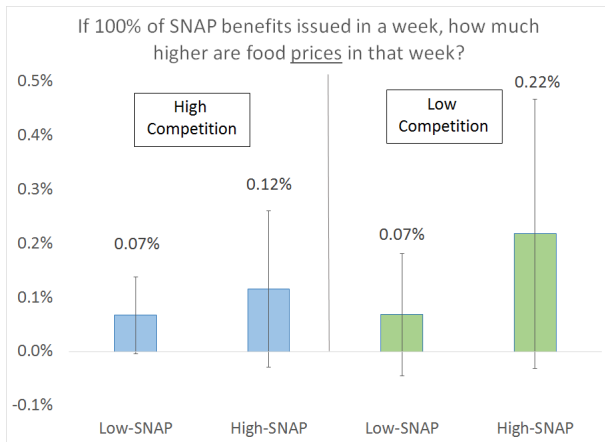
- Slightly larger, though still economically small price response in stores in high-SNAP zip codes with few local competitors

Conclusion

- Expenditure: SNAP issuance policy significantly affects cyclicality in aggregate food demand

  - Aggregate food expenditure of SNAP households peaks at the start of the month in states that do not stagger SNAP issuance

  - No aggregate cyclicality in states that stagger issuance

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- Prices: no evidence that retailers respond to these predictable increases by changing food prices

- Policy implications of SNAP issuance staggering:

  - Likely to reduce surges in customer traffic
  - Unlikely to substantially affect food prices/incidence of benefits

- Thank you to the NBER Project on the Economics of Food Security, Nutrition, and Health

- Thank you to Jason Somerville and Lawrence Jin for their excellent research assistance

- Questions? tah297@nyu.edu