Does the Presence of Casinos Increase Crime? An Examination of Casino and Control Communities

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This study is an analysis of crime in six new casino communities and compares the crime rates to those found in six noncasino control communities. The experimental and control communities were matched on 15 socioeconomic variables. The crime rates were calculated using resident population and population at-risk, which includes tourists in the crime rate calculations. Both Part I and Part II crimes were analyzed using data encompassing the pre- and postcasino presence. Crime was expected to rise in the casino communities, consistent with routine activity theory and the belief that casinos serve as hot spots for crime. The analysis yielded few consistent findings across the test and control communities. Crime rates increased significantly in some casino communities, some remained relatively stable, and others decreased. The authors conclude that crime does not inevitably increase with the introduction of a casino into a community, but that the effects of casinos on crime appear to be related to a variety of variables which are only poorly understood.

Keywords: *casinos and crime; gambling and crime*

America is experiencing a gambling boom of unprecedented proportions. In 1975, only Nevada had casino gambling, and 13 states had lotteries. Between 1982 and 1998, consumer spending on gambling increased $43.9 billion to $54.4 billion, only slightly less than the amount spent on movie tickets, spectator sports, cruise ships, recorded music, and theme parks in 1998. Of the $54.4 billion, $22.3 billion (41%) was from casino gambling (Christiansen, 1999). Thirty states have casino gambling (including Native

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American casinos), and 37 states and the District of Columbia have lotteries. Only 3 states (Hawaii, Tennessee, and Utah) do not have some form of legal betting sanctioned within their borders (National Gambling Impact Study Commission [NGISC], 1999).

As gambling has grown, dire predictions have been made concerning gambling's effect on society. In an official report to the state legislature, the Attorney General of Maryland examined the effect casino gaming could be expected to have on crime. He stated,

> The impact would be this: casinos would bring a substantial increase in crime. . . . Crime would rise because of crime related problems of compulsive gamblers, the constant exposure of casino workers to substance abuse and other social ills, the pervasive availability of alcohol to casino patrons, and the growing problem of teenage gambling addiction. (Curran, 1995, E2-3)

Rose (1991) labeled this national foray into large-scale legalized gambling as "the Golden Age of Gambling" and "the Third Wave" (following a pattern similar to the 1820s and the 1890s). He believes that the current wave of legalized gambling will inevitably end badly, as did the first two, with gambling becoming increasingly pervasive but also increasingly socially disruptive. Eventually, gambling will take an unacceptable toll on the citizenry and society will return to traditional values and a near prohibition on gambling. Although a substantial majority (68%) of Americans approve of gambling in resort areas, nearly the same percentage of Americans believe that gambling is associated with a variety of negatives for society such as organized crime (61%), compulsive gambling (61%), and encouraging people who can least afford it to squander their money (67%) (Gallup Poll, 1996).

Concern surrounding gambling's effect on individuals and communities culminated in 1996 when Congress authorized the NGISC (1999). The Commission's task was to study the effect of all forms of gambling (casinos, lotteries, parimutual wagering) on society. Although the Commission was widely criticized for being a political group appointed to represent various interest groups (German, 1999), its final report took a moderate position toward gambling. It noted contradictory evidence surrounding gambling's effect on a variety of social and economic variables. The Commission ultimately called for a moratorium on new gaming jurisdictions, stating that more evidence was needed to clarify gambling's effect on communities, and calling for more research on gambling's social and economic effects.

The present research is an attempt to answer some of the questions raised by the NGISC concerning casinos and crime. Before describing the methodology employed in the current study, a discussion of the theoretical relation-

ship between casinos and crime and a review of the empirical studies of this relationship is necessary to put in context the variables to be studied.

CASINOS AND CRIME: A THEORETICAL PERSPECTIVE

In their review of the literature, Miller and Schwartz (1998) noted that most studies of casinos and crime amount to little more than data dredging. They believe that too many studies assume that casinos are somehow different from other forms of entertainment that draw large numbers of tourists. Yet the research lacks theoretical grounding that specifies these differences, and no attempt is made to reconcile contradictory findings. Miller and Schwartz believe that if casino-related crime exists, research should be able to distinguish it from other crime and explain how the casino-related crime is consistent with a theoretical orientation. They noted that no research has as yet been able to theoretically and empirically demonstrate that casinos are, indeed, different from other tourist attractions resulting in a different incidence of crime.

It appears that routine activity theory (Cohen & Felson, 1979) and the concept of hot spots (Sherman, Gartin, & Buerger, 1989) are best suited to distinguish between casino-related crime and most other crime. Cohen and Felson (1979) believed that as routine patterns of behavior take people away from household and family activities, this dispersion places individuals in environments where they are in increased jeopardy of becoming victims of predatory crime. The convergence of motivated offenders, suitable targets, and the absence of capable guardians results in an increase in predatory crime. Predatory crime is defined as offenses that definitely and intentionally damage the person or property of another (Glazer, 1971). Cohen and Felson viewed predatory crime not simply as an indicator of social breakdown but as a "byproduct of freedom and prosperity as they manifest themselves in the routine activities of everyday life" (p. 605). Messner and Blau (1987) succinctly summarized routine activities by stating it is concerned with "where people spend their time and with whom they come in contact" (p. 1037).

Sherman et al. (1989) built on the ecological aspect of routine activities by focusing on the concept of place, defining it as a geographic location and, in the sociological sense, as the social organization of behavior at a specific location. They noted that crime is not randomly distributed in a community but that a vastly disproportionate number of calls for police service typically comes from a small proportion of addresses. They concluded that routine behaviors characteristic of certain places, termed *hot spots*, contribute to

increased levels of crime. These hot spots are often characterized by forbidden or specifically encouraged activities, such as alcohol consumption, in places of public access, which lead to higher rates of crime.

Casinos appear to provide an environment consistent with routine activities and hot spot criteria. Gambling is different from other tourist or entertainment events (such as theme parks, concerts, nightclubs, and sporting events) in that money is not simply needed to purchase a ticket or provide for food and beverage. Instead, money is the medium that forms the basis of the entertainment. Furthermore, it is customary for individuals to openly display money (or currency denominated tokens) while playing casino table games (blackjack, craps, or roulette). In fact, casino employees have a derogatory term (*squirrel*) for individuals who attempt to hide or protect their winnings by keeping only a small portion in front of them and stashing the rest. When a casino patron wins a large payoff on the most common form of casino gambling, slot machines, casinos "advertise" the fact with bells, lights, and whistles. These customs of keeping money or chips in plain view in table games and drawing attention to individuals who hit big on slot machines make it simple to assess an individual's suitability as a potential crime target.

There are several other reasons why casinos are believed to be fertile ground for motivated offenders. Besides the obvious lure of casinos and their surroundings (hotels, parking lots) to individuals intent on committing crime for gain, the casinos may also inspire situational and opportunistic crime by gamblers who have sustained big losses and who are desperate to recoup those losses. Compulsive gamblers have been found to have a high involvement in crime and an incarceration rate more than three times the expected rate (National Opinion Research Center [NORC], 1999, p. 46). The free alcohol provided to gamblers in many casinos may make the potential victim less vigilant and an inviting target. Alternately, the easy availability of alcohol may remove restraints from potential offenders.

The belief that casinos cause crime is widely accepted in society. In a report presented to a legislative task force considering legalizing casino gambling in Maryland, the Maryland Attorney General argued that casino-based tourism is different from other types of tourism in that casinos are different from other forms of entertainment (Curran, 1995). Casinos attract many young adults to the 24-hour-a-day action. There is a constant flow of free alcohol. Casinos appeal to "high rollers" through the "glitz and glamour of life in the fast lane" (p. 36). The casinos were also believed to provide an environment that encouraged substance abuse and provided a "meeting place for dealers" (p. 36). The Attorney General of Maryland reached an "unequivocal conclusion" that "casinos create more crime" (p. E-3).

However widely held the belief that casinos cause crime, and despite reasoned theoretical underpinnings to support the belief, Miller and Schwartz (1998) pointed out that research has yet to demonstrate the connection. Although there is considerable support for hot spots and routine activity theory (Messner & Blau, 1987; Sampson & Wooldredge, 1987), there is some dispute as to the types of criminality best explained by these theories. Miethe, Stafford, and Long (1987), for example, found a strong relationship between lifestyle, demographic variables, and victims of property (but not violent) offenses. Kennedy and Forde (1990), however, found that property crime and personal crime were consistent with routine activity theory. In a recently reported study examining riverboat gambling in Indiana, Wilson (2001) reported that "the Hammond and Rising Sun communities did not result in general increases in crime as expected from routine activities theory or studies based on resorts and traditional casinos" (p. 635). The present study is an attempt to more fully specify the casino-crime linkage relating predatory, as well as other types of crime to casinos especially as they relate to routine activity theory and hot spots.

REVIEW OF EMPIRICAL STUDIES

Two of the earliest and best studies on gambling and crime are by Albanese (1985) and Curran and Scarpitti (1991). Each of these studies dealt with casinos and crime in Atlantic City, New Jersey.

Albanese (1985) noted that several early studies simply used data from the Uniform Crime Reports, which indicated a great increase in index offenses when comparing the pre- and postcasino crime numbers for Atlantic City. Casinos opened in Atlantic City in 1978. In 1977, there were 4,391 index offenses reported to the police in Atlantic City. By 1980, the number of index offenses had increased to 11,899. Albanese noted, however, that these crime numbers do not answer the question of whether Atlantic City residents were less safe because the crime data did not include tourists in the population at risk. As a result of casinos, Atlantic City, a community of 38,000 inhabitants (U.S. Bureau of the Census, 1994), attracted more than 27 million tourists in 1983 (Albanese, 1985).

Albanese (1985) calculated the average tourist population and arrived at the crime rate by adding the tourist population to the resident population to form the denominator of the crime rate formula. In addition, he looked at several other relevant factors, such as what occurred during the time period in other communities in the state. His conclusion was that "casinos have no

direct effect on the serious crime in Atlantic City, and that crime has risen due to factors other than the casinos themselves" (p. 43).

Curran and Scarpitti (1991) did a follow-up study in Atlantic City. In addition to including the population at-risk measure and analyzing the Atlantic City crime in the context of the crime trends in New Jersey, they identified crimes committed in or on the grounds of the Atlantic City casinos and distinguished between casino-based and community-based crimes that occurred in Atlantic City. Curran and Scarpitti's conclusion was similar to Albanese's (1985) conclusion that legalization of casinos did not result in a significant increase in index offenses in Atlantic City.

A study by Hakim and Buck (1989) examined index crime in Atlantic City and surrounding communities. They controlled for such variables as unemployment, distance from Atlantic City, size of police force, and standardized for population (but not population at risk). They found that crime was higher in the postcasino years, and there was a spillover effect occurred in surrounding areas. Communities close to Atlantic City experienced a greater increase in crime than more distant cities.

Although Hakim and Buck (1989) found a relationship between casinos and crime in Atlantic City, as well as in the surrounding environs, Albanese (1985) and Curran and Scarpitti (1991) did not find an increase when controlling for population at risk. Questions remain, however, as to whether these relationships will hold in communities that have recently instituted casino gambling because many of these communities are in less highly populated areas and many have only one casino in the community.

Two studies examined crime in Biloxi, Mississippi. Biloxi is a new major gambling center of approximately 46,000 residents located on the Mississippi Gulf Coast. Studies were conducted analyzing Part I and Part II crimes 1 year after (Giacopassi & Stitt, 1993) and 2 years after (Chang, 1996) casinos were introduced. Each study concluded that there was no general increase in either Part I or Part II crimes in Biloxi after the introduction of casinos.

A study done in Wisconsin examined the effect of Indian casinos on Part I and Part II crime in all counties in the state from 1991 to 1995. The researchers studied 14 counties containing casinos and 13 counties bordering two or more casino counties and compared them to the other counties in the state. They found that the casino or near casino counties had rates of major crimes 6.7% higher than expected and Part II offense arrest rates were 12.2% higher than noncasino counties. They concluded that the introduction of casino gambling is associated with increased crime (Thompson, Gazel, & Rickman, 1996).

A national study of 170 casino and 3,165 noncasino counties was conducted for the years 1987 to 1996 to determine if casinos affected serious

crime (Grinols, Mustard, & Dilley, 1999). The researchers controlled for more than 50 variables (but not population at risk) and concluded that casinos increase all index offenses except murder. They also found that there was a time lag such that increased crime only appeared 3 to 4 years after casinos began operation.

Given the contradictory results from the research, the NGISC enlisted NORC to conduct a wide-ranging study of gambling's effect. To accomplish this task, NORC (in collaboration with others) conducted several national telephone surveys of adults at home, adults at gaming facilities, and adolescents at home. In addition, NORC gathered extensive statistical data on 100 communities, each being classified as within or further than 50 miles from the nearest casino. Last, 10 in-depth community studies were conducted to study the effect of casinos on communities.

The findings reported to the National Commission are that pathological and problem gamblers comprise about 2.5% of adults and that there is a higher rate of these gamblers within 50 miles of casinos. However, NORC data found that even in communities close to casinos, there was no significant increase in per capita rates of violent crime (they did not have data for other forms of crime). The NORC's final report was careful to point out that although there were no statistically significant results linking the presence of casinos to increased crime, this cannot be taken as conclusive evidence due to a variety of methodological limitations. For example, Part II crimes were not measured, so no conclusion can be drawn regarding crimes such as embezzlement and fraud. Also, it was pointed out that casinos may cause increased crime, but the increase might have been offset by other variables not controlled for in the NORC research.

In the final report, the NGISC called for more research into the question of whether casinos cause crime. It noted that although much has been written about casinos and crime, most of the research surrounding the issue has been ideologically grounded and therefore of questionable reliability. Although there have been a considerable number of objective studies, the present study is an attempt to collect and analyze data on a broader scope so as to provide better insight into many of the questions posed by the NGISC regarding the relationship of casinos to crime. The present study is one of the more comprehensive studies of casinos and crime. It focuses on six new casino jurisdictions (analyzing Part I and Part II offenses), examines the effect through both traditional crime rates and rates that include the population at risk (tourists), and also compares the casino communities to a control group of matched noncasino communities. Comprehensive Part II crime data, which are not available anywhere other than directly from the agency that collects it, are

critical because crimes such as fraud, embezzlement, bad checks, and public disorder crimes are more likely associated with gambling effects than are crimes such as aggravated assaults, armed robberies, or rapes (American Psychiatric Association, 1994). Although the accuracy of Part II data is open to question, the omission of minor crimes from an analysis examining the effect of casinos on communities would be a serious shortcoming, especially given the logical connection many of these offenses have to casinos as hot spots. Furthermore, the authors realize that the present test can only be considered a limited test of routine activities and hot spots theoretical notions. These limitations will be discussed in the conclusion.

METHOD

The present analysis is part of a larger study to determine the effects of casino gambling on crime and the quality of life in new casino jurisdictions. Because possible casino effects on crime were critical elements to be studied, community police departments had to agree to make available Part I and Part II crime data for at least 4 years prior to casinos opening in their community to be eligible for inclusion in the study. All the communities selected for the study initiated casino gambling in the 1990s and have had casino gambling for a minimum of 4 years. This time frame allows comparisons to be made before and after the casinos were in operation. A number of communities could not be included in the study due to incomplete, nonexistent, or inaccessible data.

The communities ultimately included in the study are Sioux City, Iowa; St. Joseph, St. Louis City, and St. Louis County, Missouri; Alton, Peoria, and East Peoria, Illinois; and Biloxi, Mississippi. Of these communities, Alton has had gambling the longest (since September 1991), whereas St. Joseph has had it the least amount of time (since June 1994). All of the cities lost population from 1980 to 1990 (U.S. Bureau of the Census, 1993). Of the seven cities, only Peoria does not have a casino at this time. Peoria had a riverboat in 1991, but for regulatory reasons, it was moved to East Peoria in 1993, directly across the Illinois River and easily accessible from Peoria. However, Peoria shares in the tax revenue from the riverboat with East Peoria, and many citizens of Peoria work in and are customers of the casino. Peoria, therefore, presents a unique case for study. Each of the other cities has one riverboat casino, except for Biloxi, which has nine casinos located on a bay or on the Gulf Coast on stationary barges. These barge casinos tend to be larger than the riverboat casinos, and their number and concentration have resulted in the casinos and the tourists they draw playing a much larger role in Biloxi than in

the other communities studied. The other extreme is St. Louis, a relatively large city with a single riverboat casino within the city limits but with several other casino riverboats nearby (in East St. Louis, St. Charles, Maryland Heights, and Alton). In comparison to the other communities in the study, the St. Louis riverboat has relatively little effect on tourism and the overall economy of the city and county.

For the present analysis of the relationship of casinos to crime, taking into consideration the effect of tourism and comparing the casino cities to control cities, only Sioux City, Iowa; Alton and Peoria, Illinois; St. Joseph and St. Louis, Missouri; and Biloxi, Mississippi, are examined. East Peoria was not able to provide the necessary data for analysis. Although tourism data were not available for its control jurisdiction, St. Louis City is still included in the analysis. All crime data are taken from monthly reports provided by the respective jurisdictions. For St. Joseph, Missouri, only 9 months of data were available after casinos were brought to the city because of incomplete data entry by city personnel.

Population at Risk

To calculate the population at risk, the average monthly tourist or visitor population is added to the resident population. Unfortunately, data on the exact number of visitors is unavailable for the entire sample period. However, it is possible to estimate the number of visitors to a community from studies that examine the economic effect of tourism on states and counties. This involves dividing direct tourism expenditures by the average spend per visitor per trip, thereby obtaining an estimate of the number of person trips.

Travel and Tourism offices were contacted in each state for our selected jurisdictions to obtain information on the direct expenditures by tourists in the state and for each of the counties. These data ranged from being fairly complete in Iowa, which had direct expenditure estimates for 1988-1996, to relatively incomplete in Biloxi, which only had direct expenditure estimates for 1995-1997. Average spent per trip is the state average and was obtained from the American Travel Survey (ATS) for 1995. The Department of Transportation conducted a study in 1995 which estimated the number of visitors to (and from) all states and various metropolitan areas. The average spent per visitor is calculated using the direct tourist expenditures in 1995 from the economic effect of tourism studies and the number of visitors to the state in 1995 from the ATS survey. The average spent for years other than 1995 is adjusted upward and downward based on the Consumer Price Index (CPI). Although these tourism figures are imprecise, they provide the best estimates of tourism available.

As noted above, information on direct tourist expenditures is not available for all years. Consequently, data for the missing years were estimated from existing data assuming a constant growth trend. Once direct tourism expenditures and average spending per visitor were estimated, the number of yearly visitors was obtained by dividing direct tourism expenditures by the average spent. Yearly figures were then converted to monthly (or quarterly) figures by taking a weighted average, using the percentage of visitors to the casinos during each month as the weight. Visitation to casinos is cyclical, with high visitation occurring in the warmer summer months, and should approximate tourist visitation cycles.

Finally, population figures were obtained from the U.S. Census Bureau. Yearly figures were converted to monthly assuming a constant growth trend. City population figures for all years are weighted averages of the county population using the proportion of the county population accounted for by the city in the 1990 census. Adding the monthly population estimates with the monthly tourist estimates results in the population at risk.

Having the population and tourism data allows for calculation of crime rates before and after casinos entered the community. The data allow comparisons to be drawn comparing traditional crime rates and crime rates based on the population at risk (tourist and resident population). Although each jurisdiction provided the eight index or Part I offense data, the nonindex or Part II crime categories vary from city to city due to different classification schemes used by each police department.

By definition, the at-risk crime rate is always lower than the traditional crime rate due to the larger population base, which results when tourists are included in the community population. The data used in the present study allow for comparisons of the crime rate based on the population at risk to the traditional crime rate based on the resident population. An analysis will be conducted of index and nonindex offenses to determine the number that change significantly from pre- to postcasino time periods, utilizing the traditional measure of crime based on a community's population as well as a measure based on population at risk. Furthermore, comparing the at-risk crime rate for the two time periods for specific crimes may give us some insight into the types of crimes that are generally affected by opening a casino in a community.

To analyze the effect that casino gaming has on crime, we compare the crime rates in the casino communities with closely matched control communities. Control communities were chosen based on their similarity to the casino communities comparing 15 demographic, economic, and social variables.[1] The 15 variables chosen are percentage of the population aged 15 to 34; total population; median household income; unemployment rate; per-

centage Black; percentage Hispanic; percentage Indian, Aleut, or Eskimo; percentage below poverty for the population where poverty status is known; percentage of the population not graduating high school; percentage of occupied housing units that are renter-occupied; percentage of total housing units in structures with three or more units; net migration; percentage urban; average number of persons per square mile; and a Gini coefficient of income inequality. All data are taken from the U.S. Census Bureau's *USA Counties 1996* CD-ROM, and all variables are normalized by converting them to a z score relative to the U.S. county average.

The selection of control communities is based on k means cluster analysis (Hartigan & Wong, 1979) and uses programs developed by Judson (1998). The procedure ranks control communities on their proximity to casino communities applying the following metric:

$$d(y,x) = \left(\sum_{j=1}^{k} (y_j - x_j)^q\right)^{1/q},$$

where y_j is the jth variable for the potential control community and x_j is the same variable for the casino community. In the present study, q equals 2, the usual Euclidian distance. Summing across all k variables, the control communities can be ranked in ascending order of distance from the casino communities.

Once a rank ordering of possible control communities was obtained, their respective police departments were contacted in an attempt to obtain crime data for comparison to the casino communities. It should be pointed out that in not all cases were the most closely matched communities utilized as controls due to the unavailability of comparable police data. Thus, admittedly, the control communities are not perfect but the best that could be obtained.

RESULTS

Offense by offense comparisons for the casino cities versus the control cities standardized for per capita population and population at risk measures appear in Tables 1 to 6. These tables are for Sioux City, St. Joseph, Alton, Peoria, Biloxi, and St. Louis, respectively. The number of offenses utilized for the comparison in the tables varies from 11 to 20. This is due to different coding systems used in the respective cities and the extent of data made available to the research team. Only those results which are statistically significant are discussed in this section.

The results in Table 1 comparing Sioux City with Waterloo, Iowa, using the per capita population measure reveal that aggravated assault increased in Sioux City while it decreased in Waterloo, and sex offenses increased more in Sioux City than in Waterloo. Simple assault, which decreased in both, decreased less in Sioux City. As the same time, sexual assault, embezzlement, fraud, drunkenness, and disorderly conduct decreased in Sioux City, while they increased in Waterloo. Arson and drug violations increased in both communities, but the increase was greater in Waterloo than in Sioux City. When taking the population at risk into consideration, there are three instances where the crime rates increased in Sioux City while decreasing in Waterloo. These were for aggravated assault, larceny, and sex offenses. For one crime, motor vehicle theft, both communities saw increases, but the increase was greater in Sioux City. For another crime, simple assault, there were decreases in both cities, but the decrease was again less in Sioux City. For the crimes of sexual assault, embezzlement, drunkenness, and disorderly conduct, the rates in Waterloo increased while they decreased in Sioux City. For one crime, drug violations, the rates increased in both, but the increase was greater in Waterloo. For fraud there were decreases in both, but the decrease was greater in Sioux City than in Waterloo. The case presented in the Sioux City/Waterloo analysis certainly does not indicate that casinos tend to increase crime. If anything, there is a slight incidence of the opposite revealed by these results.

Next, the results comparing St. Joseph, Missouri, to Fort Smith, Arkansas, are presented in Table 2. Of the 13 offense categories for which comparisons can be made, when per capita population is used for standardization, there are 4 offenses (aggravated assault, burglary, liquor law violations, and family offenses) where the St. Joseph rates went up while Fort Smith's went down. For one offense category, sex offenses, the St. Joseph and Fort Smith rates both increased, but the St. Joseph rate increased by a greater magnitude. There were two offenses where the St. Joseph rate decreased, but the Fort Smith rate increased. These were homicide and motor vehicle theft. For one offense, drug law violations, Fort Smith's increase was significantly greater than that witnessed in St. Joseph. The picture changes slightly when population at risk is taken into account. Here, for liquor law and family offense violations, St. Joseph's rates increase while Fort Smith's rates decrease. For one offense, burglary, rates in both cities decrease, but there is a greater decrease in Fort Smith. At the same time, homicide and drug law violations go up in Fort Smith while either decreasing in St. Joseph or, as with homicide, dropping off entirely. Finally, for motor vehicle theft, the rates go

(text continues on p. 270)

TABLE 1: Crime Data for Sioux City and Control (Waterloo, IA): Pre- and Postcasinos Using Per Capita and Population at Risk Measures

	Per Capita Population				*Population at Risk*			
Type of Crime	*Precasinos*	*Postcasinos*	*% Change*	t *Value*	*Precasinos*	*Postcasinos*	*% Change*	t *Value*
Homicide								
Sioux City	0.062	0.125	1.009	2.21	0.011	0.020	0.932	2.02
Waterloo	0.051	0.054	0.069		0.007	0.007	0.039	
Sexual assault								
Sioux City	0.643	0.633	–0.014	–2.35*	0.106	0.104	–0.026	–8.59***
Waterloo	0.464	0.592	0.275		0.063	0.072	0.157	
Robbery								
Sioux City	0.910	1.167	0.282	–1.70	0.150	0.189	0.262	0.13
Waterloo	1.571	2.036	0.296		0.212	0.248	0.171	
Aggravated assault								
Sioux City	4.343	9.291	1.140	8.65***	0.725	1.502	1.072	3.72**
Waterloo	2.611	2.575	–0.014		0.348	0.316	–0.093	
Burglary								
Sioux City	15.497	17.077	0.102	0.70	2.540	2.738	0.078	2.15
Waterloo	17.439	17.240	–0.011		2.361	2.109	–0.107	
Larceny								
Sioux City	41.384	44.340	0.071	0.33	6.823	7.197	0.055	2.42*
Waterloo	45.323	47.329	0.044		6.098	5.767	–0.054	
Motor vehicle theft								
Sioux City	2.527	3.844	0.521	0.57	0.414	0.614	0.484	2.45*
Waterloo	2.806	3.843	0.370		0.368	0.468	0.270	

(continued)

TABLE 1 (continued)

	Per Capita Population				*Population at Risk*			
Type of Crime	*Precasinos*	*Postcasinos*	*% Change*	t *Value*	*Precasinos*	*Postcasinos*	*% Change*	t *Value*
Arson								
Sioux City	0.368	0.414	0.124	–2.28*	0.061	0.066	0.091	–1.75
Waterloo	0.639	0.824	0.291		0.083	0.100	0.206	
Simple assault								
Sioux City	11.688	10.971	–0.061	2.62*	1.933	1.776	–0.081	2.35*
Waterloo	13.203	11.401	–0.136		1.767	1.397	–0.209	
Embezzlement								
Sioux City	0.107	0.061	–0.435	–12.78***	0.017	0.010	–0.430	–7.72***
Waterloo	0.355	0.597	0.684		0.046	0.073	0.560	
Forgery								
Sioux City	1.758	2.521	0.434	0.47	0.289	0.408	0.411	0.92
Waterloo	1.975	2.588	0.311		0.266	0.315	0.181	
Fraud								
Sioux City	2.087	1.542	–0.261	–5.52***	0.344	0.249	–0.276	–3.24*
Waterloo	2.929	3.166	0.081		0.390	0.384	–0.016	
Liquor law violation								
Sioux City	0.834	0.967	0.159	0.21	0.138	0.156	0.129	1.06
Waterloo	1.053	1.164	0.106		0.142	0.142	–0.005	
Drug violation								
Sioux City	2.172	4.508	1.075	–2.94*	0.359	0.718	1.003	–2.80*
Waterloo	2.337	6.440	1.755		0.303	0.781	1.576	

Family offense								
Sioux City	0.594	1.062	0.787	1.02	0.100	0.171	0.717	1.95
Waterloo	2.314	2.646	0.144		0.312	0.322	0.030	
Prostitution								
Sioux City	0.322	0.454	0.409	1.25	0.053	0.075	0.426	1.57
Waterloo	0.268	0.242	–0.094		0.036	0.029	–0.193	
Sex offenses								
Sioux City	1.665	2.052	0.232	4.44**	0.276	0.331	0.201	4.53**
Waterloo	1.124	1.186	0.055		0.152	0.145	–0.049	
Drunkenness								
Sioux City	11.342	8.888	–0.216	–3.66**	1.874	1.430	–0.237	–2.60*
Waterloo	3.741	4.342	0.161		0.497	0.531	0.070	
Disorderly conduct								
Sioux City	8.009	7.599	–0.051	–10.37***	1.326	1.216	–0.083	–7.14***
Waterloo	10.004	18.009	0.800		1.334	2.188	0.640	
Driving under the influence								
Sioux City	7.934	8.272	0.043	0.94	1.315	1.332	0.014	1.31
Waterloo	4.447	4.022	–0.096		0.586	0.492	–0.159	

*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 2: Crime Data for St. Joseph and Control (Fort Smith, AR): Pre- and Postcasinos Using Per Capita and Population at Risk Measures

	Per Capita Population				*Population at Risk*			
Type of Crime	*Precasinos*	*Postcasinos*	*% Change*	t *Value*	*Precasinos*	*Postcasinos*	*% Change*	t *Value*
Homicide								
St. Joseph	0.008	0.000	–1.000	–2.58*	0.003	0	–1.00	–2.53*
Fort Smith	0.016	0.022	0.391		0.007	0.009	0.316	
Sexual assault								
St. Joseph	0.081	0.051	–0.373	–0.07	0.027	0.013	–0.494	0.44
Fort Smith	0.199	0.170	–0.144		0.087	0.070	–0.192	
Robbery								
St. Joseph	0.139	0.144	0.038	0.03	0.046	0.039	–0.162	–0.11
Fort Smith	0.295	0.300	0.015		0.131	0.124	–0.05	
Aggravated assault								
St. Joseph	4.122	5.527	0.341	2.27*	1.362	1.493	0.096	1.57
Fort Smith	1.362	1.140	–0.163		0.602	0.472	–0.215	
Burglary								
St. Joseph	3.070	3.119	0.016	4.10***	1.061	0.841	–0.208	2.25*
Fort Smith	3.733	2.658	–0.288		1.651	1.103	–0.332	
Larceny								
St. Joseph	10.680	12.709	0.190	1.43	3.611	3.425	–0.052	–0.24
Fort Smith	13.777	14.320	0.039		6.066	5.936	–0.021	
Motor vehicle theft								
St. Joseph	0.759	0.641	–0.155	–2.89**	0.259	0.172	–0.334	–3.63**
Fort Smith	1.251	1.507	0.204		0.552	0.625	0.131	

Forgery								
St. Joseph	0.563	0.535	–0.050	0.63	0.191	0.147	–0.229	0.18
Fort Smith	0.227	0.116	–0.487		0.100	0.048	–0.517	
Fraud								
St. Joseph	0.576	0.855	0.485	0.73	0.188	0.232	0.233	–0.16
Fort Smith	0.835	1.006	0.205		0.366	0.417	0.141	
Liquor law violation								
St. Joseph	0.004	0.028	5.314	21.93***	0.001	0.007	4.481	39.93***
Fort Smith	0.567	0.443	– 0.220		0.252	0.183	– 0.273	
Drug violation								
St. Joseph	0.122	0.325	1.657	–14.10***	0.040	0.090	1.242	–20.18***
Fort Smith	1.645	2.607	0.585		0.721	1.081	0.500	
Family offense								
St. Joseph	0.059	0.149	1.533	3.40**	0.018	0.040	1.174	3.39**
Fort Smith	0.053	0.036	–0.331		0.024	0.015	–0.376	
Sex offenses								
St. Joseph	0.404	0.600	0.484	2.10*	0.134	0.162	0.211	1.22
Fort Smith	0.113	0.116	0.032		0.050	0.048	–0.030	

*$p < .05$. **$p < .01$. ***$p < .001$.

down in St. Joseph while going up in Fort Smith. Overall, these results are mixed as they bear on the likelihood of casinos affecting crime rates.

The third city, Alton, Illinois, was matched with Rockford, Illinois. The results of the analysis appear in Table 3. The results for Alton are considerably different than those for the first two cities. Here, of the 15 offense categories for which comparisons can be made, when per capita population is used for standardization, there are no offenses where the Alton rates increase more than the Rockford rates and reach statistical significance. For 5 offenses, the Alton rate went down, while the rate for Rockford, the control jurisdiction, went up (robbery, burglary, simple assault, fraud, and sex offenses). For 3 offenses (aggravated assault, motor vehicle theft, and forgery), the Alton rate increased, but the corresponding Rockford rates increased more. For 1 offense, larceny, both rates decreased, but the Rockford rate decreased less. When population at risk is used for standardization, liquor law violations was the one offense where Alton's rate decreased, but the decrease in Rockford was greater. There were 8 offenses (robbery, aggravated assault, motor vehicle theft, arson, simple assault, fraud, prostitution, and sex offenses) where the Alton rates went down, while the Rockford rates went up. For 2 offenses, forgery and drug violations, Alton's rate went up, but Rockford's rate went up more. For burglary, Alton's rate decreased, as did Rockford's, but at a greater rate. Taken in total, these results suggest that, if anything, the presence of casinos may have contributed to a lessening of crime, not an increase.

The fourth city, Peoria, was also matched with Rockford. Its results appear in Table 4. Here, the results are the opposite of those obtained for Alton. Again, the rates are first examined using per capita standardization. Although only 11 offense comparisons could be made, 7 of the 11 achieved statistical significance and 6 of those showed crime increases in the casino jurisdiction. Sexual assault, aggravated assault, motor vehicle theft, arson, and simple assault offenses increased at a greater rate in Peoria than in the control jurisdiction. In 1 instance, larceny, the rate went up in Peoria while it decreased in Rockford. In only 1 instance, burglary, did the crime decrease in Peoria while it increased in Rockford. Using population at risk, with the exception of the significant finding for burglary which disappears, all the results are the same. The data from this table suggest that casino presence may indeed have exacerbated the crime problem in Peoria.

Biloxi, Mississippi, is the city that might be expected to have experienced the greatest effect of casinos on crime since its nine casinos have significantly contributed to its success as a resort community. The crime data comparing Biloxi to its matched city of Pensacola, Florida, appear in Table 5. Of the 16 offense comparisons, 8 have significant differences in rates over time when the per capita population is used for standardization. Two offenses, robbery

and simple assault, rose in both jurisdictions but rose at a greater rate in Biloxi. One category, sex offenses, declined in both, but declined at a lower rate in Biloxi than Pensacola. Five offenses (larceny, forgery, fraud, liquor law violations, and prostitution) increased in Biloxi while decreasing in Pensacola. Utilizing the population at risk measure resulted in four changes. Robbery and simple assault now rose in Biloxi while decreasing in Pensacola, as opposed to rising in both. Also, sex offenses, which previously had gone down in both, still did so, but their difference was no longer significant. Liquor law violations still rose in Biloxi and declined in Pensacola, but the magnitude was diminished below the significance level. All of these significant differences are consistent with the notion that the presence of casinos increases crime.

Included in the results presented here are comparisons between St. Louis, Missouri, a casino jurisdiction, and Richmond, Virginia, its matched control jurisdiction. These data appear in Table 6 and are presented with only the per capita standardization because tourism data to calculate population at risk were not available for Richmond. Of the 20 offense categories, there were 4 where the rates went up in St. Louis and down in Richmond. These were larceny, liquor law violations, sex offenses, and driving under the influence (DUI). Drug violations went up in both cities but the increase was significantly greater in St. Louis. Prostitution went down in both, but the decrease was significantly greater in Richmond. Four offenses showed a relative decrease between the casino and control jurisdictions. Assaults and forgeries went down in St. Louis while they went up in Richmond. Burglaries decreased in both communities but at a greater rate in St. Louis; simple assaults went up in both, but a significantly greater increase was witnessed in Richmond. Here again, the data are inconclusive as to whether there is a casino effect on crime.

As a final investigation into the impact that casinos have on crime, we performed a Wilcoxon Rank Sum Test (RST). The RST simply involves pooling the casino and control communities and ranking the change in crime from smallest to largest. If the casino and control jurisdictions are identical, we would expect their rankings to be randomly mixed between the two groups. In contrast, if casinos increase crime we would expect the casino communities to have larger ranks than the control jurisdictions. The test involves summing the ranks for each group and testing whether the two are significantly different. In particular, for identical sample sizes in the two groups, the larger rank is compared against an upper cutoff or the smaller rank against a lower

(text continues on p. 279)

TABLE 3: Crime Data for Alton and Control (Rockford, IL): Pre- and Postcasinos Using Per Capita and Population at Risk Measures

	Per Capita Population				*Population at Risk*			
Type of Crime	*Precasinos*	*Postcasinos*	*% Change*	t *Value*	*Precasinos*	*Postcasinos*	*% Change*	t *Value*
Homicide								
Alton	0.047	0.048	0.015	–0.66	0.017	0.014	–0.172	–1.42
Rockford	0.027	0.037	0.358		0.017	0.021	0.197	
Sexual assault								
Alton	0.227	0.256	0.126	–0.52	0.173	0.179	–0.114	–1.62
Rockford	0.278	0.323	0.161		0.083	0.073	0.033	
Robbery								
Alton	0.684	0.532	–0.222	–8.40***	0.250	0.155	–0.380	–11.41***
Rockford	0.860	1.229	0.429		0.536	0.680	0.269	
Aggravated assault								
Alton	1.056	1.063	0.007	–3.61***	0.387	0.303	–0.216	–6.24***
Rockford	1.389	1.668	0.201		0.863	0.924	0.072	
Burglary								
Alton	8.211	7.245	–0.118	–2.58*	3.004	2.077	–0.308	–4.17***
Rockford	6.237	6.462	0.036		3.898	3.577	–0.082	
Larceny								
Alton	10.244	8.136	–0.206	–3.57***	3.771	2.338	–0.380	–0.71
Rockford	14.007	13.927	–0.006		8.731	7.701	–0.118	
Motor vehicle theft								
Alton	0.906	1.095	0.208	–4.95***	0.330	0.307	–0.068	–11.71***
Rockford	1.306	2.025	0.550		0.807	1.121	0.388	
Arson								
Alton	0.199	0.172	–0.139	–1.41	0.074	0.048	–0.345	–2.93**
Rockford	0.068	0.081	0.195		0.042	0.045	0.061	

Simple assault								
Alton	7.241	4.296	–0.407	–7.45***	2.657	1.241	–0.533	–8.31***
Rockford	6.186	7.018	0.135		3.850	3.858	0.002	
Forgery								
Alton	0.277	0.361	0.302	–3.25**	0.103	0.105	0.014	–5.15***
Rockford	0.509	0.745	0.464		0.317	0.406	0.278	
Fraud								
Alton	0.765	0.689	–0.099	–2.50*	0.287	0.199	–0.305	–4.41***
Rockford	0.181	0.331	0.833		0.113	0.181	0.598	
Liquor law violation								
Alton	0.482	0.145	–0.699	–1.13	0.178	0.042	–0.762	3.82***
Rockford	0.515	0.229	–0.556		0.321	0.126	–0.608	
Drug violation								
Alton	0.600	1.738	2.105	0.81	0.199	0.480	1.408	–5.09***
Rockford	0.320	1.340	3.193		0.199	0.731	2.682	
Prostitution								
Alton	0.087	0.074	–0.159	–0.20	0.032	0.020	–0.381	–2.24*
Rockford	0.144	0.174	0.208		0.090	0.095	0.058	
Sex offenses								
Alton	0.333	0.290	–0.132	–3.97***	0.122	0.083	–0.314	–4.69***
Rockford	0.434	0.520	0.197		0.271	0.284	0.045	

*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 4: Crime Data for Peoria and Control (Rockford, IL): Pre- and Postcasinos Using Per Capita and Population at Risk Measures

	Per Capita Population				*Population at Risk*			
Type of Crime	*Precasinos*	*Postcasinos*	*% Change*	t *Value*	*Precasinos*	*Postcasinos*	*% Change*	t *Value*
Homicide								
Peoria	0.019	0.024	0.299	–0.75	0.011	0.013	0.176	–0.44
Rockford	0.027	0.037	0.358		0.017	0.021	0.197	
Sexual assault								
Peoria	0.297	0.427	0.437	2.88**	0.177	0.229	0.288	2.90**
Rockford	0.278	0.323	0.161		0.173	0.179	0.033	
Robbery								
Peoria	0.761	1.132	0.487	0.02	0.452	0.609	0.346	0.26
Rockford	0.860	1.229	0.429		0.536	0.680	0.269	
Aggravated assault								
Peoria	2.719	3.804	0.399	4.68***	1.629	2.030	0.246	4.34***
Rockford	1.389	1.668	0.201		0.863	0.924	0.072	
Burglary								
Peoria	5.636	5.151	–0.086	–2.46*	3.384	2.768	–0.182	–1.79
Rockford	6.237	6.462	0.036		3.898	3.577	–0.082	
Larceny								
Peoria	12.965	14.001	0.080	2.12*	7.766	7.498	–0.034	3.06**
Rockford	14.007	13.927	–0.006		8.731	7.701	–0.118	
Motor vehicle theft								
Peoria	0.905	2.169	1.396	3.78***	0.542	1.156	1.132	4.31***
Rockford	1.306	2.025	0.550		0.807	1.121	0.388	

Arson								
Peoria	0.171	0.262	0.536	3.31**	0.102	0.141	0.381	2.80**
Rockford	0.068	0.081	0.195		0.042	0.045	0.061	
Simple assault								
Peoria	0.883	1.482	0.678	5.13***	0.530	0.791	0.492	4.65***
Rockford	0.170	0.198	0.167		0.106	0.111	0.042	
Drug violation								
Peoria	0.632	1.859	1.942	1.92	0.379	0.989	1.608	1.53
Rockford	0.320	1.229	2.846		0.199	0.681	2.426	
Prostitution								
Peoria	0.245	0.336	0.373	1.48	0.148	0.181	0.223	1.15
Rockford	0.144	0.160	0.115		0.090	0.090	–0.001	

*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 5: Crime Data for Biloxi and Control (Pensacola, FL): Pre- and Postcasinos Using Per Capita and Population at Risk Measures

	Per Capita Population				*Population at Risk*			
Type of Crime	*Precasinos*	*Postcasinos*	*% Change*	t *Value*	*Precasinos*	*Postcasinos*	*% Change*	t *Value*
Homicide								
Biloxi	0.124	0.086	–0.305	–1.13	0.006	0.004	–0.382	–1.33
Pensacola	0.101	0.094	–0.066		0.004	0.003	–0.142	
Sexual assault								
Biloxi	0.596	0.629	0.054	–1.07	0.028	0.026	–0.071	–0.52
Pensacola	0.917	1.072	0.170		0.033	0.033	0.022	
Robbery								
Biloxi	2.798	4.451	0.591	4.00**	0.130	0.183	0.403	3.19*
Pensacola	2.697	2.702	0.002		0.095	0.084	–0.116	
Aggravated assault								
Biloxi	7.979	7.901	–0.010	0.62	0.372	0.325	–0.126	0.05
Pensacola	7.438	6.949	–0.066		0.266	0.218	–0.182	
Burglary								
Biloxi	23.249	19.273	–0.171	–1.86	1.089	0.792	–0.272	–1.43
Pensacola	27.493	28.274	0.028		0.979	0.884	–0.096	
Larceny								
Biloxi	59.436	71.011	0.195	10.95***	2.765	2.907	0.051	6.63***
Pensacola	45.568	36.826	–0.192		1.646	1.148	–0.302	
Motor vehicle theft								
Biloxi	7.870	6.138	–0.220	–2.01	0.368	0.253	–0.313	–2.10
Pensacola	4.584	4.402	–0.040		0.165	0.137	–0.169	
Arson								
Biloxi	0.344	0.282	–0.180	–0.42	0.016	0.012	–0.287	–0.61

Pensacola	0.268	0.250	–0.069		0.009	0.008	–0.172	
Simple assault								
Biloxi	10.825	20.270	0.873	18.58***	0.505	0.824	0.632	3.36*
Pensacola	9.978	11.113	0.114		0.353	0.347	–0.018	
Forgery								
Biloxi	2.025	2.741	0.353	3.19*	0.090	0.113	0.250	2.69*
Pensacola	3.650	2.144	–0.413		0.126	0.067	–0.468	
Fraud								
Biloxi	1.822	2.462	0.352	3.47*	0.085	0.101	0.183	5.33**
Pensacola	1.563	1.175	–0.248		0.126	0.067	–0.468	
Liquor law violation								
Biloxi	0.451	0.607	0.346	4.61**	0.020	0.025	0.227	1.49
Pensacola	0.719	0.320	–0.555		0.013	0.010	–0.197	
Drug violation								
Biloxi	6.266	10.587	0.690	0.59	0.292	0.429	0.470	1.25
Pensacola	8.617	12.079	0.402		0.307	0.378	0.232	
Prostitution								
Biloxi	0.224	0.729	2.251	13.89***	0.010	0.030	1.976	13.15***
Pensacola	2.523	0.375	–0.851		0.088	0.012	–0.862	
Sex offenses								
Biloxi	0.805	0.746	–0.074	12.26***	0.036	0.031	–0.143	0.13
Pensacola	3.523	1.672	–0.525		0.060	0.054	–0.101	
Disorderly conduct								
Biloxi	6.202	11.205	0.807	1.86	0.277	0.453	0.639	1.81
Pensacola	0.167	0.196	0.171		0.006	0.006	0.045	

*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 6: Crime Data for St. Louis and Control (Richmond, VA): Pre- and Postcasinos Using Only the Per Capita Population Measure

	Per Capita Population			
Type of Crime	*Precasinos*	*Postcasinos*	*% Change*	t *Value*
Homicide				
St. Louis	0.548	0.500	–0.088	–1.24
Richmond	0.579	0.643	0.111	
Sexual assault				
St. Louis	0.831	0.726	–0.127	0.77
Richmond	0.872	0.738	–0.153	
Robbery				
St. Louis	25.505	24.174	–0.052	–0.70
Richmond	6.677	7.921	0.186	
Aggravated assault				
St. Louis	20.189	17.180	–0.149	–3.65*
Richmond	7.216	8.631	0.196	
Burglary				
St. Louis	64.554	58.095	–0.100	–2.32*
Richmond	21.496	20.519	–0.045	
Larceny				
St. Louis	135.514	153.664	0.134	3.17*
Richmond	58.507	53.586	–0.084	
Motor vehicle theft				
St. Louis	36.009	33.935	–0.058	–1.02
Richmond	11.786	12.264	0.041	
Arson				
St. Louis	1.980	2.266	0.144	1.94
Richmond	0.146	0.010	–0.929	
Simple assault				
St. Louis	26.667	28.328	0.062	–2.72*
Richmond	8.105	14.757	0.821	
Embezzlement				
St. Louis	0.335	0.378	0.130	0.45
Richmond	0.037	0.062	0.682	
Forgery				
St. Louis	1.013	0.764	–0.246	–5.04***
Richmond	1.232	1.545	0.254	
Fraud				
St. Louis	3.519	2.671	–0.241	2.16
Richmond	2.607	1.218	–0.533	
Liquor law violation				
St. Louis	3.160	5.044	0.596	3.27*
Richmond	1.971	0.159	–0.919	
Drug violation				
St. Louis	8.306	12.229	0.472	5.38***
Richmond	8.870	9.330	0.052	

TABLE 6 (continued)

	Per Capita Population			
Type of Crime	*Precasinos*	*Postcasinos*	*% Change*	t *Value*
Family offense				
St. Louis	0.792	1.050	0.326	1.26
Richmond	0.273	0.406	0.487	
Prostitution				
St. Louis	1.525	1.111	–0.271	5.28**
Richmond	2.571	0.770	–0.700	
Sex offenses				
St. Louis	2.069	2.329	0.125	5.97***
Richmond	1.610	0.447	–0.722	
Disorderly conduct				
St. Louis	7.947	7.197	–0.094	0.94
Richmond	1.967	0.778	–0.604	
Driving under the influence				
St. Louis	2.376	2.466	0.038	3.75**
Richmond	3.682	2.477	–0.327	

*$p < .05$. **$p < .01$. ***$p < .001$.

cutoff. If the upper rank is greater or equal to the upper cutoff, the null that both distributions are identical is rejected. Wilcoxon tables are found in most statistics books.

Results from the RST, which for brevity are not separately reported, revealed few differences between the casino and control jurisdictions. Using the per capita crime rates, only larceny and liquor violations were statistically significant at the 5% and 10% level, respectively. In both instances, the casino communities ranked higher, suggesting that casinos resulted in an increase in these crimes. For larceny, the sum of the rankings for the casino communities was 52, whereas the sum was 26 for the controls (5% critical upper cutoff value of 52). For liquor violations, the sums of the ranks for casino and control jurisdictions were 36 and 19, respectively (10% critical upper cutoff value of 36). Two other crimes were nearly significant, homicide and prostitution. For homicide, the casino and control sums were 29 and 49 (10% upper critical value of 50), whereas for prostitution the respective sums were 35 and 20 (10% upper critical value of 36). These results, which are nearly but not quite significant at the 10% level, suggest that homicide rates decrease after the introduction of casino gambling, whereas prostitution rises.

When examining the crime rates adjusted for population at risk, there are no crimes in the casino communities that are statistically different from the control communities. Liquor violations and prostitution both fall just below

the cutoffs for significance at the 10% level. For liquor violations and prostitution, the sums of the casino and control rankings are 23 and 13 (10% upper critical value of 24).[2]

In summary, the results from the Wilcoxon test suggest that casinos do not have any systematic effect on crime with the possible exception of larceny, liquor violations, and possibly prostitution. However, when examining crime rates adjusted for the population at risk, even these crimes are not statistically different between the casino and control communities.

SUMMARY AND CONCLUSIONS

To summarize the evidence bearing on whether casino presence affects crime, one could look at all of the instances where offense rates changed in the casino jurisdictions versus the control jurisdictions and the differences that were statistically significant. A simple tally of the direction (– vs. +) of the significance of the *t* values provides a rough indication of the evidence concerning a possible casino effect. Overall for the six communities, when the per capita population was the basis for standardization, 46% (24 of 52) of the statistically significant comparisons were negative, indicating decreased crime in casino communities. There were 54% (28 of 52) that were positive, suggesting a possible casino effect increasing crime. When population at risk was the measure of standardization (which excludes St. Louis due to unavailability of tourism data for the control city), the results are similar. Of the 41 comparisons where statistical significance was achieved, 49% (20 of 41) of the results were negative, indicating casinos are associated with a decrease in crime, and 51% (21 of 41) were positive, suggesting casinos are associated with an increase in crime.

As with the overall pattern of crime in the test and control jurisdictions, the analysis of index and nonindex crime rates for casino and noncasino communities leads to no definitive conclusion regarding the effect of casinos on crime. For example, when traditional crime rate calculations are used comparing six casino communities with their control communities, crime rates increased significantly in 23.4% (11 of 47) of the comparisons for the index offenses but decreased significantly in 25.5% (12 of 47) of the comparisons. When nonindex offenses are examined, 36.2% (17 of 47) of the nonindex offenses increased, whereas 25.5% (12 of 47) decreased significantly.

When the crime rates are calculated based on population at risk, 28.2% (11 of 39) of the index offenses increased and 20.5% (8 of 39) decreased significantly. The comparable population at risk crime rates for the nonindex

offenses are 27.7% (10 of 36) and increased, whereas 33.3% (12 of 36) decreased significantly.

Finally, testing for possible time lag effects was done in earlier research (Stitt, Giacopassi, & Nichols, 2000). These tests examined the change in crime rates for the casino communities without the matching control jurisdictions. In that study, the authors examined changes in crime rates 1, 2, and 3 years after the initial casino opening, and found no change in the results, that is, the authors found no evidence that crime rates significantly change after the casino has been in place for several years.

Routine activity theory and the belief that casinos constitute hot spots suggest that when casinos are introduced into a community crime will rise. The findings of the present study suggest that the hot spots theory may not apply to these new casino venues where the casinos were built with the approval and support of the community. In contrast to other types of hot spots, the casinos are located in more open and respectable locations and are tightly regulated. Because the casinos are viewed as significant entertainment and tourist attractions whose success is important to the community's economic well-being, it is likely that greater protection of the community from increased criminal activities is provided by private casino security and public law enforcement agencies. These factors apparently tend to negate many possible hot spots effects.

It is clear that some casino communities experienced increases in crime. Biloxi and Peoria are two casino communities that had large increases in crime relative to their respective control communities. Biloxi, for example, had no crime category decrease significantly relative to its control community, but had 8 of 16 per capita crime categories and 6 of 16 population at risk measures increase significantly.

Biloxi presents an interesting case study in this regard. It is the only casino jurisdiction in the current study that has multiple (nine) casinos, and Biloxi draws by far the largest number of tourists of any of the communities examined. Similarly, it is the casino jurisdiction that, arguably, has experienced the greatest increase in crime. These facts are consistent with viewing casinos as hot spots and casino tourists as engaging in the type of routine activities that would lead to higher rates of crime. The significant increase in crimes such as robbery, larceny, simple assault, and forgery are consistent with the types of predatory crime for material gain consistent with routine activity theory.

Although Cohen and Felson (1979) specified routine activities as leading to an increase in predatory crime, it seems reasonable to extend this to other types of crimes as well, especially in connection with casinos. The increase in tourist-related leisure activity could likely also lead to an increase in various types of victimless crimes. Therefore, the increases in alcohol violations and

prostitution in Biloxi appear entirely consistent with routine activities theory as applied to casino locales.

It should be noted, however, that other casino communities (such as Alton and Sioux City) had many more crimes significantly decrease than increase when compared to their respective control communities. Overall, when comparing the per capita crime rates in the casino and control jurisdictions, approximately 44% of crimes did not change significantly. Of those crimes that did change significantly, slightly more increased (30%) than decreased (26%) when compared to control (noncasino) jurisdictions. The crimes that changed significantly in new casino jurisdictions showed little consistency from community to community. The Wilcoxon RST identified larceny ($p <$ .05) and liquor law violations ($p < .10$) as the only two offense categories that had significant results when comparing per capita crime rates, in each case indicating higher rates in the new casino jurisdictions.

This general lack of increased crime in new casino jurisdictions tends to undermine the view of casinos as hot spots and weakens the linkage between routine activity theory, casinos, and crime. Two explanations may account for this lack of expected increase in crime. First, the data are community level and therefore not able to identify crimes and/or victims that are specific to the casino and their immediate environs. Second, the casinos themselves may not serve as hot spots or satisfy the minimal routine activity conditions necessary for an increase in crime to occur. Specifically, casinos may have (or appear to have) capable guardianship. A notable aspect of casino security is the "eye in the sky" camera technology through which the casino is monitored. Although one clear function of the security is to prevent gamblers (and employees) from cheating at the machines and table games, the monitored cameras may also discourage would-be offenders from predatory crime. Without further information on the location of the offenses in and around casinos, no determination can be made as to whether casinos are hot spots resulting in increases in crime or whether any increase in crime is due to a general tourism effect.

Although the present research goes beyond previous tests, by studying multiple casino jurisdictions and examining control jurisdictions and Part II crimes, there still can be no conclusive statement regarding the effect that casinos have on crime. The fact that the results are mixed suggests that there may be some contextual factors operating in some communities that allow for casinos to positively affect crime under certain, as yet unknown, circumstances. At the same time there is no way of knowing whether the apparent casino effect, when present, is a direct one. When a casino opens in a community, it often changes the nature of the community in a multitude of ways, both positively (e.g., stimulating the economy and adding employment and enter-

tainment options) and negatively (e.g., adding traffic congestion, altering traditional patterns of interaction, and introducing large numbers of nonresidents into a community). The interplay of these and other factors (location, size, and number of casinos; state gaming regulations; law enforcement policies; etc.) vary by jurisdiction and may well determine the effect of the casino on crime in the community. Finally, in those instances where crimes have increased suggesting a possible casino effect, it will be very difficult to determine if the increase is due to casino-related factors or increased tourism, which has been linked to increases in crime in other studies (Chesney-Lind & Lind, 1986; Jarrell & Howsen, 1990).

Clearly, more research is needed to clarify the relationship of casinos to crime. At this point, however, it can be concluded that comparing multiple jurisdictions where casino gambling has been introduced and comparing them to matched control jurisdictions reveals that crime does not appear to be an inevitable or necessary product of casino presence.

NOTES

1. The selection of control communities was performed by Judson using the program that was developed by Judson (1998).

2. The sample sizes, and consequently the cutoff values, are smaller for the population at risk figures due to the exclusion of Richmond, for which no population-at-risk data were available.

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