ONLINE APPENDIX for Issuance and Incidence: SNAP Benefit

Cycles and Grocery Prices^*

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A Optimal Pricing Model

To assess the implications for optimal pricing of the SNAP-induced, within-month variation in sales we estimate above, we use a simple model of retailer profits, similar to the one employed by DellaVigna and Gentzkow (2019). For simplicity, we assume pricing decisions occur at the store, rather than chain, level (or, equivalently, that each chain is comprised of a single store), as we are interested in variation in pricing over time within a given store, rather than across stores within a chain (as in DellaVigna and Gentzkow (2019)).

Grocers have local market power, which follows evidence that customers are constrained due to travel costs and perishable foods (e.g., Ellickson, Houghton, and Timmins 2013; Ellickson 2006). For a given grocer, consumer demand for product j in week w is described by $Q_{jw} = k_j (P_{jw})^{\eta_{jw}}$, where Q_{jw} is the units of product j that are sold in week w, k_j is a product-specific scale term, and η_{jw} is the retailer's price elasticity for product j in week w, $\eta_{jw} = \frac{\partial Q_{jw}}{\partial P_{jw}} \frac{P_{jw}}{Q_{jw}}$. Stores face product-specific marginal costs c_j and fixed costs C_j , which do not vary by week. The retailer sets weekly prices to maximize:

$$\max_{\{P_{jw}\}} \sum_{j} (P_{jw} - c_j) Q_{jw}(P_{jw}) - \sum_{j} C_j$$
(1)

The first order conditions to this maximization problem imply $P_{jw} = c_j \frac{\eta_{jw}}{1-\eta_{jw}}$, or, taking logs, log $P_{jw} = \log c_j + \log(\frac{\eta_{jw}}{1+\eta_{jw}})$. Hence, the percent change in the optimal price for product j between week w and week w' is approximately given by

$$\log P_{jw'} - \log P_{jw} = \log(\frac{\eta_{jw'}}{1 + \eta_{jw'}}) - \log(\frac{\eta_{jw}}{1 + \eta_{jw}})$$
(2)

Substituting the estimated coefficients from Table ?? into Equation 2 yields our predicted optimal price change between weeks in which all SNAP benefits are issued and weeks in which no benefits are issued.

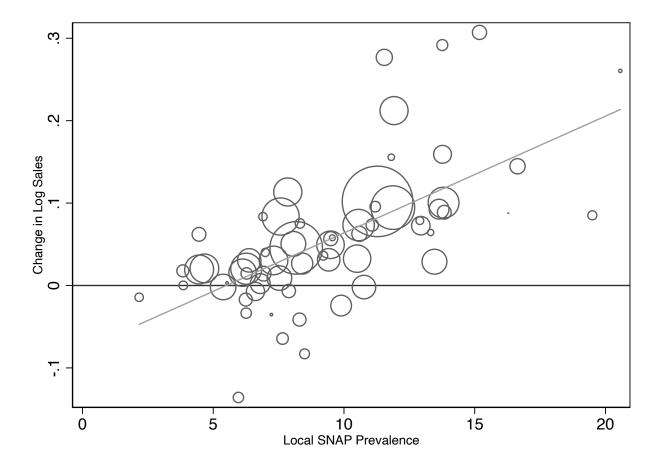
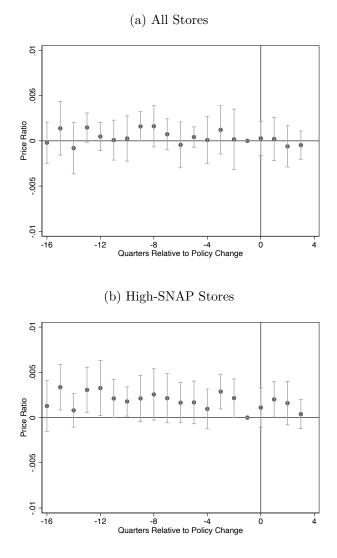


Figure A.1: Chain-Level Food Sales Cyclicality by SNAP Prevalence

Notes: The figure displays the estimated effect of SNAP issuance on log food expenditures by local SNAP prevalence at the grocery chain level. Each circle corresponds to one grocery store chain; the size of each circle reflects the average annual sales per chain. Local SNAP prevalence refers to the average estimated share of the population that are SNAP recipients across the ZIP codes in which the grocery stores belonging to a chain are located. Log food expenditures are aggregated across products using weights derived from purchases by SNAP-eligible shoppers. Change in log sales refers to the estimated coefficient on SNAP Issuance Share, which is defined as the share of SNAP benefits issued during a given week of the month in the jurisdiction in which a store is located. The effect of SNAP issuance on log food expenditures is estimated from a specification that controls for store-year-month and year-month-week fixed effects, as well as the interaction of calendar week with log state population, log gross domestic product, and unemployment rate (corresponding to Column 3 in Table ??). The estimated slope of the best linear-fit is 0.013, with standard error 0.002.

Figure A.2: Price Ratio Event-Study



Notes: The figure displays the event-study analysis of the effect of policy reforms that staggered SNAP issuance on food prices. The outcome is the ratio of average log food prices in calendar weeks one and two to average log food prices across all four weeks of the month. Log food prices are aggregated across products using weights derived from purchases by SNAP-eligible shoppers. The estimates reflect the effect of policy reforms in the ten states that expanded the share of benefits issued during the third and fourth calendar weeks of the month during our sample period (see Appendix Table A.1). The analysis excludes the two states (Oklahoma and Virginia) that altered the share of SNAP benefits issued across calendar weeks during our sample period but that did not expand the share of benefits issued during the third and fourth calendar weeks of the month. The analysis also excludes Idaho, which reformed its issuance schedule during our sample period but did not alter the share of benefits issued across calendar weeks. The estimated effects are derived from a specification that controls for store-year-month and year-month-week fixed effects and that omits a coefficient for the effect of the intervention in the quarter prior to implementation (the reference period). Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. The brackets surrounding the estimated effects reflect the 95% confidence interval from standard errors clustered by state.

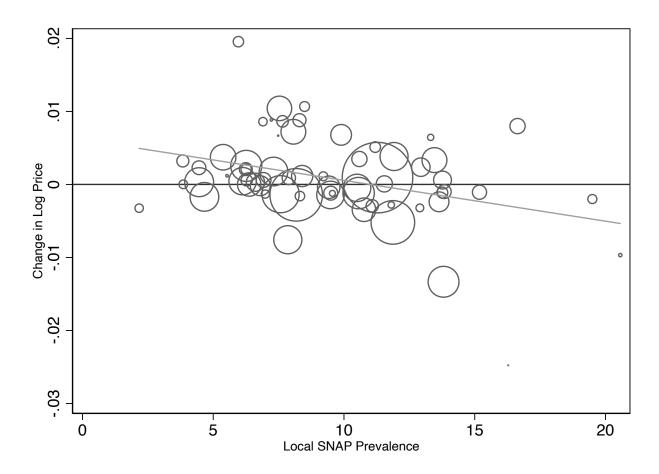
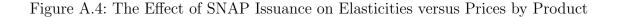
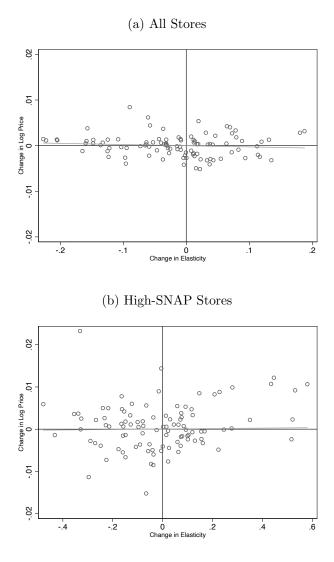


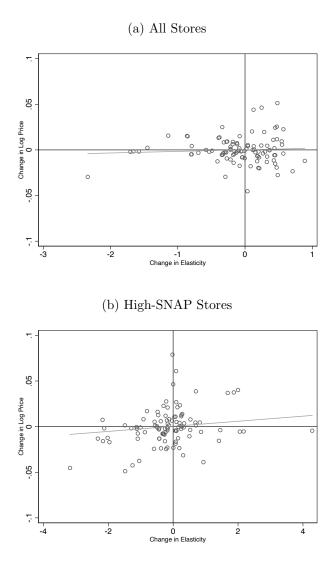
Figure A.3: Chain-Level Food Price Cyclicality by SNAP Prevalence

Notes: The figure displays the estimated effect of SNAP issuance on log prices by local SNAP prevalence at the grocery chain level. Each circle corresponds to one grocery store chain; the size of each circle reflects the average annual sales per chain. Local SNAP prevalence refers to the average estimated share of the population that are SNAP recipients across the ZIP codes in which the grocery stores belonging to a chain are located. Prices in a store-week correspond to an index of product-level log prices; the index uses weights derived from purchases by SNAP-eligible shoppers. Change in log prices refers to the estimated coefficient on SNAP Issuance Share, which is defined as the share of SNAP benefits issued during a given week of the month in the jurisdiction in which a store is located. The effect of SNAP issuance on log prices is estimated from a specification that controls for store-year-month and year-month-week fixed effects, as well as the interaction of calendar week with log state population, log gross domestic product, and unemployment rate (corresponding to Column 3 in Table ??). The estimated slope of the best linear-fit is -0.0004, with standard error 0.0003.





Notes: The figure plots the relationship between the effect of SNAP issuance on a product's price elasticity and the effect of SNAP issuance on the products price. Each point represents one of the top 100 food products by expenditure share among SNAP-eligible shoppers, subject to the limitation that the product was purchased in at least 80% of store-weeks. The x-axis represents the estimated effect of Issuance Share on a products price elasticity; it corresponds to the η coefficient in (??). The y-axis represents the estimated effect of Issuance Share on the log of a products price during a given store-week. Issuance Share reflects the share of SNAP benefits issued during a given week of the month in the jurisdiction in which a store is located. Each estimate is obtained from a product-specific regression and controls for store-year-month and year-month-week fixed effects, as well as interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. All estimates are obtained from specifications that are weighted by average annual store volume. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. The estimated slope of the best linear-fit is -0.0026, with standard error 0.0028 in Panel A and 0.0046 with standard error 0.0026 in Panel B. Figure A.5: The Effect of SNAP Issuance on Elasticities versus Prices by Product Among One-Policy Chains



Notes: The figure plots the relationship between the effect of SNAP issuance on a product's price elasticity and the effect of SNAP issuance on the products price among chains facing a single SNAP issuance policy in each of their stores during a given week. Each point represents one of the top 100 food products by expenditure share among SNAP-eligible shoppers, subject to the limitation that the product was purchased in at least 80% of store-weeks. The x-axis represents the estimated effect of Issuance Share on a products price elasticity; it corresponds to the η coefficient in (??). The y-axis represents the estimated effect of Issuance Share on the log of a products price during a given store-week. Issuance Share reflects the share of SNAP benefits issued during a given week of the month in the jurisdiction in which a store is located. Each estimate is obtained from a product-specific regression and controls for store-year-month and year-month-week fixed effects, as well as interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. All estimates are obtained from specifications that are weighted by average annual store volume. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. The estimated slope of the best linear-fit is 0.0017, with standard error 0.0027 in Panel A and 0.0057, with standard error 0.0019 in Panel B.

	Reform Date	1) 7/1/11									4/1/11				9/1/12		10/1/12			9 10/1/12						
ays	2014	3-21 (odd)								2-20 (evei	1, 5, 10				1-19		1-20			1, 4, 7, 9						
Issuance Days	2006	3-12	1	1	1-5	Q	1-5	1-20	1-9	1-10	1	1-9	1st 10 business		1-10	10	1-10	1, 3, 5 - 7, 9, 11 - 13, 15	5, 11, 15	1	1-10	1-9	2, 3, 5, 6, 8, 9, 11, 12, 14, 15	1-4	1	
	State	NC	ND	NV	NE	ΗN	NJ	NM	NΥ	НО	OK	OR	\mathbf{PA}	RI	$_{\rm SC}$	SD	TN	$\mathbf{T}\mathbf{X}$	UT	VA	WA	$\rm WV$	IM	WΥ	TV	
	Reform Date	9/1/13						3/1/13			9/1/12	9/1/09		3/1/14	2/1/14							1/1/11				
Jays	2014	4-23						2-17			5-23 (odd)	г т		1, 3, 4-10, 13, 17, 20	5-23 (odd)							$3-21 \pmod{2}$				
Issuance Days	2006	4-18	1-13	4, 5, 8-13	1-10	1-10	1-3	5-11	1-10	1-15	5-14 5-23 (1-5	1-10	1	1-10	1-10	1-10	1-14	10-14	6-15	1, 2, 4, 5, 7, 8, 10, 11, 13, 14	1-9	4-13	5-19	1-22	2-6
	State	AL	AZ	AR							GA													MS	MO	MT

Table A.1: SNAP Issuance Schedule by State, 2006-2014

across issuance days according to Social Security Number (AR, CO, LA, MA, NE, NM, NC, OR, TN, and WI), case number (AL, CA, FL, GA, KY, MI, MN, MS, MT, NJ, NY, OH, OK, PA, SC, TX, VA, and WA), last name (AZ, CT, DE, DC, IN, IA, KS, MD, UT, WV, and WY), birth year (ID), or birth month (ME). Two states use a combination of last name and case type (IL) or birth month (MO). Illinois changed issuance schedules sample period (2014), and the date of any change in the issuance schedule, if applicable. States that issue benefits on multiple days allocate benefits three times during our sample period: once on 3/1/10 (from day 1 to days 1, 3, 4, 7, 8, 10, 11, 14, 17, 19, 21, 23), then on 6/1/2013 (to 1-10), then again on 3/1/2014 (to 1,3,4,5,6,7,8,9,10,13,17,20). New York City follows a different issuance schedule than the rest of NY: benefits are issued over 13 different days excluding Sundays and holidays during the first two weeks of each month. In Ohio, staggering is optional by county with 15 percent of the smallest counties choosing not to stagger. In Pennsylvania, benefits are made available over the first 10 business days of the month (excluding weekends and holidays) with each county choosing one, two, or ten issuance days.

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	$ \begin{array}{c} (1) & (2) \\ \mathrm{AL} & \mathrm{DE} \end{array} \end{array} $	(2) DE	(3) GA	(4) IL	(5) IN	(6) MI	(2) NC	(8) OH	(9) OK	(10) SC	(11)TN	(12)VA
Panel A: All Stores0.0290***0.0397***0.0781*0.0812***0.0329***0.0312***0.0246***0.0039Issuance0.0079)(0.0090)(0.0142)(0.0440)(0.0274)(0.0048)(0.0048)(0.0048)(0.0195)	<i>Stores</i> 279*** (1079)	(0.0090)	$\begin{array}{c} 0.0493^{***} \\ (0.0142) \end{array}$	0.0397^{***} (0.0131)	0.0781^{*} (0.0440)	$\begin{array}{c} 0.0812^{***} \\ (0.0274) \end{array}$	0.0329*** (0.0048)	$\begin{array}{c} 0.0312^{***} \\ (0.0053) \end{array}$	$ \begin{array}{c} nel \; A: \; All \; Stores \\ uance \; 0.0279^{***} \; 0.0290^{***} \; 0.0493^{***} \; 0.0397^{***} \; 0.0781^{*} \; 0.0812^{***} \; 0.0329^{***} \; 0.0312^{***} \; 0.0246^{***} \; 0.0039 \; 0.0546^{**} \; 0.0212^{***} \\ Share \; \left(0.0079 \right) \; \left(0.0090 \right) \; \left(0.0142 \right) \; \left(0.0440 \right) \; \left(0.0274 \right) \; \left(0.0048 \right) \; \left(0.0053 \right) \; \left(0.0048 \right) \; \left(0.0148 \right) \; \left(0.0195 \right) \; \left(0.0220 \right) \; \left(0.0037 \right) \; \left(0.0037 \right) \; \left(0.0037 \right) \; \left(0.0033 \right) \; \left(0.0048 \right) \; \left(0.0048 \right) \; \left(0.0048 \right) \; \left(0.0195 \right) \; \left(0.0220 \right) \; \left(0.0037 \right) \; \left(0.0037 \right) \; \left(0.0037 \right) \; \left(0.0039 \; 0.0246^{***} \; 0.0033 \right) \; \left(0.0039 \; 0.0546^{***} \; 0.0037 \right) \; \left(0.0037 \right) \; \left(0.0038 \; 0.0038 \; 0.0039 \; 0.00346^{***} \; 0.0037 \right) \; \left(0.0038 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0033 \; 0.0038 \; 0.0037 \right) \; \left(0.0037 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0033 \; 0.0033 \; 0.0038 \; 0.0037 \right) \; \left(0.0037 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0038 \; 0.0037 \; 0.0037 \; 0.0037 \; 0.0038 \; 0.0048 \; 0.00048 \; 0.00048 \; 0.00185 \; (0.00328 \; 0.00328 \; 0.00328 \; 0.00328 \; 0.0033 \; 0.0038 \; 0.00328 \; 0.00328 \; 0.0037 \; 0.0037 \; 0.0037 \; 0.0038 \; 0.0048 \; 0.00048 \; 0.00048 \; 0.00195 \; 0.00220 \; 0.00030 \; 0.00328 \; 0.00320 \; 0.00320 \; 0.0033 \; 0.00038 \; 0.000038 \; 0.00038 \; 0.00038 \; $	0.0039 (0.0195)		$\begin{array}{c ccccc} 0.0546^{**} & 0.0212^{***} \\ (0.0220) & (0.0037) \end{array}$
N $2,75$	8,368 2	2,744,496	2,881,844	2,857,932	2,780,332	2,779,744	3,036,804	2,866,100	$N \ 2,758,368 \ 2,744,496 \ 2,881,844 \ 2,857,932 \ 2,780,332 \ 2,779,744 \ 3,036,804 \ 2,866,100 \ 2,726,732 \ 2,858,760 \ 2,843,840 \ 2,975,012 \ 2,756,732 \ 2,858,760 \ 2,843,840 \ 2,975,012 \ 2,756,732 \ 2,858,760 \ 2,843,840 \ 2,975,012 \ 2,756,732 \ 2,858,760 \ 2,843,840 \ 2,975,012 \ 2,756,732 \ 2,858,760 \ 2,843,840 \ 2,975,012 \ $	2,858,760	2,843,840	2,975,012
Panel B: High-SNAP StoresIssuance 0.0722*** 0.0542*** 0.1490*** 0.2961*0.1885** 0.1991*** 0.0249** 0.02290.0560*** -0.01950.1730*** 0.0900***Issuance (0.0219) (0.0090) (0.0235) (0.1566) (0.0841) (0.0338) (0.0106) (0.0155) (0.0083) (0.0573) (0.0437) (0.0249)	h-SNA. 722*** (1219) 4	$\begin{array}{c} P \ Stores \\ 0.0542^{***} \\ (0.0090) \end{array}$	$\begin{array}{c} 0.1490^{***} \\ (0.0235) \end{array}$	0.2961^{*} (0.1566)	0.1885^{**} (0.0841)	0.1991^{***} (0.0338)	0.0249^{**} (0.0106)	0.0229 (0.0155)	$nel \ B: \ High-SNAP \ Stores \\ uance \ 0.0722^{***} \ 0.0542^{***} \ 0.1490^{***} \ 0.2961^{*} \ 0.1885^{**} \ 0.1991^{***} \ 0.0249^{**} \ 0.0229 \ 0.0560^{***} \ -0.0195 \ 0.1730^{***} \ 0.0900^{***} \\ Share \ (0.0219) \ (0.0090) \ (0.0235) \ (0.1566) \ (0.0841) \ (0.0338) \ (0.0106) \ (0.0155) \ (0.0083) \ (0.0573) \ (0.0437) \ (0.0249) \\ \end{array}$	-0.0195 (0.0573)	$\begin{array}{c} 0.1730^{***} \\ (0.0437) \end{array}$	$0.0900^{***} \\ (0.0249)$
N 149),032	143,772	164,380	152,612	148, 192	153,772	169,232	159,412	$N \ 149,032 \ 143,772 \ 164,380 \ 152,612 \ 148,192 \ 153,772 \ 169,232 \ 159,412 \ 144,560 \ 162,864 \ 157,840 \ 155,448 \ $	162,864	157,840	155,448
Notes: The table shows the estimated effect of SNAP issuance on log food expenditures, separately for each state that altered its SNAP issuance schedule during our sample period. In each column, the analysis is restricted to the specified state and the set of states that did not alter their issuance	le shows our sam	the estimation of the period.	ated effect c In each colu	of SNAP issi mm, the ana	uance on lo ilysis is resti	g food expe ricted to the	nditures, se specified st	parately for ate and the	[AP issuance on log food expenditures, separately for each state that altered its SNAP issuance the analysis is restricted to the specified state and the set of states that did not alter their issuance	that altered that did not	its SNAP : alter their i	issuance issuance
schedule during our sample period. The analysis excludes one state (Idaho), which reformed its issuance schedule during our sample period but did not alter the share of benefits issued across weeks of the month. Log food expenditures are aggregated across products using weights derived from	our san are of b	aple period enefits issu	l. The analy ted across w	sis excludes eeks of the 1	one state (j month. Log	Idaho), whic food expen	ch reformed ditures are	its issuance aggregated	schedule du across produ	ring our sar ıcts using w	nple period eights deriv	but did ed from
purchases by SNAP-eligible shoppers. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which	VAP-elig	jible shopp	ers. Issuance	e Share refle	cts the sha	re of SNAP	benefits iss	ued during a	a calendar w	eek in the j	urisdiction i	n which
a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients	d. Pane	l A contair	ns all stores	in the samp	ole; Panel E	is limited	to stores for	r which we	estimate tha	t the share	of SNAP re	scipients
in the ZIP code is at least 20%. All columns correspond to the difference-in-differences specification reported in Column 5 of Table ??; they include	is at lef	ast 20%. A.	ll columns c	orrespond to	the differe	ence-in-differ	rences speci	fication repo	orted in Colu	mn 5 of Tal	ble ??; they	include
store by year by month fixed effects, year by month by week fixed effects, store by calendar week fixed effects, and interactions of calendar week with	r month	fixed effect	s, year by n	nonth by wee	sk fixed effe	cts, store by	r calendar w	eek fixed eff	ects, and int	eractions of	calendar we	ek with
state-year measures of log population, log GDP per capita, and unemployment rate. All specifications are weighted by average annual store volume.	ures of l	og populat.	ion, log GD	P per capita	, and unem	ployment ra	te. All spec	ifications ar	e weighted b	y average a	nnual store	volume.
Standard errors, reported in parentheses, are clustered by state. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.	, report ϵ	ed in paren	theses, are c	lustered by	state. $* p <$	0.10, ** p.	< 0.05, ***	p < 0.01.				

Table A.2: SNAP Issuance and Food Expenditure Cyclicality by State Policy Reform

	No Store	No Store Weights	Total Fo	Total Food Sales	Weight by	Weight by Last Name	Drop Nor	Drop Non-Uniform
	(1)	(2)	(3)	(4)	(5)	(9)	(2)	(8)
Panel A: All Stores Issuance Share	0.0621^{***} (0.0090)	0.0588^{***} (0.0127)	0.0535^{***} (0.0080)	0.0708^{***} (0.0108)	0.0559^{***} (0.0085)	0.0621^{***} (0.0122)	0.0544^{***} (0.0092)	0.0606^{***} (0.0122)
N	4156952	4156920	4156952	4156920	4156952	4156920	3308704	3308704
Panel B: High-SNAP Stores Issuance Share 0	ores 0.1823^{***} (0.0266)	0.1370^{***} (0.0361)	0.1964^{***} (0.0347)	0.2033^{***} (0.0257)	0.1872^{***} (0.0306)	0.1681^{***} (0.0325)	$\begin{array}{c} 0.1766^{***} \\ (0.0268) \end{array}$	$\begin{array}{c} 0.1724^{***} \\ (0.0304) \end{array}$
N	281,704	281,704	281,704	281,704	281,704	281,704	204,216	204, 216
Calendar Week * Store	No	Yes	No	Yes	No	Yes	No	Yes
The table contains robustness checks for the analyses measuring the effect of SNAP issuance on log food expenditures at a given store in a given week of the month. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. Columns 1 and 2 present unweighted results; all other columns report results that are weighted by store volume. In Columns 3 and 4, the outcome is the log of total food expenditures; in all other columns, the outcome is log food expenditures aggregated across products using weights derived from purchases by SNAP-eligible shoppers. In Columns 5 and 6, Issuance Share is log food expenditures aggregated across products using weights derived from purchases by SNAP-eligible shoppers. In Columns 5 and 6, Issuance Share is defined to account for the national distribution of last names from the 2010 Census for the following states: Arizona, Connecticut, Delaware, District of Columbia, Iowa, Kansas, Indiana, Utah, West Virginia, Wyoming, 2010 Census for the following states: Arizona, Connecticut, Delaware, District of Columbia, Iowa, Kansas, Indiana, Utah, West Virginia, Wyoming, Columns 7 and 8 exclude these states from the analysis, along with: Louisiana (which distributes benefits based on last name strom the 2010 Census for the following states: Arizona, Connecticut, Delaware, District of Columbia, Iowa, Kansas, Indiana, Utah, West Virginia, Wyoming, Columns 7 and 8 exclude these states from the analysis, along with: Louisiana (which distributes benefits based on last name and birth month). Ohio (in which staggering is optional by county with 15 percent of the smallest counties choosing not to stagger), and South Carolina (which distributes benefits based on last name and birth month). Ohio (in which staggering is optional by county with 15 percent of the smallest counties choosing not to stagger), and South Carolina (which distributes benefits and and and any stane fixed effects, year womunt fixed effects, year wom number nor	ess checks for t e Share reflects weighted result itures; in all ot shoppers. In C ag states: Arizc nese states from ributes benefit, , Ohio (in whi by month by by month by ent rate. Colur ted to stores fo clustered by st	he analyses me the share of Si the share of Si s; all other columns, th ber columns 5 and 6 ona, Connecticu na, Connecticu in the analysis, a s based on the sh staggering is the non-uniforml is staggering is the non-uniforml is veck fixed effection are $2, 4, 6,$ and in which we esti- ate. * $p < 0.10$	easuring the efficient of the second transmost of the second transmost of the second	ect of SNAP is ested during a sued during a ults that are w og food expend re is defined tc istrict of Colur istrict of Colur isiana (which unty with 15 r unty with 15 r ng the number ng the number ions of calends share of SNAP share of SNAP.	ssuance on log f calendar week i reighted by store itures aggregate account for the nbia, Iowa, Kani distributes bene atts last name), bercent of the sm of issuance day ar week with sta lar week by stor recipients in th	adyses measuring the effect of SNAP issuance on log food expenditures at a given store in a given share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. other columns report results that are weighted by store volume. In Columns 3 and 4, the outcome is olumns, the outcome is log food expenditures aggregated across products using weights derived from ns 5 and 6, Issuance Share is defined to account for the national distribution of last names from the connecticut, Delaware, District of Columbia, Iowa, Kansas, Indiana, Utah, West Virginia, Wyoming- analysis, along with: Louisiana (which distributes benefits to elderly/disabled recipients on different of on the first three letters of the recipients last name), Missouri (which distributes benefits based on ggering is optional by county with 15 percent of the smallest counties choosing not to stagger), and <i>n</i> -uniformly after increasing the number of issuance days in 2012). All columns include store by year fixed effects, and interactions of calendar week by store fixed effects. Panel A contains all stores in ch we estimate that the share of SNAP recipients in the ZIP code is at least 20%. Standard errors, * $p < 0.10$. ** $p < 0.05$. *** $p < 0.01$.	s at a given sto in in which a sto innns 3 and 4, th is using weights bution of last nau ution of last nau ah, West Virgini sabled recipients distributes bene distributes bene choosing not to olumns include s of log populati ² anel A contains t least 20%. Sta	re in a given re is located. the outcome is derived from nes from the a, Wyoming. s on different fits based on stagger), and stagger), and store by year on, log GDP on, log GDP all stores in ndard errors,

	Week 1	Week 2	Weeks 1 & 2	Weeks $1-3+$
	(1)	(2)	(3)	(4)
Panel A: A	ll Stores			
Week 2	-0.0619***	0.0151	-0.0293***	-0.0300*
	(0.0063)	(0.0265)	(0.0060)	(0.0151)
Week 3	-0.0654^{***}	0.0215	-0.0416***	-0.0205
	(0.0081)	(0.0241)	(0.0079)	(0.0199)
Week 4	-0.0306**	0.0072	-0.0278***	-0.0039
	(0.0112)	(0.0111)	(0.0067)	(0.0101)
Ν	565,470	55,834	3,105,655	430,127
Panel B: H	igh-SNAP Stores			
Week 2	-0.1528***	0.0860^{**}	-0.0093	0.0056
	(0.0395)	(0.0060)	(0.0216)	(0.0254)
Week 3	-0.2184***	0.0666	-0.0975***	-0.0251
	(0.0241)	(0.0118)	(0.0285)	(0.0431)
Week 4	-0.1905***	0.0077	-0.1306***	-0.0648*
	(0.0073)	(0.0069)	(0.0221)	(0.0329)
Ν	16,933	3,845	219,262	41,699

Table A.4: Food Expenditure Cyclicality by SNAP Issuance Policy

Notes: The table shows within-month expenditure patterns by state SNAP issuance policy. Log food expenditures are aggregated across products using weights derived from purchases by SNAP-eligible shoppers. Column 1 includes stores located in states that issue all benefits during the first week of the month. Column 2 includes stores located in states that issue all benefits during the second week of the month. Column 3 includes stores located in states that issue benefits on days spanning the first two weeks of the month. Column 4 includes stores located in states that issue benefits on days spanning three or more weeks during the month. Stores located in states that switch policies during our sample period are classified according to the policy that is in place during a given store-month. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include store by year by month fixed effects. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * p < 0.10, ** p < 0.05, *** p < 0.01.

	Non-Food	d Grocery	Alc	ohol
	(1)	(2)	(3)	(4)
Panel A: All Stores				
Issuance Share	0.0080^{*} (0.0045)	-0.0062 (0.0066)	$0.0082 \\ (0.0064)$	-0.0296 (0.0332)
Ν	4,156,812	4,156,812	4,000,060	4,000,060
Panel B: High-SNAP Store	8			
Issuance Share	0.0300^{***} (0.0107)	$0.0035 \\ (0.0079)$	$0.0106 \\ (0.0087)$	$0.0197 \\ (0.0119)$
Ν	281,704	281,704	270,496	270,496
Calendar Week * Store	No	Yes	No	Yes

Table A.5: The Effect of SNAP Issuance on Non-Food Expenditure Cyclicality

Notes: The table shows the effect of SNAP issuance on non-food expenditures at a given store in a given calendar week. Columns 1 and 2 present results for non-food grocery items. Columns 3 and 4 present results for alcohol products. Log expenditures are aggregated across products within these categories using weights derived from purchases by SNAP-eligible shoppers. Issuance Share reflects the share of SNAP benefits issued during a given week of the month in the jurisdiction in which a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include store by year by month fixed effects, year by month by week fixed effects, and interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. Columns 2 and 4 additionally include calendar week by store fixed effects. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * p < 0.10, ** p < 0.05, *** p < 0.01.

		Table	Table A.6: SNAP Issuance and Food Price Cyclicality by State Policy Reform	AP Issuand	ce and Fo	od Price (Cyclicality	/ by State	Policy Re	form		
	(1) AL	(2) DE	(3) GA	(4)IL	(5) IN	(6)	(7)	(8) OH	(9) OK	(10) SC	(11)TN	(12) VA
Panel A: Issuance Share	Panel A: All Stores Issuance -0.0045*** Share (0.0008)	Panel A: All StoresIssuance -0.0045^{***} Share (0.0008) (0.0008)	-0.0019 (0.0014)	-0.0024 (0.0023)	-0.0015 (0.0025)	-0.0007 (0.0022)	-0.0010 (0.0015)	-0.0015 (0.0023)	$\begin{array}{rrrr} -0.0007 & -0.0010 & -0.0015 & -0.0046^{***} \\ (0.0022) & (0.0015) & (0.0023) & (0.0007) \end{array}$	-0.0018 (0.0029)	0.0017 (0.0042)	-0.0011 (0.0023)
Ν	2,758,368	$N \ \ 2,758,368 \ \ 2,744,496 \ \ 2,881,844 \ \ 2$	2,881,844	2,857,932	2,780,332	2,779,744	3,036,804	2,866,100	, 857, 932 2, 780, 332 2, 779, 744 3, 036, 804 2, 866, 100 2, 726, 732 2, 858, 760 2, 843, 840 2, 975, 012 2, 857, 932 2, 858, 760 2, 843, 840 2, 975, 012 2, 857, 932 2, 858, 760 2, 843, 840 2, 975, 012 2, 857, 932 2, 858, 760 2, 843, 840 2, 975, 012 2, 857, 932 2, 858, 760 2, 843, 840 2, 975, 012 2, 858, 760 2, 843, 840 2, 975, 012 2, 858, 932 2, 858, 932 2, 858, 932 2, 858, 932 2, 858, 932 2, 858, 932 2, 858, 932 2, 858, 932 2, 858, 932 2, 932 2, 858	2,858,760	2,843,840	2,975,012
Panel B: Issuance Share	Panel B: High-SNAP Stores Issuance -0.0028*** -0.0028** Share (0.0008) (0.0009)	$ \begin{array}{llllllllllllllllllllllllllllllllllll$		0.0003 (0.0024)	-0.0001 (0.0020)	-0.0004 (0.0019)	0.0017 (0.0015)	0.0019 (0.0030)	$\begin{array}{c} 0.0019 & -0.0029^{***} \\ (0.0030) & (0.0008) \end{array}$	0.0013 (0.0034)	0.0040 (0.0025)	0.0007 (0.0026)
Ν	N $149,032$	143,772	164,380	152,612	148, 192	153,772	169, 232	159,412	144,560	162,864	157, 840	155,448
Notes: Th	e table show	Notes: The table shows the estimated effect of SNAP issuance on log food prices, separately for each state that altered its SNAP issuance schedule	ated effect o	f SNAP issu	ance on lo	g food price	ss, separate	ly for each :	state that al	tered its SI	VAP issuand	ce schedule
during our	sample per.	during our sample period. In each column, the analysis is restricted to the specified state and the set of states that did not alter their issuance schedule	column, the	analysis is r	estricted to	the specific	ed state and	l the set of s	tates that di	id not alter	their issuan	ce schedule
during our	sample per	during our sample period. The analysis excludes one state (Idaho), which reformed its issuance schedule during our sample period but did not alter	alysis excluc	les one state	e (Idaho), v 2	vhich reforr	ned its issu	ance schedu	lle during ou	ır sample po	eriod but di	d not alter
the share of the from building the second se	of benefits i by SN	the share of benefits issued across weeks of the month. Log food prices are measured using an index of product-level log prices; the index is derived from muchaees by SNAD alignible shormore. Issuance Share refeares the share of SNAD handits issued during a calandar mack in the invisoirtion in	t weeks of th shonners Is	ie month. La suance Shar	og food pric se reflects t	ces are mea: be share of	sured using SNAP her	an index o	f product-le ¹	vel log price lender weel	ss; the index z in the iuni	t is derived sediction in
which a sto	ore is located	which a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients	ontains all st	tores in the	sample; Par	nel B is limi	ted to store	es for which	we estimate	that the shi	are of SNAH	recipients
in the ZIP store by ye state-year Standard e	code is at ar by mont measures of arrors, repor	in the ZIP code is at least 20%. All columns correspond to the difference-in-differences specification reported in Column 5 of Table ??; they include store by year by month fixed effects, year by month by week fixed effects, store by calendar week fixed effects, and interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * $p < 0.10$, *** $p < 0.05$, *** $p < 0.01$.	vll columns c ts, year by n tion, log GD ttheses, are c	correspond t aonth by we P per capits clustered by	to the differ sek fixed eff a, and uner state. $* p$	ence-in-diff ects, store \mathfrak{k} nployment \mathfrak{k}_{p} < 0.10, ** p	erences spe yy calendar rate. All sp $\gamma < 0.05, **$	cification reweek fixed ecifications * $p < 0.01$.	ported in C effects, and are weighted	olumn 5 of interactions 1 by average	Table ??; tJ of calendar e annual stc	aey include week with are volume.

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	Table A.	7: The Effe	Table A.7: The Effect of SNAP Issuance on Food Expenditure Cyclicality by Product Group	suance on Foo	od Expend	iture Cycli	cality by F	roduct Gr	dno	
	(1) Bread	(2) Cheese	(3) Frozen Meals	(4) Frozen Meat	(5) Juice	(6) Deli	(7) Milk	(8) Produce	(9) Snacks	(10) Soda
Panel A: All Stores Issuance Share 0.0386*** (0.0053)	ores 0.0386*** (0.0053)	0.0562^{***} (0.0113)	0.0893^{***} (0.0133)	0.0895^{***} (0.0158)	$\begin{array}{c} 0.0476^{***} \\ (0.0072) \end{array}$	0.0594^{***} (0.0123)	0.0211^{***} (0.0034)	0.0388^{***} (0.0066)	0.0637^{***} (0.0111)	0.0542^{***} (0.0112)
N	N 4,156,336 4,155,920	4,155,920	4,154,500	4,144,288	4,156,596	4,156,044	4,155,896	4,155,160	3,715,204	3, 715, 152
Panel B: High-SNAP StoresIssuance Share 0.1406^{***} 0.2262^{***} (0.0234) (0.0387)	SNAP Stor 0.1406*** (0.0234)	$\begin{array}{l} VAP \ Stores \\ 0.1406^{***} & 0.2262^{***} \\ (0.0234) & (0.0387) \end{array}$	0.2881^{***} (0.0487)	0.3041^{***} (0.0536)	0.1657^{***} (0.0294)	0.2199^{***} (0.0358)	0.0755^{***} (0.0122)	0.1581^{***} (0.0296)	0.2336^{***} (0.0436)	0.1649^{***} (0.0293)
N	N 281,656	281,632	281,448	281, 340	281,684	281,656	281,632	281,556	251,860	251,856
Notes: The table shows the effect of SNAP issuance on log expenditures in the specified product group at a given store in a given week of the month. Expenditures are aggregated across products within the specified product group using weights derived from purchases by SNAP-eligible shoppers. The displayed product groups are those that correspond to the greatest share of expenditures among SNAP-eligible customers during our sample period. These product groups include: bread and baked goods; cheese; prepared foods frozen; unprepared meat, poultry, seafood-frozen; juice, drinks canned, bottled; packaged meat deli; milk; fresh produce; snacks; carbonated beverages. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include store by year by month fixed effects, and interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * $p < 0.10, *^*$	shows the ef- aggregated oduct groups duct groups packaged me week in the the share of the share of tions are wei	fect of SNAP across produ s are those t include: bree at deli; mill jurisdiction f SNAP recip and interacti ighted by ave		urce on log expenditures in the specified product group at a given store in a given week of the month. ithin the specified product group using weights derived from purchases by SNAP-eligible shoppers. orrespond to the greatest share of expenditures among SNAP-eligible customers during our sample d baked goods; cheese; prepared foods frozen; unprepared meat, poultry, seafood-frozen; juice, drinks sh produce; snacks; carbonated beverages. Issuance Share reflects the share of SNAP benefits issued ich a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which in the ZIP code is at least 20%. All columns include store by year by month fixed effects, year by f calendar week with state-year measures of log population, log GDP per capita, and unemployment annual store volume. Standard errors, reported in parentheses, are clustered by state. * $p < 0.10$, **	the specified group using hare of expe ared foods fi ted beverage A contains i 20%. All cc /ear measure ard errors, r	product gro weights der nditures am rozen; unpre es. Issuance all stores in t olumns inclu s of log pop eported in p	up at a giver ived from pu ong SNAP-e pared meat, Share reflect the sample; I de store by ulation, log arentheses, a	i store in a g gurchases by { ligible custo poultry, seaf s the share o anel B is lin year by mon GDP per cap ure clustered	iven week of SNAP-eligibl mers during ood-frozen; j of SNAP ber nited to store th fixed effec bita, and une by state. $* p$	the month. e shoppers. our sample uice, drinks uefits issued is for which its, year by mployment p < 0.10, **
p < 0.05, *** p < 0.01	0.01.									

	Tabl	e A.8: The	Table A.8: The Effect of SNAP Issuance on Food Price Cyclicality by Product Group	P Issuance on	Food Pric	e Cyclicali	ty by Prod	uct Group		
	(1) Bread	(2) Cheese	(3) Frozen Meals	(4) Frozen Meat	(5) Juice	(6) Deli	(7) Milk	(8) Produce	(9) Snacks	(10) Soda
Panel A: All Stores Issuance Share 0. (0.	<i>ores</i> 0.0012 (0.0008)	0.0012 (0.0013)	0.0011 (0.0016)	0.0008 (0.0014)	-0.0000 (0.0005)	-0.0003 (0.0012)	-0.0002 (0.0004)	(0.0009)	0.0012 (0.0009)	-0.0000 (0.0019)
Z	N 4,156,336 4,155,920	4,155,920	4,154,500	4,144,288	4,156,596	4,156,044	4,155,896	4,155,160	3,715,204	3,715,152
Panel B: High-SNAP Stores Issuance Share 0.0018* (0.0011)	$SNAP Store 0.0018^{*}$ (0.0011)	es 0.0014 (0.0019)	0.0034^{*} (0.0018)	0.0012 (0.0014)	0.0008 (0.0008)	0.0013 (0.0020)	-0.0013^{**} (0.0006)	0.0021 (0.0014)	0.0032 (0.0025)	-0.0001 (0.0035)
Ν	N 281,656	281,632	281,448	281, 340	281,684	281,656	281,632	281,556	251,860	251,856
Notes: The table shows the effect of SNAP issuance on log prices in the specified product group at a given store in a given week of the month. Prices in a store-week correspond to an index of product-level log prices; the index is derived from purchases of products in the specified product group by SNAP-eligible shoppers. The displayed product groups are those that correspond to the greatest share of expenditures among SNAP-eligible customers during our sample period. These product groups include: bread and baked goods; cheese; prepared foods frozen; unprepared meat, poultry, seafood-frozen; juice, drinks canned, bottled; packaged meat deli; milk; fresh produce; snacks; carbonated beverages. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include store by year by month fixed effects, year by month by week fixed effects, and interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.	shows the ϵ week correst ligible shopf our sample] our sample] ice, drinks ϵ issued durin or which we by month b it rate. All $*$ ** $p < 0.05$,	effect of SNA pond to an in period. The disperiod. These canned, bottlong a calendar of a calendar estimate tha week fixed specifications *** $p < 0.01$	AP issuance on I adex of product-] blayed product gr product groups ad; packaged mea ; week in the juri t the share of SN effects, and inter are weighted by L	suance on log prices in the specified product group at a given store in a given week of the month. of product-level log prices; the index is derived from purchases of products in the specified product d product groups are those that correspond to the greatest share of expenditures among SNAP-eligible duct groups include: bread and baked goods; cheese; prepared foods frozen; unprepared meat, poultry, ackaged meat deli; milk; fresh produce; snacks; carbonated beverages. Issuance Share reflects the share k in the jurisdiction in which a store is located. Panel A contains all stores in the sample; Panel B is share of SNAP recipients in the ZIP code is at least 20%. All columns include store by year by month ts, and interactions of calendar week with state-year measures of log population, log GDP per capita, weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by	specified pro- the index is hat correspo- nd baked goo sh produce; s h a store is l t the ZIP cod dar week wit dar week wit	oduct group derived fror nd to the gre ods; cheese; J nacks; carbo located. Pan le is at least h state-year le. Standard	at a given s n purchases of satest share corepared food nated bevera el A contains 20%. All colu measures of errors, repou	tore in a gir of products of f expenditur ls frozen; un ges. Issuance ges. Issuance all stores in imms include log populatio ted in paren	ven week of in the specif es among SN eprepared me Share reflec the sample: store by yea on, log GDP otheses, are c	the month. (AP-eligible at, poultry, ts the share Panel B is r by month per capita, lustered by

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	Sa	les	Pr	ice
	(1)	(2)	(3)	(4)
Panel A: All Stores				
Issuance Share	$\begin{array}{c} 0.1457^{***} \\ (0.0179) \end{array}$	0.1706^{***} (0.0253)	$0.0003 \\ (0.0011)$	$0.0013 \\ (0.0027)$
N	3,870,000	3,870,000	3,870,000	3,870,000
Panel B: High-SNAP Stores	8			
Issuance Share	0.3816^{***} (0.0614)	$\begin{array}{c} 0.3662^{***} \\ (0.0527) \end{array}$	$0.0002 \\ (0.0009)$	0.0024 (0.0032)
N	278,040	278,040	278,040	278,040
Calendar Week * Store	No	Yes	No	Yes

Table A.9: Effect of SNAP Issuance on Expenditure and Price Cyclicality, High SNAP-Share Product Modules

Notes: The table shows the effect of SNAP issuance on sales and prices for food products corresponding to modules that tend to be purchased by SNAP-eligible customers at a high rate relative to SNAP-ineligible customers. To select these modules, using the Consumer Panel we estimate, for each module, the share of all food expenditures that the module represents, separately for SNAP-eligible and ineligible customers. The sample underlying the analysis in the table corresponds to the products in the ten modules with the largest ratio of these two shares. These modules are: cracklins, frosting, frozen orange juice, candy gifts, lard, powdered milk, flavor enhancers, potted meat, syrup, and Vienna sausage. Log food expenditures (columns 1 and 2) are aggregated across products using weights derived from purchases by SNAP-eligible shoppers. Log food prices (columns 3 and 4) correspond to an index of product-level log prices derived from purchases by SNAP-eligible shoppers. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include store by year by month fixed effects, year by month by week fixed effects, and interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. Columns 2 and 4 additionally include calendar week by store fixed effects. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * p < 0.10, ** p < 0.05, *** p < 0.01.

	No Store	e Weights	Weight by	v Last Name	Drop No:	n-Uniform
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All Stores						
Issuance Share	0.0003 (0.0004)	0.0011 (0.0008)	-0.0000 (0.0004)	$0.0009 \\ (0.0009)$	$0.0001 \\ (0.0004)$	$0.0007 \\ (0.0010)$
Ν	4156952	4156952	4156952	4156952	3308704	3308704
Panel B: High-SNAP St	ores					
Issuance Share	0.0011 (0.0008)	$0.0005 \\ (0.0014)$	$0.0009 \\ (0.0007)$	0.0013 (0.0014)	$0.0003 \\ (0.0007)$	$0.0004 \\ (0.0014)$
N	281,704	281,704	281,704	281,704	204,216	204,204
Calendar Week * Store	No	Yes	No	Yes	No	Yes

Table A.10: Price Cyclicality Robustness Checks

The table contains robustness checks for the analyses measuring the effect of SNAP issuance on log food prices at a given store in a given week of the month. Prices in a store-week correspond to an index of product-level log prices; the index is derived from purchases by SNAP-eligible shoppers. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. Columns 1 and 2 present unweighted results; all other columns report results that are weighted by store volume. In Columns 3 and 4, Issuance Share is defined to account for the national distribution of last names from the 2010 Census for the following states: Arizona, Connecticut, Delaware, District of Columbia, Iowa, Kansas, Indiana, Utah, West Virginia, Wyoming. Columns 5 and 6 exclude these states from the analysis, along with: Louisiana (which distributes benefits to elderly/disabled recipients on different days), Maryland (which distributes benefits based on the first three letters of the recipients last name), Missouri (which distributes benefits based on last name and birth month), Ohio (in which staggering is optional by county with 15 percent of the smallest counties choosing not to stagger), and South Carolina (which added new recipients non-uniformly after increasing the number of issuance days in 2012). All columns include store by year by month fixed effects, year by month by week fixed effects, and interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. Columns 2, 4, 6, and 8 additionally include calendar week by store fixed effects. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. Standard errors, reported in parentheses, are clustered by state. * p < 0.10, ** p < 0.05, *** p < 0.01.

		Over 80%	Over 80% Captured			Over 90% Captured	Captured	
	(1) Sales	(2) Sales	$\begin{array}{c} (3) \\ \text{Price} \end{array}$	(4) Price	(5) Sales	(6) Sales	(7) Price	(8) Price
Panel A: All Stores Issuance Share	0.0540^{***} (0.0093)	0.0685^{***} (0.0130)	0.0001 (0.0004)	0.0011 (0.0011)	0.0489^{***} (0.0137)	0.1029^{***} (0.0336)	0.0002 (0.0006)	-0.0001 (0.0017)
Ν	2,345,996	2,345,984	2,345,996	2,345,984	285,516	285,516	285,516	285,516
Panel B: High-SNAP Stores Issuance Share	res 0.2029*** (0.0340)	0.2127^{***} (0.0251)	0.0011 (0.0007)	0.0021 (0.0017)	0.1665^{***} (0.0393)	0.2955^{***} (0.0880)	0.0008 (0.0006)	0.0026 (0.0016)
Ν	156,448	156,440	156,448	156,440	19,844	19,844	19,844	19,844
Calendar Week * Store	No	Yes	No	Yes	No	Yes	No	Yes
Notes: The table investigates the importance to our results of the fact that the Nielsen Retail Scanner data does not include price data for products in store-weeks in which the product was not purchased. Columns 1-4 restrict the analysis to stores for which we observe prices for at least 80% of expenditures during the sample period. Columns 5-8 restrict the analysis to stores for which we observe prices for at least 90% of expenditures during the sample period. The outcome in Columns 1, 2, 5, and 6 is log food expenditures at a given store in a given week of the month. The outcome in Columns 3, 4, 7, and 8 is log food prices at a given store in a given week of the month. Prices in a store-week correspond to an index of product-level log prices; the index is derived from purchases by SNAP-eligible shoppers. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. All columns include store by year by month fixed effects, year by month by week fixed effects, and interactions of calendar week by store fixed effects. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. Standard errors, reported in parentheses, are clustered by state. * $p < 0.10$, *** p < 0.05, **** $p < 0.01$.	s the importanc product was no ple period. Colu come in Column come in Column to prices at a d from purchas which a store is week with state r week by store ipients in the Z	to our results of purchased. Cc mns 5-8 restrict is 1, 2, 5, and 6 a given store in a given store in a es by SNAP-elig located. All col- s-year measures fixed effects. Pa IP code is at lea	of the fact that olumns 1-4 resta t the analysis to is log food exp a given week of jble shoppers. Is umns include st of log populati nel A contains ε ast 20%. Standa	the Nielsen Re rict the analysis stores for which enditures at a { the month. Privice ssuance Share ru tore by year by on, log GDP pe all stores in the urd errors, repol	our results of the fact that the Nielsen Retail Scanner data does not include price data for products irchased. Columns 1-4 restrict the analysis to stores for which we observe prices for at least 80% of 5-8 restrict the analysis to stores for which we observe prices for at least 90% of expenditures during 2, 5, and 6 is log food expenditures at a given store in a given week of the month. The outcome in ven store in a given week of the month. Prices in a store-week correspond to an index of product-level y SNAP-eligible shoppers. Issuance Share reflects the share of SNAP benefits issued during a calendar ted. All columns include store by year by month fixed effects, year by month by week fixed effects, ar measures of log population, log GDP per capita, and unemployment rate. Columns 2, 4, 6, and 8 d effects. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate ode is at least 20%. Standard errors, reported in parentheses, are clustered by state. * $p < 0.10$, **	a does not incluhich we observe ces for at least 9 given week of t ek correspond t of SNAP benefi ects, year by m nemployment ra is limited to st ses, are clustery	ide price data prices for at 00% of expendi he month. The o an index of I its issued durin onth by week ite. Columns 2 ite. Columns 2 ores for which ed by state. *	for products least 80% of tures during c outcome in product-level g a calendar fixed effects, 4, 6, and 8 we estimate p < 0.10, **

Table A.11: Missing Price Data Robustness Check

	Coupe	on Use	Discount	t Receipt
	(1)	(2)	(3)	(4)
Panel A: All Stores				
Issuance Share	0.0001 (0.0003)	-0.0009 (0.0008)	$0.0012 \\ (0.0009)$	-0.0022 (0.0033)
N	2,434,518	2,434,518	2,434,518	2,434,518
Mean, Dep. Var.	0.0448	0.0448	0.4227	0.4227
Panel B: High-SNAP Stores				
Issuance Share	-0.0018	0.0003	-0.0049	0.0125
	(0.0014)	(0.0035)	(0.0064)	(0.0097)
Ν	146,638	146,638	146,638	146,638
Dep Var Mean	0.0389	0.0389	0.3920	0.3920
Calendar Week * Store	No	Yes	No	Yes

Table A.12: The Effect of SNAP Issuance on Coupon Usage and Discount Receipt

Notes: The table shows the effect of SNAP issuance on coupon use and discount receipt in a given store in a given week of the month using data from the Consumer Panel. Columns 1 and 2 present results for the effect of SNAP issuance on the average value of coupons as a share of expenditures per shopping trip. Columns 3 and 4 present results for the effect of SNAP issuance on the average share per shopping trip of expenditures on items for which the panelist reported receiving a discounted price deal. Both outcomes use panelist weights to calculate the average across trips. Issuance Share reflects the share of SNAP benefits issued during a given week of the month in the jurisdiction in which a store is located. Panel A contains shopping trips at all stores in the sample; Panel B is limited to shopping trips at stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include store by year by month fixed effects, year by month by week fixed effects, and interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. Columns 2 and 4 additionally include calendar week by store fixed effects. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * p < 0.00, ** p < 0.05, *** p < 0.01.

	Non-Food Grocery		Alcohol	
	(1)	(2)	(3)	(4)
Panel A: All Stores				
Issuance Share	$0.0010 \\ (0.0006)$	0.0028^{**} (0.0010)	-0.0002 (0.0005)	0.0038^{*} (0.0022)
N	4,156,812	4,156,812	4,000,060	4,000,060
Panel B: High-SNAP Stores	3			
Issuance Share	$0.0008 \\ (0.0007)$	0.0022^{*} (0.0012)	-0.0001 (0.0005)	$0.0007 \\ (0.0013)$
Ν	281,704	281,704	$270,\!496$	270,496
Calendar Week * Store	No	Yes	No	Yes

Table A.13: The Effect of SNAP Issuance on Non-Food Price Cyclicality

Notes: The table shows the effect of SNAP issuance on non-food prices at a given store in a given week of the month. Prices in a store-week correspond to an index of product-level log prices; the index is derived from purchases by SNAP-eligible shoppers. Columns 1 and 2 present results for non-food grocery items. Columns 3 and 4 present results for alcohol products. Log prices are aggregated across products within these categories using an index derived from purchases by SNAP-eligible shoppers. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include store by year by month fixed effects, year by month by week fixed effects, and interactions of calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. Columns 2 and 4 additionally include calendar week by store fixed effects. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * p < 0.10, ** p < 0.05, *** p < 0.01.

	Qua	Quantity		ice
	(1)	(2)	(3)	(4)
Panel A: All Stores				
Issuance Share	0.0642^{***}	0.0902^{***}	0.0000	0.0002
	(0.0086)	(0.0142)	(0.0008)	(0.0017)
Ν	379,212,892	379,212,892	379,212,892	379,212,892
Panel B: High-SNAP Stor	es			
Issuance Share	0.2016^{***}	0.2195^{***}	0.0007	-0.0011
	(0.0298)	(0.0302)	(0.0014)	(0.0026)
Ν	24,576,132	24,576,132	24,576,132	24,576,132
Calendar Week * Store	No	Yes	No	Yes

Table A.14: The Effect of SNAP Issuance on Sales and Prices, 100 Product Sample

Notes: The table shows the effect of SNAP issuance on sales and prices for the top 100 food products by expenditure share among SNAP-eligible shoppers, subject to the limitation that the product was purchased in at least 80% of store-weeks. The unit of observation is a product-store-week. In Columns 1 and 2, the outcome is the log quantity of food products purchased. In Columns 3 and 4, the outcome is the log food price per product. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include product-store-year-month fixed effects and product-year-month-week fixed effects, and interactions of product by calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. Columns 2 and 4 additionally include product by calendar week by store fixed effects. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * p < 0.10, ** p < 0.05, *** p < 0.01.

	(1)	(2)
Panel A: All Stores		
Issuance Share	0.0000	0.0000
	(0.0007)	(0.0017)
N	396,074,068	396,074,068
Panel B: High-SNAP Stores		
Issuance Share	0.0008	-0.0010
	(0.0014)	(0.0025)
Ν	26,155,896	26,155,896
Calendar Week * Store	No	Yes

Table A.15: Price Imputation Robustness Check

Notes: This table provides a robustness check on estimates of the effect of SNAP issuance on prices. Unlike prior specifications, products that are not purchased during one or more weeks in a given store-month are not excluded from the analysis; rather we impute the price of such products from the average price for the specified product in the specified week in stores belonging to the same chain and located in the same state. This analysis is performed for the 100 food products used in the elasticity analysis and described in Table ??. The unit of observation is a product-store-week. The outcome is the log food price per product. Issuance Share reflects the share of SNAP benefits issued during a calendar week in the jurisdiction in which a store is located. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. Both columns include product-store-year-month fixed effects and product-year-month-week fixed effects, and interactions of product by calendar week with state-year measures of log population, log GDP per capita, and unemployment rate. Column 2 additionally includes product by calendar week by store fixed effects. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * p < 0.10, ** p < 0.05, *** p < 0.01.

	(1)	(2)
Panel A: All Stores		
DMA Price	0.9434^{***}	0.9430^{***}
	(0.0001)	(0.0001)
N	379,212,892	379,212,892
Panel B: High-SNAP Stores		
DMA Price	0.9117^{***}	0.9102^{***}
	(0.0003)	(0.0004)
N	24,576,132	24,576,132
Calendar Week * Store	No	Yes

Table A.16: First Stage Effect of DMA Price Instrument on Product Price

Notes: The table presents the first stage effect of the Designated Market Areas (DMA) price instrument on product prices. The unit of observation is a product-store-week. The analysis is restricted to the top 100 food products by expenditure share among SNAP-eligible shoppers, subject to the limitation that the product was purchased in at least 80% of store-weeks. The outcome is the log product price. DMA price refers to the log of the average price of the product across stores in the same chain but located in other DMAs. Panel A contains all stores in the sample; Panel B is limited to stores for which we estimate that the share of SNAP recipients in the ZIP code is at least 20%. All columns include product-store-year-month fixed effects and product-year-month-week fixed effects, and interactions of product by week of the month with state-year measures of log population, log GDP per capita, and unemployment rate. Column 2 additionally includes product by calendar week by store fixed effects. All specifications are weighted by average annual store volume. Standard errors, reported in parentheses, are clustered by state. * p < 0.10, ** p < 0.05, *** p < 0.01.