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THE EFFECT OF ADULT ENTERTAINMENT ESTABLISHMENTS ON SEX CRIME: EVIDENCE FROM NEW YORK CITY*

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In this paper we study how the presence of adult entertainment establishments affects the incidence of sex crimes. We build a high-frequency daily and weekly panel that combines the exact location of non-self-reported sex crimes with the day of opening and exact location of adult entertainment establishments in New York City. We find that these businesses decrease sex crime by 13% per police precinct one week after the opening, and have no effect on other types of crime. The results suggest that the reduction is mostly driven by potential sex offenders frequenting these establishments rather than committing crimes.

Sex crimes, including sexual violence, are a major public health concern. Apart from the large psychological and physical burden, these crimes also lead to public health issues including unintended pregnancies, induced abortions and sexually transmitted infections.[1] However, little is known about how to prevent sex crimes, including sexual abuse and rape. Several have argued that rape is simply a substitute for consensual sex (Thornhill and Thornhill, 1983; Thornhill and Palmer, 2000a,b). Thus, having access to substitutes such as adult entertainment or paid-for sex (i.e., prostitution) may reduce the incidence of such crimes. Yet, little causal evidence has been produced to support this claim.

In this paper we examine whether the presence of adult entertainment establishments (strip clubs, gentlemen clubs and escort girl services) reduces sex crimes. Adult entertainment establishments may include prostitution, although it is generally illegal. While these clubs and services may reduce sex crimes if individuals use them instead of committing sex crimes (Posner, 1992; Dever, 1996), they may increase sex crimes if they reinforce the view of women as objects, leading to more violence against them (Brownmiller, 1993).[2] One of the main challenges of evaluating whether adult entertainment is a substitute for sex-related crime is the difficulty of gathering data that allows for a causal interpretation of the effect of adult entertainment establishments on

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The data and codes for this paper are available on the Journal website. They were checked for their ability to reproduce the results presented in the paper.

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[1] A 2007 national study of the Department of Justice estimated that 18% of American women experienced rape (or attempted rape) at least once in their life.

[2] In addition, assuming that sex crimes are an increasing function of the number of sex workers, adult entertainment businesses may rise this sort of crime by increasing the number of sex workers.

such crimes. Sex crimes are thought to be under-reported, and related data are often protected by privacy laws.

This paper exploits a unique data set with high-frequency precinct-level crime information from New York City (NYC).[3] We construct a new data set on adult entertainment establishments that includes the names and addresses of the establishments, providing precise geographic information. We complement this with information on establishment registration dates from the New York Department of State and Yellow Pages, which we use to define when an establishment opened. We categorise adult entertainment establishments by New York Police Department (NYPD) precincts to match crime data from the 'stop-and-frisk' program. The crime data include hourly information on crimes observed by the police, including sex crimes. The data set covers the period from 1 January 2004 to 29 June 2012. Since these crimes are reported by the police, it minimises the biases associated with self-reported data on sex crime. We check the robustness of the results using police complaint data.

Using variation in the date of registration of adult entertainment establishments, we show that opening these establishments in particular areas decreases the number of sex crimes committed nearby. We find that the presence of an adult entertainment establishment in a given precinct leads to a 13% reduction in sex crime in the precinct one week after the opening. This estimated coefficient comes from the preferred specification that includes fixed effects at the precinct, year, month, day-of-the-year, day-of-the-week and holiday level, and precinct-year time trends.[4] The results are robust to different regression models and to using police complaint data.

The main identification assumption is that the opening date of an adult entertainment establishment is exogenous to any other factor affecting sex crime. Since opening a business in NYC requires a long bureaucratic procedure, we can use the date of registration as a quasi-natural experiment to study the effect of these businesses on sex crime. In addition, we exploit cross-section high-frequency variation in sex crimes across precincts within the city. Therefore, since adult entertainment businesses were not opened in response to precinct-specific trends in reported sex crime, we can exploit the exogenous variation in openings at different time periods in different precincts to obtain the causal effects of adult businesses on sex crime.

The second focus of this paper is to understand the mechanism behind the effect of adult entertainment on sex crimes. One potential mechanism is that these establishments offer services that may substitute sex crimes, leading potential sex offenders to become adult customers of such businesses. Recently, scholars have argued that adult entertainment establishments might also offer prostitution services, they refer to them also as indoor prostitution. Adult entertainment establishments might provide a way for the whole transaction to occur behind closed doors (Farley, 2003).[5] In addition, even if adult entertainment establishments do not offer paid sex they offer other services that can be considered as substitutes for sex crimes.

We find considerable evidence that sex crime is reduced when potential sex offenders frequent adult entertainment establishments. We find that at night, the effect of the establishments is

[3] A precinct is a geographical division of neighbourhoods within a city. We follow the seventy-seven precincts of the NYPD.

[4] One potential concern is that the opening date might be different from the registration date. Yet, to the best of our knowledge, there is no evidence in the literature, nor any reason to believe, that such difference might discredit our identification assumption. Furthermore, our results are robust to conducting the analysis at both weekly and monthly levels. It is important our results are robust to such specifications since opening and registration dates occur close in time.

[5] Indoor prostitution is any kind of sex work that happens behind closed doors (as opposed to street prostitution). Indoor prostitution includes massage parlours and saunas, brothels, strip clubs and escort prostitution (Urban Justice Center, 2005; Shively *et al.*, 2012). In the United States, indoor prostitution is the major source of prostitution: according to the Urban Justice Center (2005) the indoor market constitutes roughly 85% of all sex work activity.

negative and larger in absolute value than our benchmark. This suggests that these establishments are most effective at preventing sex crimes from being committed at night. Since the majority of adult entertainment establishments are only open at night, and the demand for their services is higher at that time of day, the results suggest that potential sex offenders prefer to use these services rather than commit sex crimes. Therefore, these results suggest that potential criminals consider sex crime and adult entertainment establishment services as substitute activities, as Farley *et al.* (2009) documented by interviewing men who purchase prostitution. Dahl and DellaVigna (2009) identified a similar mechanism in which violent movies have an incapacitation effect: they reduce the crime rate by keeping potential offenders off the streets and in the cinemas. The only difference is that potential sex offenders do not commit sex crimes, not simply due to incapacitation (i.e., time constraint), but because they substitute sex crimes with services offered in adult entertainment establishments.

We also use our data to rule out three other mechanisms. First, we find that opening adult establishments does not affect other types of crime, which demonstrates that the results on sex crimes are not driven by an increased police presence on the streets. This also rules out the hypothesis that these businesses may attract other types of criminal such as drug dealers as well. Second, we find that sex crimes are not moving to other areas, which shows that there are no negative spillover effects on bordering precincts.[6] Third, we also check if there is a reduction in street prostitution.[7] The number of street sex workers would decline if they started working in adult entertainment establishments or if they moved to other precincts due to the increased competition. However, we find no effects on the number of street sex workers and no reallocation to bordering precincts. This suggests that the results are not driven by a reduction in potential victims who are now avoiding the area or by a reduction in sex crimes against sex workers.[8]

To the best of our knowledge, this is the first paper to study the causal impact of adult entertainment establishments on sex crimes. The study contributes to the economics of crime literature by focusing on one of the factors that lead to sex-related crimes. So far in the literature, there is little evidence on how to prevent sex-related crimes. While most of the literature has focused on theories of control, labour markets and the role of deterrence policies (Iyengar, 2009; Aizer, 2010; Card and Dahl, 2011; Bobonis *et al.*, 2013; Munyo and Rossi, 2013; Miller and Segal, 2019; Amaral *et al.*, 2018; Kavanaugh *et al.*, 2018), this paper focuses on the role of services for men that may substitute for sex crimes. Moreover, while most of the focus has been on domestic violence, in this paper we analyse the effects of introducing adult entertainment options in an area on rape and sexual harassment in nearby public spaces, which may have other unexpected consequences such as reducing women's economic mobility. For example, Borker (2017) showed that women choose to attend lower-ranked schools than men in order to avoid sexual harassment from men on the street.

This paper is closely related to two recent studies of the effects of decriminalising prostitution. Cunningham and Shah (2017) exploited an unperceived decriminalisation of indoor prostitution in Rhode Island; their estimates are based on a year-state specification. Bisschop *et al.* (2017)

[6] These results are consistent with previous studies that have shown that increasing the number of police officers on the street does not displace crime to other areas (Di Tella and Schargrodsky, 2004; Draca *et al.*, 2011).

[7] Scholars found that about 70% of (street) sex workers have been victims of sex crimes due to their job (Farley, 2003).

[8] This is consistent with the fact that sex workers represent a small proportion of the total reported sex crimes, given the illegal nature of their work (Bridgett and Robinson, 1999).

studied the effect of street prostitution in special red-light zones, also using annual estimates.[9] Both papers find that decriminalising prostitution decreases sex crimes against sex workers.

We make four contributions to this literature. First, while previous studies have focused on how the decriminalisation of prostitution affects sex crimes, we find evidence that adult entertainment establishments can reduce sex crimes even in a setting where prostitution is illegal.[10] While the decriminalisation of prostitution is a contentious issue, adult entertainment establishments are generally legal around the world, although there are often strict regulations governing where they can be located.[11] The results in this paper imply that the regulation of adult entertainment establishments is one way to address sex crimes. Moreover, it is a viable alternative that is less ethically challenging than legalising prostitution and can achieve similar effects. Second, we complement previous papers that used year and state variation, by analysing the short-term effects using high-frequency precinct data within a city as well as non-self-reported data. Third, by shedding light on the mechanisms linking adult establishments and the incidence of sex crimes, the results have several policy implications. The fact that the effects are driven by potential customers and that there is no increase in other crimes suggests that these establishments can have positive effects on reducing sex crimes without the negative externalities often associated with decriminalising prostitution (such as an increase in the use of drugs or violent crimes against sex workers).[12] However, it could be argued that adult entertainment establishments should be supervised since some of their customers are potential sex offenders. Finally, we complement the previous literature by showing direct evidence that opening adult entertainment businesses generates positive externalities on sex crime for the whole population: sex crimes are reduced for both sex workers and non-sex workers.[13]

The paper proceeds as follows. In the next section, we provide background information on adult entertainment establishments in NYC. In Section 2 we present the data and discuss the identification strategy and possible threats. In Section 3 we show the results of our specification. In Section 4 discuss the possible mechanisms that could be driving the effect. In the last section we summarise the findings and offer concluding remarks.

1. Background Information on Adult Entertainment Establishments

1.1. *Adult Entertainment Establishments in NYC*

The New York State Department of State classifies adult entertainment establishments as businesses that *regularly feature movies, photographs or live performances that emphasise 'specified*

[9] In 1980 in Rhode Island the prostitution law was amended and prostitution was degraded from a felony to a misdemeanour. The legislators removed the section that addressed committing the act of prostitution itself, yet street solicitation, running a brothel and pimping remained illegal. Therefore, indoor prostitution was 'de iure' decriminalised. As a matter of fact, Arditi (2009) argued that this decriminalisation occurred by mistake, so probably neither legislators nor citizens realised that the amendment created a legal vacuum.

[10] Although in the United States (except Nevada) prostitution is illegal, there is a lack of agreement about how to legislate against it. European countries such as Germany, the Netherlands and Belgium legalised and regulate prostitution via licenses, while Sweden and Norway opted to criminalise the *purchase* of prostitutes rather than the supply of such services. In 2014 the European Parliament passed a resolution to follow the Swedish model.

[11] The legalisation of prostitution is one of the most frequently discussed topics related to gender issues. For example, *The Economist* has published many articles on this debate. See, e.g., Basin and Farly, *Prostitution debate*, 6 September 2010; *A job like any other*, 8 August 2014; *A personal choice*, 9 August 2014.

[12] In a theoretical model, Lee and Persson (2015) showed that decriminalising prostitution increases the size of the sex market by reducing the costs of entry. Using country cross-sectional data, Cho (2018) and Cho *et al.* (2013) argued that legalised prostitution leads to an expansion of the prostitution market, and an increase in human trafficking.

[13] These results are in line with Cunningham and Shah (2017), who showed that decriminalising prostitution affects the health outcomes of both sex workers and non-sex workers.

anatomical areas' or 'specified sexual activities' and excludes minors by reason of age. We define such businesses more narrowly, only considering four types—strip clubs, gentleman's clubs, adult entertainers and escort girl services.

In the early 1990s the NYC Division of City Planning published a report on the nature and impact of adult entertainment establishments on the city. In October 1995, following this study, the New York City Council amended its zoning regulations to restrict the location and size of adult entertainment establishments and to disperse such businesses across different areas (i.e., decrease their concentration in certain neighbourhoods).[14]

The New York City zoning amendment applies to all sorts of *adult establishments*, including adult bookstores and adult cinemas, that are not studied in this article. The amendment does not ban adult establishments; it simply requires that they: (1) must be located at least 500 feet from a school, house of worship, day care centre or residential district; (2) must be located at least 500 feet from any other adult establishment; (3) must be limited to one establishment per zoning lot; and (4) must not exceed 10,000 square feet of floor space. None of these features are related to the distribution of sex crimes.

1.2. *Adult Entertainment Establishments and Indoor Prostitution*

Recent literature has documented that most prostitution takes place indoors in massage parlours and saunas, brothels, strip clubs and escort prostitution services (Farley, 2005; Urban Justice Center, 2005). Hence, the adult entertainment establishments considered in this article may represent a share of the prostitution market.

The US prostitution market is stratified into three segments.[15] The lowest rung of the ladder is formed by outdoor prostitution (i.e., street prostitutes), which is usually run by pimps. Hence, street prostitutes lack control about their choice of clients, earnings and health checks. They also tend to be younger and are more likely to be victims of violence, to be arrested or to be drug addicted. Strip clubs and gentlemen's clubs comprise the medium rung of the ladder. In this sector prostitution is run as a business; prostitutes might lack control over their clients but enjoy higher earnings, safer controls and more frequent health checks. Self-employed escort girls occupy the top rung. In this market segment, prostitution is professionalised: since prostitutes are not *pimped*, they have control over their customers, earnings, health status and 'careers'.

Nonetheless, even sex workers on the medium and high rungs might face many difficulties. A recent paper documents the close connection in NYC between strip clubs, gentleman's clubs, escort girl services and prostitution (Urban Justice Center, 2005). The majority of indoor prostitutes studied in this report lived precarious lives, and encountered similar problems faced by street-based prostitutes, including violence, constant fear of police interference and a lack of substantive support services.

2. Data and Empirical Strategy

NYC is divided into five boroughs: the Bronx, Brooklyn, Queens, Manhattan and Staten Island. The data are organised in a panel of observations of seventy-seven police precincts in NYC from 1 January 2004 to 29 June 2012. We combine two sets of data: police stops and adult entertainment establishment data. For robustness checks, we use police complaint data.

[14] For further information, see Department of State New York State (1998).
[15] For further information, see Church *et al.* (2001), Albert (2002), Shively *et al.* (2012) and Ciacci (2017).

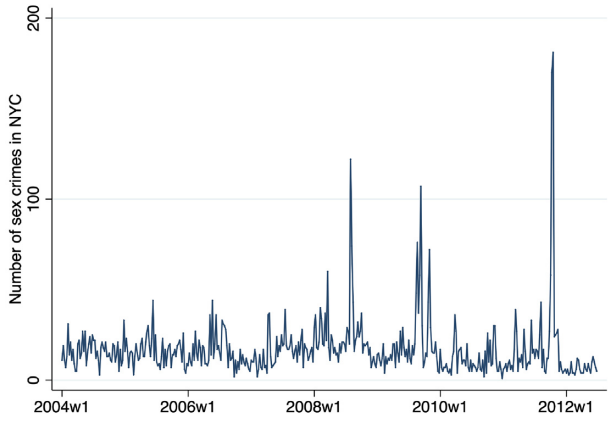

Fig. 1. *Evolution of Sex Crimes in NYC from January 2004 to June 2012.*
Notes: This figure shows the evolution of sex crimes in NYC between 1 January 2004 and 29 June 2012. For this plot, data has been collapsed weekly. Note that in 2012 we only have data till June.

2.1. *Sex Crimes: 'Stop-and-Frisk' Data Set*

Sex crimes in the main specification are drawn from the NYPD 'stop-and-frisk' data set that provides information on each 'stop-and-frisk' encounter. Among sex crimes we include sexual abuse, sexual misconduct and rape.[16] This data set has three convenient features. First, it minimises the problem of self-reporting of sex crimes, since the data come directly from what the NYPD saw in the street. Previous studies have relied on self-reported measures, which most likely suffer from a high degree of non-random under-reporting. There are multiple reasons why respondents may under-report, including fear of the aggressor and the social stigma associated with victims of these crimes. Second, this data set can be easily used at the daily level since crimes are counted according to when the officers report it. Other data sets document information about crimes that happened during a given time period without documenting the number of occurrences. Thereby, it is difficult to compare them or to use them at the daily level. Third, the 'stop-and-frisk' data have information on the exact position, hour and day of the crime, which is crucial for the analysis.

The 'stop-and-frisk' data set contains 7,478 stops for sex crimes (sexual abuse and rape) in NYC. Table 1 (panel A) presents the summary statistics of sex crimes per day. We observe that on average only 0.0313 sex crimes were committed in each precinct per day. Sex crime data have substantial variation over years and precincts. Figure 1 shows that the number of sex crimes stayed roughly constant from 2004–2008, after which they peaked three times.

In addition, the total number of sex crimes presents considerable differences across boroughs. Table 1 (panel B) shows that sex crimes are concentrated in the borough of Manhattan (3,844 during the 8.5-year study period). Brooklyn and Queens have roughly half as many sex crimes as Manhattan (1,464 and 1,646, respectively). These patterns motivate the inclusion of geographical fixed effects and time trends.

Since the total number of sex crimes also varies by season, we include month fixed effects in the analysis. Table 1 (panel C) presents these results. The fewest sex crimes are committed

[16] Appendix A contains precise information on the categories used to count sex crime occurrences.

Table 1. *Descriptive Statistics Sex Crimes and Adult Entertainment Establishments.*

Panel A: basic descriptive statistics

	Sex crimes	Adult entertainment establishments
Observations	238,931	238,931
Mean	0.031	1.957
SD	0.341	5.128

Panel B: by borough

	Sex crimes by borough	Openings by borough
The Bronx	454	10
Brooklyn	1,464	20
Manhattan	3,844	150
Queens	1,646	24
Staten Island	170	2
Total	7,478	206

Panel C: by season

	Sex crimes by season	Openings by season
Winter	1,554	42
Spring	1,894	39
Summer	2,115	70
Fall	1,915	55
Total	7,478	206

Panel D: by day of the week

	Sex crimes by male offenders (per day)	Percentage over total
Weekend	2,431	95.9%
- Friday	1,013	96.85%
- Saturday	712	95.57%
- Sunday	706	94.89%
Weekdays	4,776	96.62%
Total	7,207	96.38%

Notes: Panel A presents descriptive statistics (mean and SD) during our sample period for sex crimes and adult entertainment establishments. The two statistics are computed using daily data. Panels B and C present the distribution of sex crimes and openings of adult entertainment establishments in our sample period by NYC borough and season, respectively. Panel D presents the distribution of sex crimes committed by male offenders by day of the week. Column (1) presents the absolute frequency, while column (2) presents the percentual frequency. As expected, male offenders commit almost 90% of all such crimes. Further sex crimes are not concentrated on weekends.

in the winter. There is also substantial variation in the number of sex crimes committed across precincts within a given borough. For example, in Manhattan the highest proportion of sex crimes is concentrated in precinct 14 (28%), followed by precinct 13 (16%).[17]

Men commit 95% of sex crimes, and the percentage of such crimes committed by men on weekdays versus weekends is relatively constant (panel D of Table 1). Sex crimes are not concentrated on particular days of the week (Figure 2) or particular hours of the day.[18]

[17] Precincts 13 and 14 are both located in midtown Manhattan. The former is primarily a commercial and entertainment-oriented precinct. The latter is home to several residential complexes, insurance companies and major health care facilities. Further descriptions are available in the NYPD database.

[18] Table B1 in Appendix B shows the total number of sex crimes committed on weekends versus weekdays and divides weekend days into four different parts: morning (6 a.m. to 12 p.m.), afternoon (12 p.m. to 6 p.m.), evening (6 p.m. to 12 a.m.) and night (12 a.m. to 6 a.m.).

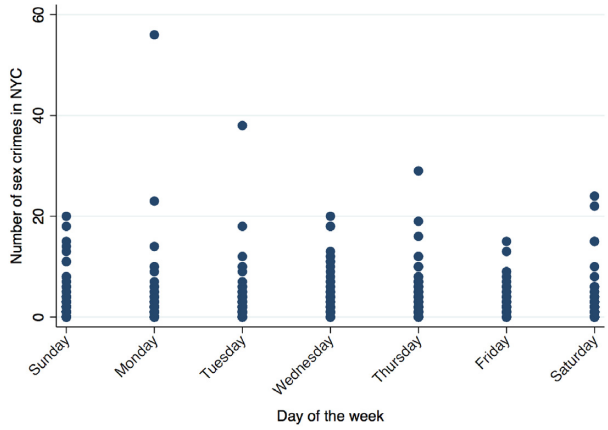

Fig. 2. *Distribution of Sex Crimes Over Days of the Week.*
Notes: This figure shows the distribution of sex crimes across days of the week in NYC during the study period.

2.2. *Adult Entertainment Establishments*

The second data set was obtained from Reference USA and provides information on all registered adult entertainment establishments from 2004–2012 in NYC. It contains data about the year when each establishment was registered, the number of employees in each establishment and its geographic coordinates. Using businesses' records such as the Yellow Pages, Superpages and the NY State Department of State records, we match almost every establishment with a registration date to proxy the effective opening date of each establishment; we also searched for closing dates.[19]

We use these two data sets to construct a panel counting the total number of establishments in each precinct for each day of the period of observation. We mainly used three sources to determine the opening date of the establishments. The first two are the Yellow Pages and Superpages, which are telephone directories of businesses organised by category. Advertising a business in these directories is free, and it takes at most five business days to get an establishment advertised after applying online. Since owners have to supply their name and phone number, the ads are likely to be accurate. The third source is the Department of the State of NY, which records every business in the state; for each business, it provides detailed information, including jurisdiction, address, current entity status, etc. In some cases the names of the establishments are different from those they used to register with the Department of the State of NY's database, so they cannot be matched. This problem does not apply to Yellow Pages and Superpages, since the name of the registered business is the same as that used to register with Reference USA.

The number of adult entertainment establishments increased significantly during the period of observation from 76 in 2004 to approximately 280 in 2012. Thus, the data include roughly two hundred openings of adult entertainment establishments during the 8.5-year study period. We use this variation to identify the effect of adult entertainment establishments on sex crime. Figure 3 displays the evolution of adult entertainment establishments during the sample period.

[19] We were able to match 90% of the adult entertainment establishments found in Reference USA. In our data set we observe only a closure of such establishments.

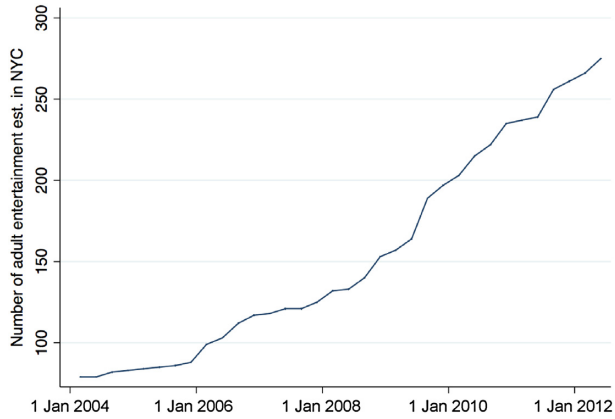

Fig. 3. *Evolution of Adult Entertainment Establishments from January 2004 to June 2012.*
Notes: This figure shows the evolution of adult entertainment establishments in NYC during the study period.

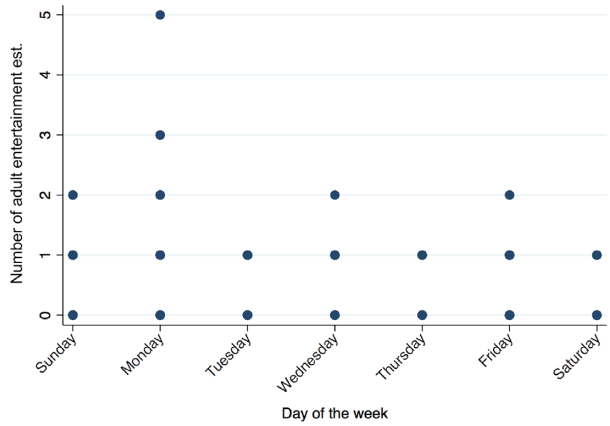

Fig. 4. *Opening of Adult Entertainment Establishments by Day of the Week.*
Notes: This figure shows the distribution of the day of opening of adult entertainment establishments across days of the week in NYC during the study period.

In Appendix C we analyse the geographic evolution of such establishments across precincts.[20]

Column (2) of Table 1 (panels B and C) shows that adult entertainment establishments' openings are concentrated in Manhattan (75%, 150 out of 206) and in the summer (34%, 70 out of 206). Table B2 in Appendix B shows that the openings are roughly equally distributed between weekends and weekdays (90 versus 116, respectively). Finally, Figure 4 illustrates that openings are not more likely to take place on a particular day of the week.

[20] In addition, Figure C9 in Appendix C shows the estimated coefficients and corresponding SEs at the 90% level of computing our main specification interacting our treatment variable with borough fixed effects. It is encouraging to find no borough exhibits a statistically positive estimated coefficient; two out of five boroughs exhibit statistically negative estimated coefficients and Manhattan is one of the two.

2.3. *Sex Crimes: Complaint Data Set*

To check the robustness of our results in Subsection 3.4, we also use data on sex crimes from two different versions of the NYPD Complaint Data Historic.

First, we use the disaggregated data set at the daily level. We refer to this data set as the complaint disaggregated data set. This data set contains all valid felony, misdemeanour and violation crimes reported by legal complaint to the NYPD. In this data set crimes are recorded according to the time range in which they took place (i.e., for each crime a starting date and an ending date can be reported and in some cases one of the two is missing). While the information is recorded, the classification is carried out in this way since the NYPD is concerned with how long the crime lasted. Yet, for our purposes we need to quantify how many times that crime occurred in a certain number of days.

Second, we use the aggregate version at the yearly level of the NYPD Complaint Data Historic. We refer to this data set as the complaint aggregated data set. This data set also contains all valid felony, misdemeanour and violation crimes reported by legal complaint to the NYPD. However, this data set accumulates total crimes occurred at the precinct and year levels. This allows us to precisely quantify the number of times a certain offence takes place. This data set will be useful to compare the distribution of sex crimes across the two data sources (i.e., 'stop-and-frisk' and complaint). Unlike the former database, these two data sets do not include any information on the aggressor. Moreover, none of these two data sets geocodes the location of sex crimes, but includes the precinct of occurrence, which allows for precinct-by-precinct comparisons.

Both data sets only include valid complaints. Complaints judged unfounded due to reporter mistakes or misinformation (or invalid due to internal errors) are excluded, since they are not reflected in official figures and are thus not considered to have occurred in a criminal context.[21] Also, since *mala prohibita* crimes do not require a complaint report, they may not be represented accurately, or at least in the complaint disaggregated data set. Such incidents are usually recorded using other department forms, such as arrests and summonses. These offences include (but are not limited to) certain drug, trespassing, theft of service and prostitution charges.

In Appendix D we compare descriptive statistics between the complaint data set and the 'stop-and-frisk' data set. The distribution of sex crimes in the complaint data set is substantially similar to that of the 'stop-and-frisk' data set.[22]

Unlike the 'stop-and-frisk' data set, data from the NYPD Complaint Data Historic might include domestic violence cases as sex crimes. This seems plausible for two reasons. First, the domestic violence category does not exist in this data set. Second, since these crimes happen indoor and are self-reported, the victim might report domestic violence cases as sex crime.

2.4. *Identification Strategy*

Similar to Dahl and DellaVigna (2009), we estimate the specification

$$\log(\text{Sex Crime}_{pt}) = \beta \text{Adult Enter}_{pt} + \Gamma X_{pt} + \varepsilon_{pt}. \tag{1}$$

The dependent variable is the logarithm of one plus the number of sex crimes committed in precinct p on a given day t.[23] The variable Adult Enter_{pt} denotes the total number of adult

[21] Investigation reports are not included either, in order to guarantee relevance and lessen extraneous material.

[22] Figures similar to those explored for the 'stop-and-frisk' data set are available upon request.

[23] We use $\log(1 + y)$ since our dependent variable takes a value of 0 on days that no sex crimes were committed. In Section 3 we test the robustness of this functional form.

entertainment establishments in precinct p for day t. This variable accumulates the opened businesses up until day t. Here X_{pt} represents a set of seasonal and geographic control variables: indicators for precinct, year, month, day of the week, day of the year and holidays, and geographic (precinct-level) year trends. All SEs are clustered at the precinct level.

The identification strategy relies on the exogeneity of variation in the time of openings and registration of adult entertainment establishments across precincts in NYC.[24] The main assumption is that opening and registration dates are exogenous in a model of high-frequency crime. In other words, given that opening a business in NYC requires a long bureaucratic procedure, we can take the opening of this type of business as random. Since our specification is daily, this amounts to the opening date of a business being exogenous to any other factor affecting sex crime. The comparability of the treatment and control groups boils down to the comparability of NYC police precincts over time. Thus, our specification captures any confounding factor that varies at the precinct or day level. The inclusion of precinct time trends ensures that $\hat{\beta}$ is not capturing any effect simply due to temporal changes in trends by precinct.[25]

One potential threat could be measurement error in the dependent variable and/or the explanatory variable. On the one hand, measurement error in the former could easily arise if we do not observe all the sex crimes committed in NYC. Measurement error is an issue in every crime data set, and even more in data related to sex crimes. Measurement error in the crime economics literature is mostly due to victims choosing not to report the crime (especially sex crimes). Thus, we believe using the 'stop-and-frisk' data set minimises this concern since victims do not decide whether or not to report the crime. Indeed, since our crime data set is not self-reported, this would imply sex crimes are committed but are not seen/reported by officers. However, if this is the case, there is no reason to believe that officers would systematically avoid reporting some sex crimes. As a consequence, the most plausible scenario is that, if there is measurement error, it is random. This would produce larger SEs, suggesting that the level of statistical significance of the coefficient is smaller than what we found. On the other hand, measurement error in the explanatory variable might arise if these businesses are not registered in the Reference USA database. In this case, assuming that this measurement error is random would lead to attenuation bias, suggesting that the population regression function's coefficient is negative but larger in absolute value than our estimates.[26]

3. Results

In this section we show that adult entertainment businesses can reduce sex crimes by 13% per day per precinct. This result is robust to different specifications and to using different data

[24] We consider the police precinct level to be the best geographic unit we can use for our analysis. First, they plausibly comprise comparable geographical units. Put differently, given the size of such areas and that they are used by officers to curb crime, it is credible to believe that a precinct would have evolved as its neighbouring precincts have no adult entertainment establishments. Second, concerns about SUTVA can easily be checked using data at the precinct level since it is the level at which crime data are collected in NYC. Third, NYC areas are heterogeneously populated; any other criterion to divide NYC into geographic areas would be arbitrary and should take into account demographical variables across such areas.

[25] A critique of this specification could be that the stable unit treatment value assumption is not satisfied, since the number of adult entertainment establishments in a precinct could affect the number of sex crimes in bordering precincts. We address this in Subsection 3.7; we find further evidence against this issue in the mechanism analysis (when we explore the *potential victims channel*).

[26] There is no reason to believe that some adult entertainment establishments would prefer not to appear in Reference USA since their activity is totally legal. Yet even if this were the case, there is no evidence to suggest that such mismeasurement would not be random.

Table 2. *The Effect of Adult Entertainment Establishments on Sex Crimes.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Adult entertainment est.	−0.00209**	−0.00214**	−0.00215**	−0.00215**	−0.00214**	−0.00214**	−0.00397*
	(0.000855)	(0.000947)	(0.000947)	(0.000947)	(0.000948)	(0.000948)	(0.00217)
Observations	238,931	238,931	238,931	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y	Y	Y	Y
Year FEs		Y	Y	Y	Y	Y	Y
Month FEs			Y	Y	Y	Y	Y
Day-of-the-week FEs				Y	Y	Y	Y
Day-of-the-year FEs					Y	Y	Y
Holiday FEs						Y	Y
Precinct trends							Y
Mean of sex crime	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313
SD of sex crime	0.3405	0.3405	0.3405	0.3405	0.3405	0.3405	0.3405

Notes: This table presents the results of running specification (1). The dependent variable is the logarithm of one plus the number of sex crimes committed in precinct p on a given day t. The variable Adult Enter$_{pt}$ denotes the total number of adult entertainment establishments in precinct p on day t. This variable cumulates all the opened businesses up to day t. We denote by X_{pt} a set of seasonal and geographic control variables: precinct, year, month, day-of-the-week, day-of-the-year and holiday indicators, and geographic (at the precinct level) year trends. All SEs are clustered at the precinct level. Note that besides the classical year and month fixed effects, our daily specification allows us to include day-of-the-week, day-of-the-year and holiday fixed effects to capture deeper variation due to timing factors. In each column we add a different control. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

sets to measure sex crimes. Moreover, effects are persistent over time and only occur after the introduction of the treatment.

3.1. *The Effect of Adult Entertainment Establishments on Sex Crime*

Table 2 presents the results. Column (1) presents the correlation between the opening of an adult entertainment establishment and sex crimes, including precinct fixed effects (FEs). Columns (2) and (3) add month and year fixed effects. In all the specifications the coefficient is statistically significant and negative, indicating that having an adult entertainment establishment in a certain precinct is negatively associated with the number of sex crimes.

Since it is plausible that crime patterns may differ throughout the week, during the year and in holidays, columns (4)–(6) present the results based on the day-of-the-week, day-of-the-year and holiday indicators, respectively. The results do not change.

Column (7) presents the results with the inclusion of precinct-specific year trends, which increases the absolute value of the coefficient. This pattern suggests that omitted variables were attenuating the estimated coefficient. This is the preferred specification; it shows that having an adult entertainment establishment decreases the number of sex crimes by roughly 13% per day in a particular precinct.[27]

After taking into account precinct-year trends the estimated coefficient approximately doubles; this might give rise to the concern that the model over-saturates. This is not the case since we have about 238,000 observations and the inclusion of the trends simply implies that we have a

[27] Taking into account the transformation of the dependent variable, the effect can be computed using the formula

$$\frac{\partial \log(y)}{\partial x} = \frac{\partial \log(1+y)}{\partial x}\frac{\partial \log(y)}{\partial \log(1+y)} = \beta\frac{1+y}{y} \simeq \hat{\beta}\frac{1+\bar{y}}{\bar{y}} = -0.4\%\frac{1+0.0313}{0.0313} = -13.18\%.$$

different linear trend (i.e., slope) for each of the seventy-seven precincts of our sample period. Yet, to double check that our results are not driven by the inclusion of the precinct-year trends, we use the double-Lasso technique. This technique gets more 'parsimonious' trends by selecting the trends given an optimisation problem that penalises high coefficients and converges the irrelevant ones to zero.[28] In Appendix E we present our main findings using this methodology. The results do not change.[29]

3.2. *Sensitivity to Model Specification Changes and the Definition of the Dependent Variable*

In this section we explore the robustness of the results to different specifications. First, we replace the day-of-the-year and holiday indicators with exact-day indicators so that each day in the study period has its own fixed effect that captures any day-to-day differences. Second, we include precinct-month trends instead of precinct-year trends. Third, we include different precinct trends based on every month of each year and drop the precinct-year trends. The main difference is that precinct-year trends were varying in each precinct across years, while these are varying across each month of the year. For example, in this specification, January 2004 has a different trend than both February 2004 and January 2005. In Appendix F we present the results of running these specifications. In particular, columns (1) to (3) in Table F1 report the results of these three specifications. All estimates are negative and statistically significant in each of the three specifications, and the magnitude of the effect does not change.

Column (4) of Table F1 in Appendix F presents the estimates of specification (1), but only for sex crimes committed by male offenders. As before, we include all the fixed effects and precinct time trends in the specification. The results do not change, which is consistent with the fact that male offenders commit the large majority of sex crimes. In line with these results, column (5) displays the outcomes of running this regression using the inverse hyperbolic sine (IHS) transformation of the dependent variable.

Table F2 in Appendix F presents the results of using different transformations of the dependent variable. First, we apply the IHS transformation. In our main specification the dependent variable is $\log(1+y)$, while in this specification using the IHS it becomes $\log(y+(y^2+1)^{1/2})$. The IHS is commonly used where there are fat tails (Pence, 2006). Column (1) of Table F2 shows the results of running such a regression. In line with our main findings, the estimated coefficient is statistically negative but larger in absolute value.

Another concern could be that the effect is driven by extreme values of the dependent variable. To address this issue, columns (2) and (3) of Table F2 in Appendix F respectively correspond to a probit and a linear probability model (LPM) using a binary variable that takes a value of 0 when no sex crimes are committed, and 1 otherwise. The coefficient of interest is negative and statistically significant at standard levels in the LPM. Finally, we estimate the model in levels form and find a negative, statistically significant coefficient in this case as well (column (4) of Table F2). In this specification, an extra establishment decreases sex crimes by 0.0076 units. This is equivalent to a 23% reduction.[30]

[28] For further details, this methodology is developed in Belloni *et al.* (2014).

[29] Further tables/figures using this methodology are available upon request.

[30] This last specification is the most sensitive to extreme values, which is probably why the estimated coefficient is the largest (in absolute value) of all the specifications considered. In Appendix H we present all the main results in levels. Such results are larger in absolute value but do not change.

Our findings are also robust to changes in the time unit of the regression. Table G1 in Appendix G shows the estimated coefficient if we run our main specification at a weekly frequency. The results are robust to collapsing data at the month, quarter and year levels; tables are available upon request.

3.3. *Event Study Evidence*

In this section we investigate whether the decrease in sex crimes is caused by a contemporaneous increase in adult entertainment establishments or by future or past values. This exercise allows us to explore the timing of the effect; in other words, both whether the effect takes place after treatment allocation and whether it fades out or thrives.

This exercise is also helpful to explore the sign of the effect in both the short and long runs. In this regard, it is worth recalling that ex ante there might have been concerns that such establishments could increase sex crimes. Even if the results of our main specification do not support this claim, there might be doubts that this is due to the short-run and long-run effects having opposite signs. Since our identification assumption leverages high-frequency variation, if the short-run effect has a negative sign, while the long-run effect has a positive sign, the estimates of the main specification might be negative. The analysis carried out in this section will also help us to check if the data support such an hypothesis.[31]

Our setting has different features that should be taken into account. First, the identification relies on the exogeneity of the variation in the timing of the openings of adult entertainment establishments across precincts in NYC. To this extent, there might be the concern that 'earlier' openings predict future openings. We investigate this issue in Appendix I and find no evidence supporting it. Second, the regressor of interest accumulates the number of adult entertainment establishments in a certain precinct. As Table 1 shows, there were 206 openings in the sample period. Hence, even collapsing the data set at the monthly level, the correlation of adjacent changes is extremely high (0.9983). Third, given this high number of openings, there might be the concern that effects are heterogeneous.

To solve these issues, we follow Sun and Abraham (2020), who developed a methodology to estimate dynamic effects in settings where there is variation in treatment across units and effects might be heterogeneous (i.e., their methodology is robust to treatment effect heterogeneity). This methodology can easily be applied to our case since each opening can be characterised as an absorbing state (i.e., a non-decreasing sequence of zeros and then ones).[32] It also takes into account that units might receive different treatments over time. To this end, this methodology divides units in different cohorts e, depending on when they receive treatment, to avoid the estimated coefficients of lags and leads being contaminated by effects from other periods. Specifically, for each time period, this methodology computes a weighted average of the effect for that cohort, where weights are shares of such cohorts normalised by the size of the group. Moreover, since each treatment allocation is codified in a different variable, this allows us to explore settings where treatment allocation overlaps. Thus, taking this methodology into account, we consider

[31] Regressions at lower frequency (i.e., week, month and year) suggest that the long-run effect has a negative sign as well. Results of regressions at the weekly level are available in Table G1 in Appendix G, while results at the month and year levels are available upon request.

[32] Recall that in our sample we have only one closure. Indeed, the data sources we use in this paper report the number of closures and they only report one.

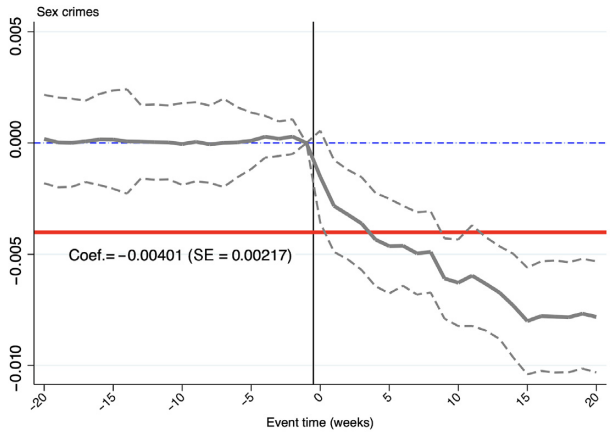

Fig. 5. *Event Study Analysis.*
Notes: This figure shows the results of running an event study at the weekly level following Sun and Abraham (2020), i.e., (2). Pre-treatment effects are close to zero and statistically equal to zero. Post-treatment effects are negative and statistically different from zero. The results are in line with specification (1).

the specification

$$\log(\text{Sex Crime}_{pt}) = \sum_{e=1}^{E} \sum_{\substack{j=-J \\ j\neq -1}}^{J} \beta_{e,j}(\mathbb{1}\{E_p = e\}\,\text{Adult Enter}_{p,t+j}) + \Gamma X_{pt} + \varepsilon_{pt}, \tag{2}$$

where X_{pt} includes the same fixed-effect controls of our main regression model (i.e., specification (1)). Time windows span periods of one week each. In particular, $\pm J$ ranges from ± 20 weeks to respectively 1 and -2 weeks, since we omit -1. Each lag (lead) takes the value of the main regressor $-j$ (j) weeks away from the opening. It is worth noting that e stands for cohorts, different time periods in which units are treated. Each estimated parameter is a weighted average of the effect of an opening of an establishment j weeks away (i.e., pre or post).

Results of this regression support the identification assumption. Figure 5 shows the results of running (2). Pre-treatment effects are close to zero and statistically equal to zero. Post-treatment effects are negative and statistically different from zero. The effects occur immediately one week after the opening and are persistent. This figure also compares these coefficients with specification (1) and shows that they have similar magnitudes.[33]

3.4. *Representability of the 'Stop-and-Frisk' Data Set*

Sex crimes drawn from the 'stop-and-frisk' data represent only a share of all the sex crimes in NYC. If such data were not representative of all the sex crimes occurring in NYC, our findings would not be either.

[33] This effect is also similar to the heterogeneous robust estimated coefficient proposed by Sun and Abraham (2020), which in our case is −0.00399.

In this section we address this issue in two different ways. First, we use high-frequency data drawn from the NYPD's historical complaints data set that fit into our specification. Second, we use aggregate (low-frequency) data to determine whether the 'stop-and-frisk' data set is representative of the patterns of all sex crimes recorded by the NYPD.

3.4.1. *Disaggregated complaint data at high frequency*

We build a database that includes complaint sex crimes and perform the same analysis as for our main specification. Columns (1) and (2) of Table J1 in Appendix J present the results of this regression using the logarithmic and IHS transformations, respectively. There might be the concern that our results might be driven by a change in the composition of sex crimes. If somehow adult entertainment establishments increase indoor sex crimes and reduce outdoor sex crimes, the estimated coefficient in columns (1) and (2) should be positive or closer to zero compared to those of the main specification (i.e., column (7) of Table 2 and column (1) of Table F2 in Appendix F).

In both cases, the coefficient of interest is statistically negative at standard levels and larger in absolute value than the estimated coefficients of the main specification in logs and IHS, indicating that indoor sex crimes decrease as well. We find that the opening of an adult entertainment business decreases sex crimes by approximately 7%.[34]

3.4.2. *Aggregated complaint data at low frequency*

In this section we explore whether sex crimes in the 'stop-and-frisk' data set are representative of all sex crimes recorded in NYC. Using the complaints data set with our specification is problematic, since the occurrence of such crimes is not recorded on a daily basis. To solve this problem, we use low-frequency data about all sex crimes committed in NYC, which is available from the NYPD.[35] These data already calculate the number of occurrences of each crime. Yet, since these data are at the precinct-year level, we cannot use them in our main specification or rely on the identification assumption. Therefore, we run the specification

$$\text{Sex CrimeSF}_{pt} = \delta \text{Sex CrimeNYPD}_{pt} + \Gamma X_{pt} + \varepsilon_{pt}, \tag{3}$$

where Sex CrimeSF$_{pt}$ and Sex CrimeNYPD$_{pt}$ are sex crimes from the 'stop-and-frisk' and NYPD data sets, respectively, and X_{pt} includes year fixed effects, precinct fixed effects and precinct-year time trends. The correlation δ captures whether sex crimes from the two data sets are correlated, netting out time and geographic differences. Column (3) of Table J1 in Appendix J shows the results for this specification. These findings suggest that even if the year-to-year changes and geographic distribution differ across the two data sets, and even if the number of sex crimes in the 'stop-and-frisk' data set is lower than in the NYPD data set (7,478 reported sex crimes in the former, compared to 52,910 in the latter), the sex crimes from the 'stop-and-frisk' data set are representative of all sex crimes recorded in NYC.

Even taking precinct and year fixed effects and year trends into account, we find that sex crimes drawn from the 'stop-and-frisk' data set are closely correlated with the complaint sex crimes.

[34] In this case, computations differ since the average value of the dependent variable is 0.1118. Therefore, using the same formula as before,

$$\frac{\partial \log(y)}{\partial x} = \frac{\partial \log(1+y)}{\partial x}\frac{\partial \log(y)}{\partial \log(1+y)} = \beta\frac{1+y}{y} \simeq \hat{\beta}\frac{1+\bar{y}}{\bar{y}} = -0.7\%\frac{1+0.1118}{0.1118} = -6.96\%.$$

[35] http://www1.nyc.gov/site/nypd/stats/crime-statistics/historical.page.

Column (4) of Table J1 in Appendix J includes precinct-year trends, and we find that sex crimes drawn from the 'stop-and-frisk' data set represent around 27% of complaint sex crimes. In other words, for every four complaint sex crimes, there is one sex crime from the 'stop-and-frisk' data set. The results at the IHS level are substantially similar. As a further robustness check, Table J2 shows the same regression but using the complaint disaggregated data set at the daily level as the regressor. These two different measures of sex crimes are positively significantly correlated in this regression as well.

In order to compare these results to the complaint disaggregated data set, columns (5) and (6) of Table J1 in Appendix J present results of running specification (3) without and with precinct-year trends but for the complaint disaggregated data set. We find similar results, namely sex crimes drawn from the 'stop-and-frisk' data set represent about 21% of such crimes.

3.5. *Sensitivity Test: Urban Development*

There might be the concern that our deterministic precinct trends do not capture urban development. To explore this concern, we collect data on the day of opening of Apple Stores and Starbucks across NYC. Hereafter, we refer to these two control variables as urban development controls.

In Appendix K we present the results of running different regressions including such controls. Specifically, Table K1 presents the results of running our main specification in logs including these two establishments as control variables. Panels A, B and C respectively present the results without trends, with trends and with double-Lasso-selected trends. Moreover, columns (1), (2), (3) and (4) respectively present the results without urban development controls, only with Apple Stores, only with Starbucks and with both establishments. The results are reassuring; inclusion of urban development controls do not affect our coefficient. If at all, the effect seems to be larger in absolute value (i.e., the estimated coefficient is negative and larger in absolute values once we include both urban development controls). This would suggest that there is a positive correlation between urban development and adult entertainment establishments and, as a consequence, our estimates are a lower bound of the true effect. Tables K2, K3 and K4 respectively repeat this analysis using the dependent variable in the IHS, levels and LPM, finding the same results.

3.6. *Placebo Test: Randomisation Inference*

To address the concern that the data are highly serially correlated across precincts, all our regressions are clustered at the precinct level. Yet, in this section we present a further test to explore this concern. In this section we present the results of randomising the number of adult entertainment establishments across precincts.[36]

Figure L1 in Appendix L presents the results of randomising the number of opened establishments stratified at the borough level with one thousand permutations. The red vertical line represents the estimated coefficient in our main specification. The intersection between the red vertical line and the estimated distribution could be interpreted as the probability of finding the same effect found in our main specification by chance.

Figure L1 shows that finding the same estimated coefficient as in our main specification is extremely unlikely: out of one thousand permutations, none could replicate the estimate.[37] This

[36] Similar approaches and results are developed in Aglasan *et al.* (2017) and Pinotti (2017).

[37] These results are robust to using 10,000 permutations. Figures are available upon request.

Table 3. *Spillover Effects.*

	(1) Log sex crimes	(2) IHS sex crimes	(3) Log sex crimes	(4) IHS sex crimes
Adult entertainment est.	−0.00681***	−0.0136***	−0.00681**	−0.0136**
	(0.00223)	(0.00445)	(0.00293)	(0.00585)
Observations	68,266	68,266	68,266	68,266
Clustered variance at the precinct level	Y	Y	Wild	Wild
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y

Notes: This table presents results for the baseline regression using the log and IHS of sex crimes but using bigger precincts. These precincts were chosen according to their geographic distance. A complete list of the new precincts can be found in the Appendix Section A. If women are avoiding precincts where adult entertainment establishments open, we should find either a statistically negative but smaller estimated coefficient in absolute value, a statistically positive coefficient or a coefficient that is statistically equal to zero. In both cases the estimated coefficients are negative and larger in absolute value than those in our baseline regression. This evidence rejects there were spillover effects and does not support the potential victims channel. Wild clusters refer to wild cluster-bootstrap methods; see Cameron *et al.* (2008). Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

finding seems to exclude the possibility that our estimates were driven by serial correlation across precincts.[38]

3.7. *Spillover Effects*

In this section we explore whether there are spillover effects across precincts.[39] There might be concerns that there is a spillover effect caused by women moving to other precincts. If women are simply avoiding precincts with adult entertainment establishments, we should observe an increase in sex crime in neighbouring precincts. To this end, we consider a specification with twenty-two precincts in which we group precincts on the basis of their geographic position.[40] If the effect found is only due to women avoiding precincts with adult establishments, then we would observe sex crimes moving from one precinct to another. Therefore, this would imply that sex crimes are increasing in precincts with no establishments but which have neighbouring precincts with at least one establishment. If this were the case, the total effect in larger precincts should compensate and be closer to zero than the main estimated coefficient. If sex crimes are not moving, the coefficient should still be negative and larger in absolute value since we are taking into account larger geographic units.

Table 3 presents the results. We still find a negative effect on sex crimes. Since in these regressions there are only twenty-two precincts, SEs could be smaller due to the smaller number

[38] Randomisation inference might also be interpreted as a test to the notion that establishments affect sex crimes of close precincts, possibly due to customers moving across NYC. This would be an issue in our identification insofar as it might lead to establishments in one precinct preventing sex crimes in another precinct. The results in this section are not supportive of this notion.

[39] The analysis presented in this section is connected to the potential victim channels presented in Subsection 4.2. The empirical results in this section discard that such a mechanism is driving our results.

[40] For example, we group precincts 1, 5 and 7 together; precincts 6, 9, 10 and 13 together, and so on. A complete list of groupings is available in Appendix M.

Table 4. *Spillover Effects.*

	(1) Log sex crimes	(2) Log sex crimes	(3) Log sex crimes	(4) Log sex crimes
Neighbouring adult entertainment est.	−0.000310	−0.000308	−0.000308	−0.00187
	(0.000391)	(0.000391)	(0.000391)	(0.00154)
Adult entertainment est.	−0.00172*	−0.00172*	−0.00172*	−0.00282
	(0.000975)	(0.000975)	(0.000975)	(0.00173)
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs		Y	Y	Y
Holiday FEs			Y	Y
Precinct trends				Y

Notes: This table presents specification (4). We regress sex crimes on adult entertainment establishments in precinct p and in neighbouring precincts. The estimated coefficients associated with neighbouring establishments across regressions are low in point estimate and statistically insignificant. These results suggest that there are no spillover effects. However, the estimated coefficients associated with our treatment variable are statistically negative in every regression model. In the last regression, this estimated coefficient is marginally significant with a p-value of 10.7%. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

of clusters. Therefore, columns (3) and (4) present the same regressions but using wild cluster-bootstrap methods (Cameron *et al.*, 2008). The results do not change. Overall, these findings do not support the notion that women avoid precincts where adult entertainment establishments are located.

Likewise, there might be the concern that the results might be explained by population moving across precincts. For example, it could be the case that an adult entertainment business attracts criminals from other districts and thus reduces sex crimes at other precincts where no adult entertainment business opened.[41] This could violate our identification assumption only if it implies that the opening of an establishment in one precinct somehow affects neighbouring precinct sex crimes. To analyse this issue, we consider the following specification similar to our main one (i.e., (1)):

$$\log(\text{Sex Crime}_{pt}) = \delta\,\text{Neighbouring Adult Enter}_{pt} + \beta\,\text{Adult Enter}_{pt} + \Gamma X_{pt} + \varepsilon_{pt}. \quad (4)$$

Here $\text{Neighbouring Adult Enter}_{pt}$ denotes the total number of adult entertainment establishments in neighbouring precincts of precinct p at time t. If there are spillover effects, neighbouring establishments opened in precinct p at time t should have a statistical association with sex crimes even after taking into account the establishments opened in such a precinct.

Table 4 shows the results of running specification (4). In line with our results, the coefficient of $\text{Neighbouring Adult Enter}_{pt}$ is low in point estimate, about 10% of our main estimate, and statistically insignificant in every regression model, while the coefficient of Adult Enter_{pt} is statistically negative in every regression model and similar in size to the estimates of the main specification.[42]

[41] Note that if this is the case, our estimates would be a lower bound.

[42] In the last regression it is marginally significant with a p-value of 10.7%. Note that all estimates are closer than one SE distance with respect to their counterpart in the main specification table (Table 2).

4. Mechanisms Driving the Effect of Adult Entertainment Establishments on Sex Crimes

In this section we explore three mechanisms that can help explain the decrease in sex crimes caused by adult entertainment establishments: police channel, potential victims channel and potential criminals channel. Each of these mechanisms can be tested using our database. We also discuss other channels such as psychological factors and urban development.

First, it could be the case that adult entertainment establishments reinforce security in the precinct if more police officers are assigned to the area. In this case, a decline in sex crimes could reflect a general decline in crime due to the higher number of officers present in the area after an establishment opens (police channel).[43] Given our identification strategy, this would imply that the number of police officers systematically increases at the same time (i.e., on the same day) that a new adult entertainment establishment opens in a certain precinct. Second, women may be avoiding precincts where adult entertainment businesses have opened and are moving to bordering precincts where there are no establishments. Thus, the decline in crime could be explained by a reduction in potential victims. It could also be the case that adult entertainment establishments are employing potential street sex workers who, in absence of opportunities for indoor prostitution, would work on the streets. If most sex crimes are committed against street sex workers, adult entertainment establishments might reduce sex crimes by merely providing protection to street workers (potential victims channel). Finally, potential offenders might prefer to use adult entertainment establishment services instead of committing sex crimes. As a matter of fact, these establishments are a major supplier of consensual sexual activities, and comprise a large share of the sex work market (see Urban Justice Center, 2005), so they are a cheaper alternative to committing sex crimes. To put it another way, they provide consensual sexual activities that could substitute forced sexual activities (potential criminals channel).[44]

4.1. *Police Channel*

The ideal way to explore the police channel is to use data about the number of police officers working in each NYC precinct on each day. However, since these data are not publicly available, to explore this mechanism, we estimate the effect of adult entertainment businesses on any other crime category available in the data set (e.g., stops for drug use, burglaries).[45] Table 5 presents the results of this specification. Each specification resembles (1) but with a different dependent

[43] Di Tella and Schargrodsky (2004) and Draca *et al.* (2011) provided evidence on how increasing the number of police officers reduces crime.

[44] The hypothesis that consensual sexual activities are substitutes to non-consensual sexual activities (i.e., forced sexual activities) is consistent with evolutionary biological theories (see, inter alia, Thornhill and Thornhill, 1983; Thornhill and Palmer, 2000a,b). These theories suggest that rape might be an evolutionary adaptive strategy: when individuals face the choice between forced sex (i.e., rape) and genetic extinction, they would unconsciously choose force in order to avoid the second outcome.

[45] Two features are important about such crimes. First, they should not be related to sex crimes, and there should not be a plausible mechanism of why adult entertainment establishments could affect them directly (i.e., other than via a change in the number of police officers). Second, it is preferable to select crimes that are easier to catch/control by officers compared to sex crimes. If it is a change in police presence that is driving the findings then such crimes are much more likely to experience a decrease as well. Specifically, Table 5 explores every sort of crime recorded in the 'stop-and-frisk' data set that fulfils these two features.

Table 5. *Police Channel.*

	(1) Burglary	(2) Drug	(3) Arson	(4) Weapon	(5) Criminal mischief	(6) Murder	(7) Forgery	(8) Obscenity	(9) Graffiti	(10) Trespass
Log	−0.00769	0.00545	−0.000374	−0.000837	−0.000865	0.000109	−0.0164	-1.12×10^{-6}	0.00120	0.0131
	(0.0137)	(0.00796)	(0.000562)	(0.000899)	(0.00273)	(0.000133)	(0.0113)	(1.22×10^{-5})	(0.00198)	(0.00871)
IHS	−0.0154	0.0109	−0.000748	−0.00167	−0.00173	0.000217	−0.0328	-2.25×10^{-6}	0.00240	0.0261
	(0.0273)	(0.0159)	(0.00112)	(0.00180)	(0.00547)	(0.000266)	(0.0227)	(2.45×10^{-5})	(0.00397)	(0.0174)
Levels	−0.0243	0.0182	−0.000241	−0.00184	−0.00146	0.000279	−0.0293	-7.80×10^{-7}	0.00415	0.0941**
	(0.0519)	(0.0249)	(0.00119)	(0.00248)	(0.00472)	(0.000286)	(0.0207)	(1.78×10^{-5})	(0.00424)	(0.0393)
Observations	238,931	238,931	238,931	238,931	238,931	238,931	238,931	238,931	238,931	238,931

Notes: This table presents the results of running specification (1) for different crimes and functional forms. Crimes are listed in the column headings and functional forms in the row headings. We find no evidence to support the fact that adult entertainment establishments affect other crimes. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

variable—for example, the number of stops for burglaries (column (1)) and the number of stops for drug use (column (2)).[46]

If sex crimes decline because there are more police officers in the area when an adult entertainment establishment opens, we should also find a decrease in the number of crimes that are more frequent and easier to control, such as arsons, burglaries or drug use. However, we find no effect of adult entertainment establishments on these crimes, suggesting that an increase in security is not the main channel behind the decline in sex crimes.

There might be the concern that some estimates in Table 5 are statistically insignificant due to a lack of precision in the data. We consider this to be highly unlikely given the precision of the database (i.e., high-frequency variation at the day level for a sample of roughly nine years) and the frequency of the crimes considered. Many crimes considered (e.g., burglary, drugs, graffiti) are either more likely to be caught by police and/or more likely to occur. To this extent, finding that estimates are not statistically negative seems plausible evidence that adult entertainment establishments do not have any impact on such crimes.

Furthermore, the results of this specification suggest that adult entertainment establishments have no effect on crimes other than sex crimes (e.g., drugs and burglaries, which might be affected by the number of these establishments). In fact, rows (2) and (3) respectively repeat the same analysis but with the dependent variable in the IHS transformation and in levels. Also, for these regressions, there is no significant effect.

By and large, these results do not support either the police channel or any other mechanism connected to changes in crimes occurring at the same time as openings of adult entertainment establishments.[47]

4.2. *Potential Victims Channel*

To determine whether adult entertainment establishments are changing the location of street sex workers, we estimate specification (1) by replacing the dependent variable with street prostitution stops. If this were the case, we would observe that adult entertainment establishments have a negative effect on street prostitution. The results of this specification are reported in columns (1) and (2) of Table 6. We find no statistically significant effect on this new outcome. This result suggests that there has not been a reallocation of street sex workers to adult entertainment businesses, and it rules out the possibility that the decline in crime is driven by a reduction of street sex workers who could be the main potential victims of sex crimes on the street.[48]

The New York State Division of Criminal Justice Services classifies loitering as including 'loitering for prostitution'.[49] Thus, columns (3) and (4) in Table 6 present the same analysis but for loitering. Both coefficients are positive and not statistically significant. Hence, we conclude

[46] Hence, in these specifications we cluster the variance at the precinct level and include precinct, year, month, day-of-the-week, day-of-the-year and holiday indicators and precinct-year trends.

[47] These findings are in line with Linz *et al.* (2004).

[48] A further concern is that sex crimes transfer from other women to indoor prostitutes. Three points are worth mentioning in this regard. First, Subsection 3.4.1 provides evidence against this since indoor sex crimes decrease as well. Second, we acknowledge that this concern would be difficult to address since there is evidence in the literature that prostitutes in the United States rarely report sex crimes (Anderson, 2004). Third, there is evidence in the literature that adult entertainment establishments provide protection to their workers, making this concern particularly unlikely (Church *et al.*, 2001; Shively *et al.*, 2012).

[49] For further information, see Urban Justice Center (2005).

Table 6. *Potential Victims Channel.*

	(1) Log street prost.	(2) IHS street prost.	(3) Log loitering	(4) IHS loitering
Adult entertainment est.	−0.000634	−0.00127	0.00149	0.00298
	(0.00113)	(0.00226)	(0.00100)	(0.00200)
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y

Notes: This table presents the results of exploring the potential victims channel. Columns (1) and (2) present the results for the baseline regression using the log and IHS of street prostitutes. If sex crimes are decreasing because street prostitutes, who were victims of sex crimes before, are now working in adult entertainment establishments, we would observe a statistically negative estimated coefficient. The results suggest that this is not the case. Columns (3) and (4) repeat the analysis using as a dependent variable the stops for loitering. Clustered SEs at the precinct level in parentheses.

that there is no evidence that the reduction in sex crimes is due to a reallocation of outdoor sex workers to indoor venues. There might be the concern that women are avoiding precincts with adult entertainment establishments. To address this issue, Table N1 in Appendix N explores if there is evidence that sex crimes in precincts without adult entertainment establishments are affected by opening in neighbouring precincts. We find no evidence supporting this hypothesis. For this purpose, Appendix N provides further evidence that sex crimes are not moving to neighbouring precincts.

4.3. *Potential Criminals Channel*

To address the potential criminals channel, we focus on sex crimes committed in the evening and at night. If potential criminals prefer to use adult entertainment establishment services rather than commit sex crimes, the effect should be larger when the supply of the services offered by these establishments is higher. It seems plausible to assume that the supply of these services is higher in the evening and at night, given that most of these establishments are only open during these two time slots.[50]

We divide the day into four quarters—morning (from 6 a.m. to 12 p.m.), afternoon (from 12 p.m. to 6 p.m.), evening (from 6 p.m. to 12 a.m.) and night (from 12 p.m. to 6 a.m.)—and create four corresponding indicator (fixed effect) variables and saturate the model with their interactions with the treatment variable. The former variables are useful to capture how frequently sex crimes occur in a certain time slot, while the latter variables capture the effect of adult entertainment establishments for each time slot considered.

Table 7 presents the results of the fixed effect for afternoon, evening and night, and their corresponding interactions. Morning is the reference category. As benchmarks, columns (1) and (3) of this table present the results for our logarithmic and IHS transformations, respectively,

[50] For further information, see The New York State Senate (2013).

Table 7. *Potential Criminals Channel.*

	(1) Log sex crimes	(2) Log sex crimes	(3) IHS sex crimes	(4) IHS sex crimes
Adult entertainment est.	−0.00114*	−0.000372	−0.00229*	−0.000745
	(0.000619)	(0.000292)	(0.00124)	(0.000585)
Evening FE		0.00160**		0.00320**
		(0.000715)		(0.00143)
Night FE		0.00105		0.00211
		(0.00101)		(0.00202)
Interaction evening		−0.000954*		−0.00191*
		(0.000567)		(0.00113)
Interaction night		−0.00146		−0.00292
		(0.000939)		(0.00188)
Afternoon FE		0.000507		0.00101
		(0.000527)		(0.00105)
Interaction afternoon		−0.000672		−0.00134
		(0.000446)		(0.000892)
Observations	955,724	955,724	955,724	955,724
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y
p-value joint effect		0.084		0.084
p-value		0.008		0.008
Evening versus night FEs		0.19		0.19

Notes: This table presents specification (1), separating the day into four quarters, morning, afternoon, evening and night, and saturating the specification including the fixed effects for three quarters out of four (morning is the base group)—morning (from 6 a.m. to 12 p.m.), afternoon (from 12 p.m. to 6 p.m.), evening (from 6 p.m. to 12 a.m.) and night (from 12 p.m. to 6 a.m.)—and their interactions with the main regressor. As benchmarks, columns (1) and (3) of this table present the results for our logarithmic and IHS transformations, respectively, without the interactions. Columns (2) and (4) present the results of the fully saturated model. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

without the interactions. Columns (2) and (4) present the results of the fully saturated model. The results in Table 7 corroborate the initial finding: the two interaction coefficients are jointly statistically significant and negative at the 1% level. In addition, their total effect is statistically different from zero at the 10% level. Since the evening fixed effect is statistically positive, there might be the concern that this result is driven by a larger number of sex crimes taking place in this time slot. It is worth noting that such a coefficient is extremely low: 0.16%. Yet, to address this concern, this table presents the *p*-value associated with the null of equal coefficients between evening and night dummies. The associated *p*-value is 19%, suggesting that we fail to reject that there are the same amount of sex crimes in the two time slots. All in all, these results suggest that we cannot discard the potential criminals channel.

4.4. *Compositional Effects and Other Channels*

In this section, we further explore whether changes in the demographic of the population could be driving the findings. One potential mechanism could be that a different type of population

is moving into precincts with an adult entertainment business, decreasing the supply of sex offenders and, as a consequence, the number of sex crimes. For example, this might be the case if less sexually inhibited criminals move to the precinct after an adult entertainment business opens. Similarly, we could observe a decline in sex crimes if wealthier men, who might be more likely to be customers of adult entertainment establishments and less likely to commit outdoor crimes, move to these precincts.

Several pieces of evidence indicate that results could not be explained by such a channel. First, we find immediate results one week after the opening and the effects are sustained over time. This suggests that if the effect is due to different sorts of people moving to these precincts, such a movement should take place within a week to explain the decline in sex crimes. Second, if wealthier men, who are less likely to either commit or be caught committing outdoor crimes (such as sex crimes), are now moving to these precincts, adult entertainment establishments would also reduce outdoor crimes, such as vandalism, graffiti, arsons or obscenities. Nonetheless, we find no effect on such crimes (Table 5). In line with these results, in Subsection 3.5, we do not find any evidence suggesting that the found fall in sex crimes is due to an increase in wealth or urban renewal in precincts where adult entertainment establishments opened. Third, if it were the case that another type of sex offender moves to precincts where such businesses open (for example, one who commits fewer outdoor crimes and/or who is also more sexually inhibited), we would also expect to find a reduction in street prostitution. Yet, our regressions in the potential victims channel do not endorse such a possibility (Table 6). Moreover, we also find a reduction in sex crimes using the complaint data set, suggesting that there was no displacement into indoor sex crimes.

Overall, while no test individually provides conclusive information about the presence or absence of a particular mechanism, we believe that, taken together, the different tests presented in this section provide evidence that is supportive of the potential criminals channel and would be difficult to reconcile with other mechanisms.

5. Conclusion

To the best of our knowledge, this paper presents the first causal estimates of the effect of adult entertainment establishments on sex crimes. Using high-frequency daily and weekly data for all NYC, we find that opening adult entertainment establishments reduces sex crimes by 13%. Furthermore, our results suggest that these effects are driven by potential customers who substitute sex crimes with services provided by adult entertainment businesses.

These results have several policy implications. First, while previous academic and policy research has focused on the role of deterrence policies, here we focused on an alternative tool—providing legal substitute services. Second, adult entertainment establishments appear to be a viable alternative to decriminalising prostitution. Indeed, their effect on rape is similar to that of decriminalising prostitution, but prostitution law is a contentious issue, regulation of these establishments is not. Third, the fact that these services are legal may explain why we do not find an increase in other types of crime. Fourth, the results show that providing substitute services may have positive externalities not only for sex workers but also for all women in the areas where these businesses opened.

Appendix A. Classification of Crimes in the 'Stop-and-Frisk' Data Set

The 'stop-and-frisk' data set classifies crime using the 113 categories listed in Table A1. We classified sex crimes using categories 7, 18, 77, 87 and 88. A possible concern could be whether sex crimes contain public lewdness crimes. Such crimes are connected to sex crimes but are considerably different from them. Yet, as Table A1 shows, such crimes are classified in category 76.

Table A1. *List of Crime Categories in Stop-and-Frisk Database.*

1	Abandonment of a child
2	Abortion
3	Absconding
4	Adultery
5	Aggravated assault
6	Aggravated harassment
7	Aggravated sexual abuse
8	Arson
9	Assault
10	Auto stripping
11	Bigamy
12	Bribe receiving
13	Bribery
14	Burglary
15	Coercion
16	Computer tampering
17	Computer trespass
18	Course of sexual conduct
19	CPSP
20	CPW
21	Creating a hazard
22	Criminal contempt
23	Criminal mischief
24	Criminal possession of a controlled substance
25	Criminal possession of computer material
26	Criminal possession of forged instrument
27	Criminal possession of marijuana
28	Criminal sale of a controlled substance
29	Criminal sale of marijuana
30	Criminal tampering
31	Criminal trespass
32	Custodial interference
33	Eaves dropping
34	Endanger the welfare of a child
35	Escape
36	Falsify business records
37	Forgery
38	Forgery of a VIN
39	Fortune telling
40	Fraud
41	Fraudulent accosting
42	Fraudulent making of an electronic access device
43	Fraudulently obtaining a signature

Table A1. *Continued*

44	Gambling
45	Grand larceny
46	Grand larceny auto
47	Harassment
48	Hazing
49	Hindering prosecution
50	Incest
51	Insurance fraud
52	Issue a false certificate
53	Issue a false financial statement
54	Issuing abortion articles
55	Jostling
56	Kidnapping
57	Killing or injuring a police animal
58	Loitering
59	Making graffiti
60	Menacing
61	Misapplication of property
62	Murder
63	Obscenity
64	Obstructing firefighting operations
65	Obstructing governmental administration
66	Offering a false instrument
67	Official misconduct
68	Petit larceny
69	Possession of burglar tools
70	Possession of eaves dropping devices
71	Possession of graffiti instruments
72	Prohibited use of a weapon
73	Promoting suicide
74	Prostitution
75	Public display of offensive sexual material
76	Public lewdness
77	Rape
78	Reckless endangerment
79	Reckless endangerment property
80	Refusing to aid a peace or police officer
81	Rent gouging
82	Resisting arrest
83	Reward official misconduct
84	Riot
85	Robbery
86	Self abortion
87	Sexual abuse
88	Sexual misconduct
89	Sexual performance by a child
90	Sodomy
91	Substitution of children
92	Tampering with a public record
93	Tampering with a consumer product
94	Tampering with private communications
95	Terrorism
96	Theft of services
97	Trademark counterfeiting
98	Unlawfully dealing with fireworks
99	Unauthorised recording
100	Unauthorised use of a vehicle
101	Unauthorised use of a computer
102	Unlawful assembly

Table A1. *Continued*

103	Unlawful duplication of computer material
104	Unlawful possession of radio devices
105	Unlawful use of a credit card, debit card
106	Unlawful use of secret scientific material
107	Unlawful wearing of a body vest
108	Unlawful imprisonment
109	Unlawfully dealing with a child
110	Unlawfully use slugs
111	Vehicular assault
112	Other
113	Forcible touching

Notes: This table shows all the 113 categories of crimes in the 'stop-and-frisk' data set.

Appendix B. Sex Crimes by Hour and Day

This section presents descriptive statistics for sex crimes and adult entertainment establishment openings.

Table B1. *Total Number of Sex Crimes by Day of the Week and Time of the Day.*

	Sex crimes (per day)				
		Morning	Afternoon	Evening	Night
	Entire day (1)	6 a.m. to 12 p.m. (2)	12 p.m. to 6 p.m. (3)	6 p.m. to 12 a.m. (4)	12 a.m. to 6 a.m. (5)
Weekend	2,535	444	539	781	771
- Friday	1,046	253	243	322	228
- Saturday	745	78	157	253	257
- Sunday	744	113	139	206	286
Weekdays	4,943	1,567	1,154	1,359	863
Total	7,478	2,011	1,693	2,140	1,634

Notes: This table presents the distribution of sex crimes over weekdays and time of the day. Time of the day is divided into 4 shifts of 6 hours each: morning (6 a.m. to 12 p.m.), afternoon (12 p.m. to 6 p.m.), evening (6 p.m. to 12 a.m.) and night (12 a.m. to 6 p.m.).

Table B2. *Total Number of Openings by Day of the Week.*

	Openings (per day)
Weekend (Friday–Sunday)	90
- Friday	30
- Saturday	20
- Sunday	40
Weekdays (Monday–Thursday)	116

Notes: This table presents the number of openings of adult entertainment establishments by day of the week.

Appendix C. Geographic Evolution of Adult Entertainment Establishments by Precinct

Figures C1–C3 show the evolution at the daily level of adult entertainment establishments disaggregated at the borough level. Namely, Figure C1 presents such results for Brooklyn and

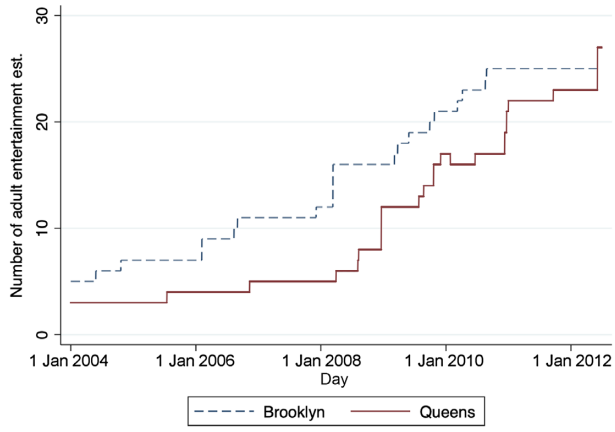

Fig. C1. *Evolution of Adult Entertainment Establishments from January 2004 to June 2012: Brooklyn and Queens.*
Notes: This figure shows the evolution of adult entertainment establishments in Brooklyn and Queens during the study period.

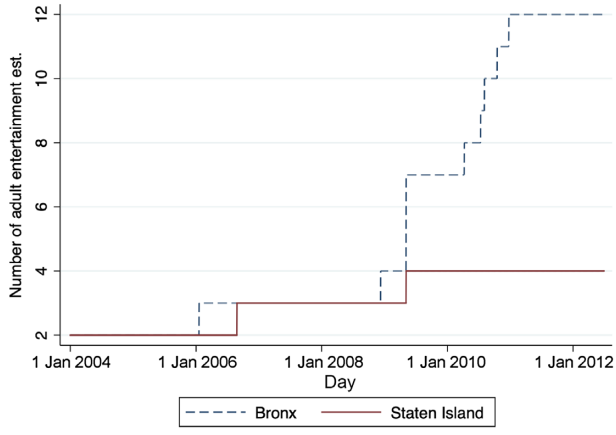

Fig. C2. *Evolution of Adult Entertainment Establishments from January 2004 to June 2012: The Bronx and Staten Island.*
Notes: This figure shows the evolution of adult entertainment establishments in The Bronx and Staten Island during the study period.

Queens, Figure C2 for The Bronx and Staten Island and Figure C3 for Manhattan and the whole New York City.

Figures C4–C6 show the evolution at the daily level of the fraction of adult entertainment establishments (with respect to the total) disaggregated at the borough level. Likewise, Figure C4 presents such results for Brooklyn and Queens, Figure C5 for The Bronx and Staten Island and Figure C6 for Manhattan and the whole New York City.

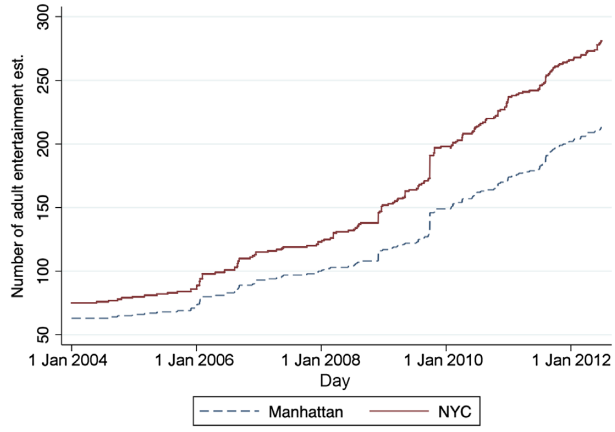

Fig. C3. *Evolution of Adult Entertainment Establishments from January 2004 to June 2012: Manhattan and NYC.*
Notes: This figure shows the evolution of adult entertainment establishments in Manhattan and NYC during the study period.

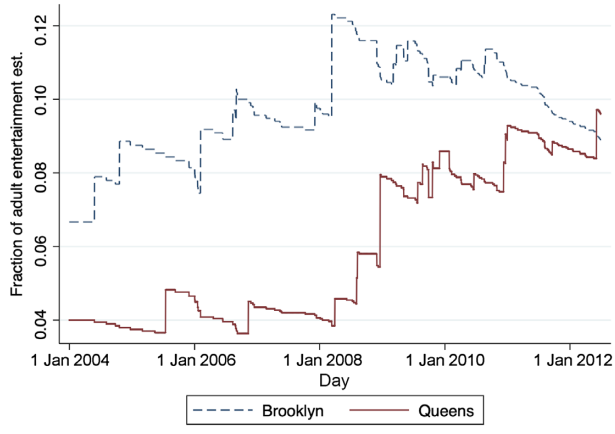

Fig. C4. *Evolution of the Fraction of Adult Entertainment Establishments (with Respect to the Total) from January 2004 to June 2012: Brooklyn and Queens.*
Notes: This figure shows the evolution of the fraction of adult entertainment establishments (with respect to the total) in Brooklyn and Queens during the study period.

The maps given in Figures C7 and C8 show the evolution of adult entertainment establishments during our sample period. The maps show that there has been a substantial increase in the number of these businesses, not only by boroughs, but even between precincts within the same borough.

Figure C9 shows the results of running our main specification but interacting our treatment variable with borough fixed effects. This figure depicts the estimated coefficient, and corresponding SE at the 90% level, of each interacted regressor. We see that Manhattan, Queens and Staten

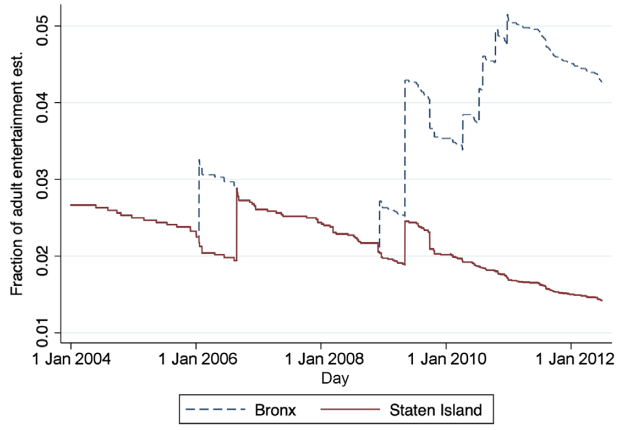

Fig. C5. *Evolution of the Fraction of Adult Entertainment Establishments (with Respect to the Total) from January 2004 to June 2012: The Bronx and Staten Island.*
Notes: This figure shows the evolution of the fraction of adult entertainment establishments (with respect to the total) in The Bronx and Staten Island during the study period.

Fig. C6. *Evolution of the Fraction of Adult Entertainment Establishments (with Respect to the Total) from January 2004 to June 2012: Manhattan.*
Notes: This figure shows the evolution of the fraction of adult entertainment establishments (with respect to the total) in Manhattan during the study period.

Island have negative estimated coefficients. Although, the estimated coefficient in Queens is not statistically significant. The estimated coefficient in Brooklyn is close to zero and not statistically significant. The estimated coefficient in The Bronx is positive and not statistically significant. It is encouraging to find that at least two boroughs are driving our results and that Manhattan is one of those.

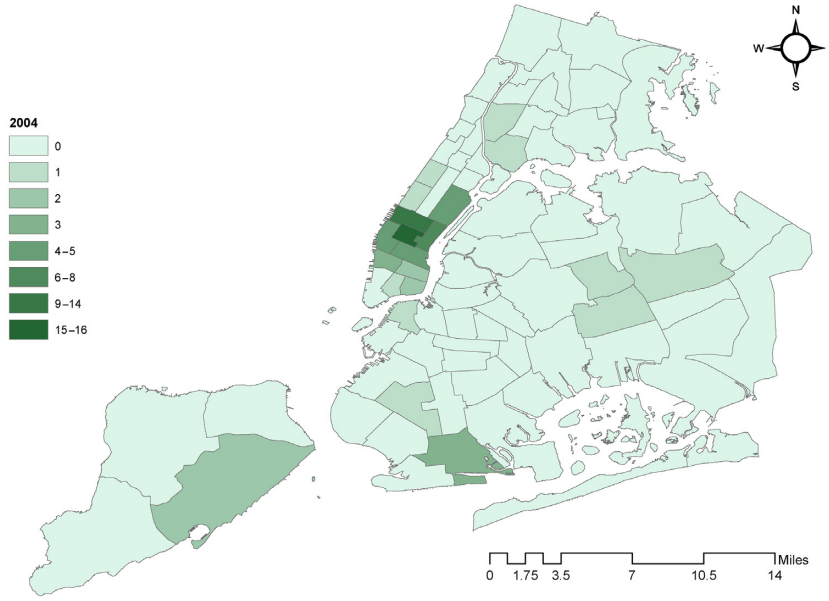

Fig. C7. *Geographic Distribution of Adult Entertainment Establishments in NYC in 2004.*
Notes: This figure shows the geographic distribution of adult entertainment establishments in NYC on 1 January 2004, the first day of our sample period.

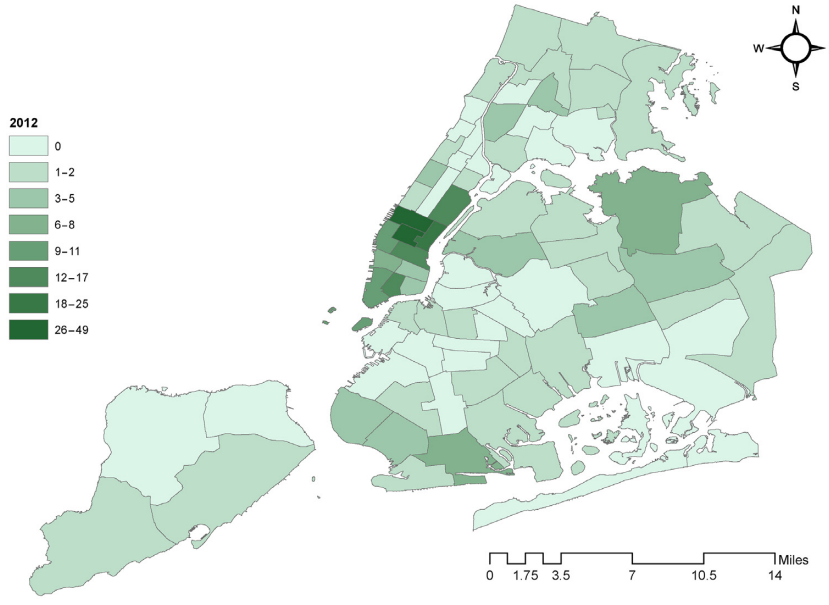

Fig. C8. *Geographic Distribution of Adult Entertainment Establishments in NYC in 2012.*
Notes: This figure shows the adult entertainment establishments in NYC on 29 June 2012, the last day of our sample period.

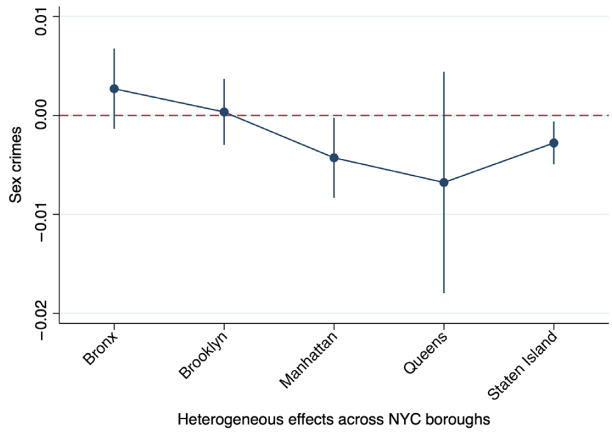

Fig. C9. *Heterogeneous Effects Across Boroughs.*
Notes: This figure shows the estimated coefficient, and corresponding SE at the 90% level, of running our main regression but interacting our main regressor with borough fixed effects.

Appendix D. Representability of 'Stop-and-Frisk' Data Set: Summary Statistics

Appendix D presents summary statistics for data on sex crimes from both the Stop and Frisk and Complaint dataset.

Table D1. *Total Number of Sex Crimes. Summary Statistics.*

	(1) Stop and frisk	(2) Complaint disaggregated	(3) Combined data set	(4) Complaint aggregated
Observations	238,931	238,931	238,931	693
Mean	0.0312977	0.0804751	0.1117729	76.34921
SD	0.3405145	0.3022442	0.4647225	40.44663

Notes: This table presents descriptive statistics for the three data sets used to measure sex crimes: 'stop-and-frisk', complaint disaggregated and complaint aggregated. Furthermore, column (3) displays the descriptive statistics for the *combined data set* resulting from joining both 'stop-and-frisk' and complaint disaggregated. This latter data set is used in Subsection 3.4.1

Table D2. *Total Number of Sex Crimes by Borough and Season. Absolute and Relative Frequencies.*

Panel A: by borough

	Stop and frisk	Complaint disaggregated	Complaint aggregated
The Bronx	454 (6.07%)	3,238 (16.84%)	9,790 (18.5%)
Brooklyn	1,464 (19.58%)	5,746 (29.88%)	17,100 (32.32%)
Manhattan	3,844 (51.4%)	4,849 (25.22%)	11,890 (22.47%)
Queens	1,646 (22.01%)	4,806 (24.99%)	12,254 (23.16%)
Staten Island	70 (0.94%)	589 (3.06%)	1,876 (3.55%)
Total	7,478	19,228	52,910

Panel B: by season

	Stop and frisk	Complaint disaggregated
Winter	1,554 (20.78%)	4,896 (25.46%)
Spring	1,894 (25.33%)	5,551 (28.87%)
Summer	2,115 (28.28%)	4,634 (24.1%)
Fall	1,915 (25.6%)	4,147 (21.57%)
Total	7,478	19,228

Notes: Panels A and B present the absolute frequencies of sex crimes in our sample period by borough and season, respectively, for the three data sets used: 'stop-and-frisk', complaint disaggregated and complaint aggregated. Relative frequencies in parentheses.

Appendix E. Results Using Double-Lasso Techniques

E.1. Main Results with Different Functional Forms

This section presents our main results using Double-Lasso techniques.

Table E1. *Main Results Using Double-Lasso Techniques.*

Variables	(1) log(1 + y)	(2) IHS	(3) Levels	(4) LPM
Adult entertainment est.	−0.00242**	−0.00483**	−0.00444*	−0.00279**
	(0.00119)	(0.00237)	(0.00229)	(0.00129)
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Precinct trends	Double Lasso	Double Lasso	Double Lasso	Double Lasso

Notes: This table presents the results of running specification (1) with different functional forms of the dependent variable and using double-Lasso-selected precinct-year trends. In this specification, Adult Enter_{pt} denotes the total number of adult entertainment establishments in precinct p on day t. This variable cumulates all the opened businesses up to day t. We denote by X_{pt} the set of seasonal and geographic control variables: precinct, year, month, day-of-the-week, day-of-the-year and holiday indicators, and geographic (at the precinct level) year trends. All SEs are clustered at the precinct level. Note that besides the classical year and month fixed effects, our daily specification allows us to include day-of-the-week, day-of-the-year and holiday fixed effects to capture deeper variation due to timing factors. In each column we consider a different functional form of the dependent variable: logarithm of one plus the number of sex crimes (column (1)), IHS of sex crimes (column (2)), levels (column(3)) and a binary variable taking value 1 if sex crimes are positive and 0 otherwise (column (4)). Results are stable across specifications. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Appendix F. Sensitivity to Model Specification Changes and to the Definition of the Dependent Variable

This section introduces results from different additional specification to explore the robustness of our results.

Table F1. *Additional Specifications.*

	(1) Log sex crime	(2) Log sex crime	(3) Log sex crime	(4) Log sex crime by men	(5) IHS of sex crime by men
Adult entertainment est.	−0.00414*	−0.00424*	−0.00439*	−0.00410*	−0.00820*
	(0.00220)	(0.00237)	(0.00245)	(0.00225)	(0.00450)
Observations	238,931	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y	Y
Day-of-the-year FEs		Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y	Y
Exact day FEs	Y				
Precinct-month trends		Y			
Precinct-year-month trends			Y		

Notes: This table presents the results of running specification (1) with different controls and definition of the dependent variable. Column (1) includes exact day FEs, column (2) adds precinct-month trends, column (3) precinct-year-month trends. Finally, columns (4) and (5) respectively use sex crimes only committed by men in $\log(1+y)$ and IHS. Each column is a different regression and includes a set of seasonal and geographic control variables. Namely, precinct, year, month, day-of-the-week, day-of-the-year and holiday indicators, and geographic (at the precinct level) year trends. All SEs are clustered at the precinct level. Results are robust across specifications. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table F2. *Robustness Check.*

	(1) IHS	(2) Probit	(3) LPM	(4) Levels
Adult entertainment est.	−0.00510*	−0.0154	−0.00453*	−0.00754*
	(0.00279)	(0.0106)	(0.00231)	(0.00433)
Observations	238,931	235,828	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y

Notes: This table presents the results of running specification (1) with different functional forms of the dependent variable. Column (1) uses IHS. Columns (2) and (3) use a binary variable taking value 1 if sex crimes are positive and 0 otherwise; column (2) runs specification (1) in a probit framework, while column (3) runs it in a linear probability model. Column (4) makes use of the dependent variable in levels. Each column is a different regression and includes a set of seasonal and geographic control variables. Namely, precinct, year, month, day-of-the-week, day-of-the-year and holiday indicators, and geographic (at the precinct level) year trends. All SEs are clustered at the precinct level. Results are robust across specifications and close to standard levels of significance for column (2). Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Appendix G. Weekly Regression

In Table G1 we present the results of the baseline regression but at a weekly frequency. Hence, we exchanged all the fixed effects varying daily for week fixed effects. The results are negative and statistically significant for both log, the IHS transformation and in levels.

Table G1. *Regression at a Weekly Frequency.*

Variables	(1) log(1 + y)	(2) IHS	(3) Levels	(4) LPM	(5) Probit
Adult entertainment est.	−0.0172*	−0.0345*	−0.0529*	−0.0113**	−0.0262*
	(0.00884)	(0.0177)	(0.0302)	(0.00551)	(0.0146)
Observations	34,034	34,034	34,034	34,034	33,592
Clustered variance at the precinct level	Y	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y	Y
Week FEs	Y	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y	Y

Notes: This table presents the results of running specification (1) at a weekly frequency. Column (1) uses the dependent variable in logs, column (2) in IHS and column (3) in levels. Column (4) and (5) respectively consider an LPM and probit regression of specification (1), where the dependent variable is a binary variable taking value 1 if sex crimes are positive and 0 otherwise. Each column is a different regression and includes a set of seasonal and geographic control variables. Namely, precinct, year, month, day-of-the-week, day-of-the-year and holiday indicators, and geographic (at the precinct level) year trends. All SEs are clustered at the precinct level. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Appendix H. Results in Levels

This section explores our main results with the dependent variable in levels.

Table H1. *Main Results in Levels.*

	(1) Levels	(2) Levels	(3) Levels	(4) Levels
Adult entertainment est.	−0.00421**	−0.00421**	−0.00421**	−0.00754*
	(0.00180)	(0.00180)	(0.00180)	(0.00433)
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs		Y	Y	Y
Holiday FEs			Y	Y
Precinct trends				Y

Notes: This table presents the results of running specification (1) with the dependent variable in levels. The dependent variable is the number of sex crimes committed in precinct p on a given day t. The variable Adult Enter$_{pt}$ denotes the total number of adult entertainment establishments in precinct p on day t. This variable cumulates all the opened businesses up to day t. We denote by X_{pt} the set of seasonal and geographic control variables: precinct, year, month, day-of-the-week, day-of-the-year and holiday indicators, and geographic (at the precinct level) year trends. All SEs are clustered at the precinct level. Note that besides the classical year and month fixed effects, our daily specification allows us to include day-of-the-week, day-of-the-year and holiday fixed effects to capture deeper variation due to timing factors. In each column we add a different control. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Appendix I. Event Study Evidence, Further Analysis

In Figure I1 we present the results of running an event study analysis on the number of establishments using the first opening in each precinct. If the first opening predicts future openings, this analysis would highlight it. We do not find evidence supporting the notion that the first opening predicts future ones. This analysis is similar to that developed in Gagliarducci and Manacorda (2020).

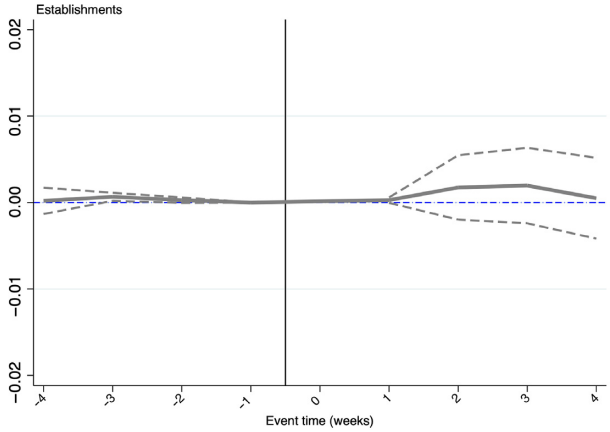

Fig. I1. *Event Study: First Opening.*
Notes: This figure shows the results of running an event study analysis on the number of establishments using the first opening in each precinct at the weekly level. We find no evidence supporting the notion that the first opening predicts future ones.

Appendix J. Representability of the 'Stop-and-Frisk' Data Set: Regression Results

This section introduces different robustness checks to explore the representability of the Stop-and-Frisk dataset with respect to the Complaint dataset.

Table J1. *Effect of Adult Entertainment Establishments on Sex Crimes Using the Disaggregated Complaint Data Set and Representability of the 'Stop-and-Frisk' Data at the Yearly Level Using Both Complaint Data Sets.*

	(1) Log sex crimes	(2) IHS sex crimes	(3) Sex crimes stop & frisk	(4) Sex crimes stop & frisk	(5) Sex crimes stop & frisk	(6) Sex crimes stop & frisk
Adult entertainment est.	−0.00660*	−0.0132*				
	(0.00395)	(0.00790)				
Sex crimes, agg. complaints			0.193*	0.265*		
			(0.106)	(0.139)		
Sex crimes, disagg. complaints					0.121**	0.205***
					(0.0499)	(0.0562)
Observations	238,931	238,931	693	693	693	693
Clustered variance at the precinct level	Y	Y	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y
Month FEs	Y	Y	N/A	N/A	N/A	N/A
Day-of-the-week FEs	Y	Y	N/A	N/A	N/A	N/A
Day-of-the-year FEs	Y	Y	N/A	N/A	N/A	N/A
Holiday FEs	Y	Y	N/A	N/A	N/A	N/A
Precinct trends	Y	Y		Y		Y

Notes: Columns (1) and (2) of this table present the results of running specification (1) also using sex crimes from the NYPD's historical complaints disaggregated data set. Column (1) uses the logarithm of one plus the number of sex crimes as the dependent variable, while column (2) uses the IHS. Columns (3) and (4) of this table respectively present results of running specification (3) (note that the main regressor is the complaint aggregated data set) without and with precinct-year trends. Columns (5) and (6) present results of running specification (3) without and with precinct-year trends but for the complaint disaggregated data set (collapsed at the yearly level). The results are comparable to former ones. N/A denotes that a certain fixed effect cannot be included due to the frequency of the regression model. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table J2. *Representability of the 'Stop-and-Frisk' Data Using the Disaggregated Complaint Sex Crimes at the Daily Level.*

	(1) Sex crimes stop & frisk	(2) Sex crimes stop & frisk
Sex crimes, disagg. complaints	0.0383***	0.0391***
	(0.0115)	(0.0120)
Observations	238,931	238,931
Clustered variance at the precinct level	Y	Y
Precinct FEs	Y	Y
Year FEs	Y	Y
Month FEs	Y	Y
Day-of-the-week FEs	Y	Y
Day-of-the-year FEs	Y	Y
Holiday FEs	Y	Y
Precinct trends		Y

Notes: This table explores the correlation between our main dependent variable and sex crimes from the disaggregated NYPD's historical complaints at the daily level. These two different measures of sex crimes are positively significantly correlated. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Appendix K. Sensitivity Test: Urban Development

This section presents results controlling for urban development proxy variables.

Table K1. *Main Results Using Urban Development Controls, Logs.*

Variables:	(1) log(1 + y)	(2) log(1 + y)	(3) log(1 + y)	(4) log(1 + y)
Panel A: without precinct-year trends				
Adult entertainment est.	−0.00214**	−0.00198**	−0.00261*	−0.00258*
	(0.000948)	(0.000886)	(0.00154)	(0.00151)
Panel B: with precint-year trends				
Adult entertainment est.	−0.00397*	−0.00399*	−0.00379*	−0.00378**
	(0.00217)	(0.00206)	(0.00201)	(0.00185)
Precinct trends	Y	Y	Y	Y
Panel C: double Lasso selected precinct year trends				
Adult entertainment est.	−0.00242**	−0.00233**	−0.00326*	−0.00337*
	(0.00119)	(0.00113)	(0.00180)	(0.00175)
Precinct trends	Double Lasso	Double Lasso	Double Lasso	Double Lasso
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Urban development controls		Apple	Starbucks	Both

Notes: This table presents the results of running specification (1) in logs including Apple Stores and Starbucks establishments as control variables for urban development. Panels A, B and C respectively present the results without trends, with trends and with double-Lasso-selected trends. Moreover, Column (1), (2), (3) and (4) respectively present the results without urban development controls, only with Apple Stores, only with Starbucks and with both establishments. Results are robust to the inclusion of such controls. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table K2. *Main Results Using Urban Development Controls, IHS.*

Variables:	(1) IHS	(2) IHS	(3) IHS	(4) IHS
Panel A: without precinct-year trends				
Adult entertainment est.	−0.00429**	−0.00395**	−0.00522*	−0.00515*
	(0.00190)	(0.00177)	(0.00307)	(0.00303)
Precinct trends				
Panel B: with precinct-year trends				
Adult entertainment est.	−0.00795*	−0.00798*	−0.00757*	−0.00755**
	(0.00434)	(0.00413)	(0.00402)	(0.00370)
Precinct trends	Y	Y	Y	Y
Panel C: with double-Lasso selected precinct-year trends				
Adult entertainment est.	−0.00483**	−0.00465**	−0.00652*	−0.00673*
	(0.00237)	(0.00226)	(0.00360)	(0.00349)
Precinct trends	Double Lasso	Double Lasso	Double Lasso	Double Lasso
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Urban development controls		Apple	Starbucks	Both

Notes: This table presents the results of running specification (1) in IHS including Apple Stores and Starbucks establishments as control variables for urban development. Panels A, B and C respectively present the results without trends, with trends and with double-Lasso-selected trends. Moreover, columns (1), (2), (3) and (4) respectively present the results without urban development controls, only with Apple Stores, only with Starbucks and with both establishments. Results are robust to the inclusion of such controls. Clustered SEs at the precinct level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table K3. *Main Results Using Urban Development Controls, Levels.*

Variables:	(1) Levels	(2) Levels	(3) Levels	(4) Levels
Panel A: without precinct-year trends				
Adult entertainment est.	−0.00421**	−0.00393**	−0.00488*	−0.00483*
	(0.00180)	(0.00169)	(0.00282)	(0.00279)
Panel B: with precinct year trends				
Adult entertainment est.	−0.00754*	−0.00756*	−0.00722*	−0.00721*
	(0.00433)	(0.00417)	(0.00406)	(0.00382)
Precinct trends	Y	Y	Y	Y
Panel C: double Lasso selected precinct-year trends				
Adult entertainment est.	−0.00444*	−0.00430*	−0.00596*	−0.00613*
	(0.00229)	(0.00219)	(0.00341)	(0.00333)
Precinct trends	Double Lasso	Double Lasso	Double Lasso	Double Lasso
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Urban development controls		Apple	Starbucks	Both

Notes: This table presents the results of running specification (1) in levels including Apple Stores and Starbucks establishments as control variables for urban development. Panels A, B and C respectively present the results without trends, with trends and with double-Lasso-selected trends. Moreover, columns (1), (2), (3) and (4) respectively present the results without urban development controls, only with Apple Stores, only with Starbucks and with both establishments. Results are robust to the inclusion of such controls. Clustered SEs at the precinct level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table K4. *Main Results Using Urban Development Controls, LPM.*

Variables:	(1) LPM	(2) LPM	(3) LPM	(4) LPM
Panel A: without precinct-year trends				
Adult entertainment est.	−0.00234**	−0.00213**	−0.00286*	−0.00282*
	(0.00102)	(0.000955)	(0.00163)	(0.00161)
Panel B: with precinct-year trends				
Adult entertainment est.	−0.00453*	−0.00455**	−0.00433**	−0.00432**
	(0.00231)	(0.00218)	(0.00213)	(0.00195)
Precinct trends	Y	Y	Y	Y
Panel C: double Lasso selected year trends				
Adult entertainment est.	−0.00279**	−0.00268**	−0.00367*	−0.00380**
	(0.00129)	(0.00122)	(0.00192)	(0.00186)
Precinct trends	Double Lasso	Double Lasso	Double Lasso	Double Lasso
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Urban development controls		Apple	Starbucks	Both

Notes: This table presents the results of running specification (1) including Apple Stores and Starbucks establishments as control variables for urban development. The dependent variable is a binary variable taking value 1 if sex crimes are positive and 0 otherwise. Panels A, B and C respectively present the results without trends, with trends and with double-Lasso-selected trends. Moreover, columns (1), (2), (3) and (4) respectively present the results without urban development controls, only with Apple Stores, only with Starbucks and with both establishments. Results are robust to the inclusion of such controls. In addition, since the results hold with the aforementioned binary version of the dependent variable, it suggests robustness to urban development controls is not driven by extreme values of the dependent variable. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Appendix L. Randomisation Inference

This section presents results for randomisation inference checks.

Fig. L1. *Randomisation Inference Stratified at the Borough Level with the Estimated Coefficient.*
Notes: This figure presents the results of randomising the number of opened establishments stratified at the borough level with one thousand permutations. The red vertical line represents the estimated coefficient in our main specification.

Appendix M. List of Larger Precincts in Potential Victims Channel

The 77 precincts are grouped into 22 big precincts according to geographic proximity (see Table M1). For instance, precincts 1, 5 and 7 were grouped together, as were precincts 6, 9, 10 and 13.

Table M1. *List of Big Precincts to Test the Potential Victims Channel.*

Big precinct	Formed by precincts
1	1, 5 and 7
2	6, 9, 10 and 13
3	14, 17 and 18
4	19, 20, 22 and 24
5	23, 25, 26 and 28
6	30, 32, 33 and 34
7	40, 41, 42, 43 and 44
8	46, 48 and 52
9	45, 47, 49 and 50
10	60, 61, 62 and 68
11	66, 70 and 72
12	71, 76, 77 and 78
13	79, 81, 84 and 88
14	63, 67, 69 and 73
15	83, 90 and 94
16	104, 108 and 114
17	75, 102 and 106
18	110, 112 and 115
19	100 and 101
20	103, 105 and 113
21	107, 109 and 111
22	120, 121, 122 and 123

Notes: This table lists the original precincts that comprise each *big* precinct to explore the potential victims channel.

Appendix N. Mechanisms Behind the Effect of Adult Entertainment Establishments on Sex Crimes: Potential Victims Channel

In this section we consider the possibility that women are simply avoiding precincts with at least one adult entertainment establishment in favour of those that have none. If this is the case, we should observe an increase in the number of sex crimes in these latter precincts. Indeed, if the estimated negative coefficient is due only to fewer women passing through precincts with at least one establishment, it implies that we should observe an increase in the bordering precincts that do not have any such establishments. Therefore, we restrict the sample to precincts with no adult establishments in bordering precincts, where one of these bordering precincts experienced at least one opening of an establishment at a later point in time. If it is true that the reduction in sex crimes we observe is merely due to women avoiding adult entertainment establishments, we should find that increasing the number of these establishments increases sex crimes in bordering precincts that do not have an adult entertainment establishment.

We therefore consider a specification like regression model (1) but where the dependent variable is the number of sex crimes that occurred in the bordering precincts; we also add two explanatory variables. The first is a binary variable taking value 1 if there is no adult entertainment establishment in a bordering precinct and 0 otherwise. The second is the interaction between this

Table N1. *Potential Victims Channel.*

	(1) Log bordering precincts	(2) IHS bordering precincts	(3) Log bordering precincts	(4) IHS bordering precincts
Adult entertainment est.	−0.00857	−0.0171	−0.00857	−0.0171
	(0.00718)	(0.0144)	(0.00699)	(0.0140)
Dummy no adult enter. est. in bordering precinct	0.00275	0.00550	0.00275	0.00550
	(0.00752)	(0.0150)	(0.00497)	(0.00994)
Interaction	0.0158	0.0315	0.0158	0.0315
	(0.0107)	(0.0214)	(0.0146)	(0.0292)
Observations	77,575	77,575	77,575	77,575
Clustered variance at the precinct level	Y	Y	Wild	Wild
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y

Notes: This table presents the results for a regression model similar to (1) but where the dependent variable is the number of sex crimes, either in logs or IHS, that occurred in the bordering precincts; we also add two explanatory variables. The first is a dummy variable taking value 1 if there is no adult entertainment establishment in a bordering precinct. The second is the interaction between this dummy and the number of adult entertainment establishments in the precinct of interest. If women are avoiding precincts with adult entertainment establishments, the interaction should be statistically significant and positive. In other words, sex crimes would be moving from precincts with adult establishments to those without them. The results do not support this hypothesis. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

binary variable and the number of adult entertainment establishments in the precinct of interest. If women are avoiding precincts with adult entertainment establishments, the interaction should be statistically significant and positive. In other words, sex crimes would be moving from precincts with adult establishments to those without them.

Table N1 presents the results of this specification. Columns (1) and (3) present the results of our logarithmic transformation respectively using regular clustered errors at the precinct level and wild cluster bootstrap (since the number of considered precincts decreases in this case). Columns (2) and (4) repeat the same analysis but for IHS. We find that the estimated coefficient is not statistically significant in any of our four specifications.[51]

A plausible explanation could be that women avoid precincts with adult entertainment establishments only at night. If this is the case, it may be that our previous specifications find no empirical evidence only because they are not separating sex crimes happening at night from those happening during the day. To address this issue, we run the previous specifications separating sex crimes according to the time of day. Table N2 separates sex crimes that occurred at night from those occurred during the day. The reasoning behind running these regressions is identical to the previous ones but applied at night.

As a benchmark, column (1) of Table N2 presents the results of using only the number of establishments (i.e., with neither a fixed effect for crimes committed at night nor the interaction between such a fixed effect and the number of establishments). Columns (2) and (3) of Table N2 report the coefficients of running this regression using our usual logarithmic transformation and

[51] Likewise, the results of this table support the hypothesis that sex crimes are not moving to bordering precincts.

Table N2. *Potential Victims Channel.*

	(1) Log big precincts	(2) Log big precincts	(3) IHS big precincts	(4) Log big precincts	(5) Log big precincts	(6) IHS big precincts
Adult entertainment est.	−0.00368***	−0.00287**	−0.00574**	−0.00368**	−0.00287*	−0.00574*
	(0.00122)	(0.00121)	(0.00243)	(0.00179)	(0.00164)	(0.00328)
Dummy night		0.00616**	0.0123**		0.00616***	0.0123***
		(0.00282)	(0.00564)		(0)	(0)
Interaction night		−0.00162***	−0.00324***		−0.00162**	−0.00324**
		(5.54e−05)	(0.000111)		(0.000695)	(0.00139)
Observations	136,532	136,532	136,532	136,532	136,532	136,532
Clustered variance at the precinct level	Y	Y	Y	Wild	Wild	Wild
Precinct FEs	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y	Y	Y

Notes: This table presents results for the baseline regression, specification (1), using sex crimes either in logs or IHS, bigger precincts and separating the day into two halves: day and night. Precincts were chosen according to their geographic distance. A complete list of the new precincts can be found in the Appendix Section A. If women are avoiding precincts where adult entertainment establishments open only at night, we should find either a statistically negative but smaller estimated coefficient in absolute value, a statistically positive coefficient or a coefficient that is statistically equal to zero for the main regressor and its interaction with the dummy variable taking value 1 at night. In columns (2) and (4) these estimated coefficients are statistically negative and their sum is larger in absolute value than those in our baseline regression or benchmark (columns (1) and (3), respectively). The results are robust to using wild cluster-bootstrap methods. This evidence rejects the potential victims channel. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

the IHS, respectively. Columns (3) and (4) of Table N2 repeat the same analysis using wild cluster-bootstrap methods due to the low number of clusters in this case.

If women avoid precincts with adult establishments at night, we should find that the estimated coefficient of the interaction term is either statistically significant and positive, or not statistically significant. In fact, if the decrease in sex crimes is due to women avoiding precincts with establishments at night, this would imply that at night sex crimes decrease in precincts with establishments but increase (or do not change) in other precincts. Therefore, the total effect of such establishments in larger precincts at night should be either positive or insignificant. In all four columns, the coefficient of the interaction term is statistically negative, suggesting that a decline in potential victims at night is not the main channel.

Table N3 repeats the regressions of Table N1 separating sex crimes happening at night from those happening during the day. In these regressions we are interested in the coefficient of the triple interaction between adult entertainment establishments, the dummy variable taking a value of 1 if there is no adult entertainment establishment in a bordering precinct and the dummy variable taking a value of 1 for sex crimes committed at night. For ease of comparison, columns (1) and (4) respectively present the results of running the model using only the number of establishments and the fixed effect and interaction (as in Table 7) for regular clustered errors at the precinct level and wild cluster-bootstrap clustered errors at the precinct level, respectively. Columns (2) and (3) present the results of running the whole model respectively for our logarithmic transformation and the IHS with regular clustered errors at the precinct level. Columns (4) and (5) repeat these computations using wild cluster-bootstrap clustered errors at the precinct level. The level of significance of the coefficient of interest (i.e., triple interaction) is shown in the table as the '*p*-value'. Moreover, the row '*p*-value joint effect' shows the *p*-values associated with testing whether the total effect (i.e., the sum of the coefficients associated with our main regressor and its interactions) is zero. In our four regressions (i.e., columns (2), (3), (4) and (5)) the coefficient of interest is statistically insignificant. These findings do not support the hypothesis that women avoid precincts that have adult entertainment establishments.

There might be the concern that adult entertainment establishments reduce sex crimes by 'displacing' such crimes to indoor establishments. In particular, this could be the case for minor sexual crimes such as sexual misconduct. To this extent, we divide sex crimes into felonies (rape and aggravated sexual abuse) versus the rest of sex crimes considered. We refer to these two categories as felony sex crimes and minor sex crimes. Table N4 shows the results for our main specification using felonies and minors as dependent variables. The findings show that adult entertainment establishments decrease felony sex crimes, suggesting that adult entertainment establishments did not displace crime to indoor establishments.

Table N3. *Potential Victims Channel.*

	(1) Log bordering precincts	(2) Log bordering precincts	(3) IHS bordering precincts	(4) Log bordering precincts	(5) Log bordering precincts	(6) IHS bordering precincts
Adult entertainment est.	−0.00424	−0.00290	−0.00579	−0.00424	−0.00290	−0.00579
	(0.00378)	(0.00430)	(0.00859)	(0.00331)	(0.00552)	(0.0110)
Dummy night		0.00546**	0.0109**		0.00546*	0.0109*
		(0.00249)	(0.00497)		(0.00312)	(0.00624)
Interaction night & no adult enter. est. in bordering precinct		−0.000384	−0.000768		−0.000384	−0.000768
		(0.00416)	(0.00831)		(1.304×10^{19})	(1.304×10^{19})
Dummy no adult enter. est. in bordering precinct	0.00211	0.00211	0.00423	0.00211	0.00211	0.00423
	(0.00416)	(0.00416)	(0.00832)	(0.00835)	(0.00835)	(0.0167)
Interaction night		−0.00270	−0.00540		−0.00270	−0.00540
		(0.00257)	(0.00514)		(0.00211)	(0.00421)
Interaction no adult enter. est. in bordering precinct	0.00781	0.00800	0.0160	0.00781	0.00800	0.0160
	(0.00553)	(0.00641)	(0.0128)	(0.00665)	(0.0104)	(0.0207)
Observations	155,150	155,150	155,150	155,150	155,150	155,150
Clustered variance at the precinct level	Y	Y	Y	Wild	Wild	Wild
Precinct FEs	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y	Y	Y
p-value joint effect		0.737	0.737		1	1
p-value		0.927	0.927		1	1

Notes: This table presents the results for a regression model similar to (1) but where the dependent variable is the number of sex crimes in levels that occurred in the bordering precincts, separating the day into two halves: day and night; we also add two explanatory variables. The first is a dummy variable taking value 1 if there is no adult entertainment establishment in a bordering precinct. The second is the interaction between this dummy and the number of adult entertainment establishments in the precinct of interest. We also interact these two variables with a dummy variable taking value 1 at night. If women are avoiding precincts with adult entertainment establishments at night, the interaction should be statistically significant and positive. In other words, sex crimes would be moving from precincts with adult establishments to those without them. The results are robust to using wild cluster-bootstrap methods. The results do not support this hypothesis. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table N4. *Potential Victims Channel.*

Variables:	(1) Log felonies	(2) IHS felonies	(3) Log minors	(4) IHS minors
Number of adult entertain. est.	−0.00391**	−0.00502**	−0.000294	−0.000379
	(0.00190)	(0.00244)	(0.000466)	(0.000597)
Observations	238,931	238,931	238,931	238,931
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y

Notes: Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Appendix O. Mechanisms Behind the Effect of Adult Entertainment Establishments on Sex Crimes: Potential Criminals Channel

In this section we run the same analysis as in Subsection 4.3 but dividing the day into two equal halves: morning (6 a.m. to 6 p.m.) and night (6 p.m. to 6 a.m.). So now the time unit is a half-day. Furthermore, we create a dummy variable that takes a value of 1 at night and 0 in the morning. Finally, we saturate the main specification including the interaction between the number of establishments and this dummy.

Table O1 presents the results of this specification for the logarithmic transformation and the IHS, respectively. The effect of the number of establishments is still negative, and the coefficient on the night/day dummy variable is positive, showing that at night there are more sex crimes, as expected. The coefficient of the interaction term is negative, but it is not statistically significant at standard levels. Yet, by comparing the size of the coefficients in columns (1) to (2) to those in columns (3) to (4), we can observe that most of the effect is driven by the effect of adult entertainment establishments at night. These results suggest that the effect of adult entertainment establishments is mostly driven at times when these establishments are open for business.

Table O1. *Potential Criminals Channel.*

	(1) Log	(2) Log	(3) IHS	(4) IHS
Number of adult entertain. est.	−0.00214*	−0.00132*	−0.00427*	−0.00263*
	(0.00117)	(0.000761)	(0.00233)	(0.00152)
Dummy night		0.00183		0.00365
		(0.00115)		(0.00231)
Interaction		−0.00164		−0.00328
		(0.00100)		(0.00201)
Observations	477,862	477,862	477,862	477,862
Clustered variance at the precinct level	Y	Y	Y	Y
Precinct FEs	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y
Month FEs	Y	Y	Y	Y
Day-of-the-week FEs	Y	Y	Y	Y
Day-of-the-year FEs	Y	Y	Y	Y
Holiday FEs	Y	Y	Y	Y
Precinct trends	Y	Y	Y	Y
p-value joint effect		0.0718		0.0718
p-value		0.106		0.106

Notes: This table presents specification (1), separating the day into two halves, day and night, saturating the specification including both the fixed effect for night (day is the base group)—day (from 6 a.m. to 6 p.m.) and night (from 6 p.m. to 6 a.m.)—and its interaction with the main regressor. The dependent variable is either in logs (columns (1) and (2)) or IHS (columns (3) and (4)). Columns (1) and (3) respectively present the results of the specification without the interactions as a benchmark for logs and IHS. Columns (2) and (4) respectively present the results of the fully saturated model for logs and IHS. For both functional forms, we find that the total effect at night is statistically negative at the 10% level and the interaction is marginally statistically (p-value = 10.6%) significant. These results imply that we cannot reject the potential criminals channel. In Table 7, we better investigate this channel, dividing the day into four quarters. Clustered SEs at the precinct level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

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Additional Supporting Information may be found in the online version of this article:

Replication Package

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