The Impact of Repealing Sunday Blue Laws on Alcohol Sales and Retail Competition[*]

Cristina Connolly Marcello Graziano Alyssa McDonnell Sandro Steinbach

Abstract

This paper studies the impact of repealing Sunday Blue laws on alcohol sales and retail competition. Connecticut repealed its sales restriction in 2012, allowing grocery retailers to sell beer in their stores on Sunday. We rely on a comprehensive scanner dataset and establishment-level business information for the entire United States from 2004 to 2021. Our baseline event studies show that repealing the Sunday Sales law led to a considerable increase in beer sales at grocery stores over the first seven weeks after treatment. After that period, the dynamic treatment effects become statistically insignificant. At the same time, there is no statistical evidence for adverse or positive treatment effects on the long-run economic outcomes for grocery retailers and liquor stores after the policy shift. These results hold up to several robustness checks and a heterogeneity analysis that reveals no differences in the treatment effects for chain and standalone grocery and liquor retailers. These results imply that the liberalization of alcohol sales had limited lasting implications for the performance and conduct of firms operating in the alcohol retail industry.

JEL: Q13, Q18

Keywords: Sunday blue laws, alcohol sales, retail competition, Connecticut, event studies, treatment heterogeneity

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1. Introduction

Blue laws, which, among other things, restrict the sale of alcohol to certain days and times, differ across the United States and often within States. These varying regulations effectively restrict access to alcohol and often align with public moral codes predating the formation of the United States (Dilloff, 1980; Teupe, 2019). Along with linked moral and public health objectives, these laws are thought to affect retail activities across the regulated sectors (e.g., McNiel and Yu, 1989). Specifically, in states with liquor sales outside liquor stores, these laws effectively limit competition between these types of stores and grocery stores over six days of the week, reducing potential sales for grocery stores on Sundays (McNiel and Yu, 1989). Through the years, these possible effects have created pressure from grocery retailers and other outlets to liberalize the sale of alcohol, at least by repealing Sunday Blue laws.

A growing literature studies the behavioral and economic implications of repealing Blue Laws in the United States. Throughout the 1980s and 1990s, those laws were loosened by local and state governments, potentially contributing to behavioral changes (Giles et al., 2023). In 2012, Connecticut repealed its Sunday Sales law, which impacted beer in grocery stores and all alcohol in liquor stores. While research on alcohol accessibility suggests consumers may drink more alcohol when it can be sold in grocery stores (Smart, 1986; Adrian et al., 1995; Wagenaar and Langley, 1995; Rickard, 2012), there is less clarity on the impact of repealing Sunday Sales laws (Popova et al., 2009; Meany et al., 2017), although some studies suggest repealing these laws may either reduce (Greene et al., 2014) or have no effects (Lovenheim and Steefel, 2011) on linked negative behaviors such as fatal vehicle accidents. However, the combined effects on consumption and retail competition have not been studied.

To fill this gap in the literature, this paper uses the repealing of Blue Laws in Connecticut as a case study to assess how this policy shift affected sales, business survival, and employment in both the short and long runs. To this end, this work focuses on the U.S. state of Connecticut from 2004 to 2021. The state repealed its Sunday alcohol blue laws in 2012, among a wave of repeals that went through multiple jurisdictions in the U.S. In many states, including Connecticut, the alcohol market is regulated through a "three-tiered system," separating manufacturers, distributors, and retailers with some exceptions for small, local, craft, and farm producers (Chen, 2018). For Connecticut, these retailers include (1) package stores, which are allowed to sell beer, wine, and liquor, and (2) grocery stores which are allowed to sell beer, and there are additional restrictions on the number of permitted retail establishments any individual can own (Chen & Dwyer, 2012; Chen, 2018). Additionally, Connecticut's minimum pricing laws limited the discounting of alcohol to no less than 90% of the price the retailer pays and regulated when retailers could sell alcohol, including restrictions on Sunday sales and hours of operations (Chen & Dwyer, 2012). This combination fostered an environment in which many package stores are small and independently owned stores while concurrently, the grocery store industry has trended towards consolidation (Capozzi, 2022; Zeballos et al., 2023).

When the question of allowing Sunday Sales arose, there was contentious debate concerning tradeoffs between the underlying religious aspects that led to Sunday sales prohibitions and consumer demand for increased access (Yörük & Lee, 2018). However, concerns from small retailers and distributors, who benefit from regulated hours that reduce costs and limit competition, were especially vocal. When the state of Connecticut ultimately allowed Sunday sales in 2012, proprietors of liquor stores expressed anxiety that this would have a negative impact on their livelihood as they would now need to pay operating costs for an extra day of the week, with little effect on

the operating costs of grocery stores, which were already open on Sundays (CPSA, 2010). Additionally, there were concerns that this expansion of Sunday sales would shift where consumers purchased alcohol as Sunday is one of the largest food shopping days, allowing these patrons to purchase beer in the grocery store.

The objectives of this paper are twofold. First, we investigate and measure the effects that repealing Blue Sunday laws has on alcohol sales at grocery retailers in the short run. Second, we investigate and measure whether changes to Blue Sunday laws impact business survivability, employment, and sales of grocery retailers and liquor stores in the long run. To answer these research questions, we compiled a comprehensive dataset from two sources. First, we use the National Establishment Time Series (NETS) database, which covers all U.S. businesses at the establishment level from 2004 to 2021 (Walls & Associates, 2023). Each establishment includes information on employment count, gross sales, business location, headquarters linkages, and years of activity. Second, we use NielsenIQ retail scanner data, which contains weekly sales data at the UPC level for establishments across the U.S. from 2004 to 2021. Both sources provide the North American Industry Classification System (NAICS) codes for each establishment. We use NAICS codes 445310 (Beer, Wine, and Liquor Stores) and 445110 (Supermarkets and Other Grocery (except Convenience Stores) for the analysis. We match the two datasets by focusing on the period from 2004 to 2019, thus also excluding the potential effects of the COVID-19 pandemic.

Our baseline event studies show that repealing the Sunday Sales law led to a considerable increase in beer sales at grocery stores over the first seven weeks after treatment. After that period, the dynamic treatment effects become statistically insignificant. Additionally, we find no statistical evidence for adverse or positive treatment effects on the long-run economic outcomes for grocery retailers and liquor stores after the policy shift. These results hold up to several robustness checks

and a heterogeneity analysis that reveals no differences in the treatment effects for chain and standalone grocery and liquor retailers. Since for all three outcomes, alcohol sales, business survival, and employment, our results show limited quantity and time effects, we can conclude that the repeal of these laws has not harmed liquor stores. From a policy perspective, our results suggest it is possible to repeal Blue Laws without negatively impacting smaller package and liquor stores.

2. Methods and Data

2.1. Methods

To assess the potential for dynamic treatment effects of blue laws (BL) on business activities, we adopted a non-linear panel regression model for count data with dynamic treatment effects (Freyaldenhoven et al., 2021):

$$y_{it} = \exp\left(\alpha_i + \alpha_t + \alpha_{m,t} + \sum_{k=-n}^{n} \delta_k \, BL_{i,t-k} + X_{it}\gamma_x\right) + \eta_{it} \,, \qquad (1)$$

where we denote the establishment with i, the market with m, and the year/week with t. The model controls for the influence of unobserved factors that could confound the relationship of primary interest with establishment α_i and time α_t fixed effects. We account for changes in the market attractiveness through the market-year/week $\alpha_{m,t}$ trends. The specification of the linear market trends follows earlier research on the impact of competitive entry in the retail grocery industry (see, e.g., Arcidicano et al., 2020).[1] The dependent variable is denoted by y_{it} and maps into three specifications: business survival, sales, and employment. Instead of assuming static treatment

[1] Note that the no other states changed their Blue Laws in the event window. Hence, we are not concerned about the research design being biased due to staggered adoption (Athey & Imbens, 2022) and differences in treatment timing (Goodman-Bacon, 2021).

paths, we allow them to be dynamic before and after the treatment year. We center the event study according to the year/week when blue laws were implemented. We use an event window of twelve weeks to study the short-run response of beer sales and six years before and after the policy shift to assess the long-run treatment dynamics. We binned the endpoints of the event window to show long-term trends and test for pre-trends and leveling-off treatment effects. Deploying the parsimonious assumption that all latent confounders are invariant at the establishment, year, and market-trend levels, we identify the dynamic treatment effects by relying on variation between treated and untreated establishments over time.

We use the Poisson pseudo-maximum likelihood (PML) estimator to identify the relationship between the treatment variables and the outcome of interest (Gong & Samaniego, 1981; Gourieroux et al., 1984). The estimator is unbiased and consistent in the presence of heteroskedasticity. Even if the conditional variance is not proportional to the conditional mean, the estimator is consistent (Wooldridge, 1999; Cameron & Trivedi, 2013). An advantage of the Poisson PML estimator is that the scale of the dependent variable does not affect the parameter estimates. If the conditional mean is correctly specified, the Poisson PML estimator yields parameter estimates that have a similar magnitude to the estimates of both the Gaussian and Negative Binomial PML estimators. We account for the high-dimensional fixed effects by using a modified version of the iteratively re-weighted least-squares (IRLS) algorithm that is robust to statistical separation and convergence issues (Correia et al., 2020). Following standard practice, we assume that the standard errors are correlated at the establishment level, prompting us to cluster them at this level (Cameron & Miller, 2015).

2.2. Data

The two primary datasets used for this analysis are the NielsenIQ retail scanner data (Chicago Booth, 2023), which contains weekly sales data at the UPC level for all U.S. establishments for 2012, and the National Establishment Time Series (NETS) database, which covers business information (survival, employment, and sales) for all U.S. retail establishments from 2004 to 2021. Both datasets contain a classification of all establishments according to the North American Industry Classification System (NAICS) code. We use NAICS codes 445310 (Beer, Wine, and Liquor Stores) and 445110 (Supermarkets and Other Grocery (except Convenience Stores) for the analysis. To control for confounding factors that could impact alcohol purchases, we use states with similar alcohol laws as a control group. Specifically, a state was included in the analysis if it allowed Sunday Sales in the pre-period, allowed alcohol to be sold in grocery stores in the pre-period, and did not have any dry counties.

NielsenIQ Retail Scanner Data

Data on weekly alcohol sales come from the NielsenIQ retail scanner data from the Kilts Marketing Data Center at the University of Chicago Booth School of Business. Data on weekly pricing and sales volume at a UPC level is collected from participating retail stores (ranging from 30,000-50,000 across all categories in a given year). Generally, all stores within a participating chain are included (Chicago Booth, 2023). The identity of individual stores is protected, and stores are instead identified through a unique code; the lowest available geographic information is the county in which the store is located. These establishments are primarily grocery and drug stores and are mostly part of the 90 largest U.S. retail chains. While there are a small number of liquor stores in the retail scanner data set, they were not representative for the 2011-2012 period; the dataset covered approximately 53 percent of all food stores but only 1 percent of liquor stores.

National Establishment Time Series

Data for the business impact analysis comes from the National Establishment Time Series (NETS) database. NETS is an establishment-level business micro-level dataset prepared by Walls & Associates using Dun & Bradstreet's archival data and covers all U.S. businesses at the establishment level from 2000 to 2021. Key NETS concepts are the industry classification, the establishment type, the employment count, the gross sales, the business location, headquarters linkages, and years of activity. In NETS, each establishment is assigned a unique DUNS number, which follows that establishment over time, relocations, and acquisitions. Our analysis focuses on sales, employment, industry, and location. NETS provides the North American Industry Classification System (NAICS) codes, which are self-reported by each establishment. The NAICS codes in our NETS version are from the 2017 NAICS classification, a system that is constant over time. We use NAICS codes 445310 (Beer, Wine, and Liquor Stores) and 445110 (Supermarkets and Other Grocery (except Convenience) Stores) for the analysis.

Although NETS purportedly covers the entirety of the U.S. business universe, questions about the quality of the data and its use have arisen in the economics literature and in the process of our work. The primary concerns surround the coverage of the data and the quality/consistency of reporting. Comparing NETS to proprietary federal sources, like the Census Bureau's County Business Patterns (CBP) or the Bureau of Labor Statistics' Quarterly Census of Employment and Wages, Barnatchez et al. (2017) find that NETS does correlate strongly with official statistics but does not completely cover the same universe of firms for certain sub-industries. For instance, NETS over-represents small establishments and contains discrepancies in employment and sales for the largest businesses. Evidence that suggests that NETS is rounding to the nearest 5 or 10 employees has also been presented in the past (Neumark et al., 2005). Additionally, some concepts,

like industry classification, are self-reported by the establishments, causing potential inconsistencies in the longitudinal observations of each establishment. Some establishments change industry codes over time, which we corrected when identifying the format. Despite these issues, NETS represents one of the best panel data sources on U.S. establishments and is the only one that allows for empirical studies of business activities without accessing proprietary federal data that limit reproducibility.

2.3. Selection of Control Groups

Since the end of prohibition in the US, regulating alcohol sales and distribution has primarily occurred at the state level. These laws vary greatly between states, including minimum pricing laws, excise taxes, availability of permits, and legal hours of operation (Byrne & Nizovtsev, 2017). Regulations generally differ between on-premises sales, where alcohol is consumed in the same place it is sold, such as a restaurant, and off-premises sales, where alcohol is purchased in a store to be consumed elsewhere. For this study, we focus on off-premises sales. To develop a series of control states for Connecticut, we concentrate on three major types of alcohol regulations: (1) Sunday alcohol sales bans, (2) the ability for grocery stores to sell alcohol, and (3) the presence of dry counties (counties which prohibit the sale of alcohol).

Dry Counties

States differ in whether counties are allowed to restrict the sale of alcohol and whether any counties do so. For this study, we excluded any states with at least one dry county, as there are no dry counties in Connecticut. We used data from the National Alcohol Beverage Control Association to identify all states with dry counties from 2004 to 2021. Our control group includes all states without dry counties during the study period, including those that allow for dry counties. However,

we did include states that may have a small number of rural, dry towns or municipalities, as data at this sub-county level is not available across states.

Grocery Store Sales

As Connecticut allows beer to be sold in grocery stores, we only included states that also allow alcohol (beer, wine, or liquor) to be sold in grocery stores. This is a key element for our control group as we will compare beer sales pre- and post-2012, and retail scanner data from Nielsen is predominantly composed of grocery retailers. Our data comes from the National Alcohol Beverage Control Association and is accurate as of 2016 (NABCA, 2016). Work is ongoing to manually identify these values as of 2003.

Sunday Sales

We have excluded any states from our control that, during 2004-2021, had some form of a prohibition on off-premises Sunday alcohol sales. We use the Alcohol Policy Information dataset (APIS, 2023) on Sunday sales as our starting point, which tracks the changes in Sunday Sales laws since 1998. We have also used primary news sources to augment APIS data where relevant.

3. Results and Discussion

3.1. Retail Sales

As Connecticut only allows beer to be sold in grocery stores, we focus on beer sales in our empirical analysis. In Table 1, we see summary statistics for 2012 beer sales in food stores. Generally, Connecticut has higher sales in both the pre- and post-time periods than the control states. However, Connecticut also has higher beer prices, which could explain differences in overall sales. Looking instead at the total milliliters sold, we see that Connecticut's values more closely mirror that of the

control states. In both Connecticut and the control states, there are more sales in the post period, which begins on May 20, 2012.

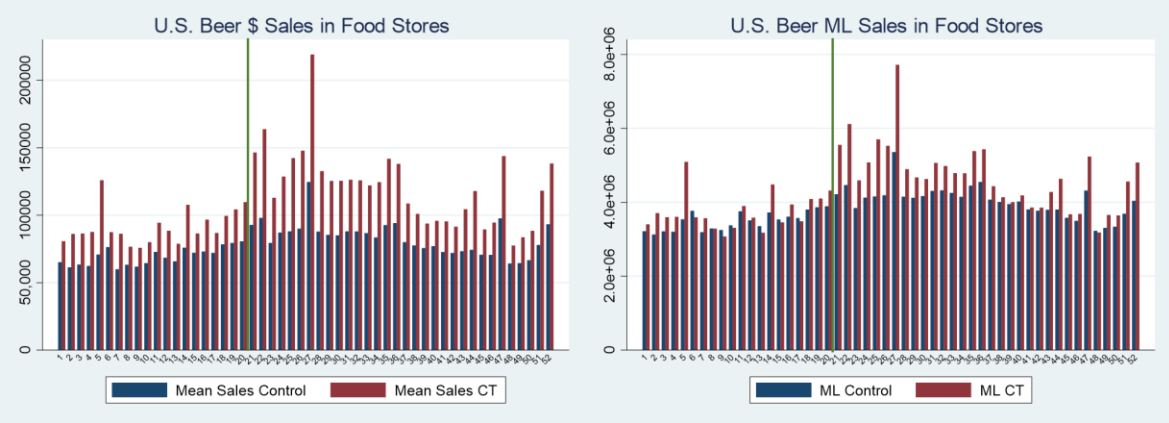
Table 1. Comparison of Treatment and Control Groups.

	Connecticut	Control States
Total Sales		
Overall	109,441.54	77,821.83
Pre	91,272.60	69,382.70
Post	120,797.12	83,105.21
Total ML Sold		
Overall	4,341,275.40	3,823,573.32
Pre	3,737,363.54	3,489,335.07
Post	4,718,720.31	4,032,825.63
Total Units Sold	10,779.01	
Overall	9,146.46	8,253.33
Pre	9,146.46	7,482.96
Post	11,799.36	8,735.63
Average Price per ML		
Overall	0.0294	0.0263
Pre	0.0293	0.0261
Post	0.0295	0.0264

Note. This table contains information for Connecticut and the 24 control states in 2012. This includes 619 counties, 591 of which had data for all 52 weeks.

Visually we can see these differences in Figure 1. Sales in both dollar values and millimeters are higher in the post-period, but the value difference between Connecticut and the control states is higher for sales, at least partly due to higher overall prices.

Figure 1. Beer Sales in $ and ML Before and After the Policy Shift.



Note: This figure shows mean sales data across all 52 weeks. The green line represents the date of policy implementation, which occurred at the end of Week 20.

The initial estimation results for the impact of the Sunday Sales policy on total sales are in Table 2. We include two specifications. The first one looks solely at the impact of treatment, where 1 represents a Connecticut county after implementing the policy. We see that over this post period (May 20 through the end of the year), there is no significant difference in grocery beer sales between Connecticut and the control states. However, there may be a difference between immediate and longer-term impacts over the remainder of the year. In our second specification, we include each week as a separate covariate in the regression, where 1 represents an interaction between Connecticut and a given week. Our omitted category is the week before the implementation of the policy. We find almost no difference in sales between Connecticut and other states in the pre-period. However, the results are more heterogenous after implementation of the policy. There is an uptick in grocery sales relative to control states in the first week. That result doubles in the second week of implementation, which could represent an information impact, though this period also includes the Memorial Day holiday. We see significant results for most of the weeks in the remainder of the summer, though this effect levels off beginning in August. Thus, there is not a longer-term impact on sales resulting from the policy implementation. These results can be visually seen in Figure 2, representing the parameter estimates for sales in Connecticut relative to

control states. There is heterogeneity in sales across all weeks, with a jump after policy implementation. While in the latter part of the year, this increase becomes statistically insignificant, sales are still slightly higher than before the Sunday Sales policy.

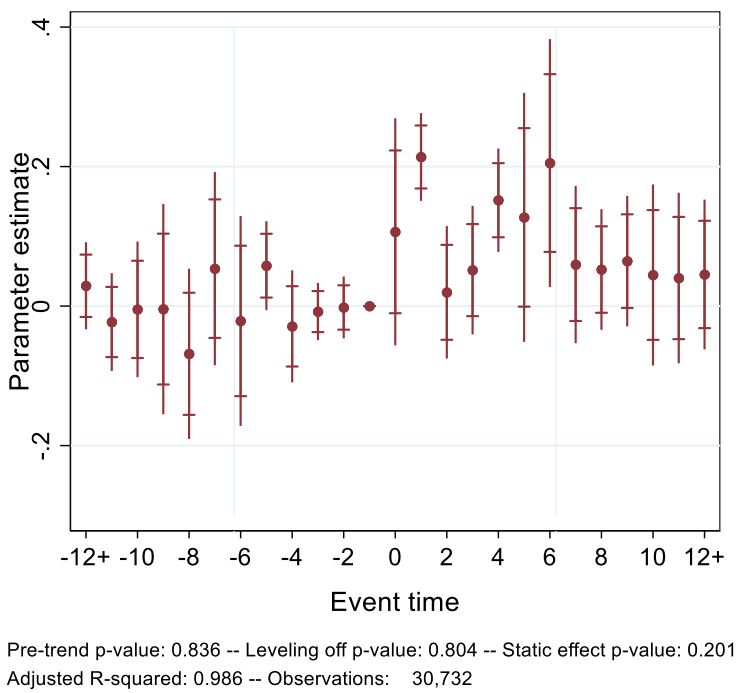
Table 2. Estimates for Beer Sales (in $) at Grocery Stores.

	Static Model		Dynamic Model	
	Coeff	*Std Error*	*Coeff*	*Std Error*
Treatment	0.053	(0.042)		
Week ending in…				
03/3/12 or earlier			0.029	(0.023)
03/10/12			-0.023	(0.026)
03/17/12			-0.005	(0.036)
03/24/12			-0.004	(0.055)
03/31/12			-0.068	(0.045)
04/07/12			0.054	(0.051)
04/14/12			-0.021	(0.055)
04/21/12			0.058**	(0.023)
04/28/12			-0.029	(0.029)
05/05/12			-0.008	(0.015)
05/12/12			-0.002	(0.016)
05/19/12				
05/26/12			0.106*	(0.060)
06/02/12			0.214***	(0.023)
06/09/12			0.020	(0.035)
06/16/12			0.052	(0.034)
06/23/12			0.152***	(0.027)
06/30/12			0.127*	(0.065)
07/07/12			0.205***	(0.065)
07/14/12			0.060	(0.041)
07/21/12			0.052*	(0.032)
07/28/12			0.064*	(0.034)
08/04/12			0.045	(0.047)
08/11/12			0.040	(0.045)
08/18/12 or later			0.045	(0.039)
Constant	9.718***	(0.000)	9.718***	(0.000)
Observations	30,732		30,732	
R2	0.986		0.986	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Includes County, Week and County-Based Statistical Area Fixed Effects

Note. This regression includes only the 591 counties that had sales data for all 52 weeks, resulting in a fully balanced panel.

Figure 2. Event Estimates for Beer Sales (in $).



Pre-trend p-value: 0.836 -- Leveling off p-value: 0.804 -- Static effect p-value: 0.201
Adjusted R-squared: 0.986 -- Observations: 30,732

Note. The figure shows event study estimates for the impact of repealing Sunday laws in Connecticut on beer sales (in $) in grocery stores. All regressions include establishment fixed effects, time dummies, and linear market trends. Standard errors are adjusted for within-cluster correlation at the county level. We plot the dynamic treatment parameters, 95 percent confidence intervals, and uniform sup-t bands for the event-time coefficients. The figure notes report Wald tests for pre-trends, leveling off dynamic treatment effects, the adjusted R-squared, and the observation numbers.

In Table 3, we look at the impact of total milliliters sold rather than dollar sales. Results are generally similar. The treatment variable is insignificant, and there are no significant differences between Connecticut and control states in the pre-period. However, there are again significant differences in the post-period, with a long-term leveling off beginning in August. This suggests there may be seasonal effects on a Sunday Sales policy, especially in areas such as the Northeast, where barbecuing, which generally involves purchasing food and alcohol, occurs primarily in the summer. The event plot in Figure 3 shows this pattern starkly, with a large jump immediately after the

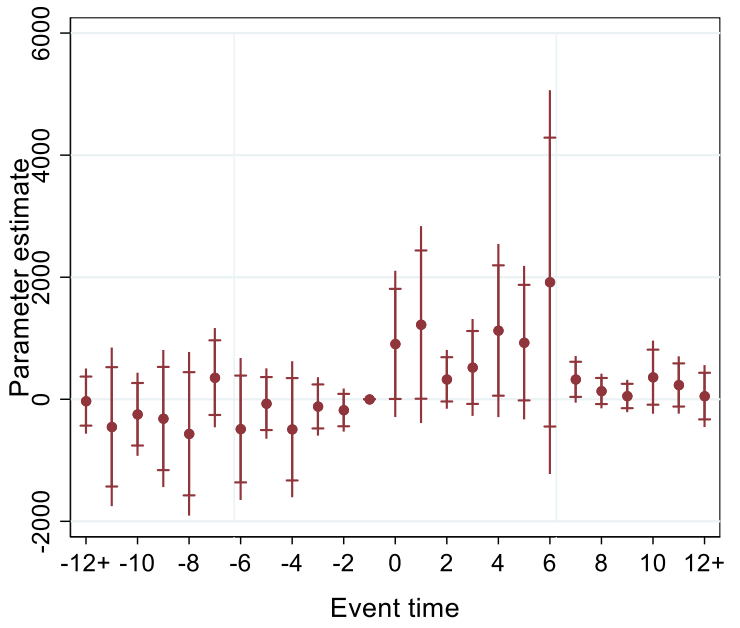
implementation of the policy and a clear leveling off after the 6th post-period week (which includes the 4th of July).

Table 3. Estimates for Beer Sales (in ML) at Grocery Stores.

	Static Model		Dynamic Model	
	Coeff	*Std Error*	*Coeff*	*Std Error*
Treatment	426.502	(292.072)		
Week ending in…				
03/3/12 or earlier			-29.745	(205.106)
03/10/12			-451.790	(498.904)
03/17/12			-245.752	(261.385)
03/24/12			-315.721	(431.386)
03/31/12			-565.192	(514.813)
04/07/12			354.191	(312.176)
04/14/12			-486.658	(446.441)
04/21/12			-70.291	(221.472)
04/28/12			-491.182	(427.935)
05/05/12			-117.124	(183.876)
05/12/12			-177.002	(135.417)
05/19/12				
05/26/12			907.279**	(460.072)
06/02/12			1,223.676**	(619.619)
06/09/12			326.593*	(185.038)
06/16/12			521.291*	(304.874)
06/23/12			1,126.591**	(544.924)
06/30/12			928.115*	(482.892)
07/07/12			1,920.092	(1,207.518)
07/14/12			326.476**	(146.765)
07/21/12			135.189	(109.028)
07/28/12			53.409	(101.800)
08/04/12			362.019	(229.954)
08/11/12			234.396	(180.444)
08/18/12 or later			52.409	(194.783)
Constant	3,947.514***	(1.216)	3,948.473***	(0.762)
Observations	30,732		30,732	
R2	0.986		0.986	
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Includes County, Week and County-Based Statistical Area Fixed Effects				

Note. This regression includes only the 591 counties that had sales data for all 52 weeks, resulting in a fully balanced panel.

Figure 3. Event Estimates for Beer Sales (in ML).



Pre-trend p-value: 0.420 -- Leveling off p-value: 0.358 -- Static effect p-value: 0.145
Adjusted R-squared: 0.985 -- Observations: 30,732

Note. The figure shows event study estimates for the impact of repealing Sunday laws in Connecticut on beer sales (in ML) in grocery stores. All regressions include establishment fixed effects, time dummies, and linear market trends. Note that we estimated the specification in levels. Standard errors are adjusted for within-cluster correlation at the county level. We plot the dynamic treatment parameters, 95 percent confidence intervals, and uniform sup-t bands for the event-time coefficients. The figure notes report Wald tests for pre-trends, leveling off dynamic treatment effects, the adjusted R-squared, and the observation numbers.

3.2. Business Activities

We present event study estimates for the impact of repealing Sunday laws in Connecticut on the survival, employment, and sales of grocery retailers and liquor stores in Figure 4. Each subfigure plots the dynamic treatment parameters, 95 percent confidence intervals, and uniform sup-t bands for the event-time of the outcome (Montiel Olea and Plagborg-Møller 2019; Freyaldenhoven et al.

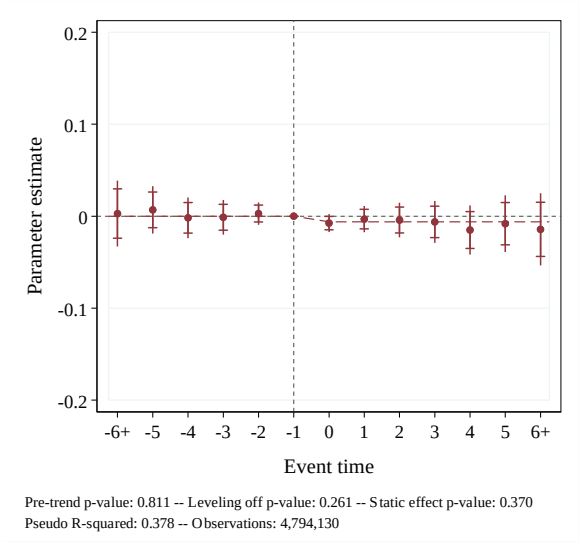
2021).[2] We also overlay estimates from a static model represented by the dashed red line. Each figure note reports the corresponding p-value for Wald tests for pre-event trends and anticipatory behavior. We find no evidence of significant pre-trends for the survival, employment, and sales specifications of grocery retailers and liquor stores. Since the pre-trend tests are statistically insignificant and the treatment pathways in the pre-treatment period are flat, the research design is validated. The fixed effects accurately account for unobservables unrelated to the treatment but predictive of the outcome. We also conduct a Wald test for the null hypothesis that the treatment dynamics decrease. This is important because the treatment effect could be dynamic at the endpoints of the event window. The Wald tests provide no statistical support for leveling off treatment effects at conventional levels of statistical significance for all outcomes.

The event study estimates reveal intriguing patterns regarding the relationship between Sunday laws and the survival, employment, and sales of grocery retailers and liquor stores. First, we find evidence that the response to the policy shift is anticipated or delayed, with the exit probability being indifferent from zero for grocery retailers and liquor stores across all post-treatment years. In contrast to the concerns raised by the retail liquor industry, we find that the number of liquor stores increases beyond the counterfactual level six years after treatment. Next, we turn to the employment effects of the repealing of Sunday laws in Connecticut. This is an important margin of adjustment to changes in competition caused by the policy shift. One could expect grocery retailers to increase employment (at the margin) to deal with the increasing demand, while liquor stores should experience a decline in employment. As for the survival analysis, we find no

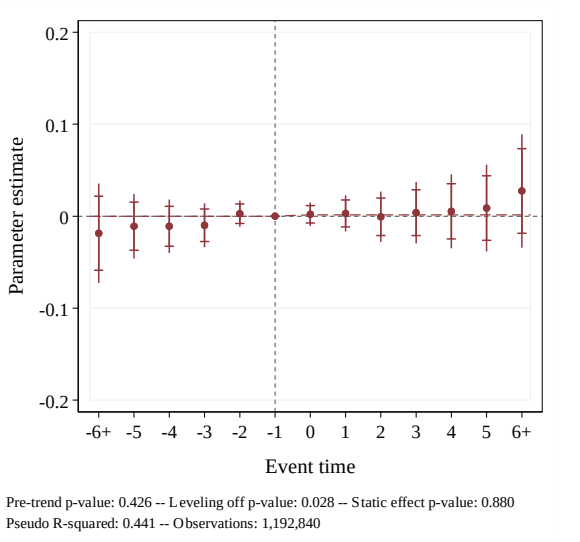
[2] Although various simultaneous confidence bands are available, there exists little theory to select among them. To address this issue, we follow Montiel Olea and Plagborg-Møller (2019) and use a Bayesian sup-t band with exact finite-sample simultaneous credibility.

evidence of statistically significant treatment effects in the post-event period. Lastly, we turn to the impact of policy change on establishment-level sales. If the policy had impacted business activities in the long run, one could expect higher sales for grocery retailers and lower ones for liquor stores. Interestingly, there is limited evidence for adverse treatment effects on the sales of both business types. Therefore, one can conclude that the liberalization of alcohol sales had no discernible long-term consequences for economic outcomes for the average liquor store in Connecticut. These results contribute to the ongoing policy discussions surrounding Sunday Blue laws and their implications for the retail sector.

Figure 4. Long-run Survival, Employment, and Sales Treatment Effects.



(a) Survival, grocery retailers.



(b) Survival, liquor stores.

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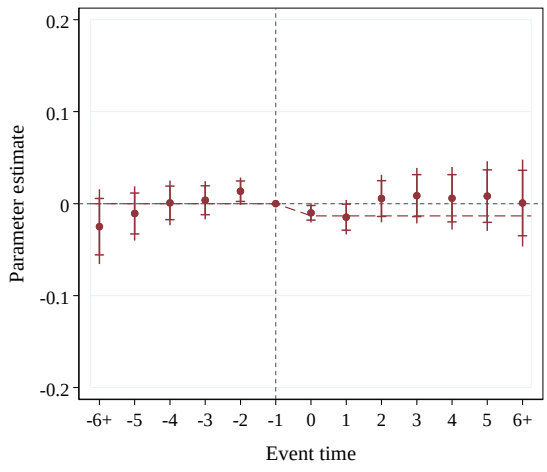
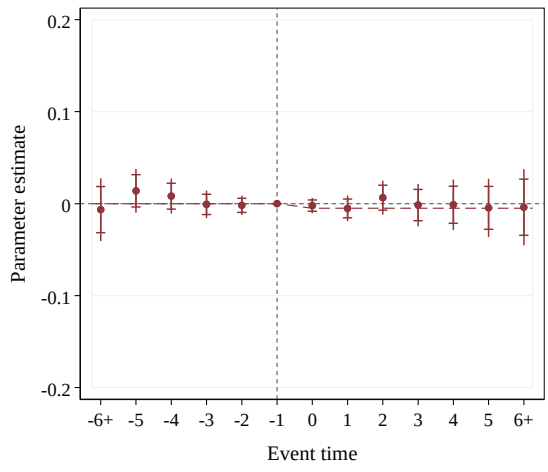


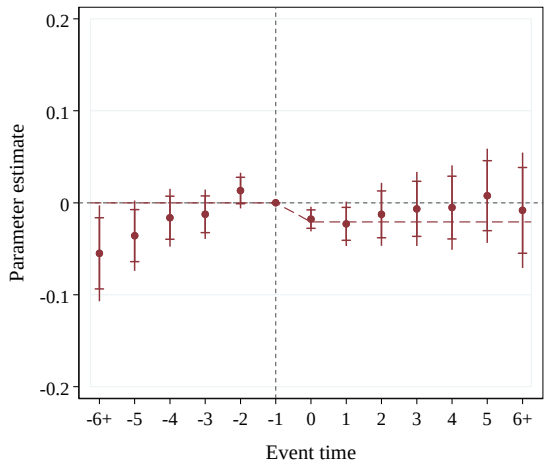
Pre-trend p-value: 0.818 -- Leveling off p-value: 0.151 -- Static effect p-value: 0.026
Pseudo R-squared: 0.949 -- Observations: 1,917,283

(c) Employment, grocery retailers.



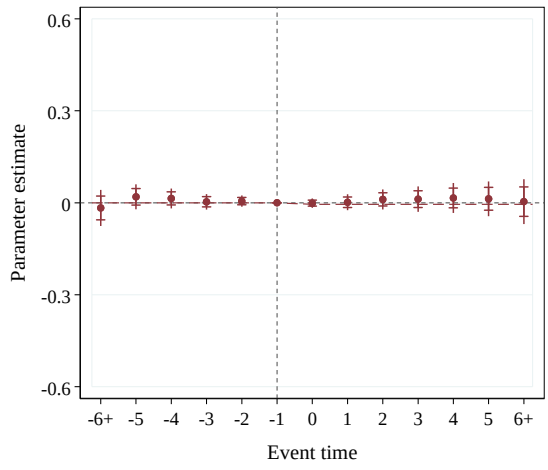
Pre-trend p-value: 0.410 -- Leveling off p-value: 0.886 -- Static effect p-value: 0.363
Pseudo R-squared: 0.893 -- Observations: 573,186

(d) Employment, liquor stores.



Pre-trend p-value: 0.212 -- Leveling off p-value: 0.035 -- Static effect p-value: 0.012
Pseudo R-squared: 0.950 -- Observations: 1,916,281

(e) Sales, grocery retailers.



Pre-trend p-value: 0.246 -- Leveling off p-value: 0.231 -- Static effect p-value: 0.570
Pseudo R-squared: 0.895 -- Observations: 572,130

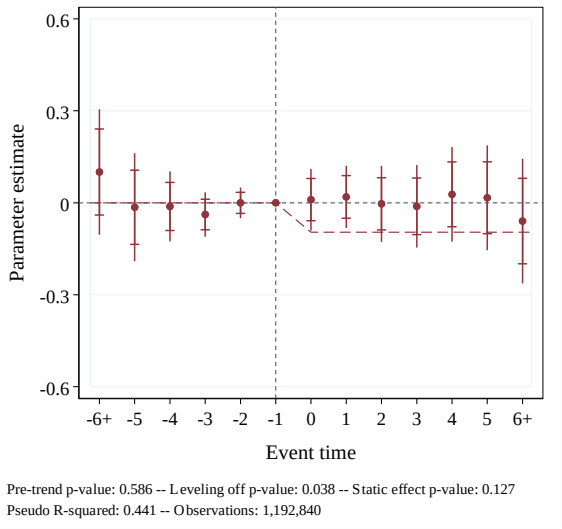
(f) Sales, liquor stores.

Note. The figure shows event study estimates for the impact of repealing Sunday laws in Connecticut on the survival, employment, and sales of grocery retailers and liquor stores. All regressions include establishment fixed effects, time dummies, and linear market trends. Standard errors are adjusted for within-cluster correlation at the establishment level. We plot the dynamic treatment parameters, 95 percent confidence intervals, and uniform sup-t bands for the event-time coefficients. Results from a static regression model are overlaid as a dashed line. The figure notes report Wald tests for pre-trends, leveling off dynamic treatment effects, the pseudo R-squared, and the observation numbers.

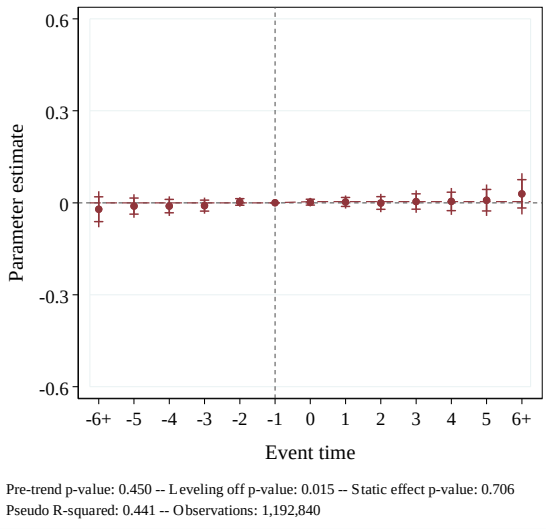
Next, we focus on differences in the treatment effects for chain and standalone liquor stores. We identified chain liquor stores as those companies with two or more locations. We use an interaction

coefficient to assess treatment differences, as presented in Figure 5. We find no evidence for statistically significant pre-trends for all outcomes. There is also no evidence for leveling off treatment effects. Notably, we find some evidence of an adverse response in chain liquor store employment and sales four years after the repealing of Sunday laws in Connecticut. Their employment and sales are about 30 percent below the counterfactual. In contrast, standalone liquor stores have no evidence of such adverse treatment effects in the post-event period. Their probability of exiting is unaffected by the policy change. A similar pattern is observable for their employment and sales, indicating that the liberalization of alcohol sales had not caused heterogeneous and adverse consequences for the economic outcomes of standalone liquor stores in Connecticut.

Figure 5. Event Studies for Chain and Standalone Liquor Stores.



(a) Survival, chain liquor stores.



(b) Survival, liquor stores.

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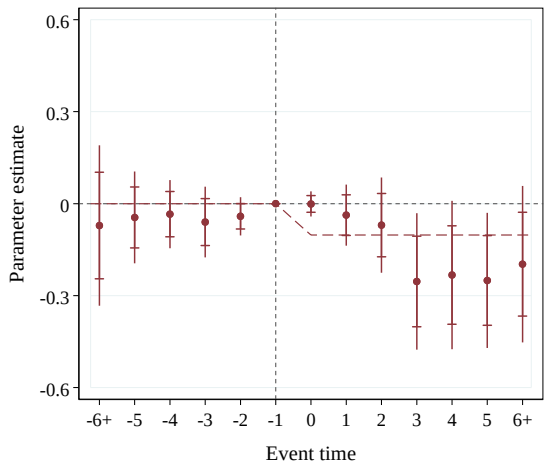
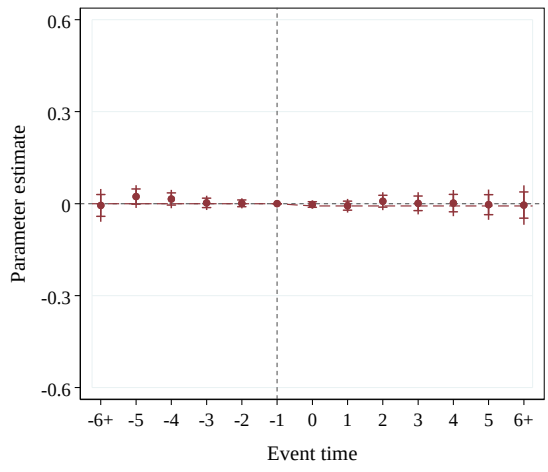


Pre-trend p-value: 0.165 -- Leveling off p-value: 0.200 -- Static effect p-value: 0.071
Pseudo R-squared: 0.886 -- Observations: 573,186

(c) Employment, chain liquor stores.



Pre-trend p-value: 0.211 -- Leveling off p-value: 0.824 -- Static effect p-value: 0.353
Pseudo R-squared: 0.886 -- Observations: 573,186

(d) Employment, standalone liquor stores.

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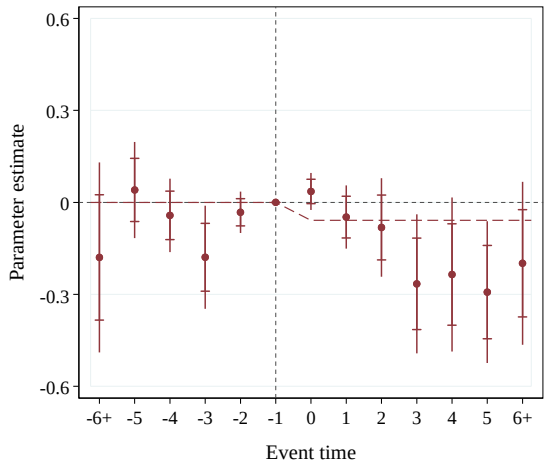
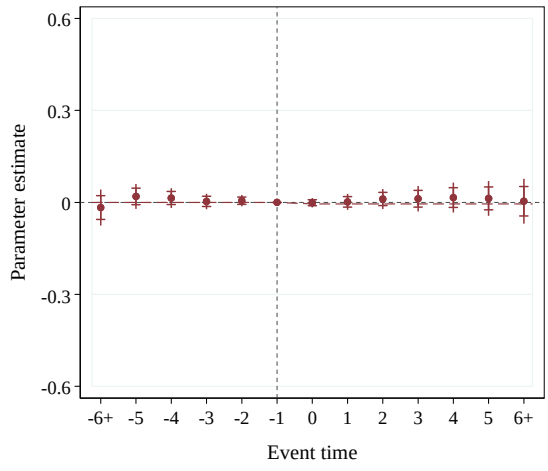


Pre-trend p-value: 0.124 -- Leveling off p-value: 0.024 -- Static effect p-value: 0.372
Pseudo R-squared: 0.895 -- Observations: 572,130

(e) Sales, chain liquor stores.



Pre-trend p-value: 0.246 -- Leveling off p-value: 0.231 -- Static effect p-value: 0.570
Pseudo R-squared: 0.895 -- Observations: 572,130

(f) Sales, standalone liquor stores.

Note. The figure shows event study estimates for the impact of repealing Sunday laws in Connecticut on the survival, employment, and sales of chain and standalone liquor stores. All regressions include establishment fixed effects, time dummies, and linear market trends. Standard errors are adjusted for within-cluster correlation at the establishment level. We plot the dynamic treatment parameters, 95 percent confidence intervals, and uniform sup-t bands for the event-time coefficients. Results from a static regression model are overlaid as a dashed line. The figure notes report Wald tests for pre-trends, leveling off dynamic treatment effects, the pseudo R-squared, and the observation numbers.

4. Conclusion

Sunday Blue laws, which restrict or prohibit certain activities on Sundays, have long been a subject of debate in various states across the United States. One area where these laws have garnered attention is the sale of alcoholic beverages, particularly in grocery stores. This paper focuses on Connecticut, where the Sunday sales law was repealed in 2012, enabling grocery retailers to sell beer on weekends. By leveraging a comprehensive dataset and employing various robustness checks, the paper provides novel insights regarding the consequences of this policy change on alcohol sales and retail competition.

To assess the impact of repealing the Sunday Sales law, we utilize a detailed scanner dataset and establishment-level business information covering 2004 to 2021. Our analysis employs event studies to examine the short-term effects of the policy change on beer sales at grocery stores. Additionally, we investigate the long-term economic outcomes for grocery retailers and liquor stores, considering various robustness checks and conducting a heterogeneity analysis to examine potential differences across chain and standalone grocery and liquor retailers. The baseline event studies reveal a substantial increase in beer sales at grocery stores during the first seven weeks following the repeal of the Sunday Sales law. However, beyond this initial period, the dynamic treatment effects become statistically insignificant. Furthermore, our analysis finds no statistical evidence supporting adverse or positive treatment effects on the long-run economic outcomes for grocery retailers and liquor stores. These findings hold up to several robustness checks and are consistent across the chain and standalone grocery and liquor retailers.

The results of our study suggest that the liberalization of alcohol sales, specifically the repeal of Sunday Blue laws, had limited lasting implications for the performance and conduct of firms operating in the retail liquor industry. While the immediate increase in beer sales at grocery stores is

noteworthy, the absence of long-term effects on economic outcomes for both grocery and liquor retailers indicates that the policy change did not significantly alter the competitive landscape or market behavior in the industry. By examining the case of Connecticut's repeal of the Sunday Sales law, this study provides empirical evidence on the impact of repealing Sunday Blue laws on alcohol sales and retail competition. Our findings indicate that the liberalization of alcohol sales had a short-lived effect on beer sales at grocery stores, with no discernible long-term consequences for economic outcomes in the retail liquor industry. These results contribute to the ongoing policy discussions surrounding Sunday Blue laws and their implications for the retail sector.

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