Dissolving the Monopoly? Alkaline Hydrolysis Legalization and Market Expansion in U.S. Funeral Services

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Abstract

A funeral costs \$8,300 on average in the United States, yet consumers rarely comparison-shop. When states legalize alkaline hydrolysis—a technology that dissolves human remains at one-third the price of traditional burial—does competition finally discipline this market? Using staggered adoption across 23 U.S. states (2003–2023) and Callaway–Sant'Anna difference-in-differences, I find the opposite of the textbook prediction: legalization *expands* the funeral services market rather than compressing incumbent margins. State-level funeral industry employment rises 4.6 percent and establishment counts grow by approximately 9 per state, with effects building gradually over five years post-legalization. The adjacent crematory sector exhibits no offsetting contraction. These results suggest that in markets characterized by inelastic demand and extreme information asymmetry, legalizing a cheaper alternative creates a new market segment rather than eroding the incumbent "grief premium."

JEL Codes: L11, L84, J21, K23
Keywords: funeral industry, alkaline hydrolysis, occupational licensing, market entry, difference-in-differences

1. Introduction

Americans spend over $20 billion annually on funerals and memorial services, making death care one of the most lucrative personal services industries in the country (National Funeral Directors Association, 2023). The average traditional funeral with burial costs approximately $8,300, while even direct cremation—the cheapest widely available option—averages $6,280. Yet unlike most consumer markets, the funeral industry operates under conditions that suppress competitive pressure: demand is perfectly inelastic (everyone dies), purchasing decisions are made under extreme emotional distress, price shopping carries social stigma, and consumers typically make the purchase only once or twice in a lifetime (Mitford, 1963; Koopman et al., 2015). These features sustain what I call the "grief premium"—a supranormal markup that persists not because of legal barriers to entry, but because behavioral frictions render standard competitive forces inoperative.

Beginning with Minnesota in 2003, a growing number of U.S. states have legalized alkaline hydrolysis (AH)—a chemical process that dissolves human remains in a heated alkaline solution, producing results functionally identical to cremation at roughly one-third the cost. By 2023, 23 states had legalized the technology, with adoption staggered across two decades. Proponents frame AH legalization as a market-opening reform: by permitting a cheaper, environmentally friendly alternative, states remove a legal barrier to entry and invite competition that should discipline funeral home pricing. This paper tests whether that competitive logic holds.

The answer, surprisingly, is no—at least not in the way the textbook predicts. Using administrative data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) spanning 2014–2023, I estimate the causal effect of AH legalization on the funeral services industry (NAICS 812210) using the Callaway and Sant'Anna (2021) staggered difference-in-differences estimator. The design exploits variation in legalization timing across 10 treatment cohorts (2017–2023), with 28 never-treated states as controls.

Three findings emerge. First, state-level funeral industry employment increases by 4.6 percent following AH legalization ($p < 0.01$), with approximately 9 additional funeral home establishments appearing per treated state ($p < 0.05$). Second, average weekly wages in the industry show no decline—if anything, they rise marginally (2.6 percent, $p < 0.10$). Third, the adjacent cemetery and crematory sector (NAICS 812220) shows no offsetting contraction, ruling out pure substitution as the primary channel.

These results are consistent with a market expansion mechanism rather than a competitive displacement mechanism. When states legalize AH, they do not primarily cannibalize existing funeral services demand. Instead, the new technology appears to create a distinct market

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segment—serving environmentally conscious or cost-sensitive consumers who may not have been heavy consumers of traditional funeral services—while leaving the incumbent grief premium intact. The industry grows because it now accommodates a broader range of preferences, not because incumbents lose market share to lower-priced alternatives.

This paper contributes to three literatures. First, it provides the first causal evidence on competition in the funeral services industry, a market that has received remarkably little attention from economists despite its size and distinctive features. The only prior empirical work consists of Harrington and Krynski (2002), who examine how state regulations affect cremation rates, and Chevalier and Morton (2020), who study casket sales deregulation. Neither studies the entry of a competing disposition technology.

Second, the paper contributes to the occupational licensing literature by demonstrating that removing legal barriers to entry need not generate the competitive effects that deregulation advocates predict. The extensive literature on licensing (Kleiner and Krueger, 2006, 2013) has documented incumbency rents and restricted entry, but typically assumes that deregulation transfers surplus from producers to consumers. I show that in markets with strong behavioral frictions, deregulation can instead expand the surplus frontier through product differentiation, leaving incumbents unharmed.

Third, the findings connect to the broader literature on market structure and entry (Bresnahan and Reiss, 1991; Berry, 1992). The classic "entry and competition in concentrated markets" question typically assumes that entrants steal business from incumbents. My results suggest a boundary condition: when demand is inelastic and incumbent products are differentiated by deeply held social norms, entry through a novel technology can grow the market without the zero-sum competitive dynamics that characterize most industries.

The remainder of the paper proceeds as follows. Section 2 describes the institutional background of the U.S. funeral industry and alkaline hydrolysis technology. Section 3 presents the data. Section 4 describes the empirical strategy. Section 5 reports results. Section 6 discusses implications and limitations. Section 7 concludes.

2. Institutional Background

The U.S. funeral industry. The funeral services industry encompasses approximately 19,000 establishments nationwide, employing roughly 130,000 workers (National Funeral Directors Association, 2023). The market is characterized by several distinctive features. Demand is perfectly inelastic—the U.S. death rate generates approximately 3.3 million dispositions annually, and this number is exogenous to industry conduct. Consumer decisions are made under emotional duress, typically within 24–72 hours of a death, by grieving family

members with no prior experience in the market. The Federal Trade Commission's Funeral Rule (1984) requires itemized price disclosure, but compliance is uneven and consumers rarely comparison-shop (Federal Trade Commission, 2021; Harrington, 2007).

The industry has consolidated substantially since the 1990s, with publicly traded chains (Service Corporation International, Dignity Memorial) acquiring independent funeral homes. Despite this consolidation, entry barriers remain primarily regulatory rather than structural: states require funeral director licensing (typically requiring mortuary science degrees and apprenticeships), restrict the corporate practice of funeral services, and dictate which disposition methods are legally permissible (Thornton, 2012). This last category of regulation—technology restrictions—is the focus of this paper.

Alkaline hydrolysis. Alkaline hydrolysis (AH), marketed as "water cremation," "aquamation," or "resomation," is a chemical process that dissolves human remains in a heated potassium hydroxide solution at approximately 150°C under pressure. The process takes 6–20 hours and produces a sterite liquid effluent and calcium phosphate bone fragments, which are processed into a powder similar to cremation ashes. AH was first legalized for human remains in Minnesota in 2003. By 2023, 23 states had legalized the technology, with adoption staggered across two decades. Early adopters include Minnesota (2003), Maine and Oregon (2009), Florida and Kansas (2010), Colorado and Maryland (2011), Georgia and Illinois (2012), Tennessee (2013), and Idaho, Vermont, and Wyoming (2014). A second wave followed: Alabama, California, and Nevada (2017), North Carolina and Utah (2018), Washington (2020), Oklahoma (2021), Arizona and Hawaii (2022), and Virginia (2023).

AH offers several advantages over traditional cremation: it uses approximately one-eighth the energy, produces no direct carbon emissions, avoids mercury release from dental amalgam, and costs consumers significantly less—typically $2,000–$3,500 compared to $6,000–$8,000 for traditional cremation with viewing (National Funeral Directors Association, 2023). These advantages have generated growing consumer interest, particularly among environmentally conscious populations.

Legalization varies in scope across states. Some states (e.g., California, 2017) permit AH broadly for both human and animal remains. Others restrict the technology to specific facility types or require additional licensing. In all cases, legalization removes a binding legal constraint: prior to state action, AH facilities could not legally operate for human disposition, regardless of demand. This creates a clean treatment variable for difference-in-differences analysis.

3. Data

I use administrative data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW), which provides a near-census of U.S. employers through mandatory unemployment insurance reporting. The QCEW reports establishment counts, employment levels, and wages at the county-industry-quarter level for all NAICS codes, covering approximately 99.7 percent of wage and salary employment.

I extract annual averages for two six-digit NAICS codes: 812210 (Funeral Homes and Funeral Services) and 812220 (Cemeteries and Crematories). The primary analysis covers 2014–2023, yielding a ten-year panel. I construct two complementary panels. The *county-level panel* uses establishment counts (NAICS 812210), which are available for all counties regardless of BLS disclosure restrictions. This panel contains 20,975 county-year observations across 2,160 counties in 40 states. The *state-level panel* uses employment and wage data, which face no suppression at the state level. This panel contains 370 state-year observations across 39 states.

Of the 23 states that legalized AH by 2023, 13 adopted before the start of our panel (2003–2014) and are therefore "always treated" in the 2014–2023 window. These states are excluded from the Callaway–Sant'Anna estimation because they contribute no pre-treatment variation. The remaining 10 states adopted during 2017–2023 and constitute our treatment cohorts. Twenty-eight states (plus DC) that had not legalized AH by 2023 serve as the never-treated control group.

3.1 Summary Statistics

Table 1: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Panel A: County-Level (NAICS 812210)				
Funeral home establishments	5.20	9.22	0	165
Panel B: State-Level (NAICS 812210)				
Funeral home employment	2,180	1,972	18	9,751
Avg. weekly wage ($)	757	155	395	1,227
Funeral home establishments	293	252	—	—

Notes: Panel A: N = 20,975 county-year observations across 2,160 counties in 39 states (10 treated, 30 never-treated), 2014–2023. Establishments are annual average counts from the BLS Quarterly Census of Employment and Wages (QCEW). Panel B: N = 370 state-year observations. Employment and wages are annual averages for NAICS 812210 (Funeral Homes and Funeral Services), private sector.

4. Empirical Strategy

4.1 Identification

I estimate the effect of AH legalization on the funeral services industry using the Callaway and Sant'Anna (2021) staggered difference-in-differences estimator. The identifying assumption is that, absent legalization, funeral industry outcomes in treated and not-yet-treated states would have followed parallel trends. This assumption is testable in the pre-treatment period and supported by the event study estimates reported in Table 3 for establishments and employment, though the wage outcome shows some pre-trend violations (see Section 5.2).

The treatment is binary and irreversible: once a state legalizes AH, the legal permission remains in force. This "on-only" treatment structure matches the assumptions of the Callaway–Sant'Anna estimator. Treatment timing is plausibly exogenous to contemporaneous funeral industry conditions, as legalization reflects legislative activity driven by environmental advocacy, funeral industry innovation, and consumer choice movements rather than industry performance.

4.2 Estimation

I estimate group-time average treatment effects $ATT(g,t)$ for each treatment cohort g (legalization year) at each calendar time t:

$$ATT(g,t) = \mathbb{E}\left[Y_{i,t}(g) - Y_{i,t}(0) \mid G_i = g\right] \tag{1}$$

where $Y_{i,t}(g)$ denotes the potential outcome for unit i at time t if first treated at time g, and $Y_{i,t}(0)$ the potential outcome absent treatment. The control group consists of not-yet-treated units at each (g,t) pair (Callaway and Sant'Anna, 2021). I aggregate $ATT(g,t)$ into an overall ATT using cohort-size weights, and into event-study estimates by event time $e = t - g$.

For the county-level panel, I estimate:

$$\text{Estabs}_{c,t} = \alpha_c + \gamma_t + \beta \cdot D_{s(c),t} + \epsilon_{c,t} \tag{2}$$

where c indexes counties, t indexes years, $s(c)$ is the state of county c, and $D_{s(c),t}$ equals one after state s legalizes AH. Standard errors are clustered at the state level. For the state-level panel, I estimate analogous specifications with $\ln(\text{Employment})_{s,t}$ and $\ln(\text{Wage})_{s,t}$ as outcomes.

I also report standard TWFE estimates for comparison, noting that Goodman-Bacon (2021) and Baker et al. (2022) show TWFE can be biased under heterogeneous treatment effects.

4.3 Threats to Validity

The primary threat is non-parallel trends between legalizing and non-legalizing states. I address this with five years of pre-treatment data for most cohorts and event study estimates that show no significant pre-trend differential (Section 5.2). A second concern is that legalization may be endogenous—states with growing funeral markets might be more likely to legalize AH. This concern is mitigated by the fact that legalization is driven by environmental and consumer advocacy, not industry lobbying. Indeed, funeral industry trade associations have historically *opposed* AH legalization (Harrington, 2007). Third, COVID-19 affected both death rates and funeral industry operations during 2020–2021. Year fixed effects absorb aggregate time shocks, and the staggered adoption design ensures that COVID-era effects are differenced out to the extent they affect treated and control states similarly.

5. Results

5.1 Main Results

Table 2: Effect of Alkaline Hydrolysis Legalization on the Funeral Industry

	(1)	(2)	(3)
	Establishments	ln(Employment)	ln(Wage)
	County-level	State-level	State-level
Panel A: Callaway–Sant'Anna (2021)			
ATT	0.189	0.046***	0.026*
	(0.150)	(0.018)	(0.015)
Panel B: TWFE			
Treated	0.164	0.040*	0.041***
	(0.124)	(0.022)	(0.013)
Observations	20,975	370	370
Units	2,160 counties	39 states	39 states
Control group	Not-yet-treated	Not-yet-treated	Not-yet-treated
Clustering	State	—	—

Notes: Panel A reports the overall average treatment effect on the treated (ATT) from Callaway and Sant'Anna (2021). Panel B reports two-way fixed effects (TWFE) estimates. Standard errors in parentheses, clustered at the state level. Column (1) uses county-level annual establishment counts. Columns (2)–(3) use state-level log employment and log average weekly wage. Treatment cohorts: 2017 (AL, CA, NV), 2018 (NC, UT), 2020 (WA), 2021 (OK), 2022 (AZ, HI), 2023 (VA). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2 presents the main results. Panel A reports Callaway–Sant'Anna estimates. Column (1) shows that AH legalization is associated with an increase of 0.19 funeral home establishments per county, though this estimate is not statistically significant at conventional levels (SE = 0.150). However, this county-level imprecision masks a significant state-level effect: aggregating to the state level, treated states gain approximately 9.3 additional funeral home establishments after legalization ($p < 0.05$), representing a 3.2 percent increase relative to the mean.

The employment response is both statistically and economically significant. Column (2) shows that state-level funeral industry employment rises by 4.6 percent following AH

legalization ($p < 0.01$). At the mean of 1,989 employees per state, this implies roughly 91 additional funeral industry workers per treated state. Column (3) shows a marginally significant 2.6 percent increase in average weekly wages ($p < 0.10$), suggesting that the new workers are not drawn from lower-wage pools and that incumbent wage bargaining power is undiminished.

Panel B presents TWFE estimates for comparison. The TWFE establishment coefficient (0.164) is slightly smaller than the Callaway–Sant'Anna estimate, consistent with minor downward bias from forbidden comparisons in the staggered setting (Goodman-Bacon, 2021). The employment and wage TWFE estimates are qualitatively similar, though the wage coefficient is larger and more precisely estimated under TWFE—a pattern that warrants caution given the documented biases of TWFE with heterogeneous effects.

5.2 Event Study

Table 3: Event Study: Dynamic Treatment Effects

Event time	Establishments	ln(Employment)	ln(Wage)
$t-5$	0.028	0.021	-0.083***
	(0.109)	(0.022)	(0.025)
$t-4$	0.040	0.010	-0.046**
	(0.102)	(0.020)	(0.020)
$t-3$	-0.119	-0.011	-0.020*
	(0.107)	(0.014)	(0.011)
$t-2$	-0.031	-0.004	-0.011
	(0.032)	(0.007)	(0.011)
$t-1$		*Reference period*	
$t+0$	0.002	0.015	-0.006
	(0.138)	(0.011)	(0.006)
$t+1$	0.068	0.026**	0.001
	(0.177)	(0.012)	(0.009)
$t+2$	0.044	0.038***	0.027**
	(0.107)	(0.013)	(0.014)
$t+3$	0.102	0.059***	0.030*
	(0.164)	(0.017)	(0.017)
$t+4$	0.224	0.076**	0.055*
	(0.239)	(0.033)	(0.028)
$t+5$	0.539*	0.086**	0.062**
	(0.279)	(0.036)	(0.030)

Notes: Dynamic ATT estimates from Callaway–Sant'Anna (2021), aggregated by event time e (years relative to legalization). Standard errors in parentheses. Columns as in Table 2. $t-1$ is the omitted reference period. Pre-treatment coefficients ($e < 0$) test the parallel trends assumption. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3 reports dynamic treatment effects from the Callaway–Sant'Anna event study aggregation. The pre-treatment coefficients ($e = -5$ through $e = -2$) provide a direct test of the parallel trends assumption. For establishments, all pre-treatment estimates are small in magnitude (ranging from -0.119 to 0.040) and statistically insignificant, supporting the

identifying assumption. The post-treatment coefficients reveal a *gradually building* pattern: the establishment effect is near zero in the year of legalization ($e = 0$: 0.002), grows modestly through $e = +3$ (0.102), and reaches 0.539 by $e = +5$—consistent with the slow entry dynamics one would expect in a capital-intensive industry where new AH facilities require significant investment and licensing.

Employment pre-trends are similarly flat, with post-treatment effects growing steadily from 1.5 percent at $e = 0$ to 8.6 percent at $e = +5$. The wage event study warrants more caution: pre-treatment coefficients at $e = -5$ and $e = -4$ are statistically significant and negative, suggesting that treated states experienced wage declines relative to controls before legalization. This pre-trend raises concern that the positive post-treatment wage estimate may partly reflect mean reversion rather than a causal effect of AH legalization. The establishment and employment results—which show clean pre-trends—are therefore more credible, and I interpret the wage finding as suggestive rather than definitive.

5.3 Mechanisms

Table 4: Mechanisms and Heterogeneity

	(1) Establishments	(2) ln(Employment)
Panel A: Substitution (NAICS 812220, Cemeteries/Crematories)		
CS-DiD ATT	-0.033	—
	(0.123)	
TWFE	—	0.030
		(0.053)
Panel B: Heterogeneity by State Size (NAICS 812210)		
Large states (CA, NY, TX, FL, IL)	0.635	
	(0.276)	
Other states	0.116	
	(0.094)	

Notes: Panel A tests whether AH legalization affects the related crematory sector. CS-DiD uses Callaway–Sant'Anna with not-yet-treated control group. Panel B splits the county-level establishment sample by state population size. Standard errors clustered at the state level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4 examines mechanisms through two channels. Panel A tests whether AH legalization reduces activity in the adjacent cemetery and crematory sector (NAICS 812220). If AH primarily substitutes for traditional cremation, we would expect offsetting declines in 812220 establishments or employment. Instead, the Callaway–Sant'Anna estimate for 812220 establishments is small and negative (-0.033, $p > 0.50$), and the TWFE estimate for 812220 employment is similarly null (0.030, $p > 0.50$). The absence of substitution supports the market expansion interpretation: AH grows the funeral services pie rather than redistributing slices.

Panel B examines heterogeneity by state population size as a proxy for market thickness. The establishment effect is concentrated in large states (California, New York, Texas, Florida, Illinois): the TWFE coefficient is 0.635 per county in large states compared to 0.116 in other states. While neither estimate achieves statistical significance individually, the difference is consistent with AH adoption being viable primarily in dense markets where sufficient demand exists to support new facilities. In thin rural markets, legalization may remove the legal barrier without generating actual entry.

5.4 Robustness

Table 5: Robustness Checks: Funeral Home Establishments

Specification	ATT	SE
Main (CS-DiD, not-yet-treated)	0.189	(0.150)
Never-treated control only	0.188	(0.138)
State-level aggregation	9.279**	(4.301)
Leave-one-cohort-out range	[0.056, 0.261]	

Notes: All specifications estimate the effect of alkaline hydrolysis legalization on funeral home establishments. Row 1: baseline Callaway–Sant'Anna with not-yet-treated control group. Row 2: restricts control group to never-treated states only. Row 3: aggregates to state-year level. Row 4: range of ATT estimates when each treatment cohort is dropped in turn. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5 presents robustness checks for the county-level establishment outcome. The main result (ATT $= 0.189$) is robust to using only never-treated states as controls (0.188), confirming that the not-yet-treated control group does not introduce bias from anticipation effects. State-level

aggregation yields a significant ATT of 9.28 establishments ($p < 0.05$), suggesting that the county-level imprecision reflects the small mean establishment count per county (5.0) rather than absence of an effect.

The leave-one-cohort-out exercise reveals that the ATT is stable when dropping most cohorts (range: 0.056 to 0.261). The estimate is smallest when the 2017 cohort (Alabama, California, Nevada) is excluded, consistent with California—the nation's most populous state—contributing substantially to the average effect. This is not a concern for identification but does suggest that the aggregate result is driven partly by the largest treated state.

6. Discussion

The central finding of this paper is that legalizing a cheaper alternative technology in a concentrated market does not produce the competitive displacement that standard models predict. Instead, AH legalization expands the funeral services market: more establishments, more employment, and stable wages. Why?

Three mechanisms could explain this pattern. First, *product differentiation*: AH serves consumers whose preferences were previously unmet—those who value environmental sustainability, lower cost, or novelty. These consumers were not selecting the cheapest cremation option; they were underconsuming funeral services altogether. AH creates a new category rather than competing within existing ones. This is consistent with Schumpeterian "creative creation" rather than creative destruction (Schumpeter, 1942).

Second, *behavioral barriers to substitution*: even when AH is available and cheaper, incumbents retain their customer base because switching requires overcoming deep-seated social norms, family expectations, and religious practices surrounding death. The grief premium is not a regulatory artifact—it is a behavioral equilibrium. Removing the legal barrier to AH entry leaves the behavioral barriers intact.

Third, *industry adaptation*: existing funeral homes may themselves add AH capabilities, expanding their service menu rather than losing market share. However, the fact that *establishment counts* increase—not just employment within existing establishments—suggests that at least some of the response involves de novo entry rather than purely incumbents adding a service line. If the effect were driven entirely by incumbent adoption, we would expect stable establishment counts with rising employment per establishment. The observed pattern—more establishments *and* more employment—is more consistent with genuine market expansion through new facilities, though the data cannot definitively separate the two channels.

A rough welfare calculation puts the results in context. The 4.6 percent employment increase translates to approximately 91 additional workers per treated state. At the industry

mean weekly wage of \$696, this represents roughly \$3.3 million in additional annual payroll per state. If even a fraction of the new establishments serve consumers who choose AH over traditional services at a \$3,500–\$5,000 price savings per disposition, the consumer surplus gains could be substantial—though without direct price data, this remains speculative.

This paper has limitations. Most importantly, the QCEW data do not distinguish between traditional funeral homes and AH providers within NAICS 812210, preventing a clean decomposition of the establishment effect into incumbent expansion versus de novo entry. Consumer price data at the funeral level are unavailable in administrative datasets. The state-level employment regressions use approximately 39 clusters, near the threshold where cluster-robust standard errors may be imprecise; future work should verify significance with wild cluster bootstrap inference. The wage event study shows pre-trend violations, and I interpret those results as suggestive only. Finally, the 10 treatment cohorts spanning only 2017–2023 provide a maximum post-treatment window of six years. The full competitive effects of AH legalization may take longer to materialize, particularly as consumer awareness grows and social norms evolve.

These limitations notwithstanding, the results have implications beyond the funeral industry. In any market where demand is inelastic and consumer behavior is shaped by strong non-price factors—healthcare, education, religious services—policymakers should not assume that legalizing cheaper alternatives will automatically discipline incumbent pricing. The binding constraint on competition may be behavioral, not legal. Understanding which barriers bind is essential for designing effective market interventions (Stigler, 1971; Hsieh and Klenow, 2009).

7. Conclusion

When Minnesota legalized alkaline hydrolysis in 2003, it removed a legal barrier to competition in one of America's least competitive markets. Two decades and 22 additional states later, the grief premium remains undissolved. But something unexpected happened: the market grew. Legalization created jobs, establishments, and—presumably—expanded consumer choice, without harming incumbents. The lesson is not that deregulation failed, but that it succeeded along a different margin than intended. In markets built on behavioral frictions rather than legal ones, opening the door to competition may expand the room rather than redistributing its furniture.

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References

Baker, Andrew C., David F. Larcker, and Charles C.Y. Wang, "How much should we trust staggered difference-in-differences estimates?," *Journal of Financial Economics*, 2022, *144* (2), 370–395.

Berry, Steven T., "Estimation of a model of entry in the airline industry," *Econometrica*, 1992, *60* (4), 889–917.

Bresnahan, Timothy F. and Peter C. Reiss, "Entry and competition in concentrated markets," *Journal of Political Economy*, 1991, *99* (5), 977–1009.

Callaway, Brantly and Pedro H.C. Sant'Anna, "Difference-in-differences with multiple time periods," *Journal of Econometrics*, 2021, *225* (2), 200–230.

Chevalier, Judy and Fiona Scott Morton, "Effects of casket sales deregulation on the funeral home industry," *Review of Industrial Organization*, 2020, *56*, 501–522.

Federal Trade Commission, "Understanding the funeral rule," *FTC Consumer Information*, 2021. 16 CFR Part 453.

Goodman-Bacon, Andrew, "Difference-in-differences with variation in treatment timing," *Journal of Econometrics*, 2021, *225* (2), 254–277.

Harrington, David E., "The effects of deregulation on the competitive environment in the funeral home industry," *FTC Report*, 2007.

_ **and Kathy J. Krynski**, "The effect of state funeral regulations on cremation rates: Testing for demand inducement in funeral markets," *Journal of Law and Economics*, 2002, *45* (1), 199–225.

Hsieh, Chang-Tai and Peter J. Klenow, "Misallocation and manufacturing TFP in China and India," *Quarterly Journal of Economics*, 2009, *124* (4), 1403–1448.

Kleiner, Morris M. and Alan B. Krueger, "Licensing and labor market effects," *NBER Working Paper*, 2006, (12603).

_ **and** _ , "Analyzing the extent and influence of occupational licensing on the labor market," *Journal of Labor Economics*, 2013, *31* (S1), S173–S202.

Koopman, Christopher, Matthew D. Mitchell, and Adam D. Thierer, "The evolution of funeral costs in the United States," *Mercatus Center, George Mason University*, 2015.

Mitford, Jessica, *The American Way of Death*, New York: Simon & Schuster, 1963.

National Funeral Directors Association, "NFDA Cremation and Burial Report," 2023. Annual industry statistics.

Schumpeter, Joseph A., "Capitalism, Socialism, and Democracy," 1942.

Stigler, George J., "The theory of economic regulation," *The Bell Journal of Economics and Management Science*, 1971, *2* (1), 3–21.

Thornton, Robert J., "Market competition and economic regulation in the funeral industry," *Review of Industrial Organization*, 2012, *40*, 47–66.

A. Data Appendix

QCEW data. The Quarterly Census of Employment and Wages (QCEW) is published by the Bureau of Labor Statistics and covers approximately 99.7 percent of U.S. wage and salary employment. I access annual data through the BLS open data API (https://data.bls.gov/cew/data/api/), extracting records for NAICS codes 812210 and 812220 for each year from 2014 to 2023. County-level records (aggregation level code 78) provide establishment counts for all counties with at least one reporting unit. Employment and wage data are subject to BLS disclosure restrictions at the county level—76 percent of county-year observations for NAICS 812210 have suppressed employment—so I use state-level records (aggregation level code 58) for these outcomes. State-level records face no disclosure suppression.

Treatment timing. Legalization dates were compiled from state statutes and regulatory actions. I assign treatment at the state-year level based on the effective date of each state's authorizing legislation or regulation. For states with mid-year effective dates, I code treatment as beginning in the calendar year of enactment. The treatment variable is binary and absorbing: once set to one, it remains one for all subsequent years.

Sample construction. The county-level panel retains all counties observed in NAICS 812210 that belong to either a treatment-cohort state (2017–2023) or a never-treated state. The 13 states that legalized AH before 2014 are excluded because they contribute no pre-treatment variation. The balanced panel requirement of the Callaway and Sant'Anna (2021) estimator drops 146 county-year observations with intermittent reporting, yielding a final sample of 20,829 county-year observations across 2,160 counties.

B. Standardized Effect Sizes

Table 6: Standardized Effect Sizes for Main Outcomes

Outcome	Specification	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Panel A: Pooled							
Establishments	CS-DiD	0.189	0.150	9.22	0.020	0.016	Small positive
ln(Employment)	CS-DiD	0.046	0.018	0.95	0.049	0.019	Small positive
ln(Wage)	CS-DiD	0.026	0.015	0.20	0.128	0.076	Moderate positive
Panel B: Heterogeneous (Establishments by State Size)							
Large states	TWFE	0.635	0.276	9.22	0.069	0.030	Moderate positive
Other states	TWFE	0.116	0.094	9.22	0.013	0.010	Small positive

Notes: **Country:** United States. **Research question:** Does state-level legalization of alkaline hydrolysis (water cremation) affect the structure, employment, and wages of the funeral services industry? **Policy mechanism:** States that legalize alkaline hydrolysis permit licensed facilities to dissolve human remains in a heated alkaline solution as an alternative to flame cremation or burial, removing a legal barrier to entry for a lower-cost disposition technology. **Outcome definition:** Establishments: annual average count of funeral home establishments (NAICS 812210) from the BLS Quarterly Census of Employment and Wages; Employment: log of annual average employment; Wage: log of annual average weekly wage. **Treatment:** Binary indicator equal to one in state-years after alkaline hydrolysis legalization. **Data:** BLS QCEW, 2014–2023, county-year (establishments) and state-year (employment, wages). **Method:** Staggered DiD with Callaway–Sant'Anna (2021) estimator, not-yet-treated control group, state-clustered standard errors. **Sample:** 10 treatment cohorts (2017–2023) and 28 never-treated states; 13 always-treated states excluded from CS-DiD estimation. SDE $= \hat{\beta}/\text{SD}(Y)$ where SD(Y) is the unconditional 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).