Do Liquor Stores Increase Crime and Urban Decay? Evidence from Los Angeles[†]

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Abstract

Liquor stores are a common sight in many distressed neighborhoods. But does the presence of liquor stores actually *cause* crime and urban decay – as suggested by situational models of criminal activity – or are liquor stores more likely to open in declining neighborhoods? In this paper, I use administrative data on the locations of alcohol outlets in the city of Los Angeles, merged with detailed incident crime reports and property transactions, to evaluate the effects of alcohol outlet openings and closings on local crime rates and property values. I specify an event-study framework to measure the changes in violent and property crimes just after the opening and closing of outlets. Both types of crime increase following an outlet opening, with larger effects in the immediate vicinity of the new outlet. The overall impact of new outlet openings is driven by effects in low socioeconomic status (SES) neighborhoods: openings in high-SES neighborhoods only have small effects on property crime. Outlet closings have smaller impacts, on average, although there is some indication that the closing of an outlet in a low-SES neighborhood reduces crime. A parallel analysis of residential property transaction values find that outlets located in low-SES neighborhoods are seen as a disamenity, whereas outlets located in high-SES neighborhoods are valued by homeowners. Overall, it appears that additional alcohol outlets – especially in lower-SES neighborhoods – contribute to both crime and urban decay.

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1 Introduction

Do increases in alcohol outlet density increase crime? The media and the general public certainly think so: One CBS 5 Investigates report documented how liquor stores that stay open late at night in downtown Californian neighborhoods tend to be a congregation place of gangs, leading to such stores becoming 'hot spots' for violent crime; Another report from the Sacramento Bee quotes Sacramento Police Captain Ted Mandalla commenting that "people purchase alcohol and consume it close by, and then they become bold enough to do things they wouldn't ordinarily do, or (they) consume alcohol and become prey". Subsumed within the larger umbrella of rational choice theory, a criminological theory that fits the above description is Cohen and Felson's (1979) routine activities theory, which states that crime results from a nonrandom convergence in time and space of likely offenders (drunkards and/or drug addicts), suitable targets (other intoxicated individuals or passer-bys) and the lack of able guardians (absence of a strong police presence).

Is the crime increase brought about by alcohol outlets confined to the immediate vicinity of the outlet? Or does the increased availability of alcohol also lead to an increase in alcohol abuse, thereby increasing crime in the broader neighborhood of the outlet as well? According to a Bureau of Justice Statistics 1998 report, 40% of criminal offenders report using alcohol during the time of offense, while 60% say they have been drinking regularly the year before the offense was committed. This suggests that alcohol consumption may play a role in crime, although the exact magnitude of its impact and the causal channels through which it operates, if any, remain unknown.

Possibly due to an increased awareness from media reports and growing frustrations of residents who live close to liquor stores, it has become increasingly common to see reports in local newspapers of residents uniting to either close down problem liquor stores or to prevent more liquor stores from opening in their neighborhood. However, while numerous studies find a correlation between alcohol outlet density and crime, to my knowledge, no study has shown a *causal* relationship between alcohol outlets and crime. Hence, although there is strong evidence that alcohol outlet density is related to crime, it remains inconclusive as to whether alcohol outlets themselves cause crime, result in a displacement of crime from surrounding areas, or whether they simply tend to be located in areas that inherently have higher crime rates. In addition, in part due to a lack of readily available databases, many of these studies rely on crime data that has been aggregated to either the census tract level or municipality level, and limit their study to a single decennial census year (a cross-section) and a single category of crime (e.g., Scribner et al., 1995; Scribner et al., 1999; Gorman et al., 1998). Another potential impediment is the high costs involved in accessing and using geographical information systems (GIS) software and its associated spatial databases.

This study uses administrative historical liquor licensing data from the California Department of Alcoholic Beverage Control (DABC), incident crime reports from 1992-2004 with detailed location information from the Los Angeles Police Department (LAPD) and a database of all residential property transactions in Los Angeles County between January 1980 and June 2000 from DataQuick, together with census tract demographic data from the 1990 and 2000 decennial census, to understand the magnitude and spatial distribution of the effect of alcohol outlets on crime and urban decay.

The variation in the geographical allocation of off-sale retail alcohol outlets over time is used to identify the causal impact of alcohol outlets on crime and urban decay. More specifically, I look at the change in the number of violent and property crimes per square mile per month (from here on to be referred to as the crime density for simplicity) at varying distances (from 0 to 0.5 miles) away from the outlet 24 months before and after the opening or closing of the outlet. By limiting the sample to neighborhoods that experience at least one outlet opening (or closing) during the time frames of the crime (January 1992-December 2004) and residential property transaction (January 1980-June 2000) data sets, this event study (Fama et al., 1969; Binder, 1998) specification estimates changes in crime density across areas that are more similar to one another than to other areas in the city. Moreover, I allow for a different time trend before and after the event, outlet tract specific time trends, and include controls for the number of existing outlets in the neighborhood, time fixed effects as well as individual outlet fixed effects. While the original intent was to conduct an event study estimating monthly coefficients following Jacobson, LaLonde and Sullivan (1993), the noisiness of reported crime data led to the use of between one and four estimated coefficients to summarize the effect of alcohol outlet openings and closings over the 49 month interval that I study.

While the alcohol outlets that make the news are typically "mom and pop" liquor stores located in low socioeconomics status (SES) neighborhoods, the liquor licensing data[1] I use includes not only liquor stores, but also supermarkets, specialty wine stores, grocery stores and gas stations. Moreover, a liquor store located in a low-SES neighborhood is very different from a liquor store located in a high-SES neighborhood in terms of the physical appearance of the store interior and exterior, their clientele and the range of products sold. In view of the vast heterogeneity that exists between outlets located in different neighborhoods, I group outlets by using the average of the 1990 and 2000 levels of median household income of the census tract in which the outlet is located. I then considered outlets belonging to the top 2 and bottom 2 SES quintiles separately.

One common complaint against some alcohol outlets is that because they tend to be the only stores open till late at night or even into the early morning hours, they serve as a neighborhood congregation place for people involved in illicit activities. In addition, it is common knowledge that different types of crime occur at varying frequencies during different times of the day. To determine how an entry or exit of an alcohol outlet affects crime during different times of the day, I split up my crime database into four categories of equal time intervals.

Assuming externalities stemming from alcohol outlets are fully capitalized into property prices, we can use the change in residential property transaction prices as a measure of the costs (benefits) alcohol outlets impose on communities through urban decay (development). By integrating a difference-in-difference model into a hedonic regression framework, the marginal impacts of recent (within 12 months) alcohol outlet openings and closings on the residential property transaction values in its neighborhood are estimated. As before, I examine the differential effect of outlets in low and high-SES neighborhoods separately.

Upon the opening of alcohol outlets in low-SES neighborhoods, I find that the estimated increase in property crime density (number of property crimes per square mile per month) is much higher than when I considered all outlet openings together. Within 0.1 miles of new outlets in low-SES neighborhoods, property crime density increases as

[1] Previous studies that examine the relationship between alcohol outlet density and crime (e.g., Scribner et al., 1995; Scribner et al., 1999; Gorman et al., 1998) do not distinguish between outlets situated in different neighborhoods.

long as there are less than 8 existing outlets in that 0.1 mile radius. Comparing the estimated percent change in property crime density in areas within 0.1 miles from the new outlet against that in areas between 0.1 and 0.25 miles away, we observe an interesting phenomenon: property crime is displaced from areas further away to areas closer to the new outlet. This suggests that property crimes are 'mobile' and are sensitive to the higher human traffic brought about by the opening of a new outlet. Conversely, the estimated increase in violent crime density within 0.1 miles from the new outlets is magnified by the presence of other outlets in the same area. Unlike property crimes, there appears to be agglomeration effects for violent crimes in low-SES neighborhoods.

When I limit my sample to outlets located in high-SES tracts, I find that new outlets in high-SES neighborhoods cause property crime density to increase but on the other hand, appear to decrease violent crime density as well. This is not surprising since outlets in high-SES neighborhoods typically consist of supermarkets, specialty wine stores and grocery stores and these outlets will typically attract a clientele consisting largely of families and wine connoisseurs.

The closure of outlets in low-SES neighborhoods decreases property crime density in the immediate vicinity of the outlet. There is some evidence, however, that this decrease in property crime results in a corresponding increase further away. This is consistent with earlier findings that suggest that property crimes are displaced and are sensitive to changes in human traffic. The closure of outlets in low-SES neighborhoods has virtually no effect on violent crime density when there are other outlets around.

In contrast, the closure of outlets in high-SES neighborhoods appear to increase both property crime and violent crime. While the effect of a closure on violent crime is mitigated by the presence of other outlets, the increase in property crime density is magnified by the presence of other outlets. One plausible explanation for this is that the other outlets that remain after the outlet closure may be located in relatively lower-SES neighborhoods if the outlet that closed was situated near the edge of a high-SES tract. Another possibility is the business that replaced that particular alcohol outlet may not draw as desirable a clientele as the alcohol outlet.

In addition, I find that homes located within 0.5 miles from new outlets in low-SES neighborhoods sold for between 2 and 4 percent less on average but homes located within 0.5 miles from new outlets in high-SES neighborhoods sold for between 0.75 and 1.6 percent more on average. Similarly, the closure of outlets in low-SES neighborhoods increases transaction prices by between 4 and 5 percent, while the closure of an outlet in a high-SES neighborhood led to a decrease of transaction prices by between 0.1 and 1 percent. These results suggest that outlets located in low-SES neighborhoods are seen as a disamenity, whereas outlets located in high-SES neighborhoods are valued by homeowners. Also, I observe that outlets in high-SES neighborhoods have a smaller effect on property prices than outlets in low-SES neighborhoods. This is consistent with the findings in the earlier parts of the paper where I find that outlets in low-SES neighborhoods have a relatively larger impact on crime.

The rest of the paper is organized as follows. In the next section, I present an overview of my conceptual framework. In Section 3, I describe the data used in this study and then in Section 4, I examine the relationship between alcohol outlets and crime, detailing both my empirical methodology and results. Section 5 looks at the relationship between alcohol outlets and urban decay as measured by the change in the transaction price of residential properties. It begins with an analytical model, followed by a description of the empirical methodology and results. Section 6 concludes.

2 Conceptual Framework

Assuming criminals are utility maximizing agents whose decision to commit a crime is affected by the costs associated with punishment (Becker, 1968), why might crime be affected by the presence of alcohol outlets? One explanation is its alteration of routine activity (1979): Alcohol outlets serve as a congregation place for motivated offenders, increase human traffic and therefore the number of suitable targets (and possibly also the number of empty houses) and in the absence of a guardian, an opportunity for crime is created. Another associated strand of rational choice theory is situational crime prevention theory (Clarke, 1997) which posits that patterns in criminal activity are not solely determined by where criminals live, but also where opportunities for crime concentrate.

A related question is whether alcohol outlets displace crime or cause additional crimes. If alcohol outlets lead to either a temporal or geographical displacement of crime, the policy implications are very different than if it causes additional crimes that would not have occurred otherwise. By studying changes in crime patterns at varying distances away from an outlet due to changes in outlet density, I attempt to determine whether alcohol outlets displace crimes geographically.

To my knowledge, this is the first study to exploit both the time series and cross-sectional variation in the location of alcohol outlets on property and violent crime density. However, there are several studies that have exploited the cross-sectional variation alone: Scribner et al. (1995) uses cross-sectional data from 74 Los Angeles County cities in 1990 and find that a higher alcohol outlet density is associated with a higher rate of assaultive violence: For a typical Los Angeles County city, 1 outlet was associated with 3.4 additional assaultive violence offenses. However, a replication of Scribner et al. (1995) by Gorman et al. (1998) using a cross section of 223 New Jersey municipalities find that outlet density does not appear to significantly affect the explained variance. Since assaultive violence crimes may suffer from underreporting, Scribner et al. (1999) chose to use homicide rates as the outcome variable instead. Looking at 155 urban residential census tracts in New Orleans, they find that 10% higher off-sale alcohol outlet density was related to a 2.4% higher homicide rate.

An obvious drawback of the cross-sectional approach used in the existing literature relating alcohol outlets and crime is that the estimated parameters do not have an explicitly causal interpretation, making it less interesting for policy evaluation purposes. In addition, a common criticism of the existing literature is the exclusive use of aggregate data. Using counties, municipalities or census tracts as the unit of analysis ignores local variation, which is important for the purpose of this research question since alcohol outlets are not evenly distributed across the geographical units concerned and neither is crime. In fact, crime has been known to be concentrated in "hot spots" such as in bus depots and malls (Sherman et al., 1989). Hence, it appears that while it is generally well established that neighborhoods with more alcohol outlets tend to have a higher violent crime rate, it remains inconclusive as to whether alcohol outlets themselves create crime or whether they cause a redistribution of crime away from the surrounding areas. I use variants of an event study framework to identify the causal impact of alcohol outlets on crime density, the details of which are explained below in Section 4.1.

Another issue that has not been addressed in the existing literature is the vast heterogeneity that exists between alcohol outlets. Alcohol outlets are not restricted to ‘mom and pop’ corner liquor stores, but also include supermarkets, specialty wines stores and grocery stores. While it is impossible to exactly identify the type of alcohol outlet from the alcohol licensing data, I overcome this problem by stratifying alcohol outlets by the socioeconomic status (SES) level of the census tract it is located in. In fact, grouping outlets by the SES level of their location may even be superior to separating alcohol outlets into their various types. This is because while there is typically a higher concentration of supermarkets and wine stores in high-SES neighborhoods and a higher concentration of liquor stores in low-SES neighborhoods, we also find liquor stores in high-SES neighborhoods and supermarkets in low-SES neighborhoods. Instead, the heterogeneity that exists between outlets usually stems from the *location* of the outlet: A liquor store in a low-SES neighborhood sells more single serving bottles of fortified wine and is generally characterized by a badly maintained building and iron bars across window panes. In contrast, a liquor store in a high-SES neighborhood sells more expensive bottles of red wine and generally has a nice and clean store front.

Turning to the estimation of the effect of alcohol outlets on residential property transaction values, I adopt the hedonic model framework. It is not unusual for home buyers to search for properties within a set of pre-selected neighborhoods that they consider to be a good match for their family’s needs. A recurring theme in this study is the importance of *location*. In this case, it is important because it determines, among many things, the schools your children go to, the length of your commute to work and how far you will have to drive to your favorite restaurant. These location specific amenities are traded in a “bundle”, along with the physical structure of a house in the residential property market. The hedonic model has been widely used to estimate the value of these non-market goods: Black (1990) uses house prices to estimate the value parents put on school quality while Linden and Rockoff (2006) use house prices to estimate the cost of perceived crime risk from living close to a sex offender. These “bundles” are generally heterogeneous in nature (Rosen, 1974; Witte et al., 1979; Epple, 1987; Sheppard, 1999) and it is difficult to separately identify the hedonic price function of each amenity because the variation in the amenity may be correlated with factors that are not observable. Hence, I integrate a difference-in-difference set-up into the basic hedonic framework to allow me to infer the value homeowners place on new and old alcohol outlets in their neighborhood. Furthermore, I group alcohol outlets by the SES level of the census tract they are located in as before, to estimate the difference between residents' marginal willingness to pay for a desirable outlet, and an undesirable one.

3 Description of Data

Four data sets were used in this study: A historical panel of retail alcohol licenses from the California Department of Alcoholic Beverage Control (DABC), detailed crime reports from the Los Angeles Police Department (LAPD), residential property transactions data from DataQuick, a commercial company that provides real property and land data and demographic variables at the census tract level from the 1990 and 2000 decennial census.

The alcohol outlet data set consists of a panel of all 211,964 retail alcohol licenses that have been issued by the DABC over time and spans 31 license types, including off-sale beer and wine (type 20), off-sale general (type 21), on-sale beer (type 40), on-sale beer and wine eating place (type 41), on-sale beer and wine public premises (type 42) and on-sale general eating place (type 47). For the purpose of this study, I focus on the alcohol outlets with off-sale retail licenses (types 20 and 21). Type 20 licenses are typically held by convenience stores and gas stations while type 21 licenses are typically held by liquor stores and supermarkets. Other variables in this data set include the file number, file status (active, surrendered, canceled, revoked etc.), file status date, type status, type original issue date, premise street address, premise city, premise 5-digit zip code and DBA (doing business as) name.

The tenure of each active license is determined by its original issue date and the date the tape list was generated. The tenure of the rest of the licenses is determined by its original issue date and the file status date, which is the date of the most recent change in file status. Since license transfers between past and present owners operating at the same premise are common, there are several cases whereby a few licenses correspond to the same premise address over different time periods. Hence, the data had to be sorted in a way to take into account repetitions of the same address several times over the years. I then looked at each unique premise address individually to determine the time frame during which each alcohol outlet was in operation. I individually looked up each ambiguous case using the DABC's License Query System available online at the DABC's website (www.abc.ca.gov). The online License Query System also contains information on the disciplinary record of each alcohol outlet including the reporting agency, the type of violation, fines imposed, disciplinary action taken, and the date of the violation.

To my knowledge, this administrative database is the best available data set that can be used to determine alcohol outlet openings and closings. However, there are some limitations to this data set: The DABC switched over to a new database system during 1993 as a result of which some records of licenses that became inactive prior to the time of the transfer may have been lost. Some of the records of inactive stores that survived the transfer had missing file status dates and file statuses that were later imputed as January 1, 1994 and "automatically revoked due to non-payment" respectively. Hence, there are an unusually high number of outlets that appeared to have closed on January 1, 1994. To minimize the error from this imputation, these outlets were dropped from the data set when looking at the changes in crime level and residential property transaction values due to an outlet closure. However, these observations were preserved when determining the number of active alcohol outlets within an x-mile radius since dropping them may lead to erroneous under counting of alcohol outlets in several time periods.

For the part of this study that looks at the relationship between alcohol outlets and crime, only outlets situated within the boundaries of the city of Los Angeles were considered as detailed crime reports are only readily available for Los Angeles. The exception to the rule was when I was determining the number of active alcohol outlets within an x-mile radius. In that case, I included the outlets in the areas surrounding the city of Los Angeles as well.

One should be mindful that different subsets of the alcohol licensing data are used for different parts of the paper: The sections involving crime use data from 1992-2004, whereas the sections involving real estate transactions use data from 1980-2000.

Next, I geocoded the locations of these alcohol outlets onto a digital map by using a combination of ESRI's StreetMap USA database and the Census Bureau's Tiger Line Files. As with any low-cost street address database, both the versions I use have both missing and erroneously named streets. Thankfully, the alcohol outlet database was small enough for me to individually check each alcohol outlet the address locator was either unable to locate or matched with a very low score (below 40).

The Los Angeles detailed crime reports database[2] from January 1991 to October 2005[3] was obtained directly from the LAPD. This database contains detailed information on all reported crimes that violate the Californian Penal Code, including street intersection or zip+4 of the location of each crime, except for certain classes of crime (mainly rape, sex or abuse-related crimes) as it is against the Californian State law to disclose information that may allow for the identification of the victim of these crimes. Hence, I am able to locate individual crimes down to the street block level. In this study, I focus on crimes that occur at a high frequency and these crimes can be divided into two main categories: violent crimes and property crimes. The violent crimes I examine in this study are robbery and assault with a deadly weapon and the property crimes I examine are burglary, vehicle theft and vandalism[4]. While each of these five crimes is individually examined, for purposes of conciseness, I will only discuss results pertaining to violent and property crimes as a whole[5] for the remainder of this paper.

In addition, there is information on the exact date and time of the crime, which I use to group the data into monthly cells and to differentiate between crimes committed during the day and at night. There is also information on the reporting district of the crime, reporting division of the crime and the type of premise (for example a parking lot, a single family residence or a school) at which the crime was committed.

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[2] The retrieval process for this crime reports database is detailed in the appendix.
[3] It should be noted that only data between January 1992 and December 2004 were used in the study due to missing and/or incomplete data in the first and the last years of the data set.
[4] I am in the process of geocoding more crimes to be included in this analysis. However, I believe the present selection of crimes is good, especially considering that they appear to be among the most frequently reported set of crimes (Levitt, 1998).
[5] Estimation results of each of the 5 crimes are available from the author upon request.

One general concern with reported crime data is the presence of measurement error as a result of changes in crime reporting by victims over time and across neighborhoods. However, since crime density is the dependent variable in my study, and given that there is no obvious reason to believe that crime reporting changes as a result of an alcohol outlet opening or closing, it is reasonable to assume classical measurement error. Also, by using crime reports from only one police department, I can easily control for changes in police department reporting practices and changes in crime classification across jurisdictions over time with the inclusion of time dummies.

As with the alcohol outlet data, I also geocoded the locations of these crimes onto a digital map by using a combination of ESRI's StreetMap USA database and the Census Bureau's Tiger Line Files. However, given the considerable number of crimes in a city as large as Los Angeles, I was unable to individually check all crime locations that were either unmatched or matched with a very low score. Instead, I used the reporting district variable in the dataset to make sure that the crime was not geocoded to a location that was clearly incorrect. In the case of unmatched crime locations, this was typically a result of inherent errors in the data set, including, but not limited to spelling errors and incomplete street addresses. While it was possible to correct the spelling errors and re-geocode these crime locations, there was nothing much I could do for the other error types. Fortunately, I fail to match less than 4% of the data.

The DataQuick data consists of all residential real estate transactions in Los Angeles County from January 1980 to June 2000. Some variables of interest include the exact address of the property, the date of transaction, the transaction price, the assessed value of the property, the size of the property, the number of bedrooms and the number of bathrooms. A nice feature of the DataQuick data is the availability of the *actual* transaction price of the property, which gives us the true market valuation of the property, instead of the *assessed* value of the property, which does not necessarily reflect the market valuation of the property. While this data set included the whole of Los Angeles County, only transactions within the city of Los Angeles and transactions within a 2 mile radius of the boundary of the city of Los Angeles were considered. I also geocoded the locations of these transacted properties using the same street address databases as above. I utilized the same matching strategy for the transactions data as I did for the crime data.

For the residential property transactions data, I failed to match fewer than 1% of the addresses.

The census tract level demographic variables for both 1990 and 2000 are downloaded directly from the Census Bureau's website (www.census.gov).

4. Do Alcohol Outlets Increase Crime?

4.1 Empirical Strategy

The approach I take in this study aims to exploit the strengths of my data— that it consists of a large number of individual crime reports with detailed information on the location and time of the crime and that it covers a long period of time, 1992-2004. I use an event study framework to identify the causal impact of alcohol outlets on crime density (number of crimes per square mile per month) as illustrated in Figure 1 below.

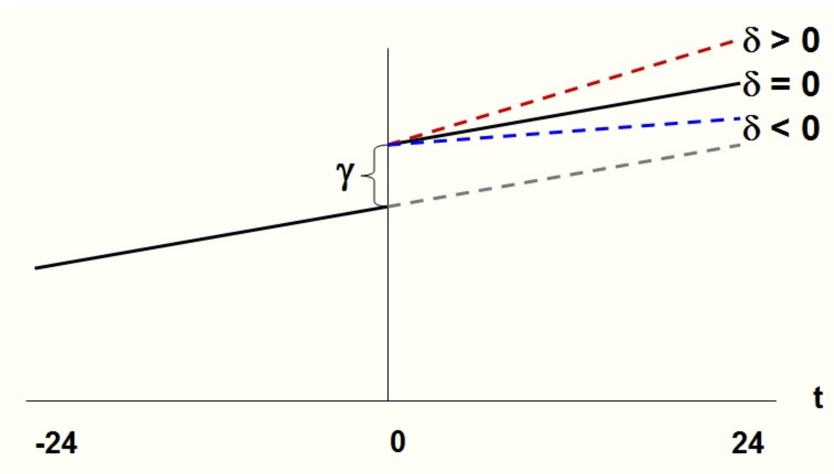

Figure 1

I limit the sample to neighborhoods that experience at least one outlet opening (or closing) during the time frame of the crime (January 1992-December 2004) data set so that this event study specification estimates changes in crime and transaction density pre and post event across areas that are more similar to one another than to other areas in the city. In addition, since the concept of a mile in a very densely populated area is potentially different from that in a relatively less densely populated area, I begin by limiting my analysis to only alcohol outlets located in "Los Angeles", as indicated by their postal address[6]. I begin by looking at whether there is a break in trend following either the opening or closing of an outlet with the following specification:

(1) $$Crime\_den[p,q]_{it} = \alpha_i + \beta_{(c)} t_{i(c)} + \gamma 1(t_i \geq 0) + Month\ dummies + Year\ dummies + \varepsilon_{it}$$

The subscripts *i* and *t* respectively index the outlet and time relative to the outlet opening or closing event, where *t* takes on the value of 0 at the time of the event. $Crime\_den[p,q]_{it}$ is the crime (property crime or violent crime) density in the area between *p* and *q* miles away from outlet *i* at event time *t*. Although there are certainly concerns relating to the presence of underlying trends in crime, the property market and the local demographic composition, these trends should be smooth, especially in the short run. While I cannot directly control for changes in the demographic composition of the outlet's neighborhood since there is no demographic data available at a local level at a monthly frequency, the linear trend term, t_i, indirectly controls for these underlying trends that may be correlated to the opening and closing times of alcohol outlets. The coefficient of interest, γ, measures the change in crime density pre and post event time as a result of one additional or one less outlet. In addition, store level fixed effects control for time invariant characteristics particular to the specific location of the store, while month and year dummies[7] are included to control for time varying macroeconomic business cycles. ε_{it} is assumed to be a mean 0, normally distributed error term. Finally, to take into account that the error terms are not independent across neighborhoods, the standard errors are clustered at the store level. Together, this constitutes a natural experiment whereby the simultaneity of alcohol outlet location choice and the socioeconomic characteristics of the location itself are eliminated. I estimate equation (1) three separate times, with *p* and *q* taking on the following set of values: [0, 0.1]; [0.1, 0.25] and [0.25, 0.5]. By studying

[6] This area is approximately the Southern half of the city. Unlike most other cities, the City of Los Angeles consists of around 37 other communities such as Venice and Tujunga. I am in process of geocoding crimes committed in these other communities of Los Angeles and will include these communities in the analysis for future versions of this paper.

[7] Equation (1) was also estimated using 156 time period dummies, one for each month instead of month and year dummies. The results were robust to this change in specification.

the estimated effect of a new or old alcohol outlet on crime density in areas that are of various distances away from the outlet, we can obtain a measure of the 'sphere of influence' of the outlet in question and determine whether there are displacement or agglomeration effects.

On the other hand, it is also conceivable that the total number of alcohol outlets in operation in the neighborhood also has a part to play in crime. Besides, it is reasonable to expect the event of opening the first outlet (or closing the last outlet) in the neighborhood to have a very different impact on crime than the opening of the 10th outlet in the neighborhood. Suppose crime and the total number of outlets are related in the following manner:

$$\textbf{(2)} \qquad Crime\_den[p,q]_{it} = \alpha_i + \beta \; t_i + \xi \; f(Outlets[0,q]_{it}) + \varepsilon_{it}$$

where $f(Outlets[0,q]_{it})$ is some nonlinear function of $Outlets[0,q]_{it}$ and $Outlets[0,q]_{it}$, the number of outlets in operation at event time t (including the outlet i, that opened or closed at event time t=0) within a q-mile radius from outlet i. However, since the number of outlets may be endogenous to other neighborhood factors, an ordinary least squares estimation of ξ will be biased. Let us now suppose that $f(Outlets[0,q]_{it})$ is a quadratic function such that:

$$\textbf{(3)} \qquad f(Outlets[0,q]_{it}) = a + b \; Outlets[0,q]_{it} - \tfrac{1}{2} c \; (Outlets[0,q]_{it})^2$$

Where $c>0$ and $f(.)$ is concave. Then $df(Outlets[0,q]_{it})/d(Outlets[0,q]_{it})|_{Outlets[0,q]it=(Outlets[0,q]it - 1)} = b - c*(Outlets[0,q]_{it} - 1)$. In other words, one will expect an effect of $b - c*(Outlets[0,q]_{it} - 1)$ from a reduced form regression of crimes and outlet openings. Thus, I augment equation (1) with $(Outlets[0,q]_{it} - 1)*1(t_i \geq 0)$, the corresponding number of outlets in operation within a q-mile radius from outlet i (in addition to outlet i) post event time:

(4) $$Crime\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\ t_{i(c)} + \gamma\ 1(t_i \geq 0) + \varpi\ (Outlets[0,q]_{it} - 1) * 1(t_i \geq 0)$$
$$+\ Month\ dummies + Year\ dummies + \varepsilon_{it}$$

Next, returning to equation (1), I attempt to make my initial specification more flexible by adding $t_i * 1(t_i \geq 0)$, a term that allows the linear time trend, t_i, to shift following the event, to the equation. δ is the measure of this shift in the time trend:

(5) $$Crime\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\ t_{i(c)} + \gamma\ 1(t_i \geq 0) + \delta\ t_i * 1(t_i \geq 0)$$
$$+\ Month\ dummies + Year\ dummies + \varepsilon_{it}$$

To account for the presence of other alcohol outlets in the vicinity, I combined equation (4) with equation (5), yielding:

(6) $$Crime\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\ t_{i(c)} + \gamma\ 1(t_i \geq 0) + \delta\ t_i * 1(t_i \geq 0)$$
$$+\ \varpi\ (Outlets[0,q]_{it} - 1) * 1(t_i \geq 0) + Month\ \ dummies + Year\ dummies + \varepsilon_{it}$$

Finally, returning to equations (2) and (3), I consider how crime density (i.e. the number of crimes per square mile per month) is affected by a change in the total number of alcohol outlets in operation in the neighborhood. I regress $Crime\_den[p,q]_{it}$ on a second order polynomial of $Outlets[0,q]_{it}$. As before, I include a time trend, outlet level fixed effects and calendar time dummies since the number of outlets in the neighborhood may be endogenous:

(7) $$Crime\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\ t_{i(c)} + Outlets\,[0,q]_{it} + (Outlets\,[0,q]_{it}\ )^2$$
$$+\ \ Month\ dummies + Year\ dummies + \varepsilon_{it}$$

In an attempt to better control for any heterogeneity in underlying trends present at the local level, I also allow the time trend, t_i, to differ across outlets located in different census tracts, *c,* for equation (1) and equations (4) thru (7). The results of these 2 sets of regressions (with and without outlet-tract specific time trends) are summarized in Tables II to V.

In order to determine whether alcohol outlets in different areas have different effects on crime, I separated the alcohol outlets in my data set into two groups—those located in high socioeconomic status (SES) neighborhoods and those located in low-SES neighborhoods. While the alcohol outlets that make the news are typically "mom and pop" liquor stores located in low-SES neighborhoods, the liquor licensing data I use includes not only such liquor stores, but also supermarkets, specialty wine stores, grocery stores and gas stations. Moreover, aside from their location choice, a liquor store located in a low-SES neighborhood is very different from a liquor store located in a high-SES neighborhood in several ways: The physical appearance of the store interior and exterior (stores in low-SES neighborhoods typically have iron bars over window panes and around the cash register to guard against potential robberies); their clientele and the range of products sold (single-serving bottles of fortified wine in outlets in low-SES neighborhoods compared to first growth Bordeaux reds in outlets in high-SES neighborhoods). In view of the vast heterogeneity that exists between outlets located in different types of neighborhoods, I group outlets by using the average of the 1990 and 2000 census tract level of median household income to separate outlets into two groups: those located in high-SES tracts (top 2 quintiles of average median household income) and those located in low-SES tracts (bottom 2 quintiles). I then re-estimated equation (1) and equations (4) thru (7) separately for outlets located in these two groups. Selected regression results of the subset of outlets located in low-SES tracts are presented in Tables VI and VIII, while the corresponding results for the outlets located in high-SES tracts are presented in Tables VII and IX.

Following that, to determine whether liquor stores cause more problems in the day or in the night and whether the number of different types of crimes tend to be affected differentially during different times of the day, I re-estimated equation (6) by replacing $Crime\_den[p,q]_{it}$ with the density of crimes that occurred in the area between p and q miles away from outlet i at event time t between 0000 hours and 0559 hours, between 0600 hours and 1159 hours, between 1200 hours and 1759 hours and between 1800 hours and 2359 hours. This set of results is summarized in Tables X and XI.

4.2 The Effect of Alcohol Outlets on Crime Density

4.2.1 Alcohol Outlet Openings

Examining the regression results of equations (1), (4), (5) and (6) in Tables II and III, we see that the estimated jump in both property and violent crime density is always positive upon the opening of an additional outlet. Focusing on columns (1), (2), (4) and (5)[8], we see that in general[9], this jump decreases significantly in magnitude as we move from the immediate vicinity of the outlet to a distance between 0.1 and 0.25 miles away. Although the estimated jumps are not precisely estimated (possibly due to the noisiness of crime in small areas), the consistency of the magnitudes of these effects going from specification to specification is reassuring. Violent crime density is estimated to increase between 2.8 and 6 percent within 0.1 miles from the outlet following its opening and decreases to as low as 0.2 percent between 0.1 and 0.25 miles away from the outlet. The effect on property crime density is similar.

Turning to equations (4) and (6), we see that the effect of an additional outlet on crime density can either be muted or magnified when there are already other outlets in operation in the neighborhood. For example, when we allow for outlet-tract specific trends and a shift in trend following the opening time (equation (6) in Table III), if the additional outlet is the first outlet in the neighborhood, property crime density within the 0.1-0.25 mile radius ring increases by 0.38 crimes per square mile per month. However, if there were already 2 other outlets in the neighborhood, the effect drops to an increase of 0.38 + 2*(-0.08) = 0.22 crimes per square mile per month. Conversely, within 0.1 miles from the new outlet, property crime density increases by 1.09 crimes per square mile per month if the additional outlet is the first outlet in the 0.1 mile circle. If there were already 2 other outlets, the increase in crime density increases by 2*1.47 = 2.94 crimes per square mile per month.

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[8] As we move further away from the outlet, the spatial correlation problem is worsened and estimates are more likely to be confounded by multiple openings and closings in a larger geographical area. As a result, the standard errors of the coefficients presented in columns (3) and (6) are likely to be severely underestimated. In a future version of this paper, I plan to make the necessary corrections.

[9] This is not true for the property crime results of equations (4) and (6) in Table II. However, once outlet-tract specific trends were included, we observe the general pattern seen in the other regressions.

While the overall impact of all new outlets may be interesting, the estimated effects may be confounded by the vast heterogeneity that exists between outlets located in different neighborhoods and is therefore less valuable from a policy perspective. Considering only outlets located in census tracts belonging to the bottom 2 socio-economic status (SES) quintiles as measured by tract level median household income (Table VI), the estimated percent increase in property crime density within 0.1 miles of new outlets in low-SES neighborhoods is higher than the corresponding set of estimates presented in Table III. In fact, when the number of existing outlets is controlled for (equations (4) and (6)), the estimates for the change in property crime density within 0.1 miles of new outlets in low-SES neighborhoods is more than three times the size of the corresponding estimates for all the new outlets in my sample although the estimated impact of existing outlets on property crime density becomes negative. When we compare the estimated percent change in property crime density in areas within 0.1 miles from the new outlet against that in areas between 0.1 and 0.25 miles away, we observe an interesting phenomenon: property crime is displaced to areas closer to the new outlet. In the case of violent crime density, the estimated increase in crime density within 0.1 miles from the new outlets in low-SES neighborhoods is larger in magnitude than the corresponding estimates for the whole sample when the presence of other outlets is not controlled for. However, once I control for the number of existing outlets, the percent increase in violent crime density resulting from one additional outlet (if it is the first outlet within a 0.1 mile radius) becomes negligible. At the same time, the estimated impact of existing outlets on violent crime density more than quadruples. I find no evidence of violent crime being displaced. Using estimates from equation (7), we see that increasing the number of outlets from 2 to 3 in a 0.1 mile radius, results in a 7.2% increase in property crime density and a 0.6% decrease in violent crime density, although none of the estimates are statistically significant. Taken together, these results suggest that property crimes are more 'mobile' and tend to occur as a result of the higher human traffic brought about by the opening of a new outlet in a low-SES neighborhood. An additional outlet has a big impact (6-7% increase) on property crime density although this impact is diminished when there are other outlets around. The mechanism that drives violent crime, on the other hand seems to be slightly different: While increased human traffic does seem to have a small effect on violent crime, this effect is magnified by the presence of other outlets in the vicinity. Unlike property crimes, there seems to be agglomeration effects for violent crimes in low-SES neighborhoods, the effects of which are magnified when new outlets provide more opportunities for conflicts to arise between intoxicated individuals.

Conversely, when I limit my sample to outlets located in high-SES tracts (top 2 quintiles), I find that overall, new outlets in high-SES neighborhoods have a small positive and sometimes negative effect on both property and violent crime densities. Estimates from equations (4) and (6) in Table VII suggest that a new outlet in a high-SES neighborhood decreases property crime density (~6.8%) if it is the first and only outlet within 0.1 miles from its location. However, if there are already outlets present within 0.1 miles, the overall impact on property crime density is positive. The opposite is true for violent crime: The overall impact of new outlets in high-SES neighborhoods on violent crime is negative when there are other outlets present. While the increase in human traffic increases the likelihood of property crime, it appears that it may actually reduce violent crime. Using estimates from equation (7), we see that increasing the number of outlets from 2 to 3 within a 0.1 mile radius from the outlet results in an 8.7% increase in property crime density and a 0.3% decrease in violent crime density. This is not surprising since outlets in high-SES neighborhoods typically consist of supermarkets, specialty wine stores and grocery stores and these outlets will typically attract a clientele consisting largely of families and wine connoisseurs.

In summation, the results from Tables VI and VII suggest that while new alcohol outlets located in lower-SES neighborhoods increases both property and violent crime density, new outlets located in high-SES neighborhoods may have an overall positive impact on the neighborhood: while property crime density may increase, violent crime density also decreases at the same time.

4.2.2 Alcohol Outlet Closings

Next, turning to Table V, we see that overall, the closing down of alcohol outlets appears to decrease property crime density by around 3 - 4% within a 0.1 mile radius.

However, the presence of other outlets diminishes this effect and there is some evidence that property crime has simply been displaced to other areas further away. Violent crime density does not appear to be affected by outlet closings: There appears to be a tiny and insignificant 1% increase in violent crime density when outlet closes and this effect becomes negative when there just two other outlets in operation.

Examining Table VIII, there appears to be strong evidence that the closing down of outlets in low-SES neighborhoods decreases property crime density in the immediate vicinity of the outlet. There is some evidence, however, that this decrease in property crime results in an increase in property crime further (beyond 0.1 miles) away. This is consistent with earlier findings that suggest that property crimes are relatively mobile and tend to occur wherever human traffic increases. For violent crimes, the closure of outlets in low-SES neighborhoods appears to have virtually no effect on crime density when there are other outlets around.

From Table IX, we see that the closure of outlets in high-SES neighborhoods appear to increase property crime and also violent crime. While the effect of a closure on violent crime is mitigated by the presence of other outlets, the increase in property crime density is magnified by the presence of other outlets. One possible explanation for this is that the other outlets that remain after the outlet closure may be located in relatively lower-SES neighborhoods if the outlet that closed was situated near the edge of a high-SES tract. Another possibility is that the business that replaced the alcohol outlet that closed may not draw as desirable a clientele as before[10].

4.2.3 Varying Effects of Alcohol Outlets across Different Times of the Day

Table X illustrates how each category of crime is affected differentially during different times of the day when new alcohol outlets open. From Table XI, there is some evidence that property crime density falls throughout the day when outlets close while violent crime density appears to increase.

[10] I plan to address this in a follow-up paper upon the acquisition of a new data set that will allow me to determine the business that was in operation at the same location prior to the alcohol outlet and also the business that came into operation after the alcohol outlet closure.

For violent crimes, there is evidence that crime density jumps discretely within 0.1 miles as a result of an outlet opening during 0000-0559 hours. This jump is estimated to be around 13%. This is consistent with anecdotal observations that alcohol outlets are problematic partly because they open late at night and also because they are magnets for alcohol abusers and individuals involved in illicit activities, most of whom are most active from after dark until the early hours of the day. As for outlet closings, there may be some evidence that violent crime density experiences no significant changes for most of the day within 0.1 miles from the location of the outlet that closed. The only exception is during 1200-1759 hours, where the evidence is suggestive of an increase in violent crime density after an outlet closure. This may be due to the vacancy status of the site previously occupied by an alcohol outlet although I am unable to confirm this hypothesis with the data I have at hand.

In the case of property crimes, the evidence for a discrete jump in crime density upon the opening of an additional outlet is the strongest during 1200-1759 hours and 1800-2400 hours. The estimated jump is estimated to be between 2 and 9 percent within 0.25 miles from the store. This is consistent with when we think property crimes such as vandalisms, vehicle thefts and burglaries typically happen. When outlets close, the coefficients taken together suggest that there is a re-distribution of property crimes away from the outlet though the statistical evidence is admittedly weak.

5 Do Liquor Stores Lead to Urban Decay?

To the extent that the existence of alcohol outlets has an effect on crime, one would expect it to also have an effect on property transaction prices and perhaps quantities[11] as well, since areas with higher crime rates (both actual and perceived) are also usually less desirable to potential property buyers or renters. Assuming that externalities (both positive and negative) created by alcohol outlets are fully capitalized into land values, we can use the change in residential property prices as a proxy for the degree of urban decay resulting from additional outlets. These estimates will then shed

[11] I perform an analysis of property transaction density using the same empirical strategy as in section 4.1. However, given that these results are less interesting than the ones relating to changes in property transaction prices, I defer the discussion of this analysis to the appendix.

some light on the extent to which alcohol outlets affect urban decay both spatially and temporally. I begin by presenting a simple model of the hedonic framework I use to estimate households' marginal willingness to pay for the presence of alcohol outlets in their neighborhood.

5.1 A Simple Hedonic Model

The housing market, given the heterogeneous nature of housing, is usually described as a hedonic market. Households are assumed to derive utility U by consuming a housing bundle that consists of a vector, A^H, the amenity derived from H different characteristics of the physical structure of the property (number of baths, number of stories etc.), another vector, A^N, the amenity derived from N different characteristics of the neighborhood in which the property is located in, and by the consumption of a composite good, X. Hence, the preferences of household h, located in neighborhood n, at time t, with a vector of household preference parameters, π, is given by the utility function:

(8) $U_{hnt} = U(A^H, A^N, X, \pi)$

Households receive a fixed income, Y, and the price of the property is given by $P(A^H, A^N)$.

Given utility, U, income, Y, the physical characteristics of the property, A^H, and the neighborhood characteristics of the property, A^N, the willingness of the household to pay for the property can be summarized by the function $W(U, Y, A^H, A^N, \pi)$ and the utility function can be re-written as:

(9) $U_{hnt} = U(A, Y\text{-}W, \pi)$

where $A = A(A^H, A^N)$.

Hence, the utility maximization problem of the household is:

(10) $\max_{A, X} \ U(A, X, \pi)$ subject to the budget constraint $Y \geq P(A) + X$.

Solving the maximization problem, I arrive at this condition:

(11) $\frac{U_{A,I}}{U_Y} = \frac{\delta P}{\delta A_I}$ = Hedonic price of amenity I = Marginal willingness to pay for amenity I.

For the purpose of this paper, we can think of alcohol outlets as an amenity, I. In locations where the opening or closing of outlets result in an increase in crime level, $U_A < 0$, and since $U_Y > 0$, the opening or closing of these outlets creates a negative externality and decreases a representative household's marginal willingness to pay for a property in this neighborhood. However, when the opening or closing of outlets generates a positive externality either through no increase or decrease in crime level and/or an increase in convenience for residents, thereby increasing the desirability of the neighborhood, $U_A > 0$, and a representative household's marginal willingness to pay for a property in this neighborhood increases.

5.2 Examining the Change in the Average Value of Housing Transactions

5.2.1 Empirical Strategy

It is common practice for home buyers to search for properties within a set of pre-selected neighborhoods that they consider to be a good match for their family's needs. The *location* of the property is important because it determines, among many things, the schools your children go to, the length of your commute to work and how far you will have to drive to your favorite restaurant. Therefore, to the extent that the set of local amenities (and disamenities) are fully capitalized into property prices, we can use transaction prices to estimate resident's marginal willingness to pay for alcohol outlets in their neighborhood. As we discussed before, alcohol outlets located in different neighborhoods can be very different. While my data allows me to compare transaction prices within small local areas where properties are presumably more homogeneous than in bigger aggregated areas, there may still be other unobservable characteristics of the property that I cannot control for. Hence, instead of relying solely on the cross sectional variation, I look at how the average value of transactions is affected by the presence of new alcohol outlets in the neighborhood and whether average transaction values change when existing alcohol outlets in the neighborhood close. This time round, I restrict the sample of housing transactions to those that occurred within the City of Los Angeles (Appendix 4 list I). The reason for doing so is to ensure I do not under-count the number of alcohol outlets within a 0.5 mile radius from the property that was transacted. By integrating a difference-in-difference set-up into the standard hedonic framework, I arrive at:

(12) $$ln\ (Price_{ijt}) = \alpha_j + \beta X_{it} + \rho_1 Outlets\,[0,0.1]_{it} + \rho_2 Outlets\,[0.1,0.25]_{it} + \rho_3 Outlets\,[0.25,0.5]_{it} + \kappa_1 (Outlets[0,0.1]_{it} * Open12_{it}) + \kappa_2 (Outlets[0.1,0.25]_{it} * Open12_{it}) + \kappa_3 (Outlets[0.25,0.5]_{it} * Open12_{it}) + Month\ dummies + Year\ dummies + \varepsilon_{ijt}$$

Where $ln\ (Price_{ijt})$ is the natural logarithm of the real[12] transaction price of property *i* located in location *j* transacted at calendar time *t*, α_j is the location (5-digit zip code or zip+4) fixed effect and X_{it} is a vector of housing characteristic including year built, size, number of bedrooms and bathrooms, number of stories and the presence of a pool or jacuzzi[13] at calendar time *t*. $\text{Outlets}[0,0.1]_{\text{it}}$ is number of alcohol outlets that *ever* existed between a distance of 0 and 0.1 miles away from property *i* and $Open12_{it}$ is an indicator variable that takes on the value 1 if the outlet has been open for 12 months or less at calendar time *t*. The coefficients, κ_1, κ_2 *and* κ_3 are the estimates of the change in transaction price due to the location of new alcohol outlets at various distances away from the property. As before, since the error terms are not independent across space, they are clustered at either the 5-digit zip code or the zip+4 level. Similarly, to estimate the change in transaction price due to the closure of alcohol outlets at various distances away from property *i*, I replace $Open12_{it}$ in equation (12) with $Close12_{it}$, an indicator variable that takes on the value 1 if the outlet has been closed for 12 months or less at calendar time *t*. Table XII summarizes the results from equation (12).

As before, I separate the alcohol outlets by the median household income of the census tract they are located in order to take into account the heterogeneity of outlets

[12] Property transaction prices are deflated by annual levels of the West Urban CPI downloaded from the Bureau of Labor Statistics website: http://www.bls.gov/cpi/home.htm

[13] The number of bedrooms is top-coded at 6; the number of baths is top-coded at 6; the number of rooms is top-coded at 15; the number of stories is top-coded at 3.

located in different areas. In equation (13), $Bottom_i$ is an indicator variable that is equal to 1 if the outlet is located within a census tract that belongs to the bottom 2 quintiles in terms of median household income among all the census tracts in my sample. On the other hand, Top_i indicates that the particular outlet is located within a tract in the top 2 quintiles:

$$\textbf{(13)} \quad \ln(Price_{ijt}) = \alpha_j + \beta X_{it} + \rho_1 Outlets[0,0.1]_{it} + \rho_2 Outlets[0.1,0.25]_{it}$$
$$+ \rho_3 Outlets[0.25,0.5]_{it} + \eta b_1 (Outlets[0,0.1]_{it} * Open12_{it} * Bottom_i)$$
$$+ \eta b_2 (Outlets[0.1,0.25]_{it} * Open12_{it} * Bottom_i)$$
$$+ \eta b_3 (Outlets[0.25,0.5]_{it} * Open12_{it} * Bottom_i)$$
$$+ \eta t_1 (Outlets[0,0.1]_{it} * Open12_{it} * Top_i)$$
$$+ \eta t_2 (Outlets[0.1,0.25]_{it} * Open12_{it} * Top_i)$$
$$+ \eta t_3 (Outlets[0.25,0.5]_{it} * Open12_{it} * Top_i) + Month\ dummies$$
$$+ Year\ dummies + \varepsilon_{ijt}$$

Thus, $Bottom_i$ identifies outlets in low-SES neighborhoods while Top_i identifies outlets in high-SES neighborhoods and equation (13) allows for the estimation of the differential effects of the opening of these 2 types of outlets. To understand the differential effects from closing outlets in low and high-SES neighborhoods, I re-estimated equation (13), replacing $Open12_{it}$ by $Close12_{it}$. The regression results of equation (13) are presented in Table XIII.

5.2.2 The Effect of Alcohol Outlets on Property Transaction Values[14]

Table XII illustrates that overall, the opening of new outlets have no statistically significant effect on the price of residential property transactions while the closing of outlets have a positive and economically significant effect on transaction prices. However,

[14] Note that the time frame of the property transactions data (January 1980 - June 2000) is different from that of the incident crime reports (January 1991 – December 2004). As a result, a different sample of the alcohol licensing data is used in this section than in section 4.

when the outlets are separately identified as being located in low and high-SES neighborhoods, I find that homes located within 0.5 miles away from new outlets in low-SES neighborhoods sold for between 2 and 4 percent less on average but homes located within 0.5 miles away from new outlets in high-SES neighborhoods sold for between 0.75 and 1.6 percent more on average. Given that the average property in my dataset sold for about $223,000 between 1980 and 2000, homeowners who live close to a new outlet in a low-SES neighborhood lost between $4,500 and $9,000 relative to the amount they would have received had an outlet not opened within 0.5 miles from their home while homeowners who live close to a new outlet in a high-SES neighborhood stand to gain between $1,700 and $3,600. Furthermore, the closing of outlets in low-SES neighborhoods increase transaction prices by between 4 and 5 percent, translating to a gain of between $9,000 and $11,150. The closure of an outlet in a high-SES neighborhood led to a decrease of transaction prices by between 0.1 to 1 percent, translating to a loss of between $220 and $2,200.

In general, we see that new outlets located further away from the residential property have a smaller impact on the price of the property. This is reasonable since we would expect amenities that are located closer to the property to have a relatively larger effect. However, column (2) of Table XIII seems to indicate that the closure of an outlet further away from the residential property has a bigger impact on its price than a closure of an outlet within 0.1 miles. This may be due in part to the imprecision of the estimates of the effect of the changes in the number of outlets closer to the property. We also observe that outlets in high-SES neighborhoods have a smaller effect on property prices than outlets in low-SES neighborhoods. This is consistent with the findings in the earlier part of the paper where we find that outlets in low-SES neighborhoods have a relatively larger impact on crime.

The heterogeneity of alcohol outlets are evident when we look at new outlets located in low and high-SES neighborhoods individually: Outlets located in low-SES neighborhoods are seen as a disamenity by existing and potential homeowners. On the other hand, outlets located in high-SES neighborhoods are valued by homeowners. In addition, outlets located in low-SES neighborhoods impose a larger shock on the transaction price of the property than outlets in high-SES neighborhoods.

Reassuringly, the estimates of the effect of alcohol outlets on residential property values are similar in magnitude to the effect of other changes in local amenities other recent studies find: Black (1999) finds that parents are willing to pay 2.5% more for a 5% increase in test scores; Chay and Greenstone (2005) find that homeowners' marginal willingness to pay for reductions in air pollution to be around 2% ; Linden and Rockoff (2006) find that value of properties in the immediate vicinity of a sex offender's home fall by 4% on average.

6 Concluding Remarks

Does the presence of alcohol outlets actually *cause* crime and urban decay – as suggested by situational models of criminal activity – or are alcohol outlets more likely to open in declining neighborhoods? This paper tests this question using an event study framework. One important take-away of this paper is the vast heterogeneity that exists between outlets located in low and high-SES neighborhoods and their resulting effects on the neighborhoods they are situated in.

I find that while both types of outlets result in a displacement of property crime to the immediate vicinity of the outlet, the magnitude of this effect is bigger for outlets located in low-SES neighborhoods. Furthermore, additional outlets in low-SES neighborhoods appear to increase violent crime, and there is some evidence that this increase in violent crime is not contained within the immediate vicinity of the outlet but instead, spills over to locations further away. Likewise, outlets located in low-SES neighborhoods have a more pronounced effect on residential property transaction values within a 0.5 mile radius from the outlet: transaction prices fall upon the opening of an additional outlet and rise when an outlet closes. Conversely, transaction values increase, albeit to a smaller extent, with additional outlets in high-SES neighborhoods and decrease correspondingly when such outlets close.

Together, these results indicate that policy makers should be mindful of the differences between the 'good' and the 'bad' outlets when formulating policy. While some outlets may potentially increase crime and urban decay in their neighborhoods, others may be an important source of tax revenue, create jobs for residents and may also provide residents with services that they value. It is encouraging that some cities are already recognizing this difference: The City of San Francisco is proposing new legislation that exempts "larger grocery and other retail stores that also sell alcoholic beverages from regulations that prevent liquor stores from opening in five special use districts".

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8 Appendices

Appendix 1

Examining the Change in Residential Property Transaction Density

Empirical Strategy

In order to have a complete picture of the effect of alcohol outlets on urban decay, one has to consider both the change in property prices and the change in transaction quantities since both price and quantity are required to map out the housing market's equilibrium point. Moreover, quantity data tends to have less error than price data and sheds light on the rate of turnover in the neighborhood. The empirical strategy I use in this part of the paper is the same as the one in section 4.1 except that I substitute in Crime_$den[p,q]_{it}$ in equations (1), (4), (5), (6) and (7) with $Trans\_den[p,q]_{it}$, the property transaction density (number of property transactions per square mile per month) in the area between p and q miles away from outlet i at event time t:

(A1) $$Trans\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\, t_{i(c)} + \gamma\, 1(t_i \geq 0) + Month\ dummies + Year\ dummies + \varepsilon_{it}$$

(A2) $$Trans\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\, t_{i(c)} + \gamma\, 1(t_i \geq 0) + \varpi\, (Outlets[0,q]_{it} - 1) * 1(t_i \geq 0) + Month\ dummies + Year\ dummies + \varepsilon_{it}$$

(A3) $$Trans\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\, t_{i(c)} + \gamma\, 1(t_i \geq 0) + \delta\, t_i * 1(t_i \geq 0) + Month\ dummies + Year\ dummies + \varepsilon_{it}$$

(A4) $$Trans\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\, t_{i(c)} + \gamma\, 1(t_i \geq 0) + \delta\, t_i * 1(t_i \geq 0) + \varpi\, (Outlets[0,q]_{it} - 1) * 1(t_i \geq 0) + Month\ dummies + Year\ dummies + \varepsilon_{it}$$

$$\textbf{(A5)} \quad Trans\_den[p,q]_{it} = \alpha_i + \beta_{(c)}\, t_{i(c)} + Outlets[0,q]_{it} + (Outlets[0,q]_{it})^2$$

$$+ \ Month\ dummies + Year\ dummies + \varepsilon_{it}$$

As before, the standard errors are clustered at the store level since the error terms are not independent across space. In an attempt to make sure that there is no undercounting of the number of transactions as a result of crossing city boundaries, I considered all transactions that occurred in neighborhoods within a 0.5 mile radius of all the alcohol outlets in the City of Los Angeles (Appendix 4 List II) in addition to those that occurred within the neighborhoods of the city (Appendix 4 List I). The results of equations (A1) to (A5) with outlet-tract specific time trends are summarized in Appendix Table I.

As before, in order to account for the heterogeneity of outlets, I separate the alcohol outlets into two groups: those located in high-SES areas (top 2 quintiles of average median household income) and those located in low-SES areas (bottom 2 quintiles). I then re-estimated equations (A1) – (A5) separately for each group. Selected results from this set of regressions are presented in Appendix Tables II and III.

The Effect of Alcohol Outlets on Residential Property Transaction Density

Perhaps unsurprisingly, most of the coefficients in this part of the paper are estimated imprecisely. One explanation is the small number of property transactions that occur during the 49 month window makes it difficult for us to detect any changes. Another explanation is we probably will not expect the opening or closing of one alcohol outlet to have any ramifications on transaction volume but on transaction prices instead. Nonetheless, from Appendix Table I, the general pattern we observe is that the number of property transactions generally increases following an outlet opening and decreases following the closing of an outlet. Also, the magnitude of the effects is larger closer to the outlet than further away. This is consistent with the pattern we see in crime density. However, the implications are difficult to interpret given the lack of any strong evidence.

In the case of outlets in low-SES neighborhoods, while only a handful of the coefficients are estimated precisely, taken together, the coefficients in Appendix Table II suggest that transaction density increases within 0.1 miles from a new outlet but decreases at locations further away. There is no consistent pattern when outlets in low-SES neighborhoods close. Again, while the decrease in transaction density between 0.1 and 0.5 miles away from the outlet is consistent with residents demonstrating loss aversion when transaction prices fall (Genesove and Mayer, 2001), the increase in transactions closer to the outlet is puzzling.

On the contrary, the opening of outlets in high-SES neighborhoods appears to decrease transaction density within 0.1 miles from the new outlet and increase transaction density further away from the outlet. The closing of outlets in high-SES neighborhoods appear to decrease transaction density up to 0.5 miles away. Again, this is loosely consistent with sellers demonstrating loss aversion.

Appendix 2
Geocoding Procedure

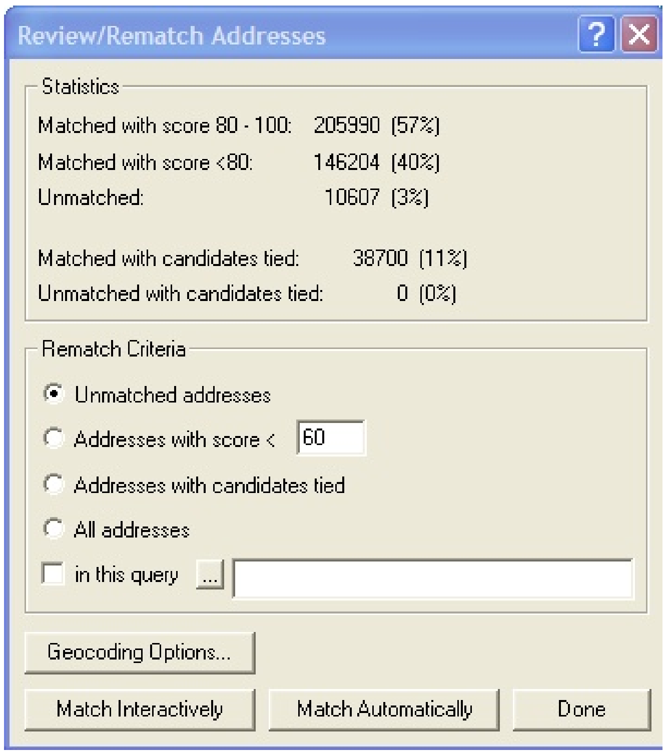
Data Retrieval from the Los Angeles Police Department (LAPD)

Due to third party privacy rights issues, the LAPD did not allow me to retrieve their incident crime reports with the location field in its original form. In cases where the location field variable takes the form of an intersection of two streets, I was allowed to retrieve it as is. However, in cases where the location field variable contained a street address, I had to run the list of street addresses through a software, ZP4, that in turn determined the corresponding ZIP+4 codes of the addresses. I then replaced the street addresses with their corresponding ZIP+4 codes before retrieving the data.

However, complications arose from the lack of a readily available spatial database of ZIP+4 codes for geocoding purposes. Instead, the only spatial databases I had available for geocoding were made up of street addresses and intersections. In order to circumvent this problem, I made used of the official United States Postal Service (USPS) data files available in my version of ZP4 to manually construct a database consisting of ZIP+4s and street addresses that corresponded to approximately the centroid of the ZIP+4 codes. Finally, I proceed to geocode this list of artificially constructed crime locations.

Geocoding in ArcGIS Version 9.1

The address locator was created using a combination of 2 street address databases: The Census Bureau's Tiger line files and ESRI's StreetMap USA database. Geocoding results are displayed in the following format after each geocoding procedure:



The score indicates how closely the individual street addresses in the list of geocoded addresses correspond to the street address it is matched to in the street address databases in terms of its various components such as the street number, street name and directional prefix and suffix. For many reasons including but not limited to the errors in the data and the street address databases, I did not find these scores to be particularly indicative of how accurately each data point is being geocoded. Instead, I found that geocoding accuracy was greatly improved by using other geographical variables in the data sets, such as the reporting district in the LAPD crime data and the 5 digit zip code in the DataQuick and liquor licensing data, for cross checking purposes. Unfortunately, due to the manually intensive nature of this process and the immense number of addresses I had to geocode (well over 1 million), I could only cross check each individual address in the liquor licensing data. As for the LAPD crime data and the DataQuick transactions data, I limited the cross checking to points that were “matched with candidates tied” (i.e. addresses matched to 2 or more points with the same score). I did, however, individually cross check each address for a subset of my data and found that the geocoding errors of the address locators were not systematic such that my results will be biased in a particular way. Nevertheless, these data and geocoding errors will certainly affect the precision of my estimates and bias me against estimating significant coefficients.

Appendix 3
Where Do Alcohol Outlets Locate?

The general perception is areas that have a higher minority presence, a higher proportion of female headed households, a lower median household income and a lower proportion of high school graduates tend also to have many undesirable alcohol outlets. While my data does not allow me to easily differentiate between desirable and undesirable alcohol outlets, it remains interesting to ask where alcohol outlets tend to locate, and whether certain types of neighborhoods tend to have more alcohol outlets than others. To answer this set of questions, I regressed the number of alcohol outlets per thousand in each census tract (Outlets) against the following demographic variables: per cent high school plus (HS), per cent college plus (College), per cent White (White), per cent Black (Black), per cent Asian (Asian), median household income (MedHHY), per capita income (percapY), number of households (HH), number of owner occupied households (Owner), average family size (FamSize), per cent receiving public assistance (PubAssist), per cent ratio of income to poverty level equals two (YPov2) and per cent ratio of income to poverty level is greater than two (YPov2plus). The above list of demographic variables is downloaded at the census tract level from the 1990 and 2000 decennial census and interpolated for each year from 1990 to 2004.

I begin with an OLS regression of equation (A6):

(A6)
$$Outlets_{it} = \phi_1\, HS_{it} + \phi_2\, College_{it} + \phi_3\, White_{it} + \phi_4\, Black_{it} + \phi_5\, Asian_{it} + \phi_6\, MedHHY_{it} + \phi_7\, percapY_{it} + \phi_8\, HH_{it} + \phi_9\, Owner_{it} + \phi_{10}\, FamSize_{it} + \phi_{11}\, PubAssist_{it} + \phi_{12}\, YPov2_{it} + \phi_{13}\, YPov2plus_{it} + \varepsilon_{it}$$

In this equation, *i* and *t* index census tracts and years respectively. The results are reported in the first column of Appendix Table IV. Next, I added dummy variables for each year. The results are reported in column 2 of Appendix Table IV. Finally, I augmented equation (A6) with fixed effects for each census tract. The results of this fixed effects regression can be found in the third column of Appendix Table IV.

Prior to controlling for census tract fixed effects, the estimated coefficients for per cent high school plus, median household income, number of households and average family size are negative and significant at the 1% level, while the estimated coefficients for per capita income, per cent White, per cent Asian, per cent receiving public assistance, per cent ratio of income to poverty level equals two and per cent ratio of income to poverty level is greater than two are positive and significant at the 1% level. However, only the estimated coefficients for per cent college plus, number of households, average family size and per cent receiving public assistance remain significant once census tract fixed effects are controlled for. The same set of regressions is repeated for the number of alcohol outlets with type 20 (off-sale beer and wine) and type 21 (off-sale general) licenses per thousand separately. From columns 4-9 of Appendix Table IV, we see that the results from separating alcohol outlets based on their license types is very similar to the results obtained from using the total density of alcohol outlets. Overall, Appendix Table IV suggests that census tracts that are less residential (fewer number of households), poorer (higher per cent receiving public assistance and higher per cent of population with their ratio of poverty level to income greater than or equals to 2) and less educated (lower per cent of population with college and above level of education) tend to have higher alcohol outlet density. One caveat to note is that because demographic data is only available at the census tract level once every 10 years, interpolating 2 observations over the course of fifteen years may result in over-smoothing of the data, which may then cause the tract fixed effects to explain more of the variance than they would have if demographic data is available at a higher frequency.

Appendix 4

List I: Neighborhoods Within the City of Los Angeles

1. Arleta
2. Canoga Park
3. Chatsworth
4. Encino
5. Granada Hills
6. Harbor City
7. Highland Park
8. Hollywood
9. Lake View Terrace
10. Los Angeles
11. Mission Hills
12. North Hills
13. North Hollywood
14. Northridge
15. Pacific Palisades
16. Pacoima
17. Panorama City
18. Playa Del Rey
19. Reseda
20. San Pedro
21. Sepulveda
22. Shadow Hills
23. Sherman Oaks
24. Studio City
25. Sun Valley
26. Sunland
27. Tarzana
28. Toluca Lake
29. Tujunga
30. Valley Village
31. Van Nuys
32. Venice
33. West Hills
34. West Los Angeles
35. Westchester
36. Wilmington
37. Winnetka
38. Woodland Hills

List II: Neighborhoods Surrounding the City of Los Angeles

1. Alhambra
2. Beverly Hills
3. Burbank
4. Calabasas
5. Carson
6. Commerce
7. Compton
8. Culver City
9. East Los Angeles
10. El Segundo
11. Gardena
12. Glendale
13. Hidden Hills
14. Huntington Park
15. Inglewood
16. Lennox
17. Lomita
18. Long Beach
19. Lynwood
20. Marina Del Rey
21. Monterey Park
22. Pasadena
23. Rancho Palos Verdes
24. Rolling Hills
25. San Fernando
26. Santa Monica
27. South Gate
28. South Pasadena
29. Torrance
30. Universal City
31. Vernon
32. West Los Angeles
33. Willowbrook

9 Tables

TABLE I
SAMPLE CRIME DENSITY MEANS IN 1992 BY TRACT LEVEL MEDIAN OUTLET NUMBER

	All LA	Tracts with 0 outlets	Tracts with 2 or less outlets	Tracts with 5 or more outlets
	(1)	(2)	(3)	(4)
Violent crimes	9.6	1.6	5.0	16.2
Assault with deadly weapon	4.1	0.9	2.2	6.9
Robbery	5.5	0.7	2.8	9.4
Property crimes	16.0	3.1	9.3	24.5
Burglary	5.9	1.1	3.3	9.1
Vandalism	2.8	0.7	1.7	4.3
Vehicle theft	7.3	1.2	4.3	11.1

The entries correspond to the mean number of crimes per square mile per month in each census tract in the geographic subsample of downtown Los Angeles during 1992. We observe that census tracts with more alcohol outlets also have higher crime densities.

TABLE II
THE EFFECT OF ALCOHOL OUTLET OPENINGS ON CRIME DENSITY

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (1)	*1* (t_i ≥ 0)	2.41	0.81	1.60 ***	2.76 *	0.53	0.38
		(2.02)	(0.98)	(0.51)	(1.53)	(0.63)	(0.35)
	Percent jump	3.7	1.7	3.7	6.0	2.0	1.5
Equation (4)	*1* (t_i ≥ 0)	2.20	2.86 **	4.67 ***	2.01	1.50 *	3.77 ***
		(2.51)	(1.20)	(0.96)	(1.75)	(0.81)	(0.89)
	1 (t_i ≥ 0)*(*Number of outlets - 1*)	0.15	-0.52 *	-0.25 ***	0.56	-0.25	-0.28 ***
		(1.27)	(0.27)	(0.08)	(0.81)	(0.17)	(0.07)
	Percent jump (for first outlet)	3.4	6.0	10.8	4.3	5.6	14.7
Equation (5)	*1* (t_i ≥ 0)	2.33	0.32	1.36 ***	2.62 *	0.59	0.42
		(2.05)	(0.97)	(0.51)	(1.52)	(0.63)	(0.36)
	t_i **1* (t_i ≥ 0)	-0.03	-0.21 ***	-0.10 **	-0.06	0.02	0.02
		(0.17)	(0.08)	(0.05)	(0.11)	(0.05)	(0.04)
	Percent jump	3.6	0.7	3.1	5.6	2.2	1.6
Equation (6)	*1* (t_i ≥ 0)	2.12	2.41 **	4.45 ***	1.87	1.55 *	3.79 ***
		(2.52)	(1.21)	(0.95)	(1.74)	(0.84)	(0.91)
	t_i **1* (t_i ≥ 0)	-0.03	-0.21 ***	-0.11 **	-0.06	0.02	0.01
		(0.17)	(0.08)	(0.05)	(0.11)	(0.05)	(0.04)
	1 (t_i ≥ 0)*(*Number of outlets - 1*)	0.15	-0.54 **	-0.26 ***	0.56	-0.25	-0.28 ***
		(1.27)	(0.27)	(0.08)	(0.81)	(0.17)	(0.07)
	Percent jump (for first outlet)	3.2	5.1	10.3	4.0	5.8	14.8
Equation (7)	*Number of outlets*	4.26 *	1.93 **	1.38 ***	2.12	1.20 *	-0.11
		(2.56)	(0.97)	(0.47)	(1.52)	(0.76)	(0.42)
	(Number of outlets)^2	0.20	-0.03	-0.00	-0.12	0.01	0.04 ***
		(0.48)	(0.09)	(0.01)	(0.28)	(0.06)	(0.01)
	Mean crime density	65.24	47.4	43.31	46.38	26.74	25.69

The dependent variable is the number of crimes per mile^2 per month. There were 703 outlet openings in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean crime density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE III

THE EFFECT OF ALCOHOL OUTLET OPENINGS ON CRIME DENSITY, WITH OUTLET-TRACT SPECIFIC TRENDS

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (1)	$1(t_i \geq 0)$	3.43 *	0.47	1.00 **	2.40	0.48	0.24
		(1.94)	(0.93)	(0.48)	(1.57)	(0.61)	(0.34)
	Percent jump	5.3	1.0	2.3	5.2	1.8	0.9
Equation (4)	$1(t_i \geq 0)$	1.40	0.63	0.93	1.37	0.06	-0.04
		(2.42)	(1.35)	(0.81)	(1.67)	(0.82)	(0.65)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	1.52	-0.04	0.01	0.77	0.11	0.02
		(1.19)	(0.35)	(0.07)	(0.98)	(0.22)	(0.06)
	Percent jump (for first outlet)	2.1	1.3	2.1	3.0	0.2	-0.2
Equation (5)	$1(t_i \geq 0)$	3.05	0.08	0.86 *	2.32	0.50	0.25
		(1.97)	(0.93)	(0.49)	(1.56)	(0.61)	(0.35)
	$t_i * 1(t_i \geq 0)$	-0.20	-0.20 **	-0.07	-0.04	0.01	0.01
		(0.17)	(0.09)	(0.05)	(0.12)	(0.05)	(0.04)
	Percent jump	4.7	0.2	2.0	5.0	1.9	1.0
Equation (6)	$1(t_i \geq 0)$	1.09	0.38	0.86	1.31	0.07	-0.03
		(2.42)	(1.34)	(0.80)	(1.70)	(0.83)	(0.64)
	$t_i * 1(t_i \geq 0)$	-0.19	-0.20 **	-0.07	-0.04	0.01	0.01
		(0.17)	(0.09)	(0.05)	(0.12)	(0.05)	(0.04)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	1.47	-0.08	0.00	0.76	0.11	0.02
		(1.20)	(0.35)	(0.07)	(1.00)	(0.22)	(0.06)
	Percent jump (for first outlet)	1.7	0.8	2.0	2.8	0.3	-0.1
Equation (7)	*Number of outlets*	1.83	0.71	0.72 *	0.02	0.38	-0.02
		(2.23)	(0.97)	(0.40)	(1.59)	(0.63)	(0.31)
	(Number of outlets)^2	0.63	-0.04	-0.01	0.08	0.03	0.02 **
		(0.44)	(0.10)	(0.01)	(0.31)	(0.05)	(0.01)
	Mean crime density	65.24	47.4	43.31	46.38	26.74	25.69

The dependent variable is the number of crimes per mile^2 per month. There were 703 outlet openings in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean crime density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE IV
THE EFFECT OF ALCOHOL OUTLET CLOSINGS ON CRIME DENSITY

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (1)	$1(t_i \geq 0)$	-1.48	-0.20	-0.09	0.49	0.03	-0.32
		(1.12)	(0.46)	(0.29)	(1.05)	(0.38)	(0.25)
	Percent jump	-2.1	-1.2	-0.8	-2.4	-1.5	-1.0
Equation (4)	$1(t_i \geq 0)$	-0.74	3.38 ***	5.31 ***	1.74	3.14 ***	4.18 ***
		(1.29)	(0.95)	(0.70)	(1.48)	(1.11)	(0.71)
	$1(t_i \geq 0)$*(*Number of outlets - 1*)	-0.67	-1.05 ***	-0.46 ***	-1.13	-0.91 ***	-0.38 ***
		(0.70)	(0.23)	(0.06)	(0.90)	(0.33)	(0.06)
	Percent jump (for first outlet)	-1.4	8.7	14.5	4.0	12.4	17.4
Equation (5)	$1(t_i \geq 0)$	-1.48	-0.21	-0.08	0.47	0.04	-0.33
		(1.13)	(0.46)	(0.29)	(1.05)	(0.39)	(0.25)
	$t_i * 1(t_i \geq 0)$	-0.00	-0.02	0.01	-0.03	0.01	-0.01
		(0.09)	(0.04)	(0.03)	(0.08)	(0.03)	(0.02)
	Percent jump	-2.8	-0.5	-0.2	1.1	0.2	-1.4
Equation (6)	$1(t_i \geq 0)$	-0.74	3.36 ***	5.31 ***	1.72	3.15 ***	4.17 ***
		(1.30)	(0.95)	(0.70)	(1.48)	(1.11)	(0.71)
	$t_i * 1(t_i \geq 0)$	-0.00	-0.02	-0.00	-0.03	0.01	-0.02
		(0.09)	(0.04)	(0.03)	(0.08)	(0.03)	(0.02)
	$1(t_i \geq 0)$*(*Number of outlets - 1*)	-0.67	-1.05 ***	-0.46 ***	-1.13	-0.91 ***	-0.38 ***
		(0.70)	(0.23)	(0.06)	(0.90)	(0.33)	(0.06)
	Percent jump (for first outlet)	-1.4	8.7	14.5	4.0	12.4	17.4
Equation (7)	*Number of outlets*	1.49	-1.98 **	-1.01 ***	0.80	-2.37 **	-0.69 **
		(1.54)	(0.93)	(0.34)	(1.78)	(1.20)	(0.34)
	(Number of outlets)^2	0.09	0.25 ***	0.05 ***	0.03	0.34 ***	0.04 ***
		(0.22)	(0.09)	(0.01)	(0.27)	(0.13)	(0.01)
	Mean crime density	53.74	38.64	36.65	43.32	25.38	24.03

The dependent variable is the number of crimes per mile^2 per month. There were 634 outlet closings in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean crime density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE V
THE EFFECT OF ALCOHOL OUTLET CLOSINGS ON CRIME DENSITY, WITH OUTLET-TRACT SPECIFIC TRENDS

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (1)	$1(t_i \geq 0)$	-1.58	-0.15	-0.05	0.48	0.01	-0.29
		(1.13)	(0.46)	(0.29)	(1.05)	(0.38)	(0.25)
	Percent jump	-2.9	-0.4	-0.1	1.1	0.0	-1.2
Equation (4)	$1(t_i \geq 0)$	-2.18 *	0.68	2.20 ***	1.73	0.72	1.29 **
		(1.31)	(0.81)	(0.67)	(1.57)	(1.01)	(0.63)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	0.54	-0.25	-0.19 ***	-1.13	-0.21	-0.14 **
		(0.76)	(0.21)	(0.06)	(1.01)	(0.30)	(0.06)
	Percent jump (for first outlet)	-4.1	1.8	6.0	4.0	2.8	5.4
Equation (5)	$1(t_i \geq 0)$	-1.59	-0.17	-0.03	0.47	0.01	-0.30
		(1.14)	(0.46)	(0.29)	(1.06)	0.38	(0.25)
	$t_i * 1(t_i \geq 0)$	-0.02	-0.02	0.02	-0.01	0.00	-0.02
		(0.09)	(0.04)	(0.03)	(0.08)	(0.03)	(0.02)
	Percent jump	-3.0	-0.4	-0.1	1.1	0.0	-1.2
Equation (6)	$1(t_i \geq 0)$	-2.19 *	0.66	2.21 ***	1.72	0.72	1.28 **
		(1.32)	(0.81)	(0.67)	(1.58)	(1.01)	(0.63)
	$t_i * 1(t_i \geq 0)$	-0.02	-0.02	0.02	-0.01	0.00	-0.02
		(0.09)	(0.04)	(0.03)	(0.08)	(0.03)	(0.02)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	0.54	-0.24	-0.19 ***	-1.13	-0.21	-0.14 **
		(0.76)	(0.21)	(0.06)	(1.01)	(0.30)	(0.06)
	Percent jump (for first outlet)	-4.1	1.7	6.0	4.0	2.8	5.3
Equation (7)	*Number of outlets*	2.31	-0.68	-0.54 *	-0.18	-1.79 *	-0.48 **
		(1.50)	(0.77)	(0.29)	(1.84)	(1.04)	(0.24)
	(Number of outlets)^2	-0.37	0.11	0.03 ***	0.04	0.28 **	0.04 ***
		(0.25)	(0.07)	(0.01)	(0.30)	(0.11)	(0.01)
	Mean crime density	53.74	38.64	36.65	43.32	25.38	24.03

The dependent variable is the number of crimes per mile^2 per month. There were 634 outlet closings in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean crime density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE VI

THE EFFECT OF ALCOHOL OUTLET OPENINGS IN LOW-SES NEIGHBORHOODS ON CRIME DENSITY, WITH OUTLET-TRACT SPECIFIC TRENDS

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (4)	$1(t_i \geq 0)$	5.33	-1.53	4.32 ***	0.03	0.14	1.47
		(4.22)	(2.63)	(1.53)	(3.05)	(1.76)	(1.40)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	-0.55	0.25	-0.16 *	3.08 **	0.05	-0.07
		(1.71)	(0.56)	(0.10)	(1.54)	(0.34)	(0.09)
	Percent jump (for first outlet)	6.8	-2.6	7.6	0.0	0.3	3.6
Equation (6)	$1(t_i \geq 0)$	4.80	-1.65	4.26 ***	-0.15	0.29	1.48
		(4.28)	(2.61)	(1.51)	(3.12)	(1.77)	(1.40)
	$t_i * 1(t_i \geq 0)$	-0.30	-0.12	-0.11	-0.10	0.15	0.01
		(0.32)	(0.16)	(0.08)	(0.20)	(0.10)	(0.08)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	-0.60	0.22	-0.17 *	3.06 **	0.08	-0.06
		(1.70)	(0.56)	(0.10)	(1.53)	(0.34)	(0.09)
	Percent jump (for first outlet)	6.1	-2.8	7.5	-0.2	0.7	3.6
Equation (7)	*Number of outlets*	6.19	1.35	1.19 **	-1.24	1.43	0.00
		(3.37)	(1.57)	(0.60)	(2.80)	(1.19)	(0.53)
	(Number of outlets)^2	-0.11	-0.06	-0.02 *	0.17	-0.02	0.02
		(0.40)	(0.13)	(0.01)	(0.50)	(0.08)	(0.01)
	Mean crime density	78.76	59.61	56.97	63.78	40.35	40.99

The dependent variable is the number of crimes per mile^2 per month. 313 outlets in low-SES neighborhoods opened in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean crime density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE VII
THE EFFECT OF ALCOHOL OUTLET OPENINGS IN HIGH-SES NEIGHBORHOODS ON CRIME DENSITY,
WITH OUTLET-TRACT SPECIFIC TRENDS

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (4)	*1* (*t*$_i$ ≥ 0)	-3.44	-0.18	-1.46	0.80	-1.53 *	-0.83 **
		(2.78)	(1.38)	(0.95)	(1.94)	(0.92)	(0.43)
	1 (*t*$_i$ ≥ 0)*(*Number of outlets - 1)*	4.26 **	0.59	0.29 **	-0.89	0.64 **	0.18 ***
		(1.76)	(0.37)	(0.14)	(1.04)	(0.26)	(0.07)
	Percent jump (for first outlet)	-6.9	-0.5	-5.4	3.3	-12.7	-8.7
Equation (6)	*1* (*t*$_i$ ≥ 0)	-3.32	-0.37	-1.46	0.72	-1.63 *	-0.83 *
		(2.76)	(1.38)	(0.95)	(1.95)	(0.92)	(0.43)
	t$_i$ **1* (*t*$_i$ ≥ 0)	0.07	-0.17 *	0.01	-0.05	-0.09 *	0.01
		(0.18)	(0.09)	(0.05)	(0.14)	(0.05)	(0.02)
	1 (*t*$_i$ ≥ 0)*(*Number of outlets - 1)*	4.27 **	0.55	0.30 **	-0.90	0.62 **	0.18 ***
		(1.77)	(0.37)	(0.14)	(1.04)	(0.26)	(0.07)
	Percent jump (for first outlet)	-6.7	-1.1	-5.4	3.0	-13.5	-8.7
Equation (7)	*Number of outlets*	-5.42 **	1.43	0.54	-1.32	-0.29	-0.09
		(2.49)	(0.99)	(0.48)	(1.81)	(0.76)	(0.20)
	(Number of outlets)^2	1.95 ***	-0.07	0.00	0.25	0.04	0.04 ***
		(0.60)	(0.13)	(0.02)	(0.31)	(0.09)	(0.01)
	Mean crime density	49.63	33.64	27.07	24.23	12.08	9.49

The dependent variable is the number of crimes per mile^2 per month. 255 outlets in high-SES neighborhoods opened in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean crime density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE VIII
THE EFFECT OF ALCOHOL OUTLET CLOSINGS IN LOW-SES NEIGHBORHOODS ON CRIME DENSITY, WITH OUTLET-TRACT SPECIFIC TRENDS

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (4)	*1* (t_i ≥ 0)	-4.46 **	1.74	3.50 ***	1.67	1.64	1.70
		(1.88)	(1.24)	(1.10)	(2.78)	(1.68)	(1.08)
	1 (t_i ≥ 0)*(*Number of outlets - 1*)	1.46	-0.52 *	-0.23 ***	-1.54	-0.51	-0.16 **
		(1.06)	(0.28)	(0.08)	(1.90)	(0.45)	(0.08)
	Percent jump (for first outlet)	-7.2	3.7	7.6	2.9	4.5	4.9
Equation (6)	*1* (t_i ≥ 0)	-4.43 **	1.74	3.51 ***	1.65	1.65	1.67
		(1.91)	(1.24)	(1.10)	(2.79)	(1.68)	(1.08)
	t_i **1* (t_i ≥ 0)	0.03	-0.00	0.03	-0.03	0.02	-0.04
		(0.13)	(0.06)	(0.04)	(0.14)	(0.06)	(0.04)
	1 (t_i ≥ 0)*(*Number of outlets - 1*)	1.45	-0.52 *	-0.23 ***	-1.53	-0.51	-0.16 **
		(1.06)	(0.28)	(0.08)	(1.90)	(0.45)	(0.08)
	Percent jump (for first outlet)	-7.1	3.7	7.6	2.8	4.6	4.8
Equation (7)	*Number of outlets*	3.05	-1.56	-0.87 **	-0.66	-3.00 **	-0.50
		(2.18)	(0.99)	(0.36)	(3.49)	(1.20)	(0.32)
	(Number of outlets)^2	-0.75 *	0.19 **	0.03 ***	0.24	0.45 ***	0.03 ***
		(0.41)	(0.09)	(0.01)	(0.69)	(0.12)	(0.01)
	Mean crime density	62.06	47.65	46.10	58.39	36.21	34.64

The dependent variable is the number of crimes per mile^2 per month. 331 outlets in low-SES neighborhoods closed in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean crime density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE IX
THE EFFECT OF ALCOHOL OUTLET CLOSINGS IN HIGH-SES NEIGHBORHOODS ON CRIME DENSITY, WITH OUTLET-TRACT SPECIFIC TRENDS

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (4)	*1* (*t* $_i$ ≥ 0)	2.19	-0.04	0.15	2.24	-0.06	0.30
		(2.15)	(1.06)	(0.62)	(1.51)	(0.58)	(0.38)
	1 (*t* $_i$ ≥ 0)*(*Number of outlets - 1)*	0.02	0.10	-0.04	-1.10	0.23	-0.02
		(1.17)	(0.31)	(0.07)	(0.87)	(0.18)	(0.05)
	Percent jump (for first outlet)	5.0	-0.2	0.7	11.5	-0.6	3.9
Equation (6)	*1* (*t* $_i$ ≥ 0)	2.15	-0.12	0.15	2.24	0.07	0.31
		(2.15)	(1.06)	(0.61)	(1.51)	(0.60)	(0.39)
	t $_i$ **1* (*t* $_i$ ≥ 0)	-0.03	-0.05	0.01	0.01	-0.01	0.01
		(0.16)	(0.06)	(0.04)	(0.09)	(0.03)	(0.02)
	1 (*t* $_i$ ≥ 0)*(*Number of outlets - 1)*	0.03	0.12	-0.03	-1.11	0.23	-0.02
		(1.18)	(0.31)	(0.07)	(0.87)	(0.18)	(0.05)
	Percent jump (for first outlet)	4.9	-0.5	0.7	11.5	0.7	4.0
Equation (7)	*Number of outlets*	-2.90	0.55	0.20	-1.43	-0.06	-0.32 **
		(2.16)	(0.77)	(0.28)	(1.56)	(0.40)	(0.14)
	(Number of outlets)^2	-0.03	-0.07	-0.01	0.07	0.00	0.01 ***
		(0.25)	(0.05)	(0.01)	(0.32)	(0.03)	(0.00)
	Mean crime density	43.70	25.95	21.85	19.56	9.55	7.74

The dependent variable is the number of crimes per mile^2 per month. 180 outlets in high-SES neighborhoods closed in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean crime density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE X: THE EFFECT OF ALCOHOL OUTLET OPENINGS ON CRIME DENSITY DURING DIFFERENT TIMES OF THE DAY

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
0000 - 0559 hrs	$1(t_i \geq 0)$	0.12	0.55 *	0.50 ***	1.33 *	-0.05	1.21 ***
		(0.71)	(0.32)	(0.18)	(0.69)	(0.29)	(0.28)
	$t_i * 1(t_i \geq 0)$	-0.09 *	-0.04 **	0.00	-0.06	-0.01	0.01
		(0.05)	(0.02)	(0.01)	(0.05)	(0.02)	(0.01)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	-0.07	-0.04	-0.02	-0.22	0.04	-0.07 ***
		(0.32)	(0.06)	(0.01)	(0.34)	(0.06)	(0.02)
	Mean crime density	8.72	6.24	5.72	10.14	5.81	5.71
	Percent jump (for first outlet)	1.4	8.8	8.7	13.1	-0.9	21.2
0600 - 1159 hrs	$1(t_i \geq 0)$	-0.80	-0.33	0.54 **	0.75	0.05	0.34 **
		(0.75)	(0.37)	(0.24)	(0.54)	(0.23)	(0.15)
	$t_i * 1(t_i \geq 0)$	-0.02	-0.02	0.00	-0.01	0.03 *	0.02 **
		(0.05)	(0.02)	(0.01)	(0.04)	(0.01)	(0.01)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	0.51	0.04	-0.03 **	0.09	-0.04	-0.03 ***
		(0.33)	(0.07)	(0.02)	(0.22)	(0.05)	(0.01)
	Mean crime density	11.08	8.64	8.09	5.95	3.48	3.42
	Percent jump (for first outlet)	-7.2	-3.8	6.7	12.6	1.4	9.9
1200 - 1759 hrs	$1(t_i \geq 0)$	1.56	0.24	1.25 ***	-0.23	0.75 **	0.69 **
		(1.18)	(0.48)	(0.29)	(0.79)	(0.37)	(0.29)
	$t_i * 1(t_i \geq 0)$	0.04	-0.04	-0.05 ***	0.07	0.02	-0.02
		(0.07)	(0.03)	(0.02)	(0.05)	(0.02)	(0.01)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	-0.03	-0.14	-0.09 ***	0.37	-0.17 **	-0.06 ***
		(0.50)	(0.12)	(0.02)	(0.42)	(0.08)	0.02
	Mean crime density	17.78	12.23	11.21	11.95	7.00	6.62
	Percent jump (for first outlet)	8.8	2.0	11.2	-1.9	10.7	10.4
1800 - 2359 hrs	$1(t_i \geq 0)$	1.24	1.91 ***	2.13 ***	0.03	0.80 *	1.54 ***
		(1.38)	(0.61)	(0.49)	(1.10)	(0.43)	(0.38)
	$t_i * 1(t_i \geq 0)$	0.05	-0.12 ***	-0.07 ***	-0.06	-0.01	0.00
		(0.10)	(0.04)	(0.02)	(0.07)	(0.02)	(0.02)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	-0.24	-0.39 ***	-0.11 ***	0.32	-0.08	-0.11 ***
		(0.73)	(0.13)	(0.04)	(0.46)	(0.09)	(0.03)
	Mean crime density	27.63	20.27	18.27	18.33	10.45	9.94
	Percent jump (for first outlet)	4.5	9.4	11.7	0.2	7.7	15.5

The dependent variable is the number of crimes per mile^2 per month during a particular 6 hour interval. There were 703 outlet openings in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of $1(t_i \geq 0)$ by the mean crime density of the sample. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE XI: THE EFFECT OF ALCOHOL OUTLET CLOSINGS ON CRIME DENSITY DURING DIFFERENT TIMES OF THE DAY

		Property crimes			Violent crimes		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
0000 - 0559 hrs	$1(t_i \geq 0)$	-0.01	0.64 ***	1.02 ***	0.81	0.52 *	1.25 ***
		(0.40)	(0.21)	(0.17)	(0.53)	(0.30)	(0.21)
	$t_i * 1(t_i \geq 0)$	0.03	-0.00	0.00	0.05	-0.00	0.01
		(0.03)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	-0.21	-0.20 ***	-0.08 ***	-0.64 **	-0.15 *	-0.11 ***
		(0.18)	(0.05)	(0.01)	(0.29)	(0.08)	(0.02)
	Mean crime density	7.30	5.09	4.85	9.22	5.40	5.10
	Percent jump (for first outlet)	-0.1	12.6	21.0	8.8	9.6	24.5
0600 - 1159 hrs	$1(t_i \geq 0)$	-0.46	0.35	0.87 ***	0.02	0.19	0.72 ***
		(0.50)	(0.25)	(0.16)	(0.42)	(0.21)	(0.12)
	$t_i * 1(t_i \geq 0)$	0.01	-0.01	0.00	-0.02	0.00	-0.01
		(0.03)	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	0.11	-0.09 *	-0.07 ***	-0.15	-0.12 **	-0.05 ***
		(0.22)	(0.05)	(0.01)	(0.15)	(0.06)	(0.01)
	Mean crime density	9.95	7.61	7.28	6.05	3.55	3.38
	Percent jump (for first outlet)	-4.6	4.6	12.0	0.3	5.4	21.3
1200 - 1759 hrs	$1(t_i \geq 0)$	-0.26	0.60 *	1.15 ***	0.78	1.00 ***	1.01 ***
		(0.57)	(0.32)	(0.23)	(0.58)	(0.36)	(0.22)
	$t_i * 1(t_i \geq 0)$	0.03	-0.01	-0.00	-0.00	0.00	-0.01
		(0.04)	(0.02)	(0.01)	(0.04)	(0.01)	(0.01)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	-0.39	-0.21 ***	-0.11 ***	-0.23	-0.27 ***	-0.10 ***
		(0.28)	(0.07)	(0.02)	(0.33)	(0.10)	(0.02)
	Mean crime density	14.78	10.31	9.75	11.71	6.87	6.50
	Percent jump (for first outlet)	-1.8	5.8	11.8	6.7	14.6	15.5
1800 - 2359 hrs	$1(t_i \geq 0)$	-0.02	1.77 ***	2.28 ***	0.12	1.43 ***	1.18 ***
		(0.77)	(0.50)	(0.31)	(0.75)	(0.48)	(0.27)
	$t_i * 1(t_i \geq 0)$	-0.07	0.00	-0.00	-0.05	0.01	-0.01
		(0.05)	(0.02)	(0.01)	(0.05)	(0.02)	(0.01)
	$1(t_i \geq 0)$*(*Number of outlets - 1)*	-0.17	-0.55 ***	-0.20 ***	-0.11	-0.38 ***	-0.13 ***
		(0.34)	(0.13)	(0.02)	(0.38)	(0.13)	(0.02)
	Mean crime density	21.70	15.62	14.76	16.33	9.56	9.05
	Percent jump (for first outlet)	-0.1	11.3	15.4	0.7	15.0	13.0

The dependent variable is the number of crimes per mile^2 per month during a particular 6 hour interval. There were 634 outlet closings in this geographic subsample of downtown Los Angeles between 1992 and 2004. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of crime density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti ≥0) by the mean crime density of the sample. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE XII

THE IMPACT OF ALCOHOL OUTLETS ON RESIDENTIAL PROPERTY TRANSACTION PRICES

	Openings within the last 12 months		Closings within the last 12 months	
	(1)	(2)	(3)	(4)
Number of outlets that ever existed ...				
within 0 - 0.1 miles	-.0239 ***	-.0132 ***	-.0255 ***	-.0152 ***
	(.0037)	(.0040)	(.0036)	(.0040)
within 0.1 - 0.25 miles	-.0105 ***	-.0024	-.0111 ***	-.0030 *
	(.0017)	(.0016)	(.0016)	(.0016)
within 0.25 - 0.5 miles	-.0070 ***	-.0002	-.0074 ***	-.0008
	(.0013)	(.0009)	(.0013)	(.0009)
Number of new openings or closings ...				
within 0 - 0.1 miles	-.0246	-.0194	.0362 **	.0509 ***
	(.0173)	(.0153)	(.0155)	(.0173)
within 0.1 - 0.25 miles	-.0022	-.0031	.0271 ***	.0240 ***
	(.0056)	(.0053)	(.0077)	(.0059)
within 0.25 - 0.5 miles	-.0042	-.0049 *	.0120 ***	.0158 ***
	(.0037)	(.0026)	(.0045)	(.0029)
Zip code fixed effects	√		√	
Zip+4 fixed effects		√		√
Month and year dummies	√	√	√	√
Sample size	303735	303735	303735	303735
Adjusted R-squared	0.58	0.67	0.58	0.67

The dependent variable is the natual logarithm of the real transaction price of the property. In addition to the size of the property, a full set of housing characteristic dummies were also included: the number of bedrooms is top-coded at 6; the number of baths is top-coded at 6, the number of rooms is top-coded at 15; the number of stories is top-coded at 3; the year built and the presence of a pool, jacuzzi or both. Huber-White standard errors clustered at either the 5-digit zip code or zip+4 level are in parentheses. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

TABLE XIII
THE DIFFERENTIAL IMPACT OF ALCOHOL OUTLETS IN LOW-SES AND HIGH-SES NEIGHBORHOODS ON RESIDENTIAL PROPERTY TRANSACTION PRICES

	Openings within the last 12 months (1)	Closings within the last 12 months (2)
Number of outlets that ever existed ...		
within 0 - 0.1 miles	-.0136 ***	-.0147 ***
	(.0040)	(.0040)
within 0.1 - 0.25 miles	-.0024	-.0030 *
	(.0016)	(.0016)
within 0.25 - 0.5 miles	-.0000	-.0007
	(.0009)	(.0009)
Number of new openings or closings in low-SES neighborhoods ...		
within 0 - 0.1 miles	-.0440 *	.0424 *
	(.0243)	(.0252)
within 0.1 - 0.25 miles	-.0223 **	.0527 ***
	(.0106)	(.0110)
within 0.25 - 0.5 miles	-.0321 ***	.0440 ***
	(.0050)	(.0055)
Number of new openings or closings in high-SES neighborhoods ...		
within 0 - 0.1 miles	.0157	-.0010
	(.0245)	(.0263)
within 0.1 - 0.25 miles	.0102	-.0047
	(.0072)	(.0081)
within 0.25 - 0.5 miles	.0075 **	-.0109 ***
	(.0037)	(.0041)
Zip+4 fixed effects	√	√
Month and year dummies	√	√
Sample size	303735	303735
Adjusted R-squared	0.67	0.67

The dependent variable is the natual logarithm of the real transaction price of the property. In addition to the size of the property, a full set of housing characteristic dummies were also included: the number of bedrooms is top-coded at 6; the number of baths is top-coded at 6; the number of rooms is top-coded at 15; the number of stories is top-coded at 3; the year built and the presence of a pool, jacuzzi or both. Huber-White standard errors clustered at either the 5-digit zip code or zip+4 level are in parentheses. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

APPENDIX TABLE I
THE EFFECT OF ALCOHOL OUTLETS ON RESIDENTIAL PROPERTY TRANSACTION DENSITY,
WITH OUTLET-TRACT SPECIFIC TRENDS

		Outlet openings			Outlet closings		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (A1)	*1* (t_i ≥ 0)	0.05	0.07	0.05	-0.26	-0.15	0.24 **
		(0.08)	(0.05)	(0.03)	(0.34)	(0.21)	(0.12)
	Percent jump	2.8	2.7	1.7	-8.6	-3.8	5.6
Equation (A2)	*1* (t_i ≥ 0)	0.03	0.03	0.01	-0.66	-0.50	-0.05
		(0.09)	(0.06)	(0.04)	(0.63)	(0.44)	(0.22)
	1 (t_i ≥ 0)*(*Number of outlets - 1)*	0.02	0.02	0.00	0.20	0.08	0.03 *
		(0.04)	(0.01)	(0.00)	(0.20)	(0.07)	(0.01)
	Percent jump (for first outlet)	1.7	1.1	0.3	-21.7	-12.5	-1.2
Equation (A3)	*1* (t_i ≥ 0)	0.06	0.07	0.05 *	-0.63	-1.52 **	-0.53
		(0.08)	(0.05)	(0.03)	(1.27)	(0.74)	(0.44)
	t_i **1* (t_i ≥ 0)	0.01	0.00	0.00	0.29	-0.13	-0.04
		(0.01)	(0.00)	(0.00)	(0.33)	(0.10)	(0.05)
	Percent jump	3.4	2.7	1.7	-20.7	-38.1	-12.4
Equation (A4)	*1* (t_i ≥ 0)	0.04	0.03	0.01	-2.00	-1.78	-0.73
		(0.09)	(0.06)	(0.04)	(1.99)	(1.08)	(0.64)
	t_i **1* (t_i ≥ 0)	0.01	0.00	0.00	0.29	-0.13	-0.04
		(0.01)	(0.00)	(0.00)	(0.32)	(0.10)	(0.05)
	1 (t_i ≥ 0)*(*Number of outlets - 1)*	0.02	0.02	0.00	0.64	0.06	0.02
		(0.04)	(0.01)	(0.00)	(0.76)	(0.15)	(0.03)
	Percent jump (for first outlet)	2.3	1.1	0.3	-65.8	-44.6	-17.1
Equation (A5)	*Number of outlets*	0.01	-0.02	-0.06	0.07	-0.05	0.09
		(0.08)	(0.04)	(0.01)	(0.26)	(0.10)	(0.05)
	(Number of outlets)^2	0.01	0.01 **	0.00	0.03	0.00	-0.00
		(0.01)	(0.00)	(0.00)	(0.03)	(0.01)	(0.00)
	Mean transaction density	1.77	2.62	2.86	3.04	3.99	4.28

The dependent variable is the number of residential property transactions per mile^2 per month. 3201 outlets opened and 732 outlets closed in this sample of the City of Los Angeles between 1980 and 2002. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of transaction density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean transaction density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

APPENDIX TABLE II

THE EFFECT OF ALCOHOL OUTLETS IN LOW-SES NEIGHBORHOODS ON RESIDENTIAL PROPERTY TRANSACTION DENSITY, WITH OUTLET-TRACT SPECIFIC TRENDS

		Outlet openings			Outlet closings		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (A2)	*1* (t_i ≥ 0)	0.13	-0.11	-0.03	-0.65	0.39	0.37
		(0.13)	(0.08)	(0.05)	(1.25)	(0.61)	(0.30)
	1 (t_i ≥ 0)*(*Number of outlets - 1)*	-0.01	0.04 **	0.00	0.27	0.01	-0.01
		(0.06)	(0.01)	(0.00)	(0.49)	(0.09)	(0.01)
	Percent jump (for first outlet)	7.9	-5.8	-1.5	-22.5	12.1	11.0
Equation (A4)	*1* (t_i ≥ 0)	0.14	-0.10	-0.03	3.08	0.73	-1.22 *
		(0.13)	(0.08)	(0.05)	(3.55)	(1.80)	(0.72)
	t_i **1* (t_i ≥ 0)	0.01	0.00	-0.00	-0.03	-0.14	-0.10
		(0.01)	(0.00)	(0.00)	(0.24)	(0.09)	(0.08)
	1 (t_i ≥ 0)*(*Number of outlets - 1)*	-0.01	0.03 **	0.00	-0.27	-0.11	0.03
		(0.06)	(0.01)	(0.00)	(1.27)	(0.24)	(0.03)
	Percent jump (for first outlet)	8.5	-5.3	-1.5	106.6	22.6	-36.4
Equation (A5)	*Number of outlets*	0.02	-0.06	-0.04 **	0.22	0.17	0.20
		(0.12)	(0.05)	(0.02)	(0.37)	(0.12)	(0.07)
	(Number of outlets)^2	0.02	0.01	0.00 *	0.00	-0.01	-0.00
		(0.02)	(0.00)	(0.00)	(0.06)	(0.01)	(0.00)
	Mean transaction density	1.64	1.90	1.97	2.89	3.23	3.35

The dependent variable is the number of residential property transactions per mile^2 per month. 1268 outlets opened and 359 outlets closed in low-SES neighborhoods in this sample of the City of Los Angeles between 1980 and 2002. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of transaction density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean transaction density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

APPENDIX TABLE III
THE EFFECT OF ALCOHOL OUTLETS IN HIGH-SES NEIGHBORHOODS ON RESIDENTIAL PROPERTY TRANSACTION DENSITY, WITH OUTLET-TRACT SPECIFIC TRENDS

		Outlet openings			Outlet closings		
		(1)	(2)	(3)	(4)	(5)	(6)
		0 - 0.1	0.1 - 0.25	0.25 - 0.5	0 - 0.1	0.1 - 0.25	0.25 - 0.5
Equation (A2)	*1* (t_i ≥ 0)	-0.07	0.07	0.03	-0.39	-0.70	-0.20
		(0.15)	(0.09)	(0.06)	(0.81)	(0.68)	(0.31)
	1 (t_i ≥ 0)*(*Number of outlets - 1)*	0.02	-0.01	0.01	0.18	0.03	0.03
		(0.06)	(0.03)	(0.01)	(0.20)	(0.12)	(0.03)
	Percent jump (for first outlet)	-3.8	2.2	0.9	-13.8	-14.9	-3.8
Equation (A4)	*1* (t_i ≥ 0)	-0.06	0.07	0.03	0.39	-1.35	-1.11
		(0.15)	(0.10)	(0.06)	(1.76)	(1.33)	(1.03)
	t_i **1* (t_i ≥ 0)	0.00	0.00	-0.00	0.47	-0.22 *	0.01
		(0.01)	(0.01)	(0.00)	(0.50)	(0.12)	(0.06)
	1 (t_i ≥ 0)*(*Number of outlets - 1)*	0.02	-0.01	0.01	-0.20	-0.03	0.13
		(0.06)	(0.03)	(0.01)	(0.63)	(0.27)	(0.11)
	Percent jump (for first outlet)	-3.3	2.2	0.9	13.8	-28.7	-21.1
Equation (A5)	*Number of outlets*	-0.05	0.00	-0.06	-0.46	-0.15	0.03
		(0.14)	(0.07)	(0.03)	(0.43)	(0.18)	(0.07)
	(Number of outlets)^2	0.01	0.00	0.00	0.07	0.01	-0.00
		(0.02)	(0.01)	(0.00)	(0.04)	(0.01)	0.00
	Mean transaction density	1.83	3.18	3.52	2.82	4.71	5.27

The dependent variable is the number of residential property transactions per mile^2 per month. 1299 outlets opened and 252 outlets closed in high-SES neighborhoods in this sample of the City of Los Angeles between 1980 and 2002. Clustered Huber-White standard errors are in parentheses. Each column (1)-(6) presents the results of a separate OLS regression using measures of transaction density at various distances away from the outlet. Percent jump refers to the estimated percent change in crime density and is obtained by dividing the coefficient of 1(ti≥0) by the mean transaction density of the sample presented at the bottom row of the table. ***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.

APPENDIX TABLE IV
WHERE DO ALCOHOL OUTLETS LOCATE?

	Outlets per 1000			Type 20 Outlets per 1000			Type 21 Outlets per 1000		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Per cent high school plus	-1.32 ***	-1.62 ***	0.28	-0.80 ***	-0.81 ***	0.35	-0.53 ***	-0.82 ***	-0.07
	(-0.26)	(0.29)	(0.69)	(0.15)	(0.16)	(0.41)	(0.16)	(0.19)	(0.40)
Per cent college plus	-0.28	-0.20	-1.14 **	0.17	0.17	-1.05 **	-0.45 ***	-0.37 ***	-0.09
	(0.20)	(0.20)	(0.56)	(0.14)	(0.14)	(0.42)	(0.08)	(0.08)	(0.23)
Per cent white	0.47 ***	0.70 ***	-0.34	0.21 *	0.22 **	-0.26	0.26 ***	0.47 ***	-0.08
	(0.18)	(0.17)	(0.40)	(0.12)	(0.11)	(0.27)	(0.09)	(0.09)	(0.19)
Per cent black	0.05	0.22	0.36	-0.18	-0.17	-0.06	0.23 **	0.40 ***	0.41
	(0.18)	(0.17)	(0.61)	(0.12)	(0.11)	(0.41)	(0.09)	(0.09)	(0.33)
Per cent asian	0.52 **	0.71 ***	-0.32	0.17	0.17	-0.16	0.36 ***	0.54 ***	-0.16
	(0.23)	(0.23)	(0.55)	(0.15)	(0.14)	(0.39)	(0.13)	(0.14)	(0.26)
Median household income (100,000s)	-0.61 ***	-0.68 ***	0.07	-0.50 ***	-0.50 ***	0.05	-0.11 *	-0.18 ***	0.02
	(0.10)	(0.10)	(0.38)	(0.07)	(0.07)	(0.29)	(0.06)	(0.05)	(0.21)
Per capita income (100,000s)	0.52 ***	0.38 **	-0.20	0.16	0.15	-0.15	0.37 ***	0.23 ***	-0.05)
	(0.17)	(0.18	(0.76)	(0.11)	(0.12)	(0.51)	(0.08)	(0.08)	(0.38)
Number of households (10,000s)	-3.74 ***	-3.65 ***	-5.36 ***	-1.86 ***	-1.85 ***	-3.35 ***	-1.88 ***	-1.80 ***	-2.01 ***
	(0.34)	(0.33)	(0.82)	(0.17)	(0.17)	(0.55)	(0.23)	(0.21)	(0.40)
Number of owner occupied households (10,000s)	-0.06	-0.09	2.10	-0.63 **	-0.63 **	1.73	0.57 *	0.53 *	0.37
	(0.48)	(0.47)	(2.20)	(0.17)	(0.25)	(1.37)	(0.33)	(0.32)	(1.20)
Average family size	-0.70 ***	-0.72 ***	-0.36 **	-0.26 ***	-0.26 ***	-0.13	-0.44 ***	-0.46 ***	-0.23 ***
	(0.09)	(0.09)	(0.15)	(0.03)	(0.03)	(0.11)	(0.07)	(0.07)	(0.07)
Per cent public assistance	1.76 ***	2.16 ***	1.70 **	1.04 ***	1.05 ***	1.03 **	0.73 **	1.11 ***	0.67 *
	(0.42)	(0.48)	(0.67)	(0.18)	(0.22)	(0.43)	(0.32)	(0.34)	(0.39)
Poverty level/Income =2	1.65 ***	1.75 ***	0.85	0.58 **	0.59 **	0.44	1.07 ***	1.16 ***	0.41
	(0.54)	(0.55)	(0.92)	(0.25)	(0.26)	(0.57)	(0.39)	(0.40)	(0.44)
Poverty level/Income >2	1.03 ***	1.36 ***	1.61 *	0.69 ***	0.70 ***	1.13 **	0.34 **	0.66 ***	0.48
	(0.25)	(0.30)	(0.88)	(0.14)	(0.17)	(0.57)	(0.15)	(0.17)	(0.39)
Year fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Tract fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
(Adjusted) R-squared	0.09	0.10	0.56	0.07	0.08	0.47	0.09	0.10	0.81

The dependent variables are the number of outlets per 1000 people, the number of type 20 outlets per 1000 people and the number of type 21 outlets per 1000 people. Huber-White standard errors are in parentheses. They are clustered at the census tract leve in columns (3), (6) and (9). Each column (1)-(9) presents the results of a separate OLS regression.
***, ** and * denote coefficients significant at the 1%, 5% and 10% levels respectively.