Place Based Economic Development and Tribal Casinos

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Abstract

Tribal lands in the U.S. have historically experienced some of the worst economic conditions in the nation. We review some existing research on the effect of American Indian tribal casinos on various measures of local economic development.This is an industry that only started out in the early 1990s and currently generates more than $40 billion annually. We also review the state of the literature on the effects of casino operations on communities adjacent to tribal areas. Using a new dataset linking individual and enterprise-level data longitudinally, this study examines the industry- and location-specific impacts of tribal casino operations. We focus in particular on the employment of American Indians. We document positive flows from unemployment and non-casino geographies to work in sectors related to casino operations. Tribal casinos differ from other standard place-based economic development projects in that they are focused on a single industry; we discuss these differences and note that some of the positive spillover effects may be similar to other, more standard place-based policies. Finally, we discuss additional and open-ended questions for future research on this topic.

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JEL classification: R11, J20, O2

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1 Introduction

Tribal gaming, as an economic policy, affects both places (tribal lands) through business formation, and people through improved employment opportunities and the provision of public goods. The impact of tribal gaming likely transcends geographic and industry boundaries. The advent of gaming operations usually heralds the openings of a new type of industry on tribal lands. It likely boosts labor demand in related service sectors such as tourism and entertainment. Tribes and related entities develop local infrastructure through public and private investment intended to improve access to casino locations and associated industries. Places that open casinos see stronger individual and public investment than comparable locations. Yet, American Indian tribes own tribal casinos, and they are required by law to use casino revenues on specific activities related to tribal economic development and welfare, much of which is distinctly local in nature and specific to the tribal citizenry. Thus, casino operations directly impact American Indian tribal members whether they are employed in the gaming industry or not. Some of these tribally provided benefits may be available to tribal citizens even if they do not reside on tribal lands. The specific nature of tribal gaming in the context of place-based economic policies offers an excellent opportunity to compare and contrast the effects of economic development policies targeted at treating geographic locations versus those treating specific individuals.

The Indian Gaming Regulatory Act (IGRA) of 1988, which paved the way for large-scale tribal gaming, is unique in size and purpose in terms of an economic development program for American Indian tribal nations. In particular, IGRA recognized and embraced the exercise of tribal sovereignty inherent in American Indian tribal governments to operate and manage their own economic activities.

The Tribal gaming industry is large and growing. Revenues exceeded $40 billion in 2023 (Simermeyer and Hovland, 2023). This is at par with place-based economic policies pursued at the federal level: estimates suggest that the U.S. government spends between $60 and $95 billion per year on place-based economic development programs throughout the U.S. as a whole (Bartik, 2020; Kline and Moretti, 2014a).

In this study we discuss the differences between the IGRA approach to place-based (and tribal nation-based) economic development and that of other standard place-based programs. Further, we review the existing research on the impact of IGRA on American Indian economic development. We add to the literature by examining how the start of tribal casino operations affects employment and movement from adjacent industries and geographies into these new enterprises and related employment sectors. We demonstrate how the establishment of a casino impacts total employment, average wages, and differential inward mobility by individuals and employers.

We find evidence pointing to potentially important selection effects of place-based programs. In particular, there may be a significant inflow of new people or establishments when new casinos and related businesses open. These inflows are especially important for small-population communities such as many American Indian tribal nations or other smaller rural towns in the U.S. This change in worker and industry composition highlights the challenges of evaluating place-specific economic development policies when populations simultaneously undergo in- and out-migration.

2 Place-Based Policies and Background of American Indian Economic Development Projects

Locations are important, and the conditions that they offer, from environmental to socio-economic, could have long-lasting impacts on their residents (Bartik, 2020; Kline and Moretti, 2014b). In light of the strong evidence suggesting substantial influence of geographic location on economic and social outcomes, contemporary economic policy has grappled with the question of whether to target individuals or locations. For decades, poor and rich areas appeared to converge in terms of income, making the targeting of poorer individuals within places seem more salient. However, this convergence has stagnated as places have struggled with persistent lack of economic opportunity and high non-employment (Austin et al., 2018).

2.1 Standard Place-Based Economic Policies

Place-based economic development policies are intended to provide the means to develop industries in a specific region that may have experienced a downturn in employment and/or business creation over time. The purpose of these types of programs is to encourage the formation of businesses in regions that were in the process of transitioning from older, declining industries (Neumark and Simpson, 2015). Place-based economic policies may take many forms. For example, there are U.S. federal programs such as the Enterprise Community or Empowerment Zone policies that provide tax incentives (or sometimes government block funding) for businesses to develop in historically low-income and/or high-unemployment areas (Moretti, 2024). Different states may also offer tax incentive programs aimed to stimulate job creation; evaluation of these programs have shown that they are associated with increases in employment levels in treated areas (Freedman et al., 2023).

Other types of place-based policies include government funding of infrastructure improvements to foster economic development in rural or impoverished regions. In the U.S., one of the best known examples of these types of policies is the Tennessee Valley Authority (TVA), which focused on the construction of hydroelectric dams to provide relatively cheap electricity for Tennessee, Alabama, Mississippi and Kentucky.. This new energy source was intended to spur manufacturing industries growth across the area. Kline and Moretti (2014a) find that TVA led to improvements in regional incomes as manufacturing employment increased over time in the target area; however, the authors caution that these benefits may have come at the cost to manufacturing in other regions of the country.

The open question of whether such policies create negative "offsets" in adjoining areas is a central one in the literature. Related discussion has spurred efforts to assess whether there are net benefits to these place-based policies at the aggregate level (Moretti, 2024). There is some evidence that increases in local employment may have spillover effects into other industries depending upon the industry type and wage levels; Moretti (2010) shows that local demand is spurred by increases in skilled or high-wage employment, and this results in an additional 2.5 jobs in the local goods and services industries. Other work also indicates that the efforts to attract new industries pay off on average even when there are costs associated with attracting new industries; Greenstone and Moretti (2003) show that both earnings and, importantly, local property values increase in counties that attract new manufacturing plants. This suggests that benefits are real for employees but also non-employee residents of the county.

Place-based policies aim to establish or enhance new or emerging industries in impoverished re-

gions. In particular, they aim to solve agglomeration issues that might be necessary for the development of a mature industry; firms and businesses need to be located near one another in order to spur innovation and improvements in productivity. Alternatively, other market imperfections may justify the use of place-based policies for certain areas. Low levels of in-migration may result in a spatial mismatch where individuals do not flow to different regions where their labor would be economically productive (Neumark and Simpson, 2015); these obstacles may result fromthe lack of housing opportunities due to general discrimination or employment-specific discrimination. New policies may help to spur in-migration and reduce these market imperfections that would persist in the absence of government policies.[1]

2.2 Review of Economic Development Projects for American Indians Prior to IGRA

For at least the past 150 years, the U.S. federal government developed and applied numerous policies and programs that were intended to improve the economic conditions of American Indians. These programs were often initiated using a top-down approach that did not include input from the American Indian population or tribal nations in their design or implementations. Among programs such as boarding schools (Maruthiah, 2024) and the intentional destruction of bison (Feir et al., 2024), which were meant to undermine traditional economies and force assimilation, certain programs can be categorized as "place-based." Not all of these programs resulted in measurable improvements; many actually worsened economic conditions. Some of the most well-known, place-based federal programs for tribal nations, such as the General Allotment Act (1887), resulted in increased land dispossession and impoverishment (Wilkins and Stark, 2017). The Allotment program was focused on assimilation of the American Indian population and assigned reservation lands into private, fee simple parcels for American Indian families. However, large amounts of land were often lost to non-Native land speculators or farmers; Canby (1988) estimates that approximately two-thirds of lands under American Indian jurisdiction prior to 1887 was controlled by non-Natives by the mid 1920s (see also (Akee, 2009; Carlson, 1983; Leonard et al., 2020)).

A variety of other programs aimed at quickly assimilating American Indians into U.S. society arose over the first half of the 20th century. For example, Resolution 108 (1953), also known as the Indian Termination Policy, essentially eliminated certain Tribal nations and removed any federal government relationship (or responsibilities) for particular American Indian tribal nations and their tribal citizens (Wilkinson and Biggs, 1977). While there is little empirical analysis, to our knowledge, assessing the impact of this program, the general consensus was that it was a failure and this program was ended in subsequent decades (Walch, 1983).

As part of the move from federal responsibility to local, the U.S. federal government initiated policies aimed to put American Indian tribal nations under state jurisdiction for criminal and some civil purposes. Public Law 280 (1953) was initially imposed upon American Indian tribal nations in the states of California, Minnesota, Nebraska, Oregon and Wisconsin, but extended to other states in subsequent years (Goldberg and Champagne, 2005).[2] Recent research suggests that this policy had a negative effect on economic outcomes for these particular tribal nations, largely related to implementation and

[1] Neumark and Simpson (2015) note that, "The gist of the spatial mismatch hypothesis is that the mobility usually assumed in urban economics may be restricted; hence, out-of-equilibrium behavior may persist for a long time."

[2] Note that Alaska was also included once it became a state in 1958.

interpretation of the law. The federal handover to state jurisdiction did not involve the transfer of federal funds (in fact, implementation included reducing funds to tribal courts). Moreover, because of ambiguity in the law, state and tribal law enforcement often did not have clarity on jurisdiction. In turn, tribal areas covered by PL 280 experienced increased crime rates and decreases in family income compared to non-covered tribal jurisdictions (Dimitrova-Grajzl et al., 2014).[3]

In more recent years, there has been a movement to center economic development decision-making and policies at the tribal government level. The U.S. federal government enacted the Indian Self-Determination and Education Assistance Act in 1975 (Cornell and Kalt, 2010), which allows tribal nation governmental agencies to provide direct services to their tribal members on behalf of federal agencies. In this regard, the tribal government is the service provider and the U.S. federal government provides the funds for the tribal government to hire personnel and equipment and to deliver services directly. Initially, this program focused on forestry, education, and health services provided by the U.S. Department of the Interior and Department of Health and Human Services. In later years, the Tribal Self-Governance Act extended tribal nation activities to manage federal lands and resources (King, 2007). Research shows that this management has resulted in better yields and profits but also better conservation efforts (Krepps and Caves, 1994).

Members of tribal nations are eligible for a variety of funding programs from different agencies; standard federal programs generally available to all citizens as well as special programs targeted for tribal governments specifically. In the current era, tribal economic development programs total approximately $930 million annually, which is well below the $40 billion in annual revenues from tribal gaming operations (GAO, 2023). However, appropriations for these programs have decreased in recent decades; Walke (2000) showed that U.S. per capita spending on economic development for the U.S. population was about $4,000 in 1997 dollars, but only $3,000 for American Indians. Analysis conducted by the Government Accountability Office (GAO, 2023) found the following: "We identified 22 programs that provide economic development assistance to tribal entities in the form of grants, loans, and loan guarantees. These 22 programs are administered by seven agencies: USDA (six programs), Interior (five programs), Commerce (five programs), SBA (three programs), Energy (one program), HHS (one program), and HUD (one program)."

In Table 1 we reproduce a list compiled by the Government Accountability Office (GAO, 2023) showing a list of existing programs allocated for American Indian tribal governments directly related to economic development. It is important to note that this total amount is approximately $900 million over the course of five years. This amount is approximately 2.5 percent of the annual revenues from tribal gaming in the past year.

In addition to the grant programs outlined above, a number of tax credit and incentive programs have arisen, which are outlined in Table 2. These programs are similar in some respects to other place-based policies that provide tax incentives intended to spur economic and other development. To our knowledge, very few of these programs have been evaluated to assess whether tribal nations have actually accessed them and, if so, whether program use has led to positive outcomes. One exception is the study by Brashares and O'Keefe (2013), which examines the use of tax-exempt bonds by tribal nations; the authors find that this program is underutilized relative to municipal bond financing by

[3] Anderson and Parker (2008) find positive effects of the imposition of PL 280 for tribal nations; however, they do not account for the potentially endogenous selection into this program in their analysis.

Table 1: Obligations for Federal Economic Development Programs Designed to Provide Assistance Specifically to Tribal Entities, Fiscal Years 2017–2021 in millions of dollars

Agency	Program Name	Type of Assistance	Total Obligations
Grants			
HUD	Indian Community Development Block Grant	Grant	239.2
HHS	Social and Economic Development Strategies	Grant	102.6
DOI	Energy and Mineral Development Program	Grant	18.5
	Tribal Energy Development Capacity Grant	Grant	5.1
	Native American Business Development Grant	Grant	3.2
	Tribal Tourism Grant	Grant	1.5
EDA	Public Works	Grant	36.7
Total Grants			**406.7**
Loan Guarantee			
DOI	Indian Loan Guarantee and Insurance Program	Loan Guarantee	563.2
DOE	Tribal Energy Loan Guarantee Program	Loan Guarantee	0
Total Grants			**563.2**

GAO (2023) Table 4 p. 20 and Table 5 p. 22

small towns and cities (of comparable size to tribal nations).

2.3 Brief Overview of the Indian Gaming Regulatory Act

We contrast these standard place-based policies with the advent of American Indian tribal casinos. The Indian Gaming Regulatory Act (IGRA) of 1988 aimed to standardize and normalize the processes required to establish and operate tribal casino businesses on American Indian reservations. Unlike the standard place-based policies that focused on either federal or state-level tax incentives, or direct federal government infrastructure investment, IGRA re-affirmed tribal nations' inherent sovereign right as governmental agencies to establish a government-owned enterprise. In this case, the business enterprise was high-stakes casino operations; these types of businesses had only previously existed in Nevada or New Jersey. Prior to the passage of IGRA in 1988, American Indian gaming existed on reservations as small-scale bingo and card games operated by tribes mainly in California and Florida (Meister et al., 2009). However, even these relatively small-scale operations came under state legal threat of closure as states attempted to deploy state regulations regarding hours, stakes, and jackpots.

As a result of this conflict, the State of California sued a California tribal nation, with the case ending up in the U.S Supreme Court in 1987 with *California vs. Cabazon and Morongo Bands of Mission Indians* (Spilde and Taylor, 2013). The Supreme Court ruled that if states allow any type of gaming within state borders, then the state has no legal jurisdiction to regulate gaming on tribal lands. As a result of this judgment, and in an effort to harmonize operations with state regulations, the U.S. Congress passed IGRA, which lays out the legal framework for tribal gaming. Under IGRA, tribal casinos fall under Class III gaming.[4] A compact must be signed between the tribe and the state

[4]See Akee et al. (2015) for a discussion of the different classes of gaming. Generally, Class III is the most

Table 2: Selected Tax Incentives for Tribal Economic Development

Tax Incentive	IRS Citation	Description
Investment Tax Credit for Energy (1978)	IRC § 48	Tax credit for investment in certain energy properties, such as wind and solar projects.
Low Income Housing Tax Credit (1986)	IRC § 42	Tax credit for developers for the rehabilitation or construction of low-income residential rental housing.
Production Tax Credit (1992)	IRC § 45	Tax credit for electricity produced from certain renewable resources, such as wind resources.
New Markets Tax Credit (2000)	IRC § 45D	Tax credit to incentivize private capital investment in low-income areas via investments in qualified Community Development Entities.
Tribal Economic Development Bonds (2009)	IRC § 7871(f)	Provides tribal governments with authority to issue tax-exempt bonds, up to an amount allocated by IRS, to finance economic development projects.
Indian Reservation Depreciation (1993)	IRC § 168(j)(4)	Provides accelerated depreciation for certain Indian reservation property, which is, among other things, property used by the taxpayer predominantly in trade or business within an Indian reservation.
Opportunity Zones (2017)	IRC §§ 1400Z-1, 1400Z-2	Provides tax benefits on certain capital gains to incentivize private capital investment in Opportunity Zones.

Source: GAO (2023) Table 8 pg 33.

and may contain various provisions regarding revenue-sharing between the tribe and local authorities. Following the passage of this legislation, many states signed compacts with tribes to allow for high stakes gambling operations; many of these states also permitted the operation of non-tribal commercial casinos as well.[5]

Through IGRA, Congress re-affirmed American Indian tribal nation sovereignty and the tribal government's ability to establish tribal gaming enterprises where none had previously existed. The law established the National Indian Gaming Commission, which monitors gaming activity, approves revenue sharing agreements and other uses of gaming revenue, and has the power to inspect high stakes gaming operations held on tribal lands. The law requires that the, "Indian tribe will have the sole proprietary interest and responsibility for the conduct of any gaming activity," but that revenues must be used for specific purposes: to fund tribal government operations or programs; to provide for the general welfare of the Indian tribe and its members; to promote tribal economic development; to donate to charitable organizations; or to help fund operations of local government agencies.

2.4 Previous Research Findings on American Indian Casino Operations

Replacing historical programs and policies aimed at improving the socioeconomic conditions of American Indians through assimilation and external decision-making, more recent trends in federal policy focus on tribal self-determination. Casino operations represent one category of economic development undertaken by American Indian tribal governments, but it should be noted that other forms of economic enterprise have met with considerable success (Cornell and Kalt, 2010). Tribes who have undertaken a "nation-building" approach to economic development have experienced strong economic growth over the decades since self-determination.[6] Compared with these successes, tribal nations for whom barriers to self-determination still exist (such as the Wabanaki people of Maine (Kalt et al., 2022)) have experienced considerably less economic progress.

In what follows, we summarize research on the economic and personal wellbeing of American Indians whose tribes established casino operations and, in some cases, per capita payments of casino profits (cash transfers).

2.4.1 General Casino Effects

Prior research on the effect of IGRA have focused on several economic outcomes for both American Indians and non-Indians. Some of these studies have attempted to examine whether there are positive spillover effects for adjacent communities and/or populations. One of the first papers on this topic uses the 1990 and 2000 U.S. decennial censuses to evaluate the effect of casino openings on tribal lands over the decade of the 1990s (Evans and Topoleski, 2002). This analysis finds that populations increase by 12 percent after the start of casino operations and employment also increases by 26 percent, which

lucrative as it includes house-banked card games and casino-style slot machines; these are the games that allow for the largest wages and bets in casino operations.

[5] Wenz (2008) examines the evolution of tribal casinos vs other gambling operations. He finds no evidence of competition between American Indian and non-tribal casinos.

[6] Cornell and Kalt (2005) write: "[T]he nation-building approach puts genuine, decision-making power in indigenous hands; it backs up that power with capable institutions of self-governance; it matches those institutions to indigenous political culture; it has a strategic orientation toward long-term outcomes; and it is guided by public-spirited leadership."

means there is a 4.4 percentage point reduction in unemployment. This in-migration is driven by working-age adults. The jobs-to-adults ratio in surrounding counties increases by about 3.8 percent of the median value after the start of tribal casino in the county. The authors note that since American Indians are a relatively small proportion of most counties, this increase in employment is probably dominated by non-American Indians. Positive effects extend beyond purely economic outcomes. The study documents a reduction in mortality at the county level. However, it also finds some increases in crime and bankruptcies after the start of casino operations.

There are several follow-up papers examining this same topic for different populations: some focus on different locations or geographic units of analysis; others focus exclusively on tribal members alone or a more general population. The authors Gitter and Reagan (2007) focus on American Indians who report tribal membership in 2000; they find that casino openings increased household income and decreased unemployment for American Indian tribal members, compared with those whose tribes did not open a casino. Their sample is limited by privacy constraints imposed on Census microdata, and they use one cross-section of data to measure outcomes in 2000. A similar paper by Anderson (2013) examines the effect of tribal casino openings during the 1990s on tribal outcomes. The analysis is restricted to individuals residing on tribal lands only. According to their findings, incomes increase after casino openings by about 7.4 percent, and child poverty is reduced by 4.6 percent, again relative to American Indians on non-casino reservations. An obvious concern with this type of cross-sectional analyses is that tribes who had opened casinos by 2000 could differ in many unobserved ways from those that had not opened gaming operations. Selective migration in and out of tribal areas engaging in gaming activities is another major concern.

Thompson (2019) focuses his analysis at the county level. In comparing children exposed to casino operations to adult members of the same tribes, he finds an increase in years of education by about one-third of a year on average. Additionally, individuals growing up in counties with a tribal casino are about 4 percentage points more likely to have a high school diploma and 5.7 percentage points more likely to have an associates degree. The analysis also shows that families of focal children realized an increase in incomes of almost $3,500 in 2016 dollars. There was a reduction in poverty of two percentage points, indicating that the underlying mechanism for children's later life success includes family resources in childhood. There is some suggestive evidence that individuals with more years of education are likely to migrate to the reservation locations after the start of casino operations, although the effects are not statistically significant.

A recent paper by Wheeler (2023) uses a repeated cross-section of confidential-use data obtained from the decennial census and the American Community Survey (ACS) and finds improved economic conditions on reservations after casino operations commence. These gains are particularly strong among the American Indian population. A substantive body of previous work has produced important descriptive data suggesting that tribal casinos were beneficial for economic development on the local and surrounding region. However, none of these studies are able to follow outcomes across time for the same individuals.

Policymakers are concerned that the expansion of tribal casino operations comes at the expense of other non-monetary measures of wellbeing. There is a growing body of literature that finds mixed results across different outcome measures. For example, studies have found that casino operations may lead to increased traffic accidents related to alcohol consumption, though it is unclear whether local

residents are the ones involved in these accidents (Cotti and Walker, 2010). Reece (2010) reports that increasing casino activity is associated with a decrease in most types of crime in various counties in Indiana. One study using data at the county level finds that the presence of tribal casino within the county is associated with a reduction in heavy drinking, smoking, obesity and hypertension (Wolfe et al., 2012).

Another related branch of the existing literature has examined the effect of tribal gaming on local inequality. Spilde and Taylor (2013) find that tribal casino operations may be equality-enhancing across tribal nations. They note that, "On average, a ten percent lower average income in 1990 implied a 1.4 percent improvement in the decade's growth." In other words, tribal nations that started their own tribal casinos and were initially poorer at the start of the decade have a higher growth rate in average incomes compared with those that had higher initial average incomes (and also started their own tribal casinos).[7] Taylor (2012) surveyed twenty-five of the twenty-nine federally recognized tribes in the state of Washington in order to assess the effect of tribal expenditures and businesses. He notes that, "Tribes paid the $1.3 billion in payroll to more than 27,000 Washington residents, the vast majority of whom were non-Indian. Fully eighty-one percent of the gaming employees and more than half of the employees of other enterprises were non-Indians." This analysis indicates that benefits extend beyond American Indians and reservation residents. Gerstein et al. (2011) find that after the introduction of tribal casino operations, there was approximately a one percentage point decrease in unemployment in areas up to fifty miles from the casino. In their analysis, they do not find a large change in business or individual bankruptcy filings. They also do not find any change in various crime measures.

A common criticism of the studies outlined above is that they are unable to account for selective migration as a result of the start of tribal casino operations given the availability of cross-sectional data alone. We are aware of only a few studies that attempt to circumvent this issue by constructing panel data of individuals or business establishments residing on or off reservations before casino operations started and following these individuals in a panel setting over time.

Using U.S. Census and IRS data linked at the individual level over several decades, Simeonova et al. (2021) show that casino operations increase income rank for affected tax units, regardless of race, residing on reservation lands with a tribal casino by about a percentage point. However, income rank increases by almost an additional two percentage points for American Indian tax filers residing on reservations with a tribal cash transfer program. These findings indicate that while income improvements are largely realized by the American Indian population as a result of tribal casinos, there is some evidence that benefits also accrue to non-American Indians. Considering tax filers who originally resided off reservations, Simeonova et al. (2024) find that tribal casino operations and casino cash transfer programs increase working age migration to American Indian reservations. Casino operations alone have the largest effects for unmarried parents with children. On the other hand, the largest effects of the casino cash transfer on return migration is found for married couples with no children.

Finally, in a recent working paper, Aguilar et al. (2024) use data from the National Establishment Time Series (NETS) dataset, which contains longitudinal information for a large share of U.S. business establishments. To our knowledge, this paper is the first to use firm establishment-level data in a longitudinal manner to identify the effects of casino operations on businesses over time. The authors examine the effect of tribal casino openings on both existing and new businesses on tribal reservation

[7] See Spilde and Taylor (2013) Figure 7 on page 24.

lands. The advent of casino operations is associated with a large jump in sales and employment in businesses relative to locations that did not open a casino. Existing businesses see a gradual increase in employment and sales across all industries. Further, there are some positive effects for business establishments outside of the arts, entertainment, recreation, accommodations, and food services industries, although these results are not all statistically significant at conventional levels.

2.4.2 Direct Cash Transfer Effects

One of the potential uses of the tribal gaming revenues as dictated by the IGRA is to provide direct cash transfers to tribal citizens. As a result, some tribal governments with tribal casinos have elected to provide unconditional cash transfers from the casino-generated profits. All tribal citizens are eligible to receive the transfers, regardless of where they reside. Conner and Taggart (2013) provides one of the first studies to examine the effect of per capita cash transfers on American Indian economic outcomes. The authors use the 1990 and 2000 decennial censuses to examine changes, due to the start of casino operations, on per capita income and unemployment. They find that per capita income for American Indians goes up by $4,000 in 2000 dollars when a casino opens up with Class III gaming and there is a per capita transfer program; these results hold for the total population including all races, but the effect is slightly smaller at about $3,300. The authors do not find a comparable result for income changes for reservations with only Class III gaming alone, suggesting that the cash transfers are most directly responsible for the change in income.

In a series of papers following the trajectories of American Indian children exposed to a tribal cash transfer during their childhood, a number of studies find positive outcomes during adolescence and later in life for the treated children. Akee et al. (2010) examine the effect of increased household incomes due to the casino-related cash transfer program provided by one tribal government. Contrary to most other existing research, in this study the authors are able to follow children who resided on the reservation before the casino opened. They find that the treated children are more likely to complete high school on time by age 19 and have higher educational attainment by age 21. Children who resided in initially poorer households realize the largest gains in this analysis. In further research, Akee et al. (2013) find that increases in household income result in a heterogeneous health effects, where children treated to the increased income have larger increases in BMI during adolescence than their initially richer counterparts. In a third paper, Akee et al. (2018) show that children treated to exogenously increased household income during childhood due to the casino cash transfer program realize improvements in personality traits and a concurrent reduction in psychopathologies. A more recent paper, using more recent waves of the same survey, showed that these improvements in late adolescence persist into adulthood. Depression and anxiety symptoms are reduced for the treated children. Furthermore, these same treated children have on average better economic outcomes than their untreated counterparts (Akee et al., 2024).

The empirical research on tribal casinos points to positive effects on standard economic outcomes such as earnings, income, and employment. Further, there is some evidence of spillover effects on the population of non-American Indians residing in casino areas. The effect of cash transfers, while limited by fewer studies, appears to have a sustained positive effect on children from treated families over their lifetimes. Finally, there is some evidence that inward migration (to the tribal reservation) may be an important outcome of the establishment of tribal casinos. This has implications for assessing

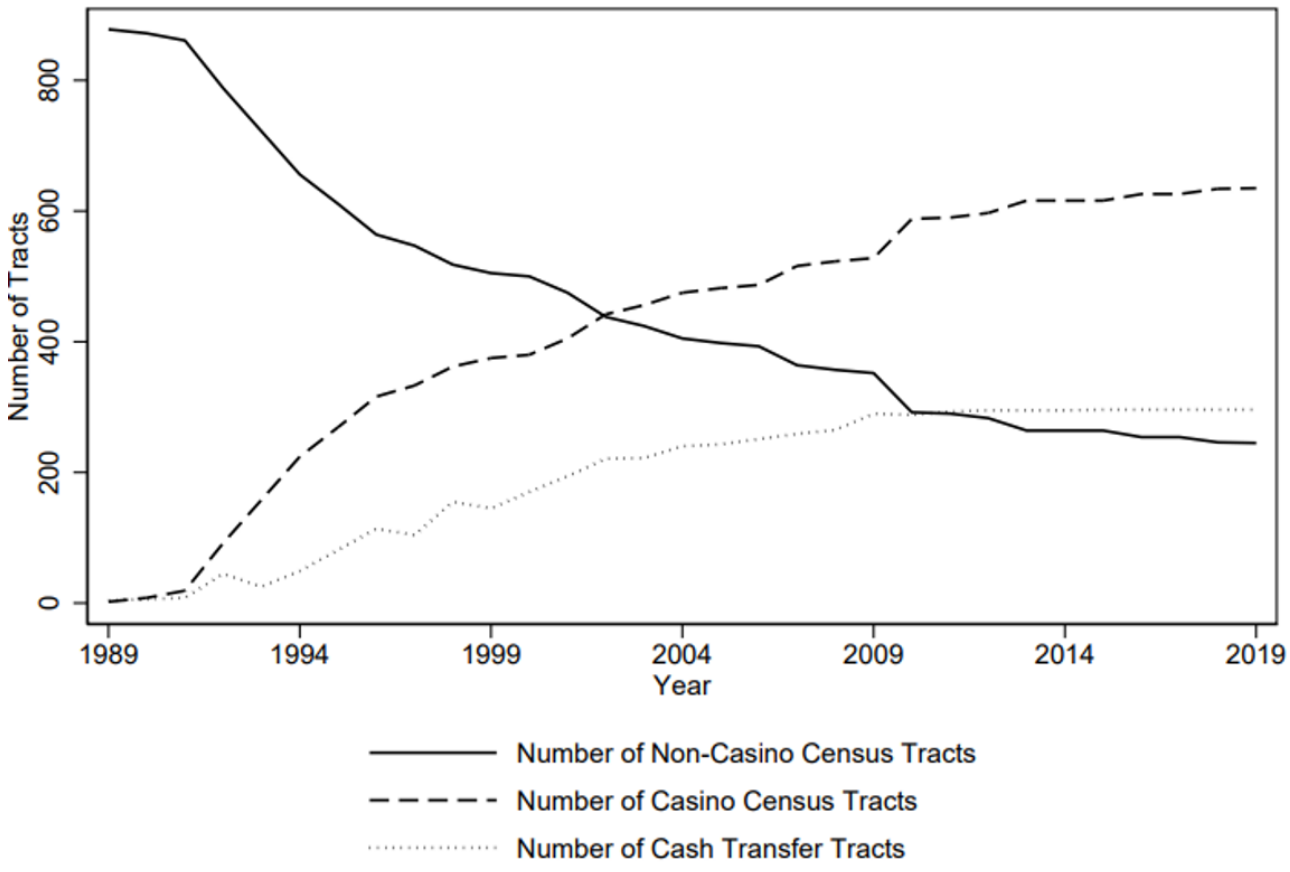
the impact of tribal casinos, especially in cross-sectional data, as it strongly suggests the presence of selection effects.

3 Data Description

3.1 Reservation Characteristics Prior to IGRA and After

After the enactment of Indian Gaming Regulatory Act of 1988 (IGRA), the gaming industry expanded across American Indian lands and the U.S. as a whole. As shown in Figure 1 the number of U.S. census tracts with an American Indian tribal casino operation increased from almost zero in 1989 to almost 600 by 2019; this is denoted by the long-dashed line in the figure. The dotted line indicates the number of tracts that have tribal casinos and have applied to distribute cash transfers to the tribal citizens. This number has increased to about half the tribal casino tracts.

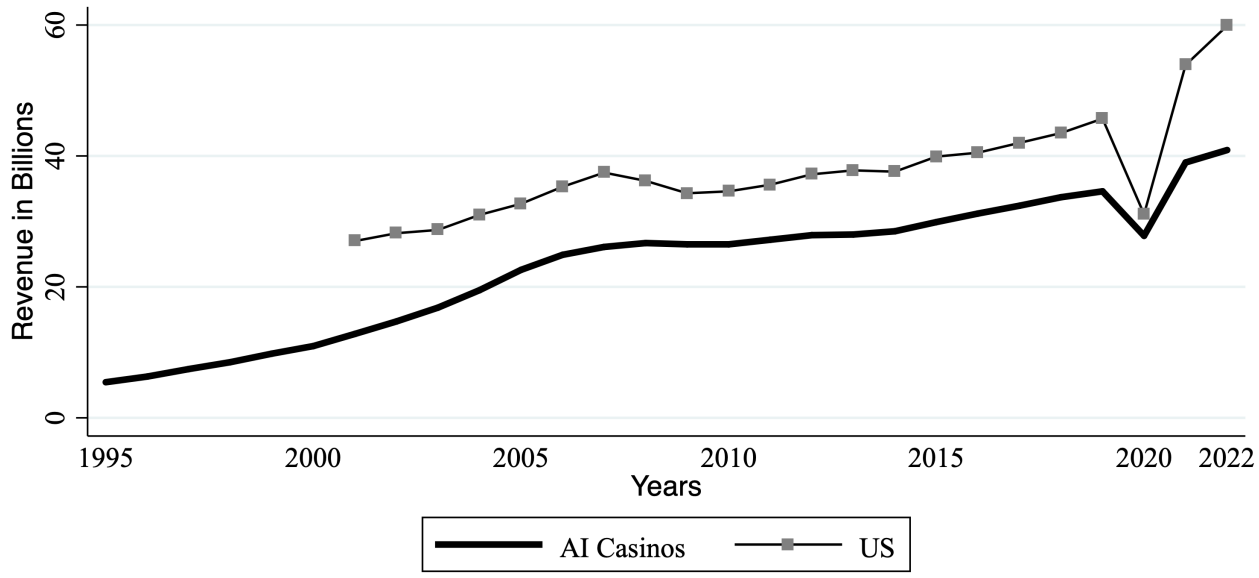
Figure 1: Casino Expansion by Year for all U.S. Census Tracts that Overlap American Indian Tribal Lands



Notes: These are the counts of U.S. census tracts that overlap American Indian Tribal reservation lands. The lines show the shift over time from tribal reservation lands without casino operations to reservation lands with casino operations. Data collected by the authors and Conner and Taggart (2013).

The American Indian gaming industry has been steadily growing over time in terms of total revenues. It was steadily gaining market share from the commercial gaming industry at least until the COVID-19 pandemic. In Figure 2, we plot the real 2018 dollar value of casino revenues for both

Figure 2: Casino Revenues in Nominal Dollars for American Indian and Non-Indian Owned, 1995-2022



Source: https://gaming.unlv.edu/reports/national˙monthly.pdf;
https://gaming.unlv.edu/reports/national˙annual˙revenues.pdf;
https://www.nigc.gov/commission/gaming-revenue-reports

the American Indian and non-Indian casino industries. Since the early 2000s, American Indian casino revenues represent, in dollar terms, between 77 to 85 percent of the non-Indian casino industry.

Publicly available data reveal socio-economic trends on AI reservations that suggest steady improvements relative to the rest of the US over the period of IGRA-related gaming expansions. In the Table 3 we provide some suggestive evidence showing the dramatic change in economic conditions for the population of American Indians living on reservations over the first two decades of the Indian Gaming Regulatory Act—1990s and 2000s. The data is derived from the 1990, 2000, and 2010 decennial censuses and the American Community Survey as compiled by (Akee and Taylor, 2013), p.14. They produce estimates of changes for American Indians residing on reservation lands between 1990 and 2000 and between 2000 and 2010 and between 1990 and 2010; then the analysis is replicated for the U.S. as a whole in the next three columns.

The first four rows provide different measures of economic and financial wellbeing. There are large improvements for the American Indian population over the decade of the 1990s—almost three times the improvement as compared for the U.S. as a whole for real per capita income (32.5 percent vs. 11.40 percent). There are increases over the 2000s as well. Finally, across both decades, there is an improvement in real per capita income of 46.5 percent for American Indians living on reservations, while it only increases by 7.8 percent for the US as a whole. Median household income also increases for this group over this period. Both child and family poverty experience substantial decreases over the decade

Table 3: Changes in Selected Characteristics on American Indian Tribal Reservations Other Than Navajo

	AI on Reservations other than Navajo			US All Races		
	1990s	2000s	Both Decades	1990s	2000s	Both Decades
Real per capita income	32.50%	10.50%	46.50%	11.40%	-3.30%	7.80%
Real median household income	30.40%	-2.20%	27.50%	4.00%	-5.50%	-1.80%
Child poverty	-11	0.8	-10.1	-1.7	2.6	0.9
Family poverty	-10.9	-1.4	-12.3	-0.8	0.9	0.1
Unemployment	-4.2	-0.2	-4.4	-0.5	2.1	1.6
Labor force participation	1	-0.6	0.4	-1.3	1.1	-0.3
Male labor force participation	-3.1	0.3	-2.8	-3.7	0.2	-3.5
Female labor force participation	4.8	2.5	7.2	0.8	1.9	2.6
Overcrowded homes*	-0.3	-3.7	-4	1.1	-2.6	-1.6
Homes w/o complete plumbing	-3.5	-1.2	-4.7	-0.1	-0.1	-0.3
Homes w/o complete kitchens*	-0.2	1.1	0.8	0.2	1.4	1.6
High school degree only	1.4	2.3	3.7	-1.4	0.4	-1
College graduate or more	2.1	1.9	3.9	4.1	3.5	7.6

Source: Akee and Taylor (2013)

of the 1990s while there is no significant change for the U.S. as a whole. We see a sustained reduction in unemployment and a large increase in female labor force participation for American Indians residing on reservation lands. There is also a reduction in homes without complete plumbing. Finally, we see an increase in high school completion and college degrees for American Indians, although the change in college degrees is relatively smaller than for the U.S. as a whole.

These aggregate data provide strong suggestive evidence of major socioeconomic changes occurring on American Indian tribal reservation lands in the two decades after the start of Indian Gaming. While this is purely descriptive evidence, it indicates that tribal casino operations must have played a role in explaining these dramatic changes for the American Indian population residing on reservation lands.

Table 4: Summary Statistics on Enterprises in Tribal Zip Codes, 2005

	Never Casino	Casino
All sectors except 71 & 72		
Total employment	6,274	6,367
AIAN employment	1,153	899.7
Unique employers	289.6	328.7
Average Earnings	24,410	21,750
Sectors 71 and 72		
Total employment	1,003	1,449
AIAN employment	211.6	284.6
Unique employers	32.5	36.1
Average Earnings	11,170	12,170

Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

This bird's eye view of economic conditions on reservation lands is based on repeated cross-sections of data. This type of data do not support plausible associations linking gaming operations and local economic conditions on the reservations. Previous research attempting to identify the place-specific effects of tribal gaming has relied on county-level or repeated individual cross-section data. Much more detailed individual and enterprise panel data are required to link local industry development and economic wellbeing. Our analysis provides the first evidence linking enterprise-level data to individual employment records.

To assess how casino operations impact places, and in particular employment in enterprises located in those places, we construct a new dataset combining the Longitudinal Business Database (LBD) linked to individual characteristics from demographic and tax data (the Opportunity Databank, or OD). To link workers to businesses in this setting, we rely on the employer identification number (EIN) reported on a person's Form W-2. This new data allow us to track individuals in and out of employment, as well as across employers in different industries and geographic locations. W-2 information is available from 2005 onward, which is why we exclude areas that opened a casino before 2005. We further restrict the analysis to, first, enterprises located on tribal reservations (identified by zip code) that opened a casino after that year; second, to comparison reservation zip codes in the same state that did not open a casino. We find 326 unique zip codes, associated with 12 states, for our treatment (casino) and control (no casino) groups.

We start our link by selecting all single-establishment employers in these zip codes between 2005 and 2017, and then finding all persons whose highest W-2 earnings, in any year, were associated with that employer.[8] We then trace out these individuals' employment histories, from 2005–2017, and collect their demographic information. The key variables of interest are: industry of work in a tribal zip code, pervious industry of work (or unemployment), and race and ethnicity.

[8]Note that our analysis spans these specific years due to data availability and the desire to examine effects prior to the COVID-19 pandemic.

4 Casino operations and zip-code level employment

Our analysis proceeds at the zip code level.[9] To our knowledge this is the first insight into the effect of tribal casino operations on employment changes by race at the zip code level and within specific industry sectors. Our analysis is based on simple difference-in-differences models, comparing reservations zip codes that experienced a casino opening after 2005 to zip codes in the same state that did not start gaming operations, or started them in later years. The model follows a staggered approach like that proposed by Callaway and Sant'Anna (2021), using csdid in Stata version 16.

Our set up focuses on calculating the treatment effect for units treated at time g, measured at time t ($ATT(g,t)$) and then calculating the weighted sum of these treatment effects to get an overall average treatment effect for each period. In this case, g is zip codes defined by having a casino, where zip codes without a casino and those who never have a casino form the comparison group. The weighted estimates are

$$ATT_{TYP} = \frac{\sum_{TYP} w_{g,t} ATT(g,t)}{\sum_{TYP} w_{g,t}} \tag{1}$$

with t indicating years before and after casino opening (with a window of 6 years pre and post). We also control for state fixed effects to account for differences in state-level economic conditions that might affect zip-code-level outcomes. The dependent variables in our model include the number of overall employees in the zip code and the number of American Indian employees, overall and separately by casino-realted sectors (Accommodations and Food Services and Arts and Entertainment). Table 4 presents the means of the variables we examine, including average counts and wages. We also examine flows into the zip code from non-employment and from outside geographies.

As an economic development program, tribal gaming is distinct from other endeavors because IGRA stipulates the use of related revenues to improve the welfare of tribal citizens. Our novel dataset allows to specifically examine the employment trajectory of American Indians and their representation in specific industries. To our knowledge, this is the first study to explore such detailed location and group-specific evidence.

Our results should be interpreted as the response of business establishments at the zip-code-level to the opening of a casino in that geographic location. Key evidence from prior work confirms that casino zip codes experience differential in-migration by individuals after casino establishment—a selection problem that researchers must take into account when analyzing the individual or employer response to casino establishment. In previous and ongoing research on individual-level outcomes by the authors of this chapter, we account for selection by identifying people and employers who were located in tribal lands *before* the implementation of IGRA. Such a strategy directly addresses the issue of selection and thus leads to a causal interpretation of individual- and employer-level results in that research.

[9] We show additional analyses in the appendix that use the LBD at the county level to show overall cross-section patterns of employment and non-employment by American Indian and non-American Indian workers.

4.1 Effects within the Accommodations and Food Services, Arts and Entertainment Industries

We start by focusing on the specific sectors most likely to be affected by gaming operations, and on the American Indian population, whose economic wellbeing is one of the goals of IGRA. In this section, we investigate whether the tribal casino has a direct effect on employment for American Indians in the Accommodations and Food Services, Arts and Entertainment Industries. In the following Figure 3 we restrict our analysis to the NAICS codes 71 and 72 (which correspond to the Accommodations and Food Services and Arts and Entertainment industries) for American Indian workers. These industries are closely related to the types of economic activity that could be spurred by the advent of gaming operations. Spot checks of employer identification numbers confirmed that casinos are either categorized in code 71 (as gaming establishments) or in 72 (as hotel casinos). We would expect casino operations to spill over into associated business types, such as restaurants.

We find that there is an increase in the number of American Indian workers in these casino-related industries. There is a statistically significant increase in the number of American Indian employees in years two, three, and four. On average, between five and 10 additional American Indians are likely to be employed in these industries compared with similar zip codes that did not open casinos. From Table 4, we see that on average, around 250 American Indians worked in the sector in 2005 in zip codes that introduced casino operations; thus we estimate an employment gain of around 2 percent to 4 percent each year due to casino operations.

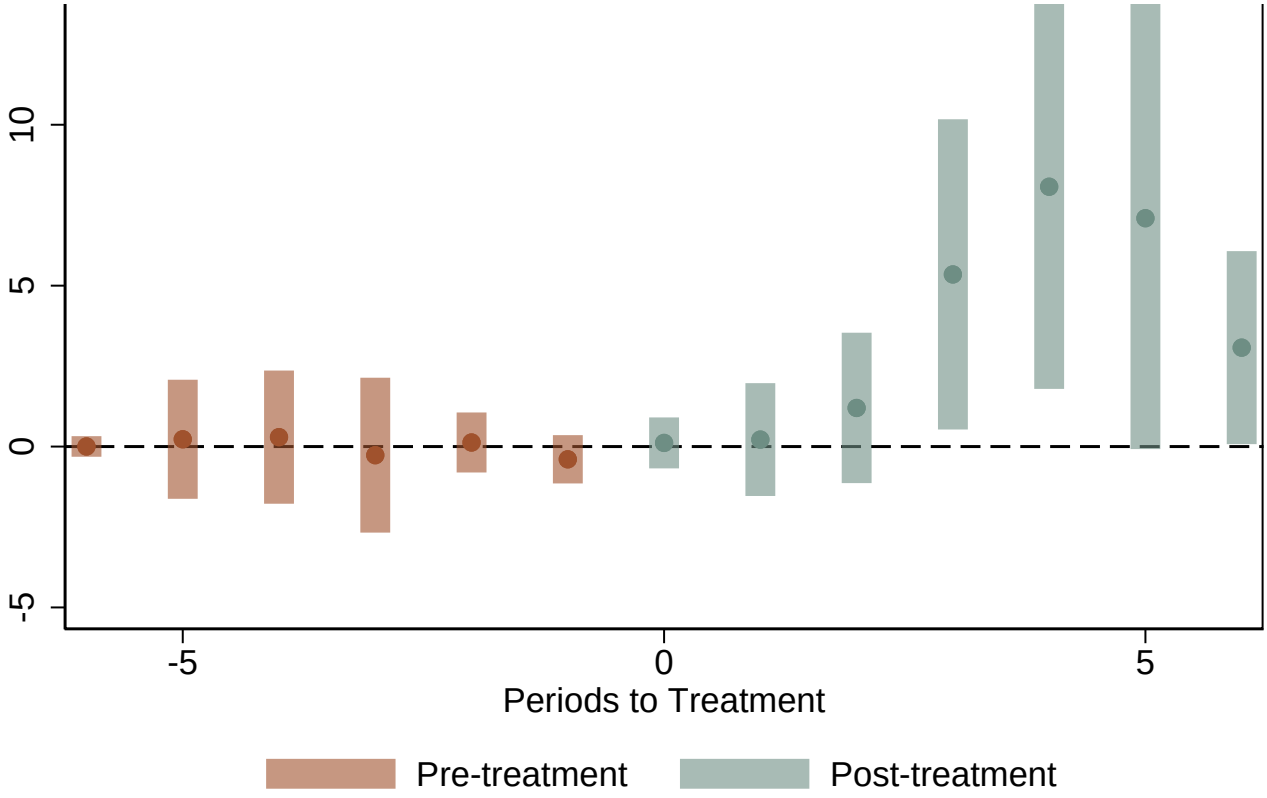
Next, we investigate whether this modest increase in American Indian net employment in these sectors was concurrent with a general employment expansion, affecting all workers from all races. In Figure 4 we expand our analysis to include all workers within the zipcode area and again restrict our industry analysis to NAICS codes 71 and 72. There is an increase in employment of about 20–30 additional individuals, regardless of race, in these industries in years two, three and four after the start of the tribal casino operations; however, the point estimates are not statistically significant. While we do find some evidence of sector employment expansion, it is only suggestive, and rather small compared to the overall average level of employment in these sectors in 2005.

Our findings show a clear positive association between casino operations and an increase in employment for American Indians. This association appears to be limited, however, only to the targeted industries and to a specific group, with little evidence of spillovers to the wider economy or the labor force as a whole. In unreported analysis, we considered other industries, unrelated to the casino operations. We found no differences between casino zip codes and enterprises operating in other sectors.

Next, we examine whether this increased employment for American Indians is also associated with a change in wages for the American Indians employed in this sector. Even if employment did not rise substantially on the extensive margin, casino operations and associated economic activity could have contributed to increases in productivity among those already employed. Figure 5 shows these results. American Indian workers in related industries experienced substantial wage gains with approximately $2000 gained each year after casino opening. Wages in the casino sector are quite low, at around $12,000 per year.[10] An increase in $2000 suggests an effect size of 16 percent in response to

[10]We should note that we took the highest paying W-2 for an individual. Considering the high turnover that is likely in this sector, the W-2 we capture may represent part-year employment. Our results may reflect an increase in hourly pay, better retention, or both.

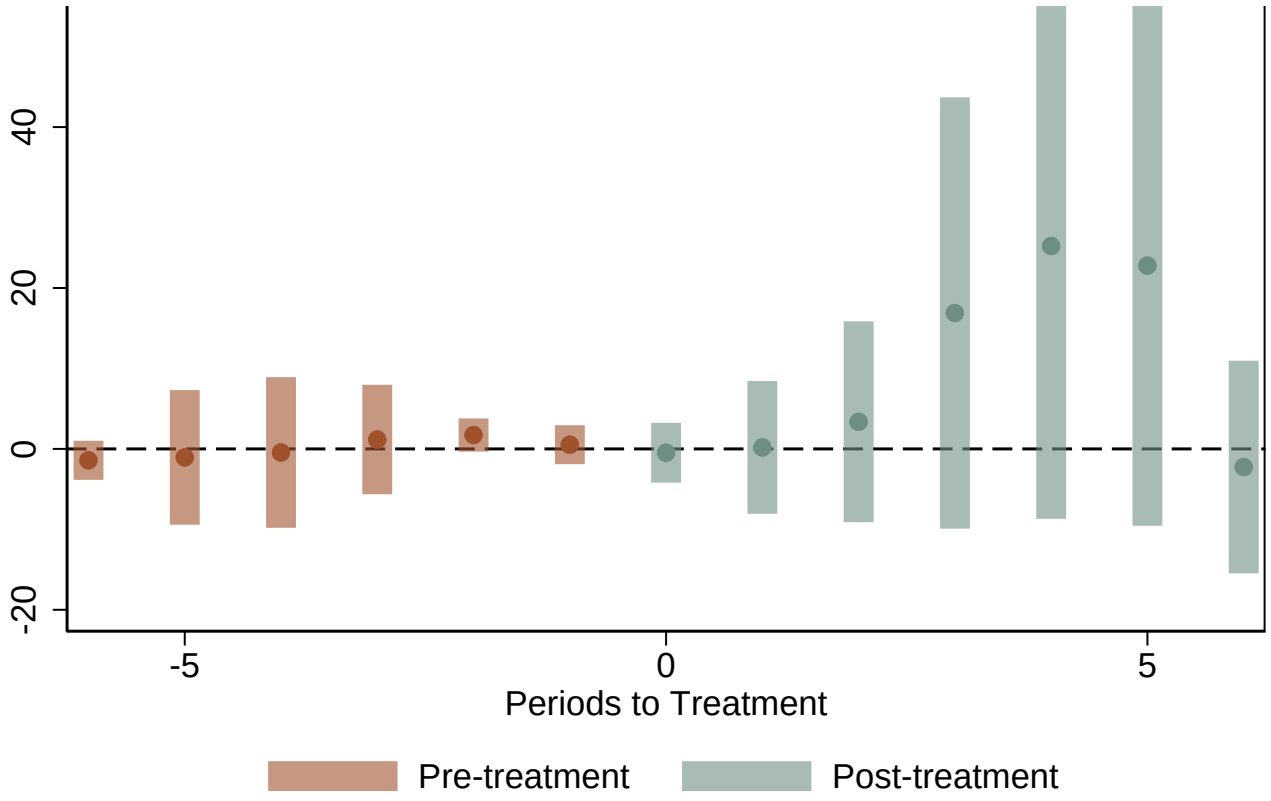
Figure 3: Employment for AIAN Workers in the Accommodations, Food Services, Arts and Entertainment Industries



Note: The method of analysis here uses the staggered difference in difference set up as suggested by Callaway and Sant'Anna (2021). Data Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

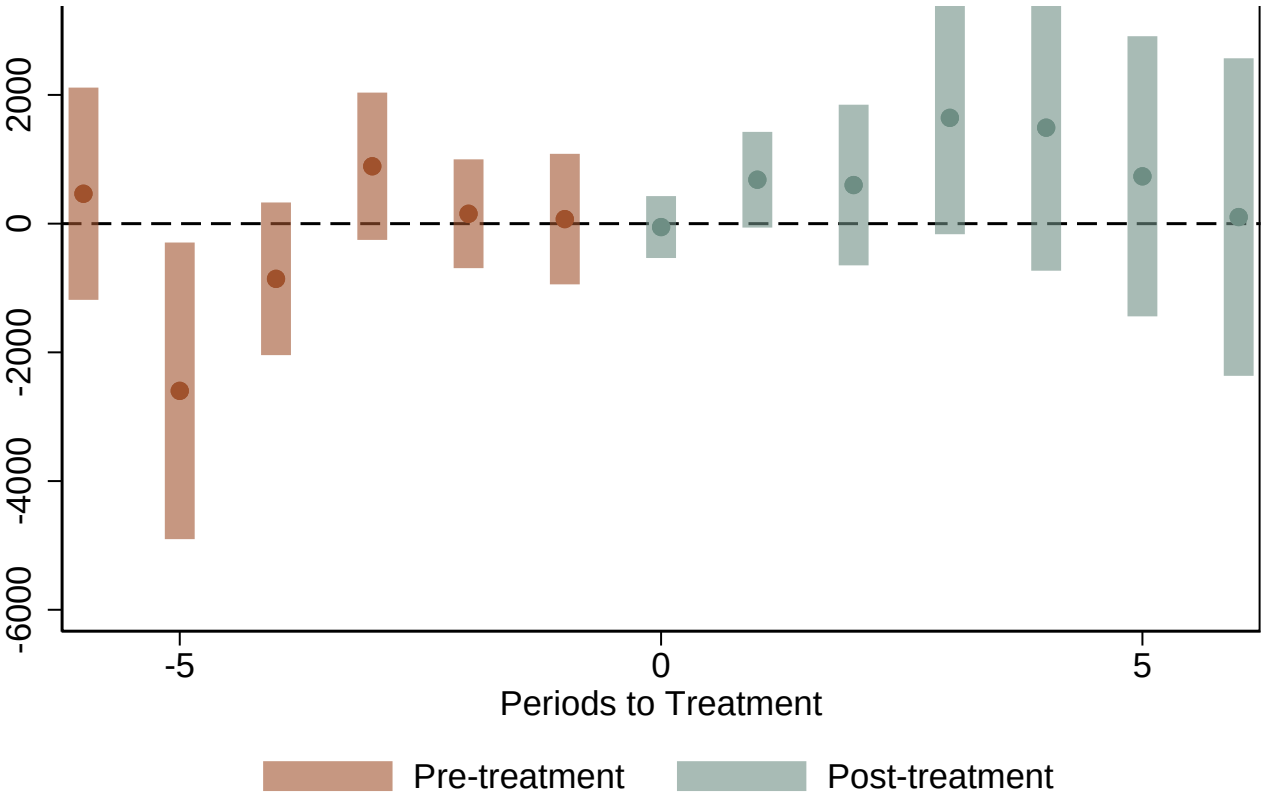
casino operations.

Figure 4: Employment for All Workers in the Accommodations and Food Services/Arts and Entertainment Industries



Note: The method of analysis here uses the staggered difference in difference set up as suggested by Callaway and Sant'Anna (2021). Data Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

Figure 5: Wages for AIAN Workers in the Accommodations and Food Services/Arts and Entertainment Industries



Note: The method of analysis here uses the staggered difference in difference set up as suggested by Callaway and Sant'Anna (2021). Data Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

4.2 Movement Due to Casino Operations

The net increase in American Indian employment in casino-related industries does not appear to be displacing non-American Indian workers from these jobs. On the contrary, we document modest increases in overall employment, though the statistical significance of the estimates is not strong. To better understand how casino operations could affect local labor markets, we consider the prior working history of individuals who are hired there after the start of casino operations. These workers could be moving to these sectors from other industries, or they could be gaining employment after being unemployed.

In Figure 6 we show the movement out of unemployment to employment for those employed (in a tribal zip code) in the Accommodations and Food Services and Arts and Entertainment industries. The change from unemployment to employment is defined as a switch from missing a W-2 in the year prior to working in sectors 71 and 72. Individuals may have been unemployed anywhere including in non-tribal casino zipcode locations. In other words, we do not distinguish between workers who were always residing in the same zip code and those who may have migrated from other locations. Compared with non-casino zip codes, there is a significant shift out of prior unemployment and towards employment in these industries in casino zip codes, first seen in the period prior to the start of tribal casino operations. On average, between twenty and forty individuals gain employment in casino-related industries from the year before the formal start of casino operations to five years after. This inflow is statistically significant and persistent. Compared to the net gains in total employment in these sectors shows in Figure 5, these estimates are larger at least in the beginning, from the year before the casino opens to two years after. One potential explanation is that during the initial period, there was simultaneous outflow of workers, either to from employment in the same industry in other zip codes or to related industries in the same location.

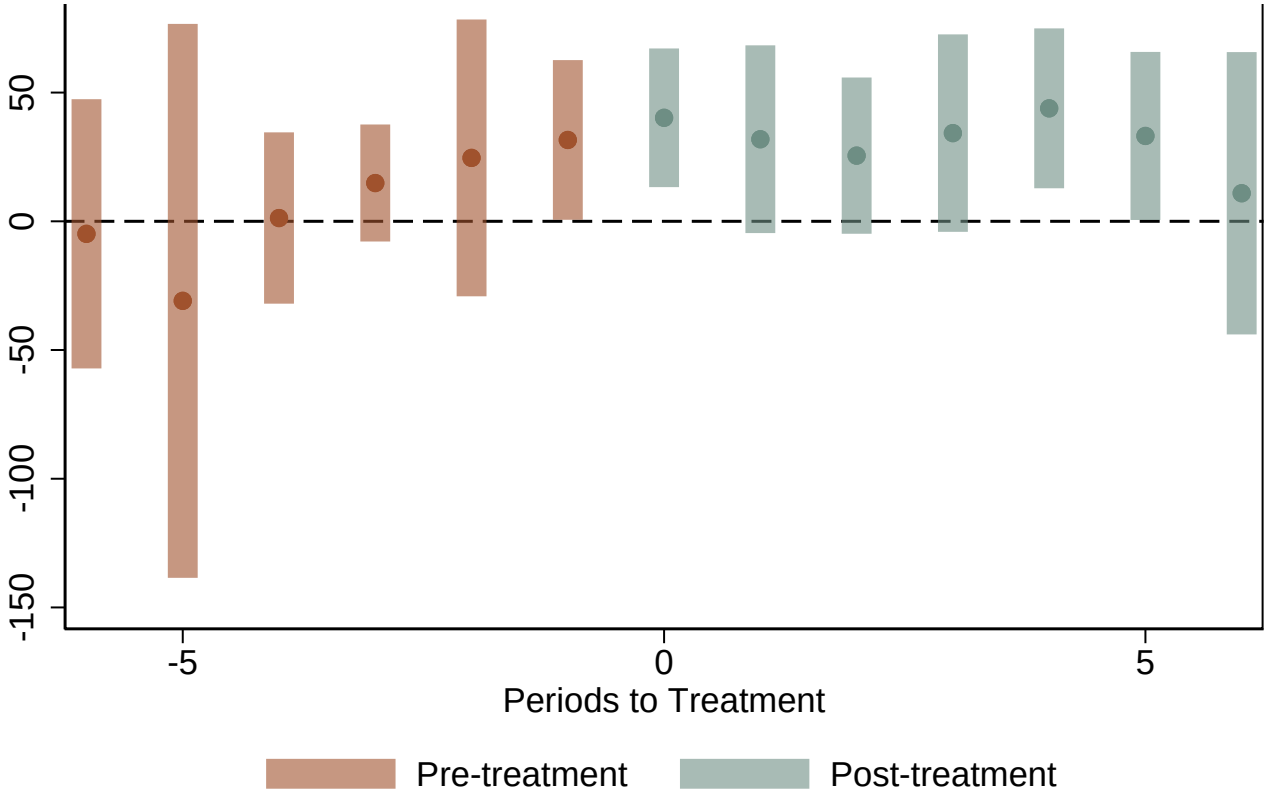
Workers can move into an industry from other industries or from unemployment within the same zip code, or they could move from employment in other zip codes to employment in casino zip codes. This may be associated with a residential move (Akee, Jones, and Simeonova, 2024), though that is not strictly necessary.

In Figure 7 we show whether or not a person changes employer zip code in order to work in the Accommodations and Food Services and Arts and Entertainment industries. In contrast to the group who is unemployed in the year prior, a change in zip code is conditional on having a W-2 in the year prior to observing a worker in the zip code and sector (since zip codes are identified via EINs).

The estimates indicate that casino operations are associated with significantly more worker changes in zip code locations, beginning in the year prior to the start of operations. This change persists for an additional five or six years. To our knowledge, this is the first analysis that demonstrates that casino operations are associated with significantly more individuals flowing into employment in affected zip codes from outside locations. These could be individuals moving residential locations in addition to their work locations, or they could be local residents who worked outside the zip code switching jobs. Prior work examining the migration of American Indians to reservations in response to casino operations suggests that a non-trivial proportion of zip code changers may be tribal members returning to reservation lands (Simeonova et al., 2024).

Although we do not see a significant large change in the net number of workers employed in related industries, casino operations appear to attract a different profile of employee than similar industries in non-casino zip codes. These employees are more likely to be coming out of unemployment,

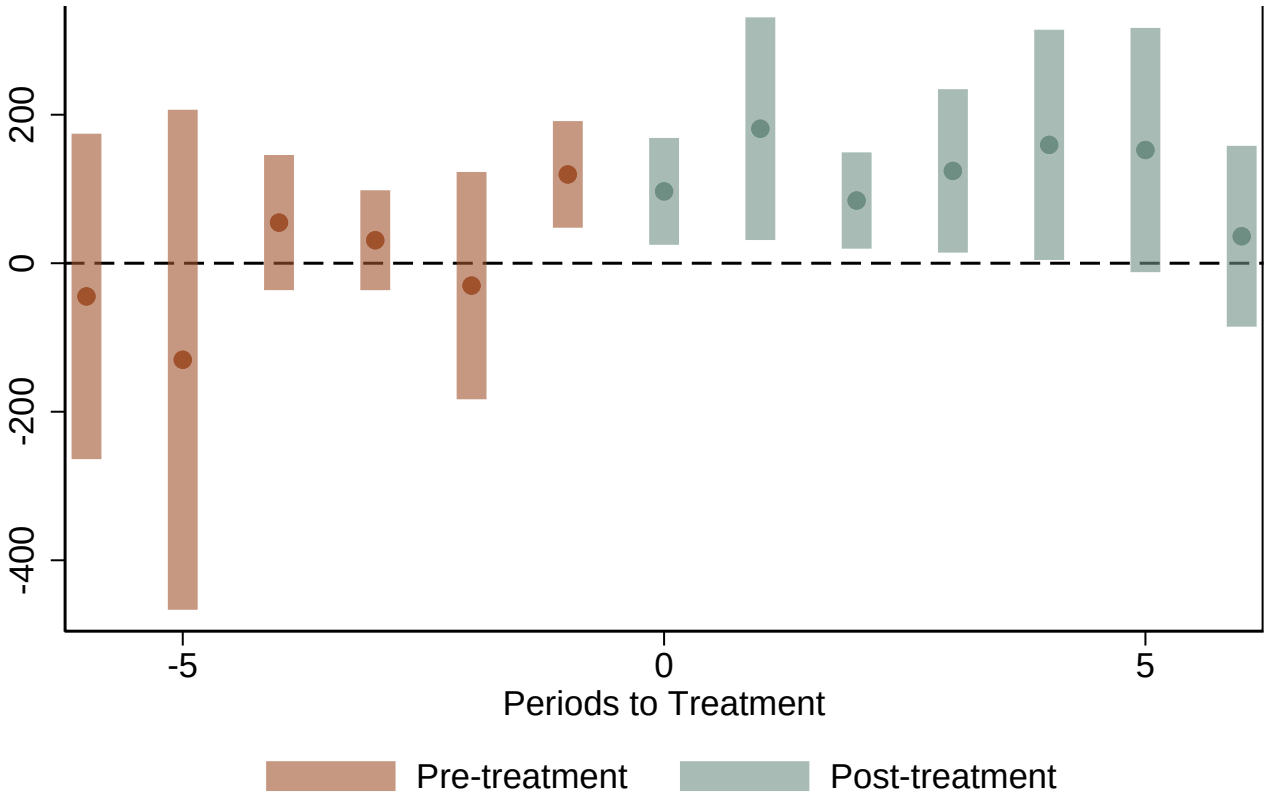
Figure 6: Movement into Employment in the Accommodations and Food Services/Arts and Entertainment Industries for the Previously Unemployed



Note: The method of analysis here uses the staggered difference in difference set up as suggested by Callaway and Sant'Anna (2021). Data Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

and more likely to be re-locating in terms of their employment zip code.

Figure 7: Change in Employer Zip Code for Individuals in the Accommodations and Food Services/Arts and Entertainment Industries

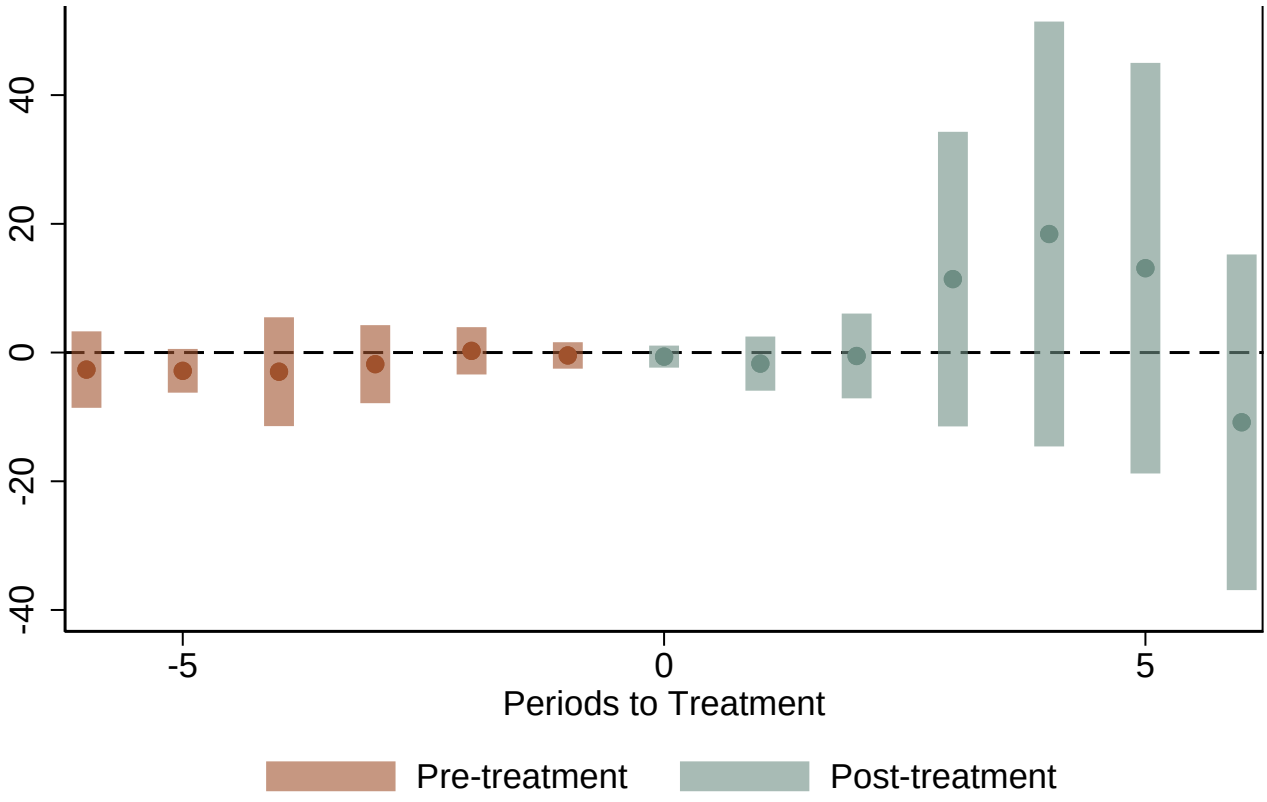


Note: The method of analysis here uses the staggered difference in difference set up as suggested by Callaway and Sant'Anna (2021). Data Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

4.3 Employment Expansion after Casino Operation Across All Industries

In this section, we examine whether the start of tribal casino operations results in employment effects across all industries at the zicode level. WE focus on American Indian workers first. We plot the coefficients from a simple event-study analysis showing the difference in total employment for American Indians for all businesses within zip codes prior to and after the start of tribal casino operations and the comparison zip codes. This analysis pools all American Indian workers and all business establishments in the zip-code, regardless of when they were first employed or started operations in the geographic area. Figure 8 shows the casino treatment effects for the net number of American Indian employees in the zip code . In the figure, there are some increases in years three and four, which roughly corresponds to the results we obtained specific of casino-related industries. The size of the coefficients is also similar. These increases might be picking up the same phenomenon we observed in casino-related industries, but none of those results attain statistical significance at conventional levels. Overall, there is no substantive evidence of a large change in American Indian net employment in enterprises (other than in the narrow categories of NAICS codes 71 and 72 as shown in Figure 3 located within zip code as a result of the tribal casino operations.

Figure 8: Casino Treatment Effect on Employment for AIAN Workers

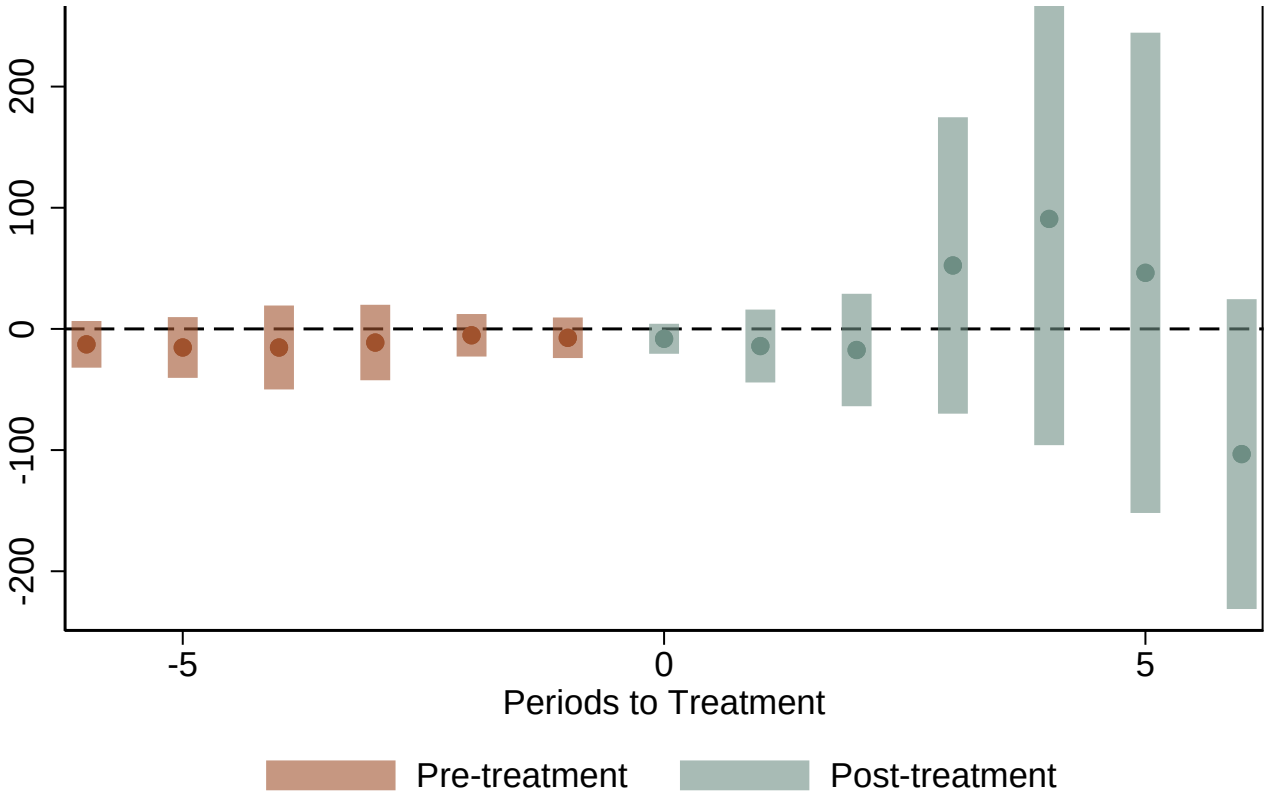


Note: The method of analysis here uses the staggered difference in difference set up as suggested by Callaway and Sant'Anna (2021). Data Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

In Figure 9 we repeat the analysis from above but include all workers, not just American Indians. We find that there is no evidence of significant change in employment leading up to the start of tribal casino operations or in the first two years after the start of operations. We do observe positive point

estimates in years two, three and four after the start of casino operations, suggesting modest gains in net total employment of about 80 to 100 individuals. However, none of those individual estimates reach statistical significance.

Figure 9: Casino Treatment Effect on Employment for All Workers



Note: The method of analysis here uses the staggered difference in difference set up as suggested by Callaway and Sant'Anna (2021). Data Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

The results in this section suggest that the observed effects from tribal casino operations had no noticeable effect on employment in other non-casino related industries in these zipcodes. These results hold for both the American Indian and non-American Indians workers in those zipcodes.

5 Discussion of Lessons Learned about this Alternative Place-Based Development Policy and Conclusion

Prior research into casino gaming on American Indian reservations suggests broad benefits to locations hosting these enterprises, to both the on-reservation American Indian population, off-reservation beneficiaries of profit-sharing, and non-American Indian residents. The evolution of the casino industry can be seen as a process of evolving tribal self-determination, and is not the only economic success story arising from a new era of tribal "national building." The research into casino gaming as a place-based policy does, however, contain certain gaps, a few of which we have attempted to address.

Our main findings in this paper show that the start of tribal casino operations are associated with significantly higher employment of American Indians in the Accommodations, Food Services, Arts and Entertainment Industries compared with non-casino zipcodes in the same state. These results also accompany an increase in wages for AIAN workers in these same industries. Finally, we find that there is some evidence for movement from unemployment (for all races) into employment in these industries after the start of tribal casino operations. We also find evidence that people change their employment across zipcodes to work within these industries after the start of tribal casino operations. Overall, these results indicate, on average, that tribal casino operations provide an increase in employment and wages for the AIAN population. The new economic activity also attracts employment by formerly unemployed individuals (across all race groups) and individuals who were not necessarily employed previously within tribal zipcode locations. We take this as some suggestive evidence of the economic effects of tribal casino operations on the local populations, both American Indian and non-American Indian.

One of the most enduring questions in place-based economic development is the question of whether the novel policy or program comes at the expense of development from another region. Our current analysis is not able to fully identify whether American Indian Tribal casinos divert economic activity from other, adjacent surrounding areas. Presumably, given the lack of alternative activities in this particular industry, there was probably little diversion within this specific industry. However, there may be a reallocation of labor across regions or counties that may have an effect on economic development. In Figure 7, we have shown that individuals move across zipcodes in order to work in the tribal casino sector. This is some evidence that there is reallocation of labor across space for this new economic activity. However, given the relatively small size of these tribal casino operations, at least in the short-run, these movements may not account for a large change across different regions. On average, the movement across Zipcode regions would amount to approximately 600-700 new individuals for employment in the Accommodations, Food Services or Arts and Entertainment Industries over a five year period. This may certainly prove to be a large influx for some relatively small tribal nations, but represents a tiny fraction of most county and certainly state populations.

Another enduring question is whether the observed results provide some insight and evidence for either other industries or other populations. In particular, are there other industries where the provision of monopoly rights would provide a source of economic development for a particular population? This is probably most salient for rural American Indian tribal nations and where there are significant public lands or resources. In this case, there may be significant opportunities for the management of public (primarily federal) lands and resources; Krepps and Caves (1994) has shown the significant benefits of

tribal nation management of forest resources. There may be other opportunities in watershed protection, fire reduction, and fish and wildlife management. Finally, there may be significant climate-change harm reduction or mitigation efforts given that many tribal nations have been early-adopters of these efforts in their communities (Bronen, 2014; EPA, 2024). These results may hold promise for Indigenous Peoples in other parts of the world as well.

Finally, as the maturation and growth of the gaming industry increases across the U.S., there are remaining questions as to whether the tribal gaming industry will remain a viable economic development policy. While this paper does not address those items, future work should investigate the degree to which these same tribal nations have diversified their economic activities in the short-run. Additionally, investment in productive activities such as infrastructure development and the provision of resources for education for tribal citizens may prove to be additional long-term benefits of the industry. Evaluation of these diversification activities would provide insight into the methods for sustaining long-run economic development even as the underlying monopoly-right starts to diminish given the proliferation of competitors in the same industry on non-reservation lands.

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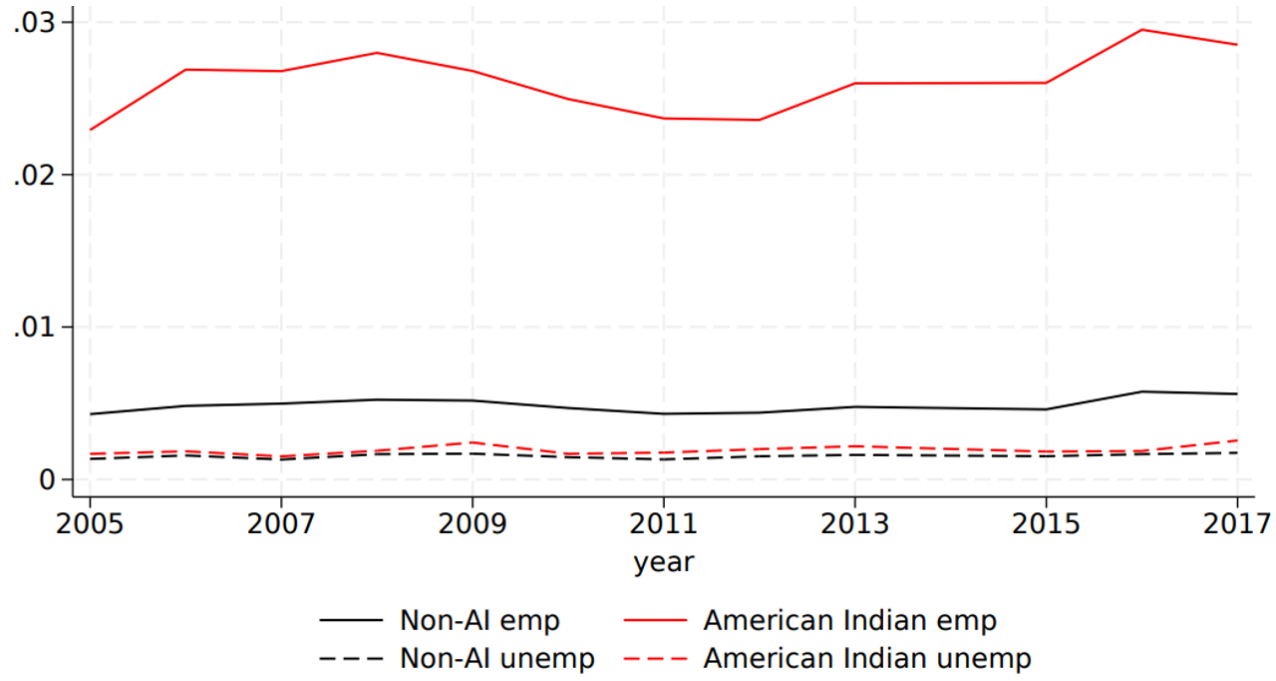
A Appendix figures

A1 County results in cross-section

In an additional analysis that did not restrict casino geographies to post-2005 casino establishment, we examined the repeated cross-section association of casinos on employment and wages of American Indians and non-American Indians. These results are simple mean graphs shown in this appendix. Impacts vary by the size of the casino: in general, we find that over time, a higher percentage of American Indian workers are employed in casino work at the end of the period compared with white non-Hispanic workers, even though over time these proportions vary by casino size.

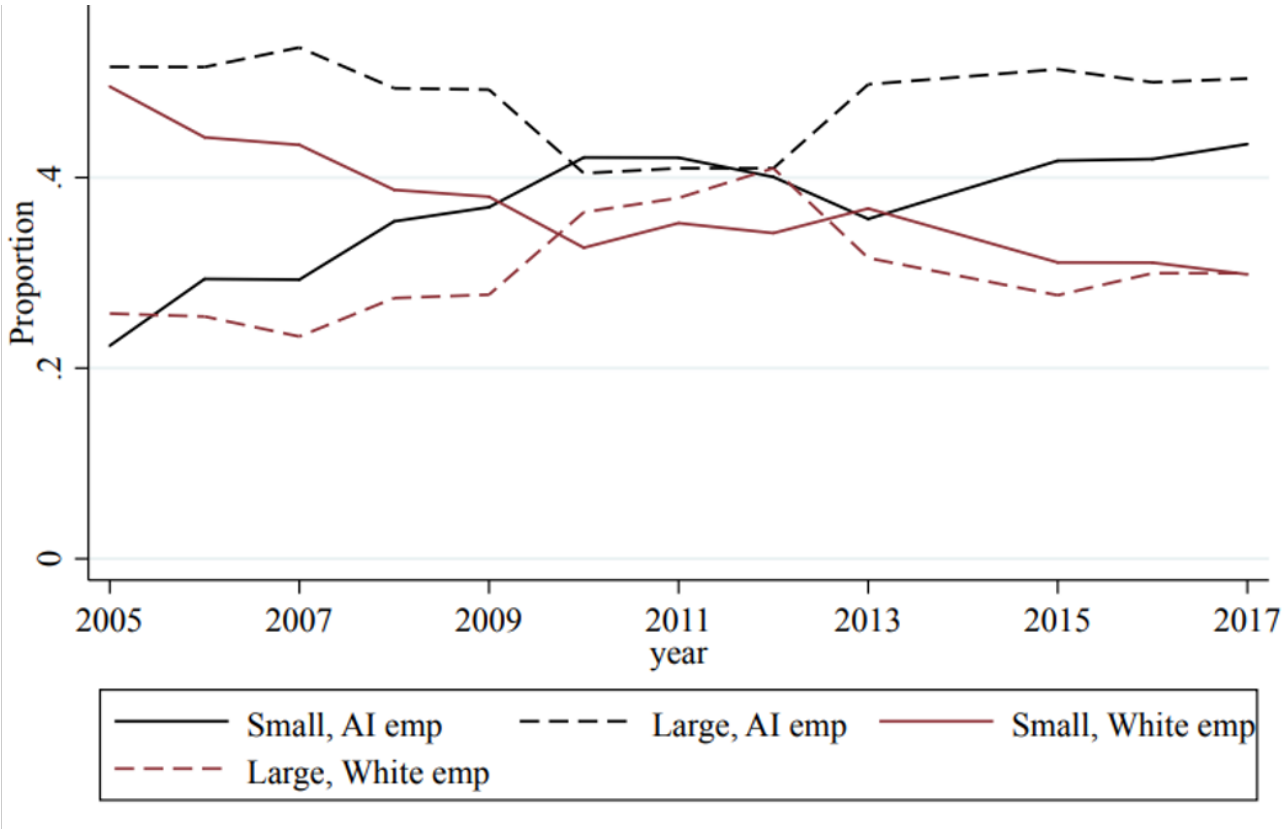
In figure A2 we show the trajectory of employment for workers who lived on reservation lands in 1989 (based on tax filing). Figure 9 shows the same information for any workers in a casino, regardless of in-migration. This second graph indicates that American Indian worker may only begin experiencing differentially positive employment benefits from casinos after a few years of operation.

Figure A1: Employment in Casino Industry vs Unemployment



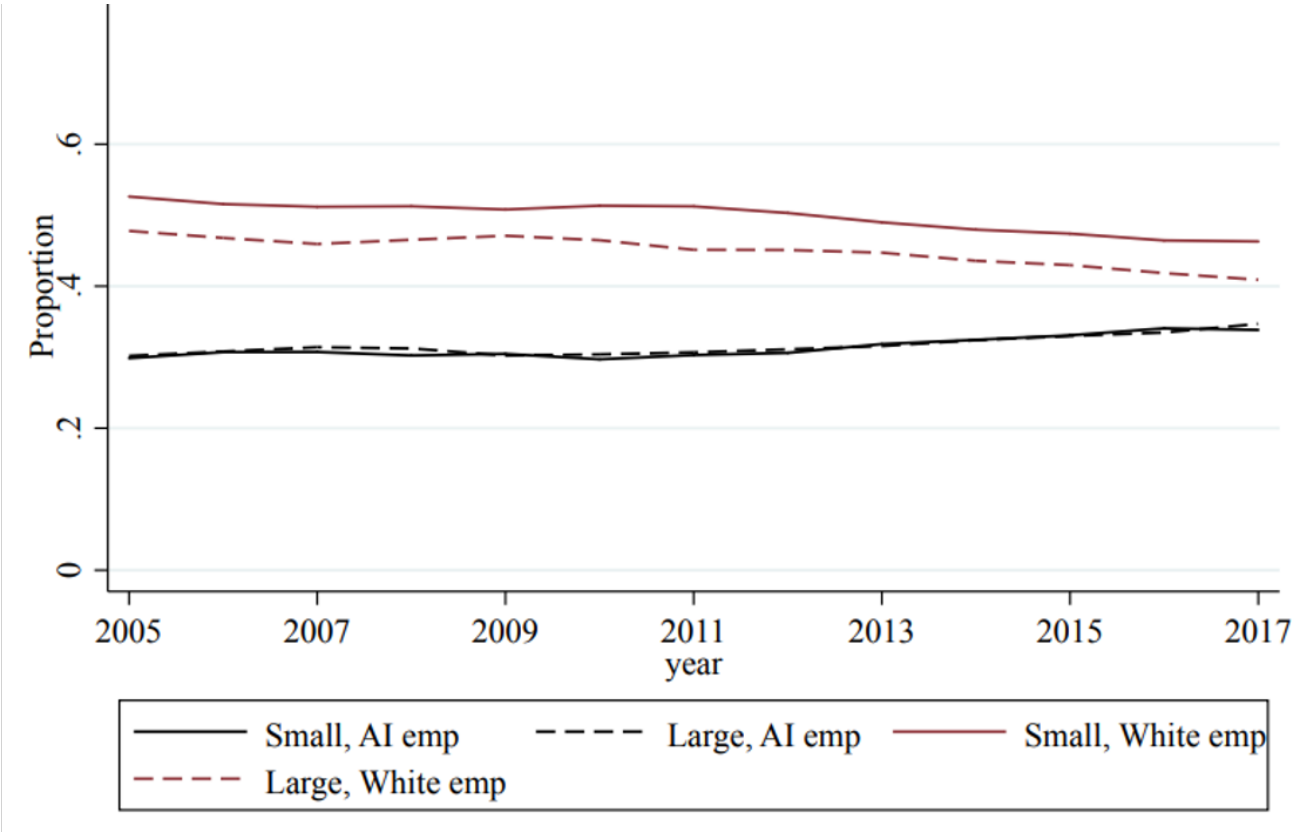
Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

Figure A2: Employment in Casino Industry by Race



Note: We separate the data by whether a tribal casino is large or small. Large indicates that the tribal casino is above the median in terms of XYZ; small indicates that the tribal casino is below the media of XYZ. Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.

Figure A3: Employment in Casino Industry by Race and Casino Size



Source: Longitudinal Business Database and Opportunity Databank data, 2005–2017.