The Compliance Trap: SNAP Stocking Requirements and the Erosion of Food Access in Convenience-Store Counties

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March 27, 2026

Abstract

In January 2018, the USDA tripled the minimum number of staple food items that SNAP-authorized retailers must stock from 12 to 36. Only 30% of small-format stores met the new threshold. I exploit cross-county variation in pre-2018 convenience store share as a measure of exposure to this binding regulatory constraint. Using a balanced panel of 3,163 U.S. counties from 2013–2022, I find that counties with higher convenience store dependence experienced a modest decline in SNAP participation after the provision took effect, with the effect peaking in 2019 before attenuating by 2022. Pre-trends are flat across five pre-treatment years and all leave-one-state-out estimates are negative. The effect is concentrated in high-poverty counties. The results suggest the "compliance trap" is real but temporary—the retail network adjusts, muting the long-run food access impact.

JEL Codes: I38, Q18, L81

Keywords: SNAP, food access, stocking requirements, convenience stores, compliance costs

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1. Introduction

The Supplemental Nutrition Assistance Program (SNAP) serves roughly 42 million Americans through a network of over 250,000 authorized retailers. The physical accessibility of this network—the distance to the nearest store that accepts SNAP benefits—is a binding constraint for low-income households without reliable transportation (Allcott et al., 2019). Policymakers have long sought to improve the *quality* of food available at SNAP retailers by raising stocking requirements. But requirements that cannot be met by the smallest stores create a compliance trap: the regulation designed to improve what SNAP households can buy may instead reduce *where* they can shop.

In 2016, the USDA finalized a rule containing five provisions to strengthen SNAP retailer stocking standards (81 FR 90675). Congress blocked the headline provision—increasing the variety requirement from 3 to 7 staple food categories—through the 2017 Appropriations Act. But a less visible provision survived: effective January 17, 2018, every SNAP-authorized retailer was required to stock at least three units per staple variety per category, tripling the minimum from 12 to 36 items. This depth-of-stock provision has received almost no attention in the economics literature, despite coinciding with a net loss of approximately 15,000 SNAP-authorized retailers between fiscal years 2017 and 2019 (USDA Food and Nutrition Service, 2023).

The compliance burden fell disproportionately on small-format retailers—convenience stores, small grocery stores, and specialty food outlets—which lack the shelf space, supply chains, and capital to stock 36 or more staple items. Andreyeva et al. (2019) found that only 30.2% of small-format stores met the full stocking standard at the time of implementation. The question is whether these deauthorizations reduced food access enough to affect SNAP participation itself.

This paper exploits cross-county variation in the pre-2018 share of convenience stores among food retailers as a measure of exposure to the depth-of-stock provision. Counties where convenience stores constitute a larger share of food retail have more SNAP retailers operating near the compliance margin. Using a balanced panel of 3,163 U.S. counties from 2013 to 2022—constructed from the American Community Survey and Census County Business Patterns—I estimate a difference-in-differences specification with county and state-by-year fixed effects, clustering standard errors at the state level.

The main results show a modest, suggestive decline in SNAP participation in more-exposed counties. A one-standard-deviation increase in convenience store exposure is associated with a 0.058 percentage point reduction in the SNAP participation rate (randomization inference $p = 0.112$). The event study reveals clean pre-trends across five pre-treatment years and an

effect that peaks in 2019 before attenuating by 2022. The effect is concentrated in high-poverty counties and essentially zero in low-poverty counties, consistent with the mechanism: where SNAP redemption constitutes a larger share of store revenue, deauthorization is more likely to trigger closure or reduce access.

The fade-out pattern is itself informative. If the compliance trap were permanent, we would expect a persistent reduction in SNAP participation. Instead, the market adjusts: surviving stores may comply, new SNAP-authorized retailers may enter, and households may travel to more distant retailers. The temporary nature of the disruption suggests that the SNAP retail network exhibits greater resilience than the aggregate decline in authorized store counts would imply.

This paper contributes to several literatures. First, it adds to the growing body of work on food access and SNAP participation (Allcott et al., 2019; Bitler and Currie, 2005; Currie et al., 2010; Handbury and Weinstein, 2015; Hoynes and Schanzenbach, 2016). While Allcott et al. (2019) studied the entry of supermarkets into food deserts, I study the reverse channel: the regulatory-induced *exit* of small-format retailers. Second, the paper speaks to the literature on regulatory compliance costs for small firms (Djankov et al., 2002; Crain and Crain, 2010), documenting a case where a seemingly modest stocking requirement generates a sharp discontinuity in compliance capacity between small and large retailers. Third, it informs an active policy debate: in 2025, the USDA proposed further increasing the stocking requirement to 84 items. This paper provides the first causal evidence on whether the 2018 increase to 36 items affected downstream food access—a parameter that should inform whether further increases are wise.

The remainder of the paper is organized as follows. Section 2 describes the institutional background. Section 3 presents the data. Section 4 outlines the empirical strategy. Section 5 reports results. Section 6 discusses implications.

2. Institutional Background

SNAP retailer authorization. To accept SNAP benefits, a retail food store must be authorized by the USDA Food and Nutrition Service (FNS). Authorization requires meeting minimum stocking standards—historically, a relatively low bar. Prior to 2018, a store needed to carry at least three varieties of food in each of four staple food categories (dairy, bread/cereal, meat/poultry/fish, and fruits/vegetables), with at least one stocking unit per variety, for a minimum of 12 items total (USDA Food and Nutrition Service, 2016).

The 2016 final rule. The USDA's 2016 final rule (81 FR 90675) sought to raise these standards through five provisions. The most discussed was the "variety" increase from 3 to 7 items per category. Congress blocked this provision through Section 765 of the Consolidated Appropriations Act of 2017. However, four other provisions survived, including the depth-of-stock provision: effective January 17, 2018, each required variety must have at least three stocking units available for sale, tripling the minimum from 12 to 36 items (USDA Food and Nutrition Service, 2016).

Differential compliance burden. The tripling of stocking requirements created a sharp divide between store formats. Supermarkets and large grocery stores—which typically stock thousands of items—were unaffected. But convenience stores, small grocery stores, and specialty retailers operate with limited shelf space and thin margins. Andreyeva et al. (2019) surveyed 148 small stores in Albany, NY and found that only 30.2% met the full stocking standard. Stores that failed to comply faced deauthorization—the loss of their SNAP license—which for stores in low-income areas can mean losing a substantial share of revenue.

Aggregate retailer decline. The timing of retailer exits is consistent with the provision's implementation. SNAP-authorized retailers peaked at 263,105 in fiscal year 2017 and fell to 248,069 by FY2019—a net decline of 15,036 stores (5.7%). The small-format share dropped from 73% to 69% over the same period, suggesting that roughly 21,000 small-format stores exited while some large-format stores entered (USDA Food and Nutrition Service, 2023).

3. Data

County Business Patterns. I obtain annual establishment counts from the Census Bureau's County Business Patterns (CBP) for two NAICS codes: 445120 (Convenience Retailers) and 445110 (Supermarkets and Other Grocery Retailers). I use the 2015–2016 average (the last two years with consistent NAICS 2012 codes and full county coverage) to construct each county's pre-treatment convenience store share: $\text{CS}_c = \text{Convenience}_c/(\text{Convenience}_c + \text{Supermarket}_c)$. This variable captures the county's structural dependence on small-format food retail.

American Community Survey. The primary outcome is the SNAP participation rate from ACS 5-year estimates, Table B22003 (Receipt of Food Stamps/SNAP in the Past 12 Months). I use vintages 2013–2022 at the county level, constructing the participation rate as SNAP households divided by total households. I also extract the poverty rate (B17001) and total population (B01003) for use as controls and for computing per-capita rates. The ACS 5-year estimates are rolling averages, so the 2019 vintage (covering 2015–2019) is the first in

which the majority of the reference period falls after the January 2018 provision. I define the post-treatment period as ≥ 2019 in the main specification.

SNAP aggregate data. For context, I use USDA FNS published data on total SNAP-authorized retailers by fiscal year. These data are not used in the regression analysis but provide aggregate evidence on the magnitude of the retailer decline.

Sample construction. The analysis panel consists of 3,163 counties observed over 10 years (2013–2022), yielding 31,630 county-year observations. I restrict to counties with nonmissing CBP food retail data (at least one establishment in either category) and population above 100. The panel is balanced: all counties appear in all 10 years.

Table 1: Summary Statistics

Variable	Pre-Period (2015–2017)	Post-Period (2019–2022)
SNAP participation rate (%)	14.75 (7.96)	13.34 (8.36)
Poverty rate (%)	17.33 (8.26)	15.42 (7.89)
Population	99946 (320535)	103547 (330856)
Convenience store share	0.240 (0.204)	0.240 (0.204)
Total households	36947 (112145)	38872 (118365)
SNAP households	4850 (14578)	4587 (14723)
Counties	3,163	3,163
County-years	15,815	12,652

Notes: Standard deviations in parentheses. The pre-period covers ACS 5-year estimates centered on 2015–2017 (before the January 2018 depth-of-stock provision). The post-period begins with the 2019 ACS vintage (2015–2019), the first 5-year window in which the majority of the reference period falls after the provision. Convenience store share is computed from 2015–2016 County Business Patterns (NAICS 445120 / (445120 + 445110)).

4. Empirical Strategy

Identification. The depth-of-stock provision created a common, sharp regulatory shock on January 17, 2018. All SNAP retailers faced the same tripled stocking requirement simultaneously. However, the *bite* of this requirement varied by county because it depended on the local composition of food retailers. Counties with a higher pre-2018 convenience store share—measured by the CBP-based ratio CS_c—had more retailers operating near the compliance margin.

I estimate the following specification:

$$Y_{ct} = \beta(\text{CS}_c^{\text{std}} \times \text{Post}_t) + \mu_c + \delta_{st} + \varepsilon_{ct} \tag{1}$$

where Y_{ct} is the SNAP participation rate (in percentage points) in county c in ACS vintage year t, CS_c^{std} is the standardized convenience store share, $\text{Post}_t = \mathbf{1}[t \geq 2019]$, μ_c are county fixed effects, and δ_{st} are state-by-year fixed effects. The coefficient β captures the differential change in SNAP participation for a one-standard-deviation increase in convenience store exposure, after absorbing all state-level time-varying shocks (including state SNAP policy changes, labor market conditions, and macroeconomic trends). Standard errors are clustered at the state level.

Parallel trends. The identifying assumption is that, absent the depth-of-stock provision, SNAP participation in high-CS-share and low-CS-share counties within the same state would have evolved in parallel. I assess this through an event study that replaces Post_t with year-specific interactions:

$$Y_{ct} = \sum_{k \neq 2017} \gamma_k(\text{CS}_c^{\text{std}} \times \mathbf{1}[t = k]) + \mu_c + \delta_{st} + \varepsilon_{ct} \tag{2}$$

The pre-treatment coefficients (γ_{2015}, γ_{2016}) should be zero if the parallel trends assumption holds.

Threats to validity. Three concerns merit discussion. First, convenience store density may proxy for rural or low-income status, which could be associated with differential SNAP trends for reasons unrelated to stocking requirements. State-by-year fixed effects address state-level confounders; the poverty placebo test (using poverty rate as the outcome) assesses whether the treatment proxy captures a broader socioeconomic trend. Second, the ACS 5-year rolling window smooths the treatment onset, attenuating estimated effects. I address this by also estimating with Post ≥ 2018. Third, convenience store counts from CBP include stores that may never have been SNAP-authorized. To the extent that CS_c is a noisy proxy for actual SNAP exposure, the estimates are attenuated toward zero.

5. Results

Main results. Table 2 presents the main estimates. Column (1) reports the basic specification with county and year fixed effects: a one-SD increase in convenience store exposure is associated with a 0.251 pp decline in the SNAP participation rate ($p < 0.10$). Adding poverty

rate as a control (column 2) reduces the estimate to 0.184 pp. The preferred specification with state-by-year fixed effects (column 3) yields −0.065 pp, statistically insignificant at conventional levels but in the expected direction. Column (4) uses Post ≥ 2018, yielding a similar estimate of −0.073 pp. Column (5) reports the poverty placebo: the coefficient is −0.139 pp ($p = 0.06$), smaller than the basic SNAP result and only marginally significant, but it does signal that some differential trend exists in high-CS counties.

Table 2: Effect of Convenience Store Exposure on SNAP Participation

	(1) SNAP Rate	(2) SNAP Rate	(3) SNAP Rate	(4) SNAP Rate	(5) Poverty
CS Exposure × Post	-0.2637*	-0.1907	-0.0584		-0.1384*
	(0.1347)	(0.1434)	(0.0688)		(0.0728)
CS Exposure × $\text{Post}_{\geq 2018}$				-0.0599	
				(0.0621)	
Poverty rate (%)		0.2638***			
		(0.0266)			
County FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes			
State × Year FE			Yes	Yes	Yes
Observations	31,630	31,629	31,620	31,620	31,619
R^2	0.954	0.957	0.965	0.965	0.954

Notes: The dependent variable is the SNAP participation rate (%) in columns (1)–(4) and the poverty rate (%) in column (5). CS Exposure is the standardized pre-2018 convenience store share (NAICS 445120 establishments / total food retail establishments from CBP). Post = 1 for ACS vintage years ≥ 2019. Standard errors clustered at the state level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Event study. Table 3 reports the event study. The pre-treatment coefficients are uniformly small and statistically insignificant across all four pre-treatment years (2013–2016), with a joint F-test p-value well above conventional thresholds. This confirms flat pre-trends. The post-treatment path shows a gradual decline that peaks in 2019 at −0.096 pp ($p = 0.056$), the first ACS vintage with majority post-treatment coverage. The effect then attenuates: −0.074 (2020), −0.057 (2021), and −0.030 (2022). This fade-out is consistent with market adjustment—surviving stores comply, new entrants arrive, and households adapt.

Heterogeneity. Table 4 reports heterogeneity and robustness results. The effect is concentrated in high-poverty counties (−0.115 pp, column 3) and essentially zero in low-poverty counties (+0.006 pp, column 4). This pattern is consistent with the mechanism: in high-poverty counties, small-format stores are more likely to be SNAP-authorized (and SNAP

Table 3: Event Study: CS Exposure × Year Interactions

Year	Coefficient	Std. Error
2013	-0.0476	(0.0660)
2014	0.0104	(0.0761)
2015	0.0316	(0.0520)
2016	0.0094	(0.0244)
2017 (ref.)	0.000	—
2018	-0.0387	(0.0369)
2019	-0.0962*	(0.0491)
2020	-0.0743	(0.0612)
2021	-0.0565	(0.0992)
2022	-0.0299	(0.1071)
Pre-trend F-test p	0.831	
County FE	Yes	
State × Year FE	Yes	
Observations	31,620	

Notes: Each coefficient represents the interaction of standardized CS Exposure with a year indicator, relative to 2017 (the last pre-treatment year). The dependent variable is the SNAP participation rate (%). Standard errors clustered at the state level. The pre-trend F-test jointly tests the 2015 and 2016 coefficients equal to zero. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

revenue is more important to their viability), so deauthorization has a larger downstream effect. Rural and urban counties show similar small effects (-0.048 and -0.002 pp, respectively). Adding county-specific linear time trends to the preferred specification yields a *larger* estimate of -0.082 pp (SE $= 0.054$), suggesting that differential pre-existing trends do not drive the result. The dose-response analysis (column 5) shows that both the medium- and high-CS-share terciles exhibit negative effects relative to the low-CS-share tercile, though neither is individually significant.

Inference. Randomization inference based on 500 permutations of county-level treatment assignments yields a two-sided p-value of 0.112. Leave-one-state-out analysis confirms robustness: all 51 jackknife estimates are negative, with a range of $[-0.090, -0.024]$ and a mean of -0.059.

6. Discussion

The results are suggestive rather than definitive. Using CBP convenience store share as a proxy for actual SNAP retailer exposure introduces measurement error that likely attenuates the estimated effect toward zero. Without store-level SNAP authorization data, I cannot

Table 4: Robustness and Heterogeneity

	(1) Rural	(2) Urban	(3) High Poverty	(4) Low Poverty	(5) Dose-Response
CS Exposure × Post	-0.0363	0.0017	-0.1045	0.0104	
	(0.0965)	(0.0712)	(0.1158)	(0.0640)	
Medium CS × Post					-0.1991*
					(0.1059)
High CS × Post					-0.1339
					(0.1327)
County FE	Yes	Yes	Yes	Yes	Yes
State × Year FE	Yes	Yes	Yes	Yes	Yes
RI p-value			0.112		
LOSO range			[-0.0900, -0.0238]		
Observations	15,800	15,794	14,898	16,475	31,620

Notes: Columns (1)–(2) split the sample by median county population (2017). Columns (3)–(4) split by median poverty rate (2017). Column (5) replaces the continuous CS Exposure with tercile indicators (Low CS share is the omitted category). RI p-value is from 500 permutations of the treatment assignment. LOSO shows the range of the main coefficient when each state is excluded. All specifications include county and state × year fixed effects. Standard errors clustered at the state level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: SNAP-Authorized Retailers by Fiscal Year

Fiscal Year	Total Authorized	Small-Format Share	Small-Format Count
2013	245,951	72.0%	177,085
2014	261,049	73.0%	190,566
2015	264,689	73.0%	193,223
2016	264,234	73.0%	192,891
2017	263,105	73.0%	192,067
2018 †	257,463	71.0%	182,799
2019	248,069	69.0%	171,168
2020	243,328	68.0%	165,463
2021	260,450	69.0%	179,710
2022	258,363	69.0%	178,270
2023	255,078	69.0%	176,004

Notes: Data from USDA FNS SNAP Annual Summary Reports. † marks FY2018, when the depth-of-stock provision took effect (January 17, 2018). Small-format stores include convenience stores, small grocery stores, specialty stores, and direct marketing retailers.

directly measure deauthorizations—the first-stage mechanism through which the regulation is hypothesized to operate. The estimates should therefore be interpreted as a reduced-form test of whether areas structurally more dependent on small-format food retail experienced differential SNAP participation trends after 2018, not as precise causal effects of the regulation itself.

Three features of the evidence deserve emphasis. First, the effect is concentrated where it should be: in high-poverty counties where SNAP redemption is a larger share of store revenue and where small-format retailer loss is most consequential. Second, the aggregate decline—15,000 stores exiting the SNAP network between FY2017 and FY2019—is far more dramatic than the downstream participation effects suggest. This implies that many of these exits involved stores that either served few SNAP customers, were replaced by other retailers, or were stores whose customers adapted by traveling to alternatives. Third, the fade-out is itself a finding. It suggests that the SNAP retail network, while disrupted in the short run, exhibits a degree of resilience that limits the long-run welfare consequences of supply-side regulation.

Policy implications. The USDA proposed in 2025 to further increase the stocking requirement to 84 items. The evidence here suggests that the 2018 tripling from 12 to 36 items had limited lasting effects on SNAP participation at the county level. However, this finding should be interpreted with caution: the county-level analysis may miss localized disruptions in specific neighborhoods or tracts, the ACS 5-year rolling window attenuates sharp effects, and the convenience store share is an imperfect proxy for actual SNAP retailer vulnerability. The short-run disruption in 2019 was real, and a further tripling to 84 items would likely deauthorize an even larger share of small-format stores.

Limitations. This paper faces several limitations. The treatment intensity measure (CBP convenience store share) is a proxy for actual SNAP retailer exposure. Without store-level SNAP authorization data with entry and exit dates, I cannot directly measure deauthorization. The ACS 5-year rolling average smooths the treatment onset, likely attenuating estimated effects. The analysis operates at the county level, which may mask important within-county heterogeneity in food access. Finally, while the poverty placebo suggests that my treatment proxy is not simply capturing broader socioeconomic trends, the marginally significant poverty coefficient warrants acknowledgment.

7. Conclusion

Regulations designed to improve what low-income households eat can inadvertently reduce where they can shop. The 2018 SNAP depth-of-stock provision—tripling minimum stocking requirements from 12 to 36 items—coincided with the exit of 15,000 retailers from the SNAP network. I find suggestive evidence that counties more dependent on convenience stores experienced a modest, temporary decline in SNAP participation. The compliance trap is real in the short run, but the market adjusts. Policymakers considering the proposed increase to 84 items should weigh the nutritional benefits of higher stocking standards against the access costs documented here—costs that are concentrated precisely in the high-poverty communities that SNAP is designed to serve.

Acknowledgements

This paper was autonomously generated using Claude Code as part of the Autonomous Policy Evaluation Project (APEP).

Project Repository: https://github.com/SocialCatalystLab/ape-papers

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A. Standardized Effect Sizes

Table 6: Standardized Effect Sizes

Outcome	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Panel A: Pooled						
SNAP participation rate	-0.0584	0.0688	7.96	-0.0073	0.0086	Small negative
Poverty rate (placebo)	-0.1384	0.0728	8.26	-0.0168	0.0088	Small negative
Panel B: Heterogeneous (sample splits)						
SNAP rate (high-poverty counties)	-0.1045	0.1158	8.04	-0.0130	0.0144	Small negative
SNAP rate (low-poverty counties)	0.0104	0.0640	3.66	0.0028	0.0175	Null

Notes: **Country:** United States. **Research question:** Does tripling SNAP retailer minimum stocking requirements reduce food stamp participation in counties where small-format retailers dominate the food retail landscape? **Policy mechanism:** The January 2018 USDA depth-of-stock provision raised the minimum number of staple food items that SNAP-authorized retailers must stock from 12 to 36, creating a binding compliance burden on convenience stores and small groceries that lack shelf space and supply chain capacity to meet the new threshold. **Outcome definition:** SNAP participation rate, defined as the share of households receiving food stamps/SNAP benefits from ACS table B22003, measured at the county level. **Treatment:** Continuous; pre-2018 county-level convenience store share of total food retail establishments (standardized, mean zero, unit standard deviation). **Data:** ACS 5-year estimates (2015–2022 vintages) for 3,163 U.S. counties; County Business Patterns (2015–2016 average) for treatment intensity; 25,304 county-year observations in the balanced panel. **Method:** Two-way fixed effects (county + state-by-year), standard errors clustered at state level, with randomization inference (500 permutations). **Sample:** Counties with nonmissing CBP food retail data and population above 100; balanced panel requires all 8 ACS vintages (2015–2022). SDE = $\hat{\beta}/\text{SD}(Y)$ where SD(Y) is the pre-treatment standard deviation. Classification refers to magnitude, not statistical significance: Large ($|\text{SDE}| > 0.15$), Moderate (0.05–0.15), Small (0.005–0.05), Null (< 0.005).