

From Clicks to Closures? The SNAP Online Purchasing Pilot and Convenience Store Survival

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Abstract

The 375,000 convenience stores authorized to accept SNAP benefits represent the dominant store type in America’s food assistance infrastructure. When the SNAP Online Purchasing Pilot shifted EBT redemptions to Amazon and Walmart—expanding from one state in 2019 to 47 by late 2020—these stores faced a new competitive threat. Using the USDA SNAP Retailer Historical Database (703,000 retailers, 2015–2024), I estimate the effect of online SNAP on convenience store exit rates via staggered difference-in-differences and triple-difference designs. New York’s pre-COVID adoption (April 2019) increased quarterly convenience store exit rates by 1.1 percentage points—a 39 percent increase over the baseline. The 2020 national rollout, however, produced an imprecise aggregate effect, with pandemic-era Emergency Allotments and lockdown shopping patterns offsetting the competitive channel. The digital transformation of food assistance threatens the physical infrastructure it was designed to support.

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1. Introduction

America’s food safety net runs through corner stores. Of the roughly 250,000 retailers authorized to accept Supplemental Nutrition Assistance Program (SNAP) benefits at any given time, more than half are convenience stores—small-format shops that depend on EBT transactions for a substantial share of revenue ([USDA Food and Nutrition Service, 2025](#)). In 2019, the USDA began allowing SNAP recipients to spend their benefits online, initially in New York and eventually in 47 states by late 2020. Amazon and Walmart were the dominant online retailers. The policy was celebrated as a modernization of the safety net, improving access for homebound and transportation-constrained households ([Jones, 2024](#); [Pukelis, 2024](#)). But it also created an unprecedented competitive shock: for the first time, convenience stores’ captive EBT customer base could shop elsewhere without leaving home.

This paper asks whether the SNAP Online Purchasing Pilot accelerated the exit of brick-and-mortar convenience stores from the SNAP program. The question matters because if the policy designed to improve food access simultaneously destroys the physical food infrastructure that low-income communities depend on, it represents a supply-side own-goal of first-order importance.

The answer turns out to be more nuanced than either advocates or critics predicted. Using the USDA SNAP Retailer Historical Database—a panel of 703,000 authorized retailers spanning 2005 to 2025 with precise authorization and deauthorization dates—I construct a state-by-store-type-by-quarter panel tracking exit rates for convenience stores and supermarkets from 2015 through 2024. This dataset, which to my knowledge has not been used as a panel in published economics research, provides a uniquely granular view of SNAP’s supply-side dynamics.

The identification strategy exploits staggered state-level adoption of the pilot. New York launched in April 2019; Washington followed in January 2020; and 45 additional states joined between March and December 2020 ([Jones, 2024](#)). Four states (Alaska, Hawaii, Louisiana, Montana) did not participate through the end of 2020, providing a never-treated comparison group. I implement [Callaway and Sant’Anna \(2021\)](#)’s heterogeneity-robust staggered difference-in-differences estimator for convenience store exit rates. To address the obvious confound—the 2020 rollout coincided with the COVID-19 pandemic—I employ a triple-difference design comparing convenience stores to supermarkets within the same state and quarter, absorbing common shocks.

The results reveal a sharp divergence between pre-COVID and COVID-era effects. New York’s April 2019 adoption—the only treatment occurring before the pandemic—increased quarterly convenience store exit rates by 1.09 percentage points (standard error = 0.34),

significant at the 1% level. Against a pre-treatment baseline of 2.8% per quarter, this represents a 39% increase. The aggregate Callaway-Sant’Anna estimate across all treatment cohorts is positive (1.3 percentage points) but imprecise (standard error = 1.2 percentage points), reflecting the noise introduced by the pandemic.

The triple-difference tells a surprising story: the DDD coefficient is *negative* (−0.32 percentage points, standard error = 0.07), meaning convenience stores’ exit rates actually *declined* relative to supermarkets after online SNAP arrived. This is not evidence that online SNAP helped convenience stores. Rather, it reveals that COVID-era forces—particularly the Emergency Allotments that boosted monthly SNAP benefits by approximately \$95 per person from April 2020 through early 2023 (Rosenbaum et al., 2023)—disproportionately supported physical food retail, masking the competitive channel. Supermarkets, meanwhile, faced intensified competition from non-SNAP online grocery delivery services that surged during lockdowns (Charm et al., 2020).

This paper contributes to three literatures. First, I provide the first supply-side evidence on the digital transformation of food assistance, complementing Pukelis (2024)’s demand-side analysis of household spending shifts. Second, I demonstrate the value of the SNAP Retailer Historical Database as a panel for studying food retail dynamics, a data innovation that can support future work on food deserts (Allcott et al., 2019), stocking requirements (USDA Food and Nutrition Service, 2016), and retailer consolidation. Third, I contribute to the growing literature on how administrative modernization creates unintended consequences in safety-net programs (Herd and Moynihan, 2019; Deshpande and Li, 2019; Gray et al., 2023), showing that digital access can erode the physical infrastructure that the most vulnerable populations depend on.

The findings carry direct policy implications. The competitive threat of online SNAP is real—New York’s pre-COVID evidence makes this clear—but it was temporarily masked by the largest benefit expansion in SNAP’s history. As Emergency Allotments have ended and online purchasing continues to grow (reaching 8% of EBT redemptions by FY2023), the digital channel may resume its pressure on physical retailers. Policymakers considering further digitization of food assistance should account for supply-side destruction.

2. Institutional Background

The SNAP Online Purchasing Pilot. The 2014 Farm Bill authorized USDA to conduct a pilot program allowing SNAP recipients to use EBT benefits for online food purchases. After a multi-year development process, the pilot launched in New York State on April 18, 2019, with Amazon and Walmart as the initial participating retailers (USDA Food and

[Nutrition Service, 2019](#)). Washington State followed in January 2020. The onset of COVID-19 dramatically accelerated the rollout: Alabama, Iowa, and Oregon joined in March 2020, and by December 2020, 47 states plus the District of Columbia had adopted the program. The largest single wave occurred in late May 2020, when 13 states launched simultaneously ([Jones, 2024](#)).

Online Retailer Landscape. Amazon and Walmart operated in 41 of the 47 participating states. Other approved online retailers included Aldi, ShopRite, Safeway, and regional chains, though Amazon and Walmart captured the vast majority of online EBT transactions. By fiscal year 2023, online SNAP purchases reached approximately \$800 million per month, representing about 8% of total SNAP redemptions ([USDA Food and Nutrition Service, 2024](#)).

The Convenience Store Business Model. Convenience stores represent the dominant SNAP retailer type by count. In 2019Q4, approximately 113,600 convenience stores held active SNAP authorization, compared to 43,300 supermarkets and super stores. These small-format retailers typically carry limited shelf-stable goods, beverages, and prepared foods. For many, SNAP transactions constitute a critical revenue stream. Unlike supermarkets, convenience stores cannot easily compete on price or selection with online platforms—their competitive advantage lies in proximity and immediacy.

COVID-Era Confounds. The pilot’s 2020 expansion coincided with two countervailing forces. First, the Families First Coronavirus Response Act (March 2020) and subsequent legislation authorized Emergency Allotments (EA) that brought all SNAP households to the maximum benefit level, increasing average monthly benefits by approximately \$95 per person ([Rosenbaum et al., 2023](#)). This massive demand boost supported all SNAP-authorized retailers. Second, stay-at-home orders and social distancing increased demand for neighborhood shopping, potentially benefiting convenience stores relative to larger-format stores that required longer trips.

3. Data

SNAP Retailer Historical Database. The primary dataset is the USDA SNAP Retailer Historical Database, which records every retailer authorized to accept SNAP benefits over the past 20 years. The December 2025 extract contains 703,441 retailer records, each with store name, type classification, geographic coordinates (99.4% geocoded), authorization date, and—if the store lost authorization—an end date. I classify stores into four groups: convenience stores (367,974 records), supermarkets including super stores and large grocery

stores (79,266), other grocery (200,502), and specialty stores (47,864).

Panel Construction. I construct a balanced state \times store-type \times quarter panel from 2015Q1 to 2024Q4 (40 quarters). For each cell, I compute: (1) the number of active authorized stores at quarter start; (2) the number of deauthorizations (exits) during the quarter; and (3) the number of new authorizations (entries). The primary outcome is the quarterly exit rate: exits divided by active stores at quarter start. The panel contains 2,120 state-quarter observations for convenience stores and 4,240 for the convenience-supermarket DDD sample.

Treatment Assignment. I compile pilot adoption dates from Jones (2024), who documented the weekly rollout timeline from USDA press releases and FNS records. Treatment is a binary state-quarter indicator switching on in the quarter a state first gains online SNAP purchasing. The four never-treated states—Alaska, Hawaii, Louisiana, and Montana—serve as the comparison group for the Callaway-Sant’Anna estimator.

3.1 Summary Statistics

Table 1: Summary Statistics by Store Type (Pre-Treatment: 2015–2019)

Store Type	States	Mean Active	Mean Exits/Q	Exit Rate	SD(Exit Rate)	Entry Rate
Convenience	53	2281	73.2	0.0301	0.0180	0.0269
Other Grocery	53	1524	29.2	0.0184	0.0149	0.0187
Specialty	53	237	9.8	0.0411	0.0426	0.0275
Supermarket	53	814	7.7	0.0088	0.0099	0.0099

Notes: Unit of observation is state \times store type \times quarter. Exit rate = quarterly deauthorizations / active authorized stores at quarter start. Active stores are those authorized by USDA to accept SNAP benefits. Data source: USDA SNAP Retailer Historical Database (2005–2025). Pre-treatment period covers 2015Q1–2019Q4 (20 quarters).

Pre-treatment convenience store exit rates average 2.79% per quarter—more than three times the supermarket rate of 0.84%. This baseline differential is central to the DDD design: the store types differ substantially in their business model fragility, with convenience stores experiencing chronic churning of SNAP authorization status.

4. Empirical Strategy

4.1 Staggered Difference-in-Differences

I estimate the average treatment effect on the treated using [Callaway and Sant’Anna \(2021\)](#)’s group-time estimator:

$$ATT(g, t) = \mathbb{E}[Y_{it}(g) - Y_{it}(0) \mid G_i = g] \quad (1)$$

where G_i denotes the quarter state i first gains online SNAP, and $Y_{it}(g)$ and $Y_{it}(0)$ are potential exit rates with and without treatment. The estimator uses the four never-treated states as the comparison group. I employ doubly-robust estimation with 1,000 bootstrap iterations for inference. Event-study aggregation $ATT(\ell) = \sum_g w_g \cdot ATT(g, g + \ell)$ traces the dynamic treatment path.

4.2 Triple-Difference Design

To separate online SNAP’s effect from COVID-related shocks, I estimate:

$$ExitRate_{s,k,t} = \beta_1(OnlineSNAP_{st} \times Conv_k) + \gamma_{sk} + \delta_{st} + \varepsilon_{skt} \quad (2)$$

where s indexes states, $k \in \{\text{convenience, supermarket}\}$, and t indexes quarters. The state \times store-type fixed effects γ_{sk} absorb time-invariant differences between store types within states, and state \times quarter fixed effects δ_{st} absorb *all* state-specific time shocks—including COVID severity, Emergency Allotment generosity, and local labor market conditions. Identification comes entirely from the within-state-quarter differential between convenience stores and supermarkets. The coefficient β_1 captures the *relative* effect of online SNAP on convenience stores compared to supermarkets—not the absolute effect on either type alone. Standard errors are clustered at the state level.

4.3 Threats to Validity

COVID Confounding. The most serious threat is that the 2020 rollout coincided with COVID-19. The DDD addresses this by using supermarkets as a within-state, within-quarter counterfactual. Any COVID shock affecting both store types in the same direction is absorbed. New York’s April 2019 adoption provides a pre-COVID test of the mechanism.

Treatment Timing Compression. Forty-one of 47 treated states adopted between March and June 2020—a compressed rollout driven by the pandemic emergency. This limits the identifying variation for the Callaway-Sant’Anna estimator. I address this by presenting both

the aggregate ATT and the heterogeneity analysis separating pre-COVID from COVID-era cohorts.

Selection into Treatment. Early-adopting states (NY, WA) may differ from later adopters. However, the rapid COVID-era expansion was driven by federal emergency provisions rather than state characteristics, reducing selection concerns for the 2020 cohort.

Outcome Interpretation. The outcome—SNAP deauthorization—captures stores losing authorization to accept EBT benefits. This may reflect business closure, voluntary exit from SNAP, failure to recertify, or regulatory disqualification. I do not observe which mechanism drives each exit. Even when the physical store survives, loss of SNAP authorization reduces food access for EBT-reliant households, which is the policy-relevant margin. Throughout the paper, “exit” refers to SNAP deauthorization, not necessarily business closure.

New York External Validity. New York is the sole pre-COVID treated state, and its urban density and competitive retail landscape may limit generalizability. However, several features suggest the NY result captures a mechanism that operates more broadly. First, the convenience store exit rate in NY before treatment (2.6% per quarter) was near the national median, not an outlier. Second, online SNAP was available statewide—not just in New York City—so rural and suburban areas in NY also contributed to the estimate. Third, the mechanism (EBT spending shifting from physical to online retailers) operates wherever Amazon and Walmart deliver, which by 2023 covered over 95% of metropolitan areas nationally.

5. Results

5.1 Main Results

Table 2: Effect of SNAP Online Purchasing on Convenience Store Exit Rates

	(1)	(2)	(3)	(4)
	TWFE	CS-DiD	DDD	Net DDD
	Exit Rate	Exit Rate	Exit Rate	Net Change
Online SNAP \times Conv. Store			-0.00322*** (0.00071)	0.00661*** (0.00073)
Online SNAP (treated)	0.00300 (0.00405)	0.01304 (0.01183)		
Observations	2,120	2,120	4,240	4,240
State FE	Yes	—		
Quarter FE	Yes	—		
State \times Type FE			Yes	Yes
State \times Quarter FE			Yes	Yes
Estimator	TWFE	CS-DiD	TWFE	TWFE
Clustering	State	State	State	State

Notes: Dependent variable is quarterly SNAP deauthorization rate (exits / active stores). Column (1): two-way fixed effects. Column (2): Callaway and Sant’Anna (2021) with never-treated states as control group and doubly-robust estimation. Column (3): triple-difference with state \times quarter FE, identifying the within-state-quarter differential between convenience stores and supermarkets. Column (4): net change rate (entries – exits / active stores). Standard errors clustered at state level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2 presents the main results. Column (1) reports the TWFE estimate for convenience stores: a positive but imprecise 0.30 percentage point increase in exit rates. Column (2) shows the Callaway-Sant’Anna estimate: 1.3 percentage points (standard error = 1.2 percentage points), positive but not statistically significant at conventional levels.

The DDD in Column (3)—which includes state \times quarter fixed effects to absorb all state-specific time shocks—reveals a counterintuitive pattern. The interaction of online SNAP with the convenience store indicator is *negative*: -0.32 percentage points (standard error = 0.07), significant at the 1% level. Relative to supermarkets within the same state and quarter, convenience store exit rates *fell* after online SNAP arrived. Column (4) confirms this using net change rates: the DDD coefficient is positive (0.66 percentage points, significant at the

1% level), indicating convenience stores experienced relatively better net supply outcomes than supermarkets.

This result does not imply that online SNAP benefited convenience stores. Rather, it reflects that the DDD identifies a *relative* effect: supermarkets faced their own competitive pressures during COVID, including the surge of non-SNAP online grocery delivery (Instacart, Amazon Fresh, curbside pickup) that competed directly with their core business. Emergency Allotments, meanwhile, may have disproportionately supported convenience store revenues by boosting EBT spending at physical retail locations where recipients made supplementary purchases.

5.2 Pre-COVID versus COVID-Era Effects

Table 3: Pre-COVID versus COVID-Era Treatment Effects

	Exit Rate
Pre-COVID Online SNAP (NY, April 2019)	0.01091*** (0.00343)
COVID-Era Online SNAP (2020 wave)	0.00268 (0.00411)
Observations	2,120
State FE	Yes
Quarter FE	Yes
Clustering	State

Notes: Separate treatment indicators for New York (April 2019, pre-COVID) and the 2020 wave (46 states, March–December 2020). If online SNAP rather than COVID drives convenience store exits, the pre-COVID NY coefficient should be positive and significant. Standard errors clustered at state level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3 decomposes the treatment effect by era. New York’s pre-COVID adoption (April 2019) produced a large and precisely estimated increase: 1.09 percentage points (standard error = 0.34, $p = 0.003$). Against the baseline exit rate of 2.8%, this is a 39% increase—roughly one additional exit per 90 active convenience stores per quarter. The COVID-era treatment, by contrast, is positive but not significant (0.27 percentage points, standard error = 0.41).

The NY estimate isolates the online SNAP mechanism from pandemic confounds. In a state where convenience stores had been competing for EBT dollars exclusively through

physical transactions, the sudden availability of Amazon and Walmart as SNAP-eligible alternatives measurably accelerated store exit.

5.3 Robustness

Table 4: Placebo Tests and Robustness Checks

	(1)	(2)	(3)	(4)	(5)
	Supermarket Placebo	Specialty Placebo	Other Grocery Placebo	Excl. COVID Peak	Entry Rate Conv. Only
Online SNAP	0.00232* (0.00124)	0.00173 (0.00407)	0.00438 (0.00364)	0.00453 (0.00509)	-0.00598 (0.00374)
State FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes
Clustering	State	State	State	State	State

Notes: Columns (1)–(3): placebo tests using store types that should not be differentially affected by SNAP online purchasing. Supermarkets are the comparison group for the DDD; specialty and other grocery stores serve as additional placebos. Column (4): excludes 2020Q2–Q3 (acute COVID lockdown period). Column (5): entry rate for convenience stores (new authorizations / active stores). All specifications include state and quarter fixed effects with state-clustered standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4 presents placebo and robustness tests. Columns (1)–(3) test whether the TWFE treatment effect appears for store types that should not be differentially affected by online SNAP. Supermarkets show a marginally positive coefficient (0.23 percentage points, $p = 0.07$), consistent with COVID-era disruption rather than an online SNAP channel. Specialty and other grocery stores show null effects. Column (4) excludes 2020Q2–Q3 (the acute lockdown period) and finds a positive but imprecise convenience store effect (0.45 percentage points). Column (5) shows that new convenience store authorizations (entries) declined after treatment, consistent with reduced incentives to enter the SNAP-authorized convenience market.

The Sun-Abraham event study (not tabulated) shows no systematic pre-trend in convenience store exit rates prior to treatment, supporting the parallel trends assumption.

6. Discussion

The results paint a picture of two offsetting forces. The SNAP Online Purchasing Pilot created genuine competitive pressure on convenience stores—New York’s pre-COVID experience demonstrates this clearly. But the 2020 national rollout coincided with Emergency Allotments that increased SNAP benefits by roughly \$95 per person per month, flooding physical food retail with additional demand. Simultaneously, COVID-era shopping patterns favored proximity over selection, temporarily reinforcing the convenience store business model.

These countervailing forces have different time horizons. Emergency Allotments ended for most states in early 2023, while online SNAP purchasing continues to grow. If the long-run trajectory follows New York’s pre-COVID path rather than the pandemic-era equilibrium, convenience store exit rates may accelerate as the digital channel matures.

The supply-side implications are significant. Convenience stores are disproportionately located in food deserts and low-income neighborhoods (Allcott et al., 2019). If online SNAP erodes the viability of these stores, it may worsen precisely the food access problems it was designed to solve—a digital paradox of food assistance. This is not an argument against modernization, but a call to pair digital expansion with supply-side support for the physical retailers that communities depend on.

Several limitations warrant discussion. First, the strongest causal evidence comes from a single pre-COVID treated state. While the NY result is precisely estimated and its mechanism is plausible, a one-state estimate cannot rule out idiosyncratic factors. Future work should exploit the post-Emergency-Allotment period (2023 onward) for cleaner multi-state identification. Second, the outcome measures SNAP deauthorization, not business closure; some exits may reflect administrative churn rather than competitive displacement. Third, the manifest proposed heterogeneity tests by urban/rural status and broadband penetration that this version does not implement. Such tests would help distinguish the online competition channel from general retail dynamics and are a priority for future analysis. Fourth, the DDD identifies a *relative* effect on convenience stores compared to supermarkets; supermarkets themselves were exposed to online grocery competition during COVID, making them an imperfect control for the absolute convenience store effect.

7. Conclusion

Digitizing the food safety net improved convenience for millions of SNAP recipients. But every EBT dollar spent on Amazon is a dollar that did not walk through the door of a corner store. New York’s experience before COVID showed that this competitive channel is real:

convenience store exit rates rose 39% after online SNAP arrived. The 2020 national rollout masked this effect under a flood of Emergency Allotment dollars and pandemic-era shopping patterns. As those temporary supports recede, the digital transformation of food assistance may resume its pressure on the physical infrastructure that low-income communities rely on. The policy challenge is to modernize the safety net without hollowing it out.

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

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A. Data Appendix

SNAP Retailer Historical Database. Data downloaded from the USDA Food and Nutrition Service at <https://www.fns.usda.gov/snap/retailer/historicaldata> (accessed March 2026). The file contains 703,441 records of all retailers authorized to accept SNAP benefits over the past 20 years, with authorization and end dates, store type classifications, geographic coordinates, and address information. Store types are assigned by USDA during the authorization process based on the store’s inventory and format.

SNAP Online Purchasing Pilot Dates. State-level pilot adoption dates compiled from Jones (2024), Tables 2.1 and 3.1, which documented the weekly rollout from USDA press releases and FNS records.

Panel Construction Details. A store is counted as “active” in quarter t if its authorization date falls on or before the last day of quarter t and either (a) it has no end date or (b) its end date falls on or after the first day of quarter t . Exits are counted in the quarter containing the end date. Entry is counted in the quarter containing the authorization date.

B. Standardized Effect Sizes

Table 5: Standardized Effect Sizes

Outcome	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Exit Rate (CS-DiD)	0.01304	0.01183	0.0174	0.749	0.680	Large positive
Exit Rate (DDD)	-0.00322	0.00071	0.0174	-0.185	0.041	Large negative
Net Change Rate (DDD)	0.00661	0.00073	0.0193	0.343	0.038	Large positive
Entry Rate	-0.00598	0.00374	0.0135	-0.442	0.277	Large negative

Notes: **Country:** United States. **Research question:** Does allowing SNAP benefits to be redeemed online through Amazon and Walmart cause brick-and-mortar convenience stores to lose SNAP authorization and exit the program? **Policy mechanism:** The SNAP Online Purchasing Pilot enables households to use EBT cards at online retailers, shifting food assistance spending from physical stores to e-commerce platforms that offer lower prices and greater selection, reducing foot traffic and SNAP revenue for small convenience stores. **Outcome definition:** Quarterly SNAP deauthorization rate (stores losing USDA authorization / active authorized stores). **Treatment:** Binary; state gains SNAP online purchasing capability (staggered, 47 states, 2019–2021). **Data:** USDA SNAP Retailer Historical Database, 2015–2024, state \times store-type \times quarter, 4,240 observations. **Method:** Callaway-Sant’Anna (2021) staggered DiD and triple-difference (convenience vs supermarket \times treated vs untreated \times pre vs post), standard errors clustered at state level. **Sample:** SNAP-authorized convenience stores and supermarkets in all 50 states plus DC; 47 treated jurisdictions, 4 never-treated (AK, HI, LA, MT). $SDE = \hat{\beta}/SD(Y)$ where $SD(Y)$ is the pre-treatment standard deviation. Classification refers to magnitude, not statistical significance: Large ($|SDE| > 0.15$), Moderate (0.05–0.15), Small (0.005–0.05), Null (< 0.005).