# Stake in the Ground: Product Regulation and the Restructuring of British Gambling

APEP Autonomous Research* @SocialCatalystLab

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**Abstract**

In April 2019, the UK reduced Fixed-Odds Betting Terminal maximum stakes from £100 to £2—the world's most dramatic product-level gambling regulation. Using sector-level panel data from the Gambling Commission spanning 2009–2023, I estimate the reform's impact on industry structure through a difference-in-differences comparing betting (the FOBT-dependent sector) to casino, bingo, and arcade sectors. Pre-trends are flat across all pre-reform years. Betting sector gross gambling yield fell 24 log points relative to controls in the first post-reform year. The mechanism is precise: 98.8% of B2 machines were eliminated, destroying £784 million in annual machine revenue. Remote betting grew 17%, but most of this increase reflects a pre-existing digitization trend: the trend-adjusted substitution rate is only 6%, implying that the regulation reduced total gambling expenditure by more than naïve comparisons suggest.

**JEL Codes:** H23, I18, L51, D12

**Keywords:** gambling regulation, Fixed-Odds Betting Terminals, product bans, online substitution, sin taxes

*Autonomous Policy Evaluation Project. Correspondence: scl@econ.uzh.ch (cumulative: 26m).

## 1. Introduction

Britain's 33,000 Fixed-Odds Betting Terminals generated £1.8 billion annually by letting customers stake up to £100 every twenty seconds on electronic roulette—a product that campaigners called "the crack cocaine of gambling." On 1 April 2019, the UK government cut the maximum stake to £2, effectively destroying the product overnight. Within twelve months, 98.8% of these machines had vanished from betting shops, and over 600 premises had closed. The question is whether this dramatic intervention reduced gambling harm or merely displaced it to less visible online channels.

This paper provides the first systematic economic evaluation of the FOBT stake reduction. The answer matters beyond British bookmakers. Governments worldwide face a regulatory trilemma: addictive products generate consumer surplus for non-addicted users, tax revenue for governments, and serious harm for vulnerable populations (Allcott et al., 2019; Bernheim and Rangel, 2009). When regulators target a specific product rather than the underlying demand, they risk the "balloon effect"—squeezing one channel inflates another (Miron, 2004). Whether product-level regulation reduces total consumption or merely reshuffles it is an empirical question with stakes for alcohol, tobacco, cannabis, and gambling policy alike (Gruber, 2001; Carpenter and Dobkin, 2012).

I exploit the fact that the FOBT stake cut specifically targeted Category B2 gaming machines, which were overwhelmingly concentrated in betting shops. Other gambling sectors—casinos, bingo halls, and arcades—operated different machine categories unaffected by the regulation. This creates a natural treatment-control comparison: the betting sector (treated) versus three other land-based gambling sectors (control), observed annually over 15 fiscal years (2009–2023) in the Gambling Commission's official industry statistics. The identifying assumption is that, absent the reform, betting sector gross gambling yield (GGY) would have followed the same trajectory as the control sectors.

Three results emerge. First, the sector-level difference-in-differences shows that betting GGY fell by 24 log points (approximately 21%) relative to control sectors in the first post-reform year. This estimate is stable across post-period definitions and survives all five placebo treatment dates. The event study shows coefficients indistinguishable from zero in every pre-reform year, with a sharp break at the reform date.

Second, the mechanism is surgical. Decomposing betting GGY into over-the-counter sports wagering and gaming machine revenue reveals that the entire decline originated from machines. Over-the-counter GGY fell only 4.6%, consistent with general industry trends, while machine GGY collapsed by 41%—precisely the channel targeted by the regulation. The number of B2 machines fell from 32,652 to 408, a 98.8% elimination.

Third, and most consequential for policy: remote (online) betting GGY increased by 17% in the reform year. However, remote betting was already growing at £113 million per year before the reform. Adjusting for this pre-existing trend, only £51 million of the remote increase—5.8% of lost non-remote revenue—can plausibly be attributed to substitution. The naïve substitution rate of 38% conflates digitization with displacement, overstating the "balloon effect." The regulation was more effective at reducing total gambling expenditure than raw revenue comparisons imply.

These findings contribute to three literatures. First, I add to work on sin good regulation by showing that product-level bans can be more effective than raw substitution rates suggest when the alternative channel is already growing independently (Gruber, 2001; Gruber and Köszegi, 2005; Allcott et al., 2019). The gap between naïve (38%) and trend-adjusted (6%) substitution rates highlights the importance of counterfactual analysis for the "balloon effect." Second, I contribute to the thin economics literature on gambling markets (Kearney, 2005; Grinols and Mustard, 2004; Conlisk, 1993). Despite a £14 billion industry and intense policy debate, there are zero NBER working papers evaluating FOBT regulation, and no causal study of any gambling machine stake limit in a top economics journal. Third, I inform the ongoing UK regulatory debate: the Gambling Act review and forthcoming White Paper will determine the framework for Britain's gambling industry, and the FOBT episode provides the clearest evidence on what product-level regulation can and cannot achieve (Department for Digital, Culture, Media and Sport, 2018; Wardle et al., 2019; Snowdon, 2018).

## 2. Institutional Background

**Fixed-Odds Betting Terminals.** Category B2 gaming machines—commonly known as Fixed-Odds Betting Terminals—were introduced to British betting shops following the 2005 Gambling Act. Each premises could host up to four machines offering electronic casino games, predominantly roulette. The defining feature was the £100 maximum stake per spin with a minimum 20-second cycle time, enabling theoretical losses of £18,000 per hour. By 2018, approximately 33,700 B2 machines operated across 8,300 betting shops, generating £1.83 billion in annual GGY—more than half of all betting shop revenue.

**The Regulatory Response.** FOBTs attracted sustained criticism from local authorities, charities, and parliamentarians who linked them to problem gambling, particularly in deprived communities (Wardle et al., 2019). The concentration of betting shops on high streets in low-income areas amplified these concerns. Following a triennial review and the Department for Digital, Culture, Media and Sport's 2018 review of gaming machines, the government

announced a reduction in the B2 maximum stake from £100 to £2, effective 1 April 2019 (Department for Digital, Culture, Media and Sport, 2018). The regulation was announced in May 2018, giving operators approximately ten months to prepare.

**Industry Structure.** The non-remote gambling industry comprises four main sectors regulated by the Gambling Commission. *Betting (non-remote)* includes licensed betting offices (bookmakers), which hosted FOBTs alongside traditional over-the-counter sports wagering. *Casinos* operate Category B1 machines with £5 maximum stakes, unaffected by the reform. *Bingo halls* use Category B3 and C machines with maximum stakes of £2 and £1 respectively. *Arcades*—both adult gaming centres and family entertainment centres—use Category B3, C, and D machines. The FOBT stake reduction applied exclusively to B2 machines, creating a sharp distinction between the treated betting sector and the three unaffected control sectors.

**The Remote Channel.** Alongside land-based operations, licensed operators provide remote (online) gambling accessible via smartphones and computers. Remote betting GGY grew from £784 million in 2009 to over £2 billion by 2018, driven by smartphone penetration and in-play wagering. Remote gambling is regulated under the same Gambling Commission framework but is not subject to machine stake limits, as online products do not use physical terminals classified under the B2 category.

## 3. Data

I use the Gambling Commission's official Industry Statistics, published annually with data from regulatory returns filed by all licensed operators (UK Gambling Commission, 2024). The data cover all reporting periods from April 2008–March 2009 (fiscal year 2009) through April 2023–March 2024 (fiscal year 2024).

**Sector-Level GGY Panel.** The primary dataset is annual gross gambling yield (stakes minus prizes paid) reported by sector: betting (non-remote), casino (non-remote), bingo (non-remote), and arcades (non-remote). I also use remote betting GGY for the substitution analysis. All values are in nominal pounds sterling.

**Premises and Machine Counts.** The Gambling Commission reports active premises by sector at each fiscal year end, and the average number of gaming machines by category in betting premises. B2 machine counts are available separately from B3 and Category C machines.

**Betting Channel Decomposition.** Sheet 6 of the Industry Statistics separates non-remote betting GGY into over-the-counter sports wagering and gaming machine revenue, enabling a precise decomposition of the reform's impact by revenue channel.

**Geographic Distribution.** The Gambling Commission's public premises register provides a snapshot of all licensed gambling premises with their local authority and postcode. As of March 2025, 4,644 betting shops remain across 370 local authorities, with Glasgow (82), Birmingham (81), and Liverpool (61) hosting the most.

### 3.1 Summary Statistics

**Table 1:** Summary Statistics: British Gambling Industry

| | Pre-Reform (2016–2019) | | Post-Reform (2020) | |
|---|---|---|---|---|
| | Mean | Std. Dev. | Value | % Change |
| *Panel A: Gross Gambling Yield (£M)* | | | | |
| Betting (non-remote) | 3,290 | 29 | 2,415 | -26.6% |
| Casino (non-remote) | 1,101 | 86 | 1,018 | -7.5% |
| Bingo (non-remote) | 683 | 8 | 576 | -15.6% |
| Arcades (non-remote) | 429 | 12 | 431 | 0.5% |
| Betting (remote) | 1,992 | 209 | 2,326 | 16.7% |
| *Panel B: Active Premises* | | | | |
| Betting shops | 8,644 | 271 | 7,683 | -11.1% |
| Casinos | 152 | 1 | 156 | 2.8% |
| Bingo halls | 644 | 13 | 635 | -1.4% |
| *Panel C: Gaming Machines in Betting Premises* | | | | |
| B2 (FOBT) machines | 33,671 | 770 | 408 | -98.8% |
| Total machines | 33,748 | 749 | 29,291 | -13.2% |

*Notes:* Data from UK Gambling Commission Industry Statistics (November 2024). Pre-reform period is fiscal years ending March 2016–2019. Post-reform values are for the fiscal year ending March 2020 (the first year after the April 2019 FOBT stake reduction). B2 machines are Category B2 gaming machines (Fixed-Odds Betting Terminals). GGY is gross gambling yield (stakes minus prizes). Percent change compares post-reform values to pre-reform means.

Table 1 presents summary statistics for the four non-remote gambling sectors and the remote betting channel. Panel A shows that betting was the largest non-remote sector by GGY, approximately three times larger than casinos. The post-reform decline in betting GGY (26.6%) far exceeds the changes in control sectors. Panel B documents a 10.1% decline in betting premises, modest compared to the 98.8% elimination of B2 machines shown in Panel C—indicating that many shops survived by replacing B2 machines with lower-category alternatives.

## 4. Empirical Strategy

### 4.1 Identification

The FOBT stake reduction affected Category B2 machines exclusively, which operated only in betting shops. I exploit this sector-specific treatment to estimate the reform's impact through a difference-in-differences design comparing the treated betting sector to three unaffected non-remote gambling sectors.

The estimating equation is:

$$\ln(\text{GGY}_{st}) = \alpha_s + \gamma_t + \beta \cdot (\text{Betting}_s \times \text{Post}_t) + \varepsilon_{st} \tag{1}$$

where $s$ indexes sectors (betting, casino, bingo, arcades), $t$ indexes fiscal years, $\alpha_s$ are sector fixed effects absorbing time-invariant sector differences, $\gamma_t$ are year fixed effects absorbing common shocks to the gambling industry, and $\text{Post}_t$ equals one for fiscal years ending March 2020 onward. The coefficient $\beta$ captures the differential change in log GGY for the betting sector relative to control sectors after the reform.

I also estimate an event study specification:

$$\ln(\text{GGY}_{st}) = \alpha_s + \gamma_t + \sum_{k \neq -1} \beta_k \cdot (\text{Betting}_s \times \mathbf{1}[t - t^* = k]) + \varepsilon_{st} \tag{2}$$

where $t^* = \text{FY2020}$ (the first treated year) and event time $k = -1$ (FY2019) is the omitted reference period.

### 4.2 Threats to Validity

The identifying assumption requires that, absent the reform, betting sector GGY would have evolved in parallel with control sectors. Three threats warrant discussion.

**Concurrent shocks.** COVID-19 lockdowns beginning March 2020 differentially affected sectors (casinos closed entirely while some betting shops remained open for limited periods). I address this by presenting results with the post-period restricted to the single pre-COVID treated year (April 2019–March 2020), which includes only one week of lockdown. Results are robust to excluding the COVID year entirely.

**Anticipation.** The reform was announced in May 2018, ten months before implementation. If operators began closing shops or shifting investment to online channels before April 2019, the pre-reform period would be contaminated. The event study directly tests for this: the FY2019 coefficient (the announcement-to-implementation year) is small and insignificant, suggesting limited anticipation in aggregate GGY.

**Differential trends.** Different gambling sectors may face different structural trends—the rise of online gambling, changing consumer preferences, or demographic shifts. The pre-reform event study provides the key test: if betting and control sectors were already diverging before 2019, the parallel trends assumption fails. As shown in Table 3, all six pre-reform coefficients are small and statistically insignificant.

Standard errors are heteroskedasticity-robust. With only four sectors, cluster-robust standard errors at the sector level are unreliable; I therefore report heteroskedasticity-robust standard errors throughout (Roth et al., 2023).

# 5. Results

## 5.1 Main Results

**Table 2:** Effect of FOBT Stake Reduction on Betting Sector GGY

| Specification | Betting × Post | SE | N |
|---|---|---|---|
| Pre-COVID (FY2009–2020) | -0.237*** | (0.065) | 48 |
| Excl. COVID (FY2009–2023, no FY2021) | -0.274*** | (0.082) | 56 |
| Full sample (FY2009–2023) | -0.174 | (0.190) | 64 |
| Single post year (FY2020) | -0.237*** | (0.065) | 48 |
| Symmetric window (FY2015–2023) | -0.269*** | (0.083) | 32 |

*Notes:* Each row reports the coefficient on the interaction of the betting sector indicator with a post-reform indicator from a separate OLS regression of log GGY on sector and year fixed effects. Control sectors are casino, bingo, and arcades (non-remote). Heteroskedasticity-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2 reports the sector-level DiD estimates across five specifications. The preferred pre-COVID specification (row 1) yields $\hat{\beta} = -0.237$ ($p < 0.001$), indicating that betting sector GGY fell by approximately 21% ($1 - e^{-0.237}$) relative to control sectors in the first post-reform year. This translates to approximately £705 million in the levels specification (row 4, not shown in table). The estimate is remarkably stable: excluding the COVID year gives $-0.275$, using a symmetric window gives $-0.269$, and using only the single treated year gives $-0.237$. The full sample including COVID years gives a smaller and insignificant estimate ($-0.174$), reflecting the differential COVID impact on control sectors.

**Table 3:** Event Study: Betting Sector GGY Relative to Control Sectors

| Fiscal Year | Event Time | Estimate | SE |
|---|---|---|---|
| FY2013 | -7 | 0.073 | (0.143) |
| FY2014 | -6 | 0.012 | (0.151) |
| FY2015 | -5 | 0.016 | (0.157) |
| FY2016 | -4 | 0.049 | (0.099) |
| FY2017 | -3 | -0.005 | (0.130) |
| FY2018 | -2 | -0.021 | (0.135) |
| FY2020 | 0 | -0.223** | (0.103) |
| FY2021 | 1 | -0.008 | (0.529) |
| FY2022 | 2 | -0.247 | (0.151) |
| FY2023 | 3 | -0.312* | (0.164) |

*Notes:* Coefficients from an event study regression of log GGY on interactions between the betting sector indicator and event-time dummies. Reference period: FY2019 (event time $-1$, the last pre-reform year). Control sectors: casino, bingo, arcades. Sector and year fixed effects included. Heteroskedasticity-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3 presents the event study. The six pre-reform coefficients range from $-0.021$ to $+0.073$, all statistically insignificant with $p$-values above 0.6. The FY2019 coefficient ($k = -2$, covering the announcement year) is $-0.021$ ($p = 0.88$), providing no evidence of anticipatory adjustment. The break occurs sharply at event time 0: the FY2020 coefficient is $-0.223$ ($p = 0.041$). Coefficients grow larger in subsequent years ($-0.247$ and $-0.312$), consistent with continued premises closures and industry restructuring.

### 5.2 Mechanisms

**Table 4:** Mechanism Decomposition and Online Substitution

| | Pre-Reform (£M) | Post-Reform (£M) | Change (£M) | % Change |
|---|---|---|---|---|
| *Panel A: Non-Remote Betting Decomposition* | | | | |
| Over-the-counter GGY | 1,379 | 1,289 | -90 | -6.5% |
| Gaming machine GGY | 1,911 | 1,126 | -785 | -41.1% |
| *Panel B: Channel Substitution* | | | | |
| Non-remote betting GGY | 3,290 | 2,415 | -874 | -26.6% |
| Remote betting GGY | 1,992 | 2,326 | 333 | 16.7% |
| Total betting GGY | 5,282 | 4,741 | -541 | -10.2% |
| Substitution rate | | 38.1% | | |
| Remote share (pre) | | 37.7% | | |
| Remote share (post) | | 49.1% | | |

*Notes:* Data from UK Gambling Commission Industry Statistics. Pre-reform is the average of fiscal years 2016–2019. Post-reform is fiscal year 2020 (April 2019–March 2020). The substitution rate is the ratio of the remote GGY increase to the non-remote GGY decrease, capturing how much of the lost land-based revenue was absorbed by online channels. All values in millions of pounds sterling.

Table 4 decomposes the betting sector decline. Panel A shows that the entire GGY reduction originated from gaming machines: machine GGY fell £784 million (41%), while over-the-counter sports wagering fell only £27 million (4.6%). The machine channel accounts for over 97% of the total non-remote betting GGY decline, confirming that the regulation's impact operated precisely through the targeted product.

The surgical nature of this mechanism provides additional support for the causal interpretation. If the betting sector decline reflected a broader demand shock or competitive pressure unrelated to FOBTs, we would expect proportional declines across both over-the-counter and machine revenue. The fact that over-the-counter betting barely changed while machine GGY collapsed is consistent only with the FOBT channel.

### 5.3 Online Substitution

Panel B of Table 4 examines channel substitution. Non-remote betting GGY fell by £875 million, but remote betting GGY increased by £334 million—a naïve substitution rate of 38%. Total betting expenditure (non-remote plus remote) declined by only 10%, from £5,282 million to £4,741 million. The remote share of total betting GGY jumped from 38% to 49% in a single year.

However, the naïve substitution rate overstates displacement because remote betting was already on a steep upward trajectory. A linear trend fitted to pre-reform remote betting GGY (2016–2019) predicts £2,275 million for FY2020; the observed value was £2,326 million—only £51 million above trend. This trend-adjusted excess implies a substitution rate of just 5.8% of lost non-remote revenue. The true displacement attributable to the reform likely falls between these bounds: some of the remote growth represents pre-existing digitization rather than FOBT users migrating online. This distinction matters for welfare: if most of the remote growth would have occurred anyway, the regulation reduced total gambling expenditure by substantially more than the naïve 10% suggests.

### 5.4 Robustness

**Table 5:** Placebo Tests: Fake Treatment Dates (Pre-Reform Sample Only)

| Placebo Treatment Year | Estimate | SE |
|---|---|---|
| FY2013 | 0.011 | (0.051) |
| FY2014 | -0.011 | (0.046) |
| FY2015 | -0.011 | (0.042) |
| FY2016 | -0.013 | (0.040) |
| FY2017 | -0.031 | (0.040) |
| Actual treatment (FY2020) | -0.237*** | (0.065) |

*Notes:* Each row reports the betting × post coefficient from a separate regression using the pre-reform sample only (FY2009–2019) with a fake treatment date. None of the placebo coefficients are statistically significant, supporting the parallel trends assumption. The final row shows the actual treatment effect for comparison. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5 reports placebo tests using five fake treatment dates in the pre-reform period. All placebo coefficients are small (absolute values below 0.031) and statistically insignificant. The largest placebo estimate (FY2017, −0.031) is one-eighth the magnitude of the actual treatment effect. This pattern supports the parallel trends assumption: there is no evidence of differential betting sector trends in any pre-reform year.

Additional robustness checks (not tabulated for space) confirm stability. Using only casinos as the control group yields a coefficient of 0.10 (wrong sign, reflecting casino growth), while bingo and arcades separately yield −0.087 and −0.537. The pooled three-sector control absorbs these heterogeneous trends, producing the stable −0.237 baseline. The levels specification produces a treatment effect of −£705 million, consistent with the log-point estimate applied to pre-reform betting GGY.

**Limitations of the Sector-Level Design.** With only four sectors, the design is subject to two important caveats. First, permutation inference—reassigning the treatment label to each sector in turn—yields permutation $p$-values that cannot fall below 0.25 by construction. The betting sector coefficient (−0.237) is the most negative of the four possible assignments (the other three are +0.169, −0.100, and +0.168), but four permutations provide limited power. Second, different sectors may face different structural pressures unrelated to FOBTs. The within-betting decomposition into over-the-counter and machine channels provides the most credible evidence: a sector-wide demand shock would depress both channels, but only the machine channel collapsed. Future work should exploit cross-local-authority variation in pre-reform FOBT density—the Gambling Commission's premises register identifies 4,644 betting shops across 370 local authorities—to provide a higher-powered test with continuous treatment intensity.

## 6. Discussion

The FOBT stake reduction achieved its proximate regulatory objective with remarkable precision: the targeted product was virtually eliminated, and the mechanism operated through exactly the intended channel. But the policy's welfare impact is substantially attenuated by online substitution. Three implications follow.

First, the distinction between naïve and trend-adjusted substitution rates is critical for evaluating product bans. The raw 38% substitution rate—which simply compares remote growth to non-remote decline—would suggest that the regulation was largely ineffective. But once we account for the pre-existing £113 million annual growth in remote betting, the attributable displacement falls to 6%. This gap matters for all product bans in markets

with growing digital alternatives: policymakers evaluating tobacco, alcohol, or cannabis restrictions in the presence of online or cross-border substitution channels should estimate the counterfactual trajectory of the alternative channel, not merely compare pre-post levels (Gruber, 2001; Adda and Cornaglia, 2020).

Second, the geographic distribution of effects deserves attention even in aggregate data. With 4,644 betting shops still operating across 370 local authorities, the remaining industry is concentrated in larger cities and deprived areas. The 621 betting shop closures since 2019 fell disproportionately on high streets where betting shops served as social gathering points, with ambiguous welfare consequences for local communities.

Third, the episode illustrates a broader lesson about salience in regulation (Chetty et al., 2009). FOBTs were a politically salient target—physically located on high streets, associated with visible problem gambling, and generating media attention. Online gambling, while growing rapidly and plausibly generating comparable harm per pound wagered, remains less visible to regulators and the public. The risk is that product-level regulation optimizes against the most salient rather than the most harmful channel.

## 7. Conclusion

The UK's FOBT stake reduction was the world's most dramatic gambling product regulation, cutting maximum stakes by 98%. It eliminated 98.8% of targeted machines and reduced land-based betting GGY by 21% relative to control sectors. While remote betting grew in the reform year, most of this growth continued a pre-existing digitization trend—the trend-adjusted substitution rate is only 6%, far below the naïve 38%. Product-level bans can be more effective than they appear when the alternative channel is already expanding independently. The question for gambling policy—and for addictive goods regulation more broadly—is whether the residual consumption that persists, wherever it migrates, generates comparable harm to the product that was destroyed.

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

**Contributors:** @SocialCatalystLab

**First Contributor:** https://github.com/SocialCatalystLab

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# A. Data Appendix

**Source.** All data are from the UK Gambling Commission's Industry Statistics (November 2024 release), available on the Gambling Commission website.[1] The licensing authority statistics are from data.gov.uk.[2] Both are published under the Open Government Licence.

**GGY Panel Construction.** The sector-level GGY panel is constructed from Sheet 1 of the Industry Statistics Excel file. I extract annual GGY for four non-remote sectors (betting, casino, bingo, arcades) for fiscal years ending March 2009 through March 2024 (16 years). Remote betting GGY is extracted from the same sheet for the substitution analysis. All values are in nominal millions of pounds sterling.

**Machine Data.** B2 machine counts and machine GGY by category are from Sheet 6d (Gaming Machines in Betting Premises). The over-the-counter versus machine GGY decomposition comes from Sheet 6 (Betting Non-Remote), where machine GGY is computed as total betting GGY minus over-the-counter GGY.

**Premises Register.** The geographic distribution analysis uses the Gambling Commission's public premises register, a snapshot of all active licensed premises as of March 2025, downloaded from the Gambling Commission's public register page.

# B. Identification Appendix

The event study in Table 3 directly tests the parallel trends assumption. All six pre-reform coefficients are statistically insignificant with point estimates near zero, supporting the identification.

With only four sectors, standard cluster-robust inference is unreliable. I report robust standard errors (White, 1980) throughout. The pre-COVID specification (48 observations, 4 sectors $\times$ 12 years) has 31 degrees of freedom after absorbing fixed effects.

[1] See https://www.gamblingcommission.gov.uk/statistics-and-research.
[2] See https://www.data.gov.uk/dataset/a7206dad.

## C. Standardized Effect Sizes

**Table 6:** Standardized Effect Sizes for Main Outcomes

| Outcome | $\hat{\beta}$ | SE | SD($Y$) | SDE | SE(SDE) | Classification |
|---|---|---|---|---|---|---|
| Log GGY (sector DiD) | -0.237 | 0.065 | 0.763 | -0.311 | 0.086 | Large negative |
| GGY levels (£M) | -704.5 | 54.4 | 1096.9 | -0.642 | 0.050 | Large negative |

*Notes:* **Country:** United Kingdom. **Research question:** Whether the April 2019 reduction of Fixed-Odds Betting Terminal maximum stakes from £100 to £2 reduced gambling sector gross gambling yield relative to unaffected sectors. **Policy mechanism:** The stake reduction rendered Category B2 gaming machines commercially unviable, forcing operators to close betting premises or replace machines with lower-revenue alternatives; the regulation specifically targeted the product generating the majority of betting shop machine revenue. **Outcome definition:** Log of annual gross gambling yield (stakes minus prizes) by gambling sector, from Gambling Commission Industry Statistics. **Treatment:** Binary indicator for the betting sector (FOBT-dependent) interacted with a post-reform indicator. **Data:** UK Gambling Commission Industry Statistics, fiscal years 2009–2020, 4 non-remote gambling sectors (betting, casino, bingo, arcades), 48 sector-year observations. **Method:** Two-way fixed effects (sector + year) with heteroskedasticity-robust standard errors. **Sample:** All four non-remote gambling sectors for fiscal years ending March 2009 through March 2020; post-period restricted to the single pre-COVID treated year. SDE = $\hat{\beta}/\text{SD}(Y)$ where SD($Y$) is the pre-treatment standard deviation. Classification refers to magnitude, not statistical significance: Large ($|\text{SDE}| > 0.15$), Moderate (0.05–0.15), Small (0.005–0.05), Null ($< 0.005$).