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THE ECONOMIC IMPACT OF TRIBAL GAMING ON NON-NATIVE
COMMUNITIES IN OKLAHOMA USING L.O.S.T. DATA

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THE ECONOMIC IMPACT OF TRIBAL GAMING ON NON-NATIVE
COMMUNITIES IN OKLAHOMA USING L.O.S.T. DATA

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Chapter 1: Introduction

One of the greatest challenges facing Native nations today is bolstering tribal sovereignty, to accomplish this; tribes must improve their methods of economic development. According to Jorgensen, a tribe protects its sovereignty through economic development by improving “its economic ability to sustain its citizens, achieve its sociocultural goals...and governing processes”(2007: 36). Currently, the greatest resource in contributing to tribal economic development, resulting from the generation of large amounts of revenue, is gaming. Although tribal gaming is a relatively new phenomenon in Indian Country, the industry is founded in legislation that has overcome many legal challenges.

1.1 Development of Tribal Gaming

Development of the tribal gaming industry began in the late 1970s with the establishment of small bingo operations. However, it was not until 1987 when the Supreme Court upheld the California v. Cabazon Band of Mission Indians case, legalizing tribal gaming. The Cabazon Band is a small tribe located in southern California. In the 1980s, the tribe ran a bingo parlor and poker room on its reservation. The band sued the state after it threatened to shut down the gaming operation because its sovereign status prevented California from intervening (U.S. Supreme Court 2011). The Supreme Court ruled in favor of the Cabazon Band as a result of California’s promotion of a state lottery, citing native tribes were granted the right to offer gaming on reservation land without state interference (Schaap 2010: 11

365-367). This outcome permanently altered the scope of economic development for tribes throughout the country, and opened a new era of prosperity for Indian Country.

After tribal nations were legally granted the ability to offer gaming on reservations, further legislation was created to provide a regulatory framework for the industry. In 1988, Congress passed the Indian Gaming Regulatory Act (IGRA), providing a guide to govern tribal gaming. This act separates gaming into three distinct classes: Class I gaming consists of social and traditional games, Class II gaming consists of bingo and non-house-banked card games, and Class III gaming consists of all other types of gaming (National Indian Gaming Commission 2011). IGRA requires “all the revenues from gaming activities be used to promote the economic development and welfare of the tribe” (Schaap 2010: 366). This criterion that ensures tribal gaming revenues benefits the members of gaming tribes and the communities in which tribes are located. Another requirement of IGRA states, tribes that offer Class III gaming work in conjunction with the state that encompasses their boundaries to develop compacts. While the purpose of IGRA is to provide a guideline for tribes to improve their economic status, this requirement has led to many questions regarding sovereignty and state jurisdiction in tribal gaming.

1.2 Tribal Gaming in Oklahoma

Gaming in Oklahoma dates back to the early 1980s, when several tribes won court cases regarding jurisdiction over gaming enterprises. Until 1992, the state’s gaming industry primarily consisted of bingo and pull-tabs; however, that year, the state began compacting with tribes for the ability to wager on horse-races in casinos

(McBride 2010: 14). Compacts determine the fees that tribes must pay on Class III gaming revenues, these are earmarked for educational use by the state government in Oklahoma. In 2004, Oklahoma voted on and passed legislation allowing for compacting with tribes for Las Vegas-style games, including: Blackjack, Three-card Poker, and Texas Hold'em. Since the establishment of compacting, Oklahoma tribes have paid fees of over \$250 million to the state for Class III gaming (McBride 2010:14). By 2009, the tribal gaming industry in Oklahoma was growing faster than anywhere else in the nation.

In addition to fees on Class II gaming, compacts require tribes to waive their sovereign immunity to suit for tort and prize claims (McBride 2010:16). This allows casino patrons to sue a tribe for injury or prize money disputes that occur in a given casino despite that tribe's sovereign status. These cases must be heard in "courts of competent jurisdiction," the Oklahoma Supreme Court ruled state courts were of competent jurisdiction (McBride 2010: 16). However, this has caused problems because tribal governments believe that the cases should be heard in either tribal or federal courts, an argument based in their sovereign status. These conflicts have led to arbitration between the Chickasaw and Choctaw Nations and the state. In both cases the arbitrator ruled in favor of the tribes, but Oklahoma has failed to recognize the decisions (McBride 2010: 16). This example of a state's dispute regarding gaming jurisdiction displays the Indian Gaming Regulatory Act's varied impact on tribes. While the increase in revenue has improved the economic status of tribe's, the

policies laid out by IGRA, requiring state compacts for Class III gaming, have infringed upon tribal sovereignty, reducing the political power of tribal governments.

1.3 Economic Development and Welfare

As of 2009, there were 237 tribes that conducted gaming in twenty-eight states throughout the country. As a result, the industry produced \$26.2 billion in gross revenue directly from gaming and \$3.2 billion from related hospitality and entertainment services (National Indian Gaming Association 2009). The federal government earned \$9.4 billion in taxes and revenue savings from the industry. These funds include social security taxes, excise taxes, and savings on unemployment and welfare payments (National Indian Gaming Association 2009). State governments also received \$2.4 billion in taxes, revenue sharing, and regulatory payments from the tribal gaming industry. State revenue consists of state income, sales and excise taxes, regulatory payments, and unemployment and welfare payments (National Indian Gaming Association 2009). States that have high concentrations of gaming tribes benefited greatly from these funds during the national recession of 2008. For example, Oklahoma, it has been opined, was insulated from the recession for over a year, partially because of the funds it received from tribal gaming compacts. However, the largest area of improvement from the tribal gaming industry comes in the way of job creation.

Although economic impacts of tribal gaming are typically the first taken into consideration, gaming holds significant social impacts on tribal communities. Tribes are using their gaming revenues to invest in schools, roads, emergency services,

health services, and academic attainment (Schaap 2010: 375). According to Schaap, the number of citizens from gaming tribes who had less than a ninth-grade education decreased from fourteen percent to eight percent, between 1990 and 2000 (2010: 376). Of all tribes that conduct gaming, sixty-four percent have reported an overall positive educational impact from gaming revenues, allowing tribal members to take advantage of higher education opportunities (Schaap 2010: 380). However, the social benefits of gaming do not end with education, healthcare for Native Americans has improved greatly among gaming tribes. In 2007, the Chickasaw Nation broke ground on a 370,000 square-foot hospital in Ada, Oklahoma, providing state of the art care for Chickasaw citizens. Of the \$135 million facility, \$45 million was funded directly from tribal profits.

Gaming revenues are also used for programs that benefit tribes culturally, utilizing revenues to create a long-term tourism industry by constructing tribal museums (Piner and Paradis 2004: 95). Cultural tourism allows tribes to eliminate negative stereotypes by accurately and tastefully portraying themselves, a privilege that could not have been afforded in the past. The gaming industry has brought many improvements to participating tribes socially, culturally, and economically. Therefore, while in some cases IGRA has created sovereignty disputes between tribes and states, the establishment of a tribal gaming industry has had a markedly positive impact on tribal sovereignty through strengthening tribal economies.

1.4 Problem Statement

While the economic benefits of tribal gaming have been well documented throughout Indian Country, there is little known about the impacts of gaming on non-Native communities. In Oklahoma, tribal gaming has been strongly opposed by a number of special interest groups. The primary contribution of this study is to assess the economic impact of the tribal gaming industry on non-Native communities in Oklahoma. The goal is to eliminate any biases regarding the tribal gaming industry by providing sound econometric analysis of the economic impact of tribal gaming in Oklahoma.

Chapter 2: Literature Review

Literature concerning the gaming industry, primarily the tribal gaming industry, covers a diverse range of topics and disciplines, including political science, sociology, and economics. Because the research on the tribal gaming industry is quite varied, and to review all of it goes beyond the scope of the study, this section provides a review of the literature relevant to the economic impact of tribal gaming. Therefore, this review of literature can be divided into two primary sections: (1) the impact of tribal gaming on Native communities and (2) the impact of tribal gaming on non-Native communities. The information provided by the previous literature can then be used to develop a study that is beneficial to the scholarship of tribal gaming in Oklahoma. Previous research typically assesses the economic and social impacts of tribal gaming. The articles concerning the social impacts of gaming will contribute to the analysis of programs and services provided through gaming revenues. Literature regarding the economic impact of tribal gaming will be beneficial in providing a more complete and accurate model. This model will be used to determine the economic impact of tribal gaming facilities on non-Native communities in Oklahoma. Finally, research on the (3) Oklahoma tribal gaming industry will provide insight into the special case of tribal jurisdictional areas as opposed to reservation gaming. This analysis is important because of the unique case of Oklahoma gaming and the difficulties that are unique to conducting research in the state. The objective of this literary review is to compile the most useful information from previous research to support and strengthen the conclusions reached in this study.

When looking at the scope of literature regarding tribal gaming, most studies can be divided into two distinct categories regarding measurement variables: economic impacts and social impacts. Typical economic impact measures include: per capita income, unemployment rates, business activity, and tax revenue fluctuations. Many economic impact studies tend to have positive conclusions. Therefore, the purpose of these studies is self-evident, typically used to support the passage of IGRA and as evidence to expand the gaming industry in a given area. Research that examines social impacts of gaming are less common and measure outcomes such as crime, traditional values, and compulsive gambling. Many of these studies classify social impacts as “costs” to tribal gaming. Because impact analysis of the tribal gaming industry is often divided by economic and social measures, this literature review will provide subsections for studies based on their outcome.

Several editors and authors have chosen to write on tribal economic development, offering background information and an analysis of tribal economies throughout Indian Country. The Harvard Project on American Indian Economic Development, also referred to as the Harvard Project, has produced several works regarding the tribal gaming industry. Stephen Cornell and Joseph P. Kalt’s book *What Can Tribes Do? Strategies and Institutions on American Indian Economic Development* by the Harvard Project is the most comprehensive source of social and economic development research among tribal nations in the United States (1995). The *UNLV Gaming Research & Review Journal* is an excellent resource for obtaining information pertaining to the gaming industry. Francis Prucha’s *The Great Father:*

The United States Government and American Indians (1991) along with the *Gaming Law Review* provide primary source documents and analysis of contemporary issues concerning Federal Indian gaming law, respectively. Articles published in the *National Bureau of Economic Research*, relating to both tribal and non-tribal gaming, offer quality examples of quantitative approaches to analyzing economic impacts of the gaming industry.

2.1 Impact of Tribal Gaming on Native Communities

While the purpose of this study is to determine the economic impact of gaming on non-Native communities, it should not be ignored that gaming has a much larger impact on tribal nations and their citizens. The Harvard Project suggests that gaming is “the most significant economic development in Indian Country since the start of the self-determination era” (The Harvard Project on American Indian Economic Development 2008: 145). Although, the challenge comes when determining the potential success of one project compared to another. Proposed projects could differ based on geographic location, location populations, proximity to major thoroughfares, or on/off reservation location. Cornell and Kalt believe these decisions are so difficult because tribes are selecting projects with large short-term returns, rather than those that will provide sustainable success, the result of an inefficient political structure rather than a poor economy (What Can Tribes Do? 1995: 14). However, once a project has been selected and introduced to a tribal economy, it will have a significant impact on tribal citizens.

2.1.1 Economic Impact

In the article *The Growth of the Native American Gaming Industry*, author James Schaap gives an account on both the economic and social impacts of tribal gaming. He reports several economic indicators signaling an anemic economy among Native American tribes as opposed to that of the larger national economy. Schaap mentions the median household income among Natives was \$33,627 in 2005 with an unemployment rate of 9.3% compared to \$46,037 and 5.1% respectively in the United States (377). While this article does not conduct any research into the tribal gaming industry, it does provide a baseline for the state of tribal economies to be compared to the impacts determined in other research.

Galbraith and Stiles studied the gaming industry's social impact regarding traditional land tenure and wealth acquisition on Southern California and Arizona tribes. From their research, the writers determined that traditionally, pre-colonial, primary land ownership resided with the Band and governed by the hereditary leader (Galbraith and Stiles: 96). This structure of land ownership allowed for citizens to graze their livestock on communal land without being required to pay a "usage fee." The authors suggest that this traditional structure is equilibrium of the traditional tribal economy. The Galbraith and Stiles interviewed economic leaders of nine tribes from California and four from Arizona concerning the place of the casino in relations between tribal government and society and the state government, the economic expectations of tribal members, and the role of the casino in the tribe's economic development (100). The interviews determined that most of the business activity from

casinos occurred at the tribal level, with very little entrepreneurial activity taking place at the individual level. These findings fall within the structure of the traditional tribal economy in equilibrium. Therefore, the research concludes tribal gaming has resulted in a sudden windfall of funds rather than a shock to the tribal economy that would result in a shift of the equilibrium from tribal entrepreneurial activity to individual efforts.

Economists Patricia Reagan and Robert Gitter were the first to evaluate the economic impact of tribal gaming on Native households (2007: 428). In their research on the impact of gaming on the income and employment of 17,305 Native households, the authors used a Roy-type econometric model. The model was to determine the effect of tribal gaming based on the location and tribal affiliation of reservations, aggregate demographic and socio-economic status of tribal members before the passage of IGRA, and individual outcomes and characteristics of tribal members years after gaming facilities were in operation in both metropolitan and rural areas (2007: 429). Their study concluded that tribal gaming facilities had a positive impact on per capita household incomes of tribal members, especially in metropolitan areas; however, an increase in employment was only realized in rural areas.

In their article for the National Bureau of Economic Research, Evans and Topoleski studied the impact of gaming on reservation households. Using a difference-in-difference model, they assessed the outcomes of employment over several communities (Evans and Topoleski: 2). The economic outcomes in

communities with gaming facilities were compared to those that had not injected gaming into their tribal economies. Their research concluded that employment did not fluctuate relative to the control communities for the first four years after casinos opened; however, following that period, jobs per adult gained twelve percent to the median (Evans and Topoleski: 26). This study suggests there are long-term positive economic impacts to tribal gaming of Native communities, not just short-term benefits that can be contributed to infrastructure creation.

2.1.2 Social Impact

In his report on the tribal gaming industry, James Schaap also reports on the bleak social conditions faced by Native American communities. He found that homicide, suicide, infant mortality, and alcoholism rates are much higher in Native communities than the nation as a whole (Schaap: 377). Home lives were also worse, with higher rates of overcrowding, more homes without adequate plumbing, and a larger high school dropout rate than the national average. While gaming revenues have contributed to improving these deplorable conditions, the socioeconomic gap remains for many tribes.

After reviewing previous studies of tribal gaming, Conner and Taggart employed a quasi-experimental design of tribes in New Mexico, both gaming and non-gaming to determine the social effects of the industry. Census data concerning health, housing, and education was gathered throughout the 1990's to determine the outcome based on community (Conner and Taggart: 55). Of the thirteen social indicators assessed, six showed improvements over the ten-year period for tribal

citizens. The greatest improvements were made in households with adequate plumbing and household structures built (59). Most significantly for this study, the authors found, state level data regarding gaming is typically a more effective assessment tool since many regulations are made by state governments. However, breaking down groups to sub-segments within a state can provide even more informative analysis due to economic variations from region to region.

Stephen Lawton studied the impact of tribal gaming revenue from the Mystic Lake Casino on education in the Shakopee Mdewakanton Sioux Community. The case study assessed, anecdotally, the state of tribal education before and after casino revenue was injected into the tribal economy. Prior to the establishment of the casino, the tribe only had one source of on-reservation revenue for citizens, copper recycling (Lawton: 16). The high unemployment rate led to an elevated dropout rate for students. Revenue from gaming funded a pre-school program, teaching language and culture, to encourage education from an early age. The Tribal Education Office grew from a staff of one to nine employees, and offers a postsecondary scholarship for tribal members (16). The revenue injection earmarked for education fosters growth beyond the short-term gains to the tribal economy.

A review of the social costs of tribal gaming would be incomplete without a discussion of its effect on tribal sovereignty. The Indian Gaming Regulatory Act was established to promote self-sufficiency of tribes (Ackerman and Bunch: 64). Yet tribal sovereignty was weakened relative to states under IGRA. Congress's mandate that tribes reach a compact with the state in which they wish to operate a gaming facility

gives the state regulatory control of gaming within its borders (65). In some cases, states took this power to block Class III gaming. However, tribes were granted the right to sue states in federal court if they felt the state did not negotiate a gaming compact in good faith. It has been argued within tribal law and policy that the challenge to sovereignty as the result of IGRA is the largest social cost of gaming on tribal communities.

2.2 Impact of Tribal Gaming on Non-Native Communities

The tribal gaming industry is seldom researched for its impact on non-Native communities. Typically, this is the result of most tribal gaming facilities being classified as small local casinos on reservations away from metropolitan areas. Therefore, it is assumed that any community impacts would still be realized by tribal citizens and a study of non-Native impacts pointless. Also, few tribal casinos are classified as Las Vegas style resort casinos, assuming most patrons reside in the vicinity of a gaming facility. This assumption removes the possibility of casino patrons traveling to a destination, eliminating the revenues from travel and lodging that have a large impact on the surrounding area. However, some academics in varying fields of the social sciences have assessed the impacts of tribal gaming on non-Native communities.

2.2.1 Economic Impact

It is widely believed that tribal gaming, while beneficial for tribal economies, pulls resources from surrounding communities, in turn, diminishing municipal tax revenues. Katherine Spilde and Jonathan Taylor compiled econometric evidence from

multiple studies to test this assumption. From case studies on the Gun Lake Band of Potawatomi Indians casino in southwest Michigan and gaming facilities in Maricopa County in Arizona, economic analysis indicated that economic growth occurred in communities neighboring casinos, but “revenue leakages” were experienced in an expanded area (26). Revenue leakage refers to shifting of consumer spending from taxable to non-taxable sectors of the local economy. While these studies tend to support the prevailing assumption of tribal gaming’s negative impact on non-Native communities, it fails to consider the second step of gaming impacts. Because tribal and non-tribal economies are not mutually exclusive, payroll and expenditure data from gaming employment effect economic growth. Spilde and Taylor referenced the National Gambling Impact Study Commission (NGISC) to determine these impacts by referencing employment data over a sixteen year period for communities near the introduction of a casino. Their study witnessed net declines of 12% in unemployment, 13% in income from income maintenance programs, 17% in income from unemployment insurance programs, and 3% in incomes from other transfer payment programs (26). Therefore, the analysis suggests that tribal gaming facilities in fact encourage economic growth in communities surrounding casinos, and those outcomes are multiplied since casinos are typically constructed in rural areas where local economies are often stagnant.

In an article submitted the Journal of Gambling Studies, Taylor, Krepps, and Wang discuss the impact of tribal gaming versus non-tribal gaming facilities on non-Native Communities. They determined that because tribal gaming facilities are often

located in “economically depressed areas,” their impact was relatively stronger for the local community than the Las Vegas style non-tribal facilities, which were typically constructed in urban areas (17). The model indicates that a 3% increase in total income and 5% increase in net earnings are realized for communities surrounding tribal casino (23). The model’s results can be interpreted as an adjustment of location. For example, gaming facilities constructed in rural areas have a relatively stronger positive economic effect on communities than urban facilities. This study suggests distinctions for gaming location should be made to provide the most efficient outcomes on impact.

Patricia Janes and Jim Collison wrote on the impact of the tribal gaming industry as viewed by non-Native community leaders. The authors interviewed leaders before and after the construction of a casino to determine their perception of economic effects. Janes and Collison found that unemployment in the midwestern community “reduced from 6.3% to 2.9% from 1990 to 2000” (21). Over that same period, property values increased and the percent of households below the poverty level decreased for the county where the casino was constructed. Of the respondents to the study, they reported a perception of improved economic conditions for non-Native communities as a result of the casino (Janes and Collison: 21). These outcomes led to favorable opinions concerning the tribal gaming industry from surrounding communities.

2.2.2 Social Impact

In addition to studying the economic impact of tribal gaming on Native communities, Evans and Topoleski, looked at the social impacts those casinos had on the surrounding area. The research determined that most patrons of tribal casinos lived within its vicinity; therefore, it established a fifty mile radius as the assessment area for social impacts. They determined that mortality had fallen by 22 per 100,000 people in an impact area (Evans and Topoleski: 41). However, there were negative social impacts to gaming, including: a ten percent increase in bankruptcy, violent crime, and larceny rates within four years of a casino's opening (Evans and Topoleski: 36-37). These impacts indicate tribes are the primary winners when it comes to gaming impacts, with the bulk of the increased social costs falling on the surrounding community.

The community leader perceptions article by Janes and Collison also spoke on the perceived social impacts of of tribal gaming on surrounding non-Native communities. Of the eight respondents, they reported individuals with gambling problems increased after the addition of a gaming facility, with one identifying as knowing a problem gambler before compared to all eight being aware of people with problems after the casino's construction (Janes and Collison: 22). There was also an increase in the the number of criminal activities in the community after the casino opened. The greatest increases in crime came from fraud, a 23.5% increase, and embezzlement, an increase of 53.3%; however, this was only an increase of eight cases (Janes and Collison: 23). While this would appear to be a social cost of tribal

gaming to the non-Native community, the respondents believed the additional crime could be contributed to an increase in visitors in their community. The anecdotal evidence used in this study leaves conclusions open to interpretation because they are not adjusted for time and location effects.

In contrast to the anecdotal approach, Taylor, Krepps, and Wang use econometric analysis to determine social effects of tribal gaming on non-Native communities. They found that in communities surrounding a tribal casino, vehicle theft and robbery decreased; however, these results were not statistically significant (Taylor, Krepps, and Wang: 28). In comparison, communities near non-tribal casino's experienced a positive statistically significant effect on crime. The regression did not find any significant social outcomes in the areas of bankruptcy filings or infant mortality. This demonstrates the difficulty of determining social outcomes, statistically, of economic treatments on a community. Nevertheless, this study concludes, when adjusted for market size, tribal gaming has no net social impact on surrounding non-Native communities, an outcome rarely politicized when gaming facilities are proposed for economic improvement.

The tribal-state compacting requirement of IGRA has also impacted non-Native communities in participating states. In their article, *The Sharing Tradition: Indian Gaming in Stories and Modern Life*, Luna-Firebaugh and Fox discuss the aspects of sharing passed down from traditional stories and compare those practices to the contemporary revenue sharing from gaming between tribes and states (83). Some of the acceptable sources for expending gaming revenue are education, health,

and administrative services. The authors note that Arizona gaming tribes, in the first quarter of the 2006-2007 fiscal year, contributed over \$25.5 million to the states public schools, emergency services, wildlife conservation, the State Gaming Department, and problem gambling services (83). These revenues help state governments fund services that would normally suffer in times of budget shortfalls and spending cuts. The article suggests both tribes and states benefit from gaming revenue sharing: states in providing social services, and tribes in closing the loop by reinforcing traditional sharing.

2.3 Tribal Gaming in Oklahoma

The Oklahoma tribal gaming industry has under-researched in academia as compared to tribal gaming in other regions. While there are multiple reasons for this gap in the literature, the primary reason is the lack of distinct boundaries between tribal and local economies. For most regions, econometric analysis can be classified as on reservation and off reservation impacts. However, jurisdictional boundaries, the regions distinguishing one tribe's territory from another's, include non-Native communities and governments. Therefore the economic and social impacts of gaming are realized on both groups simultaneously. The high concentration of tribes, thirty-eight within the state, provides more complexity to any econometric analysis of gaming impacts, suppressing impacts on tribes and creating correlation bias on non-Native communities. Also, this unique integration of economies places an emphasis on tribal-state compacts and revenue sharing. The gaming industry in Oklahoma has

become one of the driving forces of the state's economy, contributing to many social services offered to citizens.

A 2015 report created by the Meinders School of Business at Oklahoma City University, at the request of the Oklahoma Indian Gaming Commission (OIGC), described the impact of the tribal gaming industry for the 2014 year. Tribal gaming generated a \$6.3 billion impact, much of that drawn from out of state visitors, 38.3% of visitors to casinos (Bailey). Patrons of casinos from neighboring states is viewed as an import of cash with few costs to state or tribal economies. The industry paid \$1.16 billion in wages and benefits to approximately 37,000 gaming employees (Bailey). From those wages, tribes and their employees paid over \$264 million in payroll taxes, \$30 million of which were paid to the state directly. The study also found that gaming operations spent over \$580 million with Oklahoma businesses (Bailey). Because the tribal gaming industry plays such a large role in the economy of Oklahoma, it is important to determine its impact on the community level economies to determine if gaming is stimulating the economy or if revenues are only being shifted from one industry to another.

Chapter 3: Data and Methodology

The purpose of this study is the impact of tribal gaming facilities on non-Native communities in Oklahoma. Aggregate data are used to determine whether a gaming facilities stimulated or inhibited economic growth in a city. The main outcome variable is the sales tax base, which provides a measure of overall economic activity at the community level. These data are available, on yearly intervals, for all communities that impose local sales taxes in Oklahoma. This allows for the application of quasi-experimental analysis, using econometrics, difference-in-difference (DID), of tribal gaming facilities.

The basic approach is to employ quasi-experimental methods by finding comparison groups for the treatment. The process for conducting a typical control group involves four steps: 1) select the treatment for the study (tribal gaming), 2) identify treatment places (Oklahoma communities with gaming facilities), 3) match treatments with one or more control places, and 4) perform post-treatment comparison between the treatment and the control groups (Rogers and Marshment 2001: 13).

It was necessary to create relevant criteria for selecting gaming facilities to analyze. Also, criteria had to be developed for selecting control towns to use in the analysis. Finally, we analyze the impact of tribal gaming on non-Native communities using DID analysis. This study will estimate the econometric model using the treatment and control communities selected based on the established criteria.

3.1 Data Collection and Sources

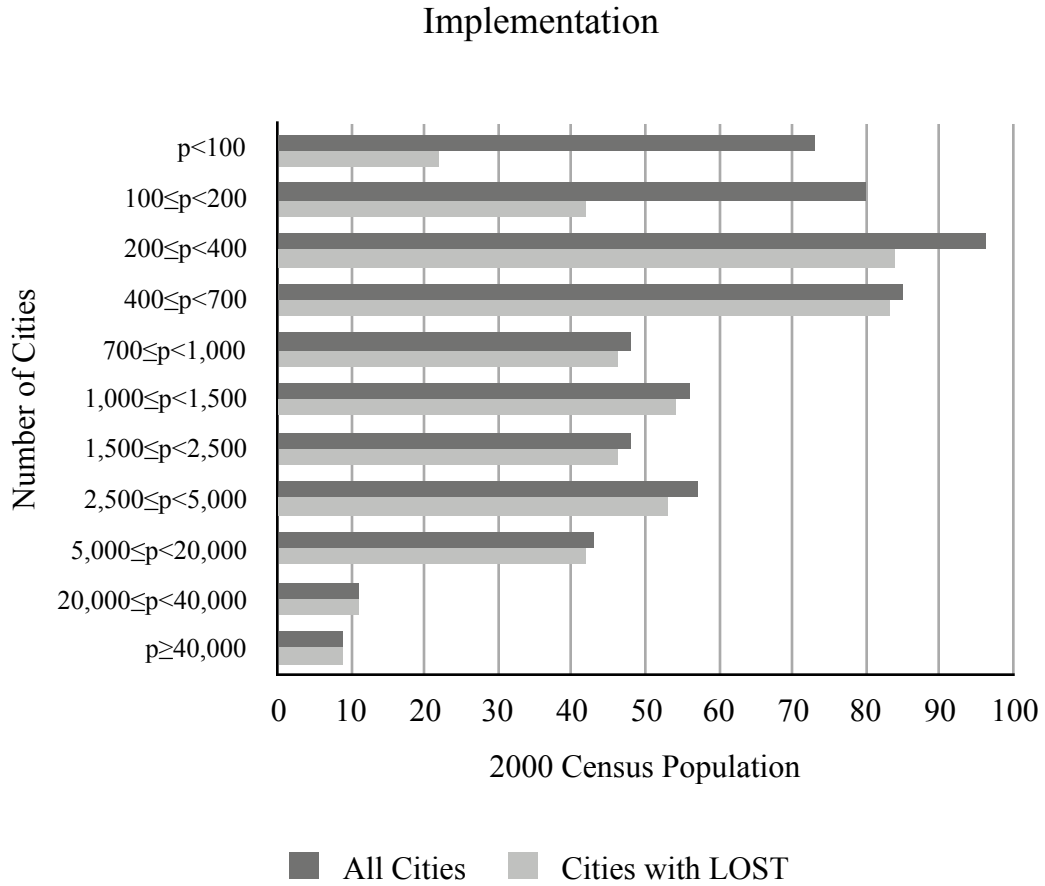
This section documents the data used in the project. The sources and relevance of the data sources are discussed. Some data were obtained as criteria in matching treatment communities with appropriate control communities.

3.1.1 Local Option Sales Tax Data

Local option sales taxes are special-purpose taxes levied at the city or county level (Mackey 1997). These taxes provide a reliable source of data for analyzing economies of small communities. A local option sales tax permits “a municipality to tax qualified sales (sales subject to sales tax) occurring in its jurisdiction” (Rogers and Marshment 2001: 13). Oklahoma law allows cities to levy sales taxes for use by the municipal government. These LOST revenues are levied as a percentage of gross receipts from the sale or rental of property and some services; however, there are exceptions in place that exempt the sale of certain goods (Rogers 2004: 31).

Oklahoma introduced LOST policies in 1966, when thirteen cities implemented the tax at a rate of one-percent, other municipalities quickly followed (Rogers 2004: 32). In 1970, 215 municipalities levied a LOST at a one-percent rate, and by 1980, 405 communities in Oklahoma imposed a local sales tax. Eighty-seven municipalities implemented LOST policies in the twenty years from 1980 to 2000, and as of January 2013, there were 512 communities levying local sales taxes in Oklahoma (Oklahoma Tax Commission 2013).

Graph 3.1 Oklahoma Cities by 2000 Census Population and LOST



Graph 3.1 shows the distribution of Oklahoma cities by their 2000 Census population and LOST status. This graph shows the large acceptance of LOST policies throughout the state of Oklahoma, particularly cities with large populations. Every city with a population of 20,000 or greater have enacted local sales tax policies, while all but one city with a population between 5,000 and 20,000 impose a LOST. However, at the lowest level of population, cities rarely collect LOST revenues. Despite this fact, a local option sales tax is imposed in the majority of Oklahoma communities, allowing for this methodological approach to be possible.

The LOST data, reported by the Oklahoma Tax Commission, provides a consistent source of data on the tax base for communities of all sizes, benefitting this research because many tribal gaming facilities are located in rural areas. While some issues may arise regarding tax rate changes during the researched period, the data, as stated by Rogers and Marshment, “provides an invaluable means of quantitatively tracking a local economy, particularly the growth in a small business district” (2001: 14). Fortunately, the issue with tax rate changes can be avoided by eliminating all communities where this occurs from the study. Because of its value, LOST data will be collected for the 10 year observation period surrounding the implementation of a gaming facility. The state of Oklahoma, through the Oklahoma Tax Commission, provides a summary of all municipalities that change rates during the fiscal year.

3.1.2 Population Data

The United States Census provides population data for census years from 1890 to 2010 on the U.S. Census website, including estimates for years in-between census counts (U.S. Census Bureau 2013). The website also provides census information by state, with estimates for county and city populations. However, the accuracy of population growth estimates are unclear, and these estimates do not change much from year to year in non-census years, especially for small communities. Therefore, this study focuses mostly on census year data for analysis regarding community matching criteria.

3.1.3 General City Information

The U.S. Census Bureau's also maintains an online database with community profiles for all Oklahoma communities. The profiles offer information regarding population, racial composition, and household information (U.S. Census Bureau 2010). To obtain a more detailed profile for potential communities, the Oklahoma Department of Commerce (ODOC) was referenced. The Policy, Research, and Economic Analysis Division of ODOC compiles business and market, economic, and workforce and employer data for all counties within the state (Oklahoma Department of Commerce 2013). These databases provide detailed information for assessing location factors for casino and comparison communities.

3.1.4 Tribally-Owned Casino Data

There is no singular source of data documenting the size and years in operation of Tribally-owned casinos. However, it is possible to construct a list of Tribally-owned casinos with descriptive information about them from a number of sources. This process was aided greatly by the internet and many websites that have compiled casino information for gamblers, primarily the online Oklahoma Casino Directory (Casino City 2013). The Oklahoma Indian Gaming Commission website offers a list of member tribes, providing a starting point for this study (Oklahoma Indian Gaming Association 2013). These sources, taken together, created a sufficient list of Oklahoma Tribally-owned casinos which was used in the process of selecting case study casinos.

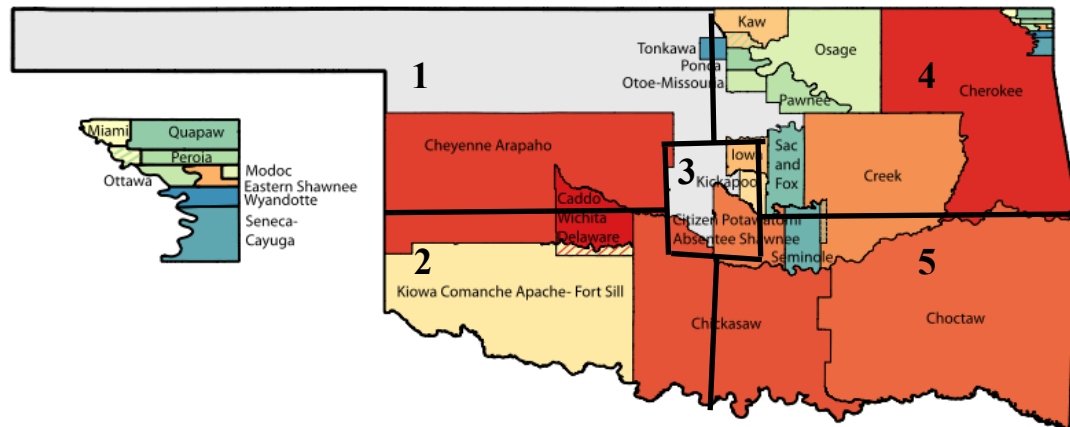
Determining the date on which a casino opened to the public was not a simple task. A complete list of gaming compact file dates is available on the Bureau of Indian Affairs website (Bureau of Indian Affairs 2013). However, there is not a direct relationship between when compacts are signed and when tribes begin operating casinos. Some tribes operate Class I and II facilities, which do not require compacting; while others wait until after a compact has been signed to begin construction on a gaming facility. Therefore, for the purpose of this research model, it is necessary to obtain the opening date of all casinos used in the study. Accomplishing this involves several steps. In some cases, a search of press articles and casino websites provided an opening date. For the majority of the casinos, calling tribal officials to inquire as to when a casino had begun operation was required.

3.1.5 Geographic Location

From previous research at the University of Oklahoma, it is evident that the Oklahoma tribal jurisdictional areas can be divided into five distinct regions. The tribes located in these regions, displayed in Figure 3.2, demonstrate similar characteristics in geography, traditions, governance, and economic atmosphere. The boundaries of these regions are roughly outlined by the state's borders, Interstate-40, Interstate-35, and the Oklahoma City metropolitan area. However, for the purpose of this study, the boundaries of these regions will be drawn more generally as vertical and horizontal lines. These boundaries divide the state into four quadrants: northwest Oklahoma (Region 1), southwest Oklahoma (Region 2), northeast Oklahoma (Region

4), and southeast Oklahoma (Region 5); with another area in central Oklahoma (Region 3).

Figure 3.2 Oklahoma Tribal Regions by Characteristics



The Figure 3.2 identifies the five tribal regions with the tribal jurisdictions that are located within each area. Region 1 contains the smallest tribal area, primarily the Cheyenne-Arapaho. This is also the least populated of the five tribal regions, making it difficult to establish a successful tribal economy. Region 2 is similar to Region 1 in that, outside of the Lawton area, it is generally composed of rural areas. However, unlike the first region, Region 2 is home to many tribes that share jurisdictional territories, creating competition for creating a successful economy. Region 3 is the most urban of all tribal areas. While the majority of the Oklahoma City metropolitan area is not under any tribal jurisdiction, several tribal territories stretch into this region. Because of the large population in this area, tribes with access to Region 3 have a great opportunity to grow their economies. Region 4 has the most concentrated Native population in the state. However, outside of the Cherokee and

Muscogee (Creek) Nations, with access to the Arkansas border and Tulsa metropolitan area, most tribes must combat their rural locations. Region 5 is primarily dominated by the Chickasaw and Choctaw Nations. These tribes benefit from many tourist destinations, such as the Arbuckle Mountains and Lake Texoma, as well as the border with Texas. The Oklahoma Tribal Regions map was used as one of the matching criteria and a guide for selecting casino and comparison communities.

3.1.6 Location and Proximity Features

The Oklahoma Department of Transportation (ODOT) Official State Maps were extremely valuable for identifying location specific features of casino and comparison communities. The Tribal Jurisdictions in Oklahoma map was useful in outlining tribal territories and determining casinos for this study (Oklahoma Department of Transportation 2013). The Oklahoma state maps assisted in identifying factors such as county seat, universities, airports, military bases, proximity to interstates, and tourism activities (Oklahoma Department of Transportation 2013). The ODOT maps were used as guide for developing matching criteria and selecting casino and comparison communities.

3.2 Methodology for Assessing Casino Impacts

This section outlines in detail the matching procedure and statistical model that will be used in this analysis. First, it was necessary to determine the best casinos, those that most completely fit within the selection criteria. Then, according to this form of case study analysis, comparison communities were selected based on the predetermined matching criteria. Finally, to estimate the impact of gaming on non-

Native communities in Oklahoma, this study employs a difference-in-difference estimator.

3.2.1 Identifying Casino Case Studies

Table 3.4 identifies the ten casinos that meet the case study selection criteria in Table 3.3. For a casino to be selected for study, it must meet the criteria. First, two casinos were selected from each of the tribal regions. One casino was selected from an urban and a rural community relative to that region. These criteria allow for regional and community variance of gaming impacts on non-Native communities. Also, a case study casino cannot be located near another casino; this provision is to eliminate any spillover of gaming impacts. However, exact parameters for this provision were not employed because of the large amount of jurisdictional overlap in Region 2. Had an exact parameter been implemented for proximity to other gaming facilities, this study would have been required to eliminate Region 2 from the analysis. Finally, for a casino to be used in this study, the community that it is located in must have a comparable matching community. If there is not a community that meets the matching criteria, that casino is eliminated from analysis and another is chosen using the selection criteria.

Table 3.3: Casino Case Study Selection Criteria

Two casinos per tribal region
One urban and one rural casino per tribal region
Proximity to other casinos
Comparable match community

The coding for when a tribe opened a casino is not straightforward. This study desires to estimate the impact of casinos that opened after the state government began compacting with tribes in 1992. Most casinos opened after compacting began, prior to 1992 tribes primarily operated bingo facilities. In this case, the year casino operation began is clear, compacts were signed in 1992 or later. For bingo facilities that were opened before 1992, once compacts were signed, these facilities were expanded into casinos; therefore, for this study, the compacting date is considered the casino's opening date. For casinos that opened after the tribe had signed a compact with the state, the casino's official opening date was used.

Table 3.4: Case Study Communities with Casinos

Region	Community	Casino	Opening Year
1	U: Clinton R: Watonga	Lucky Star Casino Clinton Feather Warrior Casino	2001 2004
2	U: Duncan R: Elgin	Chisholm Trail Casino Comanche Spur Casino	2004 2003
3	U: Norman R: Harrah	RiverWind Casino Kickapoo Casino	2006 2001
4	U: Muskogee R: Pawnee	Creek Nation Casino Muskogee StoneWolf Casino	1993 2009
5	U: Shawnee R: Pocola	Grand Casino Choctaw Casino Pocola	2006 1994

U → Urban community R → Rural community

3.2.2 Matching Procedure and General Criteria

Finding comparison communities for each casino community is as central to the methodology of this study as selecting casino communities themselves. It was necessary to develop general criteria to use in the selection process. To the extent the data availability allows, the criteria are based on factors identified as important in previous literature (Roger and Marshment 2001:19). In addition, communities were not considered as potential matches if they had already experienced the policy treatment, there is casino located within the community. The basic criteria used to select comparison communities are listed in Table 3.5.

Table 3.5: Matching Criteria

Population, level and growth rate
Sales tax base, level and growth rate
Proximity to other gaming communities
Geographic location
Special Feature: University Military Base County seat Urban/Rural area

For each case study community, all similar non-gaming communities, with respect to the matching criteria, were identified. The distinct categories such as being a county seat or having a university involved exact matching. The remaining criteria involved allowing a relative level of closeness between the casino and comparison communities. This allowance is the result of small pools of data to collect from (i.e. five tribal regions with a small number of casinos and communities). For example, exact population and sales tax base criteria were relative to region.

The criteria used for identifying matches was basic but thorough. The researcher simply looked at a state map and considered every city on a case-by-case basis, starting with the casino communities and working outward within the relevant tribal region. If there was not a sufficient comparison community, a different casino community was considered. However, given the limited number of available casino and match communities per region, the matching criteria could not explicitly be

followed, rather it was used as a guideline for selecting the best comparison communities. Table 3.6 identifies the ten comparison communities used in this study.

Table 3.6: Case Study Matching Communities

Region	Comparison Community	Casino Community
1	U: Weatherford R: Kingfisher	Clinton Watonga
2	U: Chickasha R: Rush Springs	Duncan Elgin
3	U: Edmond R: McLoud	Norman Harrah
4	U: Wagoner R: Perry	Muskogee Pawnee
5	U: Tecumseh R: Spiro	Shawnee Pocola

U → Urban community R → Rural community

3.2.3 Difference-in-Difference (DID) Estimation

To estimate the economic impact of tribal gaming on non-Native communities, this study employs a difference-in-difference estimator. This model compares the outcomes of local sales taxes before and after a casino is opened in that community (treatment group) with the outcomes over the same period in a community that did not open a casino (comparison group). Because the full economic impact of a casino may take years to appear, this model allows for the casino effect to impact a community over time.

The exact empirical specification for DID is as follows:

Let, Y_{1ist} be local option sales tax (LOST) revenue i in Oklahoma community s during time period t if there is an casino, and let Y_{0ist} be LOST revenue i in community c during time period t if there is no casino. Specifically, assume that:

$$E[Y_{0ist} | s, t] = \gamma_s + \lambda_t$$

where c denotes community and t denotes time period. This equation states that in the absence of a casino, LOST revenue is determined by the sum of a time-invariant community effect and a year effect that is common across Oklahoma communities.

Let D_{st} be a dummy variable for casino communities and time periods.

Assuming that $E[Y_{1ist} - Y_{0ist} | s, t]$ is a constant, denoted δ , observed LOST revenue, Y_{ist} , can be written:

$$Y_{ist} = \gamma_s + \lambda_t + \delta D_{st} + \epsilon_{st},$$

where $E(\epsilon_{st} | s, t) = 0$. From this, we derive

$$E[Y_{ist} | s = \text{CWOC}, t = \text{AC}] - E[Y_{ist} | s = \text{CWOC}, t = \text{BC}] = \lambda_{\text{AC}} - \lambda_{\text{BC}}$$

and

$$E[Y_{ist} | s = \text{CWC}, t = \text{AC}] - E[Y_{ist} | s = \text{CWC}, t = \text{BC}] = \lambda_{\text{AC}} - \lambda_{\text{BC}} + \delta.$$

This can be rewritten:

$$\begin{aligned} & \{E[Y_{ist} | s = \text{CWOC}, t = \text{AC}] - E[Y_{ist} | s = \text{CWOC}, t = \text{BC}]\} - \\ & \{E[Y_{ist} | s = \text{CWC}, t = \text{AC}] - E[Y_{ist} | s = \text{CWC}, t = \text{BC}]\} = \delta \end{aligned}$$

where CWOC denotes a community without a casino, CWC denotes a community with a casino, AC denotes the period after a casino is operational, and BC denotes the period before a casino is operational.

It is possible to use regression to estimate the impact of the tribal gaming industry on Oklahoma communities. Let CWC_s be a dummy variable for communities with a casino and d_t be a dummy variable that switches on for observations after a casino is operational. Then

$$Y_{ist} = \alpha + \gamma CWC_s + \lambda d_t + \delta(CWC_s \cdot d_t) + \varepsilon_{st}$$

is the same as $Y_{ist} = \gamma_s + \lambda_t + \delta D_{st} + \varepsilon_{st}$, where $CWC_s \cdot d_t = D_{st}$. This model contains two main effects for state and year and an interaction term that marks observations from communities with an operational casino.

In this model, cross-sectional, time series data are collected for a period of time that spans several years before and after the casino construction period. Meaning, there is an observation for each treatment and control community for each year of data. The treatments and controls are pooled in the regression. The economic impacts of those casinos that were in operation before the state of Oklahoma began compacting with tribes should be captured by the community fixed effects within the equation. The community fixed effects are critical for two reasons. First, the majority of the variation in outcomes will be between the two communities and not within a community over time, helping explain variation in the dependent variable. More importantly, the fixed effects help control for the potential nonrandom selection of communities into gaming. Standard hypothesis testing methods are used to test for the significance of the gaming impacts.

Because the opening date for the ten casinos occurred in different years, one model cannot explain the impact of gaming in the several communities. This is due to

the different economic conditions facing Oklahoma in various time periods and the inability to create an explanatory variable that will capture this variance within the model. Therefore, it is necessary to analyze the ten casino and comparison community sets as independent case studies. While this makes it impossible to compare gaming impacts between two gaming facilities, despite their location. This approach will provide a greater understanding of gaming impacts on non-Native communities in multiple locations, for varying populations, under differing economic conditions.

Chapter 4: Findings

This study wishes to analyze a tribal gaming facility's effect on a community's ability to generate revenue, specifically, the local option sales tax. The LOST data was collected for both treatment and control communities and grouped pre-casino and post-casino implementation, difference-in-difference. The data analysis and statistical software system, STATA, was utilized to organize, model, regress, and analyze LOST revenue for each case study (STATA). When analyzing a difference-in-difference regression, the linear regression equation itself is less explanatory than a review of the individual coefficients. The coefficients for each case study are as follows: *time*, *treated*, and *did*. *Time* is the expected mean change in LOST revenue from pre-casino to post-casino in the control community. *Treated* is the estimated mean difference in LOST revenue between the treatment and control communities in the pre-casino period. Finally, *did*, the difference-in-difference estimator, is the estimated mean difference in LOST revenue from pre-casino to post-casino periods between the two communities. Summing *treated* and *did* will result in the estimated mean difference in LOST revenue between treatment and control communities post-casino. Therefore, the discussion of findings will focus on coefficient analysis and their statistical significance. However, a review of the analysis of variance (ANOVA) statistics is necessary to determine the statistical significance, tested at the 95% confidence level, of the regression as a whole.

4.1 Region 1: Northwest Oklahoma

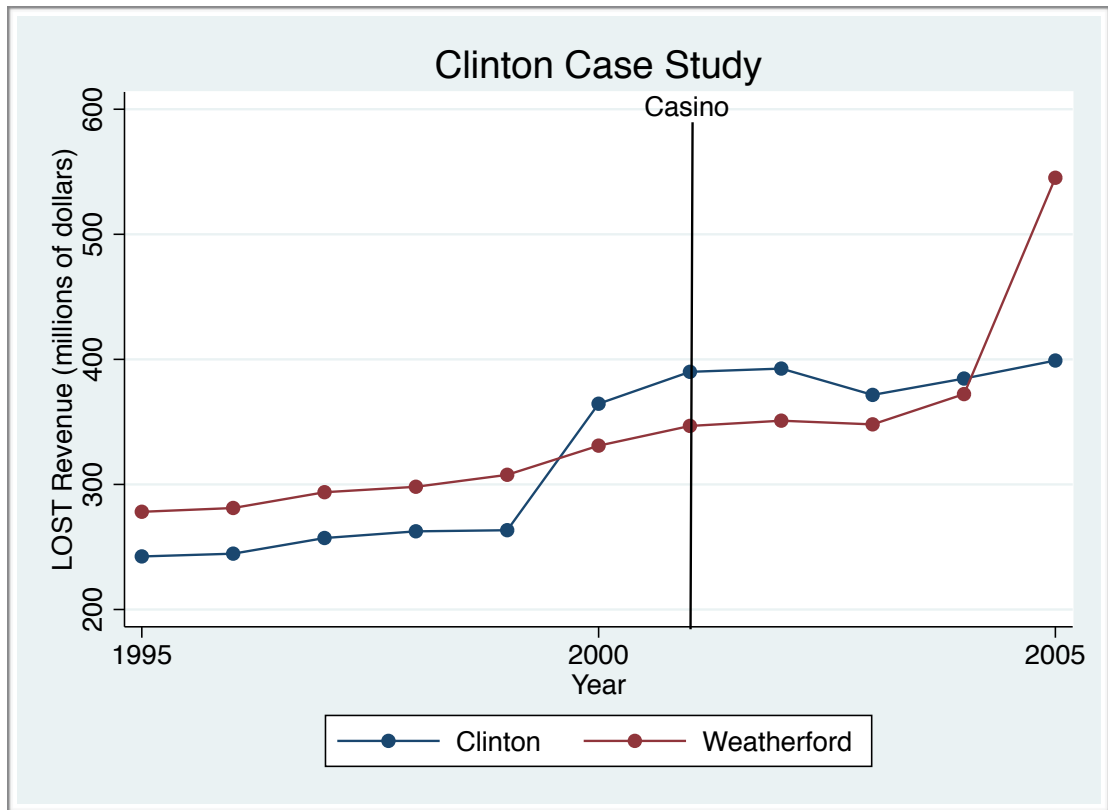
The Northwest region of Oklahoma is the most rural of the regions for this study. It is also home to the smallest area of tribal jurisdictional territory as a percentage of total area, with the fewest number of tribes, Cheyenne and Arapaho and Caddo. This region includes case studies concerning the communities of Clinton and Watonga, both located in Custer County. The Bureau of Economic Analysis (BEA) provides income statistics by county to determine regional growth over time, and economic conditions relative to the state and nation. The BEA statistics are beneficial for this study because they provide area trends without being skewed by the treatment measure, tax revenue. These statistics will be evaluated from the first year of the study, five years prior to the casino's opening, through the most recent available statistic. As of 2015, the per capita personal income (PCPI) for Custer County was \$39,014 compared to the 1996 measure of \$17,207, a 4.4 percent compound annual growth rate over the period (Bureau of Economic Analysis). This growth rate was nearly the same as that of the state, suggesting an average economy from 1996-2005, adjusted for the state's growth.

4.1.1 Case Study 1: Clinton

The urban case study for the Northwest Region focuses on Clinton as the treatment community and the Lucky Star Casino. Clinton is one of the largest communities in its region, with a population of 8,833 in the 2000 U.S. Census (USCensus Bureau). The Lucky Star Casino began operations in 2001. The control selected for Case Study 1 is Weatherford. This community was selected based on

similarities in local economies and population 9,859 in 2000 (US Census Bureau). The LOST revenues for both communities were collected from 1995 through 2005, and are presented in the Clinton Case Study graph with the casino implementation displayed by the vertical line for the year it opened.

Graph 4.1: LOST Revenue: Clinton Case Study



Regression analysis for the Clinton case study suggests that impacts from casino implementation can statistically significantly predict LOST revenue at the 99% confidence level (Prob.>F = 0.0002), above the required 95% level. Also, the regression can explain approximately 83% (Adjusted R-squared = 0.829) of the variability of LOST revenue, recommending the lack of any unnecessary coefficients. The independent variables for Clinton regression equation are the coefficients and the

dependent variable is LOST revenue. These ANOVA statistics indicate the significance of the Clinton regression model to predict the effect of a tribal casino's implementation on a non-Native community's LOST revenue.

Table 4.2: Linear Regression: Clinton Case Study

Linear regression		Number of obs	=	11		
		F(3, 7)	=	32.64		
		Prob > F	=	0.0002		
		R-squared	=	0.8808		
		Root MSE	=	1.3686		
year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	14.42931	21.15142	0.68	0.517	-35.58585	64.44447
treated	1.53e-07	2.48e-08	6.14	0.000	9.38e-08	2.11e-07
did	-7.48e-08	5.85e-08	-1.28	0.241	-2.13e-07	6.34e-08
_cons	1958.258	6.240348	313.81	0.000	1943.502	1973.014

Analysis of the DID coefficients provide greater explanation of the impact of casino implementation on both treatment and control community LOST revenues before and after opening. The *time* provides an increase in revenue for the control community from the pre-casino phase to post-casino, the coefficient is not statistically significant ($P > |t| = 0.517$) and can vary on the interval of -35.59 to 64.44. *Treated*, the difference between treatment and control communities before the intervention, is statistically significant ($P > |t| = 0.000$). While the *did* coefficient ($-7.48e^{-8}$) was only significant at the 75% confidence level; therefore, not meeting the t-test of 95% confidence. Even when considering the range of the 95% Confidence Interval provided in the analysis, the coefficient for *did* is so minuscule in relation to the

regression, it plays no effect on the outcome of the dependent variable. Therefore, the implementation of a tribal casino in an urban community in the Northwest Region of Oklahoma has no impact on the LOST revenue realized in the non-Native community for which it is located.

4.1.2 Case Study Watonga

The Lucky Star Casino in Watonga, with a population of 5,111 in the 2010 census, was the treatment community that best fit the selection criteria for this case study (CENSUS FIX). Opened in 2004, it is owned and operated by the Cheyenne and Arapaho Tribes of Oklahoma. Kingfisher was selected as the control community, meeting the comparison criteria for Watonga. Although the community was three times the size of Watonga, a population of 15,034, both are located at the intersection of two highways (CENSUS FIX). This factor ensures the ease of access to the two communities are relatively similar. While Watonga and Kingfisher result in a sufficient match anecdotally, other criteria create biases that may negatively impact results of a difference-in-difference study.

Due to a number of factors influencing local economies in rural Northwestern Oklahoma, this region does not have any sufficient rural treatment and control communities that can be analyzed using this study's criteria. Limited use of local options sales tax policies in designated communities reduces the number of eligible communities as case studies. Also, the clustering of gaming facilities surrounding the Weatherford micropolitan area results in statistical biases that would affect the impact of a local casino treatment on a community's economy. It appears the facilities are

clustered due to low population density in the jurisdictional area. For this reason, it was not possible to determine other communities as the result of this clustering. However, because the homogeneity of population, geographic variation, and economic features within the Northwest region of Oklahoma, especially among the tribal jurisdictional territories, the Clinton case study can be utilized as a baseline for analysis of the economic impact of tribal gaming for the entire region.

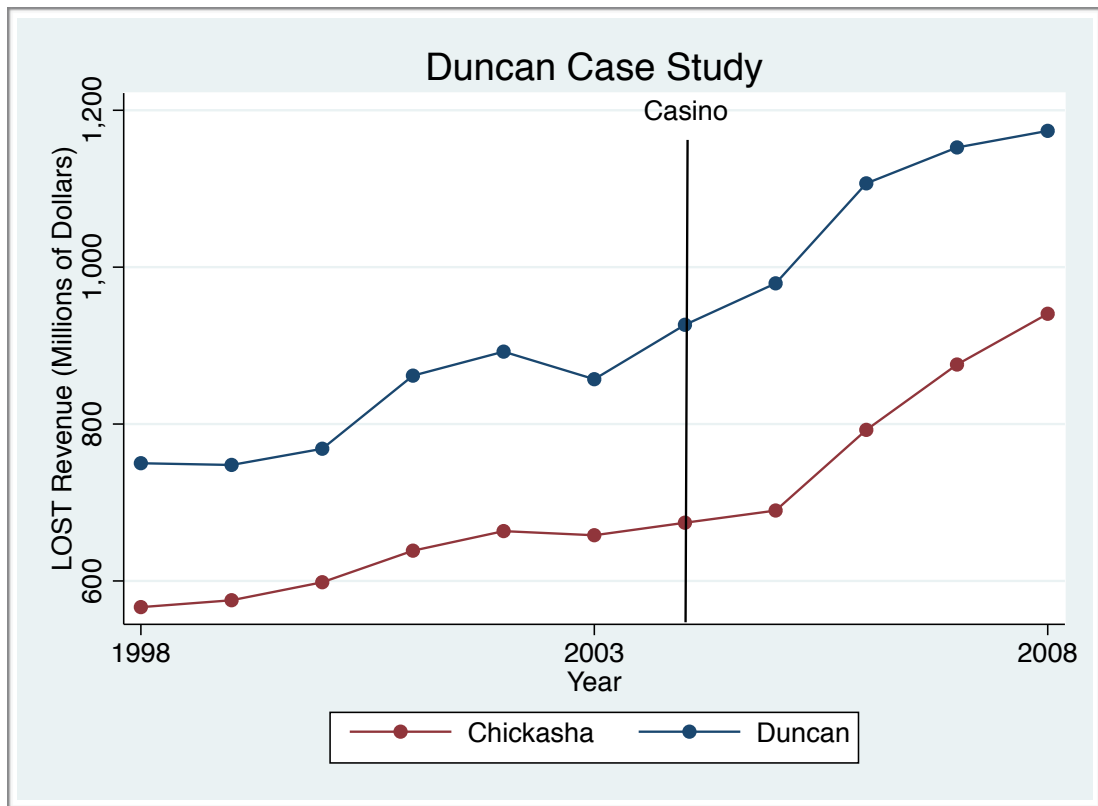
4.2 Region 2: Southwest Oklahoma

The Southwest Region of Oklahoma is home to the Lawton metropolitan area, containing a major military base, Fort Sill, that impacts the regional economy. Duncan and Elgin were selected as the case study communities for this region. Duncan is located in Stephens County, with a 2015 PCPI of \$46,750, an improvement on the state average of \$1,177 (Bureau of Economic Analysis). The county's annual growth of 5.0 percent the state average over the ten-year timeframe which suggests a growing economy. Elgin, the rural case study for region 2, is located in Comanche county. It's compound annual growth rate of 3.0 percent was nearly one- percentage point lower than the state average from 2005-2015 (Bureau of Economic Analysis). Comanche County's economy experienced a contraction relative to Oklahoma. Both counties in the Southwest suffered a downturn in per capita income in the last year of the BEA regional analysis.

4.2.1 Case Study 3: Duncan

Duncan was selected for the Southwest Region's urban case study for tribal casino impacts. It is the Chisholm Trail Casino, owned and operated by the Chickasaw Nation since its implementation in 2004. Duncan had a population of 22,505 in 2000 Census (US Census Bureau). This can be compared to the population of 15,850 in the control community of Chickasha (US Census Bureau). While these populations varied by about 7,000 citizens, their economies moved similarly during the observation period on 1998 to 2008. The LOST revenue data for both communities are charted on the above graph.

Graph 4.3: LOST Revenue: Duncan Case Study



The Duncan case study analysis is not statistically significant at the regression level. This insignificance is most likely the result of LOST revenues that moved non-linearly during the observation period. The limitations of the data, only 11 observations, can account for the statistical insignificance. Also, there are few degrees of freedom in this regression, effecting the model's significance. However, about 94% of the of the variability of the coefficients, Adjusted R-squared, are explained by LOST revenue for this study.

Table 4.4: Linear Regression: Duncan Case Study

Linear regression		Number of obs	=	11		
		F(2, 7)	=	.		
		Prob > F	=	.		
		R-squared	=	0.9582		
		Root MSE	=	.81041		
year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	11.31269	5.257251	2.15	0.068	-1.118731	23.74411
treatment	2.55e-08	6.27e-09	4.07	0.005	1.07e-08	4.04e-08
did	-1.15e-08	6.49e-09	-1.78	0.119	-2.69e-08	3.81e-09
_cons	1979.744	4.985237	397.12	0.000	1967.956	1991.532

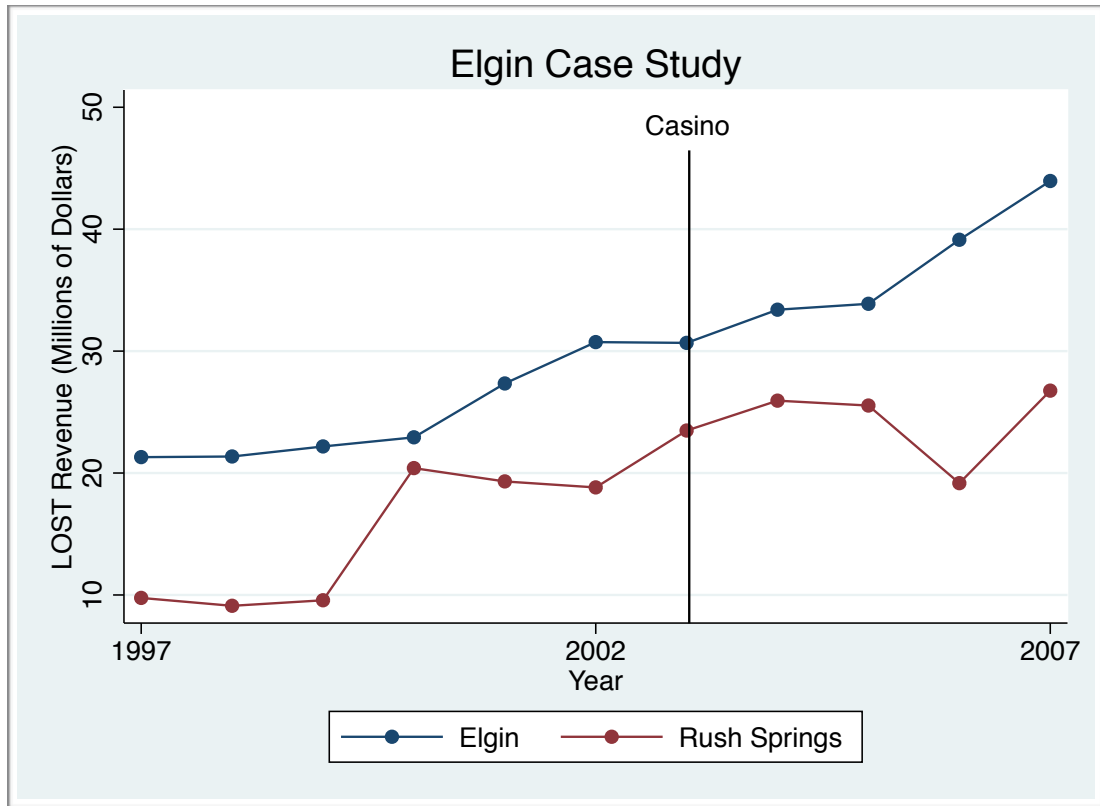
Although the regression itself was not significant, the coefficients can be reviewed to determine their correlation to tribal casinos and LOST revenues for urban communities in this region. Of the coefficients, *treated*, the mean difference of treatment and control communities before intervention, was significant at the 95% level. This coefficient implies LOST revenues increase by $2.55e^{-8}$ for treatment communities prior to casino implementation. With *time* significant at the 90% and *did* at the 85% levels. The estimated mean difference in LOST revenue between urban

treatment and control communities for the Southwest Region is $1.4e^{-8}$ greater in treatment than control communities.

4.2.2 Case Study 4: Elgin

The rural treatment community for the Southwest Region of Oklahoma was determined to be Elgin based on the selection criteria explained in a previous chapter. The Comanche Spur Casino, established in 2003, is owned by the Comanche Nation of Oklahoma. Elgin, population 1,210, is located on I-44 between Oklahoma City and Lawton (US Census Bureau). The control community being compared to Elgin was selected according to economic output and population comparisons. For this region, Rush Springs met the criteria. According to the 2000 Census, Rush Springs had a population of 1,278 (US Census Bureau). The Elgin Case Study graph displays the LOST data for the 1997 to 2007 period assessed in this case study.

Graph 4.5: LOST Revenue: Elgin Case Study



The linear regression for rural communities in this region is statistically significant at the 95% confidence level (Prob.>F=0.000). Also, LOST revenue encompasses 95% of the variability from the coefficients in the regression. Therefore, the model generated by the observed data can predict the level of tax revenue impacted by casino implementation. While the ANOVA statistics suggest significance of this regression, a review of the individual coefficients is required to determine the effect of tribal casinos on non-Native communities' ability to collect tax revenue.

Table 4.6: Linear Regression: Elgin Case Study

Linear regression		Number of obs	=	11		
		F(3, 7)	=	116.76		
		Prob > F	=	0.0000		
		R-squared	=	0.9663		
		Root MSE	=	.72798		
year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	5.817268	2.595683	2.24	0.060	-.3205485	11.95508
treated	4.41e-07	7.66e-08	5.75	0.001	2.60e-07	6.22e-07
did	-1.54e-07	8.52e-08	-1.80	0.114	-3.55e-07	4.78e-08
_cons	1988.786	2.133504	932.17	0.000	1983.741	1993.831

Of the three impact coefficients, the constant provided for the regression model does little to explain the effects of casino implementation, *treated* is the only one significant at the 95% confidence level. While, *time* narrowly fail the t-test, with a $(P > |t| = 0.060)$. The negative *did* coefficient implies the introduction of a tribal casino has an adverse effect on the level of LOST revenue collected in its community relative to a community without the treatment effect. However, throughout the 95% Confidence Interval $(-3.55e^{-7}$ to $4.78e^{-8})$, the coefficient is so insignificant mathematically, that the regression implies casinos have no impact on the level of LOST data collected in a rural Southwestern Oklahoma community.

4.3 Region 3: Central Oklahoma

The Central Region of Oklahoma is home to the state’s capital and largest metropolitan area, Oklahoma City. The region’s economy includes the government, financial, and energy sectors. The economy is also impacted by several institutions of

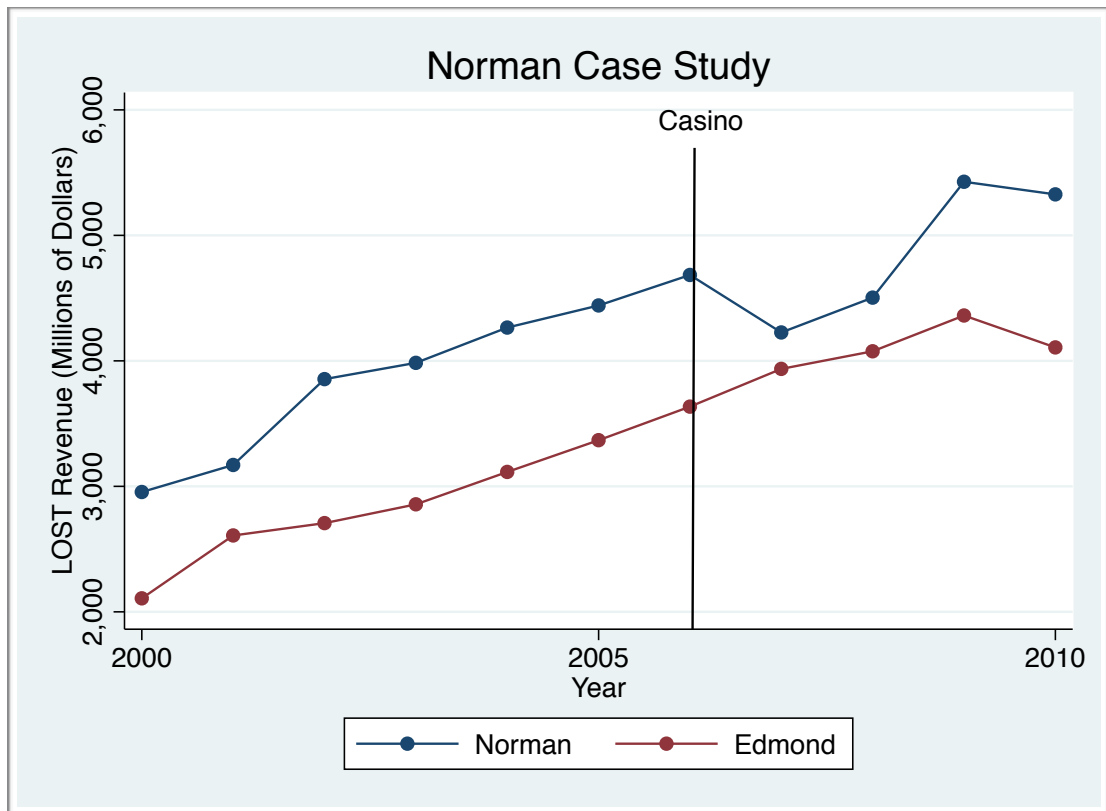
higher education, major professional athletic organizations, and Tinker Air Force Base, sectors unique to this region. Case studies were selected in Norman and Harrah for Central Oklahoma. Norman is located in Cleveland County which realized per capita personal income of \$42,716 in 2015, below the state average (Bureau of Economic Analysis)). The county growth rate, over the fourteen- year period, was 3.8 percent (Bureau of Economic Analysis). Harrah is a rural community located in Oklahoma County. The PCPI for the county was \$49,304 in 2015, greater than the state and national average (Bureau of Economic Analysis). While these indicators suggest county trends, they may not be representative of the case study economies because Norman is an urban community in a rural county and Harrah is a rural community in an urban county.

4.3.1 Case Study 5: Norman

Many economic factor play a role in urban communities in the Central Oklahoma Region. This is the result of several communities being located near each other, a common phenomenon for metropolitan areas. Despite this hurdle to regression analysis, Norman was selected as the urban treatment community and Edmond the control for Region 3. The population of Norman in the 2000 Census was recorded at 95,694 residents (US Census Bureau). The community experienced the implementation of Riverwind Casino in 2006. Riverwind is the most urban casino operated by the Chickasaw Nation. The control community, Edmond, with a 2000 population of 68,315, was selected based on its similarities to Norman. Both are affluent suburbs of Oklahoma City containing large research higher education

institutions. Although the University of Oklahoma plays a greater role than the University of Central Oklahoma in its local economy, Chesapeake Energy impacts the economy of Edmond. Both communities' LOST data are displayed graphically in the Norman Case Study graph.

Graph 4.7: LOST Revenue: Norman Case Study



Regression analysis of the Norman case study determined the model to be statistically insignificant over the 2000 to 2010 timeframe. Although, the Adjusted R-squared of 0.947 proposes the dependent variable explains the majority of the variability in the independent variables. This may have been the result of variability in the LOST revenue collected in Norman. The revenues experienced large volatility from 2006, the year the casino was implemented, until 2009, then leveling off again

in 2010. During the observation period, Edmond experienced linear revenue growth from option sales taxes. While the graph of LOST revenues may point to a casino effect playing an impact on Norman’s revenue, a look at the model coefficients is necessary before determining any implications.

Table 4.8: Linear Regression Norman Case Study

Linear regression		Number of obs	=	11
		F(1, 7)	=	.
		Prob > F	=	.
		R-squared	=	0.9521
		Root MSE	=	.86731

year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	6.08624	3.786313	1.61	0.152	-2.866967	15.03945
treated	3.06e-09	2.74e-10	11.17	0.000	2.41e-09	3.71e-09
did	-7.89e-10	7.79e-10	-1.01	0.345	-2.63e-09	1.05e-09
_cons	1990.943	.9922188	2006.56	0.000	1988.596	1993.289

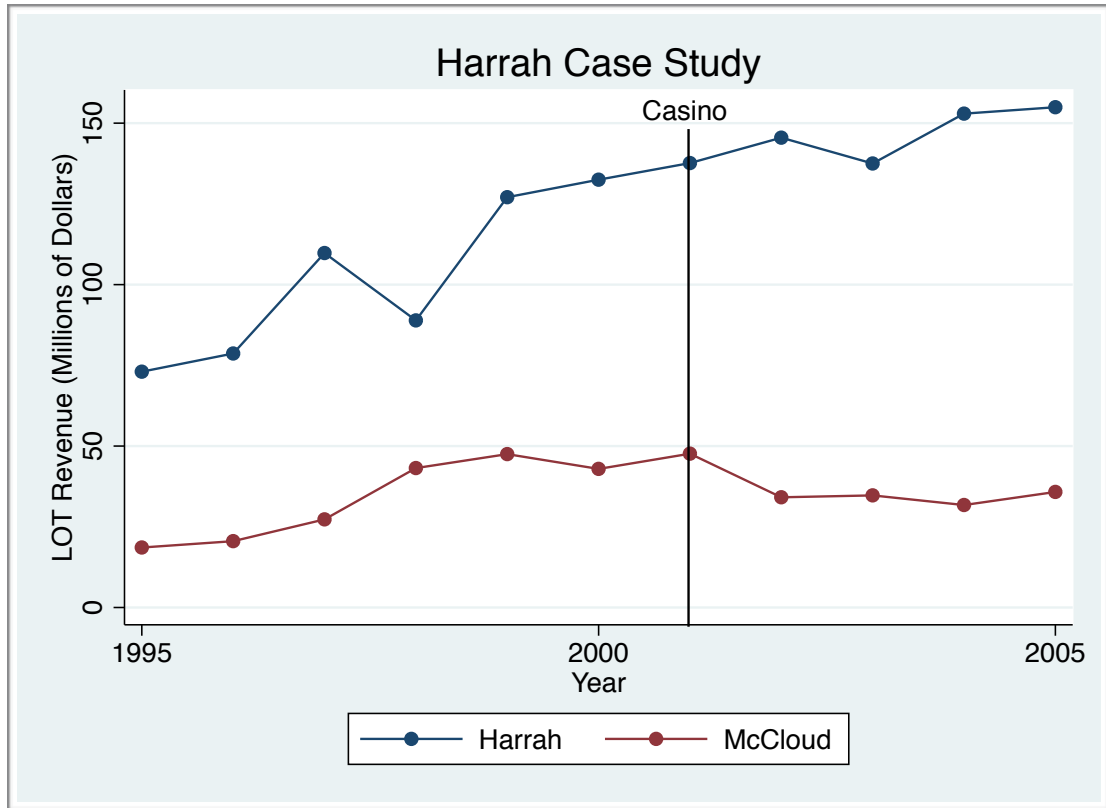
Coefficient analysis determined only *treated* passed at the 95% confidence level. *Time*, the mean difference from pre-casino to post-casino for a community without a casino improved by a coefficient of 6.086; however, only passes a confidence test at the 80% level. The *did* coefficient is not statistically significant above the 65% level. Although *did* is not significant, the sum of *treated* and *did* ($2.27e^{-9}$) is not large enough to effect tax revenue experienced in a treatment community relative to a control after the casino implementation. Therefore, the establishment of a casino in an urban community in the Central Region of Oklahoma has little impact on the generation of LOST revenue in that community relative to an

urban community without a casino.

4.3.2 Case Study 6: Harrah

Harrah was selected as the rural case study for the Central Region of Oklahoma. The community is home to Kickapoo Casino Harrah. It was opened in 2001 and is operated by the Kickapoo Tribe of Oklahoma. In 2000, Harrah experienced a population of 4,719 (US Census Bureau). Much like the urban case study, the rural areas in this region are a tight disbursement of communities that are impacted, economically, by the metropolitan economy as a whole. As a control, McCloud was determined to meet the criteria for rural Central Oklahoma, with an estimated population of 4,587 in 2015 (US Census Bureau). The LOST revenues for both communities are displayed on the Harrah case study graph. While it is evident the tax rates are higher in Harrah, the tax revenues in McCloud provide an adequate baseline for the purpose of a difference-in-difference comparison.

Graph 4.9: LOST Revenue: Harrah Case Study



Regression analysis for the Harrah case study suggests that impacts from casino implementation statistically significantly predict LOST revenue at the 95% confidence level with a $\text{Prob.}>F = 0.0000$. The Adjusted R-squares, the percentage of LOST revenue that can be explained by casino implementation, is 0.909. This implies the significance of the regression model despite Harrah's tax revenue volatility prior to the casino's establishment in 2001. The ANOVA statistics confirm coefficients of the regression, taken together, are good predictors of casino impacts in the rural communities of the Central Oklahoma region.

Table 4.10: Linear Regression: Harrah Case Study

Linear regression		Number of obs	=	11		
		F(3, 7)	=	50.25		
		Prob > F	=	0.0000		
		R-squared	=	0.9369		
		Root MSE	=	.99609		
year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	-10.43362	9.304771	-1.12	0.299	-32.43591	11.56867
treated	6.64e-08	1.17e-08	5.68	0.001	3.88e-08	9.41e-08
did	8.93e-08	6.23e-08	1.43	0.195	-5.80e-08	2.37e-07
_cons	1990.745	1.362803	1460.77	0.000	1987.523	1993.968

A further assessment of the model's independent variables can determine the confidence and impacts of the coefficients, independently. Of the coefficients holding implications for this study: *time*, *treated*, and *did*, only *treated* was significant at the 95 confidence level ($P > |t| = 0.001$). Only at the 80% level is *did* significant, while the coefficient is interpreted to have a positive impact on a treatment community tax revenue, relative to a control after the casino had been introduced. *Time* suggests the mean change in tax revenue is lower in the period following a casino's implementation for a community without a casino; however, *time* is not significant above the 70% level according to the t-test ($P > |t| = 0.299$). The mean difference in LOST revenue collected for a treatment is greater than a control community after the establishment of a casino by the coefficient of $15.57e^{-8}$, not nearly significant enough, mathematically, to hold an impact on local sales tax revenues for rural communities in Central Oklahoma.

4.4 Region 4: Northeast Oklahoma

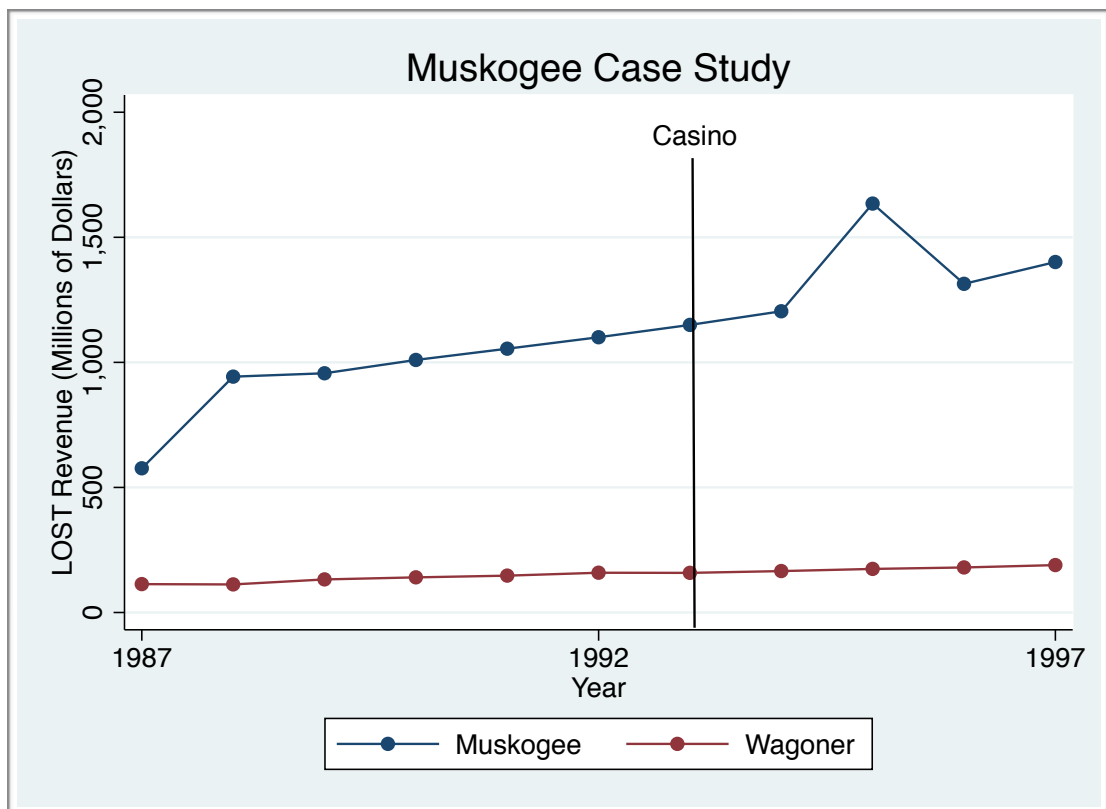
The Northeast Region of Oklahoma, home of the Tulsa metropolitan area, is predominately comprised of the Muscogee (Creek), Cherokee, and Osage tribal jurisdictional areas. The economy of this region, while smaller, is urban and centers on the financial and energy industries. Case studies for Northeastern Oklahoma were selected in Muskogee and Pawnee. Muskogee County, location of the town of Muskogee, experienced a per capita personal income of \$11,814 in 1988 and increased to \$33,990 by 2015, a growth rate of 4.0 percent (Bureau of Economic Analysis). The 4.0 percent rate of Muskogee County, narrowly lagged behind with the state's growth rate of 4.4 percent. Pawnee County's growth rate of 4.0 percent kept pace with the larger state's economy of 3.9 percent over the same range (Bureau of Economic Analysis). The economies of the Northeast's case studies mirrored that of Oklahoma for their given timeframes.

4.4.1 Case Study 7: Muskogee

The urban community selected for the Northeastern Region of this study was Muskogee. This community was selected over the Tulsa metropolitan area because of the regression bias of multiple casinos that area. Two of the state's largest casinos, River Spirit and Hard Rock are minutes apart. Also, it was difficult to select an urban control community for this region. A control could not be selected from the Tulsa area because of the casino bias, and there are few communities outside of the metropolitan area of the size of Muskogee without a casino of its own. Despite, the challenges, Wagoner was determined to be the best control for this case study. Muskogee, the

location of Creek Nation Casino Muskogee opened in 1993, had a population of 38,310 in 2000 (US Census Bureau). This can be compared to Wagoner's 7,669 citizens in the same year (US Census Bureau). While this is a large discrepancy in population, the communities experience similar economies, largely based on seasonal tourism. Their tax revenues, displayed in the Muskogee Case Study graph, are proportional to their bases, which proves beneficial for this comparison analysis.

Graph 4.11: LOST Revenue: Muskogee Case Study



Linear regression analysis of variance for this urban community case study, spanning from 1987 through 1997 to include pre-casino and post-casino periods, confidently predict tax revenue at the 95% level, with a Prob.>F= 0.0005. While the regression model was determined to be significant, the Adjusted R-squared is equal to

0.8430 implies LOST revenue can only explain 84% of the variance in the independent variables. Despite this variance, the urban Northeastern Oklahoma model can significantly predict LOST revenue for communities with and without casinos in periods before and after their introduction.

Table 4.12: Linear Regression: Muskogee Case Study

Linear regression		Number of obs	=	11		
		F(3, 7)	=	22.87		
		Prob > F	=	0.0005		
		R-squared	=	0.8901		
		Root MSE	=	1.3139		
year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	7.898465	5.372286	1.47	0.185	-4.804973	20.6019
treated	8.54e-09	2.07e-09	4.12	0.004	3.63e-09	1.34e-08
did	-4.34e-09	4.36e-09	-1.00	0.353	-1.47e-08	5.97e-09
_cons	1981.474	1.917615	1033.30	0.000	1976.94	1986.009

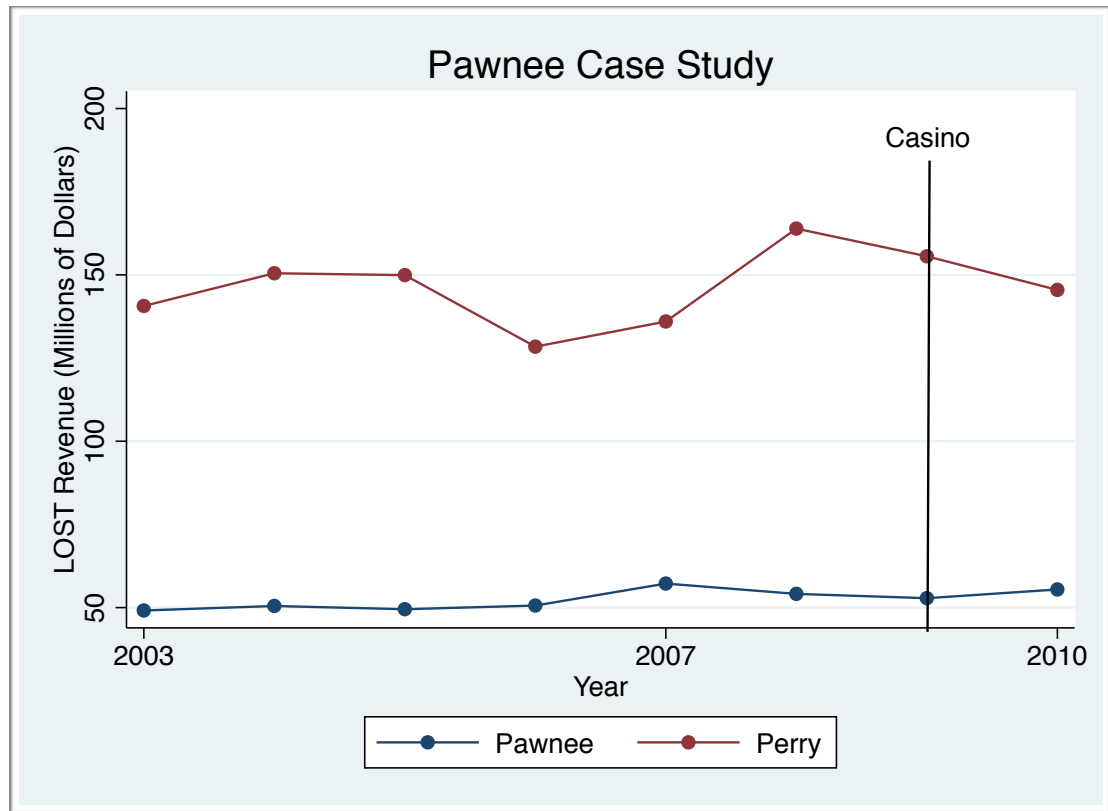
The t-testing of the linear model's coefficients results in only the *treated*'s significance at the 95 % level. This figure, $8.54e^{-9}$, implies there is almost no difference in tax revenue realized in treatment and control communities prior to a casino intervention, all else being equal. *Time* infers local tax revenues increase over time without the addition of a casino intervention. The *did* coefficient, while not being statistically significant, is also near zero, indicating there is no mean change in outcomes between the two communities after the intervention. Taken together, *treated* plus *did*, reduces the impact to of a casino on tax revenue from $8.54e^{-9}$ to $4.24e^{-9}$. Therefore, the establishment of a casino in an urban community located in the

Northeast Region of Oklahoma does not affect the collection of LOST revenue negatively nor positively.

4.4.2 Case Study 8: Pawnee

For rural case study in the Northeast Region, Pawnee was selected based on the methodological selection criteria. Pawnee is home to StoneWolf Casino, opened in 2009, operated by the Pawnee Nation of Oklahoma. Pawnee is located at the intersection of Highway 64 and Oklahoma Highway 18. The community had a 2010 population of 2,196 (US Census Bureau). As a baseline, Perry was determined to be the best rural control community for this region as the result of location. The control is located at the intersection of Highway 64 and Oklahoma Highway 86. The 2010 population of Perry was 5,126 (US Census Bureau).

Graph 4.13: LOST Revenue: Pawnee Case Study



There were issues with the collection of data for this case study. Because StoneWolf Casino is relatively new, LOST revenue is not available for years after 2010. This results in only one data point for the post-casino period. Also, the revenues in the control community of Perry experienced a large amount of variance in the pre-casino period, although the revenues in Pawnee seem to behave linearly. For these reasons, the linear regression model was not statistically significant. However, the Adjusted R-squared infers 77% of the variance in casino impacts can be explained by realized LOST revenues.

Table 4.14: Linear Regression: Pawnee Case Study

Linear regression		Number of obs	=	8		
		F(1, 4)	=	.		
		Prob > F	=	.		
		R-squared	=	0.8371		
		Root MSE	=	1.3077		
year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	7.238868	10.72856	0.67	0.537	-22.5484	37.02613
treated	4.61e-07	2.08e-07	2.21	0.091	-1.17e-07	1.04e-06
did	-7.93e-08	2.08e-07	-0.38	0.723	-6.57e-07	4.99e-07
_cons	1981.628	10.72856	184.71	0.000	1951.841	2011.415

As can be expected for a regression with too few input to be statistically significant, the three difference-in-difference figures are not statistically significant at the 95% confidence level. Although they are not significant, the coefficients still hold explanatory value for the interaction between tribal gaming facilities and local sales taxes revenues for this case study. The *time* figure indicates revenues increase overtime for communities without casinos by the coefficient of 7.239. Tax revenues prior to the casino intervention are higher in treatment communities by a factor of $4.61e^{-7}$; therefore, revenues are essentially the same regardless of community type. Similarly, the difference in revenues from treatment to control communities, $-7.93e^{-8}$, are negligible in the post-casino period. Finally, although the data set was incomplete, causing a statistically insignificant model, the coefficients imply tribal casino's hold no impact on the generation of LOST revenue for rural communities in the Northeastern Region of Oklahoma.

4.5 Region 5: Southeast Oklahoma

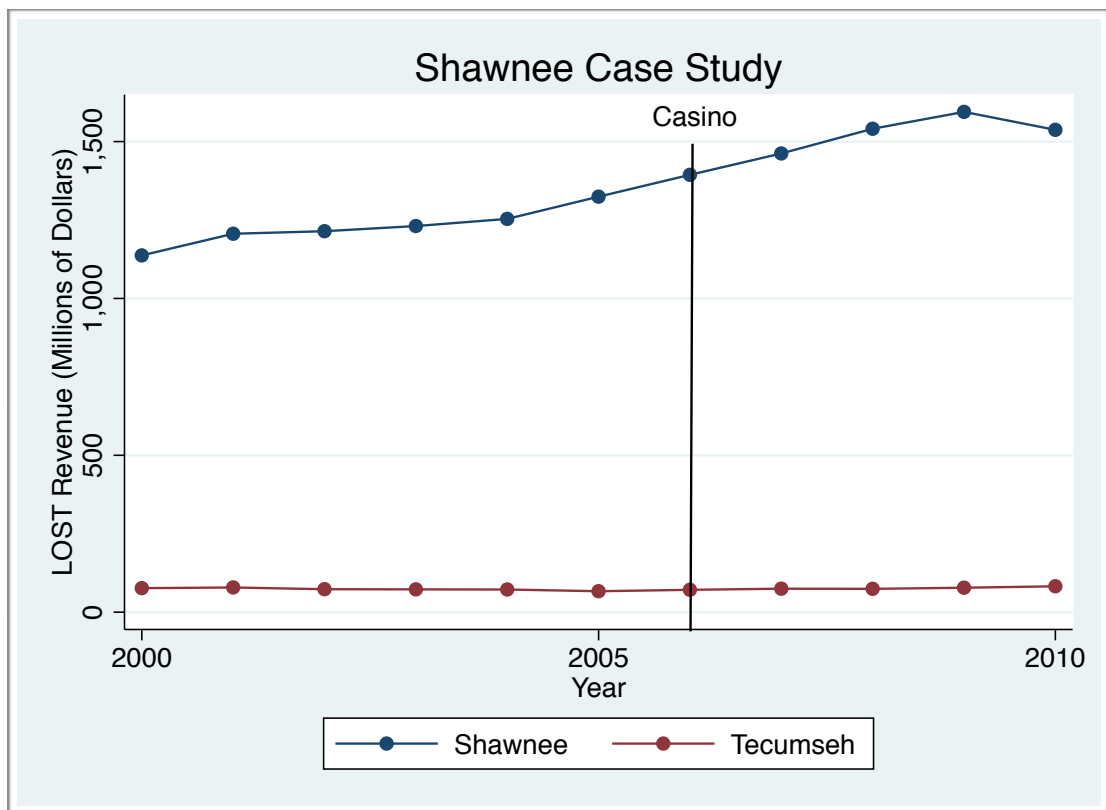
The Southeast Region of Oklahoma is primarily comprised of rural communities, which is thought to have an impact on the regional economy. The tribal jurisdictional area is primarily dominated by the Chickasaw Nation to the region's west and Choctaw Nation to the east. For the Southeast, case studies were chosen for Shawnee, urban, and Pocola, rural. Shawnee is located in Pottawatomie County. The per capita personal income for Pottawatomie County was \$20,798 in 2001, experiencing a 4.0 percent growth rate during the fourteen-year time span when it realized a PCPI of \$35,999 (Bureau of Economic Analysis). The county's compound annual growth rate narrowly lagged Oklahoma's rate of 4.2 percent from 2001 to 2015. The rural community selected for this study, Pocola, is located in Le Flore County. Le Flore witnessed a CAGR of 4.0 percent from 1989 until 2015 (Bureau of Economic Analysis). Oklahoma's PCPI growth rate of 4.2 over the same period suggests the Southeastern Region's economy behaved homogeneously from urban to rural and grew at a pace slower than that of the state's.

4.5.1 Case Study 9: Shawnee

The treatment community for the Southeast Region of Oklahoma was determined to be Shawnee. Shawnee had a population of 28,692 in the 2000 Census (US Census Bureau). It is the location of the Grand Casino, opened in 2006 and operated by the Citizen Potawatomi Nation. The control community for this case study is Tecumseh. This community had a population of 6,098 in 2000 (US Census Bureau). Although the two communities vary greatly in population, they have similar

location variables, both being located at the intersection of major highway. Also, both treatment and control communities would receive similar metropolitan effect bias, being located just outside of the Oklahoma City metropolitan area. While the total collected local sales taxes differ greatly from one community to the other, an effect of population, the revenues behave similarly, key to the difference-in-difference study.

Graph 4.15: LOST Revenue: Shawnee Case Study



Regression analysis of the Shawnee case study determined the model to be statistically insignificant over the 1988 to 1998 timeframe. During this observation period, Tecumseh experienced minimal revenue growth from option sales taxes, while Shawnee had ever increasing revenue growth. The metropolitan economic bias may have affected the significance of this model. However, the Adjusted R-squared of

0.955 proposes the dependent variable explains the majority of the variability in the independent variables. While the graph of LOST revenues suggest linear revenue growth in each community, a look at the model's analysis of variance concluded the model's insignificance.

Table 4.16: Linear Regression: Shawnee Case Study

Linear regression		Number of obs	=	11
		F(1, 7)	=	.
		Prob > F	=	.
		R-squared	=	0.9595
		Root MSE	=	.79792

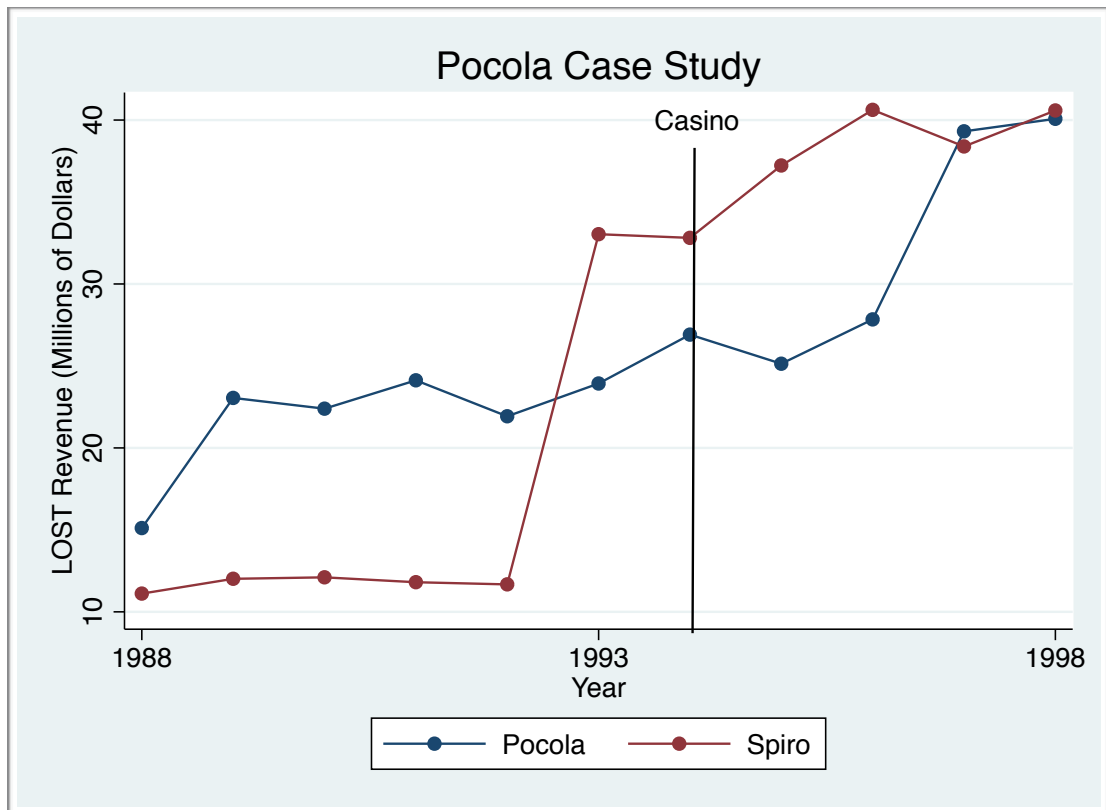
year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	15.37268	6.073523	2.53	0.039	1.01108	29.73428
treated	2.90e-08	2.77e-09	10.48	0.000	2.25e-08	3.56e-08
did	-1.19e-08	4.53e-09	-2.63	0.034	-2.26e-08	-1.20e-09
_cons	1966.882	3.380301	581.87	0.000	1958.888	1974.875

Of the difference-in-difference coefficients, *treated* was the only one to pass the 95% confidence test. This implies the difference in LOST revenue collected, prior to the casino's opening, was not different between casino and non-casino communities, a factor of $2.90e^{-8}$. The mean difference in revenue collected in a casino community from pre-casino to post-casino decreased by $1.19e^{-8}$, a mathematically insignificant figure. Finally, the mean difference in revenue increased in casino communities, relative to non-casino communities by a factor of $1.71e^{-8}$. This factor is not meaningfully different than zero, implying there is no net effect on LOST revenue for urban communities in Southeastern Oklahoma.

4.5.2 Case Study 10: Pocola

The rural treatment community for the Southeastern Region was designated to be Pocola based on criteria. Pocola is located south of Interstate 40 on the Oklahoma-Arkansas boarder. The 2000 population of Pocola was 3,994 according to the Census (US Census Bureau). Since 1994, it is home to the Choctaw Casino Pocola. The control community for this case study is Spiro, located near the Arkansas board on Highway 271. Spiro has a 2000 Census population of 2,227 (US Census Bureau). LOST revenues for both communities were volatile, did not move linearly, for the observation period surrounding the casino's establishment, 1988 through 1998.

Graph 4.17: LOST Revenue: Pocola Case Study



Linear regression analysis of variance for this urban community case study, spanning from 198 through 1998, confidently predict tax revenue at the 95% level, with a Prob.>F= 0.0000. The Adjusted R-squared equals 0.8788 implies LOST revenue can only explain 88% of the variance in the difference-in-difference variables. Despite this unpredictability in variance, the model can predict LOST revenue for rural communities in Southeastern Oklahoma. While the model as a whole is significant, the individual coefficients are of more interest, given they hold greater explanatory value in the impact of tribal casinos on tax revenue for non-Native communities.

Table 4.18: Linear Regression: Pocola Case Study

Linear regression		Number of obs	=	11		
		F(3, 7)	=	103.93		
		Prob > F	=	0.0000		
		R-squared	=	0.9152		
		Root MSE	=	1.1542		
year	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
time	4.606509	2.142703	2.15	0.069	-.4601792	9.673198
treated	2.89e-07	7.77e-08	3.71	0.008	1.05e-07	4.73e-07
did	-5.79e-08	9.16e-08	-0.63	0.548	-2.75e-07	1.59e-07
_cons	1983.844	1.253415	1582.75	0.000	1980.88	1986.808

The *treated* figure is the only coefficient among the three hallmark factors in this difference-in-difference model that holds significance at the 95% confidence level. Time is not significant above 94% and did fails the t-test 46%. The *time* coefficient indicates tax revenue increase from pre-casino to post-casino for control communities by a factor of 4.6065. *Did*, the mean difference in revenue from pre- to

post- casino in the treatment community, points to a decrease in tax revenue by a factor of $5.79e^{-8}$. Finally, the difference-in-differences, *treated* plus *did* signifies an increase in revenue from control to treatment communities in the post-casino period, by a factor of $2.31e^{-7}$. Both the *treated* and *did* coefficients are so small that their impacts on revenue are negligible. Therefore, for rural communities in Southeastern Oklahoma, the implementation of a tribal casino has no impact on a non-Native community's ability to collect local options sales tax revenue.

Chapter 5: Conclusion

Tribal casino impacts on a non-Native community's economy in Oklahoma are not implicitly understood, resulting from gaps in literature concerning gaming in tribal jurisdictional areas. This lack of knowledge holds political and economic implications in the state, especially during a time where Oklahoma is experiencing annual budget shortfalls. Reviewed studies indicate tribal gaming has differing impacts based on community size (urban or rural) and composition (Native or non-Native.) Concerning Native communities, tribal gaming has a stronger positive impact on rural economies relative to urban Native communities. This trend is a result of under performing, less diversified economies in scarcely populated regions of reservations. Casinos in these areas can be considered to 'import' revenue from other regions. For urban Native communities, casinos have a smaller impact because of the robustness of the local economy. Tribal gaming studies regarding non-Native communities often measure social impacts. While in some instances crime rose from the increase in patronization of a given community, those negative impacts were countered by an increase in social services, as dictated by IGRA. A review of literature determined tribal contributions to education, health, and administrative services are most commonly experienced in the areas surrounding the casino's location. While the review of literature was beneficial in creating a base of knowledge regarding tribal gaming impacts and creating a framework for developing a methodology for this study, it confirmed the lack of research on economic impacts of casinos on non-Native communities.

The focus of this study was to create a methodology that accurately assessed the impact of tribal gaming on the various micro-economies in Oklahoma. Because of the variation in local economic composition and tribal governance, this study divided the state into five regions. Within those regions, two case study communities were assessed, urban and rural, to account for any variation in impacts based on the size of a local economy. Economic impacts were measured by comparing local option sales tax revenues in communities that experienced the addition of a tribal casino to those of similar communities without the injection. Ten case studies were selected based on community characteristic criteria. Of the ten cases, the study could perform difference-in-difference analysis on nine of the communities. Among the nine, complete data sets were compiled for eight cases. The economic impacts were measured in two periods, pre-casino and post-casino, for both the treatment and control communities.

For the nine case studies that were regressed, the null hypothesis stating tribal casinos do not impact local option sales tax revenue was not rejected in four communities: Duncan, Norman, Pawnee, and Shawnee. Each of those communities except Pawnee were designated urban for their given region. In the case of Pawnee, LOST data after 2010 had not been made available, offering little explanatory value in the post-casino period. This contributed to the case study's insignificance. However, among the other case studies that could not reject the null hypotheses, a trend occurred based on community size. It appears that tribal casinos have no impact

on local sales taxes in urban communities, while the impacts in rural communities are statistically significant.

Of the two urban case studies that were able to reject the null hypothesis, Clinton and Muskogee, variables may have affected the communities that led them to behave similar to the rural case studies. Clinton, located in the Northwest Region of Oklahoma, is the most scarcely populated region in the state, with a population similar to many rural communities in other regions. This leads to a smaller local economy, which is more susceptible to external shocks. As a result, the impacts of a casino implementation statistically significantly affected sales tax revenues in this case. Regression analysis for Muskogee, a typical urban community for Oklahoma, rejected the null hypothesis that a tribal casino has no effects local sales tax revenue. Further research on this case study, specifically, is necessary to determine the cause of the regression's significance. However, anecdotally, location bias may have influenced this case. Although, Muskogee is an urban community, its proximity to the Tulsa metropolitan area could lead the local economy to behave like a rural community. Regardless of the Clinton and Muskogee case outliers, this study determines tribal casinos do not statistically significantly impact local option sales tax revenue for urban communities in Oklahoma.

The difference-in-difference analysis of rural communities in Oklahoma, regardless of region, indicated tribal casinos statistically significantly influenced LOST revenues for non-Native communities. These communities include Elgin, Harrah, and Pocola. To determine the extent of the impact, a review of the regression

coefficients is required. The *treated* and *did* hold explanatory value for each case study. *Treated* represents the mean difference in LOST revenue between the treatment and control communities in the pre-casino period, establishing a baseline for tax revenue variance. *Did* is the estimated mean difference in tax revenue from pre-casino to post-casino periods for the treatment community. The sum of *treated* and *did* creates the estimated mean difference in LOST revenue between treatment and control communities post-casino.

Despite their statistical significance, the DID coefficients explain the level of impact the selected casino had on tax revenue for each case study. For each of the communities that failed to reject the null hypothesis, the *treated* coefficient signified an increase in LOST revenue for treatment communities relative to their control in the pre-casino period. Casino implementation negatively impacted these revenues in Elgin and Pocola, while it had a positive impact on tax revenue in Harrah. Summing *treated* and *did*, an assessment of post-casino impacts for the two communities, suggested a positive impact on local tax revenue for each community relative to the case study control. While these results propose a positive effect on local non-Native communities from the injection of a tribal casino, the factor by which the economy is impacted suggests no real, mathematical, effect based on time or location.

Further research in this area is necessary to develop a more robust conclusion on the economic impact of tribal gaming on Oklahoma's tribal jurisdictional areas. Though, this study did not find any significant impacts, the results cannot be considered conclusive because of the small number of case studies and few data

points available for each community. Tribal gaming, especially of the Class III variety, is a relatively new phenomenon in Oklahoma, and as more data is generated, more sophisticated research methods will become available. The lack of baseline impact analysis, relative to the state proved a major hurdle in this study. In response, expanded research should be conducted on the economic impacts of tribal gaming in Oklahoma. Analysis on local employment, business activity, proximate property values, and infrastructure should be considered. This would include qualitative research methods to support the economic measures assessed using statistical analysis.

The purpose of this study was to determine the impact of tribal gaming, if any, on non-Native communities, using local option sales tax data. After performing difference-in-difference regression analysis on multiple urban and rural communities, it is evident, tribal casinos do not significantly influence local urban economies. Case studies on rural communities suggest casino implementation has a positive impact on sales tax revenue, supporting analysis from previous economic research. However, this impact is so small, relative to the total LOST revenue collected, that it can be considered to have little overall effect. Therefore, this analysis determines tribal gaming has little to no economic impact on non-Native communities in Oklahoma.

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