

Rolling the Dice: Would Casinos Harm Illinois Home Values?

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Casino gambling came to Illinois in February, 1990 when riverboat operations were approved by the General Assembly. At first, ten licenses were granted, each valid for one or two boats up to a total passenger capacity of 1,200. Among the locations for which these initial licenses were granted were sites on the Mississippi River in East St. Louis, on the Illinois River in Peoria, and on the Des Plaines River in Joliet. Authorized games included blackjack, poker, craps, roulette, video poker, keno, baccarat, and slot machines, in addition to various punch board-type games. Riverboat gaming was prohibited in Cook County and anywhere on Lake Michigan.

Boating Enthusiasts

The Illinois Gaming Board's authorization to strictly regulate the industry included such minutiae as the design of the vessels, minimum passenger capacity (500), and the route and duration of each cruise. Yet even though gaming was heavily regulated, the nose of the camel had slipped into the tent, so to speak. Once river-based gambling had been approved, it was only a matter of time before expansion was suggested.

Surely enough, subsequent to this original legislation additional bills were introduced to expand gaming, in terms of both the number of locations and the establishment of land-based operations. Legislation in 1995 sought to expand the number of sites and to add Cook County to the list of permissible locations. It proposed to establish a Metropolitan Entertainment Complex, with five riverboats and land-based entertainment facilities in Chicago. Another bill sought to allow dockside gaming. When the competitive situation worsened for Illinois riverboats operating near gambling-friendly Iowa, bills were introduced to reduce cruising requirements, and to allow dockside gaming as long as the riverboat was based within seventy-five (later fifteen) miles of a competing establishment.

Although none of these bills were adopted, their introduction signaled the willingness of some legislators to loosen

the regulation of riverboat gaming and allow expansion. Some of the proposed loosening has come in response to more liberal gambling regulation in nearby states. Cruise and wagering restrictions were lifted in Iowa in mid-1994, and Missouri vessels added slot machines in December of that year. One result has been a decline in the profitability of two gaming vessels based in northern Illinois (*Silver Eagle* and *Casino Rock Island*). Thus, there exists the real possibility that interstate rivalry and competition will lead to ever-increasing pressure on state legislatures to liberalize the regulation of gaming establishments.

Even without the expansion of sites on which gambling is permitted, Illinois gaming receipts have grown exponentially since 1991. The state's gross 1991 gaming revenues were \$14.9 million. In 1992, that figure rose to \$226.3 million, and a year later gross revenues stood at \$605.5 million. By 1994 the figure was \$980.7 million, and in 1995 it finally passed the billion-dollar mark, standing at \$1,197.3 million. Since the state government has a stake in the gross revenue figures (it takes in a fee of \$2 per passenger and 20% of adjusted gross receipts), it has an incentive to allow the expansion of the gaming industry. In contemporary business parlance, the State of Illinois has become a *stakeholder* in legal gambling.

In summary, interstate competition and the desire for added tax revenues may have combined to lead the General Assembly to expand gaming in Illinois. To the extent that expansion proliferates, we might ultimately expect to see the approval of land-based casinos. The possible existence of land-based gaming establishments in Illinois naturally leads to questions regarding the cost/benefit effects of land-based casinos. To address these questions, we must develop a clearer picture of the costs that gambling imposes on the state and its communities, and then make suitable comparisons with the accompanying benefits. The benefits, as typically enumerated by gambling proponents, include tax revenue, higher employment, and general economic

growth. To calculate the overall net effect of gaming, the analyst must then subtract the negative impact of the costs typically cited when a jurisdiction considers legalizing gambling: added crime, betting addictions, and families' financial ruin.

Leaving Rock Island? Viva Decatur?

Another critical cost – typically ignored – is the impact that nearby gaming businesses would have on residential property values if land-based casinos were permitted to locate in suburban areas. Earlier *Illinois Real Estate Letter* discussions of legalized gambling ("Illinois Waterfront Development: A Public Gamble," Winter 1997 and "On Golden Ponds and Riverboats," Winter/Spring 1994) addressed interesting issues, but not questions regarding how home values would react to casinos. Indeed, it is difficult to speculate in advance what the potential effect of land-based casinos would be on the values of residential properties in Illinois.

Fortunately, a laboratory exists where this effect can be evaluated. Las Vegas is, arguably, the gaming capital of the world, a city visited by more than thirty million travelers each year. Tourists are familiar with the huge casinos in the "downtown" area and along the "strip," where eight of the nine largest hotels in the world are located. What many people do not realize, however, is that numerous small and not-so-small local casinos are located in the surrounding suburban areas.

For example, in Henderson, Nevada, located between ten and fifteen miles from the Las Vegas "strip," there are a multitude of gaming establishments of various sizes located close to residential areas. These establishments vary in size from taverns with a few slot machines to large casinos with live table games, and they are patronized almost exclusively by local citizens. In fact, these suburban casinos seek to cater to the needs of area residents rather than tourists; they offer check cashing and other local promotions. Since many of these decentralized gaming facilities are located in close proximity to residential developments, we can use transaction information from

such areas to estimate what, if any, effect the casinos have had on nearby housing values. Furthermore, since the economy of greater Las Vegas depends heavily on the gaming industry, we would expect that a finding of a *negative* impact in that region could certainly be extrapolated to other areas where gambling would enjoy lower degrees of community acceptance.

Let's Look at the Record

Studies of the effect of *amenities* (good schools, upscale shopping, *etc.*) and *disamenities, or nuisances* (waste dumps, power lines, trailer parks, *etc.*) on nearby property values have populated the real estate journals for years. The method of testing for this effect is a well known and accepted statistical technique known as *regression analysis*. An analyst looks at a sample of transactions involving a community where an identified amenity or nuisance exists and, after accounting for differences in the physical and neighborhood characteristics, relates value (as indicated by the observed selling price) to each property's distance from the amenity or nuisance. In other words, it is possible to isolate the effect of distance to an amenity's or nuisance's location from all other factors believed to affect a property's value. If the numerical relationship between price and distance is found to be positive, such that property values increase with greater distance from the specified location, then that location (in this case, the gaming facility) is considered to be a nuisance. Moreover, the size of the numerical relationship (in regression terminology, the *coefficient*) determines the magnitude of the effect; the result need not be "all-or-nothing."

We must also remain mindful of the possibility that neighborhood characteristics other than the amenity or nuisance being studied could impact the values of the properties examined. For example, a shopping center could be located next to a casino, and the shopping center's impact on nearby home values might be as great as, or greater than, that exerted by the casino. Alternatively, a casino might locate on a parcel of land that, for some reason, already has a negative influence on the values of nearby houses. Of course, in such a case it could be difficult to disentangle the effects of these

neighborhood influences from that exerted by the casino itself.

Fortunately, we have a method for solving this problem. With access to reliable historical information on prices, we can account for the extraneous neighborhood characteristics by comparing the price-distance relationship that prevailed before the casino came into being with the corresponding figure for the period when the casino was in operation. That is, the distance measure of interest to us in the "before" analysis is distance from the house to the location where the casino was eventually placed. Therefore, only residential properties that had been sold prior to the casino's establishment are included in this sub-sample. Similarly, only houses that were sold after the facility's

those sold with existing casinos nearby, we divided the sample into properties that were located close to *smaller* casinos and those located close to *larger* casinos. We have defined an establishment as a "large" casino if it has 100 slot machines or more, and as a "small" casino otherwise. While this division is arbitrary, it allows us to determine whether the impact of a casino varies by size, and what the nature of that impact may be. The sample is large because all information in the Clark County Assessor's office is available on a CD-ROM disk, a medium that allows for quick search and download capabilities. The existence of such a large amount of supporting information gives us more confidence in the statistical results that we obtain.

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establishment are included in the "after" sub-sample. We can infer the casino's impact by comparing the "before" and "after" regression results. For example, if the measured relationship between price and proximity is zero in the "before" analysis but negative "after," then it would seem reasonable to conclude that the casino in question is, indeed, a nuisance.

The Supporting Data

To obtain specific measurements of this price-distance relationship, we looked at a sample of 10,762 residential properties that were sold between January 1980 and April 1995. All are located in two zip code areas (89014, 89015) within the Clark County, Nevada community of Henderson. The characteristics of each property that we accounted for are: the number of bathrooms, bedrooms, and fireplaces; the existence of a garage or a pool; the age of the property; the date of sale; the square footage of the building and the lot; and, of course, the distance to the nearest casino site. In addition to dividing the information into a subset of houses sold prior to the establishment of the casinos and a subset containing

The regression technique utilizes a series of *independent* variables in explaining a the magnitude of a *dependent* variable. In this study, the dependent variable is a measure of the real price (in constant dollars) of each residential property. That is, we divided the actual sales price of each included house by the Consumer Price Index (CPI) for the month when the property was sold; if observed *nominal* home prices rose each month in exact step with general inflation, as measured by the CPI, then homes' *real* prices would be unchanged. We then took the *logarithm* of the real price; converting our measured housing prices to "logs," which are exponents to which "base" numbers are raised in reaching specified totals, allows us to interpret our results in terms of percentages rather than dollars. This approach helps us apply our results to communities other than Las Vegas. For example, a reported average price difference of \$2,000 per house would not represent a large impact in a Chicago neighborhood with an average home price of \$300,000; it *is* a large impact, however, in a neighborhood where the average price is \$75,000.

In short, the coefficient that the regression output assigns to each independent variable (age, size, room count, distance to the nearest casino) is interpreted as the percentage change in the price of the home associated with each considered characteristic. In line with accepted statistical techniques, we deem the coefficients to be *significant* (more technically, significantly different from zero) if there is less than a 5% probability that the indicated relationship could have occurred simply by coincidence. That is, the smaller the probability of a chance relationship, the greater confidence we can have that the measured effect is due to the characteristic in question. Because our transaction sample is so large, there is little concern that we could mistakenly

Results of the Study

A measure of particular importance in any regression analysis is the percentage of variation in the dependent variable associated with changes in the specified independent variables. A high value for this measure, called the *coefficient of determination* or, more commonly, R^2 , would indicate that we have done a good job of identifying physical and locational features that determine home values. Our measured R^2 s were fairly high: .78 (for the “before” sub-sample), .82 (the “after” sub-sample involving “small” casinos), and .83 (the “after” sub-sample involving “large” casinos). The latter figure indicates that 83% of the variation in prices of houses located near large casinos relates to the independent variables we

with the land uses observed near those sites. After a small casino opened, however, the value of each home within one mile of that casino fell by approximately 3.27%. (If the casino was larger, the value of each house located within one mile fell by approximately 4.6%.) Because our output shows a very small probability that any coefficient could result from chance alone, we have much confidence in these distance measures. Thus, we can conclude that casinos are nuisances – they exert negative influences on the values of nearby residences – and that larger casinos create bigger problems.

We can determine the aggregate impact of having a casino in a residential area by applying the above percentage reductions to all houses located within a mile radius of the casino. For example, if the average value of the 400 residential properties located within a mile of a proposed casino is \$200,000, then the total value of all homes would be \$80 million. A small casino would have an aggregate negative value impact of $\$80,000,000 \times .0327 = \$2,616,000$; a large casino would have a negative impact of $\$3,680,000$. An analyst should include this impact in the equation that measures the typically-cited costs and benefits that communities realize through casino gaming.

Conclusions

Obviously the exact impact of any casino in a residential area will vary depending on the city in question. However, results from near Las Vegas suggest that a casino is a nuisance that negatively impacts nearby residential properties, at least those located within a mile of the facility. Illinois citizens are no more likely than their Nevada counterparts to want to live near the lights, noise, and traffic that accompany casino operations. The next time gambling legislation is discussed, they would be justified in asking gaming proponents why the impact on home values in Illinois would be any different from that found in the Henderson study. ■

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interpret coincidental outcomes as meaningful indicators of residential property values. (For example, old houses occasionally sell for more than otherwise-similar newer houses, but that unusual result will not be systematically observed across 10,000 transactions.)

The coefficients that the regression software has computed for all of our variables make sense, with the exception of those on the number of bedrooms and number of bathrooms, for which the coefficient values are negative! At first blush, this result would seem to indicate that a house with more bedrooms or bathrooms should sell for a lower price. However, since we also included the size of each house (in square feet) as an independent variable, negative coefficients on the bedroom and bathroom variables may reflect a discount imposed on properties with bedrooms and bathrooms that are large in number but small in size. While this commonly-encountered statistical problem (known as *multicollinearity*) can cause some interpretation difficulties, it has no impact on the validity of the coefficient computed for the distance-to-casino variables.

chose. The other 17% would be explained by landscaping, fence quality, location on a *cul-de-sac*, or other features we did not include as independent variables (because experience and common sense told us that their impacts would be small, and because added statistical problems can arise as the number of independent variables grows).

The coefficient value of greatest interest to us, of course, is that for the distance variable. To test for the differential impact of large vs. small casinos, we actually included *two* distance variables. The model is set up so that the effect of distance to any casino is indicated by the coefficient on a variable called MILES, while we capture the added effect of distance to a large casino (we had theorized that larger casinos would exert greater negative impacts on nearby houses) by summing the coefficients on MILES and a variable called CASMILES.

The results indicate that the value of a home sold before a casino is established is not affected by distance to the casino's future location. In other words, no disamenity is systematically associated with sites that ultimately will hold casinos, or