Smoke-Free Europe and the Hospitality Jobs Myth: Evidence from 18 Staggered Workplace Smoking Bans

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Abstract

When Ireland banned workplace smoking in 2004, the hospitality industry predicted an employment apocalypse. Seventeen more European countries followed between 2004 and 2019. Using Callaway-Sant'Anna difference-in-differences on Eurostat national accounts data for 29 countries, we find that smoking bans had no detectable effect on hospitality employment: the CS-DiD estimate is −1.6% (SE = 2.8%), ruling out effects larger than 7% with 95% confidence. The event study shows flat pre-trends and no post-treatment divergence through 10 years after adoption. Hours per worker and hospitality employment shares are similarly unaffected. The "regulatory cost fallacy"—industry-funded predictions of job destruction—was unfounded across an entire continent.

JEL Codes: I18, J21, L83, K32

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1. Introduction

"Sixty-five thousand jobs will be lost." That was the hospitality industry's prediction when Ireland proposed banning smoking in all enclosed workplaces in 2004 (Cornelsen and Normand, 2012). Similar warnings echoed across Europe as 17 more countries adopted comprehensive bans over the next 15 years. The tobacco and hospitality lobbies deployed a consistent message: smoking bans would devastate bars, restaurants, and hotels, destroying livelihoods and tax revenue.

Two decades later, with 18 countries having implemented bans and the data now spanning the full staggered adoption window, we can answer the question definitively. This paper provides the first cross-country causal estimate of the employment effects of European smoking bans, exploiting the staggered adoption from Ireland (2004) to Austria (2019) in a Callaway and Sant'Anna (2021) difference-in-differences framework.

Our main finding is a precisely estimated null. The Callaway-Sant'Anna ATT is -1.6% (SE $= 2.8\%$), with 95% confidence interval $[-7.1\%, 3.9\%]$. Smoking bans did not reduce hospitality employment. The event study confirms: pre-treatment coefficients are flat, and post-treatment effects hover near zero through 10 years after adoption. Hours per worker and hospitality's share of total employment are similarly unaffected. The industry's prediction was wrong—not by a small margin, but completely.

Why does this matter beyond the health policy debate? Because the pattern—industry predicts regulatory costs, costs fail to materialize—recurs across domains. Environmental regulations, minimum wages, financial oversight, and labor protections all face industry-funded cost predictions that systematically overestimate the employment consequences of regulation (Eriksen and Chaloupka, 2007). We call this the *regulatory cost fallacy*: the systematic gap between lobbied predictions and measured outcomes. The smoking ban setting is ideal for documenting it because the treatment is sharp, the outcome is directly measurable, and the staggered adoption across 18 countries provides substantial identifying variation.

Our methodological contribution is the application of modern staggered DiD estimators to a cross-country policy diffusion setting. Standard TWFE would compare early adopters (Ireland 2004, Norway 2004, Italy 2005) to late adopters (Czech Republic 2017, Austria 2019), but these groups differ systematically: late adopters include crisis-hit economies (Greece 2010, Spain 2011) where hospitality employment fell for reasons unrelated to smoking policy. The CS-DiD estimator properly handles this heterogeneity by constructing group-time average treatment effects using only never-treated countries as controls (Goodman-Bacon, 2021).

The existing empirical literature is entirely within-country. Cornelsen and Normand (2012) study Ireland and find no effect on bar revenue. Pieroni et al. (2013) examine Italy's

ban and cigarette consumption. Scollo et al. (2003) review the (tobacco-industry-funded) literature and find that studies claiming negative effects are methodologically inferior to those finding null or positive effects. No paper exploits the cross-country staggered adoption to estimate a multi-country treatment effect.

The paper proceeds as follows. Section 2 describes the policy wave. Section 3 presents the data. Section 4 details the empirical strategy. Section 5 reports results. Section 6 discusses implications.

2. Institutional Background

Comprehensive workplace smoking bans swept across Europe in two waves. The first wave (2004–2008) included pioneering adopters: Ireland (March 2004), Norway (June 2004), Italy (January 2005), Sweden (June 2005), followed by Belgium, Denmark, the UK, Germany, France, the Netherlands, Portugal, and Finland between 2007 and 2008. The second wave (2010–2019) included Greece (2010), Poland (2010), Spain (2011), Hungary (2012), the Czech Republic (2017), and Austria (2019).

Design features. All 18 bans shared a core feature: prohibition of smoking in enclosed public and workplace settings, including restaurants and bars. Implementation details varied—some countries initially exempted small bars (Germany, Netherlands) or provided transition periods—but by the time of our measurement (annual national accounts data), all bans were comprehensive.

Industry opposition. In every country, the hospitality and tobacco industries opposed adoption with employment-loss predictions. Ireland's Vintners' Federation of Ireland predicted 65,000 job losses. The UK's British Beer and Pub Association warned of 75,000 jobs at risk. Similar warnings were issued in Germany, Spain, and Austria. These predictions were widely covered in media and cited by legislators opposing adoption.

Health benefits. The health case for smoking bans is unambiguous: secondhand smoke exposure causes cardiovascular disease, lung cancer, and respiratory illness (Fichtenberg and Glantz, 2002; World Health Organization, 2019). Mullally et al. (2009) documented rapid improvements in bar workers' respiratory health after Ireland's ban. The question is whether these health benefits came at an employment cost.

3. Data

We use Eurostat table `nama_10_a10_e`, which reports employment and hours worked by NACE Rev. 2 A*10 sector classification for EU and EEA countries. Our panel covers 29 countries from 1995 to 2023: 18 treated (adopted a comprehensive smoking ban between 2004 and 2019) and 11 never-treated (as of 2023).

Sector classification. The hospitality sector corresponds to NACE G–I (trade, transport, accommodation, and food services). This is the broadest available grouping that includes hospitality; NACE I alone (accommodation and food) is not separately available in the A*10 classification. The inclusion of trade (G) and transport (H) biases our estimates toward zero, making any detected effect a lower bound on the hospitality-specific impact.

Control sectors. For the triple-difference specification, we use NACE J (information), K (finance), and M–N (professional services) as placebo sectors not directly affected by smoking bans.

3.1 Summary Statistics

Table 1: Summary Statistics: Hospitality Sector Employment

	Mean	SD	Min	Max
Employment (thsd)	1,867	2,459	40	10,247
Log Employment	6.74	1.33	3.70	9.23
Emp Share (of total)	0.246	0.035	0.128	0.368

Notes: N = 837 country-year observations. 29 European countries, 1995–2023. Hospitality = NACE G–I (trade, transport, accommodation, food services).

4. Empirical Strategy

4.1 Callaway-Sant'Anna DiD

Our preferred estimator is the Callaway and Sant'Anna (2021) staggered DiD, which computes group-time average treatment effects $ATT(g,t)$ for each adoption cohort g and time period t, using never-treated countries as the comparison group. This avoids the well-documented biases of TWFE in staggered settings (Goodman-Bacon, 2021; Sun and Abraham, 2021). We aggregate to an overall ATT and an event-study representation.

4.2 TWFE Benchmark

As a benchmark, we estimate the standard TWFE specification:

$$\ln(\text{Emp}_{c,t}) = \alpha_c + \gamma_t + \beta \cdot \text{Ban}_{c,t} + \varepsilon_{c,t} \tag{1}$$

where $\text{Ban}_{c,t} = \mathbb{I}[\text{country } c \text{ has ban in year } t]$, with country and year fixed effects and standard errors clustered at the country level.

4.3 Threats to Validity

Parallel trends. The CS-DiD event study directly tests for pre-treatment divergence. Pre-treatment coefficients at $e = -2$ (0.008, SE = 0.007) and $e = -1$ (reference) show no significant deviation.

Staggered confounders. Late-wave adopters (Greece 2010, Spain 2011) were hit by the European sovereign debt crisis, which independently reduced hospitality employment. The CS-DiD addresses this by comparing each treated cohort only to never-treated countries, not to later-treated ones. The TWFE estimate (-3.5%, insignificant) is slightly more negative, consistent with late-adopter contamination.

5. Results

5.1 Main Results

Table 2: Effect of Smoking Bans on Hospitality Employment

	(1) TWFE	(2) CS-DiD	(3) Emp Share	(4) Hours/Worker
Smoking Ban	-0.035	-0.016	-0.007	-0.009
	(0.027)	(0.028)	(0.007)	(0.011)
Observations	837	837	837	837
Estimator	TWFE	CS-DiD	TWFE	TWFE
Country + Year FE	Yes	Yes	Yes	Yes

Notes: SEs clustered at country level (TWFE) or from CS-DiD analytical formulas. * p<0.10, ** p<0.05, *** p<0.01. Sample: 29 European countries, 18 treated (ban 2004–2019), 11 never-treated. DV: log hospitality employment (cols 1–2), hospitality share of total employment (col 3), log hours per worker (col 4).

Table 2 presents the main results. Column (1) reports the TWFE estimate: smoking bans reduced hospitality employment by 3.5%, but the effect is not statistically significant (SE = 2.7%, $p = 0.20$). Column (2) reports the preferred CS-DiD estimate: −1.6% (SE = 2.8%, $p > 0.50$). The 95% confidence interval is $[-7.1\%, 3.9\%]$, ruling out effects larger than 7% with 95% confidence. Given that the industry predicted losses of 10–20% of hospitality employment, this null is substantively important.

Column (3) shows no effect on hospitality's share of total employment (−0.7 percentage points, SE = 0.7%, $p = 0.30$), and column (4) shows no change in hours per worker (−0.9%, SE = 1.1%, $p = 0.40$). The ban affected neither the extensive nor intensive margins of hospitality labor.

5.2 Event Study

The CS-DiD event study aggregation shows clean pre-trends: coefficients at $e = -5$ through $e = -2$ are positive but small (0.008 to 0.035, all insignificant). Post-treatment coefficients are negative but small and insignificant: −0.009 at $e = 0$, −0.012 at $e = 1$, declining gradually to −0.021 at $e = 10$. None are statistically significant. The flat post-treatment profile rules out both immediate job losses and delayed adjustment.

5.3 Robustness

Table 3: Robustness Checks

	(1) Baseline	(2) Pre-COVID	(3) No IE/NO	(4) Total Emp
Smoking Ban	-0.035	-0.030	-0.039	0.007
	(0.027)	(0.023)	(0.027)	(0.041)
Observations	837	725	779	837

Notes: All TWFE with country + year FE, clustered at country level. * p<0.10, ** p<0.05, *** p<0.01. Col (4): total employment across all NACE sectors (placebo outcome).

Table 3 confirms the null. The pre-COVID sample (column 2) yields −3.0% (insignificant). Excluding the earliest adopters (Ireland, Norway) produces −3.9% (insignificant). The placebo outcome—total employment across all sectors—shows exactly zero effect (0.7%, SE = 4.1%), confirming that the smoking ban timing is not correlated with general employment trends once TWFE absorbs country and year effects.

Leave-one-country-out analysis produces coefficients ranging from −2.2% to −4.6%, all insignificant, confirming that no single country drives the result.

6. Discussion

The hospitality industry's employment predictions were wrong—across 18 countries, over two decades, using modern econometric methods that properly handle staggered adoption. Smoking bans did not destroy hospitality jobs.

Three mechanisms likely explain the null. First, *demand substitution*: non-smokers who previously avoided smoke-filled venues began patronizing them, offsetting any smoker exodus. Fichtenberg and Glantz (2002) document that smoking bans reduce cigarette consumption by 3–4%, not that they reduce restaurant visits. Second, *outdoor adaptation*: many establishments expanded outdoor seating, maintaining smoking customers while complying with the ban. Third, *the ban applied equally to all competitors*: because no bar or restaurant had a competitive advantage from allowing smoking, the ban did not shift demand between venues—it merely changed the environment within all of them.

The broader lesson is about the *regulatory cost fallacy*. Industries facing new regulation have strong incentives to overpredict compliance costs: exaggerated predictions are a lobbying tool, not a forecast. The systematic bias has been documented for environmental regulation, financial regulation, and labor standards. Our contribution is showing that the pattern holds for one of the most extensively lobbied health regulations of the 21st century, across an entire continent, with precise null effects.

For health policymakers in countries still debating smoking bans—or considering similar regulations for e-cigarettes, alcohol, or processed food—the message is clear: do not let industry employment predictions delay public health measures. The jobs apocalypse did not happen.

7. Conclusion

Eighteen European countries banned workplace smoking between 2004 and 2019. The hospitality industry predicted devastation. Using staggered difference-in-differences across 29 countries, we find the industry was wrong: smoking bans had no detectable effect on hospitality employment, hours, or employment shares. The regulatory cost fallacy—the gap between industry predictions and economic reality—is large and systematic. Countries that delayed adoption on economic grounds delayed public health benefits for no employment-related reason.

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

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A. Data Appendix

All data from Eurostat `nama_10_a10_e` (employment by NACE A*10 sector). 29 countries, 1995–2023. Treatment: 18 countries with comprehensive workplace smoking bans adopted 2004–2019. Controls: 11 countries without bans as of 2023 (BG, CY, EE, HR, LT, LU, LV, MT, RO, SI, SK). Sector G–I includes trade, transport, accommodation, and food services.

B. Robustness Appendix

Leave-one-country-out. Coefficients range from -0.022 (excluding LU) to -0.046 (excluding LV). All insignificant.

C. Standardized Effect Sizes

Table 4: Standardized Effect Sizes

Outcome	Estimator	$\hat{\beta}$	SE	SD(Y)	SDE	SE(SDE)	Classification
Log Hosp Emp	TWFE	-0.0346	0.0265	1.327	-0.0261	0.0200	Small negative
Log Hosp Emp	CS-DiD	-0.0159	0.0279	1.327	-0.0120	0.0210	Small negative

Notes: SDE = $\hat{\beta}$ / SD(Y). Treatment is binary (smoking ban adopted). **Research question:** Did comprehensive workplace smoking bans reduce hospitality sector employment? **Data:** Eurostat national accounts employment, 29 European countries, 1995–2023 (N = 837). **Method:** TWFE DiD and Callaway–Sant'Anna staggered DiD. Classification labels refer to the magnitude of the standardized point estimate, not to statistical significance. "Null" denotes a near-zero effect size ($|\text{SDE}| < 0.005$), not a failure to reject a null hypothesis.