Strip Clubs, "Secondary Effects," and Property Values

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Abstract

The "secondary effects" doctrine allows municipalities to zone, or otherwise regulate, sexually oriented businesses like strip clubs. Negative "secondary effects" (externalities) justify limiting First Amendment protection of speech conducted inside strip clubs. We utilize a repeat sales regression model of housing prices to estimate the causal effect of strip clubs on nearby residential property price appreciation. Using real estate transactions from King County, Washington, we identify the effects of a property being located near a strip club, exploiting the unexpected end of a 17 year moratorium on new strip club openings and multiple legal cases in Seattle to generate exogenous variation in club location. We find no evidence that proximity to a strip club affected residential property price appreciation; strip clubs in Seattle did not have any "secondary effects" on nearby residential property values.

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1 Introduction

A substantial empirical literature exists examining the effects of local disamenities on local property values. In economic terms, the presence of certain individuals or conditions generate negative externalities that adversely affect property values. In many instances, the presence and location of these disamenities has an important public policy dimension. For example, the siting of group homes is often determined by public agencies, and sex offender registries are maintained and publicized by local government. In this literature, documentation of negative impacts of disamenities on property values often plays an important role in the assessment of public policy.

We analyze the impact of an economic activity that some find objectionable, the operation of "gentleman's clubs" (strip clubs, exotic dancing, nude dancing, etc.) on nearby residential property values. The relationship between the presence of a strip club and property values is of interest because a substantial body of legal decisions addresses the status of nudity and nude dancing as a form of free speech protected under the First Amendment; the extent of this protection hinges critically on the presence of "secondary effects" (a negative externality in the jargon of First Amendment law) of strip clubs on crime and property values. The existing empirical evidence on the "secondary effects" of strip clubs is either rudimentary or anecdotal.

We analyze variation in residential property values in Seattle, Washington over the period 2000-2014 using transactions data from the King County, Washington Assessors Office. Our data sample contains all residential real estate transactions that occurred over the period. We analyze these data using a repeat sales regression model that controls for unobservable residence-specific and area-specific heterogeneity. Seattle is a unique setting for analyzing the effect of strip clubs on residential real estate prices because the city passed a moratorium on the opening of new strip clubs in 1988 and renewed it annually for 18 years, until a federal court case ruled that the moratorium was illegal in 2005. This regulatory environment generated exogenous variation in the opening of new strip clubs that we exploit in our empirical analysis.

This paper contributes to the literature on local disamenities and residential real estate prices. Related research documented a negative effect of the presence of registered sex offenders (Linden and Rockoff, 2008), group homes (Colwell et al., 2000), environmental contamination (Case et al., 2006), and high voltage electrical lines (Hamilton and Schwann, 1995) on property values. It also provides important information about the impact of strip clubs on nearby residents, which adds critical information to the public debate on the regulation of SOBs (Weinstein and McCleary, 2011; McCord, 2014), in particular the evidence does not support the presence of important "secondary effects."

We find no evidence that property values were lower in proximity to strip clubs in Seattle, compared to a control group of other residential properties near the clubs, based on a large number of strip club openings and closings in the sample period. The identifying repeat sales in the sample come from residential properties transacted during periods when nearby clubs were operating and not operating, providing exogenous variation in the treatment effect (the presence of an operating strip club). The evidence does not support the idea that strip clubs represent a negative externality; strip clubs in Seattle did not generate negative "secondary effects" after the moratorium on new strip club openings was lifted in 2005.

2 Freedom of Speech, Strip Clubs and SOBs

Freedom of speech is guaranteed by the First Amendment to the U.S. Constitution, but that guarantee is not absolute. Over time, the Supreme Court of the United States (SCOTUS) has developed several doctrines to guide legal limitations on speech. For example, Justice Oliver Wendell Holmes, Jr. in *Schenck v. United States,* (1919) famously outlined one such doctrine: "The most stringent protection of free speech would not protect a man in falsely shouting fire in a theatre and causing a panic." This doctrine was ultimately refined to become the controlling legal doctrine in Brandenburg v. Ohio (1969) which restricted impinging speech to cases of "imminent lawless action."

Owners of strip clubs have sought to characterize activities occurring in their businesses as a form of speech. SCOTUS ruled, first in *California v LaRue* (1972), and later affirmed in *Doran v Salem Inn Inc* (1975), that nude dancing (or exotic dancing or stripping) operates on the periphery of First Amendment speech protections. Although nudity and nude dancing are afforded First Amendment protection, the protection afforded these activities - like shouting fire in a crowded theater – is not absolute. Nude dancing is considered symbolic speech and thus falls under the guidelines outlined in *United States v O'brien* (1968), which affords symbolic speech less protection than other forms of speech.

While SCOTUS has considered several cases that involve nude dancing, or stripping, much of the existing jurisprudence governing nude dancing applies to the general class of businesses that involve sexually explicit activities, including businesses such as adult bookstores, or adult movie theaters, in addition to strip clubs. Collectively these businesses are generally referred to as Sexually Oriented Businesses (SOBs).

Legally, municipal regulation of SOBs is controlled by the "secondary effects" doctrine, which allows the use of zoning regulations to limit the potential externalities generated by SOBs. The secondary effects doctrine was first articulated by SCOTUS in *Young v American Mini Theatres Inc* (1976) in foot note (6) which makes reference to a zoning ordinance applying to SOBs:

> In the development and execution of this Ordinance, it is recognized that there are some uses which, because of their very nature, are recognized as having serious objectionable operational characteristics, particularly when several of them are concentrated under certain circumstances

> thereby having a deleterious effect upon the adjacent areas. Special regulation of these uses is necessary to insure that these adverse effects will not contribute to the blighting or downgrading of the surrounding neighborhood. These special regulations are itemized in this section. The primary control or regulation is for the purpose of preventing a concentration of these uses in any one area (i. e. not more than two such uses within one thousand feet of each other which would create such adverse effects).

Ten years later in *Renton v Playtime Theatres Inc* (1986) SCOTUS fully established the secondary effects doctrine, writing in a decision:

> To be sure, the ordinance treats theaters that specialize in adult films differently from other kinds of theaters. Nevertheless, the District Court concluded, the Renton ordinance is aimed not at the content of the films shown at adult motion picture theaters, but rather at the secondary effects of such theaters in the surrounding community.

This doctrine holds that the SOBs can be zoned into or out of locations so as to minimize or eliminate the impact of secondary effects. Secondary effects generally include detrimental activities like personal and property crimes, prostitution, drug dealing and drug use, which affect the value of residential and commercial properties within the vicinity of the SOB. Economists will recognize these secondary effects as class examples of negative externalities.

The doctrine was further extended by SCOTUS in the *Barnes v Glen Theatre Inc* (1991) to include more than just the locational choice of strip clubs. The majority in that decision found that requiring dancers to wear g-strings and pasties was not an overbearing infringement on their speech, arguing that, as long as the message the dancer was trying to convey was not overly abridged, the requirement to wear g-strings and pasties was constitutional (Hudson, 2002). Consequently, despite First Amendment protection, the activities of nude dancers can be curtailed by local regulations if the end result of the regulation is to mitigate secondary effects.

Current SCOTUS jurisprudence is controlled by the majority decision in *Erie v Pap's AM* (2000), which holds that the desire to curb secondary effects can justify the suppression of the erotic message conveyed by nude dancing. The question raised by Justice Souter was the level of evidence required to justify the suppression. The primary task of this paper is to identify the causal effects of the presence of one type of SOB strip clubs on the value of nearby residential property. We turn now to the previous research on secondary effects.

3 Secondary Effects and SOBs

A majority of the research which investigates the existence of secondary effects focuses on identifying and quantifying two types of externalities generated by the presence of SOBs in an area: crime level associated with the existence and operation of SOBs (see for example (McCord and Tewksbury, 2012; McC) and negative impacts on the value of residential and commercial property located in the vicinity of the SOBs. Much of the existing literature fails to convincingly identify the effects of SOBs on crime and property values, and falls short of current standards of scientific proof. Much research has been carried out by municipal planning departments for cities in the process of developing new zoning ordinances, or by expert witnesses serving in court cases between municipalities and owners of SOBs (for example see (NLC, 2005; Department of Planning City of Seattle, 2006). Relatively little of research was published in peer reviewed academic journals until recently, and most focuses on the impact of SOBs on crime. (See for example Department of Planning City of Seattle (2006)).

We assess the effect of SOBs on property values, in other words develop evidence about secondary effects, for several reasons. First, the quality of property value data is generally superior to the quality of crime data. Property values can be obtained from actual real estate transactions that reflect market prices, which will not be impacted by police enforcement issues as is often the case with crime data. Property values are not subject to the debate summarized in Weinstein and McCleary (2011) about sources of crime statistics. Finally, existing evidence indicates that crime rates are already capitalized into property values (Gibbons and Machin, 2008). Even the mere existence of convicted criminals in the immediate area affects home values (Linden and Rockoff, 2008). Therefore analyzing the relationship between residential property values and SOBs should capture the disamenity of local crime and criminals stemming from SOBs, as well as and disamenity values associated with their existence.

The scholarly literature which attempts to empirically address the issue of secondary effects generally focuses on the relationship between SOBs and crime. This body of work fails to achieve consensus on the effects of SOBs on crime, with scholars providing the same contradictory results in academic research as they have in their court room testimony McCleary and Meeker (2006). For example in the *Journal of Sex Research*, Linz et al. (2006) uses "calls for service" (CFS) as a proxy for crime and finds that peep shows do not increase the number of calls, while McCleary and Meeker (2006) responds with a remedial lesson in hypothesis testing and an attack on the validity of CFS as an inappropriate measure of crime. In a related paper, Richard McCleary (2009) use the opening of a new adult business in a quasi-experimental design comparing before and after outcomes near an SOB to those from a nearby hotel. Crime around the SOB increased by 190% while increasing only 25% around the hotel.

According to McCord and Tewksbury (2012) property crime, violent crime and disorder crime are over four times more likely to occur within 500 feet of a SOB, relative to randomly selected intersections. Enriquez et al. (2006) in a study using data from a different area finds that, after accounting for the density of nearby alcohol establishments, the existence of a club that provides nude or semi nude dancers did not increase the level of crime in an area.

Aaronson et al. (2008) and Paul et al. (2001) critiqued the existing secondary effects literature, arguing that this literature fails to scientifically identify the existence of adverse secondary effects. A majority of the research in this literature relies on surveys of appraisers and real estate agents, asking them simply to provide an estimate for the effect of SOBs on residential property prices ((Associates, 2000; Community Development Department, 1986; Cooper and Kelly, 2008)). Even if an appraiser were responding to the survey by formally estimating models including the presence of a strip club, appraisal prices are not the same as actual sale prices. When forming an appraisal, the appraiser uses a hedonic model and includes a measure of proximity to the strip club which is possibly correlated with omitted variables. This omitted variable results in a biased coefficient on proximity.

Mayer (1998) finds such a bias when examining auction premiums and discounts in Dallas and Los Angeles. In order to mitigate this bias,Mayer (1998) suggests a using a modified repeat sales regression (RSR) that includes indicator variables for auction sales. The procedure is similar to a difference-in-difference estimation. Similar RSR model procedures have been used to isolate real estate price premiums and discounts as in Kiel and McClain (1995),Archer et al. (1996), Campbell et al. (2011), Billings (2014), and Redfearn (2009).

The RSR model developed by Case and Shiller (1988) assumes the existence of a single price index that shifts the price level of all houses. It is more likely the case that there are numerous submarkets with unique price dynamics in any area. However, defining a housing submarket is not a simple process. A researcher can use observable geographic delineations such as ZIP codes, school districts, or census blocks or use statistical procedures to define submarkets. Goodman and Thibodeau (2003) adopt the first approach, segmentation by ZIP code and school district and find significant predictive accuracy. Others adopted various statistical means to identify submarkets. Dale-Johnson (1982) use principal components to estimate submarket price indexes. Clapp and Wang (2006) define a procedure to delineate submarket boundaries based on prices and find their delineations are similar to US Census block delineations. Goodman and Thibodeau (2007) find that submarkets based on either property attributes or geographic location have comparable predictive properties.

We use a simple procedure for estimating the effect of proximity to strip clubs on property prices. The procedure is easy to implement and controls for unobserved, heterogenous price trends across various submarkets. The procedure is similar to the synthetic control procedure described inAbadie and Gardeazabal (2003) and further developed in Abadie et al. (2010). Abadie et al. (2010) estimate weights for a control group in the presence of unobserved variables. Here, we define a control group based on observable location under the assumption that unobserved, submarket level variables do not vary across short distances.

4 Strip Club Regulation in Seattle

The SCOTUS decisions discussed above afford only limited protection to strip clubs. Given this limited protection, many municipalities impose zoning regulations and other legal actions in an attempt to reduce or eliminate strip clubs operating under their jurisdiction. Municipal zoning rules represent the most common method of limiting the number and location of strip clubs. Municipal ordinances regarding exotic dancing are wide ranging, covering the ability to serve alcohol, the amount of clothes a dancer can remove, and the physical distance that must be maintained between the dancers and patrons. In addition, regulation of SOBs has been fueled in part by private groups like the Community Defense Counsel [1], whose publication *Protecting Communities from Sexually Oriented Businesses* (2002) is a "how to" manual for local leaders looking to eliminate exotic dance clubs through municipal regulation.

Seattle, Washington represents an interesting setting for studying externalities generated by SOBs. The city of Seattle first enacted a moratorium on the opening of new strip clubs in 1988. This moratorium was renewed annually for 18 years. On September 12th, 2005 a federal judge ended, by ruling unconstitutional, Seattle's moratorium on the opening of new strip clubs. In response, Seattle's city council – fearing a dramatic increase in the number of strip clubs operating in the city – attempted to impose some of the strictest rules ever enacted on the industry[2]. Under the proposed provisions, the dancers would be required to maintain a four foot zone between themselves and their customers, preventing them from performing lap dances and directly receiving tips. The establishments would also be required to maintain bright, commercial-store style lighting Johnson (2005). The proposed restrictions on the operation of strip clubs did not pass a November 2006 voter referendum in which Seattle voters rejected the regulations by a 2-to-1 margin. Following this referendum, several new clubs opened in in Seattle for the first time in 17 years.

We use the end of the moratorium to generate plausibly exogenous variation in the number location of strip clubs in Seattle, to help identify the causal impact of strip clubs on nearby residential property values. While the location of new strip clubs is not by random assignment, the timing of the end of the moratorium

[1] http://www.communitydefense.org/

[2] See http://seattlepi.nwsource.com/printer/ap.asp?category=6600&slug=WST%20Seattle%20Stripping. From a 2005 Associated Press article by Gene Johnson: "No lap dances. No placing dollar bills in a dancer's G-string. And the clubs must have what one council member likens to "Fred Meyer" lighting, a reference to the department store chain. 'It's wiping out an entire industry in Seattle,' said Gilbert Levy, a lawyer for Rick's gentleman's club. Johnson (2005)

on new clubs was uncertain and determined by a federal court ruling and referendum, both of which should be exogenous to other economic factors affecting property values. Also we use several synthetic controls in our dataset. We have examples of strip clubs opening in areas zoned off limits to SOBs, we have land purchased for a SOB, legally approved after a lengthy suit, but never built. These examples provide strong robustness checks to the empirical evidence generated in the paper.

5 Empirical Analysis

5.1 Methodology

We analyze the effect of proximity to strip clubs in Seattle on residential property values. We model residential property transaction prices as a function of time, location, property-specific factors, and other attributes. The log price of residential property $i = 1, \ldots, N$, in location $l = 1, \ldots L$, sold at time $t = 1, \ldots, T$, p_{lit} is given by

$$p_{ilt} = \delta_{lt} + \mu_i + \beta x_{ilt} + u_{ilt} \tag{1}$$

Time-location price dynamics, captured by δ_{lt}, vary across location and over time. This allows for different areas of the city to experience both different appreciation rates and different start and end dates for boom and bust periods. Idiosyncratic, time-invariant property effects are captured by μ_i and idiosyncratic, time-varying property effects are captured by u_{lit}.

In this context, location can be thought of as a city block, neighborhood, zip code or school district. However, we assume that each location can be represented as a bundle of markets-determined characteristics. These characteristics are not necessarily based on geographic location but rather reflect factors like school quality, commercial amenities, distance to the central business district, etc. For example, there can be multiple school districts in the "high quality" school market. δ_{lt} represents a linear combination of market characteristics and their relative prices

$$\delta_{lt} = \alpha_l + \theta_{mt} z_l. \tag{2}$$

α_l is an idiosyncratic effect specific to location l, z_l are the relative values or loadings on the $m = 1, 2, ..., M$ markets for location l, and θ_{mt} are the time-varying relative prices for the M markets. For identification purposes discussed below, it will be necessary that θ_l is not time-varying. This assumption can be defended as the sample period is not so long as to allow school quality or other slow-moving attributes to change over time.

We assume that the presence of a strip club can be interpreted as a treatment effect on all nearby properties. Define d_{ic}, as the Euclidean distance in miles from i to c. The neighboring area for strip club c with radius K, $N(c,K)$, is defined as the set of all properties where $d_{ic} < K$; any property where $i \in N(c,K)$ is defined as a neighboring property of c. We experiment with several values for K where $K \in \{0.1mi, 0.2mi, 0.5mi, 1mi\}$.

The treatment effect is assumed to shift all log property transaction prices by a constant amount ϕ. If $\phi < 0$ the effect of the treatment is to decrease property prices by an amount equal to ϕ. In order to estimate ϕ, we use an indicator variable, $I_{it}(M)$, into Equation (1) where $I_{it}(M) = 1$ if any strip club is currently operating within distance K of property i at time t and 0 otherwise. By defining $I_{it}(M)$ in this way, we allow the treatment effect be present during some periods and absent in other time periods. The presence and absence of the treatment coincides with the closing and opening of strip clubs throughout our sample period.

It is possible to estimate ϕ by adding the indicator variable $I_{it}(M)$ to Equation (1) and estimating the unknown parameters of this hedonic model

$$p_{ilt} = \delta_{lt} + \mu_i + \beta x_{ilt} + \phi I_{it}(M) + u_{ilt}. \tag{3}$$

The presence of nuisance parameters δ_{lt} and μ_i requires either 1) the use of a random-effects estimation strategy or 2) direct estimation of δ_{lt} and μ_i using fixed effects. Random-effects estimation remains a possibility so long as the closing of strip clubs are not correlated with the unobserved, local price trends δ_{lt}, or a suitable set of instrumental variables can be found. We acknowledge the possibility of a random effects approach to this problem but alternatively employ a simple, alternative method, described below.

On the other hand, fixed-effects estimation requires a fixed-effect for each (l,t) pair as well as a fixed-effect for each individual property i. Furthermore, fixed-effects estimation requires that locations be defined at the block, ZIP Code, or city level. Block level fixed-effects can, at best, soak up a large number of degrees of freedom or, at worst, preclude the identification of the parameter ϕ. In this context, the parameter ϕ might not be identified if $I_{it}(M)$ can be written as a linear combination of the fixed-effects for δ_{lt}. Using ZIP Code level fixed effects might not fully capture within zip code variation in prices.

As an alternative to specifying exact locational effects, it is possible to estimate ϕ using a repeat sales regression (RSR) approach. In the RSR, the same houses, sold multiple times in the sample period, are used to identify δ_{lt}. For two sales of property i at times s and $s <= t$, the change in price is given by differencing Equation (3)

$$
\begin{aligned}
\Delta p_{it} &= p_{lit} - p_{ils} = \delta_{lt} - \delta_{ls} + \phi \Delta I_{it}(M) + v_{it} \\
v_{it} &= \Delta x_{ilt}\beta + \Delta u_{ilt}
\end{aligned} \tag{4}
$$

In Equation (4), changes in same-house prices are driven by changes in location specific price trends, changes in the treatment effect and the error terms. It is common in the RSR literature to assume $E[v_{it}] = 0$; also, the time-invariant effect μ_i is no longer present in 4. Using differenced transaction prices eliminates the need to collect detailed information on property attributes or specify the functional form for x_{lit}.

In Equation (3), the treatment effect (the presence of an operating strip club) has an effect on transaction price levels. The treatment effect will also impact changes in prices in certain situations, as can be seen in Equation (4). There are three possible values for $\Delta I_{it}(M)$ In Equation (4)

- $\Delta I_{it}(M) = 0$: there is no change in the treatment effect. Either property i is near an operating strip club at times s and t, or property i is not near any operating strip club during periods s and t.
- $\Delta I_{it}(M) = 1$: Property i is in the neighboring area of a strip club that opens at some time τ where $s < \tau \leq t$
- $\Delta I_{it}(M) = -1$: Property i is in the neighboring area of a strip club that opens before time s and closes at some time τ where $s < \tau \leq t$

5.2 Alternative Identification Approach

Equation (4) shows that changes in residential property prices are driven by changes in location-specific price levels and differences in the treatment effect. Given L locations, we would need to estimate L different price series, one for each location. This would require $(T-1) \times L$ fixed effects. Similar to the discussion above, including this many fixed-effects can lead to a significant drop in the degrees of freedom. However, instead of estimating one price series for each location, it is possible to use the representation in Equation (2) to simplify the process. Suppose we observe the market loadings z_l for each location. Substituting 2 into Eq. 4

$$
\Delta p_{it} = p_{lit} - p_{ils} = \Delta\theta_{mt} z_l + \phi \Delta I_{it}(M) + v_{it} \tag{5}
$$

Under this approach it is possible to estimate the treatment effect while allowing for heterogenous price appreciation across locations. Although tempting, estimating 5 would require the researcher to identify the exact set of markets that are relevant for the study. Instead, we propose an estimation strategy wherein we use only sales from locations that are nearly homogenous.

For all $c = 1, ..., C$, we define the union of all of these neighboring areas (alternatively, the set of all properties in the neighboring areas) as

$$N(K) = \cup_c N(c, K) \tag{6}$$

Our identification procedure relies on the assumption of homogenous location loadings for all $i \in N(K)$. That is, we assume the unobserved market loadings are identical for all properties in the areas neighboring strip clubs. Formally, we assume $z_l = z^*, \forall i \in N(K)$. With this assumption, we define $\delta_t^* \equiv \theta_{mt} z^*$. Substituting this into Equation (5) gives

$$\Delta p_{it} = p_{lit} - p_{ils} = \delta_t^* - \delta_s^* + \phi \Delta I_{it}(K) + v_{it}. \tag{7}$$

Equation (7) forms the basis of the empirical analysis of the relationship between strip clubs and nearby property values. The parameter of interest in ϕ, the parameter on the indicator variable $I_{it}(K)$, which takes a value of 1, 0 or -1, depending on proximity to a strip club, K and weather or not a given strip club opens or closes during the sample period. As discussed above, we use alternative values for K when defining the set of residential properties near strip clubs in the sample. There is a tradeoff to be made when choosing K. The larger is K, the more identifying observations, which decreases the estimated standard errors for $\hat{\phi}$. However, enlarging the treatment effect radius also increases the heterogeneity of the sample, which affects the precision of the estimates of $\hat{\phi}$.

5.3 Data Description

The data comes from the King County, Washington Assessor's Office. King County includes the city of Seattle and surrounding municipalities. The property transaction price data available through the assessor's office goes back to 1990 and includes all transactions that took place in King County. Because the reference period for our study includes the period before and after the elimination of the moratorium on the opening of new strip clubs in Seattle, we use only those properties sold between January 1, 2000 and January 1, 2014. This leaves us with a total of 478,760 residential property sales over this period.

The Assessor's Office transactions data includes numerous property characteristics that might affect property values. Property attributes range from those commonly found in real estate data sets like square footage, year of construction, bedrooms, and bathrooms, to variables unique to the Seattle area like view indicators for Puget Sound, Lake Washington and Mount Rainier, property quality indicators on a scale 1-5, and binary indicators for property features. Summary statistics for typical property variables are presented

Table 1: Summary Statistics - Houses and Condos

Panel A:	All Sales			
	Min	Mean	Max	Std Dev
Sale Price ($1,000s)	0.607	371.283	9750	292.503
SQFT (1,000s)	0.175	1.816	15.65	0.906
Bedrooms	0	3.001	9	1.081
Year Built	1900	1972	2013	27.664
Condo	0	0.232	1	0.422
MultiStory	0	0.365	1	0.481
Panel B:	Sales Within 0.1mi of Strip Club			
	Min	Mean	Max	Std Dev
Sale Price ($1,000s)	6.481	306.027	2990	267.233
SQFT (1,000s)	0.4	1.533	6	0.843
Bedrooms	0	2.711	7	1.079
Year Built	1900	1976	2007	27.966
Condo	0	0.518	1	0.5
MultiStory	0	0.229	1	0.42
Panel C:	Sales Within 0.25mi of Strip Club			
	Min	Mean	Max	Std Dev
Sale Price ($1,000s)	1.5	348.573	4525	282.153
SQFT (1,000s)	0.32	1.718	9.53	0.861
Bedrooms	0	2.933	8	1.093
Year Built	1900	1972	2013	28.664
Condo	0	0.283	1	0.45
MultiStory	0	0.343	1	0.475

in Table 1.

Panel A contains summary statistics for all of the residential property transactions over the 2000-2014 period. Panel B is only those transactions for properties located within 0.1 mile of an operating strip club. Panel A and Panel B show that the properties located within 0.1 mile of a strip club are less expensive, newer, smaller, and more likely to be condominiums than the average property in the sample.

Panel C contains summary statistics for properties located within 0.25 miles of an operating strip club. Like the residential properties in Panel B, these nearby residential properties also tend to be less expensive and smaller than the average residential property transacted in Seattle over the sample period.

We have information on the location of 24 strip clubs that were either open during the entire sample period, opened sometime after January 1, 2000 or closed sometime before January 1, 2014. The location of the strip clubs and a random sample of 10,000 residential properties from the sample is plotted on Figure 1. Strip clubs, represented by a blue X, tend to be located in the north part of the city, downtown and south of the city. Despite this geographic variation, we use the results above to argue that the markets in these areas share similar characteristics, including unobservable factors affecting property values.

Figure 1: Houses and Strip Club Locations

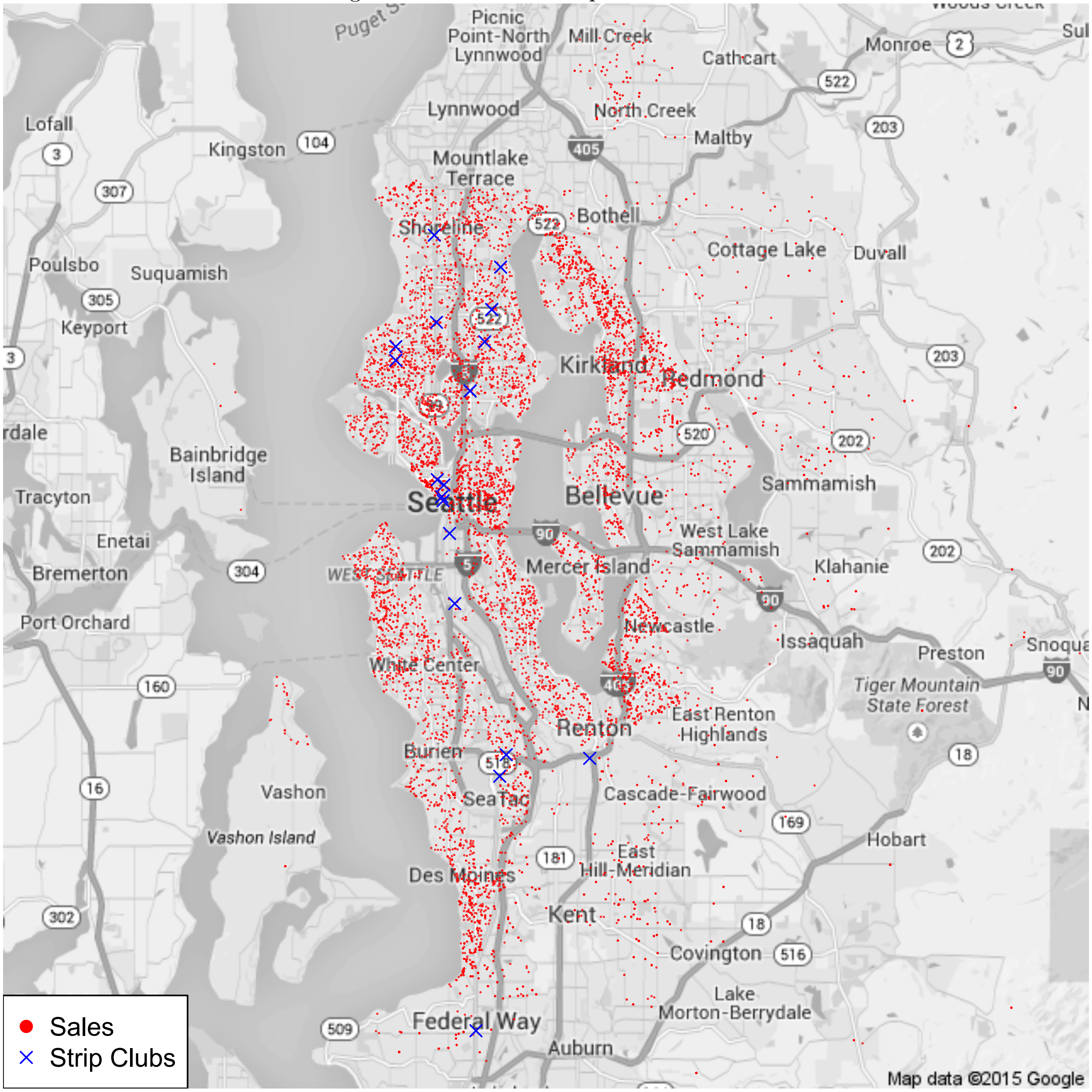
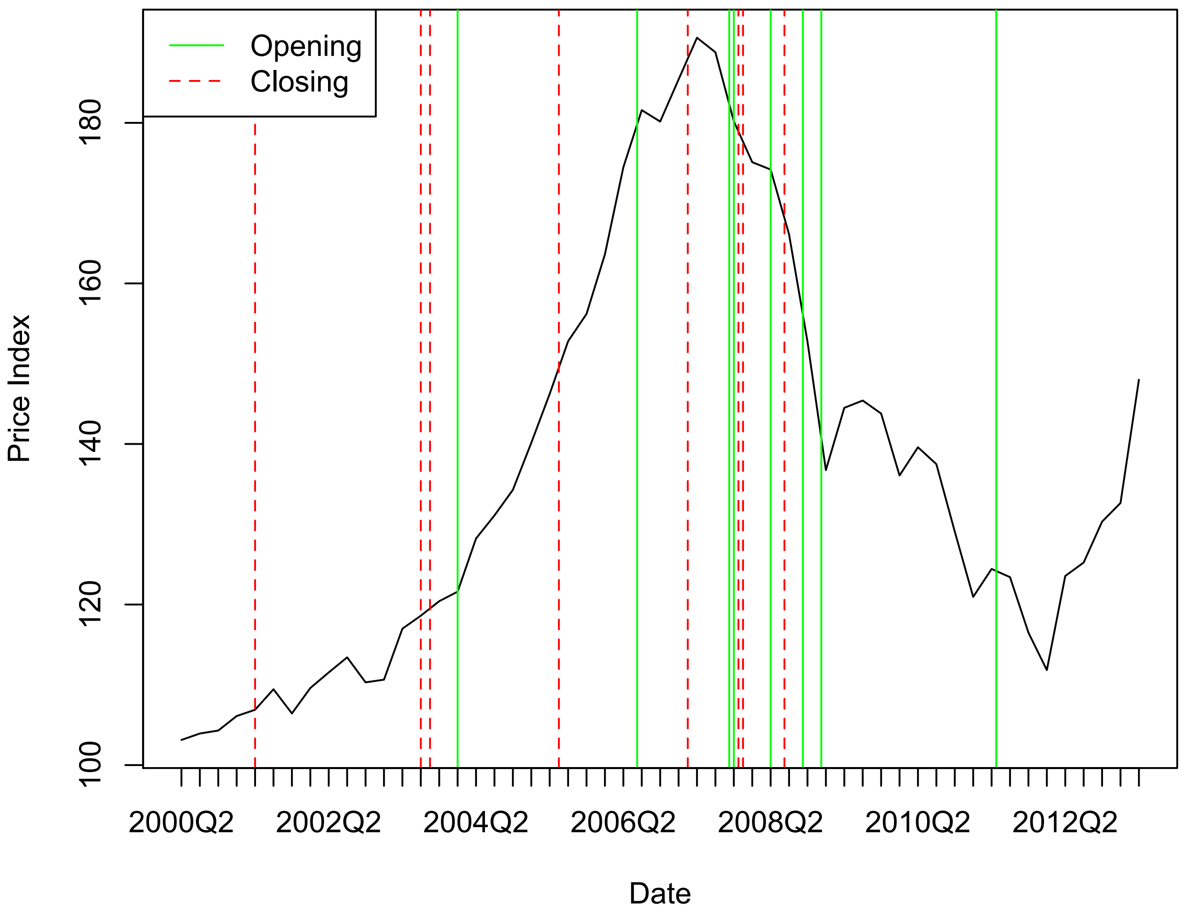


Figure 2 shows the citywide residential property price index calculated using a RSR model calculated quarterly using a base value of 100 in the first quarter of 2000. The RSR model is estimated assuming a single price index for all properties in the sample and is for illustrative purposes only.

Figure 2 shows a pattern of boom and bust common to most cities during this period. At the start of the decade, property prices grow at a moderate pace. There is a boom and bust period in the middle of the decade; the index peaks in the summer of 2007 at 190 and bottoms out in the summer of 2012 at 112.

In order to define the treatment effect of proximity to strip clubs, it is necessary to observe sales in nearby

Figure 2: Citywide Price Index and Club Openings and Closings



areas while strip clubs are operating and not operating. Figure 2 also shows club openings (green lines) and closing (red lines) in the Seattle area. A number of openings and closings are present throughout the sample period. Most of the openings occur after the lifting of the moratorium on new strip clubs in 2006. The one club opening prior to the end of the moratorium, in 2005, was the reopening of a club with a new name (Club Paradise) in the same building as a club that closed in late 2004 (Stilettos) in Lakewood, which is in King County, but outside Seattle.

Again, the boom in openings of new strip clubs in Seattle after the September 2005 moratorium end, and the 2006 referendum on the proposed operating restrictions, is not related to other economic changes that might also affect property values. While the housing market boom was going on in Seattle, from Figure 2, most of the openings took place after the housing bubble burst in 2007. Thus the openings should be plausibly exogenous to changes in other economic factors in Seattle during the sample period.

Table 2 contains information about the number of repeat residential property sales in areas near strip clubs, and the number of repeat sales while clubs were in operation for each club in the sample, and for the entire analysis sample, which contains 20 strip clubs that either opened or closed over the period 2000-2014 in King County. Some strip clubs operated continuously over the entire sample period; these clubs are not shown on Table 2, because, from Equation (7), we cannot identify the effect these strip clubs on residential property values. The 20 strip clubs shown on Table 2 form the basis of our econometric identification.

Again, it is not possible to estimate a treatment effect for residential properties near strip clubs that were in continual operation throughout the sample period. However, it is possible to estimate the treatment effect for those properties nearby strip clubs that opened or closed during the sample . From Table 2, 1,117 repeat sales occurred within 0.1 mile of any strip club that opened or closed during the 2000-2014 sample period. Of these 1,117 repeat sales, 777 sales occurred while a strip club was in operation.

Table 2: Total Sales in $N(K)$ and Total Sales in $N(K)$ While in Operation

	Total Sales				Sales While in Operation			
Club	0.1	0.25	0.5	1	0.1	0.25	0.5	1
Deja Vu Showgirls - Downtown	137	482	6501	15171	0	246	3566	8446
Rick's	32	155	1403	5632	27	133	1157	4718
Dancing Bare	129	389	1616	6415	129	389	1616	6415
Deja Vu Showgirls - Lake City	9	179	1019	3302	9	179	1019	3302
Deja Vu Showgirls - Tukwila	22	177	1098	3878	22	177	1098	3878
Deja Vu Showgirls - Seattle	217	444	7858	16724	217	444	7858	16724
Kittens Cabaret	12	80	293	1503	12	80	293	1503
Sands Showgirls	86	354	2204	9823	86	354	2204	9823
Centerfolds	53	292	1940	7466	53	292	1940	7466
Sugars	24	96	1050	3838	23	79	842	3059
Lusty Lady	174	705	6979	16418	154	526	5707	13469
Club Extasy	18	74	526	3448	4	23	175	1441
Deja Vu Showgirls - Federal Way	0	20	1818	3006	0	3	282	439
Little Darlings	74	1510	5573	19596	21	666	2004	5839
Club SinRock	0	0	76	1616	0	0	14	265
Dreamgirls at SoDo	2	6	7	1963	0	3	4	333
Jiggles Gentlemans Club	51	346	1813	6903	0	0	19	79
Pandora's Adult Cabaret	77	407	1786	6886	16	50	198	801
Dreamgirls at Rick's	32	155	1403	5632	4	11	159	597
Pasty's	51	346	1813	6903	0	0	0	0
Any Strip Club	1117	8245	29212	77625	777	5783	21534	57756

5.4 Pooled Results

The unknown parameters of Equation (7) are initially estimated using pooled data from the 20 strip clubs that opened or closed in King County over the period 2000-2014. OLS egression results, with robust standard errors, from Equation (7) are shown on Table 3 and Table 4. Table 3 displays the results obtained from Equation (7) when the time index δ_t^* is estimated at an annual frequency.

The first panel on Table 3 displays the results from 9 different model specifications. In each of these 9 model specifications, we estimate the regressions using the set of residential property transactions located within 1 mile of any strip club: $K = 1$ mile in Equation (7). In the first 3 rows of Table 3, transactions involving both single-family houses and condominiums are pooled, under the assumption that both types of properties follow the same price dynamics. In row 1, the indicator function $\Delta I_{it}(M)$ is defined using the cutoff value $M = 0.1$ miles. The cutoff value increases moving down the rows, indicating that the area impacted by each strip club gets larger. The regression results reported include the parameter estimate $\hat{\phi}$, the estimated robust standard error and p-value for the null hypothesis of no treatment effect present are shown. Estimated standard errors are robust to heteroscedasticity (White, 1980).

The first row of Table 3 displays the regression results assuming that the treatment effect operates within 0.10 miles of any strip club, where the control group is all properties located within 1 mile of any strip club. The second row displays the regression results assuming that the treatment effect operates within 0.25 miles of any strip club, and so on.

Table 3 contains no evidence that strip clubs have any effect on neighboring residential housing prices, based on a RSR model using transaction prices. Control groups of varying proximity to the strip clubs are considered, in addition to measuring the treatment effect at distances varying from 0.10 miles to 0.50 miles. The effect of strip clubs are allowed to differ for condos and single family homes, as well as in a pooled sample containing both types of residential properties. None of the configurations considered contains any evidence that strip cubs had a statistically significant, negative impact on nearby property values. These results contain no evidence of secondary effects of strip clubs, in terms of reducing nearby property values, in this sample, for different definitions of "nearby" and different control groups.

Table 4 repeats this process defining the time index δ_t^* at a quarterly frequency. The annual price index used in Table 3 may miss some price dynamics, if important prices changes take place over relatively short periods of time. Like Table 3, Table 4 systematically varies both the impact area over which secondary effects of strip clubs might occur, and the control group of properties outside the impact area. The estimated standard errors on this table are also robust to to heteroscedasticity (White, 1980).

The results on Table 4 also do not support the idea that strip clubs in Seattle generated statistically significant secondary effects on nearby residential property values. None of the parameter estimates are statistically different from zero at conventional significance levels. No matter what control group, impact area, or property type is used, property values near strip clubs that opened and closed over the sample period are no different from values of properties located farther from the strip clubs, on average.

Table 3: Least Squares Results - Pooled Sample, Annual Price Index

Panel A:		$K = 1$ mile		
Property Type	Indicator Radius (M)	Estimate	Standard Error	p-value
Combined	0.10 mi	-0.013	0.035	0.723
Combined	0.25 mi	0.013	0.032	0.675
Combined	0.50 mi	-0.013	0.023	0.584
Single Family Homes	0.10 mi	-0.038	0.060	0.520
Single Family Homes	0.25 mi	0.028	0.043	0.515
Single Family Homes	0.50 mi	-0.035	0.033	0.294
Condos	0.10 mi	0.007	0.040	0.858
Condos	0.25 mi	-0.006	0.048	0.903
Condos	0.50 mi	0.028	0.028	0.317
Panel B:		$K = 0.5$ mile		
Property Type	Indicator Radius (M)	Estimate	Standard Error	p-value
Combined	0.10 mi	-0.022	0.045	0.614
Combined	0.25 mi	0.009	0.043	0.840
Combined	0.50 mi	0.058	0.042	0.170
Single Family Homes	0.10 mi	-0.069	0.097	0.478
Single Family Homes	0.25 mi	0.051	0.057	0.368
Single Family Homes	0.50 mi	0.065	0.066	0.323
Condos	0.10 mi	-0.003	0.038	0.935
Condos	0.25 mi	-0.045	0.060	0.455
Condos	0.50 mi	0.039	0.045	0.393
Panel C:		$K = 0.25$ mile		
Property Type	Indicator Radius (M)	Estimate	Standard Error	p-value
Combined	0.10 mi	0.027	0.031	0.385
Combined	0.25 mi	0.044	0.078	0.570
Single Family Homes	0.10 mi	0.075	0.101	0.459
Single Family Homes	0.25 mi	0.001	0.091	0.987
Condos	0.10 mi	0.009	0.032	0.779
Condos	0.25 mi	0.123	0.248	0.621

5.5 Location-Specific Results

The pooled results on Table 3 and Table 4 assume that all the strip clubs in the sample are relatively homogenous, in terms of club characteristics, and the characteristics of nearby neighborhoods. However, from Figure1, the clubs are spread out over Seattle, with some clubs downtown and others in outlying areas of the city. Some heterogeneity in location likely exists, so the average results on Table 3 and Table 4 may not apply to all strip clubs in the sample.

In order to assess the extent to which club-specific characteristics and locations affect the relationship between strip clubs and nearby property values, we estimated the parameters of Equation (7) using data from specific strip clubs in the sample. The results, shown on Table 5, use $K = 1$ mile, estimate the parameters using OLS and correct the standard errors using the White (1980) heteroscedasticity correction, like the results above. The time index δ_t^* is defined as an annual index; a quarterly time index produced similar

Table 4: Least Squares Results - Pooled Sample, Quarterly Price Index

Panel A:	$K = 1$ mile			
Property Type	Indicator Radius (M)	Estimate	Standard Error	p-value
Combined	0.10 mi	-0.025	0.038	0.511
Combined	0.25 mi	0.01	0.031	0.754
Combined	0.50 mi	-0.007	0.023	0.748
Single Family Homes	0.10 mi	-0.058	0.060	0.332
Single Family Homes	0.25 mi	0.027	0.043	0.524
Single Family Homes	0.50 mi	-0.026	0.033	0.425
Condos	0.10 mi	-0.002	0.047	0.963
Condos	0.25 mi	-0.023	0.047	0.627
Condos	0.50 mi	0.026	0.027	0.352
Panel B:	$K = 0.5$ miles			
Property Type	Indicator Radius (M)	Estimate	Standard Error	p-value
Combined	0.10 mi	-0.051	0.051	0.321
Combined	0.25 mi	-0.019	0.044	0.663
Combined	0.50 mi	0.050	0.0420	0.235
Single Family Homes	0.10 mi	-0.110	0.107	0.304
Single Family Homes	0.25 mi	0.048	0.059	0.421
Single Family Homes	0.50 mi	0.064	0.065	0.329
Condos	0.10 mi	-0.014	0.044	0.744
Condos	0.25 mi	-0.102	0.061	0.096
Condos	0.50 mi	0.031	0.047	0.503
Panel C:	$K = 0.25$ miles, Homogenous Area			
Property Type	Indicator Radius (M)	Estimate	Standard Error	p-value
Combined	0.10 mi	0.037	0.043	0.381
Combined	0.25 mi	0.026	0.068	0.700
Single Family Homes	0.10 mi	0.059	0.109	0.588
Single Family Homes	0.25 mi	0.004	0.095	0.968
Condos	0.10 mi	0.069	0.054	0.198
Condos	0.25 mi	0.059	0.120	0.623

results.

The primary concern in selecting specific clubs is the number of repeat sales near these clubs over the sample period. All of the individual strip clubs shown on Table 5 opened or closed during the sample period and had a substantial number of nearby repeat sales transactions. For this analysis, we use a cutoff distance of 800 feet for the indicator function $\Delta I_{it}(M)$. In addition, we eliminated any property within 2000 feet of a school or daycare center from this analysis sample. Seattle zoning regulations prohibit the operation of a strip club within 800 feet of a school or daycare center. Results including these properties were very similar to those on Table 5.

We analyze club-specific data for five strip clubs located in Seattle: Deja Vu Showgirls Downtown location (closed in 2007), Sugars in Shoreline just north of Seattle (closed in 2009), the Lusty Lady in downtown Seattle near the Pike Place Market (closed 2010) and Pandora's Adult Cabaret, located on Lake City Way

Table 5: Location-Specific Results, Restricted Subsample

Model	Param. Est.	Std. Error	p-value	Obs.
Indicator radius 1000 ft	-0.019	0.025	0.293	8927
Indicator radius 2000 ft	0.024	0.012	0.055	8927
Indicator radius 1 Mile	-0.009	0.006	0.137	8927
Deja Vu Showgirls - Downtown, 2000 Feet	-0.001	0.018	0.398	2417
Sugars, 2000 Feet	-0.063	0.051	0.187	466
Lusty Lady, 2000 Feet	-0.049	0.020	0.018	1862
Pandora's Adult Cabaret, 1000 Feet	-0.206	0.041	0.001	685
Pandora's Adult Cabaret, 2000 Feet	-0.121	0.034	0.001	685
ASF Corporation, 2000 Feet	-0.025	0.041	0.333	858

in northeast Seattle (opened in 2011). As a counterfactual analysis, we include a property at 10507 Aurora Avenue (ASF Corporation on Table 5) that was purchased in 2008 with the intention of opening a strip club at that location, but never opened. It was sold, and in mid 2012 a mixed use five story building was constructed on the site. We use the 2008 purchase date, and 2012 ground breaking for the alternative building, as the dates for the counterfactual treatment effect.

The top panel on Table 5 shows pooled results for these clubs. Like the results on Table 3 and Table 4, the pooled results show no evidence that property values near these clubs differed from the control group residential properties within one mile.

The bottom panel contains results using data near specific clubs. Some evidence that property values were lower near these clubs, compared to property values in the one mile comparison area, can be seen on Table 5. Property values were lower near both the Lusty Lady and Pandora's Adult Cabaret. The Lusty Lady was an iconic Seattle strip club located across the street from the Seattle Art Museum and a few blocks from the Pike Place Market. Although property values were lower within 2000 feet of this club, the proximity of the Art Museum, Pike Place Market, Benaroya Hall, and other landmarks suggests that the residential real estate dynamics in downtown Seattle must have differed substantially from the rest of Seattle. It is difficult to believe that this negative impact can be attributed to a single strip club, even in the relatively small impact area used here.

Pandora's Adult Cabaret is located in suburban northeast Seattle in a neighborhood called "middle class" in many descriptions. The key feature of this strip club's location is a large mobile home park less than 1000 feet from the club. Mobile home parks have been shown to reduce nearby property values substantially (Munneke and Slawson, 1999). The proximity of a large mobile home park to Pandora's Adult Cabaret may contribute to the estimated negative impact of this club on property values. Note that the negative impact also operates at very small distances, 1000 feet, from the club.

Property values near the ASF Corporation site, in Shoreline, just north of the Seattle city line, were no different than property values for the comparison group within one mile of the location, during the period when a new strip club was proposed for this location. The proposed strip club in this location was known to Seattle residents, as some legal actions took place during the permitting process. The lack of any effect on nearby residential property values indicates that strip clubs are not necessarily located in areas with lower property values, and that the possibility that a club might open at a specific location does not have an effect on property values.

6 Conclusion

The relationship between Seattle and strip clubs is tumultuous, at best. For more than 20 years, the city sought to limit the number of new strip clubs using various forms of bans, ordinances and zoning regulations. One stated reason the city of Seattle took these actions was to prevent a decline in property values due to the disamenity generated by the presence of strip clubs in Seattle neighborhoods.

This claim by the city is directly testable under the null hypothesis that nearby property values remain unchanged after the opening or closing of a strip club. This study formally tests this hypothesis while controlling for heterogenous property price dynamics. An analysis of property transaction prices using annual and quarterly price indexes and multiple cutoffs distances for the impact area of strip clubs, we find no statistical evidence that the presence of strip clubs was associated with any abnormal property price declines or increases in Seattle over the period 2000-2014 using property transactions prices and a RSR model.

This paper is the first to analyze property values for evidence that strip clubs are disamenities/generate negative externalities/generate "secondary effects" in an urban setting. Previous research analyzed crime rate data, which have well-known limitations. Property values should reflect any direct "secondary effects," as well as any indirect impact working through a possible increase in crime near strip clubs; property values represent an improved approach for generating evidence about "secondary effects" of SOBs compared to crime rate data, since transactions prices reflect market valuations of residences, and not the many factors that can affect crime rates.

The results provide important information for policy makers seeking to regulate SOBs and firms operating in this industry. Despite claims based on anecdotal evidence, or rudimentary statistical analyses carried out by local planning agencies, the systematic evidence generated here does not support the idea that strip clubs in Seattle generated any "secondary effects" in terms of negative impacts on nearby residential property values. Furthermore, any local crime directly attributable to strip clubs would also affect property values, so our results also contradict claims that crime generated by the presence of a strip club will harm nearby property owners. While regulators may decide to limit SOBs on moral grounds, this research contributes evidence disputing claims that negative economic impacts justify regulation or elimination of SOBs in urban areas.

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