The Impact of Gaming on the Indian Nations in New Mexico*

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Objective. This study examines the economic and social impact of Indian gaming on the residents of the 22 pueblos and tribes in New Mexico. *Method.* We employ a naturally occurring quasi-experimental design that classifies each of the Indian Nations into one of two groups, gaming and nongaming, depending on the continuous operation of a "Las Vegas" style casino for multiple years in the 1990s. For these two groups we compare aggregate, primarily U.S. Census, data spanning 25 indicators in both 1990 and 2000. *Results.* Although improvements were evident for both groups, nine of the 12 economic measures and six of the 13 social measures revealed a growing disparity favoring gaming nations during the 1990s, while six other measures suggested declining but continuing differences. These findings persisted in light of controls for population and urbanization, though many of the economic differences disappeared for the rural nations. *Conclusion.* Gaming has had a positive economic and social impact on the gaming pueblos and tribes in New Mexico, especially for the more urbanized nations. The gaming nations are enjoying higher incomes, lower levels of poverty, and improvements in selected social areas compared to those nations opting not to pursue casino gaming in the 1990s.

Legalized casino gambling has become a significant economic force in the United States, with total revenues surpassing $50 billion in 2005 and Indian casinos accounting for what is approximately 50 percent of this total (American Gaming Association, 2008). Indian Nations are authorized to establish, subject to some controversial state-imposed stipulations, "Las Vegas" style casinos under the federal Indian Gaming Regulatory Act (IGRA) of 1988 (e.g., Anders, 1998; Eadington, 2004). Through the development of a tribal-state compact, this might include offering slot machines to table (bank) games such as blackjack and craps, all of which are considered to be Class III games under the IGRA. In the 20 years since passage of the IGRA,

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approximately 200 Native Nations have entered into the business of operating almost 300 casinos spanning roughly half the U.S. states (Light and Rand, 2005). Continued expansion seems likely, possibly even into those remaining states that are home to Indian Nations not currently engaged in gaming activities.

Unlike many forms of legalized gaming that are delivered to generate profits for private owners and/or revenues for state governments, the impact of Indian gaming is expected to be different. Although individuals may profit from managerial and financial arrangements, and state coffers may swell from ''revenue sharing'' provisions and the like, Indian gaming was ushered in under the promise that it would benefit tribal community members in multiple direct and indirect ways (e.g., McCulloch, 1994). This included such things as the creation of tribal enterprises and jobs in direct support of gaming activities, and the development of new infrastructure, social services, and nongaming economic opportunities. As envisioned, gaming was to serve as an economic catalyst for Native American groups to achieve self-sufficiency to better determine their future (e.g., Taylor and Kalt, 2005).

Surprisingly, however, our understanding of the effects of Indian gaming on Native American communities remains limited. A 1999 report by the National Gambling Impact Study Commission concluded that there is little systematic information concerning the social and economic consequences of legalized gaming and called for additional studies to be conducted. Five years later, the Harvard Project on American Indian Economic Development surveyed the literature and found that the situation had not changed considerably (Gardner, Kalt, and Spilde, 2005). This review identified more than 130 studies concerned with gaming's impact, a majority of which did not offer data concerning the effects of gaming. Less than one-third of this work focused specifically on Indian gaming, with only a few studies providing empirical evidence of impacts on Native Americans and employing a design strategy offering some element of research control.

The purpose of this article is to contribute to our knowledge in this area by focusing on the social and economic impacts of gaming on Indian Nations in New Mexico. To this end, we employ a research design superior to most found in the literature by taking advantage of a naturally occurring quasi-experiment as roughly one-half of the state's 22 Native Nations operated casinos during the study period. Although subject to limitations, we use aggregate, primarily U.S. Census, data in 1990 and 2000 to compare social and economic conditions between gaming and nongaming nations. In the next section, a brief overview of the literature on the impact of gaming is presented. This is followed by an equally brief discussion of our research strategy, which outlines the evolution of Indian gaming in New Mexico to explain our classification of nations as falling into one of two groups for purposes of analysis and then offers an explanation of the data informing the study. The third section summarizes our findings, which examine 25 social

and economic indicators, and consider the possible influence of multiple control variables. In the final section, we offer an assessment of what the results suggest about the impact of Indian gaming on Native Americans in New Mexico.

Studying the Impact of Gaming

The literature on the impact of gaming spans a spectrum of social science disciplines and publication outlets, and at first glance appears to lack a clear, unifying structure. In reviewing these works, the most germane share some identifiable features useful in organizing this material as it concerns issues related to Native America. One relatively simple but revealing way is with respect to the unit of analysis employed. The most common strategies for examining impacts have focused on either individual states (e.g., Center for Applied Research (CAR), 1996) or subunits within states (e.g., Taylor, Kreps, and Wang, 2000). Such an emphasis is understandable since it is a state that serves as the primary regulator of gaming activities and, at the same time, it is subnational governments that are in the greatest proximity to casino operations. Some of the more insightful investigations have examined multiple substate governmental units in a comparative framework, where typically the focus is on counties since data are readily available spanning a plethora of social and economic characteristics (e.g., Morse and Goss, 2007). A major advantage of such an approach is that it provides some degree of research control, whether it is achieved statistically or through the ability to compare gaming units (e.g., counties with casinos) to nongaming units (counties without casinos). One limitation of these studies is that it is difficult to draw conclusions about the impact of gaming activities on Native American communities since this represents a different unit of analysis. The few exceptions have suggested that gaming nations have experienced beneficial impacts relative to national averages and nongaming nations (Taylor and Kalt, 2005; Thompson, 2005).

A second pattern evident across these investigations is that while they focus on a broad range of measures, these indicators generally fall into two basic categories of impacts (e.g., Light and Rand, 2005). The most frequent, for obvious reasons, are studies concerned with the economic impact of gaming, which have explored a host of possible consequences, ranging from effects on personal income to business activity to state revenues. Clearly, these are important considerations and reflect the types of beneficial results typically touted by proponents in policy debates about legalized gambling, including Indian gaming (Grinols, 2004). Although many of these analyses overlook how Indian gaming has impacted Indian Nations economically, the impact is not expected to be much different from that associated with the larger community. Indeed, it is the positive economic impact on Native Americans that was presented as a primary justification for passage of the

IGRA and continues to be a major rationale for the expansion of Indian gaming activities (e.g., Light and Rand, 2005).

The remaining investigations, though not as plentiful, have examined gaming impacts on various noneconomic or social conditions. Perhaps the most common are those focused on the presumed negative relationship between crime and gaming (e.g., Mays, Casillas, and Maupin, 2006). There have also been analyses of other types of social consequences, including efforts to examine the costs associated with compulsive gambling (e.g., Grinols, 2004; Morse and Goss, 2007). Collins and Lapsley (2003) note there is a tendency in the literature to characterize the economic consequences as benefits, while treating the social impacts as the costs falling on the other side of the equation. The preoccupation with crime linkages, for example, is framed in ways that criminal activity is seen as one of the costs of gaming. Similarly, Peroff (2002) cites a collection of studies focusing on how Indian gaming adversely influences culture and traditional values.

Without seeking to dismiss these and other types of social costs, it is also the case that Indian gaming was expected to generate positive social impacts, particularly on the lives of Native Americans. The National Indian Gaming Association (NIGA) reports that Indian Nations are funding a broad range of initiatives to strengthen tribal communities, including new health-care facilities, fitness centers, schools and day-care facilities, language immersion programs, and substance abuse programs (2006). These and other types of community investments were part of the vision guiding the IGRA as gaming nations would direct gaming dollars in concrete ways to address local social ills. Indirectly, the economic gains anticipated to accrue to community members would also function to improve the social conditions associated with living in chronic poverty (e.g., McCulloch, 1994).

Collectively, these studies offer some useful lessons in terms of examining the impact of Indian gaming on Native American Nations. First, any attempt to understand the consequences of gaming on Indian Nations is enhanced by the adoption of a research design that treats the nations as the primary unit of analysis. Second, the strength of the design is improved by offering some degree of research control while establishing an association between gaming and hypothesized impacts. Third, it is expected that these hypothesized impacts will span a range of phenomena, representing both economic and social conditions. And fourth, gaming is expected to be associated with improvements in these conditions for Native Americans.

In light of these considerations, the strategy adopted here is to examine numerous indicators available for both gaming and nongaming pueblos and tribes in New Mexico at two distinct points in time, 1990 and 2000. This framework permits an examination of economic and social conditions across these two groups both before and after the introduction of casinos. The 1990 data are employed to establish the extent to which the two groups were similar in the pregaming period and to provide a benchmark by which to evaluate the results in 2000; evidence of impacts would be suggested to the

extent that these two groups display greater differences in the postcasino period. Our strategy, which builds on similarly constructed studies (Taylor and Kalt, 2005; Thompson, 2005), is designed to provide a more controlled analysis relative to these efforts that consider a broader spectrum of environmental conditions. In the process, we hope what emerges is a more complete and accurate picture of gaming's impact on the Native Nations in New Mexico.

New Mexico and Indian Gaming

The emergence of Indian gaming in the U.S. states appears to have followed a couple of patterns (Mays and Taggart, 2005). In some, the process of establishing gaming operations in accordance with the IGRA has proceeded in a relatively smooth and almost uneventful fashion. In many states, however, the experience has been just the opposite, following a much more protracted evolution mired in multiple political conflicts (Light and Rand, 2005). These arenas of conflict have focused on fundamental questions ranging from those concerning tribal sovereignty and states' rights to popular debates about the desirability and morality of legalized gaming. The story as it unfolded in New Mexico clearly places it in the latter category (Mason, 2000; Mays and Taggart, 2005).

The State of New Mexico, and most of the nations with gaming interests, signed two different agreements, one in 1995 and another two years later, before a 2001 governing compact was approved (Mays and Taggart, 2005). The state supreme court invalidated the 1995 agreement pursuant to a legislative challenge regarding the legality of the compacting process, while the second compact unraveled over disputes about the reasonableness of the regulatory fees. Regardless, whether it was due to the anticipation of brokering an (another) agreement or after securing what appeared to be a (another) valid compact, nations with a gaming interest either opened casinos or expanded existing operations throughout the 1990s. One consequence of this evolution is that the individual Indian casinos dotting the New Mexico landscape did not appear at a single point in time. Rather, their emergence was gradual, with a couple of establishments, though limited mostly to bingo, even dating back to the 1980s. Most of the Indian casinos in the state, however, trace their origins to the early to mid 1990s.

For purposes of analysis, we classified each of the 22 Indian Nations in New Mexico as falling into one of two groups, gaming and nongaming, depending on the continuous operation of a casino, regardless of compact status, for multiple years during the 1990s. Mason (2000) identifies nine pueblos and tribes having gaming establishments, in one form or another, as of 1993, though fragmentary evidence dates a few back even further. This includes the Acoma, Isleta, Mescalero, Pojoaque, Ohkay Owingeh (formerly San Juan), Sandia, Santa Ana, Taos, and Tesuque Indian Nations. By 1995, these nine,

joined by San Felipe, were identified in two studies examining the impact of Indian gaming on the state economy as operating a Class III gaming establishment (CAR, 1996; Popp and Stehwien, 2002). These 10 nations continue to operate casinos. The remaining 12 form the nongaming group as it existed during the 1990s; since then, two of these nations (Laguna and Santa Clara) have opened casinos and others are pursuing gaming initiatives. In addition, the Jicarilla unsuccessfully operated an establishment for a brief period during the 1990s but ceased operations and then reentered the market the next decade.

The data informing this investigation were obtained from three primary sources and represent four broad categories of variables, including economic, housing, health, and education. There are 25 separate indicators, all but three of which are calculated using Census data compiled by the Harvard Project on American Indian Economic Development (Taylor and Kalt, 2005). Eight of these measures are available for both Native Americans and for all races residing on reservation lands, for a total of 16. Another seven are reported for all races only, while the two health indicators are restricted to Native Americans only due to eligibility requirements.[1]

Multiple measures of economic vitality in 1990 and 2000 are employed, four of which are available for both all races and Native Americans only. This includes per-capita income, median household income, and three indicators of poverty—the percentage of families living below poverty, the percentage of children living in poverty, and the deep poverty rate, which is the percentage of individuals who live at less than 75 percent of the poverty level. The remaining indicators consider conditions related to employment and public assistance, including the percent of individuals receiving Supplemental Security Income (SSI), the unemployment rate, and the location quotient (LQ), which compares (by dividing) the percent of all race residents employed by government to the percent of New Mexico residents employed by government. Morse and Goss (2007) find some evidence that the relative proportion of government employees in an area might rise following the introduction of a casino due to increased demand for social and other forms of public services.[2]

[1]Data pertaining to the residents of tribal lands, whether it is for Native Americans only or for all races, are difficult to secure in any sort of systematic fashion. Information provided by the U.S. Census is subject to various limitations, including the use of self-identification to determine Native-American status. Accordingly, we decided to include the measures for all races, while comparing the results for both populations where available to assess if there were underlying differences. In New Mexico, which experienced a tremendous influx of squatters on Native-American lands in the late 1800s, the presence of non-Indians on reservation lands is noteworthy in some cases (Sando, 1992). In 2000, the percentage of non-Indians on the 22 reservations in New Mexico ranges from a high of 90.5 percent (Picuris Pueblo) to a low of 0 percent (Zia Pueblo), with a mean of 37.3 percent. There would appear to be little association between this variable and the adoption of gaming.

[2]An LQ greater than 1 indicates that the percentage of reservation residents working for government exceeds the state average, while a value less than 1 indicates that it falls beneath the state average (Morse and Goss, 2007). The percent of New Mexico residents employed by

Four measures of housing characteristics are examined, including the percent of individuals living in crowded homes, the percent of homes lacking complete plumbing, the percent of homes lacking a complete kitchen, and the percent of structures built between 1990 and 1994, and 1995 and 2000. The first three variables are for 1990 and 2000, with the percent of homes lacking complete plumbing available for both all races and Native Americans only. The percent of individuals living in crowded homes is defined as a house with more than one person per room. The next two indicators address structural deficiencies involving insufficient plumbing (i.e., lacking hot and cold piped water, a flush toilet, or bathtub/shower) and an incomplete kitchen (lacking a sink with piped water, a stove, or refrigerator). The last housing measure comes from the U.S. Census Bureau (2000a) and looks at the percentage of houses built during the first and second half of the decade.

Two measures of health characteristics are examined, including the percentage of mothers reporting diabetes and the percentage of mothers receiving little or no prenatal care. Historically, Native Americans have lagged behind other groups in receiving prenatal care, while reporting a much higher level of diabetes. These indicators are derived from data published by the Office of New Mexico Vital Records and Health Statistics (2002) and are collected for Native Americans only. Both measures span the years 1991 to 1993 and 1997 to 1999.

The final set of indicators considers three interconnected measures of education in 1990 and 2000 for both all races and Native Americans only. These measures focus on the highest level of educational attainment, including the percent of individuals over the age of 25 who have (1) earned an associates degree or higher, (2) earned a high school diploma (or equivalent), or (3) completed less than the ninth grade.

The analysis is relatively straightforward, focusing on group means, the dispersion of cases, and simple mean differences between gaming and nongaming nations in both 1990 and 2000. Although one might employ a test of significance to examine these differences, it serves no legitimate purpose given that we are working with population data and not attempting to make inferences from a sample. At the same time, we note that none of the findings were statistically significant at conventional levels, though a few were close. The small *N*s involved would require either a substantial difference to be evident or limited naturally occurring variability within the groups to obtain significance in a statistical sense. Given that gaming existed less than a full decade in most cases, and that there was considerable socioeconomic variation across the nations in 1990, the inability to achieve significance is not surprising. To the extent that the data are trustworthy, the

government (the denominator) was 23 percent in both 1990 and 2000 (U.S. Bureau of the Census, 1990, 2000b).

results reported here are accurate and capture true differences across the two groups in 1990 and 2000.

The Impact of Indian Gaming in New Mexico

The results for the economic indicators in 1990 and 2000 comparing Indian Nations with gaming and without gaming are summarized in Table 1. Before turning to the specifics, a couple of general points deserve mention. The first is the relative improvement evident for both groups across virtually all the measures, though it should be noted that the income variables have not been adjusted for inflation. Second, although gains have been realized, the economic status of the Indian Nations in New Mexico, as is true more generally, falls below that of the state, which in this case is below that of the United States. These discrepancies are even apparent when comparing measures for all races to Native Americans, where the former are relatively better off in every instance.

For nine of the 12 measures presented in Table 1, the differences between the gaming and nongaming nations are larger in 2000 than in 1990, including two instances where data are available for both Native Americans and all races. Several of these differences have more than doubled during the 10-year period. The results show that Indian Nations with gaming have enjoyed a greater increase in overall income levels than those without gaming. The gap in average per-capita income was $866 in 1990 and increased to $1,269 by 2000 when looking at all races; a discrepancy more pronounced when looking at Native Americans only, as the difference went from $790 to $1,836. By 2000, there were four nongaming nations with per-capita incomes below that of the lowest associated with a gaming nation. Even more compelling is the disparity in median household income between gaming and nongaming nations, where it went from $435 in 1990 to $2,855 in 2000. The gaming nations in New Mexico have decided, as is true in other states, not to engage in a direct distribution of casino profits to individual members according to procedures found in the IGRA (Gallagher, 2005). Hence, these differences would appear the result of a more complex economic process operating among the gaming nations rather than simply representing the direct payment of gaming revenues.

The findings concerning the measures of poverty in Table 1 are complicated by obtaining slightly different results when looking at Native Americans only versus all races. In the latter case, all three indicators suggest that poverty levels have decreased at a far greater rate for gaming nations than those without gaming. Gaming nations had a 3.4 percent lower average percentage of families living below the poverty line than those without gaming in 1990. This gap grew to 5.1 percent by the year 2000. Similar changes are discovered when looking at children in poverty and the deep poverty rate. However, when looking at the two measures of poverty avail-

TABLE 1

Means, Standard Deviations, and Mean Differences for 12 Economic Indicators for Gaming ($N = 10$) and Nongaming ($N = 12$) Indian Nations in New Mexico in 1990 and 2000

		1990			2000		
		Gaming	Nongaming	Difference	Gaming	Nongaming	Difference
Per-capita income	All races	7,954.10	7,087.67	866.43	11,990.00	10,721.33	1,268.67
		(3,324.82)	(2,940.60)		(3,193.68)	(3,817.41)	
	Indian only	6,107.60	5,317.92	789.68	9,986.20	8,150.17	1,836.03
		(1,728.59)	(1,246.55)		(1,661.07)	(1,391.57)	
Median household income	All races	19,826.10	19,390.83	435.27	30,619.10	27,764.00	2,855.10
		(4,435.61)	(4,183.38)		(6,425.82)	(5,098.21)	
	Indian only	Not available					
Percent of families living below the poverty line	All races	26.19	29.60	− 3.42	18.98	24.08	− 5.10
		(13.45)	(13.49)		(8.45)	(11.37)	
	Indian only	25.74	34.63	− 8.89	24.29	29.45	− 5.16
		(17.20)	(14.21)		(11.68)	(9.48)	
Percent of children living below the poverty line	All races	32.76	35.55	− 2.79	25.76	29.93	− 4.17
		(15.88)	(15.00)		(10.70)	(13.84)	
	Indian only	31.10	38.41	− 7.31	29.44	33.31	− 3.87
		(20.82)	(20.12)		(14.31)	(12.15)	
Percent of individuals living in deep poverty	All races	20.44	21.59	− 1.15	15.69	18.38	− 2.69
		(11.59)	(11.28)		(6.67)	(9.22)	
	Indian only	Not available					
Percent of individuals receiving public assistance	All races	14.20	16.29	− 2.08	12.31	15.95	− 3.64
		(7.82)	(7.45)		(4.68)	(9.15)	
	Indian only	Not available					
Unemployment percentage	All races	13.72	14.37	− 0.65	10.50	12.80	− 2.30
		(9.56)	(6.82)		(5.02)	(6.97)	
	Indian only	15.24	16.30	− 1.06	12.88	15.79	− 2.91
		(9.75)	(6.90)		(6.19)	(6.97)	
Location quotient	All races	1.46	1.76	− 0.30	1.57	1.86	− 0.29
		(0.47)	(0.28)		(0.51)	(0.32)	
	Indian only	Not available					

SOURCE: Taylor and Kalt (2005).

able for Native Americans only, the results indicate that while there were differences between the gaming and nongaming nations, the discrepancy decreased during the 1990s. Although the differences indicate gaming nations had comparatively less poverty, there would appear to be other forces at work to explain why nongaming pueblos and tribes experienced a greater rate of decline.

With the exception of the LQ measure, the results for the remaining variables in Table 1 also suggest that gaming has had a positive impact on Native Nations. Residents of gaming nations were less dependent on public assistance by 2000, where the percentage difference went from 2.1 percent to 3.6 percent. Likewise, there was little difference between the unemployment rates of the two groups in 1990, but a gap emerged favoring the gaming nations by 2000. Indeed, four nongaming nations had unemployment rates for all races above that of the highest rate for a gaming nation in 2000. The LQ measure, which compares government employment for all races to statewide government employment, indicates that the difference between the two was unchanged between 1990 and 2000. The introduction of Indian casinos does not appear to be associated with increased levels of demand for government employees.

Table 2 presents information on the 13 social indicators, spanning housing, health, and educational characteristics. Unlike the general uniformity of the economic findings, these results are not as consistent, with only six of the 13 measures suggesting improved conditions for Indian Nations. These mixed results are nowhere more evident than when looking at housing characteristics. For a couple of the all-race measures, the percentage of individuals living in crowded homes and the percentage of homes lacking complete plumbing, the differences in 2000 favored gaming nations but the gap narrowed during the decade, suggesting the influence of other factors. However, when looking at homes lacking complete plumbing for Native Americans only, the difference widens in favor of the gaming nations. Indeed, the percentage difference between the two groups almost tripled during the decade, as the gaming nations witnessed an almost 50 percent reduction in homes lacking complete plumbing. Similarly, while there was little divergence in the percentage of housing structures built between 1990 and 1994, a positive gap of 1.6 percent emerged in the second half of the decade. Finally and somewhat surprisingly in light of the last finding, gaming nations were almost 2 percent higher than the nongaming nations in the percentage of homes lacking a complete kitchen in 2000, representing a reversal of positions during the 10-year period.

The next two measures in Table 2 summarize information on two aspects of health among Indian Nations, prenatal care and diabetes. In looking at data compiled by the state, the percentage of Native American mothers receiving little or no prenatal care show little difference between the years 1991 and 1993. In fact, the average was slightly higher for the gaming group. By the end of the decade, 1997 to 1999, the situation had completely

TABLE 2

Means, Standard Deviations, and Mean Differences for 13 Social Indicators for Gaming ($N = 10$) and Nongaming ($N = 12$) Indian Nations in New Mexico in 1990 and 2000

		1990			2000		
		Gaming	Nongaming	Difference	Gaming	Nongaming	Difference
Percent living in crowded homes	All races	16.35	23.38	−7.03	13.64	18.14	−4.49
		(11.30)	(18.04)		(9.29)	(14.76)	
	Indian only	Not available					
Percent of homes lacking complete plumbing	All races	4.07	7.36	−3.30	2.51	4.77	−2.26
		(4.19)	(12.25)		(2.28)	(8.69)	
	Indian only	6.79	7.24	−0.45	3.77	5.21	−1.44
		(8.52)	(13.46)		(3.91)	(8.97)	
Percent of homes lacking complete kitchen	All races	7.71	8.33	−0.62	9.45	7.65	1.80
		(10.41)	(12.50)		(11.90)	(11.69)	
	Indian only	Not available					
Percent of structures built*	All races	8.60	8.43	0.17	16.19	14.59	1.60
		(2.65)	(3.07)		(5.83)	(5.59)	
	Indian only	Not available					
Percent of mothers receiving little/no prenatal care**	All races	Not applicable					
	Indian only	14.84	12.88	1.97	11.74	14.23	−2.49
		(5.77)	(8.43)		(7.04)	(3.55)	
Percent of mothers reporting diabetes**	All races	Not applicable					
	Indian only	5.94	4.93	1.01	4.15	5.42	−1.27
		(5.14)	(3.96)		(2.77)	(5.44)	

TABLE 2—continued

		1990			2000		
		Gaming	Nongaming	Difference	Gaming	Nongaming	Difference
Percent college graduates	All races	16.07	15.64	0.43	16.46	19.09	−2.64
		(6.88)	(7.78)		(8.57)	(8.24)	
	Indian only	13.03	12.28	0.75	13.45	12.96	0.49
		(5.13)	(7.70)		(8.66)	(5.55)	
Percent high school graduates or equivalent	All races	35.07	35.40	−0.32	36.89	33.56	3.33
		(4.31)	(7.78)		(7.39)	(6.11)	
	Indian only	35.40	40.72	−5.32	38.49	36.73	1.76
		(6.44)	(11.05)		(6.55)	(6.69)	
Percent less than a 9th-grade education	All races	11.04	15.24	−4.20	7.19	9.41	−2.22
		(4.20)	(6.82)		(3.94)	(5.41)	
	Indian only	9.63	12.53	−2.90	4.81	7.73	−2.92
		(3.73)	(8.38)		(3.15)	(6.20)	

*Measured for years 1990–1994 and 1995–2000 (U.S. Census Bureau, 2000a).

**Measured for years 1991–1993 and 1997–1999 (Office of New Mexico Vital Records and Health Statistics, 2002).

SOURCE: Taylor and Kalt (2005), unless noted otherwise.

reversed itself as gaming nations were 2.5 percent lower in terms of mothers receiving insufficient levels of prenatal care compared to nongaming nations. A similar pattern is evident with regard to mothers reporting diabetes. At the beginning of the decade, the gaming group was slightly above the nongaming nations in the percentage of mothers reporting diabetes, while by the close of the 1990s, their positions had reversed.

The final set of indicators in Table 2 concern education.[3] Although gaming nations held a slight advantage over those without gaming in 1990 in terms of the percentage of college graduates for all races, they were actually surpassed by the nongaming nations by the end of the decade. However, when looking at Native Americans only, the gap narrowed but continued to favor the gaming nations. On the other hand, in the year 2000, groups with gaming reported a 3.3 percent higher rate of high school graduates (or equivalent) for all residents compared to nations without gaming, up from a miniscule 0.3 percent difference in 1990. A similar reversal is detected among Native Americans only, though the results are not as dramatic. Perhaps more noteworthy is that the percentage of all races who received less than a ninth-grade education is down for both groups, though gaming nations reported 2.2 percent fewer individuals in this category, a disparity cut almost in half since 1990. In looking at Native Americans only, there was essentially no change between 1990 and 2000, though it is also the case that there was a considerable drop in the rates for both groups.

Overall, these findings suggest that the adoption of gaming is associated with positive social and economic impacts. Of the indicators examined, nine of the 12 economic measures and six of the 13 social measures revealed a growing gap between gaming and nongaming nations during the 1990s. This included two of the four economic measures and four of the six social measures available for Native Americans only. These results indicate that the gaming nations were enjoying higher incomes, lower levels of poverty, and improvements in selected social areas by the end of the decade. In addition, four of the other social indicators and two of the three remaining economic measures suggested declining but persisting differences between the two groups, which is a positive development for all nations, but one that continues to favor those with gaming.

Although hampered by a limited number of cases, an effort was made to examine the durability of these findings in light of other considerations. This included the possible impact of either population or urbanization, two factors identified in the literature as being associated with the economic and social well-being of Native Americans (e.g., Light and Rand, 2005). The potential influence of population was approached in two ways. One of the

[3]One inherent problem with the education indicators is that they are calculated using individuals 25 and older. This means a large percentage of the individuals considered in 2000 participated in primary and secondary education before the emergence of Indian gaming and therefore would not have benefited from potential gaming impacts on the educational system.

nongaming tribes during the 1990s is the Navajo Nation, the largest and one of the most socioeconomically disadvantaged in the country. According to the 2000 Census, there were slightly over 180,000 Navajos nationwide, of which 69,524 resided in New Mexico alone, giving them five times more members than the second largest pueblo in the state (Santa Clara with 10,665 residents). To explore the possibility that the inclusion of the Navajo Nation exerted undue influence, Tables 1 and 2 were reestimated minus this case. Although the relative differences between the gaming and nongaming nations were not as great in 2000, unfortunately confirming the plight of the Navajo Nation, its exclusion had little impact. The one area where changes were evident concerned deficiencies related to plumbing and kitchens, where the omission of the Navajo Nation improved the relative position of the nongaming group compared to the gaming nations.

To consider the influence of population more generally, we also examine the results between the gaming and nongaming nations in 1990 and 2000 for two subgroups: nations with populations above or below the median value of 2,975 all-race residents in 2000. This produced two groupings of 11 nations each, though again the influence of the Navajo Nation on the "large" group was considered.[4] Overall, the original results persisted when controlling for population, especially when looking at the large group, with the differences slightly diminished when the Navajo Nation was excluded. The results for the small nations were not as stable, particularly among some of the economic indicators, where the differences were not as large or the disparities were found to be growing smaller. Generally, however, gaming was associated with economic and social improvements regardless of population size.

Perhaps more important than population in shaping the economic and social conditions of Indian Nations are their location relative to urban areas. Not only are Native Americans in closer proximity to urban areas presented with greater opportunities, such locations would appear to offer the markets needed for Indian gaming to be successful economically. In New Mexico, three of the gaming nations reporting the largest "net revenues" in recent years surround the Albuquerque metropolitan area, representing roughly one-third of the state's population and containing the only major commercial airport.[5]

[4]Perhaps an admonishment that caution should be exercised is a bit of an understatement given the small number of cases involved in this and subsequent partial tables. There are four gaming nations with populations under 2,975 and five nongaming ones with populations over this number, four if one excludes the Navajo Nation. The small nations had a mean population of 1,699 ($SD = 835$) and the large an average of 21,074 ($SD = 53{,}185$), which drops to 5,055 ($SD = 2{,}542$) when excluding the Navajo Nation.

[5]This assessment is based on quarterly reports submitted by the gaming nations to the New Mexico Gaming Control Board in late 2005 and early 2006. The other top producer, the Mescalero Apache, enjoys the advantage of being the only gaming nation in the southern part of the state and is situated in a mountainous area long regarded as a popular tourist destination.

Two strategies, similar to the handling of population, were pursued to examine the possible influence of urbanization on the current findings. Four nations, two gaming (Acoma and Isleta Pueblos) and two nongaming (Laguna Pueblo and the Navajo Nation), are located in a Census-defined ''metropolitan area.'' To assert the possible influence of metropolitan status on the results, we reexamined the indicators excluding these four cases. Although once again the differences were not as great, due, in part, to the manner in which the Navajo Nation is classified as being metropolitan by the Census, the general findings persisted between gaming and nongaming nations.

One obvious problem with this approach is that one of the most successful gaming pueblos (Sandia) is located just north of Albuquerque but is not classified as being in a metropolitan area. Consequently, the possible impact of urbanization was approached from a second perspective. Using data from the 2000 Census, we calculated the percentage of all races living in a Census-defined ''urban area'' for each nation and then classified each as being either urban or rural. The rural category was composed of 11 nations, 10 of which had 100 percent of their residents living in nonurban areas, while the remaining tribe, the Navajo Nation, had 16 percent of its members living in an urban area. The urban category, also with 11 cases, included 10 nations where over half the inhabitants resided in an urban area, while the lone exception, San Ildefonso (nongaming), came in at 37 percent. We then repeated the analysis for both groups, while once again looking at the impact of excluding the Navajo Nation.[6]

Unlike population, which seemed to have limited influence, urbanization appears to be an important conditioning factor in shaping the overall impact of Indian gaming. The mean differences in 2000 between gaming and nongaming nations with urban populations were typically larger on many of the economic indicators than discovered for the rural group. Indeed, on several of the economic indicators, nongaming nations in rural areas were outperforming their gaming counterparts, differences that only grew larger when the Navajo Nation was excluded. For instance, the deep poverty rate was 2.8 percent higher for rural gaming nations compared to rural nongaming nations in 2000, a number that jumped to 5.2 percent when excluding the Navajos. Alternatively, urban gaming nations had a deep poverty rate in 2000 that was almost 7 percent lower than their nongaming counterparts, more than double the value obtained when looking at all pueblos and tribes.

The impact of controlling for urbanization when looking at the social indicators was not as uniformly consistent. For two of the education mea-

[6]The rural category includes four gaming nations, while the urban category includes five nongaming ones. It should be noted that the calculation for the Navajo Nation is based on the urban membership of the entire tribe, not just those residing in New Mexico, information that is not available.

sures, for example, the differences in rural areas suggested improvements for gaming as opposed to nongaming nations, while these differences disappeared for gaming and nongaming nations with urban populations, a pattern just the opposite of what was detected for some of the economic indicators. When looking at the percentage of mothers receiving prenatal care at the end of the 1990s, the finding, which favored gaming nations, held for urban but not rural gaming nations. On the other hand, the control appeared to make little difference when looking at the percentage of houses built at the end of the decade, which continued to favor gaming nations.

In an effort to disentangle these effects and, to some degree, to overcome the limited number of cases associated with the partial tables, regression was employed as a final step in the analysis. Each of the 25 measures in 2000 was regressed on its corresponding value in 1990, a dummy variable for gaming, reservation population, and the percentage of reservation residents living in urban areas.[7] Seventeen of the equations generated unstandardized slope estimates for the gaming variable that would indicate improved conditions among gaming nations, including 14 of the 15 measures identified in Tables 1 and 2. This also includes the two measures of poverty available for Native Americans only, which in Table 1 indicated declining but persisting differences between gaming and nongaming nations. The remaining variable, the percentage of Indians with less than a ninth-grade education, generated a 0.02 difference in the appropriate direction in Table 2 but was dismissed as a trivial result.

For these 17 equations, the standardized coefficients (beta weights) for the four variables were then compared to examine their relative influence on economic and social conditions in 2000. Not surprisingly, the most important variable overall was the value in 1990; conditions in 2000 were shaped in large measure by the relative conditions that existed at the beginning of the decade. At the other extreme, population was generally the least important variable, many times producing beta weights approaching zero. The dummy variable for gaming had the second greatest impact seven times and was the third-most important eight other times. The two instances where gaming was the least important variable involved the two measures of Native-American poverty noted above, perhaps confirming the relative unimportance of gaming in reducing poverty among Native-American residents specifically. In those 10 cases where the gaming variable was third or fourth in relative impact, urbanization was second seven times. The three exceptions involved both measures of unemployment and the percentage of Native Americans with less than a ninth-grade education.

[7]It was expected and confirmed by the beta weights, as well as various reduced models, that the inclusion of the value in 1990 would have the greatest influence in 2000, thus making for a rather conservative test of the relative importance of the other three variables in accounting for any remaining changes evident during the decade. The exclusion of the Navajo Nation did little to change the overall results, though the impact of population took on greater importance in a few instances.

Finally, for the eight measures where the regression results suggested the gaming variable was not associated with improved conditions for gaming nations compared to the nongaming, both population and urbanization surpassed it in impact half the time. In three other instances, it was the third-most important, following urbanization. These results would suggest that the forces of urbanization and, to a lesser extent, population were of greater consequence in shaping these particular conditions than the presence of gaming.

Discussion: Gaming as the New White Buffalo

Overall, these findings appear to support the claim that Indian gaming has had a positive social and economic impact on Indian Nations in New Mexico. Pueblos and tribes classified as having casino gaming facilities dating back to the early to middle 1990s showed greater improvements relative to nongaming nations on 15 of the 25 indicators examined in the study, including nine out of 12 economic variables. Gaming nations displayed a higher median household income over nongaming nations by almost $3,000, while the per-capita income for Native Americans alone was more than $1,000 greater by the end of the decade. Several measures of poverty, both measures of unemployment, and the percentage of individuals receiving public assistance revealed a growing disparity between the two groups in favor of the gaming nations.

These findings are noteworthy inasmuch as some of the economic benefits that the IGRA promised appear to have been realized by the gaming nations in New Mexico. To what extent this might be true for other gaming nations in the United States is, of course, much more difficult to assert. Regardless, it is still the case that all the pueblos and tribes in New Mexico fell far short of the national or, for that matter, even the state norm in 2000; a plight confronting all of Indian country (Taylor and Kalt, 2005). Hence, while gaming may bring economic gains it is by no means a panacea for addressing the complex financial conditions facing Native Nations. These results suggest that Indian gaming is not necessarily generating a significant redistribution of income, particularly in a case such as this where the nations are not engaged in making direct payments to their members. This is not to minimize the importance of modest increases in income, however, especially among individuals living near the bottom end of the economic spectrum. Indeed, marginal improvements are quite meaningful and can dramatically alter the quality of life on a daily basis.

In addition to these economic effects, six of the 13 social indicators revealed a widening gap between the gaming and nongaming nations. Most telling is that they included four of the six measures available for Native Americans only. Unlike the economic impacts, the social impacts of Indian gaming were intended under the IGRA to be limited to Native Americans

specifically. The development of new infrastructure, programs, and services for Native Americans were the types of changes expected to follow from the investment of gaming revenues.

Multiple controls were introduced in order to further understand the nature of these differences, with one key determinant being location. The assumption that casinos alone can fulfill the promise of the IGRA of greater revenues and, as a result, improved quality of life is perhaps sadly misguided. Gaming and nongaming nations located near urban areas were much more likely to exhibit greater discrepancies in the postgaming period than their rural counterparts. In fact, gaming and nongaming nations in rural areas were more likely to show little difference in terms of their socioeconomic condition. In some cases, especially when examining the economic measures and excluding the Navajo Nation, the nongaming group was better off by 2000. It is tempting to speculate that rural nongaming pueblos and tribes have not only explored successful alternatives to gaming, but have also invested revenues more than rural gaming nations in social programs and other community endeavors.

Of course, detecting these changes in the aggregate begs the question of what is occurring at the micro level to account for these relative improvements found among the gaming nations. Although this is not necessarily the place to delve into such matters in any depth, published materials and personal observation indicate an abundance of community initiatives and social investment strategies traceable to the adoption of Indian gaming. For example, the Isleta Pueblo, in conjunction with federal and nonprofit entities, has provided housing options for low-income tribal members in two new subdivisions, which include 100 three- to five-bedroom homes (Billingsley, 2002). The Isleta have also established a Community Health Representative Program that provides an array of services to tribal members, including nutrition, counseling, and maternity and child care (Gallagher, 2005). Similarly, the Mescalero Apache provide health services to their members through a tribally owned dialysis treatment facility as well as a 13-bed hospital offering a range of services and programs (Tiller, 2005). Tiller (2005) reports the Mescalero Apache opened a new elementary school in 2003 and over the past decade have made vast improvements to other educational facilities. The Sandia Pueblo promises college scholarships to their youth beginning as early as the first grade, and offers to cover the costs of attending private schools for any pueblo child (Gallagher, 2005). According to the pueblo's website, approximately 50 percent of Sandia's school-age population is enrolled in private schools (Pueblo of Sandia, 2005).

Although gaming has most likely played a central role in improving tribal economic conditions and social prosperity, it is important to note that all Indian Nations in New Mexico experienced a positive shift during the decade. Most of the Indian Nations in New Mexico have tapped into a variety of economic resources such as tourism, timber, mineral drilling,

retail, and human capital (Wilkins, 2002). Laguna Pueblo, a nongaming nation in the 1990s, owns a company that contracts with the federal government to assemble military equipment for the U.S. Army and, by the early 1990s, had received a total of $72 million in contracts and subcontracts (Sando, 1992).

The findings of this study offer a telling glimpse into the gains that Indian Nations may be making off gaming enterprises, but fails to explain the lack of differences in certain social areas. One of the most important resources to Native Americans in New Mexico is not found in timber, water, or casino revenues, but in education. The education of Native-American youth is a direct investment in the future economic and social well-being of the communities they are from. Without educated leaders to make sound economic decisions, many of the successes of Indian gaming may go mismanaged and greatly underutilized. The data used in this study probably fail to adequately capture the potential types of academic changes taking place among Native-American youth as they relate to Indian gaming.

Although the future of Indian gaming across the country remains uncertain, the Indian Nations in New Mexico engaged in gaming have taken action to secure the continuance of their operations into the next half-century. During the 2007 state legislative session, a majority of gaming nations in New Mexico renegotiated the 2001 compacts, offering to increase revenue sharing and grant the state more regulatory authority in exchange for gaming compacts that extend to 2037 (Jones, 2007). If these positive economic and social trends persist, it can be expected that gaming nations will continue to outperform their nongaming counterparts, and perhaps begin to pull themselves out of the poverty-stricken conditions that have plagued Indian life for over a century.

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