Can't Stop the One-Armed Bandits
The Effects of Access to Gambling on Crime*

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Abstract

We estimate the effects on criminal activity due to the approval of a state legislation in Illinois that legalized video gambling. This legislation gave municipalities discretion over whether to allow video gambling within their local boundaries. Many jurisdictions adjacent to Chicago opted in, while the City of Chicago opted out due to a long-standing ban on gambling. These decisions create a natural experiment that allows comparing crime between areas closer to and farther from video gambling establishments. Using detailed incident-level crime data and a difference-in-differences strategy, we find that (i) access to gambling increases violent and property crimes; (ii) these crimes represent "new" rather than displaced incidents; and (iii) effects are persistent over time. We further study downstream effects on property values, finding that properties adjacent to gambling establishments sell on average at a three percent discount.

Key words: video gambling, crime, amenities, Chicago.
JEL Classification: K42, L83, R38.

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1 Introduction

Commercial and tribal gambling in the United States expanded rapidly during the early nineties, becoming legal in forty states. More recently, many state governments have moved towards decentralizing gambling activity. Moving it away from casinos to smaller establishments such as bars and restaurants through video gambling.[1] In Illinois, people wagered over $14 billion in 2016, which generated over $277 million in tax revenue (equivalent to around 1 percent of total state tax revenue). Encouraged by the apparent fiscal success of video gambling in Illinois, other states are considering similar legislation. Moving towards decentralized gambling changes the nature of access to gambling: instead of being available at a few designated locations (i.e., casinos), it can become widely available across the state – increasing access drastically.

However, the potential effects on crime from such a large increase in access to gambling are not well understood. Most of the existing evidence focuses on the effect of casino constructions on crime. Nevertheless, we must be cautious when extrapolating these results in the context of decentralized gambling. Casino construction typically entails broader changes other than access to gambling. For example, a new casino may generate a positive local labor market shock that may attenuate the potential adverse effects on crime. At the same time, casinos may attract more people to the area, increasing the likelihood of crimes occurring. Thus, the introduction of casino gambling offers a less-than-ideal case in which to study the effect of gambling on crime because location decisions depend on various factors, including local, social, and economic conditions, which may not always be observed by the econometrician.

An ideal setting to study the effects of increasing access to gambling would involve

[1]This form of gambling is often referred to as "convenience gambling". Video gambling terminals or video lottery terminals are machines where a player bets on the outcome of a video game (i.e., slots, poker, roulette, etc.). In 2019, this type of gambling was legal in Illinois, Louisiana, Oregon, Pennsylvania, South Dakota, West Virginia, and Georgia.

randomly placing gaming terminals in some locations and not in others. In this setting, we could examine the effect of access to gambling by comparing how outcomes change in areas with greater access relative to those with lower access. We take advantage of a setting that comes closer to this ideal experimental situation: the legalization and expansion of video gambling in Illinois. The Video Gaming Act of Illinois was passed in 2009 and implemented in 2012. The law allows local establishments in possession of a liquor license (mainly bars and restaurants) to install up to five video gambling terminals. Local municipalities can decide whether or not to allow video gambling in their territory. The City of Chicago has maintained a ban on gambling since 1993. However, several municipalities directly adjacent to Chicago have adopted video gambling, thus considerably increasing access to gambling in some areas of Chicago.

The empirical evidence presented in this paper shows that increasing the availability of gambling can generate costs beyond those intended by policy-makers. We show that increasing the availability of gambling increases crime and impact property values negatively. This is critical for local governments because increases in crime and reduction in property tax revenues may offset any gambling tax revenues.

Our empirical analysis uses detailed data on establishments that adopted video gambling in Cook County, IL, incident-level data on crime from Chicago.[2] We use a difference-in-differences strategy that incorporates the timing of the introduction of video gambling in each establishment and compares crime in census block groups of Chicago that are closer to video gambling establishments with those that are farther away. Our identification strategy relies on the fact that the decision to allow gambling was made independently from the areas of study in Chicago. Therefore, in the absence of the Video Gaming Act, crime in areas relatively closer to establishments that ever adopted video gambling should have evolved similarly to areas further away. We test this assumption and find that, indeed, be-

[2]Incident level crime data is only available for the city of Chicago, and not the surrounding cities

fore the legalization of gambling, crime was evolving similarly in areas with greater access relative to those farther away.

We find that expanding access to video gambling leads to an increase in violent and property crimes in Chicago. On average, being near at least one video gambling establishment is associated with an 8 percent increase in violent crime and a 6 percent increase in property crime. These estimates are similar after accounting for potential confounders, including access to riverboat casinos, demographic controls, and neighborhood-specific trends. Our results suggest that video gambling is creating new crimes rather than displacing existing ones. The effects of access to video gambling are strongest in the block groups closest to video gambling establishments. The effects monotonically decrease, becoming, and remaining at zero after two block groups.

One concern is that video gambling could have increased the availability of bars. There is evidence suggesting that increasing access to bars can increase crime (Rossow and Norstrom, 2012, Anderson et al., 2017). If this were happening, our estimates could merely be capturing the effect of more bars rather than access to gambling. Using data on all liquor licenses granted in Illinois, we show that the effects of access to video gambling remain unchanged after accounting for changes in access to bars over time.

Moreover, we find that the introduction of gambling creates crime, primarily in the form of aggravated battery, robberies, and burglaries. The increase in these types of crimes is consistent with crimes directly associated with gambling, such as emotional cues driven from financial distress from pathological gamblers, and the increased payoff from victim availability. Other crimes, not related to gambling, show no noticeable changes.

Gambling can be socially costly beyond increasing crime. We find that prices of properties near establishments decline considerably following the introduction of video gambling. We estimate that the average price within two block groups drops between 1.5 and 3 percentage points. These results not only are consistent with the fact that gambling increased

crime but also may be associated with other factors beyond crime. There is not only social stigma related to gambling, but also it attracts and generates particular behaviors that people may be willing to pay a discount to live near gaming terminals.(Grinols, 2004).

This paper informs several strands of literature. It relates to research studying gambling externalities. Most of this literature has focused on examining the effect of casino expansions on crime (Gazel et al., 2001, Wilson, 2001, Reece, 2010, Hyclak, 2011, Nichols and Tosun, 2017, Falls and Thompson, 2014, Humphreys and Soebbing, 2014) finding mixed results overall. This is partly because casino constructions entail substantial changes in the affected area. For example, several studies have documented positive effects on the local labor market (Evans and Topoleski, 2002, Humphreys and Marchand, 2013). However, Grinols and Mustard (2006) have the most comprehensive study where they find that casinos increase crime. Moreover, its effects on property values have received considerably less attention (Gazel et al., 2001, Wilson, 2001, Reece, 2010, Hyclak, 2011, Nichols and Tosun, 2017, Falls and Thompson, 2014, Humphreys and Soebbing, 2014). We contribute to this literature in three ways, first, by focusing on a context where factors other than access to gambling remain mostly unchanged. Second, we study localized effects of access to gambling on crime and property values, rather than aggregate effects at the county-year level. Third, we exploit a natural experiment where cities outside of Chicago determined access to gambling.

We also add to the literature examining effects of the expansion of "sin tax" activities on crime. Recent studies focused on the effects of legalized prostitution (Ciacci and Sviatschi, 2016), marijuana dispensaries (Chang and Jacobson, 2017), and bars (Rossow and Norstrom, 2012). Our contribution to this literature is by studying the localized effects of decentralized gambling through the rapid expansion of video gambling terminals – an activity that looks set to grow in several states over the next years.

The paper proceeds as follows. Section 2 provides background on gambling in Illinois,

showing how access to gambling increased dramatically as a result of the Video Gaming Act. Section 3 describes our data. Section 4 describes our identification and results, and Section 5 examines the robustness of our main results. Section 6 describe our housing prices results. Section 7 provides a back of the envelope costs of crime of the legalization of video gambling. Section 8 concludes the paper.

2 Video Gambling in Illinois

Gambling is not new to Illinois. Riverboat casinos were legalized in 1990 through the Riverboat Gambling Act (230 ILCS 10). This made Illinois the second state (after Iowa) to legalize this form of gambling (Grinols, 2004). Gambling activities have been closely regulated in Illinois, which has allowed only 10 casinos to open throughout the State. In 2012, riverboat casinos generated about $350 million in tax revenue for the state and $83 million for municipalities (Illinois Gaming Board, 2016).

New spending initiatives have begun to rely on funds from gambling revenue to cover costs. The 2009 *Illinois Jobs Now!* project was conceived to foster economic activity, invest in infrastructure, and create new jobs in the aftermath of the 2008 financial crisis. This project's cost was estimated to be $31 billion, of which the state would account for $13 billion or roughly 40%.[3] Twenty-year bonds financed by fee and tax increases (e.g., increases in vehicle registration fees and alcohol/candy taxes) would mainly cover Illinois' share. The second largest revenue source would be tax income from video gambling.

In 2009, the State passed the Video Gaming Act (230 ILCS 40) that legalized video gambling in any retail location with a valid liquor license and not owned by a horse racing firm or riverboat casino.[4] Qualifying establishments fill out an online application and must

[3]Remaining funds were to be drawn from state debt and federal and local matching grants.
[4]Other establishments also qualified for video gambling: licensed fraternal establishments, licensed veteran organizations, and licensed truck stops.

pay a $100 annual license fee. If their request is approved, state-licensed technicians can install between one and five video gambling terminals in the establishment.[5] Terminals cannot directly dispense coins, cash, or tokens. Players instead receive vouchers that can be exchanged for cash at the register. A player can wager $2 at most and terminals cannot dispense more than $500 per game played. The total revenue generated by video gambling terminals is divided in three parts: 70% goes to establishments and terminal companies, 25% to the state, and 5% to the municipality.

Once implementation of the Video Gaming Act began in September of 2012, adoption was fast. Figure 1 plots the number of video gambling establishments over time. Many eligible businesses applied for licenses and typically installed the maximum number of terminals allowed by the law. Almost 25,000 video gambling terminals in about 5,000 establishments were operational by 2016 (Illinois Gaming Board, 2017). This places Illinois as the largest video gambling jurisdiction in the world, surpassing Nevada. Video gambling became widespread and convenient to such an extent that revenues and attendance at riverboat casinos in Illinois have been in decline since video gambling was adopted (Commission on Government Forecasting and Accountability, 2015).

While the Video Gaming Act legalized video gambling across Illinois, each municipality could choose whether to allow video gambling within its administrative limits, if it did not already have an ordinance prohibiting gambling.[6] Out of 1,475 municipalities, around 12% either opted-out or already had an ordinance that outlawed gambling. The most notable municipality that does not allow video gambling is Chicago. The City of Chicago has had an ordinance prohibiting gambling that dates back to 1993, passed by City Aldermen in opposition to Mayor Daley's plans to bring casinos to the city (ordinance Title 8, Chapter 8-12). An amendment to this ordinance was proposed in 2012 to allow video gambling

[5]Video gambling activities are extensively regulated by the State. Manufacturers, distributors, suppliers, operators, and handlers must fulfill a number of requirements, pay fees, and are subject to inspections.
[6]The regulations for the referendum may be found in Section 70 of the Video Gaming Act. They require asking constituents: "Shall video gambling be prohibited in [municipality]?" The choices are Yes or No.

(O2012-2236), it was finally voted down in May 2015.

Even though Chicago has not adopted video gambling, access to gambling has increased dramatically in the city as a result of the Video Gaming Act, notwithstanding that there were a number of riverboat casinos and land-based casinos in neighboring Indiana. This is driven by many bordering municipalities that do allow video gambling. We plot the minimum travel time from the centroid of each census block group to the nearest casino (Figure 2.a) or video gambling establishment (Figure 2.b). On average, travel time to gambling decreased by over 47% across the city (or 9 minutes). Given existing evidence suggesting that the relationship between gambling and travel time approximates an exponential function (Grinols, 2004), such a large expansion in access is set to increase gambling significantly.

In order to identify the causal effect of increasing access to gambling on crime, we exploit the increase in access to video gambling over time and space, taking advantage of detailed data on crime in Chicago that is unavailable for the rest of Illinois during periods before and after video gambling was legalized. It is important to note that there are two main potential sources of attenuation bias. First, we are examine a context where gambling was already accessible, though it became dramatically more accessible and widespread with video gambling. Second, the existence of illegal gambling locations within the city of Chicago may also attenuate any potential effects of access to video gambling. For these reasons, our estimates in the following sections should be considered lower bounds of the effects of access to gambling on crime.

3 Data

We combine data from various sources. First, incident-level data on crime from police reports between January 2006 and June 2016 available from the City of Chicago Data Portal. Similar data is not available for cities neighboring Chicago. This information comes

from the Chicago Police Department's Citizen Law Enforcement Analysis and Reporting system. The data set provides the date, time, and location of the crime at the block-level. Each incident is also classified according to the Illinois Uniform Crime Reporting (UCR) code, which in turn follows the Federal Bureau of Investigation's (FBI) Uniform Crime Reporting guidelines.[7] We classify incidents into violent and property crimes. In the case of multiple offenses, the incident is classified using the FBI's UCR Hierarchy Rule.[8] This hierarchical classification implies that reports for lower categories will be downward biased.[9]

We aggregate the data and construct a monthly panel of census block groups crime counts. Block groups are small enough to provide sufficient geographic variation in access. Additionally, we obtain demographic characteristics at this level to use as controls from the 2000 Census. Demographic data include total population, percentage of African Americans, percentage of Hispanics, number of housing units, and percentage of vacant housing. We interact these measures with a linear trend and them as controls to account for any differences in demographic characteristics. Table 1 show basic descriptive statistics.

Monthly data on establishments with video gambling comes from the Illinois Gaming board. The data contains the address of the establishment, as well as information on the number of video gambling terminals installed, statistics on volume played, and taxes collected. We geo-coded the location of each establishment and use it to construct our main measure of access to video gambling. We match establishments at the census block group level and classify block groups each month inside of Chicago based on proximity

[7]Violent crimes include: homicide, sexual assault, robbery and, aggravated assault and battery; while property crimes: arson, burglary, larceny and motor vehicle theft. See http://gis.chicagopolice.org/clearmap_crime_sums/crime_types.html for definitions and descriptions (last access August 17, 2017).

[8]This rule assigns the highest hierarchy to violent crimes followed by property crimes. It requires that in a multiple offense scenario the incident must be classified with the highest hierarchy.

[9]The data only contains incidents for which the police responded and completed a case report. The geo-location is approximate and accurate only at the block level. It also contains some missing geo-coordinates. If the address of the incident is present but not the geo-coordinates, we geo-code them to the middle of the block because the last two digits of the address are withheld. We dropped 401 (0.6%) incidents that could not be geo-coded.

to video gambling using geographic adjacency (e.g., within one block is directly adjacent, within two blocks is adjacent-to-adjacent, and so on).

Finally, we obtained from Corelogic property transaction data for Cook County for the same time period. The data contains transaction prices and structural characteristics. From these data, we create controls for dwelling characteristics: age and its square, square footage, number of bedrooms and bathrooms, indicators for brick exterior, fireplace, garage, and dwelling type (i.e. Single, Multi Family Residence).[10] We match these transactions to block groups and data demographic characteristics at this level to use as controls from the 2000 Census.

4 Gambling and Crime

There are several potential mechanisms mediating the relationship between access to gambling and crime. Previous research suggest that individuals exposed to gambling, especially to electronic gambling machines, may become problem or pathological gamblers (Wheeler et al., 2011). Pathological gamblers are more likely to engage in criminal activities as a result of financial and/or emotional distress. In this sense gamblers have been linked to engage in property crimes (Blaszczynski and McConaghy, 1994), and domestic violence (Dowling et al., 2016, Lorenz and Shuttlesworth, 1983, Bland et al., 1993). Research has also shown that pathological gamblers display other dysfunctional patterns of behavior such as excessive drinking and drug use which may also contribute to their criminal behavior(Walker, 2013).[11]

The link between increases access to gambling and crime can be also explained by the standard Becker (1968) model. The increase of availability of gambling places increases

[10]Dwelling characteristics come from the Assessor's office and correspond to the most recent property assessment.

[11]See Kindt and Palchak (2002) for a discussion on the financial and social costs of pathological gamblers.

the payoff of crime. These places lower the costs of finding potential victims who would be carrying extra cash to gamble (or from their winnings), increasing the payoffs to crime Grinols and Mustard (2006).

By studying the expansion of video gambling in a decentralized manner, we can largely minimize the role played by other mechanisms. Large scale developments, such as casinos, have been shown to increasing employment, wages, and may spur economic development the area (Evans and Topoleski, 2002, Humphreys and Marchand, 2013). In our context, these effects are mostly minimized because the expansion occurs in existing bars and restaurants, rather than in new developments.[12]

4.1 Proximity to Video Gambling and Crime

To identify the effects of increasing access to video gambling on crime in Chicago, we exploit variation over time and space of the expansion of video gambling by establishments. Our identification strategy rests on the assumption that closer block groups have greater access and are more likely to be affected. Figure 3 illustrates our identification. Using this spatial proximity strategy helps account for confounding unobserved neighborhood attributes (Linden and Rockoff, 2008, Diamond and McQuade, 2016). For this reason, we restrict the sample to census block groups that are within 6 blocks at any point in time.[13]

We employ a difference-in-differences strategy that compares crime in block groups that have greater access to video gambling establishments with blocks groups that have lower access in the same neighborhood, before and after establishments near the Chicago border adopted video gambling. Our baseline specification for a given $Crime_{i,t}$ (i.e., number of crimes in block group i in month-year t) measure is:

[12] We find that the Video Gambling Act did not significantly affect the availability of bars and restaurants. See Appendix B for details.

[13] Appendix Table A.1 shows that this restriction does not play an important role in our results.

$$Crime_{i,t} = \sum_j \beta_j BG^j_{i,t} \times Post_{i,t} + \phi X_{i,t} + t\gamma_n + \alpha_i + \delta_t + \varepsilon_{i,t} \quad (1)$$

where $Crime_{i,t}$ are either violent or property crimes. $BG^j_{i,t}$ with $j = 1, ..., 5$ is an indicator for proximity to a gambling establishment, e.g $BG^1_{i,t}$ equals one if the block group is within 1 blocks of a video gambling establishment and zero otherwise. Block groups within 6 blocks serve as our baseline. The spatial indicator are interacted with $Post_t$ and indicator that takes one after the establishment adds video gambling. α_i are block group fixed effects, δ_t are month-year fixed effects, and $\varepsilon_{i,t}$ is the error term. Our parameter of interest, β, estimates the average difference in crime between blocks that are closer to of establishments with video gambling relative to those 6 blocks away. Our main identifying assumption is that in absence of video gambling, crime would have evolved similarly in areas that eventually had high access compared to those with low access. In Section 5 we provide evidence suggesting that this assumption is likely to hold.

This strategy accounts for a number of potential threats to identification. We include $X_{i,t}$ that controls flexible for proximity to riverboat casinos in the greater-Chicago area and the 2000 census demographic characteristics described above. During our period of analysis two new riverboat casinos opened, which could potentially bias our results. To account for these potential confounding effects we include a quadratic function of the linear distance to the nearest riverboat casino. We include demographic characteristic ts to account for the possibility that crime could be driven by underlying changes in the demographic conditions of block groups with higher access to gambling. We also add, neighborhood specific time trends $t\gamma_n$.[14] These trends account for the possibility that there could have been unobserved public policies during our period of analysis that could affect crime. For example, if shocks in crime at the neighborhood-level were correlated with the adoption of video gambling,

[14]Our neighborhood definitions is based on the nine Chicago "sides": Far North Side, Northwest Side, North Side, West Side, Central, South Side, Southwest Side, Far Southwest Side, Far Southeast Side.

our estimates would be biased.

Given the count nature of the crime data, we estimate Equation (1) by maximum likelihood using a Poisson regression. Since errors are expected to be correlated within block groups and access to gambling varies at this level, we cluster our standard errors at the census block level in all our regressions.

Figure 4 shows effects by block group distance (i.e., one block away, two, etc.). If our effects were driven by increased access to gambling, we would expect that blocks that are closer to gambling (i.e., has higher exposure) establishments experience a larger increase in crime. Both violent and property crimes display a similar pattern: the effects are largest for the blocks with highest access to gambling (within 1 block), and they decrease as we move away. At a distance of three or four blocks the effects are zero and remain constant at greater distances. For areas within one block of gambling establishments, the average increase in violent and property crime is 9.9% (s.e. 0.048) and 6.8% (s.e. 0.039), respectively.

4.2 Effects of Increase Access to Video Gambling on Crime

Section 5.3, shows that effects are largest within two blocks, and becomes zero and remains zero four and more blocks away. Based on this evidence , and to maximize power, we use a single access indicator that takes one if the block group is within within two blocks of a video gambling establishment, and use blocks that are four to six blocks away as comparison group. Our estimating equation then takes the form:

$$Crime_{i,t} = \alpha_i + \beta\, Within\ 2\, Blocks_{i,t} + \phi X_{i,t} + t\gamma_n + \delta_t + \varepsilon_{i,t} \tag{2}$$

where $Within\ 2\ Blocks_{i,t}$ is an indicator that equals one if the block group is within two blocks of a video gambling establishment at time t and zero otherwise. α_i are block group

fixed effects, δ_t are month-year fixed effects, and $\varepsilon_{i,t}$ is the error term. Our parameter of interest, β, estimates the average difference in crime between blocks that are within two blocks of establishments with video gambling relative to those that are further away (4-6 blocks). Our main identifying assumption is that in absence of video gambling, crime would have evolved similarly in areas that eventually had high access compared to those with low access. In Section 5 we provide evidence that this assumption is likely to hold.

However, our estimates are robust to using alternative definitions of access to gambling, including the volume played, and access measures typically used in the trade literature (Harris, 1954, Hanson, 2005) that employ a weighted average of the linear distance (or traveling time) from the block group centroid to each establishment.[15]

We examine whether greater access to video gambling affects violent and property crime in Chicago. Table 2 presents these results using number of violent crimes as the dependent variable, while Table 2.b does the same for property crimes. We begin with a basic specification that does not control for access to riverboat casinos, demographic characteristics or geography specific time trends in column (1). Results show a statistically significant increase in both violent and property crimes. Our estimates indicate that being within two block groups of at least one video gambling establishment increases violent crime by almost 8.8% (s.e. 0.028) and property crime by 5.8% (s.e. 0.023).[16]

These estimates are robust to using alternative specifications. Column (2) presents results after accounting for proximity to Riverboat Casinos. Column (3) accounts for demographic characteristics and column (4) includes geographic specific time trends. Column (5) is our preferred specification that incorporates all the previous controls. The point esti-

[15]For example, if $d_{i,j}$ is the linear distance (or traveling time) between block group centroid i and establishment j, and $\mathbb{1}(VG_{j,t} = 1)$ indicates that establishment j has video gambling in period t, then gambling access (GA) is calculated as $GA_{i,t} = \sum_{j=1}^{J} exp(-\mathbb{1}(VG_{j,t} = 1) \cdot d_{i,j})$.

[16]Given that we estimate non-linear Poisson regressions, estimated coefficients should have a slightly different interpretation than OLS estimates. However, because the coefficient of interest is attached to a dummy variable and the resulting estimates are small, the coefficient can be interpreted as the percentage change in crime $e^{\hat{\beta}} - 1 \approx \hat{\beta}$.

mate slightly decreases to 7.9% (s.e. 0.026) for violent and increases to 6.2% (s.e. 0.025) for property crime, though they are not statistically different from the baseline specification.

Results are similar using other estimators. Table A.3 shows results a linear estimator. Results using this estimator shows an increase of 9.5% in violent crime and an 8.4% for property crime which are similar to our nonlinear estimates. The advantage of using a linear estimator is that we can perform additional robustness checks that are not yet developed for nonlinear estimators. In the Appendix Section A.4 we use Oster (2017) to show that our results are not likely to be affected by unobservables. We decompose the difference-in-difference estimates using Goodman-Bacon (2018) 2x2 decomposition and show that the variation comes from the "correct" comparison between treated and control units and not between earlier and later treated units. Finally, we take advantage of modern machine learning matrix completion techniques (Athey et al., 2018) to build counterfactual that do not need to rely on parallel trend assumptions to show that indeed our results are driven by the introduction of gambling and are not spurious.

Unlike some of the state or region-specific casino studies in the US (Gazel et al., 2001, Wilson, 2001, Reece, 2010, Hyclak, 2011, Falls and Thompson, 2014) or the Canadian gambling literature (Arthur et al., 2014, Humphreys and Soebbing, 2014), we do find that greater access to gambling increases crime. Compared to research studying casino openings across the US, our estimates are somewhat lower. Grinols and Mustard (2006) find average rises of 20% in violent crime and 16% in property crime. Evans and Topoleski (2002) find smaller increases when accounting for state-specific time trends, about 10% for both types of crime. However, crime effects due to casino openings are driven by multiple mechanisms, not just gambling itself. For example, part of the increase in crime could be driven mechanically due to an increase in the number of people visiting casino counties.

4.3 Further Results

We provide additional evidence that our results are indeed driven by access to video gambling and are not spurious. We exploit two different dimensions of our variation in access to gambling: its effects over time, and the availability of video gambling establishments.

To explore the effects of access to gambling over time, we conduct an event study analysis, where we classify block groups in bins of one year with respect to when it first had a gambling establishment within two blocks. Point estimates and 90% confidence intervals are presented in Figure 5. Both property and violent crimes show similar patterns: before becoming exposed to video gambling we do not observe any significant differences in crime between blocks that are within two blocks from gambling establishments compared to those that are further away. This provides suggestive evidence validating our main identifying assumption, that trends evolved similarly before video gambling was adopted.

The effect of access to video gambling on crime seems to be persistent. On average, the effect after three years or more on property crime it is 13.4% (s.e. 0.035), while for violent crime is 12.6% (s.e. 0.047). The pattern of the effects over time is consistent with the timing and expansion of video gambling establishments described in Figure 1. Additionally, it is also consistent with evidence that it takes around a year for individuals to become compulsive video gamblers (Grinols and Mustard, 2006).

Finally, we find that effects are also increasing in availability of video gambling establishments. One measure of availability is by volume played at gambling establishments within two blocks. On average, the monthly volume played in establishments within two blocks is $2.8 million. We present results in Figure 6, where we classify block groups within two blocks of gambling establishments by total volume played at those establishments by quartile. Indeed, results suggest that the effects are increasing in volume played as would be expected.

5 Robustness

5.1 Differential trends

Identification of the effect of access to gambling on crime depends on the assumption that in absence of video gambling, crimes in high access areas would have evolved similarly to those further away. Though we cannot test this directly, we provide a number of tests that lend support to it. One approach is to create placebo indicators that equal one for a period of time before the unit becomes "treated" (i.e., a lead of the Within two blocks variable). This variable would capture any differences in trends between groups before being exposed to video gambling. We thus estimate Equation (1) and add the placebo variable.

Results are presented in Table 3, where in each column we change the time-span of the placebo variable. Column (1) presents our preferred specification results from Table 2, column (2) and (3) add a placebo for two years prior, columns (4) and (5) for 3 years prior. The point estimates on all the placebo coefficients are close to zero and we can reject the null hypothesis that the magnitude of effects of access to gambling and the placebo are equal (the largest p-value is 0.039). Additionally, the event study figures presented before (Figure 5) tell the same story: there do not seem to be large systematic differences in trends between groups before video gambling is adopted by an establishment.[17] Taken together, the evidence is reassuring that our findings are not driven by differences predating video gambling adoption.

5.2 Randomization Inference

In this section we use randomization testing to assess the robustness of our our results. Randomization tests introduced by Fisher (1935) are special cases of permutation tests

[17]The findings are unchanged if we perform the same event study analysis using smaller time aggregations, although the estimates are more imprecise.

(Welch, 1990). Among of the advantages of this approach is that we can construct exact test for sharp nulls regardless of "sample sizes, regression design, or characteristics about the disturbance term"(Young, 2018). Recent research has also noted that randomization test may be specially suitable when uncertainty in the estimation arises as a result of unknown counterfactuals (Abadie et al., 2015, Cunningham et al., 2019).

To construct our randomization test we shuffle the start "treatment" dates to each block group. We then estimate again equation (2). We repeat the permutation 500 times and plot them in Figures 7. The blue dotted line marks our estimates. The null hypothesis is that there are no effects. We find that our preferred estimates for violent crime, 0.0791 (s.e. 0.0258)- are significant at the 7% level and for property crimes, 0.0620 (s.e. 0.0246), are significant at the 2% level. This shows that the increase in crimes are solely associated with the precise dates that gambling was introduced across block groups.

5.3 Proximity to Video Gambling and Crime Displacement

One concern with the interpretation of our results is that access to video gambling is displacing crime: shifting criminal activity towards areas closer to gambling establishments. Although we do not observe crime in the surrounding areas outside Chicago, our results suggest that our estimates capture new crimes in Chicago rather than displacing existing crime. First, if our effects were driven by displacement, we would expect to find effects decreasing monotonically with distance. However, as shown in Figure 4, point estimates of effects are zero and remain at zero after four or more census block groups away from a video gambling establishment. Second, when including all block groups of Chicago or restricting the sample to block groups ever within 10 blocks of a video gambling establishment if Table A.1 columns (2) and (3) we find that our results for violent crime remain the same and for property crime they are slightly smaller but not statistically different from each other.

Moreover, if effects were driven solely by displacement, then there is a form of crime

that should not be affected by it: domestic incidents.[18] We replicate our baseline analysis using the number of domestic crimes as dependent variable in Table 5. We find suggestive evidence that access to gambling increased the number of domestic crimes by around 3-4%, though the estimates are not precisely estimated. Depending on the specification used, they can be either borderline significant or insignifican at the 10% level. This is consistent with evidence documenting the effect of emotional cues and family violence. For example, Card and Dahl (2011) find that upset losses increase domestic violence by 10% during the hour after a football game. Our estimates on domestic crime are substantially smaller than the effects on property and violent crime, suggesting that emotional cues may play a smaller role in the context of gambling.

5.4 Access to Bars

A potential concern is that the increase in crime may be driven by an increase in access to bars rather than gambling. In 2016, video gambling terminals brought establishments over $5,100 a month on average in revenues.[19] This could have had two effects. First, it may encourage new bars to open (or extend the life of existing bars). Given that there is evidence documenting a positive correlation between bars and crime (Rossow and Norstrom, 2012, Anderson et al., 2017), an increase in the number of bars could drive our results. Second, bars located inside Chicago may relocate outside the borders to benefit from video gambling. This could have two opposing effects. On the one hand, the number of local bars can decrease and this could bias our estimates downwards. On the other hand, it could shift people towards the border increasing the likelihood of crimes happening in

[18]Besides classifying a crime by type (e.g., homicide, aggravated battery, etc.), the Chicago Police Department also notes whether the incident was domestic or not based on the relationship between the victim and the offender. Specifically we focus on violent crimes complemented with simple assault and battery classified as domestic plus offenses against family. We do so to get a domestic violence measure that best fit the definition of the Department of Justice (see https://www.justice.gov/ovw/domestic-violence)
[19]Own calculations based on data from the Illinois Gaming Board.

areas near the border.

Our results remain unchanged when accounting for access to bars. We use data on all the liquor licenses granted by the Illinois Liquor Control Committee during the period of July 2009 to March 2016.[20] We geo-coded all establishments in the greater Chicago region and constructed a monthly panel at the census block group level containing the number of active liquor licenses. From this data we generate two variables: the number of bars in each block group and the number of bars within two blocks.

Results are presented in Table 4, where the first two column replicates our original analysis with and without community area trends, restricting the sample to the time period for which we have data on liquor licenses. Column (3) adds the number of bars (in hundreds) in same block as a control, column (4) adds number of bars (in hundreds) within two blocks as a control, column (5) adds both but exclude video gambling access to show that access to bars and video gambling are not highly correlated. Column (6) re-introduces access to video gambling and includes both measures of access to bars. Notably, the coefficient of interest remains very stable suggesting that changes in access to bars are not mediating the effect of access to gambling and crime.

6 Gambling and Property Values

Increasing access to gambling can be socially costly beyond increasing crime. Increasing access to gambling can be capitalized into property values, reducing its value. This is particularly important, since for local governments, this implies that the reduction in property tax revenues due to video gambling will offset the increase in gambling tax revenues.

There are two channels that through which gambling may be capitalized into property values. First, there is a social stigma associated with gambling; therefore, individuals

[20]This was all the data available at the time of our FOIA request.

may consider living near an establishment with video gambling terminals as a dis-amenity (Grinols, 2004). At the same time, because gambling increased crime, this may, in turn, affect property values (e.g., Pope and Pope, 2012). Moreover, Albouy et al. (2018) shows the importance of accounting for complementarities in amenity valuation. Even if gambling is considered as an amenity increases in crime can generate complementary effects turning it into a dis-amenity.

In this section, we explore the consequences of access to gambling on property values. Similar to the previous section we use the variation in timing and location for all establishments adopting video gambling. Since housing transaction data is available for all Cook County we expand our analysis to the county. We estimate a parallel equation to equation 2:

$$\ln Price_{jit} = \alpha_i + \beta\, Within\ 2\, blocks_{i,t} + \theta D_j + \phi X_{i,t} + t\gamma_n + \delta_t + \varepsilon_{j,i,t} \tag{3}$$

where $\ln Price_{jit}$ is log price of house j in block i sold in month t. $Within\ 2\ Blocks_{i,t}$ is an indicator that equals one if the block group is within two blocks of a video gambling establishment at time t and zero otherwise. α_i are block group fixed effects, δ_t are month-year fixed effects, and $\varepsilon_{j,i,t}$ is the error term. The model include dwelling characteristics, D_j, which do not vary over time due to our source.[21] As before we include demographic and proximity to riverboat controls and time trends for each neighborhood which account the fact that neighborhoods may exhibit different housing price cycles. Our parameter of interest, β, estimates the average difference in prices between properties that are within two blocks of establishments with video gambling relative to properties between 4-6 blocks. Our main identifying assumption is that in absence of video gambling, housing prices would have evolved similarly in areas that eventually had high access compared to those with low

[21] Dwelling characteristics include: age and its square, square footage, number of bedrooms and bathrooms, indicators for brick exterior, fireplace, garage, and dwelling type (i.e. Single, Multi Family Residence)

access.

6.1 Results

Table 6 shows our results. As with our crime results we begin again in column (1) with a basic specification that controls only for housing characteristics . Results show a statistically significant decrease in housing prices. Our estimates indicate that being within two block groups of at least one video gambling establishment decreases hosing prices by almost 5% (s.e. 0.0055). These estimates are robust to using alternative specifications. Column (2) presents results after accounting for proximity to Riverboat Casinos. Column (3) accounts for demographic characteristics and column (4) includes geographic specific time trends. Column (5) is our preferred specification that incorporates all the previous controls. The point estimate is smaller than before and show a decrease in housing prices of 1.5% (s.e. 0.0053).

Figure 9 shows the effects of access to gambling over time on property prices. The event study figure aggregate block groups in bins of a year months with respect to when it first had a gambling establishment within two blocks. Point estimates and 90% confidence intervals are presented in Figure 9. Property prices in high access areas and in low access areas follow similar trends before the introduction of gambling. This provides suggestive evidence validating our main identifying assumption, that trends evolved similarly before video gambling was adopted.

Within two years of the introduction we see prices fall about 1% and continue to decrease. Both property and violent crimes show similar patterns: before becoming exposed to video gambling we do not observe any significant differences in crime between blocks that are within two blocks from gambling establishments compared to those that are further away.

These pattern of the effects over time is not only consistent with the timing and ex-

pansion of video gambling establishments described in Figure 1 but also with the effects on crime.

7 Back of the Envelope Cost/Benefit

Taken together, our evidence suggests that access to gambling has increased property and violent crimes in Chicago. In this section we conduct a back of the envelope cost/benefit calculation of the Video Gambling Act for the City of Chicago. For this exercise, we first break down effects by crime type and use cost estimates typically used in the literature to impute the costs of crime. Because Chicago does not directly collect tax revenue from gambling, calculating the benefit is not straight forward. Using alternative measures for benefits, we find that the costs greatly outweigh the benefits.

We disaggregate results by type of crime in Table 7. Overall, we find that the effects are mainly driven by property-type of crimes: note that violent crimes are mostly explained by robbery, a violent form of property crime. Higher access to gambling adds 12.6% more robberies (significant at the 1% level). Results for other forms of violent crime are mixed: we find no significant effects on homicide, assault or sexual assault; though we do find statistically significant increases (at the 10% level) in aggravated battery (11.1%). On the other hand, the increase in property crime is driven mostly by motor vehicle thefts (15.9%), followed by burglaries (11.3%) and larcenies (6.71%) – all statistically relevant at the 5% or 1% level.

The large increase in robbery (and burglary, larceny, car theft) is consistent with direct effects of gambling such as problem and pathological gambling, where financial distress may drive individuals to commit crimes that have a monetary return. It is also consistent with crime being more profitable, where individuals carry more cash to gamble (or from

their winnings) and become more profitable targets.[22]

We can obtain the back of the envelope estimates of the cost associated with the increase in crime in Chicago as a result of video gambling in adjacent municipalities. Following Chalfin and McCrary (2017), we use estimates produced by Cohen and Piquero (2009) on the costs of crime that take into account both direct costs to the victim and indirect costs from reductions in the victim's quality of life. We present the costs for each type of crime in Table 8. We estimate that, on average, the social cost associated to the increase in crime in areas located within two block groups from an establishment with video gambling is around $463 thousand *per month* (in 2016 dollars). This is particularly large considering that the City of Chicago does not receive any direct benefits in terms of tax revenues from video gambling because that activity is banned within city limits.

However, access to gambling can be socially costly beyond increasing crime (and crime itself can be costly in other dimensions). For instance, access to gambling might potentially affect property values. There is large social stigma associated to gambling, therefore individuals may consider living near an establishment with video gambling terminals as a dis-amenity (Grinols, 2004). At the same time, because access to gambling increased crime, this may in turn affect property values (e.g., Pope and Pope, 2012).

Policymakers typically view legalizing gambling at a convenient source of revenue. However, the direct and indirect associated costs of video gambling may upset any tax revenues generated. Specially in the current scheme on how tax revenues are shared between cities and State. .

[22]This has been observed in other contexts. For example, there is evidence that when Food Stamps switched payments to Electronic Benefits Transfers (EBT) crime decreased (Wright et al., 2014).

8 Conclusion

We estimate the effects of increasing access to gambling on crime taking advantage of the legalization and expansion of video gambling in Illinois. Using crime data for Chicago, which does not allow gambling, we compare areas in the city that have relatively higher access with those that have lower access to gambling. We show that despite there being numerous casinos in the vicinity of Chicago, the Video Gaming Act drastically increased access to gambling in the City. In turn, higher access to gambling increases both violent and property crime. This generated approximately 15 and 30 extra violent and property crimes per month in Chicago.

There are numerous avenues for future research. More work is necessary to better understand and disentangle the mechanisms at play. Our results suggest that the mechanisms could be through problem and pathological gambling (i.e., financial distress) or increased payoff of crime. Learning the extent to which one or the other operates is important to design policies for mitigating the increase in crime. This is particularly important considering that video gambling is not only here to stay, but is set to expand in other states. To the extent that the effects are driven by pathological gambling, there are several non-profits and government organizations providing numerous services targeting gambling addiction. For example, the Illinois Alliance on Problem Gambling provides a number of services such as phone and text-based counseling, and a free subscription service to receive motivational messages via text message. Learning about the effectiveness of these programs would be a step forward to stop the one-armed bandits.

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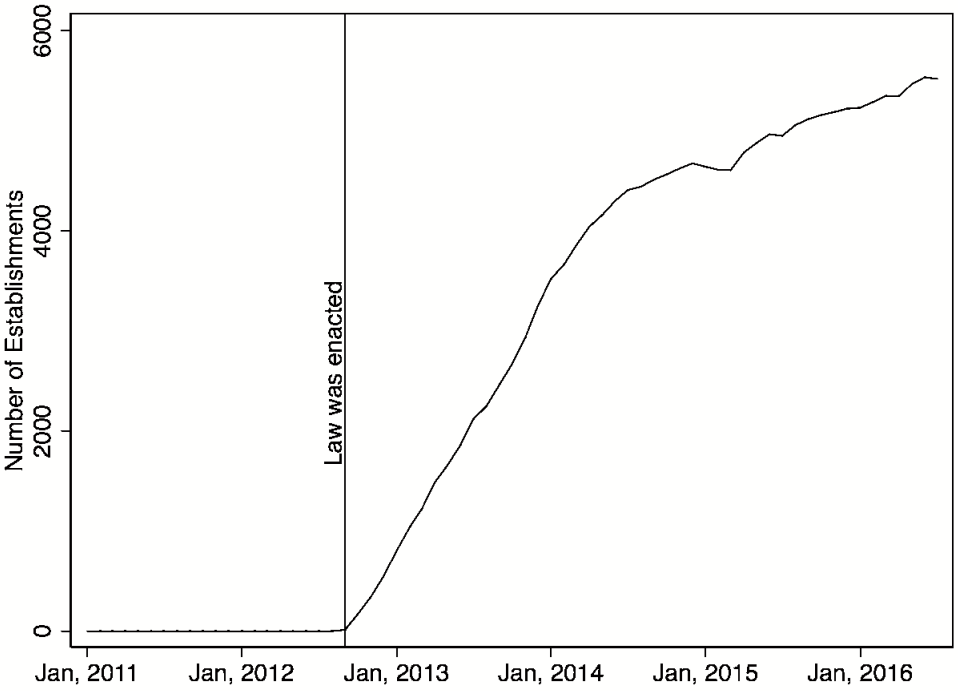
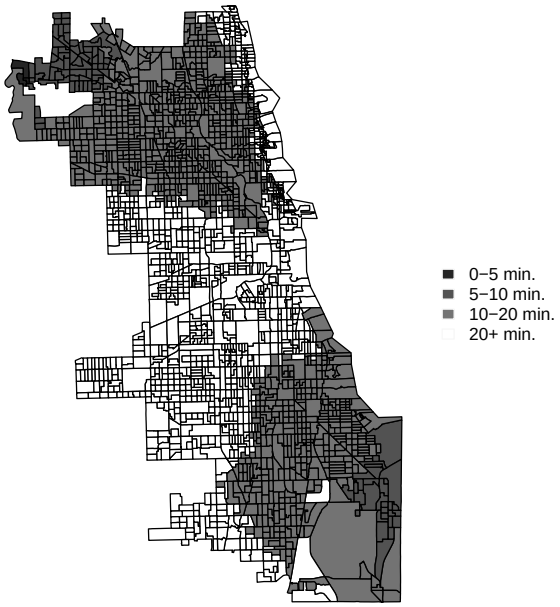
Figure 1. Number of Video Gambling Establishments in Illinois

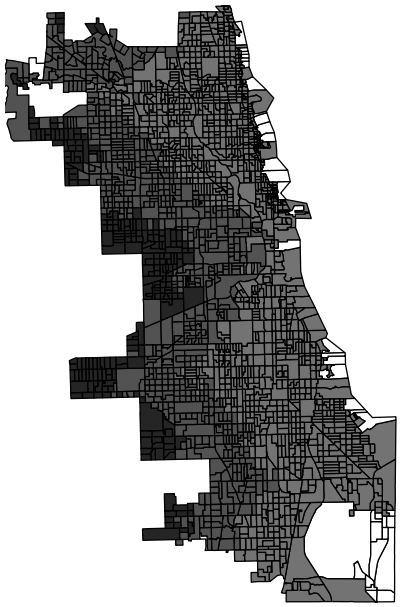


Note: Own calculations based on data from the Illinois Board of Gaming.

Figure 2. Access to Casinos versus Video Gambling Establishments in Chicago



(a) Travel Time to Nearest Casino in April 2012

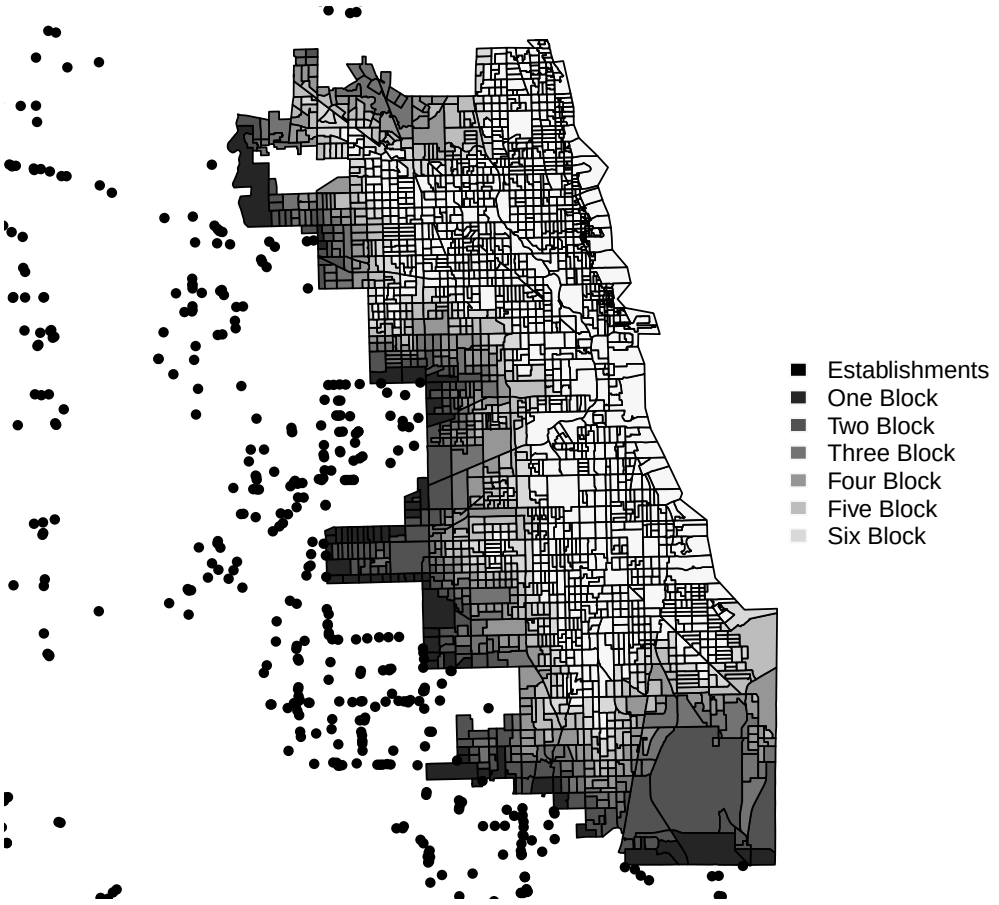


(b) Travel Time to Nearest Video Gambling Establishment in April 2014

Notes: Map of Chicago census block groups. Travel time by car in minutes measured from the census block group centroid to the nearest (a) casino or (b) video gambling establishment.

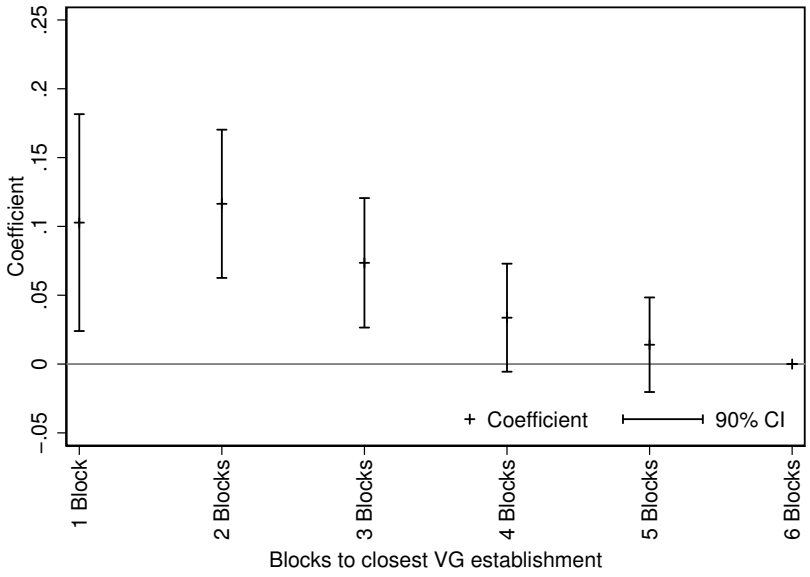
Figure 3. Identification Strategy

April 2014

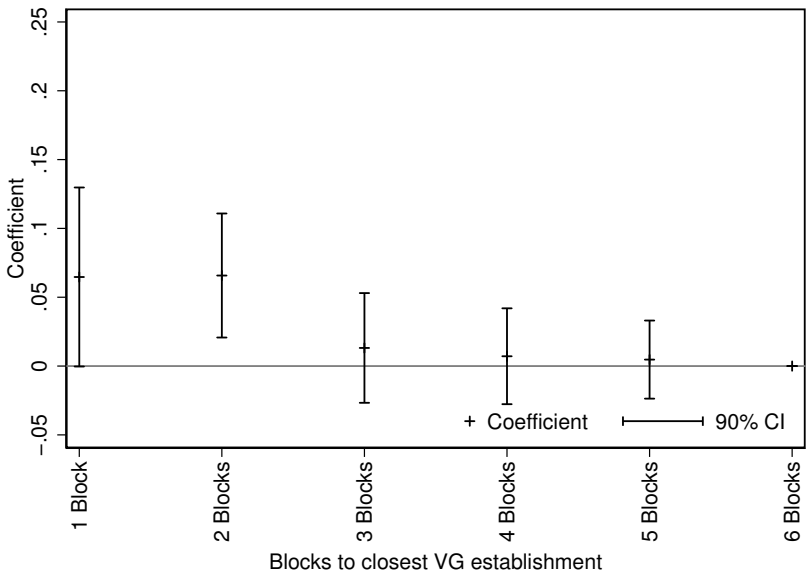


Notes: Dots represent video gambling establishments operating in April 2014. Map of Chicago census block groups. Each block group is classified by geographic proximity to video gambling establishments. For example, one block denotes directly adjacent to a block (outside Chicago) with at least one video gambling establishment, two block denotes two blocks away (i.e., adjacent-of-adjacent), and so on. Six block is six or more block groups away from a video gambling establishment.

Figure 4. The Effect of Access to Video Gambling on Crime, by Blocks



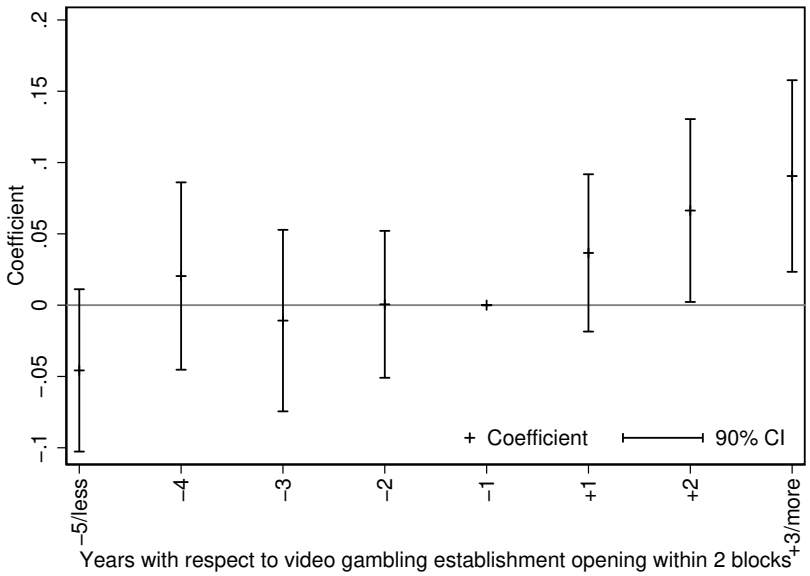
(a) Violent Crimes



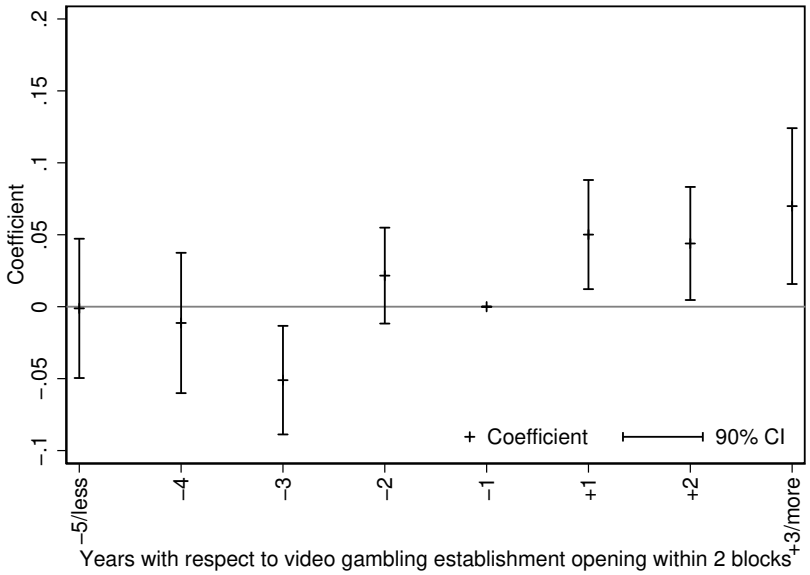
(b) Property Crimes

Notes: Sample of Chicago census block groups by month ever within six block groups from a video gambling establishment. Dependent variables are number of violent or property crimes. Point estimates and 90% confidence intervals for estimating Equation (1) using dummy variables for proximity of closest video gambling establishment (i.e., one block, two, etc.). The omitted category is 6 blocks (that is, has at least one video gambling establishment within six blocks).

Figure 5. The Effect of Access to Video Gambling on Crime, Event Study



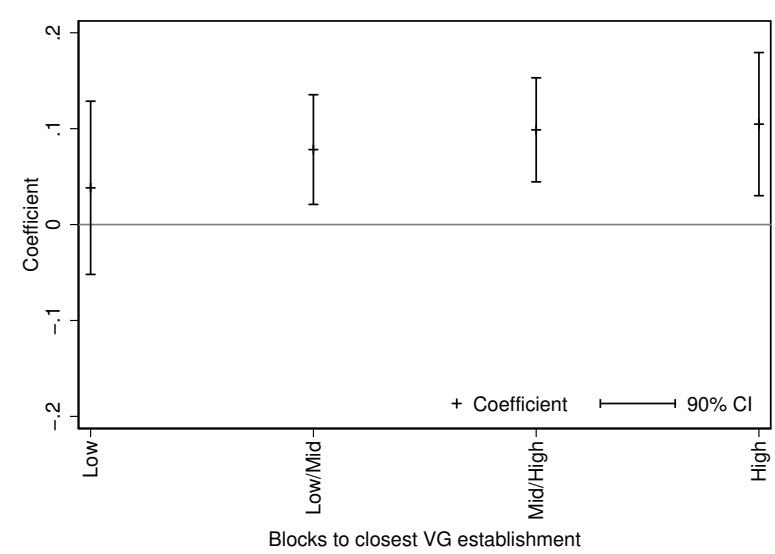
(a) Violent Crimes



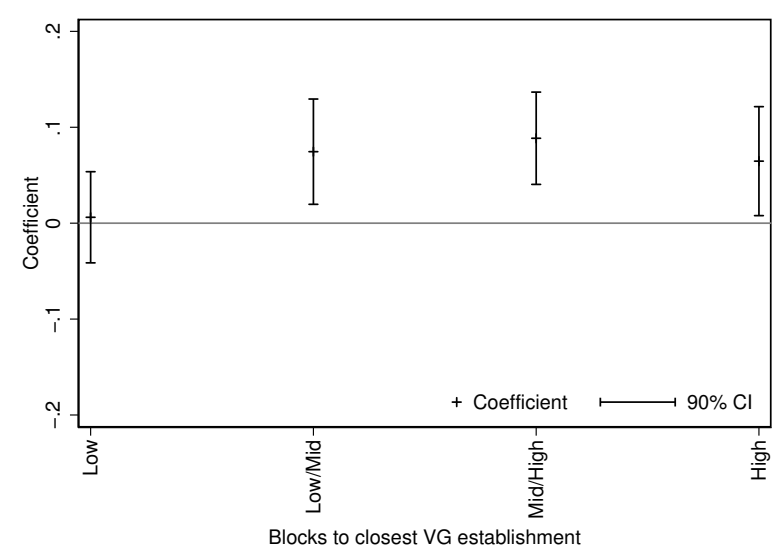
(b) Property Crimes

Notes: Sample of Chicago census block groups by month ever within one, two, four, five and six block groups from a video gambling establishment. Point estimates and 90% confidence intervals for estimating Equation (1) using dummy variables indicating timing with respect to first video gambling establishment operating within two blocks. The omitted category is one year before video gambling establishment operates within two blocks (-1).

Figure 6. The Effect of Access to Video Gambling on Crime, by Volume Gambled



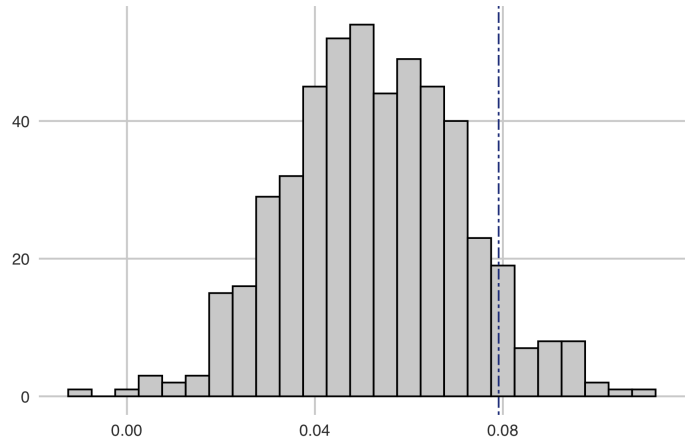
(a) Violent Crimes



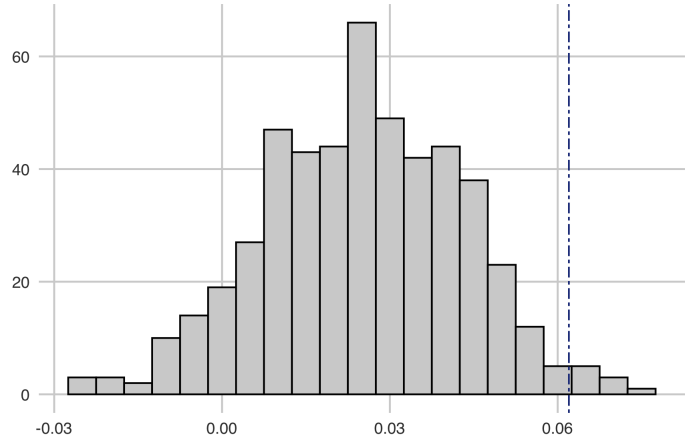
(b) Property Crimes

Note: Sample of Chicago census block groups by month ever within six block groups from a video gambling establishment. Dependent variables are number of violent or property crimes. Point estimates and 90% confidence intervals for estimating Equation (1) using dummy variables by volume played at video gambling establishments within two blocks. Classified into four groups by quartile of monthly volume played: Low ($1 - $383,451), Mid Low ($383,451 - $1,110,453), Mid High ($1,110,453 - $1,865,776), High ($1,865,776+). The omitted category is zero volume.

Figure 7. The Effect of Access to Video Gambling on Crime, Randomization Tests



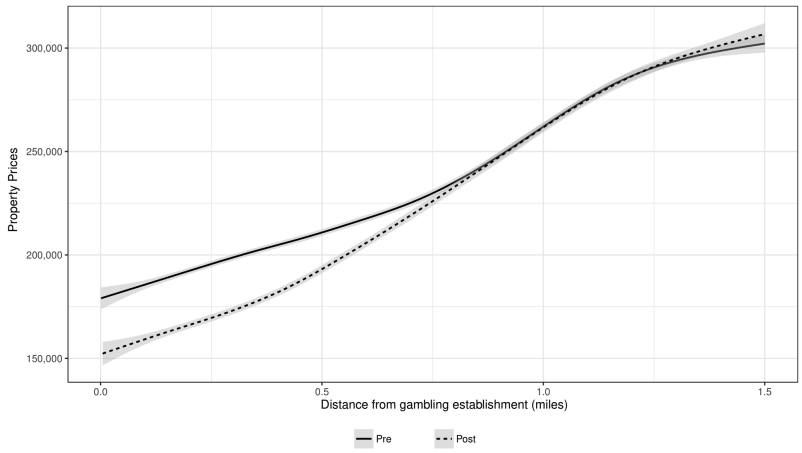
(a) Violent Crimes



(b) Property Crimes

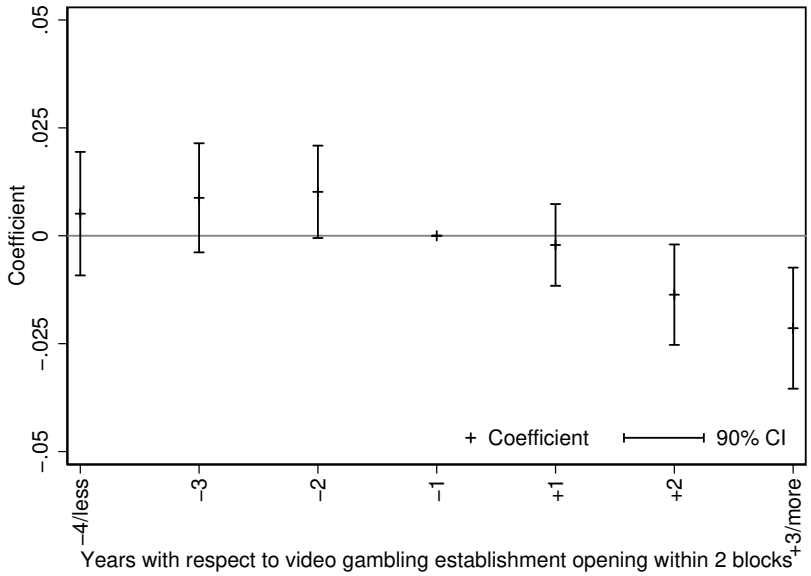
Note: Sample of Chicago census block groups by month ever within six block groups from a video gambling establishment. Dependent variables are number of violent or property crimes from equation (1). Point estimates resulting from randomizing the dates that each block-group added video gambling. Dashed line denotes the estimated effect in Table 2 column (5)

Figure 8. The Effect of Access to Video Gambling on Property Values, by Distance



Notes: Sample of housing transactions in Cook County by month within 1.5 miles from a gambling establishment. Solid line denotes the price gradient of property price on distance to establishment previous to the adoption of gambling. Dashed line post adoption of gambling. Results are from a local polynomial regression of property sale price on distance to establishment. Shaded areas denote 90% CIs

Figure 9. The Effect of Access to Video Gambling on Property Values, Event Study



Notes: Sample of of housing transactions in Cook County by census block groups and month ever within one, two, four, five and six block groups from a video gambling establishment. Point estimates and 90% confidence intervals for estimating Equation (3) using dummy variables indicating timing with respect to first video gambling establishment operating within two blocks. The omitted category is one year before video gambling establishment operates within two blocks (-1).

Table 1. Descriptive Statistics

	N	Mean	St. Dev.	Min.	Max.
(a) Crime counts					
Violent	120,777	1.148	1.639	0	17
Property	120,777	3.629	3.747	0	75
Domestic	120,777	1.973	2.313	0	22
Robbery	120,777	0.496	0.921	0	14
Aggravated Battery	120,777	0.355	0.740	0	10
Aggravated Assault	120,777	0.220	0.523	0	7
Sexual Assault	120,777	0.056	0.244	0	4
Homicide	120,777	0.021	0.154	0	6
Larceny	120,777	2.181	2.866	0	71
Burglary	120,777	0.813	1.195	0	17
Motor Vehicle Theft	120,777	0.611	0.962	0	15
Arson	120,777	0.024	0.161	0	5
(b) Access to video gambling					
Within 2 Blocks (=1)	120,777	0.062	0.240	0	1
(c) Amount Played					
Same Block ($/1000)	120,777	12.924	122.368	0	3,333.543
Within 2 Blocks ($/1000)	120,777	83.596	449.045	0	9,611.191
(d) Access to bars					
Same Block (/100)	97,747	0.005	0.010	0	0.130
Within 2 Blocks (/100)	97,747	0.129	0.101	0	1.190
(e) 2000 Census Demographic characteristics					
Population	951	1,374.767	579.424	2	11,341
% African American	951	0.381	0.441	0	0.997
% Hispanics	951	0.249	0.301	0	0.981
Housing Units	951	465.305	166.146	2	1,139
% Vacant Housing	951	0.063	0.053	0	0.554

Notes: Data in panels (a) to (d) at the census block group by month level for the sample of block groups in Chicago ever within six block groups of a video gambling establishment, used for our main analysis. Panel (e) from the 2000 Census at the block group level for the same sample.

Table 2. The Effect of Access to Video Gambling on Crime

	(1)	(2)	(3)	(4)	(5)
	(a) Violent Crime				
Within 2 Blocks (=1)	0.0881***	0.0958***	0.0934***	0.0833***	0.0791***
	(0.0284)	(0.0269)	(0.0287)	(0.0250)	(0.0258)
	(b) Property Crime				
Within 2 Blocks (=1)	0.0579**	0.0632***	0.0540**	0.0650***	0.0620**
	(0.0234)	(0.0235)	(0.0235)	(0.0239)	(0.0246)
Observations	120,777	120,777	120,777	120,777	120,777
Number of blocks	951	951	951	951	951
f(Distance to Riverboats)	No	Yes	No	No	Yes
Demographic controls	No	No	Yes	No	Yes
Neighborhood trends	No	No	No	Yes	Yes

Notes: Sample of Chicago census block groups by month ever within one, two, four, five and six block groups from a video gambling establishment. Dependent variables are number of property or violent crimes. Each coefficient is an estimate of Equation (1) using Poisson regression. Standard errors clustered at the block group level are in parentheses. *Within 2 blocks* equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. All estimates include block group fixed effects and month-year effects. f(Distance to Riverboats) is a quadratic function of distance, in miles, from the block group centroid to the closest riverboat casino. Demographic controls include total population, percentage of African Americans, percentage of Hispanics, number of housing units, and percentage of vacant housing from the 2000 Census. We interact these measures with a linear trend and them as controls to account for any differences in demographic characteristics. Neighborhood trends are linear trends for each of the nine Chicago "sides": Far North Side, Northwest Side, North Side, West Side, Central, South Side, Southwest Side, Far Southwest Side, Far Southeast Side.
* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table 3. The Effect of Access to Video Gambling on Crime, with Placebos

	(1)	(2)	(3)	(4)	(5)
	(a) Violent Crime				
Within 2 Blocks (=1)	0.0791***	0.0986***	0.0866***	0.103***	0.0894***
	(0.0258)	(0.0324)	(0.0299)	(0.0346)	(0.0320)
Placebo (2 years prior)		0.0410	0.0254		
		(0.0275)	(0.0267)		
Placebo (3 years prior)				0.0402	0.0241
				(0.0275)	(0.0269)
P-Value (Within 2 = Placebo)		.0257	.0142	.013	.0077
	(b) Property Crime				
Within 2 Blocks (=1)	0.0620**	0.0651**	0.0718**	0.0549*	0.0599*
	(0.0246)	(0.0272)	(0.0295)	(0.0288)	(0.0312)
Placebo (2 years prior)		0.0249	0.0285		
		(0.0206)	(0.0215)		
Placebo (3 years prior)				-0.00737	-0.00446
				(0.0200)	(0.0209)
P-Value (Within 2 = Placebo)		.0394	.0326	.0015	.0018
Observations	120,777	120,777	120,777	120,777	120,777
Number of blocks	951	951	951	951	951
f(Distance to Riverboats)	Yes	No	Yes	No	Yes
Demographic controls	Yes	No	Yes	No	Yes
Neighborhood trends	Yes	No	Yes	No	Yes

Notes: Sample of Chicago census block groups by month ever within one, two, four, five and six block groups from a video gambling establishment. Dependent variables are number of property or violent crimes. Each coefficient is an estimate of Equation (1) using Poisson regression. Standard errors clustered at the block group level are in parentheses. *Within 2 blocks* equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. Placebo variables equal one for the indicated period of time (1, 2 or 3 years) before an establishment within three block groups first adopts video gambling. All estimates include block group fixed effects, month-year effects. Columns (1), (3), and (5) include also a quadratic function of distance to the closest riverboat casino, neighborhood time trends, and demographic controls as described in Table 2.

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table 4. The Effect of Access to Video Gambling on Crime, Controlling for Access to Bars

	(1)	(2)	(3)	(4)	(5)
	(a) Violent Crime				
Within 2 Blocks (=1)	0.0791***	0.0634**	0.0638**	0.0645**	0.0648***
	(0.0258)	(0.0251)	(0.0251)	(0.0251)	(0.0251)
Number of Bars in:					
Same block (/100)			1.210		1.163
			(1.745)		(1.745)
Within 2 Blocks (/100)				-0.220	-0.210
				(0.306)	(0.305)
	(b) Property Crime				
Within 2 Blocks (=1)	0.0620**	0.0625***	0.0655***	0.0663***	0.0691***
	(0.0246)	(0.0226)	(0.0237)	(0.0223)	(0.0235)
Number of Bars in:			2.965		2.853
Same block (/100)			(1.830)		(1.806)
				-0.770***	-0.751***
Within 2 Blocks (/100)				(0.260)	(0.257)
Observations	120,777	97,541	97,541	97,541	97,541
Number of blocks	951	947	947	947	947

Notes: Sample of Chicago census block groups by month ever within one, two, four, five and six block groups from a video gambling establishment. Dependent variables are number of property or violent crimes. Each coefficient is an estimate of Equation (1) using Poisson regression. Standard errors clustered at the block group level are in parentheses. $Within\ 2\ blocks$ equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. Number of bars is the number of active liquor licenses in the same block group or within three block groups. All estimates include block group fixed effects, month-year effects, a quadratic function of distance to the closest riverboat casino, neighborhood time trends, and demographic controls as described in Table 2.

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table 5. The Effect of Access to Video Gambling on Domestic Crime

	(1)	(2)	(3)	(4)	(5)
	Domestic Crime				
Within 2 Blocks (=1)	0.115**	0.124***	0.140***	0.0760	0.0913*
	(0.0480)	(0.0474)	(0.0484)	(0.0466)	(0.0477)
Observations	120,777	120,777	120,777	120,777	120,777
Number of blocks	951	951	951	951	951
f(Distance to Riverboats)	No	Yes	No	No	Yes
Demographic controls	No	No	Yes	No	Yes
Neighborhood trends	No	No	No	Yes	Yes

Notes: Sample of Chicago census block groups by month ever within one, two, four, five and six block groups from a video gambling establishment. Dependent variables are number of domestic crimes. Each coefficient is an estimate of Equation (1) using Poisson regression. Standard errors clustered at the block group level are in parentheses. *Within 2 blocks* equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. All estimates include block group fixed effects and month-year effects. Controls for distance to the closest riverboat casino, neighborhood time trends, and demographic controls are the same as described in Table 2.

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table 6. The Effect of Access to Video Gambling on House Prices

	(1)	(2)	(3)	(4)
	ln Property Transaction Price			
Within 2 Blocks (=1)	-0.0491***	-0.0288***	-0.0294***	-0.0147***
	(0.0055)	(0.0054)	(0.0054)	(0.0053)
Observations	150,228	150,228	150,228	150,228
Number of blocks	1,418	1,418	1,418	1,418
Dwelling Characteristics	Yes	Yes	Yes	Yes
Distance to Riverboats	No	Yes	Yes	Yes
Demographic Controls	No	No	Yes	Yes
Neighborhood trends	No	No	No	Yes

Notes: Sample of of housing transactions in Cook County by census block groups and month ever within one, two, four, five and six block groups from a video gambling establishment. Dependent variables are ln of property transaction price. Each coefficient is an estimate of Equation (3) using linear regression. Standard errors clustered at the block group level are in parentheses. $Within\ 2\ blocks$ equals one if the transaction corresponds to a property in a census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. All estimates include block group fixed effects and month-year effects. Dwelling Characteristics include age and its square, square footage, number of bedrooms and bathrooms, indicators for brick exterior, fireplace, garage, and dwelling type (i.e. Single, Multi Family Residence). f(Distance to Riverboats) is a quadratic function of distance, in miles, from the block group centroid to the closest riverboat casino. Demographic controls include total population, percentage of African Americans, percentage of Hispanics, number of housing units, and percentage of vacant housing from the 2000 Census. We interact these measures with a linear trend and them as controls to account for any differences in demographic characteristics. Neighborhood trends are linear trends for each of the nine Chicago "sides", for properties sold in Chicago, and for each municipality for those sold outside Chicago.
* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table 7. The Effect of Access to Video Gambling on Crime, by Type

	(1)	(2)	(3)	(4)
	(a) Violent Crime			
	Robbery	Aggravated Battery	Aggravated Assault	Sexual Assault	Homicide
Within 2 Blocks (=1)	0.0817**	0.144***	0.00964	-0.00833	-0.161
	(0.0338)	(0.0407)	(0.0439)	(0.0858)	(0.129)
Share	0.44	0.31	0.19	0.05	0.02
Observations	118,618	118,110	118,237	109,601	78,232
Number of blocks	934	930	931	863	616

	(5)	(6)	(7)	(8)
	(b) Property Crime			
	Larceny	Burglary	Motor Vehicle Theft	Arson
Within 2 Blocks (=1)	0.0392	0.0810**	0.0922**	0.153
	(0.0338)	(0.0333)	(0.0367)	(0.126)
Share	0.59	0.23	0.17	0.01
Observations	120,777	120,523	120,777	94,488
Number of blocks	951	949	951	744

Notes: Sample of Chicago census block groups by month ever within one, two, four, five and six block groups from a video gambling establishment. Dependent variables are number of property or violent crimes. Each coefficient is an estimate of Equation (1) using Poisson regression. Standard errors clustered at the block group level are in parentheses. *Within 2 blocks* equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. All estimates include block group fixed effects, month-year effects, a quadratic function of distance to the closest riverboat casino, neighborhood time trends, and demographic controls as described in Table 2.
* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table 8. Back of the Envelope Monthly Cost Estimates for Chicago

Crime	Estimated New Incidents per month	Cost Per Incident	Total Cost	90% Conf. Int.
Violent	15.88		419.68	[-89.97; 897.45]
Robbery	8.92	13.80	123.06	[38.96; 207.15]
Aggravated Battery and Assault	6.97	42.56	296.62	[158.14; 435.11]
Sexual Assault	-	155.28	-	[-287.07; 255.2]
Property	33.30		43.06	[33.42; 209.5]
Burglary	14.49	2.30	33.33	[10.7; 55.96]
Larceny	18.81	0.52	9.73	[-4.13; 23.58]
Motor Vehicle Theft	12.39	6.33	78.41	[26.85; 129.96]
Total			**462.74**	**[-0.06; 1.11]**

Notes: All dollar amounts in 2016 dollars. Estimated number of new incidents per month is based on coefficients obtained in Table 7. The social cost per incident obtained from Cohen and Piquero (2009).

APPENDIX:
Can't Stop the One-Armed Bandits
The Effects of Access to Gambling on Crime

A Additional Robustness

This section details a number of additional robustness checks. We explore the sensitivity of our estimates to sample definitions, the use of alternative estimators, alternative geographic time trends and using alternative definitions for access to video gambling. Overall, results are similar across the different checks.

A.1 Robustness to Sample Definitions

We explore the sensitivity of our results to alternative definitions of the sample. In our main analysis we restrict our sample to census block groups that are ever within six block groups from a video gambling establishment. In Table A.1, column (1) we present the estimate for our preferred specification in the paper (column (5) of Table 2). In column (2) we do not apply any restrictions in the sample and include all block groups in Chicago while column (3) restricts to blocks within ten block groups of a gambling establishment. In columns (4) and (5) we return to our original sample, but drop blocks on the lake shore or those that are industrial (i.e., have no residences). Regardless of how we specify the sample, our point estimates are very stable.

A.2 Robustness to Trends

We also account for potential unobserved shocks such as community area policies or changes in policing by accounting for different geographic trends. In our preferred specification, we account for neighborhood trends time trends. An alternative concern is that policing strategies could have changed differently in different areas. To account for this potential, instead of including neighborhood area trends, we include community areas and police district in columns (2) and (3) of Table A.2. Nevertheless, results are still robust to accounting for time trends at this level.[23]

A.3 Robustness to Access Definition

Our results do not depend on how access to video gambling is defined. We present estimates using our preferred specification for a number of alternative definitions of access to gambling in Table A.7. *Number of VG within 2 Blocks* is the count of number of gambling establishments within two block groups at time t, *log(Volume Played+1* is the logarithm

[23]Our neighborhood definitions is based on the nine Chicago "sides": Far North Side, Northwest Side, North Side, West Side, Central, South Side, Southwest Side, Far Southwest Side, Far Southeast Side. These neighborhoods are comprised by 77 community areas and 23 police districts.

of total volume played plus one at time t in all video gambling establishments within two blocks. *Access to VG* is an access measure typically used in the trade literature that weights each video gambling establishment by its distance (or travel time) at time t. For example, if $d_{i,j}$ is the linear distance (or traveling time) between block centroid i and establishment j, and $\mathbb{1}(VG_{j,t} = 1)$ indicates that establishment j has video gambling in period t, then gambling access (GA) is calculated as $GA_{i,t} = \sum_{j=1}^{J} exp(-\mathbb{1}(VG_{j,t} = 1) \cdot d_{i,j})$. We standardize all the measures to have mean zero and standard deviation one for ease of comparison. Regardless of the definition used, results are very similar. For example, increasing the number of video gambling establishments within two blocks by one standard deviation is associated with an increase of 2.4% (s.e. 0.006) and 1.6% (s.e. 0.0097) in property and violent crimes.

When defining intensity of access to video gambling, in the paper we use volume played at establishments within two blocks to show that effects were increasing in volume played. Results are similar when using number of establishments within two blocks instead.

A.4 Robustness to estimators: Linear Models

Our results are also robust to the use of a linear estimator. The advantage of using a linear estimator is that we can use further robustness checks that are not available yet for non linear estimators. First, we use Oster (2017) selection on unobservable test to show that our results are likely not driven by unobservables. Next, we use Goodman-Bacon (2018) decomposition to show that our estimates are mainly driven by treated vs control block groups and not by earlier/later treated and earlier/later controls. Finally, we show the robustness of our results by using Athey et al. (2018) matrix completion method.

Table A.3 shows a parallel version of our main results Table 2. Again our preferred specification is shown in column (5). Results using this estimator shows an increase of 9.5% in violent crime and an 8.4% for property crime which are similar to our nonlinear estimates.

A.4.1 Selection on Unobservables

An advantage of using OLS is that we can consider the potential effects of omitted variable by using the methods developed by Altonji et al. (2005) and Oster (2017). These methods are yet not available for nonlinear forms like Poisson or Negative Binomial estimators. Table A.4 reports Oster's proportionality coefficients. Oster (2017) argues that in the extent that observables are related to unobservables it's inclusion can tell us about the degree of selection on unobservables.

Oster (2017) test depend on an assumption about the maximum possible R-squared that could be achieved in a model that accounts for the remaining unobservables, R_{max}. Given the potential for measurement error in crime, it is unlikely that $R_{max} = 1$ in our model. Oster suggests as a rule of thumb using $R_{max} = 1.3\tilde{R}^2$, where $\tilde{R}^2$ is the R-squared

from the model with a full set of controls.[24] Results reported in Table A.4 show that the statistic is always above one even in the most demanding case.

A.4.2 Difference-in-Difference Decomposition

As pointed out by Goodman-Bacon (2018), the model described in equation 2 is a weighted average of treatment effects estimated from a series of two by two treatment/control groups. Some of these groups compare blocks that were treated at the same time to blocks that were untreated, and at the same time to blocks that were treated at a different time (earlier or later). In our data there are 25 timing groups, or blocks that become adjacent to a establishment with video gambling. There are thus 625 distinct two by two treatment/control comparison groups for which the difference-in-difference estimate is constructed.

The concern is a design like this is that comparisons between earlier and later treated block groups may introduce bias. Using the method developed by Goodman-Bacon (2018) we can see the extent to which the estimates may be biased by the "wrong" comparisons, i.e., earlier to later treated block groups.

Results for the decomposition are reported in Table A.5.[25] The estimates of the Goodman-Bacon decomposition show that estimates are driven by comparison between treated and untreated groups. The weights are 94% for comparisons between treated and untreated block groups. There is some evidence for time varying treatment effects but weights are very small.

A.4.3 Matrix Completion Methods

The previous section shows that our results are driven by the right comparisons, treated versus control groups. However, there's always the concern that these are the correct controls. In this section we use modern machine learning techniques to build counterfactuals and show that increases in crime are driven by the increase availability of gambling and are not spurious.

Our identification problem can be thought of as a "missing data" problem: how would crime had evolved if gambling was not introduced, i.e. we don't observe the counterfactual state of the world. To address this "missing data" issue, Athey et al. (2018) proposes a matrix completion technique. The objective is to estimate counterfactual outcomes for the block group month combinations using regularization methods while maintaining the time dependency structure of the panel. Similarly to other regularization methods it depends on a regularization parameter, which we choose using 10-fold cross-validation. Standard errors are calculated using 500 bootstrap draws.

[24] The $R_{max} = 1.3\tilde{R}^2$ rule-of-thumb proposed by Oster (2017) emerges form the analysis on 65 results from published papers. At the 1.3 cutoff, she finds that 90 percent of the experimental results published would 'survive', implying that unobservable variables would explain less of the variation in the outcome than observables.

[25] We use the `STATA` module `bacondecomp` for the analysis.

Table A.6 shows our baseline linear results side by side with those generated by Athey et al. (2018) method. Estimates for violent crime are 0.083 (s.e. 0.0257) and 0.255 (s.e 0.0734). Although these are smaller than our baseline estimates, they are not statistically different

B Effect on Supply of Bars

In the paper we show that accounting for the availability of bars either in the same block or in neighboring blocks does not affect our estimates. Nevertheless, it is still valuable to examine whether the Video Gaming Act affected the supply of bars in the area.

To examine whether the access to video gambling affected the number of bars within Chicago, we replicate our analysis on crime but using number of bars as dependent variable instead. We are interested in comparing areas inside Chicago that experienced higher access to gambling with those that had relatively lower access to evaluate whether the number of bars changed differentially. We show the evidence as an event-study figure in Figure A.1.a. Overall, we do not find evidence that access to gambling inside Chicago affected the number of bars. Even though point estimates are positive after video gambling becomes accessible, the magnitude is small and in the other direction. Using our baseline specification instead of the event study, the estimated coefficient is 0.038 (s.e. 0.041).[26] This is a small magnitude considering that the average number of bars in the sample of block groups inside Chicago used for the analysis is 1.42. Even if the effect were orders of magnitude larger, economically it seems unlikely to be driving the effects on crime.

C Legalizing Video Gambling in Chicago

To explore the scenario where Chicago legalizes video gambling, we identify the potential places that could have video gambling in the City from the liquor license data. We calculate the expected change in crime by first excluding all census block groups that are already near video gambling establishments located near the border.[27] Using our main definition of access (within two block groups), virtually all of Chicago's block groups would fall within this coverage area. Using average crime incidents for the last year in our data, we calculate the expected monthly cost of legalizing video gambling in Chicago in Table 8.b. Legalizing video gambling in Chicago can be expected to cost $5.4 million each month on average, with a 90% confidence interval ranging from $1.7 to $9.3 million.

Legalizing video gambling would generate new tax revenue for Chicago. To estimate these revenues we use video gambling establishments in Cook County that are located outside of Chicago. Using the last year of our data, we select the optimistic scenario that

[26] Available in Table A.8.

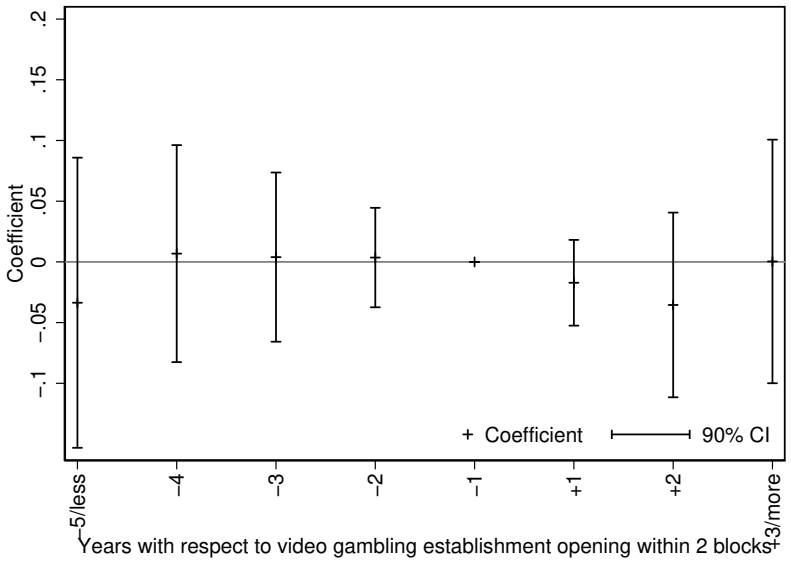
[27] This is a overly conservative assumption because access would increase more as a result of legalizing video gambling in Chicago. We found that effects are increasing with proximity, therefore these areas would likely experience an additional increase in crime.

establishments in Chicago would generate tax revenues at the 90th percentile of establishments in Cook County. This amounts to a monthly payout of $2,303 and $11,515 to the local and state governments per establishment.[28] Similar to before, we assume that the state transfers the same proportion of revenues as the state income taxes (1.34%) to Chicago, so each establishment would generate $2,457 each month. We use the average adoption rate across the state (62%) to define estimate the proportion of bars and restaurants in Chicago that would adopt video gambling. This would mean that 2170 establishments would generate tax revenue from gambling for the city.[29] Overall, we estimate that legalizing video gambling in Chicago would generate an average of $5.3 million in tax revenues per month (90% confidence interval between $4.88 and $5.78 million).

[28]With a 90% confidence interval of 2109; 2497 and 10544 ; 12487.

[29]At the time there were almost 3,500 bars and restaurants with liquor licenses in Chicago. The adoption rate is based on matching zip code level data of liquor licenses and video gambling establishments for the entire state, restricting to zip codes with video gambling.

Figure A.1. Effect of Video Gambling on Number of Bars



Notes: Sample of census block groups by year ever within six block groups from a video gambling establishment. Dependent variables are number of bars. Point estimates and 90% confidence intervals for estimating Equation (1) using dummy variables indicating timing with respect to first video gambling establishment operating within two blocks. The omitted category is one year before video gambling establishment operates within two blocks (-1).

Table A.1. Sample Sensitivity

	(1)	(2)	(3)	(4)	(5)	(6)
	(a) Violent Crime					
Within 2 Blocks (=1)	0.0791***	0.0737***	0.0742***	0.0856***	0.0817***	0.0731***
	(0.0258)	(0.0250)	(0.0245)	(0.0268)	(0.0270)	(0.0263)
	(b)Property Crime					
Within 2 Blocks (=1)	0.0620**	0.0290	0.0255	0.0695***	0.0677***	0.0709***
	(0.0246)	(0.0248)	(0.0254)	(0.0246)	(0.0250)	(0.0254)
Observations	120,777	277,495	210,693	102,108	112,268	110,363
Number of blocks	951	2,185	1,659	804	884	869
Block Restrictions	1 to 6	All	1 to 10	1 to 6	1 to 6	1 to 6
Other Restrictions	None	None	None	Drops 3rd block	No Industrial	Not near Riverboat

Notes: Sample of Chicago census block groups by month. Dependent variables are number of property or violent crimes. Each coefficient is an estimate of Equation (1) using Poisson regression. Standard errors clustered at the block group level are in parentheses. *Within 2 blocks* equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. Column (1) uses baseline sample definition used throughout the paper, column (2) includes all block groups in Chicago, column (3) excludes blocks that are more than 10 block groups away from a video gambling establishment. Column (4) is similar to the specification in column (1) but drops blocks that are three blocks away, leaving a buffer area. The last two columns use baseline sample but drop industrial blocks in column (4) and blocks near River Boat casinos in column (5). All estimates include block group fixed effects, month-year effects, a quadratic function of distance to the closest riverboat casino, neighborhood time trends, and demographic controls as described in Table 2.

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table A.2. Robustness to Alternative Trends

	(1)	(2)	(3)
	(a) Violent Crime		
Within 2 Blocks (=1)	0.0791***	0.0735***	0.0765***
	(0.0258)	(0.0248)	(0.0254)
	(b) Property Crime		
Within 2 Blocks (=1)	0.0620**	0.0590***	0.0612**
	(0.0246)	(0.0207)	(0.0254)
Observations	120,777	120,777	120,777
Number of blocks	951	951	951
Linear Time Trends	Neighborhood	Community Area	Police District

Notes: Sample of Chicago census block groups by month ever within six block groups from a video gambling establishment. Dependent variables are number of property or violent crimes. Coefficients for estimating model 1 using Poisson regression. Standard errors clustered at the block group level are in parentheses. *Within 2 blocks* equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. All estimates include block group fixed effects, month-year effects, a quadratic function of distance to the closest riverboat casino, and demographic controls as described in Table 2. Each column uses different level-specific linear time trend: (1) Neighborhood, (2) Community Area, and (3) Police District.
* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table A.3. The Effect of Access to Video Gambling on Crime
Linear Model

	(1)	(2)	(3)	(4)	(5)
	(a) Violent Crime				
Within 2 Blocks (=1)	0.147***	0.179***	0.0956***	0.192***	0.111***
	(0.0285)	(0.0284)	(0.0261)	(0.0284)	(0.0276)
R^2	0.045	0.049	0.056	0.051	0.058
	(b) Property Crime				
Within 2 Blocks (=1)	0.344***	0.411***	0.214**	0.429***	0.306***
	(0.0919)	(0.0927)	(0.0862)	(0.0922)	(0.0903)
R^2	0.103	0.106	0.115	0.108	0.117
Observations	120,777	120,777	120,777	120,777	120,777
Number of blocks	951	951	951	951	951
f(Distance to Riverboats)	No	Yes	No	No	Yes
Socio-economic controls	No	No	Yes	No	Yes
Neighborhood trends	No	No	No	Yes	Yes

Notes: Sample of Chicago census block groups by month ever within one, two, four, five and six block groups from a video gambling establishment. Dependent variables are number of property or violent crimes. Each coefficient is an estimate of Equation (1) using Linear regression. Standard errors clustered at the block group level are in parentheses. *Within 2 blocks* equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. All estimates include block group fixed effects and month-year effects. f(Distance to Riverboats) is a quadratic function of distance, in miles, from the block group centroid to the closest riverboat casino. Demographic controls include total population, percentage of African Americans, percentage of Hispanics, number of housing units, and percentage of vacant housing from the 2000 Census. We interact these measures with a linear trend and them as controls to account for any differences in demographic characteristics. Neighborhood trends are linear trends for each of the nine Chicago "sides": Far North Side, Northwest Side, North Side, West Side, Central, South Side, Southwest Side, Far Southwest Side, Far Southeast Side.
* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table A.4. Robustness to Omitted Variable Bias

R_{max}	$1.1\tilde{R}^2$	$1.2\tilde{R}^2$	$1.3\tilde{R}^2$
Violent	4.0965	2.0714	1.3861
Property	3.9288	1.9781	1.3218

Notes: This Table reports the Oster (2017) proportionality coefficient. Coefficients from Table A.3 column (5) are compared with the specification with no controls in column (1). $\tilde{R}^2$ corresponds to the R^2 from Table A.3 Column (5).

Table A.5. The Effect of Access to Video Gambling on Crime
Difference-in-Difference Decomposition

	Weight (1)	Violent Crime (2)	Property Crime (3)
	(a) Average "Uncontroled" Estimates		
Av. Treatment Effect		0.147	0.344
Treated vs Control	0.937	0.161	0.369
Earlier Treated vs Later Control	0.051	-0.069	-0.021
Later Treated vs Earlier Control	0.011	0.011	-0.119
	(b) Average "Controled" Estimates		
Av. Treatment Effect		0.111	0.306
Never vs Timing	0.8244	0.1596	.03688
Timing Groups	0.0692	-0.0604	-0.1384
Within	0.1064	-0.1526	.01058

Notes: This Table reports Goodman-Bacon (2018) difference-in-difference decomposition. Panel (a) reports results of the decomposition of Table A.3 column (1) where there are no controls controls. Panel (b) results for the estimates shown in Table A.3 column (5) with all the controls. * Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table A.6. The Effect of Access to Video Gambling on Crime
Machine Learning Matrix Completion

	(1) Linear	(2) Athey et al. (2018)
	(a) Violent Crime	
Within 2 Blocks (=1)	0.111***	0.083***
	(0.0276)	(0.0257)
	(b) Property Crime	
Within 2 Blocks (=1)	0.306***	0.255***
	(0.0903)	(0.0734)
Observations	120,777	120,777
Number of blocks	951	951

Notes: This Table reports in column (1) our baseline results from Table A.3 column (5) side by side to Athey et al. (2018) matrix completion method results in column (2). We use 10 folds for cross validation and 500 draws for bootstrapped standard errors in column (2).
* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table A.7. Alternative Video Gambling Access Definitions

	(1)	(2)	(3)	(4)
	(a) Violent Crime			
Within 2 Blocks (=1)	0.0791***			
	(0.0258)			
Log(Volume Played +1)		0.00620***		
		(0.00182)		
Access to VG (distance)			0.0246***	
			(0.00641)	
Access to VG (travel time)				0.0145***
				(0.00480)
	(b) Property Crime			
Within 2 Blocks (=1)	0.0620**			
	(0.0246)			
Log(Volume Played +1)		0.00499***		
		(0.00181)		
Access to VG (distance)			0.0156**	
			(0.00715)	
Access to VG (travel time)				0.0216***
				(0.00523)
Observations	120,777	120,777	120,777	120,777
Number of blocks	951	951	951	951

Notes: Sample of Chicago census block groups by month ever within six block groups from a video gambling establishment. Dependent variables are number of property or violent crimes. Each coefficient is an estimate of Equation (1) using Poisson regression. Standard errors clustered at the block group level are in parentheses. All measures of access are standardized with mean zero and standard deviation of one (see Section A for variable definitions). All estimates include block group fixed effects, month-year effects, a quadratic function of distance to the closest riverboat casino, neighborhood time trends, and demographic controls as described in Table 2. * Significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table A.8. Effect of Video Gambling Act on Number of Bars

	(1)	(2)	(3)
	Number of Bars		
Within 2 Blocks (=1)	0.0379		0.0485
	(0.0407)		(0.0388)
Block has VG (=1)		0.105***	0.110***
		(0.0386)	(0.0387)
Observations	26,001	44,874	44,874
Number of blocks	312	554	554
Original Sample	Yes	No	No
Expanded Sample	No	Yes	Yes

Notes: Each coefficient is an estimate of Equation (1) using Poisson regression. Standard errors clustered at the block group level are in parentheses. *Within 2 blocks* equals one if the census block group is within two block groups of a video gambling establishment after the establishment adopted video gambling. Column (1) restricts the sample to block groups in Chicago. Columns (2) and (3) include Chicago and block groups outside of Chicago that are within three block groups from the Chicago border. *Block has VG* equals one if the block group has at least one establishment with video gambling at time t. All measures of access are standardized with mean zero and standard deviation of one (see Section A for variable definitions). All estimates include block group fixed effects, month-year effects, a quadratic function of distance to the closest riverboat casino, neighborhood time trends, and demographic controls as described in Table 2.

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.