Assessing the Impact of Indian Gaming on American Indian Nations: Is the House Winning?*

Thaddieus W. Conner, *Boise State University*

William A. Taggart, *New Mexico State University*

Objective. The objective of this article is to examine the impact of Indian gaming on reservation conditions in the contiguous American states following passage of the Indian Gaming Regulatory Act in 1988. *Methods.* Utilizing 1990 and 2000 Census data for 330 Indian nations, a pretest/posttest design permits a comparison of nongaming nations to three different types of gaming nations on eight economic measures, while controlling for multiple tribal characteristics and considering the effects of certain state contextual factors confronting nations due to location. *Results.* The analysis reveals (1) that the overall impact of gaming, while generally positive, is not as extensive after controlling for certain tribal features, (2) that there are differential effects evident across the three types of gaming nations, and (3) that the state context makes a difference in influencing the relationship between gaming and reservation conditions. The most substantial impacts are for a small subset of nations with Class III gaming and making per capita payments to their members in larger, wealthier states prohibiting non-Indian casinos. *Conclusion.* These results challenge some of the core assumptions about Indian gaming radically changing the poor economic conditions endemic to Indian country.

The casino industry in the United States has experienced incredible growth over the last three decades, fueled in considerable measure by the remarkable emergence of Indian gaming (Morse and Goss, 2007; Light and Rand, 2005). Since passage of the Indian Gaming Regulatory Act (IGRA) in 1988, whereby the federal government delineated a process permitting the authorization of Indian gaming, over 200 nations have established casino operations spanning more than half the American states (Smith and Taggart, 2010). One primary consideration among supporters of the IGRA was the anticipation of gaming

*Direct correspondence to Thaddieus W. Conner, Department of Public Policy and Administration, Boise State University, 1910 University Drive, Boise, ID 83725-1935 ⟨tadconner@boisestate.edu⟩. The first author will share all data and coding for replication purposes. For space considerations, all results not reported in tabular form are also available upon request from the authors. This article has followed a lengthy path and has benefitted from the comments of many people along the way, including several attendees at the 2010 annual meeting of the Western Social Science Association. A special thanks to the reviewers and editor for their assistance and feedback. The authors would also like to thank the Harvard Project for American Indian Economic Development for making the data used in this study public.

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dollars promoting self-determination and economic prosperity for tribes at a time when federal financial assistance was declining (e.g., Anders, 1998; Light and Rand, 2005; Mason, 2000). Section 2 of the IGRA proclaims the legislation's purpose is "promoting tribal economic development, self-sufficiency, and strong tribal governments." It goes further and describes concrete ways for investing casino gaming dollars in tribal communities. Section 11 requires that gaming revenues "are not to be used for purposes other than to fund tribal government operations or programs, to provide for the general welfare of the Indian tribe and its members, to promote tribal economic development, to donate to charitable organizations, or to help fund operations of local government agencies." The policy expectation was that Indian gaming would generate a continuous revenue stream having direct, positive economic and social impacts on Native American communities (e.g., Anders, 1998; Mays and Taggart, 2005; McCulloch, 1994).

It is, therefore, surprising to discover that our understanding of the impacts of Indian gaming on Indian country remains far from complete (Gardner, Kalt, and Spilde, 2005; Light and Rand, 2005; National Gambling Impact Study Commission [NGISC], 1999). Much of what is known about gaming's effects is informed by anecdotal testimonials (e.g., National Indian Gaming Association, 2006; McAuliffe, 1996; Thompson and Dever, 1998), case studies (e.g., Anders, 1998; Wilkins, 2002), and comparative designs working with relatively small samples (e.g., Conner and Taggart, 2009a, 2009b; Thompson, 2005). These and similar studies indicate gaming is having positive and beneficial impacts on Native American communities. Of greater import, Taylor and Kalt (2005) constructed a database using information from the 1990 and 2000 U.S. Censuses on American Indians to compare nongaming and gaming nations (as of 2000) to national averages on a variety of socioeconomic indicators. Employing simple descriptive statistics, they discovered sadly that both groups continued to lag behind the rest of America, but that gaming nations had enjoyed greater success in closing the gap compared to nongaming nations on a number of dimensions during the first full decade of gaming under the IGRA.

However, studies that evaluate the impact of gaming are largely limited in their capacity to control for other possible confounding factors. Recent investigations would suggest the benefits of Indian gaming are not as substantial as first thought and tempered, perhaps significantly in some instances, by the influence of other factors (e.g., Conner and Taggart, 2009a; Light and Rand, 2005). Using national data, Morse and Goss (2007) examined the impact of casinos, both commercial and Indian, on three county-level indicators of economic development in light of several control variables. They report, contrary to expectations, that Indian gaming was negatively related to county per capita income and positively related to the unemployment rate; the coefficient for the other variable, employment, was in the expected direction and significant. Findings such as these, though based on a different unit of analysis, point to the need to investigate these issues more thoroughly before concluding that Indian gaming is having the desired effects intended by policymakers.

This article seeks to address some of these contradicting conclusions and provide a more definitive assessment regarding the impact of Indian gaming on tribal communities in the United States. Our investigation focuses on a number of measures of tribal economic conditions in 2000 and seeks to determine if gaming nations were doing better economically compared with nongaming nations after the first full decade under the IGRA. As outlined in the section entitled "Considerations in Understanding the Impact of Indian Gaming," we propose to examine the impact of nations offering different types of games. This includes differentiating between tribes with bingo (and perhaps certain other forms of games) versus those with Las-Vegas-style operations, as well as capturing the controversial practice of some gaming nations making per capita payments to members. We also introduce multiple control variables posited to be influential factors but missing in previous studies, and investigate how the broader state environment in which nations operate alters the relationship between Indian gaming and measures of tribal economic vitality. We follow this with a discussion of the data informing the investigation and address issues of model estimation. The fourth section presents the findings in three sequential steps and the last section includes a brief discussion of these results and offers suggestions for future research in this area.

Considerations in Understanding the Impact of Indian Gaming

Indian Gaming

The IGRA distinguishes between three types of gaming. Class I gaming is linked to culturally oriented games stemming from tribal traditions where participants compete for minimal prizes, while Class II gaming involves certain gambling activities where the stakes are usually low and players compete against each other as opposed to the house. Indian gaming is most typically associated with Class III gaming that includes games found in the archetypal Las Vegas casino, including slot machines and various table games where players compete against the "bank" of the house, such as in blackjack, roulette, and craps. Under the IGRA, Class III games and their provision, singularly or in any combination, are subject to several requirements. One key stipulation is that a state permits the games a nation wishes to offer; a nation cannot operate a casino with Class III games unless the state authorizes the activities. A second requirement is that a nation and state must have entered into a gaming compact, which delineates the conditions for the provision and regulation of these games. However, even in states that do not allow Class III games, Indian nations can establish casinos under different rules found in the IGRA and offer Class II games. A state must permit Class II games as well but a tribal-state gaming compact is not required. Bingo is perhaps the most recognized of the Class II games, offering substantial payouts in some instances, although it also

encompasses some card games (e.g., poker) and certain forms of electronic games associated with prizes or offering limited cash returns.

Consequently, there are different types of Indian casinos depending on the state. In 2000, seven states did not allow Class III games but were home to Class II bingo operations according to McQueen (2000). Traditionally, studies of Indian gaming have failed to differentiate between these two types of operations, and have instead pooled these classes of casinos into a single measure of gaming (e.g., Taylor and Kalt, 2005). It is the case, however, that the available evidence would suggest nations offering Class II games are generally not as successful as those nations offering Class III games (Light and Rand, 2005). In the following analysis, we attempt to determine if gaming class has differential effects on reservation conditions, with the expectation that nations with Class III gaming will display greater changes relative to nations limited to Class II gaming ventures.

A second important difference in regards to gaming that the literature has been unable to address until now is the decision of some gaming nations to make per capita payments to tribal members. These nations have adopted Tribal Revenue Allocation Plans (RAPs), permitted under the IGRA and subject to the approval of the Interior Secretary, to make direct payments to tribal members using the revenues derived from gaming activities. Some of these per capita payment nations have been the subject of media controversy (e.g., Bartlett and Steele, 2002), though others suggest that these cases may distort and exaggerate the impacts of gaming as it concerns most nations—RAP nonadopters—where the effects are not as substantial (e.g., Light and Rand, 2005; Thompson, 2005). In this article, we consider if the residents of Indian nations offering Class III games that provide per capita payments are comparatively "better off" than those from nations with Class II and III gaming not making direct payments.

Tribal Characteristics

The divergent conditions found across Indian country in 2000 are more than just the product of some nations embracing gaming activities during the 1990s. There are multiple, complex economic and social forces shaping the circumstances of individual nations (Wilkins, 2002). We consider four characteristics expected to shape reservation conditions beyond the impact of gaming. The first three, population, urbanization, and heterogeneity, represent controls associated with some of the basic social conditions of Indian communities. Independent of gaming, nations with larger populations, situated in rural settings, and/or more insulated have experienced more severe economic and social maladies historically than smaller, more urbanized, and racially diverse groups (e.g., Thompson, 2005; Wilkins, 2002).

The introduction of gaming, its success, and the magnitude of impact appears to hinge, in varying degrees, on an Indian nation's size, rural quality, and

population composition. Light and Rand (2005) have chronicled the challenges confronting the rural gaming nations of the upper plains states, while Conner and Taggart (2009a) report that rural gaming nations in New Mexico actually displayed less improvement than nongaming nations on a number of dimensions during the 1990s. Taylor and Kalt (2005), with little elaboration, found it necessary to weight their cases due to the influence of population on the results. Thompson (2005) presents data detailing unfavorable differences between the most successful gaming nations and the largest nations, regardless of gaming status. Lastly, some of these same studies (e.g., Conner and Taggart, 2009a; Taylor and Kalt, 2005) have detected differences when examining measures based on Indians only (IO) as opposed to all races (AR), with the latter suggesting comparatively greater improvements for nations adopting gaming.

The fourth control variable we include does not represent a tribal social characteristic, but is the 1990 value of the dependent variable under consideration. The inclusion of the earlier value acknowledges that a condition in 2000 does not change dramatically for any given nation in a relatively brief period, ceteris paribus. Preexisting conditions play a major role in determining future conditions, and it is unrealistic to expect radical and profound transformations within a limited timeframe (Light and Rand, 2005). The inclusion of the 1990 measure has two beneficial consequences. First, the earlier value encompasses the cumulative effects of other potentially relevant independent variables omitted from the model, thereby reducing specification error. Since it represents an earlier measure of a particular economic characteristic, its inclusion also acknowledges the different economic conditions found across Indian nations at the beginning of the decade.

The second consequence of using the lagged variable is that it leaves the difference or change in a given condition during the decade for the other variables, including the measures of gaming, to explain. This would seem a reasonable strategy for examining gaming's impact, since nations adopting gaming should experience improved economic conditions beyond what they would look like without the benefits of gaming. In short, the inclusion of the earlier value requires gaming and the other control variables to only account for any differences that may have emerged during the decade as opposed to the absolute conditions of the nations in 2000.

State Contextual Factors

Beyond tribal features, the broader environments in which these nations exist also play a role in shaping the conditions found in Indian country, as well as influencing the relative success of gaming in generating revenues to change these conditions. Unlike the tribal control variables, these contextual factors represent various situations or conditions confronting multiple nations simultaneously and, at the same time, generally beyond the control of these

nations. In the following analysis, we focus on three state contextual factors that have received perhaps the most attention from various observers. We expect the impact of gaming on tribal conditions to vary depending upon the state where a nation operates a facility. Although there are undoubtedly more localized forces coming into play, the state context is a logical place to begin searching for differential effects.

The first consideration is the possibility that Indian casinos may be competing with commercial—non-Indian—venues for customers and the money they spend. States allowing commercial casinos to operate could be offering a substitutable alternative to consumers and potentially divert dollars away from gaming nations. Indeed, some states and nations have signed exclusivity agreements, whereby the state promises not to permit non-Indian casino operations in return for the payment of an "exclusivity fee" by the nations, typically based on some percentage of adjusted gross revenue or net win (e.g., Contreras, 2002). Other states have permitted commercial casinos and "racinos," racetracks with gaming, to develop alongside Indian casinos (American Gaming Association, 2008). We posit that Indian gaming will have less of an impact on tribal economic conditions among nations situated in states allowing commercial gaming operations than compared with nations with Class III operations found in states with exclusive operating rights, whether by formal agreement or not.

The distribution of Indian nations spans 32 of 48 contiguous states, reflecting noticeable variability on multiple demographic and economic dimensions. Various writers have noted the general importance of population and wealth as two factors contributing to the relative success of Indian casinos (e.g., Light and Rand, 2005; Thompson, 2005). The population of a state holds important implications for the number of potential patrons available. Similarly, states enjoying greater levels of affluence because of better economic conditions might provide for more disposable income to support gaming activities. All things being equal, the expectation is that nations with gaming will experience greater improvements in reservation conditions in states with larger populations and higher incomes than gaming nations in smaller and less affluent states.

Data and Methods

In the following analysis, we utilize the 1990 and 2000 U.S. Census data compiled by Taylor and Kalt (2005), supplemented by other sources as discussed below.[1] The data set includes 315 federally recognized American Indian

[1]Of course, an analysis of more recent data would be highly desirable. Unfortunately, data for the population of Indian nations, as Native American scholars are keenly aware, do not exist except as made available through the decennial census and even this information, as we will describe, is problematic (Wilkins, 2002). Until the full release of the 2010 Census, the

reservations, off-reservation trust lands, and joint-use areas in the lower 48 contiguous states, all representing defined geographic areas.[2] Further, there are 25 tribal designated statistical areas (DSAs) and three designated joint-use areas in Oklahoma, as well as seven DSAs situated in other states. DSAs are artificially defined geographic boundaries for nations without a true (reservation) land base who nonetheless possess federal recognition as a nation encompassing a land area (U.S. Census Bureau, 2000b).[3] When considered together, the data set provides for 350 federally recognized nations, though 19 are missing data on all the dependent variables. In addition, we dropped the Navajo Nation due to its comparatively much larger population and extreme levels of poverty that has had unusual effects in previous studies, including the work of Taylor and Kalt (2005; also see Conner and Taggart, 2009a). This left 330 Indian nations distributed across 32 states available for analysis, though all of the variables have missing data.[4]

A formidable obstacle in studying Indian nations on a large, national scale, regardless of topic, is the lack of reliable and systematic data for the hundreds of nations found in the United States (e.g., Wilkins, 2002). It is for this reason that the work of Taylor and Kalt (2005) is noteworthy because they attempted to compile tribal-level data for the population of nations in 1990 and 2000. As they contend, these two time points represent pre- and postgaming observations for all practical purposes since Indian gaming activities were quite limited financially and numerically prior to 1990 (see NGISC, 1999).[5] This

database constructed by Taylor and Kalt (2005) offers the most comprehensive information available on American Indians and represents the first full decade under the IGRA. We will revisit these and related issues in the conclusion.

[2]The Taylor and Kalt (2005) data set excludes Alaskan Villages, numbering over 200, but does include one Hawaiian homeland, which we dropped from the analysis. Hawaii is one of two states, Utah being the other, which prohibits all forms of gambling (Taggart and Wilks, 2005).

[3]Taylor and Kalt (2005) note that DSA nations, some of which have casinos, display some unusual characteristics since they cover geographical areas containing individuals, sometimes in large numbers, having no tribal connection and often resembling the surrounding non-Indian community in regards to socioeconomic condition. The inclusion of a dummy variable for DSA nations made little difference in the analysis.

[4]Some of these are traceable to coding practices in the Taylor and Kalt (2005) data set where zero is used for missing information but also can be a legitimate and not necessarily unrealistic value for a particular variable, especially when the overall population of a nation is comparatively very small. Regardless, because we had to compute the dependent variables based on information contained in the data set, division by zero is not possible and automatically generated a certain amount of missing data. In other instances, a numerator of zero would emerge and based on the values of other variables in the data set it would appear to be valid; other times a zero in the numerator suggested missing data. We had to address this issue on a case-by-case basis and erred in the direction of trying to retain cases.

[5]A number of nations in different states were engaged in gaming activities prior to IGRA passage and some moved very quickly to develop formal arrangements after enactment (NGISC, 1999; Taylor and Kalt, 2005). Although some of these pre-IGRA operations represented casinos in a Class III sense, most were modest economic ventures, with many involving bingo halls. Schaap (2010), drawing on multiple sources, reports that in 1988 Indian gaming was generating roughly $100 million, while Taylor and Kalt put the number at $400 million the next year. Much more importantly, by 1997, the figure had climbed to a staggering $7.4 billion (Schaap,

permits a comparison of changes among gaming nations to nations opting not to embrace gaming during the 1990s.

These data are less than ideal, however, beginning with the fact that many measures are for all residents of tribal lands, regardless of race, and that Indian status, when used to measure a tribal characteristic, is self-reported and changed in meaning between the two time points (Wilkins, 2002). Further, there is a certain amount of missing data, especially in 1990, and there are a number of cases with extreme values on many variables.[6] These points notwithstanding, these data currently offer the most comprehensive coverage of Indian nations in the American states.

An important element of Taylor and Kalt's (2005) study is the inclusion of a wide variety of measures, reflecting a broad range of social and economic conditions potentially changing in response to the introduction of casino gaming. This is significant since commentators have underscored the multifaceted ways in which gaming can be changing life in tribal communities. Light and Rand (2005) have identified over 50 possible impacts on Indian nations, ranging from reductions in unemployment to cultural preservation to higher incomes. Their review, which also considers potential consequences for other political systems, delineates a complex assortment of economic, social, cultural, and other conditions likely to change in response to Indian gaming activities. When examined empirically, these conditions display positive and negative associations with gaming depending on the particular specification. Although scholars have identified a number of possible impacts attributable to gaming, we focus the present analysis on eight economic measures of reservation conditions in 2000 (RC_{00}), spanning income, employment, and labor force characteristics. Many of these measures represent conditions Light and Rand (2005) and others (e.g., Thompson, 2005) have identified as being more likely to change in beneficial ways in response to the introduction of gaming.

Dependent Variables

We computed eight RC_{00} measures for analysis. There are three measures available for both IO and AR residing on tribal lands, for a total of six, while two others are for AR only.[7] We include measures of income (one IO and

2010) and just five years later, it had more than doubled to $16.7 billion (NIGC, 2003). Thus, it seems reasonable to treat 1990 as pregaming, especially in light of the difficulties associated with documenting gaming activities in the pre-IGRA period.

[6]Some sources put the undercount of Native Americans at more than 12 percent in the 1990 Census, and it is argued to be potentially more severe in earlier versions of the census including 1980 (Ramirez, 2010). Lujan (1990) offers a detailed discussion on the census undercount of American Indians.

[7]Like Taylor and Kalt (2005), we decided to evaluate the AR data given the limited number of IO measures. The presence of non-Indians on reservation lands varies considerably across the nations, from none to other instances where Indians are in the minority. Indeed, roughly 30 percent of the 330 nations have larger non-Indian populations, including the statistical

TABLE 1

Eight Economic Measures of Reservation Conditions in 2000 (RC_{00}) with Descriptive Statistics and Hypothesized Relationship with the Adoption of Gaming[a]

Dependent Variables	Indian Only (IO) or All Races (AR)	Mean/Standard Deviation	Hypothesized Relationship
Per capita income (1999)	IO	$11,508/12,134	Positive
	AR	$12,987/10,430	Positive
Median household income	AR	$29,264/13,135	Positive
Percent of individuals in labor force who are unemployed (unemployment rate)	IO	15.02 percent/12.82	Negative
	AR	12.62 percent/11.59	Negative
Percent of individuals in labor force	IO	54.09 percent/19.81	Positive
	AR	53.36 percent/18.97	Positive
Percent of individuals receiving public assistance, including SSI	AR	16.13 percent/14.31	Negative

[a]SOURCE: Taylor and Kalt (2005).

two AR), employment (two IO and two AR), and public assistance (one AR). A brief description of the variables, with descriptive statistics and their hypothesized relationship with the adoption of gaming, appears in Table 1.

The variables found in Table 1 are standard measures associated with the general population survey and provide a snapshot of basic economic conditions in tribal communities in 2000. As such, the descriptive statistics are revealing on a couple of dimensions. First, the means confirm that American Indians face economic challenges unlike any other segment of the U.S. population, with measures of income falling well below national averages and unemployment far exceeding the norm (see Taylor and Kalt, 2005 for a discussion of these issues). A second observation is the amount of variability evident across the variables as measured by the standard deviation; the distributions are relatively spread-out and skewed in many instances, sometimes attributable to the presence of a few to several extreme cases. For most variables, the standard deviation is almost as large as the mean (it is actually larger in the case of per capita income), suggesting a considerable amount of diversity across nations, variability that does not necessarily diminish with the omission of outlying cases. This, as we will discuss in a moment, carries implications with respect to the analysis.

The final piece of information contained in Table 1 is the hypothesized relationship between gaming, generally, and the reservation condition in question. We expect indicators of income and labor force participation to be higher for

areas used in Oklahoma and elsewhere. Part of the logic of including a control variable related to heterogeneity (percent of non-Indian) is to account for the potential impact of this characteristic.

gaming nations compared with nongaming nations, while the measures of unemployment and public assistance we postulate to be lower. These expectations are consistent with the existing literature concerning arguments advanced regarding the expected impacts of gaming on Native American communities (e.g., Light and Rand, 2005).

Gaming Variables

Of the 330 cases available for analysis, 190 or almost 58 percent are gaming nations according to Taylor and Kalt (2005), which simply indicates that each had entered the market in some fashion by 2000. A large proportion of these tribes commenced gaming during the 1990s, which certainly includes the latter part of the decade for some. Hence, 10 years, perhaps a little longer in some instances, is the maximum any of these nations has operated one or possibly more facilities. Besides the "messiness" associated with the gradual introduction of the independent variable, which is an issue that should not be overlooked (Mohr, 1988), the short timeframe involved works against witnessing substantial impacts across all gaming nations (see Light and Rand, 2005 for a discussion of this issue). Unfortunately, we cannot disentangle this problem given the limitations of the data set and acknowledge that it makes it harder to detect changes in reservation conditions.

Using materials reported by McQueen (2000), 29 of 190 nations were located in states classified as having Indian bingo (Class II) but not Class III games at the end of the decade. The remaining 161 gaming nations were in states McQueen (2000) lists as having both Indian bingo and Indian casinos at the end of the 1990s, with the latter category representing Class III facilities under the IGRA. Out of these 161 nations, 41 had a RAP approved sometime during the 1990s providing for the direct distribution of casino revenues to tribal members through per capita payments.[8] All gaming nations must allocate gaming revenues as proscribed in the IGRA for the benefit of tribal members, which might include but cannot be limited to making per capita payments (Taggart and Conner, 2011).

The information about gaming class and payment plans permitted the construction of three binary variables related to different gaming conditions, with nongaming nations serving as the reference group (see Table 2). The first is a binary variable for gaming nations in states not permitting Class III

[8]The Bureau of Indian Affairs provided a list of nations with revenue allocation plans and approval dates via e-mail correspondence on October 15, 2009. In the subsequent analysis, we considered the length of time a plan had been in place as a possible gaming variable in lieu of the binary variable employed; the findings suggested similar impacts but, as expected, the coefficients were attenuated in magnitude as the effects played out over multiple years. We also note that we cannot determine from this information if any of the newer (post-1999) RAP adopters had plans during the 1990s but have since received approval for revised plans, which are now the official plans of record. Finally, it is not possible to examine how much, if anything, is paid by individual nations, information that is shielded from public records requirements.

TABLE 2

Gaming Variables and Tribal Control Variables for Indian Nations in 2000 with Descriptive Statistics[a]

	Descriptions	Mean/Standard Deviation	Range
Gaming[b]			
Class II only	1 = Class II gaming nation ($n = 29$) 0 = Other	0.09/0.28	0–1
Class III no pay	1 = Class III gaming nation without per capita payment plan ($n = 120$) 0 = Other	0.36/0.48	0–1
Class III pay	1 = Class III gaming nation with per capita payment plan ($n = 41$) 0 = Other	0.12/0.33	0–1
Tribal Characteristic			
Urbanization	Percent of AR population residing in a census-defined urban area	22.15 percent/ 34.80	0–100
Heterogeneity	Percent of individuals residing on reservation land that are non-Indian	39.08 percent/ 29.51	0–99.81
Population[c]	Number of individuals residing on reservation land (IO and AR)	(IO) 1,759/ 5,683	(IO) 2–74,739
		(AR) 10,088/ 52,911	(AR) 2–704,703

[a]Sources: McQueen (2000), National Indian Gaming Commission (2009), and Taylor and Kalt (2005). Due to space considerations, we have excluded the measures of the dependent variables in 1990, information that is available upon request.
[b]The mean is the proportion of cases coded 1.
[c]IO = Indian only and AR = all races.

games but having bingo and possibly other forms of Class II games, although McQueen (2000) acknowledges that in some instances there may have been Class III games as well, just not legally under the IGRA. The second dummy variable is for nations operating Class III casinos without payment plans, the largest proportion of gaming nations, while the third variable represents tribes with Class III gaming and an approved RAP.[9] It is not possible to determine from these sources to what extent there are nations in Class III gaming states operating casinos with Class II games only.

[9]A few nations with Class II gaming have payment plans as well but this was not examined given the small number of cases.

It is also worth noting that while it would be desirable to know more about the characteristics (e.g., types of games) and relative success of these individual gaming operations, data restrictions preclude any efforts to control for such factors. What we know is that the 1990s represents a period of remarkable growth in Indian gaming activities and revenues, as the metric quickly shifted from the millions to billions of dollars (Schaap, 2010). It is, by all accounts, a period of unprecedented expansion in the Indian gaming industry (Taylor and Kalt, 2005). Yet, we also recognize that not all nations prosper equally from the presence of gaming activities, as a comparatively small percentage of nations have generated a disproportionate share of the net revenues through the years (Light and Rand, 2005). Of course, the relative prosperity of a nation's gaming operations will directly affect its capacity to bring about positive change in reservation conditions, an issue that we simply cannot address at present.

Tribal Characteristics

The control variables representing tribal characteristics are from the Taylor and Kalt (2005) data set as well. Urbanization is the percent of AR—IO is not available—living in places with 2,500 people or more in 2000, while the measure of heterogeneity is the percentage of non-Indian residents in 2000. The 2000 population is available for both IO and AR, so in the following analysis we vary (the base 10 log of) population depending on whether the dependent variable under consideration is for IO or AR. As was true of the RC_{00} measures, the standard deviations for the control variables suggest considerable variability about the mean values (see Table 2). The Pearson correlations between urbanization, population (either form), and percent non-Indian ranges between 0.13 and 0.54, with all but one value below 0.28.

The fourth control variable is the value of any particular reservation condition in 1990 (RC_{90}). As discussed, the inclusion of this initial value helps to capture the effects of other relevant but unmeasured variables, and, concurrently, leaves the difference or change between the two time points for the remaining variables to explain. The expectation statistically is that this variable will be the most important in accounting for variability in RC_{00}, thereby creating a rather conservative, but appropriately constructed, test regarding the impact of gaming, as well as the interplay of the other variables. We do not expect gaming and the social characteristics to explain absolute economic conditions in 2000, but just the portion associated with the decade of the 1990s and the emergence of Indian gaming under the IGRA.

Method of Analysis

To investigate the impact of the three Indian gaming indicators on RC_{00}, we utilize robust regression. Virtually all of the data assembled by Taylor and

Kalt (2005) show signs of skewness and many times suffer from the presence of extreme values relative to the measurement scale. Often, it was the same nations, although not always, and tended to reflect a combination of both gaming and nongaming nations, the mix of which changed slightly given the dependent variable under consideration. Although we evaluated numerous methodological approaches, robust regression emerged as the most feasible option given the ability to retain cases with extreme values that cannot be justifiably excluded from the analysis, while, at the same time, providing the capability to explore the impact of gaming in a more rigorous fashion. Robust regression is an attractive alternative to more traditional methods when individual cases distort the results and violate the assumptions of ordinary least squares (OLS) regression (Maronna, Martin, and Yohai, 2006; Meier and Keiser, 1996; Western, 1995). Robust techniques are essentially a compromise between dropping—a common solution—extreme cases from the analysis or allowing them to remain while lessening their impact on the calculation of parameter estimates. This approach thus reduces the influence of these cases by weighting them less in the overall regression analysis but recognizes that they are in fact legitimate, and important, to understanding the relationships in question.[10]

The robust regression results reported herein were calculated using Huber M-estimators, which assign declining weights to individual cases based upon the magnitude of the residuals (Fox, 2002; Huber, 1981).[11] Thus, the larger the residual, the less weight the case receives in the overall estimation of the equation, which takes place in an iterative process and allows outlying cases to remain in the analysis without biasing the estimates. One drawback to using robust regression is that the value of R^2, typically employed by many when evaluating regression results, is artificially inflated and, therefore, is not used. Because our interest is in the individual coefficients, we will focus on their magnitude and direction, as well as their significance using a liberal 0.10 (two-tail) level of confidence.[12]

[10]We explored a variety of data analysis strategies, including weighted least squares, multiple types of data transformations (e.g., logging), hierarchical modeling, subgroup analyses based on tribal characteristics, and even OLS while removing assorted outliers. In the end, we selected robust regression because it was a solution that worked for all the dependent variables, which has the appeal of simplicity, permitted us to retain the maximum number of cases, and offered the most statistically stable parameter estimates and residuals. It is worth noting that the general findings we report here continued to emerge regardless of approach and would suggest that they are not merely a reflection of statistical artifact. We also employed White's heteroscedasticity-consistent standard errors, which yielded similar results.

[11]There are a number of approaches to robust estimation discussed in the literature (see Meier and Keiser, 1996). When comparing the estimates to other approaches, including "MM" estimation, the results were similar in both direction and significance.

[12]In light of the data, some might object to utilizing a test of significance since we are working with the population of nations in the contiguous states, minus those with missing data. On the other hand, given the number of equations and coefficients involved, as well as some of the peculiarities of the data, it serves as a convenient means to identify and summarize those results of greater import.

We investigate the impact of gaming on RC_{00} in three stages. First, we consider the impact of the three gaming variables (Class II only, Class III no pay, and Class III pay) and the appropriate RC value in 1990 on each of the eight conditions in 2000. This establishes, before moving forward, the degree to which the three gaming variables are related to changes in the eight conditions independent of the other control variables. The second step is to estimate eight full models, which include the three gaming variables and all of the controls. This permits an assessment of gaming's impact in light of the tribal social characteristics expected to influence RC_{00}.

In the third step, we consider how different state conditions either diminish or enhance the effects of gaming on tribal nations. These contextual features, external to the nations, include the population and wealth of a state, as well as the presence of competition from commercial casinos. To understand these differential effects, we reestimate the full model (step 2) for subgroups of nations situated in groupings of states according to (1) the existence of non-Indian casinos and racinos, (2) population size, and (3) level of per capita income. In each instance, we estimate separate equations for nations located in two groupings of states according to the contextual feature under consideration. Unlike the tribal characteristics, which we include as control variables in the equation, the expectation is that these contextual features will alter detected relationships between gaming and reservation conditions. These differences will appear in the relative magnitude of the coefficients associated with gaming.

The first contextual feature groups states and, therefore, nations according to the presence or absence of commercial casinos and racinos as reported by McQueen (2000) and the American Gaming Association (2001).[13] We can only assume the presence of commercial operations translates into an easily substitutable option for individuals wishing to gamble, though the decision calculus of consumers, which is beyond the scope of this study, is certainly much more complex (e.g., Grinols, 2004). Because of its continuous nature, we used the state median population (for 32 states) in 2000 to form two groups of nations in states with populations above and below 3.56 million (U.S. Census Bureau, 2000a). Similarly, median per capita income in 1999 ($27,658) was the basis for the third contextual grouping of nations (U.S. Census Bureau, 2000a). Table 3 summarizes the distribution of states according to the different contextual groupings and reports the number of gaming nations found within each set.[14]

[13]Eight nations have lands spanning two states and two others have lands in three states, which required that we "assign" them to a particular state for purposes of forming the contextual groupings. We used the relative distribution of a nation's Indian population as reported by the U.S. Census Bureau (2000c) in the states involved and assigned the nation to the state containing the largest proportion. If a nation was engaged in casino gaming, the location of the activity took precedent.

[14]In this third step, we drop the binary variable for Class II gaming because of the limited number of cases and, more importantly, as the subsequent analysis reveals, it appears to have had a limited impact on reservation conditions during the 1990s.

TABLE 3

Distribution of States and Class III Gaming Nations by State Contextual Factors in 2000[a]

State Variables	Description of Groups	States	Nations
Commercial gaming	States permitting non-Indian commercial casinos or racinos	CO, IA, LA, MI, MS, NV, NM, RI, SC, SD	27 Class III no pay 7 Class III pay
	States not permitting non-Indian commercial casinos or racinos	AL, AZ, CA, CT, FL, ID, KS, ME, MA, MN, MT, NE, NY, NC, ND, OK, OR, TX, UT, WA, WI, WY	93 Class III no pay 34 Class III pay
Population	States with populations under 3.56 million (median for 32 states)	CT, ID, IA, KS, ME, MS, MT, NE, NV, NM, ND, OR, RI, SD, UT, WY	38 Class III no pay 5 Class III pay
	States with populations over 3.56 million	AL, AZ, CA, CO, FL, LA, MA, MI, MN, NY, NC, OK, SC, TX, WA, WI	82 Class III no pay 36 Class III pay
Per capita income	States with per capita incomes below $27,658 (median for 32 states)	AL, AZ, ID, IA, LA, ME, MS, MT, NE, NM, NC, ND, OK, SC, SD, UT	37 Class III no pay 12 Class III pay
	States with per capita incomes above $27,658	CA, CO, CT, FL, KS, MA, MI, MN, NV, NY, OR, RI, TX, WA, WI, WY	83 Class III no pay 29 Class III pay

[a]SOURCES: American Gaming Association (2001), McQueen (2000), and U.S. Census Bureau (2000a) .

A couple of comments regarding Table 3 are in order. First, the number of gaming nations is comparatively quite small under certain circumstances, suggesting the need to adopt a conservative approach with respect to the subsequent findings, which prove to be provocative. At the same time, with fewer cases it also means that any detected differences will need to be relatively substantial in order for the estimated gaming coefficients to achieve significance. Second, while some states fall into the same contextual groupings, many others do not, indicating there are differing subsets of nations across the contextual factors analyzed. In fact, the highest Pearson's correlation between the three state-level variables ($n = 32$) was a modest 0.34 (population and income), and the highest lambda between the groupings was a mere 0.10, suggesting little to no assocation. This is a relevant point to keep in mind as we compare results across the different contextual settings and begin to consider the issue of what might be the "best" state conditions for witnessing changes in reservation conditions.

The Impact of Indian Gaming

Step 1: Baseline Assessment of the Impact of Indian Gaming

Table 4 summarizes the results of the first step in the analysis, which examines the influence of the three gaming variables on the eight economic measures in 2000, controlling for the appropriate condition in 1990. Generally, gaming appears to be having an appreciable effect on conditions in Indian country across a number of economic measures, as suggested in the broader literature (e.g., Taylor and Kalt, 2005). In fact, on every dependent variable in the analysis, gaming, regardless of class, appears to be having a significant impact on adopting nations with high incomes, lower unemployment, higher labor force participation, and reduced reliance on public assistance. More importantly, these differences between gaming and nongaming nations—the reference group—are not trivial. For instance, the results suggest a $4,000 higher per capita income on average for nations with Class III gaming paying members than nations without gaming. The same is true of median household income, where all the gaming coefficients indicate that the incomes are several thousand dollars higher than in the nongaming nations.

Overall, 14 of 24 gaming estimates (eight equations times three gaming variables) are in the expected directions and significant. This includes five of the Class II, four of the Class III no pay, and five of the Class III pay coefficients. In two instances (median income and AR per capita income), all three gaming variables achieve significance as postulated; in the other six instances at least one of the three gaming variables has a significant impact. Thus, at least one gaming variable emerges as significant in all eight equations. More generally, 21 of the estimates are in the expected direction, though a couple of the values are close to zero. Overall, these results demonstrate both the diverse impact of gaming across the three forms investigated here—Class II, Class III no pay, Class III pay—and the robustness of gaming across a number of measures tapping economic changes in Indian country.

Of final note are the findings for the two measures of labor force participation, which generated contradictory results. As expected, the coefficients for both Class II and Class III no pay gaming displayed a positive relationship, with these nations having higher labor force participation rates than nongaming nations for both AR and for IO. However, when examining the two estimates for the impact of Class III pay, both of which are significant at the more conventional 0.05 level, the percent of Indian and non-Indian residents in the labor force is substantially lower. Further, the estimates for the IO measure is double the AR measure, indicating a much lower participation rate. Although this runs contrary to the expectations of some who have argued that gaming is typically associated with higher levels of individuals in the labor force for both Indians and non-Indians alike (e.g., NIGA, 2006), others have suggested that payments, especially if substantial, may provide a disincentive to work (Bartlett and Steele, 2002). It is also the case that the 41 nations

TABLE 4

Robust Regression Analysis of the Impact of Gaming on Eight Measures of Native American Economic Conditions in 2000[a]

	Per Capita Income (IO)	Per Capita Income	Median Income	Unemployment (IO)	Unemployment	Labor Force (IO)	Labor Force	Public Assistance
Class II only	763.12	3,641.43***	3,575.31*	−2.38	−2.22*	4.82*	3.93**	−2.62
Class III no pay	647.07	956.61*	3,097.99**	1.04	−0.04	0.74	2.25**	−2.48***
Class III pay	4,010.77***	3,387.59***	5,732.26***	−3.73**	−1.91	−6.64***	−3.29**	−7.16***
Reservation economic condition in 1990	0.43***	0.22***	0.56***	0.37***	0.64***	42***	0.89***	0.67***
Constant	5,556.80***	7,799.27***	13,749.39***	7.84***	4.39***	32.67***	4.44***	7.54***
No. of cases	305	321	321	291	316	300	321	321

[a]Variables computed using all races, unless denoted Indian only (IO). Values are unstandardized slope estimates, with corresponding *t* significance where ***$p \leq 0.01$, **$p \leq 0.05$, and *$p \leq 0.10$.

with per capita payments in our analysis are typically the smallest of all tribes in the United States, with a median population of only 189, which might make it easier to provide payments of substantial magnitude to individual members.[15]

Based on this preliminary first step, gaming appears to be associated with changes in many reservation conditions in directions supported by earlier studies (e.g., Conner and Taggart, 2009a; Taylor and Kalt, 2005). The analysis also suggests that the form of gaming and payment plans have differential effects, with Class III gaming with per capita payments having the greatest impact, sometimes generating coefficients almost double that of the other two gaming indicators. Given these findings, the next step is to estimate the full model for the eight dependent variables to determine whether the benefits of gaming remain after controlling for a number of relevant tribal factors.

Step 2: Assessing the Durability of Gaming's Impact in Light of Controls

Table 5 shows results for the impact of gaming controlling for population size, urbanization, the percent of non-Indian residents, and the value of the condition for each dependent variable in 1990. Overall, in light of these controls, the relative importance of gaming appears to deteriorate to some degree. Of the 24 gaming coefficients, only nine achieve significance in the expected direction. In fact, almost all of the biggest improvements attributable to gaming following the introduction of the controls involve the Class III pay coefficients (six out of the nine). In regards to Class II gaming, whereas Table 4 misleadingly suggested these tribes experienced higher per capita incomes, greater median household incomes, lower unemployment, and higher labor force participation than nongaming tribes, none of the coefficients suggests significant improvements in reservation conditions when controlling for other tribal characteristics. Indeed, in five of the equations the coefficient is in the opposite hypothesized direction, suggesting the relatively weak impact of bingo and other Class II games on improving conditions for nations. In similar fashion, the Class III no pay indicator drops off considerably in both magnitude and significance, mattering only in the case of public assistance, per capita income (IO), and median household income, with the latter two at a liberal 0.10 level.

Most noticeable is the consistent impact of the Class III pay variable, however, which continues to demonstrate marked improvements across all but two of the economic indicators. Moreover, the values of these estimates are generally similar in magnitude to those reported in Table 4, suggesting the stability of these effects in light of further statistical controls. The members

[15]Light and Rand (2005) provide a couple examples of tribal payments in the six figures, though other tribes pay much less (also see Taggart and Conner, 2011).

TABLE 5

Robust Regression Analysis of the Impact of Gaming and Tribal Characteristics on Eight Measures of Native American Economic Conditions in 2000[a]

	Per Capita Income (IO)	Per Capita Income	Median Income	Unemployment (IO)	Unemployment	Labor Force (IO)	Labor Force	Public Assistance
Gaming								
Class II only	137.06	−750.69	−2,745.75	−2.14	−0.67	−1.44	0.19	−1.65
Class III no pay	831.60*	343.68	1,826.34*	0.06	0.13	−1.04	0.98	−2.38***
Class III pay	3,944.79***	3,141.17***	4,886.63***	−3.13**	−2.09**	−7.22***	−3.22**	−7.48***
Tribal Characteristics								
Population[b]	−558.28**	281.97	1,692.16***	3.35***	1.61***	3.36***	2.06***	1.86***
Urbanization	−5.81	0.68	−5.77	−0.02	0.00	−0.07***	−0.05***	0.00
Heterogeneity	23.88***	82.21***	91.89***	−0.05***	−0.09***	0.10***	0.03	−0.09***
Reservation economic condition in 1990	0.36***	0.14***	0.52***	0.28***	0.46***	0.46***	0.85***	0.51***
Constant	6,865.10***	5,395.51***	6,784.35***	2.86	5.02***	19.68***	0.94	7.65***
No. of cases	305	321	321	290	316	300	321	321

[a]Variables computed using all races, unless denoted Indian only (IO). Values are unstandardized slope estimates, with corresponding *t* significance where ***$p \leq 0.01$, **$p \leq 0.05$, and *$p \leq 0.10$.
[b]The IO or AR population (logged) depending on the RC measure under consideration.

of Class III gaming nations with payment plans were experiencing higher incomes and lower levels of unemployment and dependency on public assistance by the end of the decade. Once again, the results suggest that nations with Class III gaming and RAPs have significantly lower rates of labor force participation than the other nations by as much as 7 percent. Furthermore, these general findings would appear to suggest that those few tribes making payments directly to tribal members are perhaps accounting for at least some of the economic gains attributed to Indian gaming.

Looking briefly at the control variables, three of four reveal strong associations with RC_{00}. As expected, larger populations are generally associated with lower incomes and higher unemployment and dependence on public assistance, while the percent of non-Indians on tribal land is consistently associated with higher levels of income and lower unemployment. In fact, population and heterogeneity are significant in all but two instances, with both controls relevant in six of eight equations. Not surprisingly, the lagged variable is significant (at the 0.01 level) in all the equations, as was true in the previous table as well. Surprisingly, urbanization, which only generated two significant coefficients, tended to display little association with reservation conditions.

These findings suggest that the impact of gaming is not as extensive as previous studies suggest after controlling for other factors. Taken together, two-thirds of the estimates for the three gaming variables are significant or in the expected direction, compared with almost 90 percent of the coefficients in the first step. In terms of the gaming variables, the impact of Class II gaming virtually disappears in light of statistical controls, while nations with Class III gaming and lacking payment plans are perhaps not prospering as much as many might presume. The most meaningful impacts are reserved to nations with Class III gaming engaged in making payments to their members.

Step 3: Assessing Gaming's Impact Across State Contexts

The final step is to consider the impact of gaming under different state conditions related to population size, income level, and the presence or absence of commercial casinos. The strategy is to reestimate the full equations for different subgroups of nations, depending on state context. To simplify the presentation, we excluded the binary variable for Class II gaming given its apparent limited impact, adding these cases to the reference group. Also, although we included all of the tribal control variables with the exception of urbanization in each equation, we only report the coefficients across the subgroups for the two Class III gaming variables.[16] With these points noted,

[16]This is simply a space consideration. We dropped urbanization given its overall poor performance in the previous step; its inclusion does little to change the results reported in Table 6.

Table 6 presents a summary of the findings across the three different state contexts of casino competition, size of population, and income.

Several patterns are evident in Table 6. Perhaps most obvious, context makes a difference. In comparing the results for the subgroups of nations representing the three state contextual features, there are marked differences in the signs, magnitudes, and degree of relative importance of the individual coefficients. The impact of Class III gaming, regardless of payment status, is typically greater in states with higher per capita incomes, larger populations, and offering Indian nations exclusive gaming rights. Alternatively, Indian gaming is of much lesser consequence in states with smaller populations, lower incomes, and in states permitting non-Indian commercial casinos. In some instances, these conditioning effects are most pronounced. Regarding median household income, for example, the coefficient for nations with Class III gaming and making payments in states without non-Indian commercial gaming is almost 10 times as large as the estimate for their counterparts in states allowing commercial competition. These differences play out across the other contextual features and to a lesser degree for the measures of unemployment and public assistance, and are evident for the Class III no pay variables as well.

Overall, there are 96 gaming coefficients displayed in Table 6. Ignoring the issue of direction, which again arises for labor force participation and nations making payments, there are 42 estimates significant at the 0.10 level or less. Slightly more than three-fourths (32) of these significant estimates are in states with larger populations, higher incomes, and that prohibit non-Indian casinos. In these contextual settings, all of the RC_{00} measures are associated with at least one of two gaming variables, with the impact of Class III pay significant in *every* equation and Class III no pay appearing eight times as well. Gaming appears to have the greatest effects in states offering exclusive rights, where both variables are significant in four of eight equations.

The issue of statistical significance illustrates a second pattern evident in Table 6, which concerns the relative impact of the two Class III gaming variables. The Class III pay variable was much more likely to generate larger and statistically significant coefficients compared with the Class III no pay dummy variable. Out of the 42 significant estimates, 31 involve the Class III pay variable. In addition to its noticeable impact on all of the RC_{00} measures in states with larger populations, higher incomes, and prohibitions on commercial gaming, the Class III pay variable is also significant in its relationship with public assistance in the other three settings and per capita income (IO) in two of three. For these two RC_{00} measures, it appears that context is not critical, though there are still differences in the magnitude of the coefficients favoring nations in the larger, more affluent states without non-Indian competition. Conversely, the impact of Class III no pay is much more limited, with four of 11 significant estimates associated with nations operating casinos free of non-Indian competition, while three others are found in states with larger populations. Interestingly, three of the other five significant

TABLE 6

Robust Regression Analysis of the Impact of Gaming on Eight Measures of Native American Economic Conditions by State Characteristics in 2000[a]

Independent Variables	Commercial Casino (*n*)	No Comm. Casino (*n*)	Small Population (*n*)	Large Population (*n*)	Low Income (*n*)	High Income (*n*)
Per Capita (IO)						
Class III no pay	1,243.57**	1,015.56**	171.88	1,308.55**	−176.16	1,217.98*
Class III pay	2,533.34***	4,537.19***	775.98	5,293.70***	1,355.26***	5,728.63***
	(70)	(233)	(95)	(208)	(111)	(192)
Per Capita						
Class III no pay	−163.97	1,018.51**	136.50	1,219.33**	−329.36	522.11
Class III pay	517.21	4,121.43***	−1,332.76	4,989.02***	569.89	4,352.72***
	(71)	(248)	(96)	(223)	(112)	(207)
Median Income						
Class III no pay	66.65	3,359.74***	−186.86	4,103.14***	1,446.32	1,127.08
Class III pay	673.46	6,384.56***	2,221.35	6,876.29***	4,436.11***	4,038.04*
	(71)	(248)	(96)	(223)	(112)	(207)
Unemployment (IO)						
Class III no pay	0.49	−0.44	−0.68	0.70	1.46	−1.67
Class III pay	−1.39	−3.90**	−1.27	−3.89**	0.45	−5.40***
	(69)	(219)	(94)	(194)	(110)	(178)

TABLE 6–Continued

Independent Variables	Commercial Casino (*n*)	No Comm. Casino (*n*)	Small Population (*n*)	Large Population (*n*)	Low Income (*n*)	High Income (*n*)
Unemployment						
Class III no pay	0.29	0.03	−0.69	0.41	0.63	−0.69
Class III pay	−0.73	−2.29*	−0.26	−2.61**	−1.06	−3.29**
	(71)	(243)	(95)	(219)	(112)	(202)
Labor Force (IO)						
Class III no pay	−1.06	−0.41	−0.55	−1.28	0.24	−1.97
Class III pay	−1.02	−7.91***	1.23	−9.43***	−1.94	−9.06***
	(69)	(229)	(95)	(203)	(110)	(188)
Labor Force						
Class III no pay	1.08	1.12	0.87	1.23	1.38	0.94
Class III pay	6.32	−5.93***	2.79	−5.47***	2.87*	−8.40***
	(71)	(248)	(96)	(223)	(112)	(207)
Public Assistance						
Class III no pay	−0.78	−2.21*	−2.56*	−1.71	−3.19***	−2.27
Class III pay	−8.00***	−7.32***	−6.61**	−7.48***	−6.87***	−6.87***
	(71)	(248)	(96)	(223)	(112)	(207)

[a]Variables computed using all races, unless denoted Indian only (IO). Values are unstandardized slope estimates, with corresponding *t* significance where ***$p \leq 0.01$, **$p \leq 0.05$, and *$p \leq 0.10$. The gaming coefficients were computed controlling for logged population, percent non-Indian, and the appropriate reservation economic condition in 1990.

relationships involve public assistance, where gaming nations not making payments experienced reductions around 3 percent in larger states (and in states with lower and higher incomes, suggesting the relative unimportance of this contextual factor in this instance). Finally, most of the Class III pay coefficients, regardless of significance, tend to be comparatively larger than the corresponding Class III no pay estimates, suggesting the former gaming arrangement is having the greatest impact on conditions in Indian country.

It is also worth noting that the results in Table 6 continue to reveal a significant negative relationship between the Class III pay variable and the two measures of labor force participation, particularly in certain situations. The negative impact is greatest in larger states, in states with higher incomes, and in states not permitting other types of casinos. This pattern tends to soften for nations making payments in other state settings, with four coefficients suggesting a positive relationship as originally postulated.

In examining Table 6, one final observation would appear to be in order. Although our comments have centered primarily on those findings suggesting the positive contributions of gaming in altering reservation conditions, there is certainly another conclusion one might argue concerning these results. Out of the 96 gaming coefficients, 55 percent are not significant at our liberal 0.10 level, with many suggesting relatively trivial or, worse, adverse impacts. The general effects of Class III gaming perhaps are not as substantial as many might wish, especially under certain state conditions that are typically beyond the control of the individual nations. This is particularly true for the vast majority of tribes that do not have payment plans; this first decade of gaming has not brought about sweeping changes in reservation conditions. These gaming nations without plans are doing better arguably under certain conditions, the most important of which appears to be when they are not competing against commercial casinos. In the end, however, it is a much smaller subset of gaming nations making payments in the larger, more affluent states without commercial gaming that account for the most meaningful impacts.

To evaluate these impressions regarding the relative importance of both the context and the use of per capita payments in changing reservation conditions, we took one final step. For each of the eight RC_{00} measures examined in Table 6, we reestimated the equations for only those nations located in larger, wealthier states prohibiting commercial casinos and racinos.[17] The results, not shown in tabular form, substantiated these conclusions. Under this combination of "ideal" state conditions, all of the gaming coefficients, regardless of the payment status, generated signs in the hypothesized direction with the exception, once again, of the negative relationship associated with labor force participation. However, none of the estimates for Class III no pay achieved statistical significance whereas all of the Class III pay coefficients were significant at the 0.10 level or less, with six of eight below the 0.05 level.

[17] There is an average of 150 cases in each equation, all of which include a large proportion of the nations with RAPs.

Moreover, the magnitude of the estimates for the Class III pay coefficients was substantially larger, while simultaneously revealing even bigger impacts than detected in the earlier tables. The estimated average change in per capita income (IO) is a couple of dollars under $6,900, for instance, while the percent decline in public assistance is almost 8 percent and unemployment (IO) almost 7 percent. Most striking, the estimated average decline in labor force participation for the nations with RAPs in these particular states exceeds 11 percent on both the IO and AR measures.

Conclusion

The results of the preceding analysis reveal a number of important observations concerning the impact of gaming on Indian nations. First, it appears that gaming is associated with improvements in reservation conditions across a number of economic dimensions during the 1990s, though these gains appear to be relatively modest. Second, the impact of gaming varies substantially across different types of gaming situations in Indian country, with the nations offering Class III games and making payments to their members accounting for much of the improvements evident during the 1990s. The nations with Class III gaming but without RAPs demonstrated smaller improvements, while the detected effects among the nations with Class II were negligible. Furthermore, the impact of Indian gaming appears depressed when controlling for such tribal characteristics as population size and percent non-Indian. Concurrently, the Class III pay coefficients remain just as strong after taking into account tribal differences, suggesting the robustness of improvements attributable to those nations with per capita payment plans.

State contextual factors matter when evaluating the merits of Indian gaming in improving reservation conditions across Indian country. While excercising an admonishment of caution regarding the small numbers of cases involved, gaming nations in states with larger populations, higher per capita income, and no competition from non-Indian casinos appear to be enjoying the greatest improvements in income, employment, and decreased levels of public assistance. In many instances, these differences are quite substantial, particularly for the nations with RAPs.

The results of this analysis suggest the need to reevaluate some of the basic core assumptions associated with Indian gaming. While many nations have benefited from adopting Class III casinos, the returns on such investments in regards to increased standards of living are conditional. Relative improvements are limited by both differences across American Indian nations and the competition and characteristics of the state in which gaming takes place. These inherent characteristics of tribes and the state environments in which they reside are largely outside of the control of most Indian nations, especially given the restrictions on off-reservation gaming under the IGRA (Light and Rand, 2005; Taggart, forthcoming). Differences do exist across types of gaming situations when considering improvements in reservation conditions, but

even the improvements detected for tribes making payments appear limited by the surrounding conditions of the state in which they reside. Thus, to fully understand and appreciate who is "winning" and who is "losing" in the Indian gaming industry, one must consider a host of internal and external factors.

At the same time, we stress the "qualified" nature of these results given several data limitations. Most relevant is that we are restricted to a comparison of only two time points, 1990 and 2000, which does not speak to changes during the 2000s and hampers our ability to track improvements attributable to gaming over a longer span of time. Moreover, not all of these nations started the 1990s with gaming but joined the ranks at differing points in time. With this noted, the impacts observed in the present analysis are quite remarkable given that we are dealing with only two time points that capture changes in reservation conditions during the earliest decade of federally legalized gaming. During this 10-year period, many gaming nations were just starting out and arguably making modest gains at best, which, we believe, the results of our study are detecting. With the release of the 2010 Census, future research will not only gain another time point in which to compare the reservation conditions of gaming to nongaming nations, but also will be able to evaluate a period of time when Indian gaming markets have arguably had more time to mature (Light and Rand, 2005). Further, the addition of reservation conditions in 2010 would allow for a greater degree of control and clarity in isolating the impacts of Indian gaming, especially as more nations entered the gaming business and others have adopted payment plans.

Future research should also consider the impact of other contextual factors that condition the expected payoff of Indian gaming for tribal communities. This may include an examination of certain features of the tribal-state relationship, such as provisions found within compact agreements that vary across states and tribes. Contreras (2002) argues that revenue sharing provisions, whereby a gaming nation pays the state some type of fee defined in the gaming compact, reduce the amount of funds available for other uses. This may aid nations in negotiating more tribal-friendly agreements related to exclusivity fees or, perhaps, placing restrictions on non-Indian competition. In addition, there is a need for more research regarding how revenues generated from Indian gaming operations translate into benefits for tribal communities. The direct nature of a tribe making payments to its members is rather obvious but how a nation spends its revenues to alter reservation conditions requires further study. Lastly, we would encourage more investigations on the role of per capita payment plans in the Indian gaming landscape.

The findings observed in this study contribute greatly to our understanding of who is winning and losing in the Indian gaming business, and help address many of the assumptions and stereotypes that have proliferated through the media and have the potential to influence public policy more generally. It also says something about the policy choices that nations make in regards to Indian gaming, and the limitations that confront Native American businesses

as they attempt to compete with nontribal commercial endeavors, as well as other tribally owned enterprises. Viewing the Indian gaming industry as a whole in regards to its impacts on tribal communities masks much of the variation that exists both individually across Indian nations and across states, which typically represent different socioeconomic environments, tribal-state relationships, and policies toward native communities. For many nations, Indian gaming would appear to be a stepping-stone, and not a cure-all, for addressing the deplorable conditions found in Indian country.

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