

An Analysis on Bankruptcy and Mortgage Delinquency after Online Sports Betting Legalization

Edward Gilligan

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Abstract

I examine the financial impact of online sports betting legalization in the United States, focusing on county-level mortgage delinquencies and bankruptcy filings. Following the 2018 Supreme Court decision to overturn the Professional and Amateur Sports Protection Act, adoption of online sports betting expanded rapidly. Using the Fixed Effects Counterfactual Estimator (FECT) to address staggered policy adoption and heterogeneous treatment effects, I find that short-term mortgage delinquencies (< 89 days) rise by about .063% significant at the 10% level, while long-term delinquencies (> 90 days) increase by .13%, significant at the 1% level. Bankruptcy filings show smaller, less robust increases with an ATT of 0.037 ($p = 0.107$). Together, these results indicate that legalization has negligible effects on borrower financial behavior, suggesting policymakers need not urgently reconsider legalization.

1 Introduction

In 2009, Jack Markell, then Governor of Delaware, was sued by Major League Baseball (MLB) for trying to legalize sports betting in Delaware, an unprecedented move at the time. The MLB won the suit due to the Professional and Amateur Sports Protection Act (PASPA), an act which was implemented in large part to prohibit the legalization of sports betting so that the sanctity of professional leagues across the country could be preserved. In 2014, a similar situation occurred with the then Governor of New Jersey, Chris Christie. PASPA continued to reign supreme. In June 2015, then Dallas Cowboys quarterback Tony Romo attempted to hold a fantasy football convention in Las Vegas, which ended up being canceled by the National Football League (NFL) due to the league’s gambling policies. Although the league was not anti-gambling, league officials reiterated that it was anti-sports betting. This semantic distinction drew criticism, as the league accepted sponsorships from casinos without on-site sportsbooks and also participated in state lotteries. Although the difference was subtle, it was nonetheless present.

Hence, the future of the sports betting industry appeared to be forever confined to Nevada and to a lesser extent, Oregon, Delaware and Montana, who had other forms of sports betting that had been grandfathered in, given such unfavorable circumstances. In 2018, however, in a landmark decision, the United States Supreme Court ruled that PASPA was unconstitutional. Unsurprisingly enough, the first two states to legalize online sports betting were New Jersey and Delaware. Since the 2018 ruling, thirty four states and the District of Columbia have legalized online sports betting (Association, 2025).

Sports betting itself has become a normalized part of daily life. It has swiftly been adopted by the entertainment industry and these professional leagues who were initially against it and has become deeply embedded in the daily lives of consumers—from the broadcasts of games aired to the jerseys that teams wear and billboards across interstates. Consequently, the sports betting industry has expanded rapidly, making a cool \$13.71 billion in revenue in 2024, marking a 24.18% increase from the industry’s 2023 record revenue (Green-

berg, 2025). In sum, the sports betting industry as a whole has made \$46.61 billion (Ramsey, 2024). In regards to the platforms themselves, online sports betting app downloads grew from six million in 2019 to thirty three million in 2023 (Taylor et al., 2024), and in particular, over 95% of all wagers are now placed via mobile or online sportsbooks (Taylor et al., 2025).

Even after PASPA was ruled unconstitutional, the legalization of sports betting has remained a topic of debate. Policymakers continue to debate the trade-offs between state tax revenue to the tune of \$1.8 billion in 2023 (Hoffer, 2024) and the risks of exposing consumers, particularly those who already have an issue with gambling, to such easily accessible forms of gambling that have become so normalized. Can and Nichols (2022) found that sports betting revenues are a reliable source of tax revenue over the business cycle. However, a later paper authored by Can et al. (2023) found that each dollar of online sports betting is associated with a \$0.54 decrease in casino revenue, suggesting that the online sports betting market cannibalizes the revenues, and hence the taxable revenues of casinos located in states where online sports betting is legal. Should this substitution between online sports betting and casino gambling be true, the extra tax revenue garnered from taxing the revenues of sportsbooks may not be 'extra', but instead a redistribution of the tax revenue that was originally collected from casinos. In fact, Matsuzawa and Arnesen (2024) found just that. Furthermore, less quantitatively, opponents urge lawmakers to repeal such laws, supplementing their criticisms with the copious gambling scandals that professional and amateur players have been caught up in. (ESPN, 2025).¹ What these examples suggest, critics argue, is that these leagues, amateur and professional alike, are lacking that much more in professional integrity because of the legalization of online sports betting.

Nevertheless, proponents of legalization also cite factors such as the entertainment value derived from sports betting. Sacred Heart University's 2025 poll found that among other factors such as winning money and promotions, 31.2% of respondents were driven to sports betting for the excitement, corroborating the anecdotal evidence of those in favor (University,

¹For more information, please refer to the linked citation

2025). Sacred Heart University’s 2025 poll also found that approximately 63% of Americans aged 18-34 view it favorably (University, 2025). More generally, nine in ten Americans view sports betting as an acceptable form of entertainment (Cohen, 2024). Despite this, 48.4% of respondents to Sacred Heart University’s 2025 poll believed that the effect that sports betting had on society was more negative than it was positive (University, 2025).

Current literature attempts to answer why the effect may be more positive than negative. At the moment, there exists a limited amount of literature on how the legalization of sports betting affects consumers in the United States. These studies focus on, but are not limited to, loan delinquencies, credit score, and similar micro-indicators of financial health. Nevertheless, the most recent literature finds that the legalization of online sports betting has had incredibly adverse effects on the financial stability of the average consumer (Baker et al., 2024; Hollenbeck et al., 2024). The externalities on those around problem gamblers and those entangled with the sports betting world are also of note. Sacred Heart University’s 2025 poll found that 18.3% of respondents said that sports gambling has caused tension in their personal relationships. Espadafor and Martínez (2021) looked at how sports betting affected opportunities on human capital formation and found that betting houses around vulnerable populations increased inequality of educational opportunities. Matsuzawa and Arnesen (2024) found that in states where sports betting had been legalized, the effect of upset losses on intimate partner violence was upwards of 7% more than in states without sports betting. The effect of this negative externality can be catastrophic, as the lifetime cost of a female victim of intimate partner violence is close to \$137,000 in 2024 dollars (Matsuzawa and Arnesen, 2024).

However, the literature on perhaps the biggest, or at least most noteworthy, indicator of credit health, namely bankruptcy, is sparse possibly due to the fact that bankruptcy is not an economic outcome that materializes in a short time span. Instead, it takes years for consumers to get to the position where declaring bankruptcy is a financially viable and literate decision. Given that sports betting has been legalized for only seven years, I conjecture that

these next few years will be pivotal in our understanding of online sports betting’s effect on this financial outcome. With that being said, bankruptcy is a sign that a consumer is in the most perilous of times financially, that much cannot be argued. Thus, I think the gravity of such a situation demands a paper that thoughtfully tries to understand the mechanisms and underpinnings behind such a phenomenon.

Thus, the goal of this paper is to aid policymakers in making informed decisions regarding this seemingly perennial debate between legality and illegality. To contribute further, I also provide data on mortgage delinquency rates both within 90 days of the last payment and beyond 90 days. The debate, however, appears to be resolving itself somewhat independently of these findings, as some form of sports betting is now legal in forty states. Can and Nichols (2024) offers insight into why this trend has emerged, finding that cross-border substitution pressures states without legal sports betting to adopt it in order to counter declining tax revenues from casinos near state borders.

To estimate the effects of online sports betting legalization, I employ the Fixed Effects Counterfactual Estimator (FECT), a method designed to address limitations of traditional fixed effects models when treatment adoption is staggered and treatment effects are heterogeneous. Unlike standard fixed effects approaches, which assume uniform treatment effects and can yield biased estimates under dynamic policy implementation, FECT constructs counterfactual outcomes that capture unobserved heterogeneity across units and over time. This approach is particularly important in the context of online sports betting, where counties adopt the policy at different times and experience varying impacts. To further strengthen the robustness of these estimates, I conduct placebo tests with randomly assigned treatment years. All three of my different regressions pass the placebo test, enhancing the credibility of the findings.

I find that following the legalization of online sports betting, mortgage delinquency rates exhibit marginal increases, with patterns varying by delinquency severity. Short-term delinquencies, defined as 89 days or less, rise negligibly, with an overall Average Treatment

Effect on Treated (ATT) of 0.063, suggesting a roughly .063 percentage point increase. Pre-treatment trends remain near zero, supporting the parallel trends assumption. Early post-legalization periods show small increases that smooth over time, indicating that the overall impact on short-term borrower behavior could possibly be negligible and moderate.

Long-term delinquencies, those exceeding 90 days, respond relatively stronger. The overall ATT of 0.130, statistically significant at the 1% level, reflects a .13 percentage point increase, highlighting a more substantial economic effect, though this result is still practically insignificant by standard equivalence tests. Dynamic estimates reveal a consistent upward trajectory after legalization, peaking in later periods, whereas pre-treatment fluctuations remain small and largely insignificant. Total bankruptcy filings show an almost negligible response, with a .037% overall increase in log bankruptcies that is not statistically significant, though early post-treatment periods exhibit temporary minuscule rises. Taken together, these findings indicate that the legalization of online sports betting has an almost negligible impact on borrower financial behavior. However, given the severity of delinquency on mortgage payments and the totality of filing for bankruptcy, one could possibly argue that any increase should be interpreted with caution.

The rest of the paper is organized as follows. In Section 2, I move into related literature and establish some links between past research and my own. Section 3 attempts to piece together the behavior behind the consumer in the wake of legalized online sports betting. In Section 4 I describe the data I use, explore the limitations of that data, and finally propose my estimation method. Section 5 describes my results and Section 6 offers some concluding remarks and potential policy suggestions.

2 Literature Review

While current empirical literature is essential, revisiting earlier theoretical models helps illuminate the foundations of gambling behavior. One of the most influential contributions

in this area comes from Friedman and Savage (1948), whose *Utility Analysis of Choices Involving Risk* remains a cornerstone in understanding why consumers gamble.

To assess the relevance of their model, I pose several guiding questions: Why do consumers take risks? If they enjoy risk, to what extent? And most critically, is there a causal relationship between income level and risk-taking behavior—and by extension, gambling?

Friedman and Savage (1948) proposed that the utility of income follows a non-negative cubic function, with each change in sign representing a different socioeconomic class. This implies that small increases in income yield diminishing marginal utility, while larger, exponential jumps produce increasing marginal utility. Their model helps explain why low-income, risk-averse consumers—situated in the initial convex segment—might rationally prefer either low-risk, low-reward or high-risk, high-reward outcomes over medium-risk, medium-reward ones. The logic is that a medium-risk decision may only slightly improve their financial standing, whereas a high-risk gamble offers the possibility of escaping their current socioeconomic class entirely. This same logic extends to career choices, where individuals may pursue high-risk, high-reward paths to “distinguish themselves” among their peers.

Empirical tests of the Friedman-Savage model tend to support these propositions. For instance, consumers dissatisfied with their income are more likely to buy lottery tickets (Brunk, 1981). Lottery demand is more sensitive to jackpot size among lower-income groups (Dorn et al., 2008), and during recessions, the appeal of a low-cost ticket with a high payout increases (Mikesell, 1994). These findings reinforce the idea that gambling behavior may be driven more by aspirations for upward mobility than by financial illiteracy. Still, limited financial literacy may play a role.²

To understand how these dynamics apply to online sports betting, it’s useful to examine participation patterns. Can et al. (2023) found that sports betting skews younger, much like the broader sports entertainment industry. According to a February 2024 survey by Sienna College and St. Bonaventure University, 39% of men aged 18–49 use online sports

²For deeper analysis on financial literacy and gambling, see Watanapongvanich et al. (2021, 2022).

betting platforms, and of those, 60% engage with them at least weekly (Hollenbeck et al., 2024). A separate study by Goss and Morse (2005) found that individuals aged 25–54 are the most likely to file for bankruptcy, a significant demographic overlap. Additionally, a meta-analysis by Nowak and Aloe (2014) at the University of Buffalo revealed that one in ten college students is a pathological gambler.³ In short, the demographic most likely to go bankrupt is also the demographic most likely to participate in online sports betting.

Concerning, too, is the financial vulnerability of consumers aged 21–30, who often face less favorable financial conditions than older problem gamblers. This is largely due to outstanding student loan debt at this stage of life. Mezza et al. (2021) found that rising student loan balances increase borrowers’ demand for additional consumer debt while simultaneously restricting access to it. This dynamic places many young consumers in precarious financial positions. That is to say, it is not merely the accumulation of debt but the reduced access to credit following gambling legalization that worsens financial outcomes for constrained consumers (Hollenbeck et al., 2024). Specifically, credit card limits decreased by an average of 2.7% for existing cardholders immediately after online sports betting legalization (Hollenbeck et al., 2024), suggesting that creditors anticipate the risks outlined by studies like Mezza et al. (2021) and act preemptively to limit exposure.

The additive nature of sports betting is also critical. Baker et al. (2024) found that deposit sizes on betting platforms grew with each transaction, and 40% of bettors deposited funds more than ten times. This pattern suggests a sunk cost fallacy, which I will contextualize in Section 3. Similar behavioral trends appear in other gambling forms like poker, blackjack, and slots where Kearney (2005) observed that lottery introductions led not to reduced gambling expenditures in other forms of gambling but to decreased non-gambling expenditures, underscoring gambling’s addictive hold on vulnerable consumers. Can et al. (2023) found a complementary relationship between in-person gambling and sports betting, indicating that once consumers engage, they may enter a compounding cycle of financial

³Note that this study predates the 2018 repeal of PASPA, likely underestimating current rates of pathological gambling among college students.

loss. In severe cases, bankruptcy may be the only escape from this financial spiral.

Although direct causal evidence linking online sports betting legalization to bankruptcy is limited, broader gambling research offers insight. Goss et al. (2009) found that casino openings increased county-level bankruptcy filings in their early years. While sports betting differs in form, similar outcomes are plausible. Kearney (2005) found that instant lottery introductions reduced household non-gambling expenditures by 3.1% quarterly in affected states, with the effect more pronounced among financially constrained households. Supporting this, Lockwood et al. (2025) found that households earning less than \$50,000 spent 29% more on lotteries than those earning over \$100,000. Baker et al. (2024) reported a 14% decline in net investments following sports betting legalization, reinforcing the toll each additional bet takes on financial health. In extreme cases, this likely strains both personal and professional relationships; a 2025 Sacred Heart University poll found that 18.3% of respondents said sports betting affected their personal relationships.

The financial impact of sports betting legalization on financially constrained households deserves special attention. Taylor et al. (2024) found that irresponsible gambling—defined as spending more than 1% of income—is significantly more prevalent among consumers in the lowest income tercile than those in higher terciles. Baker et al. (2024) explored this extensively, finding that legalization “significantly increases the probability that low savings households max out their credit cards.” These households also reduced credit card payments by an average of \$550 post-legalization, potentially worsening the constraints imposed by creditors and reinforcing Hollenbeck et al. (2024)’s findings. Furthermore, among below-median savings households, bettors allocated nearly twice their quarterly income to gambling compared to those with above-median savings (Baker et al., 2024).

Amid a growing body of research, consumers continue to flock to sports betting. Taylor et al. (2024) found that online gambling policies increased monthly participation among potential gamblers by 7–15%. In Connecticut, these policies led to a 5.2% rise in the proportion of gamblers who transacted for at least six consecutive months (Taylor et al., 2024). Follow-

ing legalization, Taylor et al. (2025) reported a 372% increase in irresponsible gambling, a 75% rise in calls to gambling helplines, and a 20% increase in mass-market alcohol spending. Notably, sports betting is rarely a consumer’s first exposure to gambling; sports bettors are more likely to be pre-existing gamblers and are four times more likely to have played the lottery (Baker et al., 2024).

From a long-term financial planning perspective, the outcomes are bleak. Baker et al. (2024) found that net investments among men are entirely crowded out by sports betting. Among potential gamblers, fewer than 5% withdrew more money than they spent (Taylor et al., 2024). On average, conditional on using sports betting apps, annual losses totaled \$1,100 (Baker et al., 2024).

Why, then, do consumers continue to engage? Section 3 explores this in greater detail, but briefly, Ungemach et al. (2009) suggests that consumers tend to overweight small probabilities and underweight large ones. This may help explain the appeal of promotional offers like odds boosts. Baker et al. (2024) argues that bookmakers exploit bettors’ lack of skill. Beyond cognitive biases, ignorance of the broader research landscape may also play a role. The entertainment value of betting likely contributes as well, drawing casual fans into deeper engagement with games they now have money riding on.

This paper builds on existing literature by testing the relationship between online sports betting legalization and bankruptcy rates. Additionally, I examine mortgage delinquency rates at the county level to provide a broader, less severe measure of financial distress. While this analysis is constrained by the availability of public data—a limitation discussed in Section 4.2—to my knowledge, research examining mortgage delinquency in this context is novel. Amid extensive literature on sports betting and financial outcomes, studies on mortgage delinquency remain sparse. Including this measure offers a more comprehensive view of the financial consequences of legalization.

Prior research has largely focused on individual-level outcomes. Studies such as Baker et al. (2024) and Hollenbeck et al. (2024) document negative financial effects post-legalization.

My study extends this work by shifting the unit of analysis to the county level. This approach connects individual behavior to aggregate statistics, which are more accessible to policymakers and can help identify counties disproportionately affected by legalization—enabling targeted policy responses. By presenting findings on both mortgage delinquency and bankruptcy rates at the county level, this paper offers new insights into the broader economic consequences of online sports betting legalization.

3 Behavioral Mechanisms

The literature on sports betting and financial outcomes raises the question: why is it that the legalization of online sports has seemingly such adverse effects on consumer financial outcomes? Are there specific mechanisms that contribute to such a phenomenon? In this section I aim to explore why this increase occurs, not merely acknowledging its existence. With these potential causes in mind, I will thereafter transition to Section 6, where I provide some policy implications, naive and idealistic though they may be.

At the forefront of behavioral mechanisms that affect a gambler’s propensity to continue to bet is a misunderstanding of probabilities. While this most aptly applies to spins at the roulette wheel, or hands at the blackjack table, we can certainly attribute the misunderstanding of probabilities to specific gambling fallacies that thereby affect a gambler’s cognitive well-being. The foremost fallacy for typical gambling is the Gambler’s fallacy. In my unpacking of the relationship between this fallacy and a bettor’s cognitive state, I will refer to Zentall (2021)’s definition of the fallacy.⁴ Xu and Harvey (2014) detail this relationship in their paper. They found that gamblers who lost were more likely to lose again, however, those that won were also more likely to win again, in contradiction to the Hot Hand Fallacy. Presumably, those who lost made bets with riskier odds to try to make back all of their money as they expected their luck to change, an instance of the Gambler’s fallacy.

⁴Zentall defines the Gambler’s fallacy as “the erroneous belief that if, in the recent past, a particular event occurs more frequently than expected, and it is less likely to happen in the future because probabilities should even out.”

Their findings reflect a gambler’s subscription to the idea that their next win is ‘due’ and are a testimony to the lagged effect that my and similar models report. The primary driver of financial harm may be not one large bet but rather the accumulation of frequent smaller bets that grow in size as the losses pile up.

Adjacent to the Gambler’s fallacy is the next behavioral mechanism I wish to study, the near-miss fallacy. As the name suggests, a near-miss is a failure that comes close to being successful. It is not hard to see how this type of fallacy poses a significant risk to the cognitive health of bettors. In particular, I wish to look at the near-miss fallacy with respect to a special case of sports betting: the parlay, a combination of several different bets, called legs, into one bigger bet. Typically, the bettor only receives their winnings from the parlay if every single bet, or leg, hits. Even if, for example, twenty out of twenty one legs of a parlay hit, the bettor still loses. Tangentially, some sportsbooks have offered promotions where even if all of the legs of the parlay do not hit, the consumer can still make money. Regardless, parlays can obviously be lucrative if they hit, but in that same breath, they are incredibly profitable for the sportsbooks themselves. In September 2024 in New Jersey, parlays accounted for 72.5% of sportsbooks’ gross revenue (Health, 2024). Parlays exemplify how the near-miss fallacy’s influence on bettor behavior may contribute to declining rational decision-making among frequent bettors, thereby affecting their probability to win. Evidently, Clark et al. (2009)’s paper highlights that near-miss events increase gambling propensity as they increase their experimental subjects’ desire to play. While the setting for their experiment was slot machines, the findings undoubtedly translate to parlays and maybe even more so due to the fact that bettors have control over the legs that they can put into the parlay whereas in slots it is entirely random. The prevalence of parlays too also is a testimony to Friedman and Savage’s 1948 paper. The reason being that the small chance of winning a comparatively more amount of money for consumers in essence increases the perceived utility and the odds of making such a wager. As was also explored in the literature review, Ungemach et al. (2009) found that agents underweight large probabilities and overweight smaller probabilities which

gives credence to, in particular, how sportsbooks exploit gamblers specifically with odds boosts for parlays.

The final behavioral mechanism I will explore is the typical sunk cost effect. The sunk cost effect is perhaps the most intuitive of the mechanisms that I am exploring to understand in its relationship to sports betting. Sunk costs are resources that cannot be retrieved and should not thereafter factor into future investment decisions, but nevertheless they do. Fujino et al. (2018) study decision making under sunk costs specifically as it pertains to gambling disorder. They experiment on gambling disorder patients and healthy controls and while they did not find that people with gambling disorder (GD) have a stronger sunk cost effect than healthy units, they did find that people with longer gambling histories were more likely to show the sunk cost effect. More troubling, however, is that they found that GD patients showed reduced activity in the dorsal medial prefrontal cortex (dmPFC) during sunk cost decisions, the region of the brain that is associated with self control and rational thinking. This implies that GD patients may struggle with making rational decisions when faced with the sunk cost effect. Furthermore, for those with GD, the levels of activation in this area were negatively correlated with the length of time they have gambled for. That is to say, Fujino et al.'s findings suggest that the rationality of those who gamble problematically decreases over time. When we translate this to sports betting, a similar phenomenon surely applies.

As an addendum, I should also briefly mention the end-of-day betting effect pioneered by Ali (1977) and McGlothlin (1956). In not so many words, this behavioral mechanism biases bettors to choose higher-risk higher-reward gambles at the end of their betting session. Obviously, this is quite parallel to the sunk cost effect and the Gambler's Fallacy as bettors were making those higher-risk higher-reward bets to try and make up for earlier losses.

4 Methodology

4.1 Data

My data are aggregated at the county-year level and were formatted into panel data following cleaning, which is the required structure for the FECT framework. As noted briefly in Section 4.2, counties with unusually sparse data entries were dropped to produce a balanced panel. Data were obtained from numerous publicly available and reputable sources, including the United States Courts’ F-5A data table, the Bureau of Labor Statistics, the Bureau of Economic Analysis, the United States Census Bureau, the Consumer Financial Protection Bureau (CFPB), and the Federal Reserve. Public health data were obtained from USAFacts – COVID-19 Spread Map and County Health Rankings. Except for COVID-19 data, all datasets cover the years 2013–2023. Given that these sources are publicly available, I consider them both credible and appropriate for this study.

The primary dependent variable, total bankruptcies, was drawn from the United States Courts’ F-5A data table. This dataset spans all counties and is current through June 30, 2025. It includes both business and non-business bankruptcies and provides counts by major bankruptcy chapters—Chapter 7, Chapter 11, and Chapter 13—alongside an Other Chapters category. The data are organized by Circuit, District, and County, as well as by County Code, which serves as the key identifier in my panel. Non-standard entries, such as negative placeholders, were converted to missing using standard Stata commands to ensure proper numerical formatting. Finally, to align the observations with my other dependent variable, mortgage delinquency rate, I restrict my data to the same observation pool that my mortgage delinquency rate data uses that considers a representative subset of all United States counties.

Mortgage delinquency rates, the other primary dependent variable, were obtained from the Consumer Financial Protection Bureau. Separate datasets exist for mortgages that are 30–89 days delinquent and for mortgages that are 90 days or more delinquent. Both datasets are derived from a 5% sample of residential mortgages dating back to January 2008.

Limitations include suppressed reporting for locations with insufficient data and potential under-reporting during public emergencies, which restricts coverage. Nevertheless, the data span January 2008 through December 2024 and cover 470 counties, providing a useful but necessarily limited lens on mortgage delinquency.

Control variables were drawn from the Bureau of Labor Statistics, the Bureau of Economic Analysis, the United States Census Bureau, and the Federal Reserve. Coverage varies across sources, with some data extending as far back as the early 20th century and as recent as 2024. Given that the Census Bureau publishes five-year estimates with a one-year lag, all Census-based data are current through 2023. The breadth of these sources allows the construction of a robust set of covariates, including population, income, education, labor market, and health measures. Special symbols and placeholders in the raw data were handled using context-specific Stata commands to ensure accurate interpretation. All datasets were merged via FIPS codes.

During the merging process, some counties required special handling due to changes in FIPS codes over time. Counties that changed their codes were dropped from the sample, including Shannon County, South Dakota; Wade Hampton Census Area, Alaska; and Bedford City, Virginia. Additionally, in 2020 Connecticut replaced its traditional counties with nine Councils of Governments, which are treated as county equivalents for statistical purposes according to the United States Census Bureau. In order to account for this, I only consider counties whose FIPS codes have been unchanged since 2013.

4.2 Limitations

The limitations of my data are numerous, and as such, the findings of this paper should be interpreted with caution. The most significant limitation is that consistently available, public, and free data at a level more granular than the county level could not be obtained. Unlike the studies conducted by Baker et al. (2024) and Hollenbeck et al. (2024), which utilize individual-level datasets, my analysis is restricted to county-level data. Consequently,

the results may not achieve the same level of causal precision as these individual-level analyses. In larger, highly diverse counties, it is difficult to identify precisely which sub-regions or populations drive the observed changes. Urban-rural disparities further complicate interpretation, as large counties may have sparsely distributed populations over extensive areas, making county-level measures an imperfect proxy for local exposure. To account for any disparities as a result of my data collection, I include a vector of independent variables, discussed further in the Estimation section.

Data were drawn from numerous sources, and potential inconsistencies across sources are another limitation. Differences in estimation methods, sampling strategies, and variable definitions can introduce measurement error when merging datasets. Additionally, most of the data are collected annually, which restricts temporal granularity and prevents observation of shocks that occur within a year. As a result, state-level legal changes that occur early versus late in a year are treated separately in the panel. Those that occur in the former half of the year are treated as having begun in that year while those in the latter are treated as having occurred in the next year. Relative to Baker et al. (2024) and Hollenbeck et al. (2024), whose datasets contain millions of observations, my dataset is considerably smaller. Some counties with sparse data had to be dropped, which may limit the generalization of results to particularly isolated counties.

Unobserved, county-specific policy or economic shocks also present a potential limitation. For instance, as Can and Nichols (2024) note, states that legalize sports betting may draw casino revenue from neighboring non-legalized states. In the context of online sports betting, bettors in non-legalized states that border legalized states can often bypass restrictions simply by betting across the border. To mitigate this, I include a control variable capturing the number of neighboring states that have legalized online sports betting.

A critical requirement for the FECT framework is that the panel data be balanced, meaning that missing observations are minimized. To ensure this, counties with more than 10% missing entries for any given variable were excluded and those missing more than the

full eleven years were as well. Additionally, `xtset` and `xtdescribe` were used to confirm that the remaining data constituted a strongly balanced panel.

Finally, substantial variation in state-level sports betting regulations necessitated further exclusions. Nevada and Louisiana exhibit non-uniform regulatory frameworks: Nevada has long-established, widely accessible betting markets, while Louisiana legalized online sports betting at the state level but left implementation decisions to individual parishes, creating heterogeneous market conditions. New Jersey was excluded due to its distinct historical trajectory in legalized sports betting, particularly Atlantic City’s unique regulatory environment. Florida was excluded because of the 2021 legal dispute with the Seminole Tribe, which temporarily suspended sports betting operations, producing anomalous market conditions. Observations from Washington, D.C. were removed because its status as a federal district complicates direct comparability with states. These exclusions collectively aim to produce a more consistent and interpretable set of legal and economic environments.

4.3 Model Specification and Estimation Strategy

To evaluate the impact of online sports betting legalization on financial distress at the county level, I use the Fixed Effects Counterfactual Estimator (FECT), which is designed for panel data with staggered treatment adoption and heterogeneous treatment effects. This method is well-suited to my setting, where counties legalize online sports betting at different times and may experience different impacts due to unobserved factors that vary across both space and time. The analysis relies on my aforementioned County-Year level panel dataset that includes measures of different economic factors.

The main outcomes of interest are the share of mortgages delinquent by 89 days or less, the share of mortgages delinquent by 90 days or more, and the logarithm of total bankruptcies plus one to account for zero values. The key explanatory variable is a binary indicator for whether online sports betting was legal in a given county-year.

To account for potential confounding factors, I include a comprehensive set of time-

varying county-level covariates, including income, poverty, labor market indicators, educational attainment by age and race, health behaviors, rurality, and COVID-19 cases. The model is specified as follows:

$$Y_{it} = \alpha_i + \lambda_t + \beta \cdot \text{Legal}_{it} + \mathbf{X}_{it}'\gamma + \varepsilon_{it}$$

where Y_{it} represents the given dependent variable for county i in year t , α_i and λ_t are county and year fixed effects, Legal_{it} is the treatment indicator, \mathbf{X}_{it} is the vector of control variables, and ε_{it} is the error term.

I estimate this model using the `fect` command in Stata, specifying the fixed effects method (`method(fe)`) with a five-year pre-treatment window and a six-year post-treatment window. To obtain reliable inference, I compute bootstrap standard errors with 200 replications. This approach allows for flexible treatment effects across counties and over time while maintaining the interpretability of a fixed effects framework.

To evaluate the credibility of the results, I conduct placebo tests with randomly assigned treatment years. These tests help assess whether the estimated effects could arise by chance or by random noise confounding the Average Treatment Effect on Treated (ATT). The results of these tests are discussed in the Results section, and their figures are provided in the Appendix.

5 Results

5.1 Mortgage 89 Days or Less Delinquency Rates

Following the legalization of online sports betting, short-term mortgage delinquencies, defined as 89 days or less, show a modest but notable increase. The overall Average Treatment Effect on the Treated (ATT) is 0.063, meaning that mortgage delinquency rates rose by roughly .063 percentage points on average, a change statistically significant at the 10% level.

With 573 observations underpinning this estimate, the effect suggests that legalization has a moderate and practically negligible impact on borrowers' short-term financial behavior.

Upon examining the dynamics before legalization in Figure 1, ATT values remain near zero and statistically insignificant; for instance, seven periods prior to treatment, the ATT is effectively zero at -0.001, indicating no pre-existing upward trends in delinquency. This stability in the pre-treatment period gives credence to the parallel trends assumption and assures a level of confidence in causal inference.

In the immediate aftermath of legalization, small, practically zero, but statistically significant increases appear. One period after treatment, delinquency rises by .036 percentage points ($ATT = 0.036$), and two periods after, the effect grows to .055 percentage points. Later in the post-treatment period, at six periods after legalization, the ATT jumps to .271 percentage points. While this seems dramatic, the small sample size (16 observations) and higher p-value indicate substantial uncertainty, suggesting this spike should be interpreted cautiously.

The negligibility of these increases may reflect the influence of promotional incentives offered by sportsbooks, such as free credits or odds boosts, designed to encourage initial engagement. That is, within the first 90 days of downloading a sportsbook, consumers might be accumulating a lot of benefits and therefore not have to deposit their own money, explaining why the effect is practically zero overall.

5.2 Mortgage 90 Days Plus Delinquency Rates

Long-term mortgage delinquencies, that is those exceeding 90 days, exhibit a relatively stronger response to online sports betting legalization as compared to short-term delinquencies. The overall ATT is 0.130, equivalent to a .13 percentage point rise, and statistically significant at the 1% level. This is more economically and statistically meaningful, but the fact that it is a practically zero increase suggests that while the policy change certainly has an effect on borrowers at risk of chronic delinquency, the effect may be overblown.

Looking at the dynamic estimates, pre-treatment periods fluctuate around zero, with occasional significant deviations likely due to noise from smaller sample sizes. For example, six periods prior, there is a reported .103 percentage point increase, but this is probably an anomaly rather than a meaningful trend. Overall, the pre-treatment dynamics support the parallel trends assumption, giving confidence that post-treatment changes can be attributed to legalization.

After treatment, a consistent, albeit practically negligible, upward trend appears. One period after legalization, delinquency rises by .078 percentage points, followed by a .093 percentage point increase two periods after. By the third period post-treatment, the ATT reaches .173 percentage points, nevertheless highlighting a clear and growing effect. Subsequent periods continue to show elevated delinquency, peaking at a .592 percentage point increase six periods after legalization, though again these results should be interpreted with caution due to the small sample size and also the fact that though this is a clear upward trend, the values are can be treated as economically insignificant.

The pattern here suggests that the legalization of online sports betting has negligible immediate and escalating effects on long-term mortgage delinquency. Nevertheless, compared to short-term delinquencies, these effects are relatively stronger, more persistent, and statistically more robust.

5.3 Log(Total Bankruptcies +1)

Following the legalization of online sports betting, the overall effect on total bankruptcies appears modest. The Average Treatment Effect on the Treated (ATT) is 0.037, which corresponds to an approximate .037% increase in total bankruptcies. This result is also not statistically significant at conventional levels, suggesting that the overall effect is marginal.

Examining the dynamics over time provides a bit more insight. In the pre-treatment period, ATT values fluctuate around zero with occasional statistically significant deviations. For example, seven periods prior to legalization, the ATT is -0.026, indicating a .026%

decrease in log bankruptcies, and six periods prior, the ATT is -0.021, a .021% decline. At two periods before treatment, the ATT is -0.010, reflecting a .010% decrease. Other pre-treatment periods show values close to zero and statistically insignificant, suggesting no consistent trend and supporting the parallel trends assumption.

In the post-treatment period, dynamic estimates show modest increases in log bankruptcies, though statistical significance is limited. Two periods after legalization, the ATT is 0.062, indicating a .062% increase, and three periods after, the ATT rises slightly to 0.065, a .065% increase. These early post-treatment effects suggest a short-term rise in bankruptcy filings following legalization. Later periods show less consistent patterns. Four periods after treatment, the ATT is 0.003, effectively zero; at five periods, it is 0.041; and six periods after, it turns slightly negative at -0.009. These later estimates are not statistically significant and are based on smaller sample sizes, making them more susceptible to noise and localized shocks.

Overall, the dynamic pattern suggests a negligible temporal lag in the effect of legalization on bankruptcy filings. Bankruptcy levels remain near zero immediately after legalization, increase modestly in the second and third periods, and then stabilize and thereafter slightly decline.

5.4 Robustness Check: Placebo Tests

To assess the credibility of my findings, I conduct placebo tests that assign treatment to periods where no legalization occurred. These tests help determine whether the estimated effects are driven by spurious trends or other such random effects rather than the actual policy change.

I implement placebo tests for my three dependent variables: mortgage delinquency rates for loans 89 days or less delinquent (Figure 4a), mortgage delinquency rates for loans 90 days or more delinquent (Figure 4b), and the log of total bankruptcies plus one (Figure 4c). If these estimates are statistically insignificant, it suggests that the main results are

not confounded by anticipatory behavior or unrelated shocks. The results indicate that pre-treatment ATT estimates are close to zero and statistically insignificant across all dependent variables, providing no evidence of confounding effects. Similarly, placebo regions after treatment yield insignificant estimates, with p-values of 0.954 for Figure 4a, 0.206 for Figure 4b, and 0.453 for Figure 4c. These findings strengthen the credibility of my main results. The lack of significant placebo effects suggests that the estimated impacts reflect the causal effect of online sports betting legalization rather than pre-existing trends or random noise.

6 Policy Implications and Conclusion

I am largely confident in the results, and must discuss their implications. While the \$1.8 billion in tax revenue from sports betting in fiscal year 2023 (Hoffer, 2024) represents a significant financial benefit, my findings suggest that the legalization of online sports betting also exposes certain individuals to negative financial outcomes at a very minuscule rate. Namely, in the counties where legalization occurred, there was an increase in the total number of bankruptcy filings, though that increase very well could be interpreted as negligible. In addition, mortgage delinquency rates, both those 90 days or less delinquent and those 90 days or more delinquent increased with the latter increasing at a more significant rate than the former.

For policymakers in the ten states that have not yet legalized sports betting and the sixteen states that have not legalized it online, these potential negative outcomes are important to consider, practically negligible though they may be, when making decisions concerning the legalization of sports betting. Since, for bankruptcy filings in particular, any increase should be met with concern given its severe connotations and implications. It is unlikely that sports betting will be repealed in the states where it is already legalized. However, there are still certain regulations that could help mitigate the financial harm experienced by vulnerable individuals while still allowing the majority of those that derive entertainment

from gambling to continue to do so.

Policy changes could take many forms. Browne et al. (2019) found that exposure to messages that deceptively convey false odds were linked to a greater likelihood of betting in Australia. Thus, it could prove beneficial for U.S. policymakers to consider a ban on particular exploitative types of advertisements. In this same vein, the United Kingdom, Netherlands, and Belgium among countries across Europe have implemented some form of prohibition on gambling ads across different media (Cohen, 2023). Policymakers may also choose to take inspiration from Sweden where temporary legislation was enacted starting on July 2, 2020 that imposed a maximum deposit limit. A self-report survey study run by Håkansson et al. (2022) found that among those who were aware of the aforementioned legislation, 38.7% thought it decreased their overall gambling.

One broader and more actionable solution is to implement financial literacy education at the high school level. Currently, of all public high schools in the United States, only 26.3% offer a personal finance course (Rael, 2024), defining a proportion of the United States population that could be left reeling from the potential of the consequences of learning from their financial mistakes when it comes to unwise financial decisions as a result of a lack of previously instilled knowledge. Mandating financial literacy classes at such formative years could prove quite beneficial for the long-term collective financial health of the United States though evidence from Watanapongvanich et al. (2021) and Watanapongvanich et al. (2022) suggests that it may depend on the circumstances.

As the plethora of financial investments, wise or unwise, continues to evolve, and inevitably creates yet more markets for consumers to engage in their own specific monetary allocation preferences, it seems prudent for U.S. policymakers to continue to weigh the benefits and disadvantages of the legalization of sports betting. My results, alongside other causal evidence, presented behavioral mechanisms, and observable social anecdotes seem to indicate that, at the minimum, limiting the accessibility of sports betting may be essential for ensuring the long-term financial health of the most impressionable among us.

7 Supplemental Appendix

7.1 Regression Results

Table 1: Mortgage Delinquency Rates Less Than 90 Days
Delinquent Overall ATT Estimate

ATT	N	sd	Lower_Bound	Upper_Bound	pvalue
0.063*	573	0.036	-0.018	0.114	0.081

*Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$*

Table 2: Mortgage Delinquency Rates Less Than 90 Days Delinquent Dynamic ATT
Estimates

s	n	ATT	ATT_sd	ATT_p_value	ATT_Lower_Bound	ATT_Upper_Bound
-7	106	-0.001	0.027	0.967	-0.059	0.048
-6	121	-0.011	0.014	0.426	-0.038	0.021
-5	169	0.006	0.014	0.675	-0.026	0.029
-4	185	-0.006	0.014	0.691	-0.035	0.021
-3	185	-0.012	0.012	0.346	-0.033	0.014
-2	185	-0.010	0.011	0.365	-0.030	0.014
-1	185	0.011	0.009	0.216	-0.006	0.028
0	185	0.014	0.010	0.153	-0.008	0.035
1	185	0.036*	0.020	0.077	-0.004	0.075
2	138	0.055*	0.033	0.098	-0.021	0.112
3	112	0.069	0.049	0.158	-0.036	0.135
4	79	0.072	0.056	0.199	-0.062	0.152
5	64	0.083	0.077	0.278	-0.095	0.196
6	16	0.271	0.186	0.145	-0.233	0.513

*Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Figure 1: Mortgage Delinquency Rates Less Than 89 Days

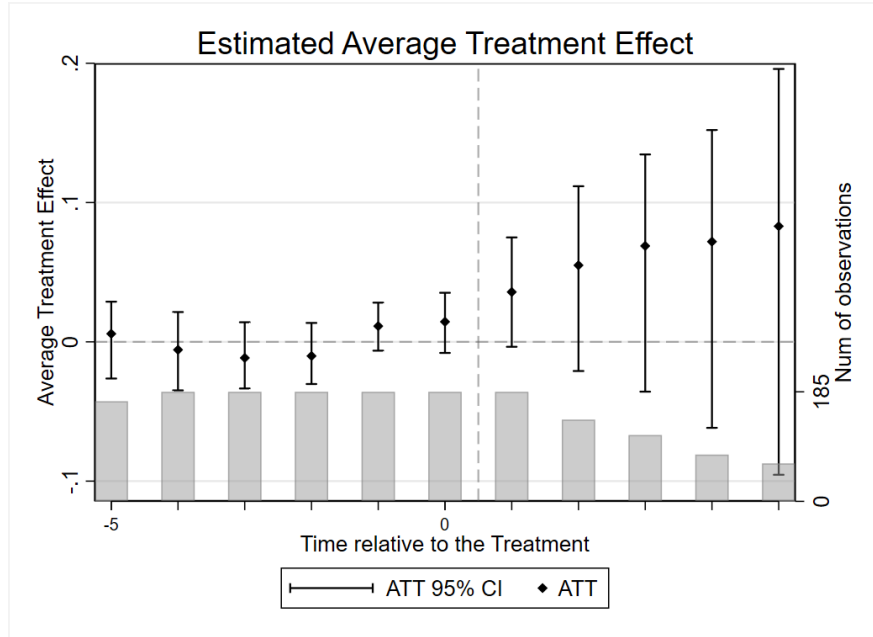


Table 3: Mortgage Delinquency Rates 90 Days or More Delinquent Overall ATT Estimate

ATT	N	sd	Lower_Bound	Upper_Bound	pvalue
0.130***	573	0.045	0.049	0.211	0.004

*Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$*

Table 4: Mortgage Delinquency Rates 90 Days or More Delinquent Dynamic ATT Estimates

s	n	ATT	ATT_sd	ATT_p.value	ATT_Lower_Bound	ATT_Upper_Bound
-7	106	-0.034	0.03	0.263	-0.094	0.026
-6	121	0.103***	0.024	0.000	0.051	0.141
-5	169	-0.028	0.019	0.149	-0.059	0.017
-4	185	-0.038***	0.011	0.001	-0.060	-0.014
-3	185	-0.011	0.012	0.384	-0.038	0.011
-2	185	-0.020*	0.010	0.061	-0.036	0.005
-1	185	0.027**	0.009	0.004	0.008	0.043
0	185	0.012	0.011	0.272	-0.010	0.033
1	185	0.078**	0.027	0.004	0.026	0.138
2	138	0.093**	0.040	0.020	0.021	0.186
3	112	0.173***	0.055	0.002	0.046	0.281
4	79	0.137**	0.067	0.041	0.021	0.274
5	64	0.163*	0.097	0.093	-0.031	0.331
6	16	0.592**	0.241	0.014	0.162	1.096

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Figure 2: Mortgage Delinquency Rates 90 Days or More

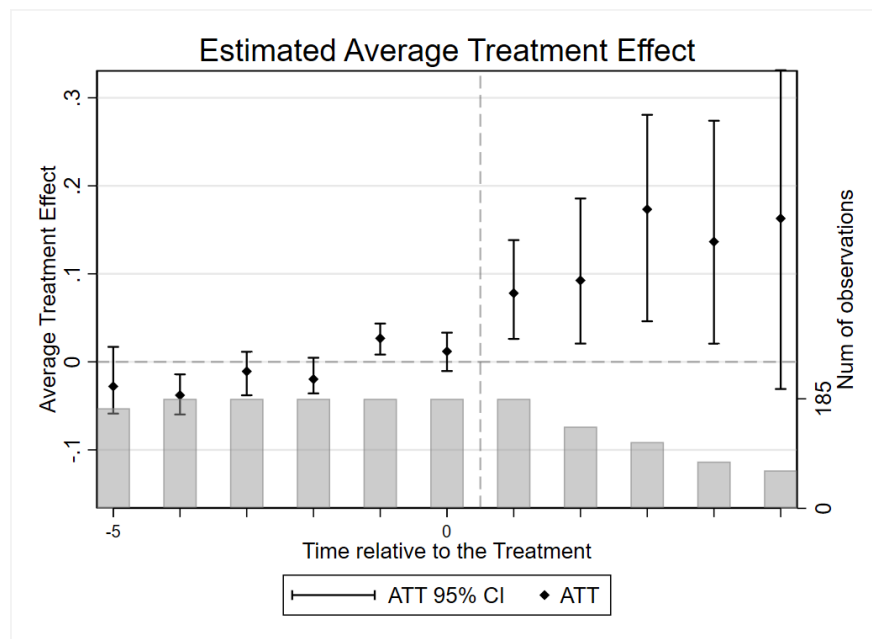


Table 5: Log(Total Bankruptcies+1) ATT Estimate

ATT	N	sd	Lower_Bound	Upper_Bound	pvalue
0.037	573	0.023	-0.005	0.086	0.107

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 6: Log(Total Bankruptcies+1) ATT Estimates

s	n	ATT	ATT_sd	ATT_p-value	ATT_Lower_Bound	ATT_Upper_Bound
-7	106	-0.026**	0.009	0.006	-0.042	-0.003
-6	121	-0.021***	0.006	0.001	-0.030	-0.005
-5	169	0.003	0.006	0.577	-0.007	0.016
-4	185	0.019***	0.005	0.000	0.008	0.027
-3	185	0.005	0.005	0.233	-0.006	0.012
-2	185	-0.010*	0.005	0.036	-0.020	-0.001
-1	185	0.006	0.004	0.182	-0.003	0.014
0	185	0	0.005	0.930	-0.011	0.010
1	185	0.017	0.016	0.310	-0.013	0.050
2	138	0.062**	0.022	0.006	0.022	0.112
3	112	0.065*	0.027	0.014	0.016	0.119
4	79	0.003	0.035	0.934	-0.059	0.074
5	64	0.041	0.046	0.370	-0.033	0.141
6	16	-0.009	0.093	0.926	-0.175	0.223

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Figure 3: Log(Total Bankruptcies +1) ATT Estimates

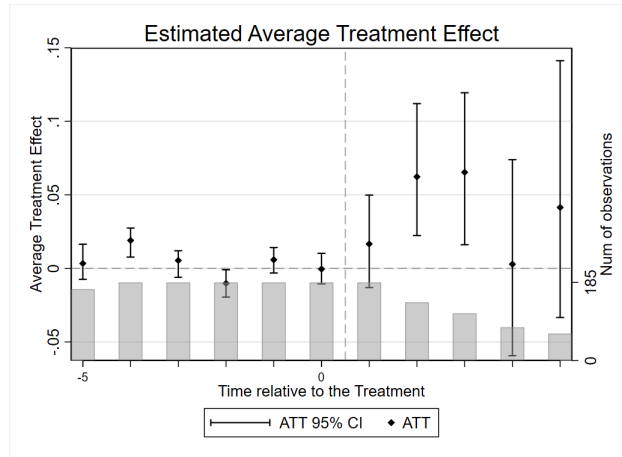
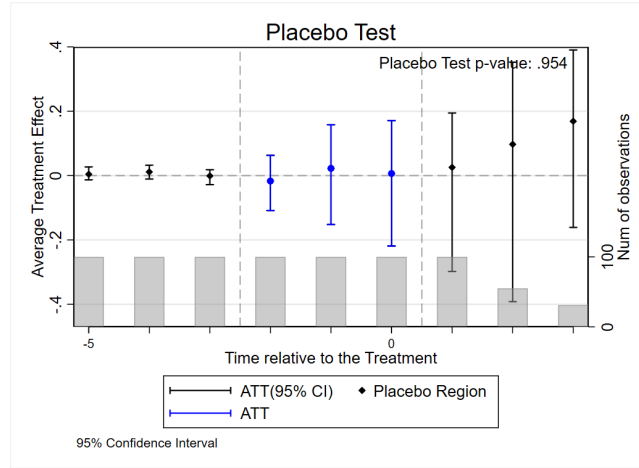
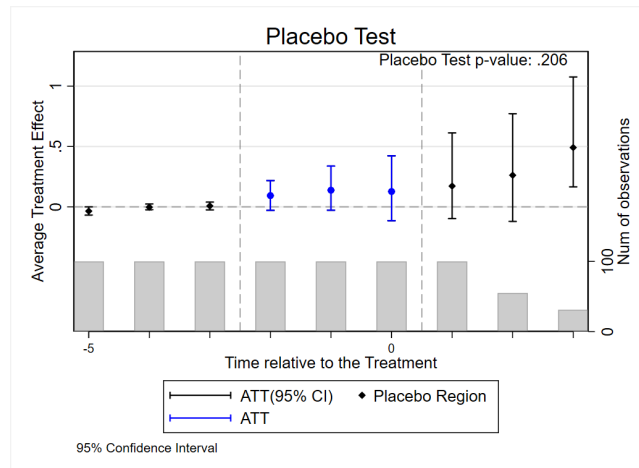


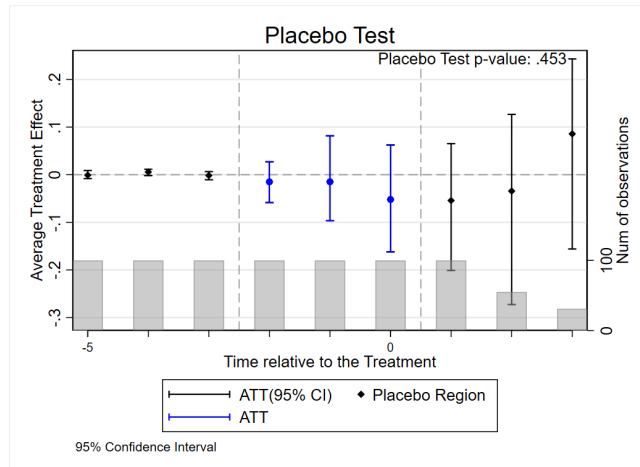
Figure 4: Placebo Tests for all Three Regressions



(a) Placebo Test for Mortgage Delinquency Rates: Delinquent for Less Than 90 Days



(b) Placebo Test for Mortgage Delinquency Rates: Delinquent for More Than 90 Days



(c) Placebo Test for Log(Bankruptcy + 1)

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