

Gambling with Graduation: Mobile Sports Betting Legalization and Student Persistence

Dylan Burke*

July 16, 2026

Abstract

This paper examines whether the legalization of mobile sports betting affects college student persistence. I construct an original dataset identifying the precise date each state first offered legal mobile sports betting, distinct from the date of legislative authorization, and combine it with an annual panel of 1,488 four-year colleges from the Integrated Postsecondary Education Data System (IPEDS), 2014–2024. Using a difference-in-differences design that accounts for staggered treatment timing (Callaway and Sant’Anna, 2021), I find that legalization is associated with a statistically significant 1.21 percentage point decline in four-year graduation rates, with effects increasing in cohorts’ cumulative exposure to legal betting access. The effect is absent from both six-year graduation rates and first-year retention, the latter serving as a falsification check since most entering freshmen are below the legal betting age of 21. Checks on applicant, admissions, and enrollment composition show no evidence that the results are driven by selection into treated institutions. The findings suggest mobile sports betting access delays, rather than prevents, college completion.

*Department of Economics, Darla Moore School of Business, University of South Carolina, Columbia, SC

1 Introduction

Since the Supreme Court’s 2018 ruling in *Murphy v. NCAA*, legal sports betting has grown into a major industry. Legal sportsbooks took in nearly \$148 billion in bets in 2024, with 95 percent of that handle wagered online rather than at a physical sportsbook (American Gaming Association, 2025). For most Americans today, placing a bet on a sporting event requires nothing more than a smartphone and an internet connection.

This paper studies whether this rapid expansion of mobile sports betting access has affected outcomes for college students, complementing a growing literature on the financial and behavioral effects of sports betting legalization with evidence on educational attainment. College students are a uniquely relevant population to study for several reasons. They are demographically similar to the typical sports bettor: survey evidence finds that bettors are disproportionately young and male, with nearly half of men aged 18 to 49 reporting an active online sports betting account (Siena College Research Institute, 2025). Mobile access also places a sportsbook within reach at any time, including during class, in a dorm room, or between assignments, lowering the cost of betting precisely for a population with substantial unstructured time. Finally, college students are unusually close to the object of wagering since their own institutions field athletic teams on which bets can be placed. A 2023 NCAA survey found that 67 percent of students living on campus report betting on sports, and that 41 percent of student bettors have wagered on their own school’s teams (NCAA, 2023), underscoring that this proximity to wagering extends to the broader student body as fans and bettors, not just athletes themselves. I construct an original dataset identifying the date on which each state first offered legal mobile sports betting to the public, and combine it with an annual panel of 1,488 four-year colleges drawn from the Integrated Postsecondary Education Data System (IPEDS), spanning 2014 to 2024. Using this panel, I examine whether the timing of a state’s legalization of mobile sports betting affected graduation rates at colleges within that state.

I identify the impact of legalized mobile sports betting on graduation rates using a difference-in-differences design that compares colleges in never-treated states to colleges in states that have legalized mobile betting, exploiting the staggered timing of state-level legalization across the sample period. Because standard two-way fixed effects estimators can be biased in staggered settings, where already-treated units serve as contaminated con-

trols for later-treated cohorts, I implement the estimator developed by (Callaway and Sant’Anna, 2021) alongside the standard approach. I also examine first-year retention rate as a falsification check: because nearly every state restricts sports betting to individuals aged 21 or older, entering freshmen are largely unable to legally wager, so a true behavioral channel operating through betting access should leave first-year retention largely unaffected even as it affects outcomes concentrated among upperclassmen.

I find that legalized mobile sports betting is associated with a statistically significant 1.21 percentage point decline in four-year graduation rates, an effect that grows with each successive cohort’s cumulative exposure to legal betting access. This effect does not appear in either the six-year graduation rate or first-year retention, both of which are statistically indistinguishable from zero, and the limited evidence on gender heterogeneity is directionally (though not statistically significant) consistent with a channel concentrated among men. On balance, these results point to a delay in completion, not a failure to ever complete.

A growing body of work studies how policy-driven changes in access to amenities or consumption opportunities affect college students. (Blake et al., 2024) find that the legalization of recreational marijuana increased college applications, particularly at larger institutions, demonstrating that this type of policy can meaningfully shift student-facing outcomes at the institutional level. (Braghieri et al., 2022) find that the staggered rollout of Facebook across U.S. college campuses worsened student mental health and increased self-reported academic impairment. Together, this literature establishes that access to new amenities, whether a legal substance, a digital platform, or, in this paper’s case, a betting product, can have measurable and sometimes unexpected effects on student-related outcomes, motivating closer attention to mobile sports betting specifically.

A separate and more directly relevant literature examines gambling behavior among college students and the broader population of sports bettors. Concern about gambling on campus predates the legalization of mobile sports betting: (Stuhldreher et al., 2007) document gambling as an emerging health problem among college students, and (Nelson et al., 2007) find that sports betting is common among college athletes, fans, and students more broadly. (Humphreys and Pérez, 2012) characterize the demographic profile of sports bettors as disproportionately young and male, while (Kim and López, 2025) examine the motivations underlying participation in sports betting and daily fantasy sports, including the role of perceived skill versus luck. Following

the legalization of mobile sports betting after *Murphy*, a newer literature has documented rising concern about gambling-related harm specifically tied to this expansion in access. (van der Maas et al., 2022) find that online problem gambling discussion activity increased following state-level legalization, and (Yeola et al., 2025) document a growing public health concern around gambling addiction in the post-*Murphy* era.

A related set of papers examines the specific psychological and financial channels through which legalized mobile sports betting access affects individuals and households, though the evidence on mental health specifically is mixed. (Hollenbeck et al., 2025) and (Baker et al., 2024) document financial distress and reduced household savings following legalization, with effects concentrated among financially constrained households. (Guo et al., 2026) similarly document a financial-distress channel, finding that legalized sports betting reduces household food sufficiency, with effects concentrated among working-age adults without a college degree. In contrast, (Bersak et al., 2024) find no average population-wide impact of legal betting access on self-reported mental health or financial distress, including among demographic groups most likely to bet. (Couture et al., 2024) find a more nuanced pattern by age and sex: legalized sports betting is associated with a roughly 3.8 percentage point increase in the likelihood of poor mental health among men aged 30 to 34, but a 5.5 percentage point decrease among men aged 18 to 24.

Turning to behavioral changes following legal betting access, (Fleming et al., 2024) find that legalization increased leisure time among young adults aged 18 to 24 at the cost of time spent on work and education, a key finding given the subject of this paper. (Dasgupta and Ghimire, 2026) find evidence linking sports betting legalization to increased substance use, and (Wilken, 2024) finds that legalization is associated with increased rates of child maltreatment, suggesting that the behavioral consequences of legalized betting can extend beyond the bettor to other members of a household. Despite this growing and at times conflicting body of evidence on the financial, behavioral, and health consequences of legalized sports betting, no existing study has examined its effect on a hard educational outcome such as college graduation. This paper addresses that gap directly, and does so using an original mobile-specific treatment date rather than the broader and less precise legislative authorization dates used throughout most of this literature.

The remainder of the paper is organized as follows: Section 2 provides information on the background of legalized sports betting in the United States.

Sections 3 and 4 outline the data and the empirical strategy, respectively. Section 5 discusses the main results. Section 6 concludes and offers avenues for future research.

2 Background

For over a quarter century, the Professional and Amateur Sports Protection Act of 1992 (PASPA) effectively prohibited sports betting throughout the United States outside of Nevada. New Jersey spent nearly a decade fighting to overturn this restriction, losing repeatedly in federal court before the Supreme Court agreed to hear the case. On May 14, 2018, the Court ruled 6-3 in *Murphy v. NCAA* that PASPA’s prohibition on state authorization of sports betting violated the Tenth Amendment’s anti-commandeering doctrine, striking the law down in its entirety.¹ Then-Governor Chris Christie, who had led New Jersey’s legal fight since 2012, celebrated the ruling as a vindication of states’ rights to regulate gambling within their own borders.² The decision did not legalize sports betting nationwide, however. Instead, it returned the question to the states, and each state was now free to authorize sports wagering on its own timeline.

In the years following *Murphy*, states legalized sports betting at a steady but uneven pace. Some states moved almost immediately: New Jersey, the plaintiff in the case, had mobile betting live within months. Others waited several years, and as of the end of this paper’s sample period in 2024, twenty states had not yet legalized sports betting in any form. States’ decisions to legalize, and when, were driven primarily by considerations unrelated to higher education, including anticipated tax revenue and political and budgetary conditions. Hollenbeck et al. (2025) test this directly using a hazard model and find no significant relationship between the timing of state legalization and a range of state-level economic and demographic conditions, including college attainment rates. This staggered, state-by-state rollout is the source of identifying variation in this paper: because the timing of legalization was not driven by conditions at individual colleges or universities, it provides a source of quasi-random variation in students’ access to mobile sports betting.

A key institutional detail shapes how this variation should be interpreted: states differ not only in whether they have legalized sports betting, but in whether that betting can be placed online or only in person. Some states permit sports wagering exclusively at licensed retail locations, such as casinos or racetracks, requiring a bettor to physically travel to place a wager. Oth-

¹Murphy v. National Collegiate Athletic Association, 584 U.S. 453 (2018).

²Christie, C. [@GovChristie], quoted in De Vogue, A., & Sneed, T. (2018, May 14). Supreme Court lets states legalize sports gambling. *CNN*. [cnn.com](https://www.cnn.com)

ers additionally permit mobile or online betting, allowing a bettor to wager from a smartphone or computer from anywhere within the state. This distinction is consequential for a population like college students, for whom the marginal cost of placing a bet is plausibly much lower when access requires only a smartphone rather than a trip to a casino. Baker et al. (2024) document substantial behavioral and financial effects specifically attributable to online sports betting access, finding that online legalization induces rapid and persistent growth in betting activity that crowds out household savings and investment, particularly among financially constrained households. For this reason, this paper defines treatment specifically around the availability of legal mobile sports betting, rather than the broader definition of legalization in any form.

Nearly every state that has legalized sports betting restricts wagering to individuals aged 21 or older, consistent with the minimum age typically required for casino gambling and the purchase of alcohol. A small number of states, including the District of Columbia, Kentucky, New Hampshire, Rhode Island, and Wyoming, set the minimum betting age at 18, often because their sports betting programs are administered through state lottery systems rather than traditional casino licensing frameworks. This near-universal 21-year-old threshold has a direct implication for this paper’s empirical design: because most students enter college well before their 21st birthday, the typical entering freshman is not legally permitted to wager when mobile sports betting becomes available in their state. Upperclassmen, particularly juniors and seniors, are far more likely to have reached the legal betting age while still enrolled. This age structure motivates the use of first-year retention as a falsification check, discussed further below, since a behavioral channel operating through legal access to mobile betting should affect upperclassmen-relevant outcomes well before it affects outcomes concentrated among entering freshmen.

3 Data

The primary data source for this paper is the Integrated Postsecondary Education Data System (IPEDS), a system of annual surveys administered by the National Center for Education Statistics (NCES) that is mandatory for any institution participating in Title IV federal financial aid programs, resulting in near-universal coverage of degree-granting institutions in the United States. Institutions report data annually across a series of survey components covering enrollment, finances, staffing, and student outcomes, making IPEDS the standard data source in higher education for institution-level measures of student persistence and completion. This paper uses annual IPEDS data spanning 2014 to 2024 on the primary outcomes of interest, four-year and six-year graduation rates. I also examine first-year retention rate, which serves as a falsification check given that most entering freshmen are below the common legal sports betting age of 21.

The panel is constructed from two IPEDS survey components. The Institutional Characteristics survey (HD) provides the institutional identifiers and characteristics (including control type, level, Carnegie classification, tribal status, and state location) used to apply the sample restrictions described below, while the Graduation Rates survey (GR) provides the outcome variables of interest. The derived IPEDS graduation rate files provide the six-year completion rate disaggregated by sex, but not the four-year rate, since NCES has historically built out demographic disaggregates around the 150%-of-time completion metric specifically rather than the supplementary 100%-of-time measure. A sex-disaggregated four-year rate could be constructed directly from the underlying cohort-level counts in the raw GR survey files; however, the gender heterogeneity analysis in Section 5.2 is now limited to the six-year outcome for this draft. Together, these components yield a panel of colleges nested within states, observed annually from 2014 to 2024. After applying the sample restrictions discussed below, the final sample includes 1,488 four-year institutions across 49 states and the District of Columbia. Table 1 presents the full sequence of sample restrictions and their effect on institution count. Because the four-year and six-year graduation rate variables exhibit additional missingness beyond these restrictions, the estimation sample for each outcome is balanced separately. This yields slightly smaller analytic samples of 1,350 institutions for the four-year graduation rate and 1,378 institutions for the six-year graduation rate.

I also construct an original dataset identifying the date on which each

state first offered legal mobile sports betting to the public, distinct from the date a state’s legislature authorized betting in principle. This distinction matters because in some states the date of legislative authorization and the date of practical mobile access diverged significantly, with implications for how treatment should be coded. Iowa represents the most extreme case, where the two dates diverged by over a year and a half. The state’s sports wagering legislation, signed in May 2019, technically permitted mobile and online sports betting from launch. However, the statute required that an account for mobile wagering be established *in person* with a licensed operator: Senate File 617 specifies that “advance deposit sports wagering” accounts must be established by an eligible individual in person with a licensee prior to January 1, 2021 (Iowa General Assembly, 2019). In practice, this meant that an Iowa resident wishing to bet from a smartphone first had to travel to a licensed casino to register before ever placing a bet remotely (Lawhon, 2020). Existing treatment codings, including the widely used American Gaming Association state-of-play map, mark Iowa as having legalized mobile sports betting in 2019, the date the legislation was signed, rather than January 1, 2021, when the in-person registration requirement was lifted and mobile betting became genuinely accessible without ever visiting a casino. For a paper concerned with the behavioral margin of college students, who are unlikely to travel to a licensed casino simply to register for an app, I code Iowa’s treatment date as 2021 rather than 2019.

Treatment dates are constructed from a combination of primary and secondary sources, including legislative documents, state gaming commission records, press releases from sports betting operators and governors’ offices, and local news archives. Where legislative text or commission records were ambiguous about the practical launch of mobile wagering, local news coverage was used to identify the specific date on which the relevant restriction was lifted or the first mobile platform went live. Table 2 reports the mobile betting launch date, corresponding first treated academic year, and source type for each state.

Once a state’s mobile launch date is identified, a second issue remains: because IPEDS measures outcomes at the academic-year level while legalization dates occur on specific calendar days, I adopt a rule to align mobile betting launch dates with academic years. A state’s first treated academic year is the first one whose fall semester begins after the legalization date, using September 30 as a cutoff for whether a launch falls early enough in a given fall to count toward that academic year. Academic years are labeled by

their starting calendar year throughout (e.g., the 2021-2022 academic year is referred to as 2021). For example, Arizona’s launch on September 9th, 2021 places the law before the cutoff, so that fall’s academic year is treated, while Arkansas’ launch on March 6th, 2022 falls well after the prior fall’s cutoff, so the academic year beginning that fall is the first treated year instead. In both cases, the first treated academic year is the first one in which mobile sports betting was available for nearly its full two semesters.

Table 3 presents summary statistics by treatment status, calculated using pre-treatment years only so that the comparison reflects baseline differences rather than any effect of legalization itself. Treated and never-treated institutions are similar on observable characteristics, though treated institutions exhibit modestly higher baseline persistence outcomes: the average pre-treatment four-year graduation rate is 45.3 percent among institutions in states that eventually legalize mobile sports betting, compared to 38.7 percent among institutions in never-treated states. A similar pattern holds for retention and six-year graduation rates. Academic preparation, measured by institutional SAT Math percentiles, and the gender composition of male applicants, admits, and enrollees are comparable across groups. The final sample includes 962 institutions in eventually-treated states and 526 institutions in never-treated states.

4 Methodology

I identify the impact of legalized mobile sports betting on graduation rates by comparing colleges in never-treated states to recently treated colleges, using both a standard two-way fixed effects (TWFE) estimator and a heterogeneity-robust difference-in-differences estimator to account for the staggered timing of state-level legalization. The basic model being estimated takes the following form:

$$Y_{ist} = \alpha + \beta \text{Legal}_{st} + \mu_i + \lambda_t + \varepsilon_{ist} \quad (1)$$

where Y_{ist} is the outcome of interest, namely four-year graduation rate, six-year graduation rate, or first-year retention rate for college i in state s in year t . First-year retention rate serves primarily as a falsification check, since most entering freshmen are not yet of legal age to place bets and should therefore be largely unaffected by mobile betting legalization. Legal_{st} is a binary indicator equal to one in the first year state s offers legal mobile sports betting and all subsequent years. μ_i are college fixed effects absorbing all time-invariant institution-level differences (and implicitly state fixed effects since colleges are nested within states). λ_t are year fixed effects absorbing common shocks. ε_{ist} is the error term clustered at the state level, the unit of treatment assignment. β is the coefficient of interest, interpreted as the average effect of mobile sports betting legalization on the outcome.

In settings with staggered treatment adoption, standard TWFE can yield biased results due to already-treated units serving as controls for later-treated units. Therefore, I also implement the technique of Callaway and Sant’Anna (2021), which estimates cohort-specific average treatment effects on the treated, $\text{ATT}(g,t)$, for each group g of states first legalizing in the same year, evaluated at time t , using only never-treated states as the comparison group. These cohort-time specific estimates are then aggregated into a single summary ATT as well as the dynamic event-study estimates presented below. To assess both pre-trends and the dynamic path of treatment effects, I estimate the following event-study specification:

$$Y_{ist} = \alpha + \sum_{k=-5}^3 \beta_k \mathbf{1}[t - G_s = k] + \mu_i + \lambda_t + \varepsilon_{ist} \quad (2)$$

where Y_{ist} is the outcome of interest as defined above. G_s denotes the year in which state s first offered legal mobile sports betting, and $k = t - G_s$ indexes

event time (the number of years before or after legalization). $\mathbf{1}[t - G_s = k]$ is an indicator equal to one when college i is k years away from its state's legalization year. β_k captures the average treatment effect at event time k , estimated using the Callaway and Sant'Anna (2021) estimator with never-treated states serving as the comparison group. The dynamic estimates β_k carry direct structural content in this setting: because IPEDS graduation rates reflect cohort outcomes, β_0 captures the effect on a cohort that was already in its senior year when legalization occurred, while each subsequent β_k reflects a cohort that was one year earlier in their college career at the time of legalization. The dynamic path of post-treatment estimates should therefore be interpreted as tracing out a dose-response relationship in cumulative exposure length. Pre-treatment estimates ($k < 0$) serve as a test of the parallel trends assumption; coefficients statistically indistinguishable from zero provide evidence that treated and never-treated colleges followed similar graduation trends prior to legalization. μ_i and λ_t denote college and year fixed effects respectively, and ε_{ist} is the error term with standard errors clustered at the state level.

5 Results

5.1 Main Results

Table 4 presents the main results. Panel A reports estimates for the four-year graduation rate. The standard two-way fixed effects estimate is negative but not statistically significant at conventional levels (-0.868 , $p=0.120$). The Callaway-Sant’Anna estimate, which accounts for the staggered timing of legalization across states, is larger in magnitude and statistically significant: legalized mobile sports betting is associated with a 1.21 percentage point decline in the four-year graduation rate at affected institutions ($p=0.042$), a decline of roughly 3.1% relative to the pre-treatment mean four-year graduation rate among never-treated institutions. The gap between the two estimators is consistent with the concern, discussed in Section 4, that standard TWFE can understate treatment effects in staggered settings by using already-treated units as contaminated controls for later-treated cohorts.

Panel B reports estimates for the six-year graduation rate. Both the TWFE and Callaway-Sant’Anna estimates are smaller in magnitude and not statistically significant (-0.561 and -0.434 , respectively). The contrast between Panels A and B is informative: a significant decline in four-year completion paired with a smaller, statistically insignificant six-year effect suggests that legalized mobile sports betting may only delay graduation. Students affected by the policy appear more likely to take longer to complete their degree than to fail to complete it at all.

Figure 1 plots the dynamic Callaway-Sant’Anna estimates for the four-year graduation rate. Pre-treatment coefficients are small and statistically indistinguishable from zero at every lead except $k=-3$, supporting the parallel trends assumption underlying the study design. Post-treatment estimates grow steadily more negative: the effect is smallest in magnitude at $k=0$ (-0.51 percentage points) and grows to -1.18 at $k=1$, -1.52 at $k=2$, and -2.78 at $k=3$. As discussed in Section 3, this follows directly from how IPEDS measures graduation cohorts. The cohort reflected in the four-year graduation rate at $k=0$ entered college four years prior to legalization, and so was already well into their college career, and in many cases already in their final year, by the time mobile betting became legal. Each subsequent post-treatment estimate reflects a cohort that entered one year later, and was therefore correspondingly earlier in their college career at the time of legalization, accumulating more potential exposure prior to their expected graduation

date. The growing magnitude of the post-treatment estimates traces a dose-response relationship in cumulative exposure to legal mobile sports betting, rather than a one-time shock that dissipates or remains constant over time.

Figure 2 plots the corresponding dynamic estimates for the six-year graduation rate. As with the four-year rate, pre-treatment coefficients are small and statistically indistinguishable from zero at every lead, supporting the parallel trends assumption. Unlike the four-year rate, however, the post-treatment estimates do not exhibit a clear growing pattern and remain statistically insignificant at every horizon, ranging from -0.27 percentage points at $k=0$ to -0.64 at $k=3$. The absence of a significant or clearly widening effect on the six-year graduation rate, set against the significant and growing effect on the four-year rate documented in Figure 1, reinforces the interpretation that legalized mobile sports betting primarily delays rather than prevents graduation.

5.2 Gender Heterogeneity

Table 5 examines whether the effect on six-year graduation rates differs by gender. The derived IPEDS graduation rate files provide the six-year completion rate disaggregated by sex, but not the four-year rate, so this heterogeneity analysis is limited to the six-year outcome for this draft, motivated by survey evidence that sports bettors are disproportionately young and male (Siena College Research Institute, 2025). The Callaway-Sant’Anna estimate for men is negative, though not statistically significant at conventional levels (-0.596, $p=0.135$), while the estimate for women is essentially zero (0.035, $p=0.925$). Although neither estimate reaches statistical significance, the point estimates suggest (directionally) a behavioral channel concentrated among male students, the population most likely to hold an active sports betting account.

Figures 3 and 4 plot the corresponding dynamic estimates separately for men and women. Among men, the post-treatment estimates grow more negative over time, reaching -1.13 percentage points at $k=2$ ($p=0.049$), a pattern similar in shape to the overall four-year result in Figure 1. Among women, the post-treatment estimates remain close to zero at every horizon and never approach statistical significance. This divergence in the dynamic pattern reinforces the cross-sectional comparison in Table 5: the effect of legalized mobile sports betting on six-year graduation appears concentrated among male students.

5.3 Falsification Check: First-Year Retention

Because most entering freshmen are below the legal sports betting age of 21, first-year retention should be largely unaffected by mobile sports betting legalization if the documented effects on graduation operate through a behavioral channel requiring legal access. Table 6 reports the corresponding estimates. Both the TWFE and Callaway-Sant’Anna estimates are small in magnitude and statistically indistinguishable from zero (-0.307 and -0.036, respectively). Figure 5 plots the dynamic estimates, which similarly remain close to zero and statistically insignificant at every pre- and post-treatment horizon, with no evidence of the growing pattern documented for the four-year graduation rate. In line with what would be expected under a behavioral channel operating primarily among students old enough to legally wager, I find no significant effect on first-year retention, in contrast to the significant and growing declines in four-year graduation rates documented in Section 5.1.

5.4 Robustness: Student Composition

A potential concern is that the main results could be driven by changes in the composition of students applying to, admitted to, or enrolling at colleges in treated states, rather than by changes in persistence among already-enrolled students. If legalization affected institutions’ applicant pools, for example by deterring risk-averse students or their families, this could generate spurious changes in graduation rates unrelated to any behavioral effect of betting access on enrolled students. Table 7 reports estimates for five measures of student composition: male applicants, male admissions, male first-time enrollment, and institutional SAT Math 25th and 75th percentiles. None of the ten coefficients (five outcomes, two estimators each) is statistically significant at conventional levels, and several point estimates run in the opposite direction from what would be expected if student composition were changing as a result of legalization. The SAT-based checks warrant some caution, however: many institutions in the sample have adopted test-optional admissions policies over the panel period, and the institutions that continue to report SAT scores, reflected in the smaller sample of 539 institutions for this outcome, are likely a more selective and less representative subset of the full sample than those used in the applicant, admissions, and enrollment checks.

6 Conclusion

This paper examines whether the legalization of mobile sports betting affects college student persistence, using an original dataset identifying the precise date each state first offered legal mobile wagering combined with an annual panel of 1,488 four-year institutions from 2014 to 2024. Using a heterogeneity-robust difference-in-difference estimator, I find that legalized mobile sports betting is associated with a statistically significant 1.21 percentage point decline in four-year graduation rates, an effect that grows with each successive cohort’s cumulative exposure to legal betting access. The limited evidence on gender heterogeneity is directionally consistent with an effect concentrated among men, though the subgroup estimates do not reach conventional significance. The effect does not appear in either first-year retention or the six-year graduation rate, both of which are statistically indistinguishable from zero.

The contrast between the four-year and six-year results suggests that legalized mobile sports betting primarily delays rather than permanently prevents graduation. The growing magnitude of the effect across successive cohorts, who accumulated progressively more exposure to legal mobile betting over the course of their college career, points in the same direction, reinforcing a cumulative rather than one-time effect. The suggestive concentration of the effect among men, who are also disproportionately likely to hold an active sports betting account, offers some additional support for a behavioral channel operating through betting access itself, rather than some broader and less targeted state-level shock coinciding with legalization (though this piece of the evidence is the weakest of the three).

The results of this paper contribute to two related literatures. First, it adds to a growing body of work documenting the financial and behavioral consequences of legalized sports betting access, extending this evidence to an educational outcome that has not, to my knowledge, been previously studied in this context. Second, it contributes methodologically by constructing an original dataset that identifies the precise date on which each state first offered legal mobile sports betting, distinct from the date of legislative authorization commonly used in existing research. The Iowa example discussed in Section 3, where a two-year gap separated legislative signing from the lifting of an in-person registration requirement, illustrates why this distinction matters and suggests that studies relying on legislative signing dates alone may meaningfully misclassify treatment timing in settings where the popu-

lation of interest is particularly sensitive to the convenience of mobile access to sports betting.

This analysis has several limitations. First, IPEDS does not provide individual-level data on student betting behavior, financial distress, or time use, so the mechanism underlying the documented decline in graduation rates cannot be directly observed. The interpretation offered above is in line with the evidence but remains indirect. Second, the derived IPEDS graduation rate files used in this paper provide the six-year completion rate disaggregated by sex, but not the four-year rate, since NCES has historically built out demographic disaggregates around the 150%-of-time completion metric specifically. A sex-disaggregated four-year rate could be constructed directly from the underlying cohort-level counts in the raw GR survey files, which I plan to incorporate in a future draft.

Several avenues remain for future work. Most directly, future drafts will construct a sex-disaggregated four-year graduation rate from the underlying IPEDS cohort counts, allowing the gender heterogeneity analysis to extend to another outcome of interest rather than the six-year rate alone. Most importantly, this paper’s interpretation of the mechanism behind the documented effect remains indirect. Linking this analysis to student-level survey data, such as the National College Health Assessment, would allow future work to test directly whether the decline in four-year graduation rates operates through time reallocation away from coursework, financial distress, or mental health channels associated with problem gambling, rather than inferring mechanism solely from the pattern of results presented here.

From a policy perspective, the findings suggest that the rapid expansion of mobile sports betting access carries consequences for at least one important population beyond the bettors themselves: the institutions and policy-makers responsible for student success. States and universities with large student populations may wish to consider targeted consumer protections or financial literacy initiatives specifically aimed at college-aged bettors, particularly given that nearly all jurisdictions already restrict betting based on age but few, if any, address the unique circumstances of the college environment.

7 Tables

Table 1: Sample Restrictions

Restriction	Institutions
IPEDS institutions reporting in all years, 2014–2024	5,274
Four-year institutions only	2,388
Drop for-profit institutions	2,165
Drop faith-related special focus institutions	1,900
Primarily baccalaureate-or-above	1,535
Drop tribal colleges	1,534
Drop territories and Nevada	1,488
Final sample	1,488

Notes: Table presents the sequential application of sample restrictions to the IPEDS panel. Each row reflects the number of unique institutions remaining after applying that restriction in addition to all restrictions above it. Because the four-year and six-year graduation rate variables exhibit additional missingness, the estimation samples for those outcomes are balanced separately and are slightly smaller; see Table 4 for exact sample sizes by outcome.

Table 2: Legal Mobile Sports Betting Launch Dates by State

State	Mobile Launch Date	First Treated Academic Year	Source Type
Arizona	September 9, 2021	2021	Local/regional news
Arkansas	March 6, 2022	2022	Local/regional news
Colorado	May 1, 2020	2020	Local/regional news
Connecticut	October 19, 2021	2022	Local/regional news
District of Columbia	May 28, 2020	2020	Local/regional news
Delaware	December 27, 2023	2024	Industry/sports news
Florida	December 7, 2023	2024	Local/regional news
Illinois	June 18, 2020	2020	Local/regional news
Indiana	October 3, 2019	2020	Local/regional news
Iowa	January 1, 2021 ^a	2021	Local/regional news
Kansas	September 1, 2022	2022	Industry/sports news
Kentucky	September 28, 2023	2023	Industry/sports news
Louisiana	January 15, 2022	2022	Industry/sports news
Maine	November 3, 2023	2024	Local/regional news
Maryland	November 23, 2022	2023	Local/regional news
Massachusetts	March 10, 2023	2023	Local/regional news
Michigan	January 22, 2021	2021	Local/regional news
New Hampshire	December 30, 2019	2020	Local/regional news
New Jersey	June 14, 2018	2018	Local/regional news
New York	January 8, 2022	2022	Industry/sports news
North Carolina	March 11, 2024	2024	State government
Ohio	January 1, 2023	2023	State government
Oregon	October 16, 2019	2020	Local/regional news
Pennsylvania	May 28, 2019	2019	Industry/sports news
Rhode Island	September 4, 2019	2019	Local/regional news
Tennessee	November 1, 2020	2021	Local/regional news
Vermont	January 11, 2024	2024	Local/regional news
Virginia	January 21, 2021	2021	Local/regional news
West Virginia	December 27, 2018	2019	Local/regional news
Wyoming	September 1, 2021	2021	Industry/sports news

Notes: Table reports the date on which each state first offered legal mobile sports betting to the public, and the corresponding first treated academic year under the alignment rule described in Section 3. Missouri legalized mobile sports betting on December 1, 2025, after the end of the sample period, and is coded as never-treated for estimation purposes. States not listed had not legalized mobile sports betting as of the end of 2024 and are coded as never-treated. Full source URLs for each state are available upon request.

^a Iowa's sports wagering legislation was signed in May 2019, but the statute required in-person registration with a licensed operator until January 1, 2021; see Section 3 for discussion.

Table 3: Summary Statistics by Treatment Status

	Treated	Control
<i>Panel A: Persistence outcomes</i>		
Full-time retention rate	77.03 (0.36)	74.42 (0.50)
6-year graduation rate	58.80 (0.58)	54.62 (0.78)
6-year graduation rate (men)	55.21 (0.62)	50.21 (0.82)
6-year graduation rate (women)	62.29 (0.57)	58.39 (0.76)
4-year graduation rate	45.27 (0.68)	38.70 (0.86)
<i>Panel B: Composition & admissions</i>		
Percent female enrollment	57.43 (0.41)	58.84 (0.53)
Male applicants	3,221 (148)	3,571 (314)
Male admissions	1,779 (73)	1,924 (123)
Male first-time enrollment	469 (21)	520 (34)
<i>Panel C: Academic preparation</i>		
SAT Math 25th percentile	504.35 (2.63)	496.35 (3.41)
SAT Math 75th percentile	607.08 (2.56)	603.05 (3.37)
Institutions	962	526

Notes: This table reports means by treatment status. Standard errors are reported in parentheses. The sample is restricted to pre-treatment years only (treated units observed before first treatment year). All institution-level outcomes are collapsed to the unit level using pre-treatment means. Applicants, admissions, and enrollment variables refer to male students only. SAT scores refer to institutional SAT Math percentiles for admitted students. Standard errors are computed as $SD/\sqrt{N}$ within treatment status groups. Observations are at the institution level (unitid).

Table 4: Effect of Legalized Mobile Sports Betting on Graduation Rates

	TWFE	Callaway-Sant'Anna
<i>Panel A: Four-Year Graduation Rate</i>		
ATT	-0.868 (0.548)	-1.206** (0.593)
Institutions	1,350	1,350
<i>Panel B: Six-Year Graduation Rate</i>		
ATT	-0.561 (0.434)	-0.434 (0.413)
Institutions	1,378	1,378

Notes: TWFE estimates from Equation 1; Callaway-Sant'Anna estimates from Callaway and Sant'Anna (2021), aggregated to a single overall ATT, with never-treated states as the comparison group. Standard errors clustered at the state level in parentheses. Institution counts reflect the outcome-specific balanced sample for each panel, which is smaller than the full sample of 1,488 institutions reported in Table 1 due to additional missingness in the graduation rate variables. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Heterogeneity by Gender: Six-Year Graduation Rate

	TWFE	Callaway-Sant'Anna
<i>Panel A: Men</i>		
ATT	-0.581 (0.422)	-0.596 (0.398)
Institutions	1,325	1,325
<i>Panel B: Women</i>		
ATT	-0.330 (0.416)	0.035 (0.379)
Institutions	1,365	1,365

Notes: TWFE estimates from Equation 1; Callaway-Sant'Anna estimates from Callaway and Sant'Anna (2021), aggregated to a single overall ATT, with never-treated states as the comparison group. Standard errors clustered at the state level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Falsification Check: First-Year Retention

	TWFE	Callaway-Sant’Anna
ATT	-0.307 (0.290)	-0.036 (0.279)
Institutions	1,381	1,381

Notes: TWFE estimates from Equation 1; Callaway-Sant’Anna estimates from Callaway and Sant’Anna (2021), aggregated to a single overall ATT, with never-treated states as the comparison group. Standard errors clustered at the state level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

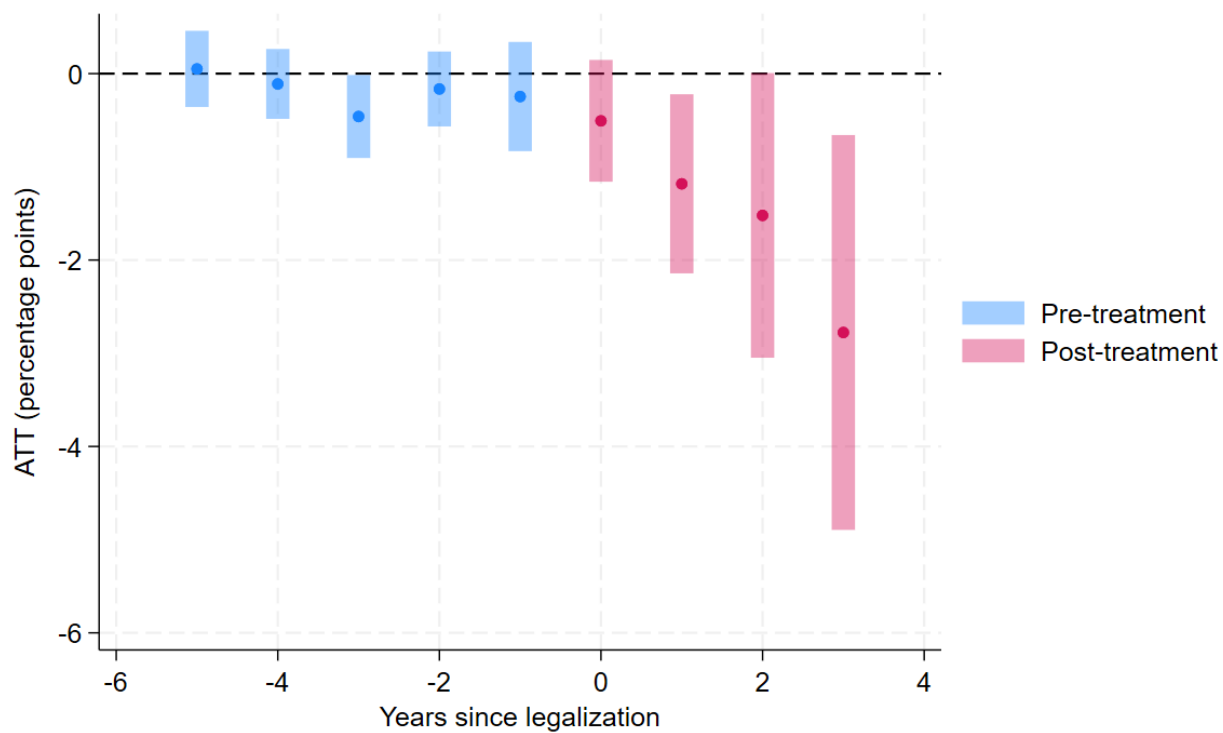
Table 7: Robustness: Student Composition

	TWFE	Callaway-Sant’Anna
Male applicants	-139.97 (152.92)	-47.30 (121.30)
Male admissions	-27.39 (88.95)	-6.58 (70.32)
Male first-time enrollment	-9.21 (11.19)	-10.88 (8.49)
SAT Math 25th percentile	-0.22 (4.49)	1.70 (4.13)
SAT Math 75th percentile	1.18 (3.21)	3.16 (2.39)

Notes: TWFE estimates from Equation 1; Callaway-Sant’Anna estimates from Callaway and Sant’Anna (2021), aggregated to a single overall ATT, with never-treated states as the comparison group. Standard errors clustered at the state level in parentheses. Institution counts range from 539 (SAT percentiles) to 1,277 (male applicants); the smaller SAT sample reflects the growing prevalence of test-optional admissions policies, which limits this check to a more selective subset of institutions that continue to report scores. No estimate is statistically significant at conventional levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

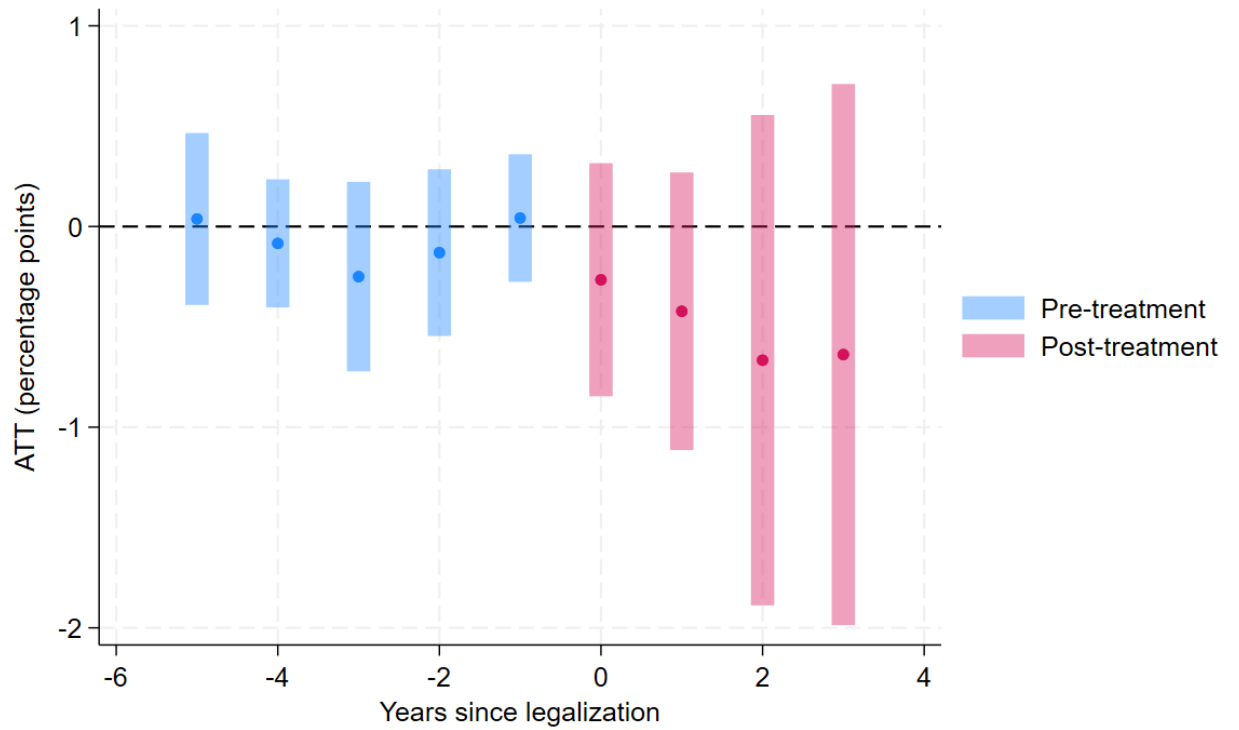
8 Figures

Figure 1: Four-Year Graduation Rate: Dynamic ATT by Event Time



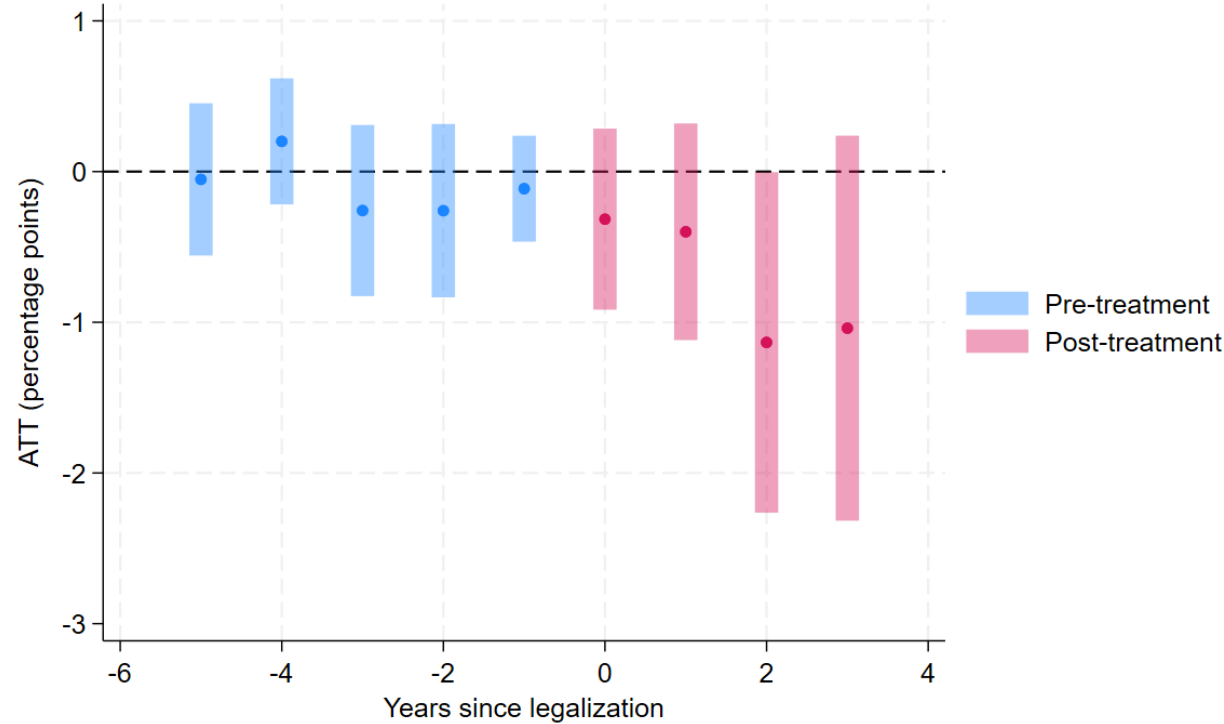
Notes: Estimates from Callaway and Sant'Anna (2021), with never-treated states as the comparison group. Event-time window restricted to -5 to $+3$ to avoid composition-driven artifacts from cohort thinning at longer horizons. Standard errors clustered at the state level.

Figure 2: Six-Year Graduation Rate: Dynamic ATT by Event Time



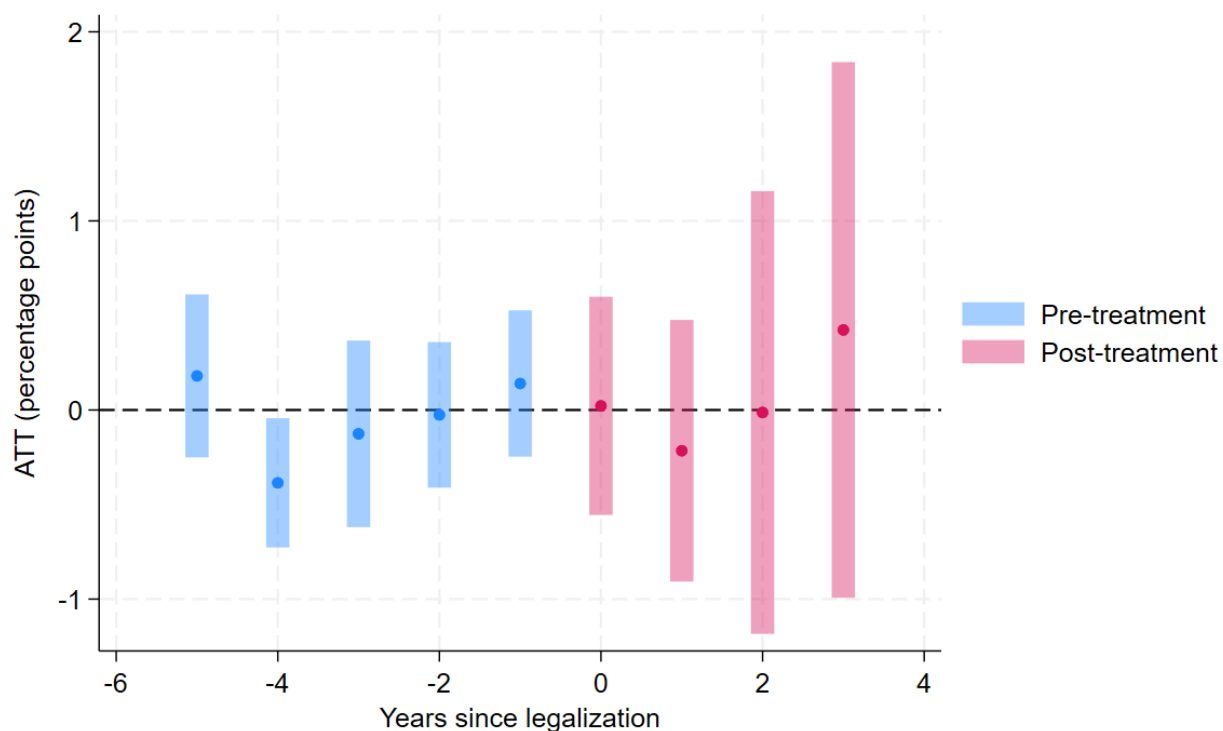
Notes: Estimates from Callaway and Sant'Anna (2021), with never-treated states as the comparison group. Event-time window restricted to -5 to $+3$ to avoid composition-driven artifacts from cohort thinning at longer horizons. Standard errors clustered at the state level.

Figure 3: Six-Year Graduation Rate (Men): Dynamic ATT by Event Time



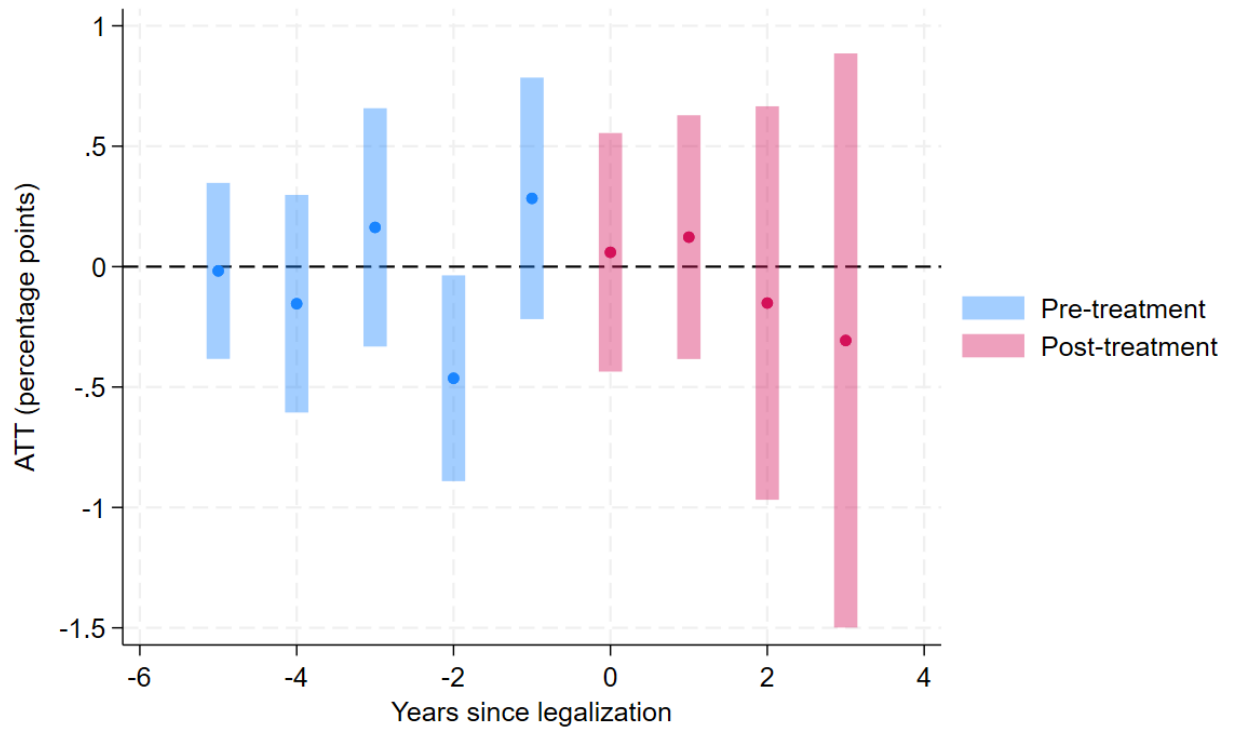
Notes: Estimates from Callaway and Sant’Anna (2021), with never-treated states as the comparison group. Event-time window restricted to -5 to $+3$ to avoid composition-driven artifacts from cohort thinning at longer horizons. Standard errors clustered at the state level.

Figure 4: Six-Year Graduation Rate (Women): Dynamic ATT by Event Time



Notes: Estimates from Callaway and Sant'Anna (2021), with never-treated states as the comparison group. Event-time window restricted to -5 to $+3$ to avoid composition-driven artifacts from cohort thinning at longer horizons. Standard errors clustered at the state level.

Figure 5: First-Year Retention: Dynamic ATT by Event Time



Notes: Estimates from Callaway and Sant'Anna (2021), with never-treated states as the comparison group. Event-time window restricted to -5 to $+3$ to avoid composition-driven artifacts from cohort thinning at longer horizons. Standard errors clustered at the state level.

References

- American Gaming Association (2025). State of the states 2025: The aga survey of the commercial casino industry, *Technical report*, American Gaming Association.
- Baker, S. R., Balthrop, J., Johnson, M. J., Kotter, J. D. and Pisciotta, K. (2024). Gambling away stability: Sports betting’s impact on vulnerable households, *Working Paper 33108*, National Bureau of Economic Research.
- Bersak, T., Gearhart, R. and Sonchak-Ardan, L. (2024). Impacts of access to legal mobile sports betting on self-reported mental health: Evidence from household pulse survey, *Working Paper 24-04*, West Virginia University, Department of Economics.
URL: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4928244
- Blake, C. D., Thomas, D. K. and Hess, J. (2024). Higher education: The impact of recreational marijuana on college applications, *Contemporary Economic Policy* **42**(2): 259–277.
- Braghieri, L., Levy, R. and Makarin, A. (2022). Social media and mental health, *American Economic Review* **112**(11): 3660–3693.
- Callaway, B. and Sant’Anna, P. H. C. (2021). Difference-in-differences with multiple time periods, *Journal of Econometrics* **225**(2): 200–230.
- Couture, C., Cross, J. and Wu, S. (2024). Impact of sports gambling on mental health, *Economics Letters* **243**: 111922.
- Dasgupta, K. and Ghimire, K. M. (2026). Gambling and substance use: Early evidence from sports betting laws, *Health Economics* .
- Fleming, O., Singh, T. P. and Yusuff, O. (2024). The effect of online sports gambling laws on time use.
URL: <https://osf.io/nxg6y>
- Guo, X., Peng, L. and Meyerhoefer, C. (2026). Wagering the bread money: Sports betting legalization and food sufficiency, *Working Paper 35305*, National Bureau of Economic Research.

- Hollenbeck, B., Larsen, P. and Proserpio, D. (2025). The financial consequences of legalized sports gambling, *Technical report*, UCLA Anderson School of Management.
URL: https://www.anderson.ucla.edu/sites/default/files/document/2025-05/Hollenbeck_The_Financial_Consequences_of_Legalized_Sports_Gambling.pdf
- Humphreys, B. R. and Pérez, L. (2012). Who bets on sports? characteristics of sports bettors and the consequences of expanding sports betting opportunities, *Studies of Applied Economics* **30**(2): 579–597.
- Iowa General Assembly (2019). Senate file 617, 88th general assembly, An Act Relating to Gambling Activities and Wagering on Sporting Events.
URL: <https://www.legis.iowa.gov/legislation/BillBook?ga=88&ba=SF617>
- Kim, K. Y. and López, C. (2025). Examining factors affecting consumers’ daily fantasy sports and sports betting participation: Comparing motivation and perception of skill versus luck, *UNLV Gaming Research & Review Journal*.
- Lawhon, D. (2020). Iowa sports betting: New rules for 2021 will let bettors register through apps, more, Des Moines Register, December 30.
URL: <https://www.desmoinesregister.com/story/sports/2020/12/30/iowa-sports-betting-new-rules-2021-register-open-up-apps-more-customers/4080544001/>
- NCAA (2023). NCAA releases sports wagering survey data, NCAA.org, May 24. <https://www.ncaa.org/news/2023/5/24/media-center-ncaa-releases-sports-wagering-survey-data.aspx>.
- Nelson, T. F., LaBrie, R. A., LaPlante, D. A., Stanton, M., Shaffer, H. J. and Wechsler, H. (2007). Sports betting and other gambling in athletes, fans, and other college students, *Research Quarterly for Exercise and Sport* **78**(4): 271–283.
- Siena College Research Institute (2025). 22% of all americans, half of men 18-49, have active online sports betting account.
- Stuhldreher, W. L., Stuhldreher, T. J. and Forrest, K. Y. (2007). Gambling as an emerging health problem on campus, *Journal of American College Health* **56**(1): 75–88.

- van der Maas, M., Cho, S. R. and Nower, L. (2022). Problem gambling message board activity and the legalization of sports betting in the us: A mixed methods approach, *Computers in Human Behavior* **127**: 107133.
- Wilken, E. (2024). Sports betting legalization’s impact on child maltreatment: Evidence from child protective services reports. Job market paper, University of Oregon.
URL: <https://ericwilken.com/research/WilkenJMP107.pdf>
- Yeola, A., Allen, M. R., Desai, N., Poliak, A., Yang, K. H., Smith, D. M. and Ayers, J. W. (2025). Growing health concern regarding gambling addiction in the age of sportsbooks, *JAMA Internal Medicine* **185**: 605–606.