

Tribal Casinos and Identifying Who Moves to Opportunity[†]

By EMILIA SIMEONOVA, RANDALL AKEE, AND MAGGIE R. JONES*

The relationship between geographic location and economic opportunity has inspired a new and growing branch of the economics literature (Chyn and Katz 2021). A large body of work has documented strong associations between neighborhood quality and economic and social mobility across generations (Chetty and Hendren 2018a, b). Using quasi-experimental variation in the opportunity cost of moving (the “push” factors leading to mobility) and within-family comparisons, previous studies have shown that relocating to geographic locations of better “opportunity” affects children’s long-term economic success (Chetty, Hendren, and Katz 2016; Chetty et al. 2018). Much less research has investigated how improvements in economic conditions in different geographic locations affect who moves to these locations. We concentrate on analyzing one type of these “pull” factors—the establishment of tribal casino operations and their effect on the geographic mobility of tribal members residing off reservation. The question we answer is: Conditional on an exogenous positive change in the tribal reservation’s social and economic conditions, what types of households are most likely to move?

Using unique panel data on American Indians (AI) who lived away from tribal lands in 1989,

we make two contributions to the literature. First, we demonstrate that there is substantial selection in the type of households that relocate to reservations in response to changes in local conditions due to casino operations. This finding emphasizes the importance of panel data approaches in evaluating the impact of economic shocks on household well-being. Second, we show that there is selection in geographic mobility in response to changing economic opportunities in locations other than a household’s residence. This selection may impact the estimation of long-term impacts of local economic conditions on children’s outcomes.

Previous studies have documented substantial economic and social mobility associated with the advent of casino operations on tribal lands (Evans and Topoleski 2002; Wolfe et al. 2012; Wheeler 2023). Which households are more likely to move is an empirical question that necessitates the use of individual panel data. We demonstrate that there is selection in the type of household that moves to the reservation in response to casino openings. The impact of tribal casino openings on the probability of moving among AI initially residing off the reservation spans the entire range of possibilities: it is large and positive among single parents, there is no discernible response for married couples with children, and single individuals are less likely to relocate to tribal lands after the start of casino operations. The implication is that cross-sectional studies that do not account for differential geographic mobility likely underestimate the impact of casinos (and other place-based economic development programs) on household economic well-being.

The US National Indian Gaming Commission (NIGC) recently announced that the gross revenues for the industry reached \$40 billion in 2022 (Harris 2022), making it one of the most successful economic development projects for this population (Akee, Spilde, and Taylor 2015). As a comparison, the annual congressional appropriations for the Bureau of Indian Affairs and

* Simeonova: Johns Hopkins University Carey School of Business (email: emilia.simeonova@gmail.com); Akee: University of California, Los Angeles (email: rakee@ucla.edu); Jones: US Census Bureau (email: margaret.r.jones@census.gov). Any opinions and conclusions expressed herein are those of the authors and do not reflect the views of the US Census Bureau. The statistical summaries reported in this paper have been cleared by the Census Bureau’s Disclosure Review Board (release authorization number CBDRB-FY2024-CES014-006). All results have been reviewed to ensure that no confidential information is disclosed. Akee and Simeonova gratefully acknowledge financial support from the W. T. Grant Foundation (grant 201352). Any errors are ours alone.

[†] Go to <https://doi.org/10.1257/pandp.20241106> to visit the article page for additional materials and author disclosure statement(s).

Indian Education is approximately \$2.8 billion per year (Bureau of Indian Affairs 2019).

The Indian Gaming Regulatory Act (IGRA) of 1988 provided a standardized method for AI tribal governments to establish casino operations on their federally recognized tribal lands. Amidst decades of state-tribal conflict on existing tribal gaming operations, Congress provided a pathway to establishing tribal gaming enterprises where none had existed previously and thus created a novel economic opportunity for tribal governments. Uses of the revenues from tribal casino operations were restricted to the following five categories: to fund tribal government operations or programs, to provide for the general welfare of the tribe and its members, to promote tribal economic development, to donate to charitable organizations, and to help fund operations of local government agencies providing services to tribes.

We assemble a panel dataset at the individual level for primary and secondary tax filers who reported tribal affiliation (according to their responses on the 2000 decennial census) and did not reside on tribal reservation lands in 1989. This initial year predates the entry of most tribal governments into the Indian gaming industry; the vast majority of tribal casinos began operations after 1989. Using this sample of nonresident individuals, we then examine whether the advent of casino operations, and in some cases the distribution of unearned cash transfers, affected their geographic mobility. We focus on relocation to tribal reservation locations, as casinos and related economic activity alter the economic and social opportunity landscape on tribal lands (Akee et al. 2020; Akee, Spilde, and Taylor 2015).

We are able to identify individuals' residence in each of the years 1989, 1994, 1995, and 1998–2017 based on the panel dataset using IRS 1040 filings. We crosswalk 1040 geographies to lists of tracts and zip codes associated with tribal lands. We demonstrate heterogeneous responses by household type to casino operations depending on marital status and the presence of children. Unmarried tribal members initially residing outside tribal lands who have children in 1989 are more likely to move to reservations after a casino opens. We refer to this mobility as “moving to opportunity.” On the other hand, tribal members without children in the household in 1989 are less likely to move to the reservation after a casino opens.

I. Data Description

We use restricted-use data in our study from two separate sources: the US Census Bureau and the IRS. Records were linked at the Census Bureau using a process whereby individuals in each dataset were given a unique, protected identification key called a “PIK.” When a SSN is available in a dataset, the identifier is assigned based on SSN and name verification. For records without a SSN, personally identifiable information such as name, address, and date of birth is used in probabilistic matching to assign PIKs.¹ Only those observations that received the unique person identifier are used in the analysis.²

Race and ethnicity data come from the 2000 decennial census—the census closest to the initial year of tax data that has reliable PIKs. We categorize as AI anyone who reported AI race alone or in combination.³ We restrict our analysis to AI residing off tribal reservation lands at the start of our data in 1989.

Tribal affiliation can be reported in addition to AI race in the 2000 census. We use these reports to link individuals to tribes; we then link tribes to information on their casino operations, such as the year of establishment and the year any profit-sharing agreements began. Only AI individuals who reported tribal affiliations in the 2000 census and resided off reservation lands in 1989 are included in the sample. Note that the use of the 2000 census necessarily restricts that sample to individuals who resided off reservation lands in 1989 and were alive in the year 2000.

We further restrict our analysis to all primary and secondary filers who were born between 1940 and 1971 (18–49 in the base tax year and 46–77 in the final year). The presence of children in the household and marital status are derived from 1040 tax filings.

¹For more information on the linking process, see Wagner and Lane (2014).

²The record-linkage approach introduces some bias. Minorities and people with lower socioeconomic status are less likely to receive a record-linkage key compared to Whites and people who have higher levels of socioeconomic status (Bond et al. 2014).

³We do not include Alaskan Native villages; thus, we use the term “American Indian” and not the official Office of Management and Budget term, “American Indian/Alaska Native.”

TABLE 1—SUMMARY STATISTICS

	Ever have a casino (means in 1994)		Never have a casino (means in 1994)	
	Mean	SD	Mean	SD
Lived on reservation in 1994	0.188	0.391	0.236	0.425
Casino opened by 1994	0.141	0.348	0	0
Cash transfer by 1994	0.002	0.044	0	0
Married in 1994	0.524	0.499	0.542	0.498
Had kids in 1994	0.702	0.457	0.708	0.455
Adjusted gross income in 1994	28,000	32,000	30,000	53,000

Notes: All estimates have been rounded according to disclosure rules. There are 82,000 observations for the “ever have a casino” data and 32,000 observations for the “never have a casino” data. Linked data are derived from SSA Numident, 2000 decennial census, and Form 1040. The Census Bureau’s Disclosure Review Board has approved all statistics and estimates for public release under approval number CBDRB-FY2024-CES014-006.

Data on the start of the casino operations were collected by the authors using publicly available information from several online sources.⁴ This variable is coded as zero for all years prior to the start of casino operations and coded as one in the year the casino started operations on the reservation and for every year thereafter. For tribes that did not open a casino until the end of our observation period in 2017, the casino variable is coded as zero throughout. The decision to pursue casino operations is dependent upon each tribal government and thus provides variation in time and geographic location.

Our key dependent variable is an indicator variable equal to one if a person moves to a tribal reservation in a given year and zero otherwise. We consider each tribal reservation as a separate location and local market. In other words, all census tracts that fall within a reservation are considered part of the same “neighborhood.”

Cash transfer programs are permissible as one of the uses of tribal casino revenues as specified in the IGRA. Cash transfer programs from casino revenues differ by AI tribal government in terms of frequency, size, and start date. Notably, it is tribal enrollment and not proximity to tribal lands that determines eligibility; thus, cash transfer recipients are not required to live near a casino or be involved in its operation. Although we do not see official enrollment, tribal affiliation is self-reported in the 2000 census. Given the likelihood that the presence

of a casino—especially if there are associated cash transfers—results in a higher probability that individuals who are not actually tribally enrolled report being tribal members, then we may inadvertently assign a casino or cash transfer treatment to individuals who are not eligible for them. As a result, we believe that our results deliver a conservative estimate of the true effect of cash transfers and casino operations in general.

Additionally, the measure used in our analysis only indicates whether a tribal government submitted a Revenue Allocation Program (RAP) document to the Office of Indian Gaming in the US Bureau of Indian Affairs (Taggart and Conner 2011). Therefore, our measure is interpretable as an intention to treat, as not all of the tribal governments that submitted the RAP actually proceeded with a cash transfer program. However, a tribal government that provides any cash transfers derived from casino revenues must have submitted a RAP document and received approval from the Assistant Secretary of Indian Affairs.

In Table 1, we provide summary statistics on our ever-treated group versus the set of AI whose reported tribe never opened a casino. First, we show the one-period mobility rate for the baseline year to the next year in our sample (1994). By 1994, five years after the sampling window opens, about 19 percent of those who were affiliated with tribal nations that started tribal casinos by 2017 had moved to tribal lands. Among individuals whose reported tribes never opened a casino, almost a quarter had moved to tribal lands in 1994. The average differences in marital status, the presence of minor children in

⁴Those sources are the following: tribal government websites, casinocity.com, various state casino regulatory websites, and the NIGC website (<https://www.nigc.gov/>).

the household, and annual income are not large across the two groups.

Consistent with trends reported elsewhere (Simeonova, Akee, and Jones 2021), only 0.2 percent of those whose tribes eventually got a casino had begun receiving cash transfers in 1994. Cash transfers could only start after the advent of casino operations and, in the majority of cases, commenced a few years after casino operations began.⁵

II. Empirical Strategy

Our analysis focuses on the effect of AI casinos and tribal cash transfers on the residential mobility of individuals who did not reside on tribal lands in 1989. The outcome variable of interest is an indicator for residence on a tribal reservation in each year of our panel. The treatment variables of interest are the presence of a tribal casino and the presence of a cash transfer agreement. Both of these variables vary within person over time.

$$(1) \text{ TribalResidence}_{it} = \alpha_0 + \gamma \times \text{Casino}_{it} \\ + \delta \times \text{CashTransfer}_{it} \\ + \theta_t + \mu_i + \epsilon_{it}.$$

In equation (1) above, Casino_{it} is our first variable of interest, and we estimate the coefficient γ in our analysis; this variable measures whether or not a casino is operating on a particular reservation that aligns with a person i 's own self-reported tribal affiliation category, in a particular year t . The second variable of interest is CashTransfer_{it} , and we estimate the coefficient δ in our analysis; this variable also differs over time and different reservation locations but must align with the individual's own self-reported tribal affiliation category and reservation. The coefficient on the cash transfer variable is separately identifiable from the casino operations variable because not all tribal governments provide cash transfers; additionally, they do not necessarily start offering cash transfers at the

same time as the casino is established. There are no publicly available data on the size of the cash transfers over time and across tribal nations; however, anecdotally, the amounts distributed may range from a few hundred dollars to thousands of dollars.

We also include a year fixed effect θ_t to account for unobserved common factors over time and a person fixed effect μ_i . Finally, we include an intercept α_0 and an error term ϵ_{it} . We cluster the standard errors at the tribal group level for all regressions.

III. Regression Results

The presence and direction of an effect of casino operations on AI migration to tribal reservation lands for those initially residing off tribal lands are hard to predict. On the one hand, associated economic activity, and, in particular, the presence of unearned cash transfers that are disbursed to all enrolled tribal members regardless of where they reside, may induce individuals to continue residing off the reservation and take advantage of local amenities with their improved household resources. On the other hand, casino revenues and related jobs in the service sector, tribal governments' investment in public goods, and other benefits available to tribally enrolled members might induce relocation to the reservation or moving to opportunity. We use "opportunity" here in a broad sense, not only in terms of opportunity for economic gain, but also the opportunity to send children to tribally sponsored educational facilities and to take advantage of subsidized housing and health care. Additionally, there may be other benefits related to assistance from family members in childcare and housing. The costs of relocating are likely higher for larger households that include children in school.

We start out by estimating the average effect of casino openings on the probability of moving to the reservation for all individuals in the sample. Coefficient estimates are reported in Table 2. Casino openings increase the individual probability of moving to the reservation in each period in our panel by about 0.7 percentage points. However, this estimate masks large differences across those who have children in 1989 and those who do not. We separate household types by the presence of children in 1989 to avoid potential issues of endogenous fertility as a

⁵The data for this measure are provided by Thaddieus Conner and used in his research (Taggart and Conner 2011); additional information was obtained directly from the US Bureau of Indian Affairs through Freedom of Information Act requests.

TABLE 2—MOVING TO TRIBAL RESERVATION LOCATIONS AFTER CASINO OPERATIONS BEGIN

Variables	Residing on reservation			Residing on reservation		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Casino</i>	0.007 (0.003)	-0.004 (0.002)	0.010 (0.004)	0.007 (0.003)	-0.005 (0.002)	0.010 (0.004)
<i>Cash transfers</i>				0.005 (0.007)	0.010 (0.005)	0.004 (0.009)
Sample Description	Total	No kids	With kids	Total	No kids	With kids
R^2	0.84	0.748	0.841	0.84	0.748	0.841
Observations	3,500,000	680,000	2,820,000	3,500,000	680,000	2,820,000

Notes: The samples are for the total set of observations, the set of households that initially have no children in 1989, and the set of households that have any children in 1989. Linked data are derived from SSA Numident, 2000 decennial census, and Form 1040. The Census Bureau's Disclosure Review Board has approved all statistics and estimates for public release under approval number CBDRB-FY2024-CES014-006.

response to IGRA. Among childless individuals, the probability of moving to the reservation is reduced after a casino opening. The opposite is true for those who have children in the household: the increase in the probability of moving for those households is about 1 percentage point. Compared to the mean mobility between 1989 and 1994 among those who were never treated to casinos, this is an increase of 4.2 percent.

Separating out the associations with cash transfers further reveals that households that do not have children have the opposite reactions to casino openings and cash transfer agreements: casinos reduce their probability of moving to the reservations, while the cash transfers act in the opposite direction. The positive effects of cash transfers are more than sufficient to reverse the negative association with casinos; thus, the combined effect for those eligible for cash transfers is positive. On the contrary, the cash transfers have no significant impact on the mobility probability of those with minor children.

Table 3 presents estimates by marital status and the presence of children. Both measures are taken in 1989. The positive association between casino operations and relocation to the reservation is driven by unmarried individuals, as is evident when we compare the coefficients in columns 1 and 2. The positive association between cash transfers and mobility is entirely contained in the sample of married couples without children. There are no significant associations with mobility among married couples with children for casino operations or cash transfers. Single

childless individuals are less likely to move to tribal lands after the advent of casino operations. Single parents are driving the positive correlation between casino operations and mobility back to the reservation.

Casino operations and the associated economic and social activity on reservations make tribal lands more attractive to single parents and less attractive to childless singles and have no significant impact on the residential mobility of married individuals with children. Our results have implications for studies of casino operations that rely on cross-sectional data and are unable to control for mobility on and off the reservation. Our results also point to intriguing patterns regarding who is and who is not mobile and what sorts of incentives induce people to move.⁶ Considering the fact that nearly three-quarters of single parents at baseline in our data are women, their greater response to economic and neighborhood incentives may reflect any number of mechanisms, including lower attachment to origin labor markets or a desire to return to extended family. We leave such questions for future research.

IV. Conclusion

Our analysis of almost 30 years of household panel data coupled with data on casino openings

⁶In a further analysis, we also examine the probability that on-reservation populations remain on the reservation over time; that analysis is not shown here.

TABLE 3—MOVING TO TRIBAL RESERVATION LOCATIONS AFTER CASINO OPERATIONS BEGIN BY MARITAL AND CHILD STATUS

Variables	Residing on reservation			Residing on reservation		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Casino</i>	0.003 (0.002)	0.008 (0.004)	-0.003 (0.002)	0.005 (0.003)	-0.006 (0.003)	0.011 (0.004)
<i>Cash transfers</i>	0.005 (0.004)	0.006 (0.009)	0.008 (0.004)	0.004 (0.005)	0.011 (0.007)	0.006 (0.011)
Sample	Married	Not married	Married no kids	Married with kids	Not married no kids	Not married with kids
R^2	0.888	0.845	0.795	0.892	0.771	0.844
Observations	1,640,000	1,860,000	380,000	1,260,000	300,000	1,550,000

Notes: Linked data are derived from SSA Numident, 2000 decennial census, and Form 1040. The Census Bureau's Disclosure Review Board has approved all statistics and estimates for public release under approval number CBDRB-FY2024-CES014-006.

demonstrates that tribal casino operations and the cash transfer programs derived from associated revenues increase the migration of AI tribal citizens to reservation lands. We find the largest impacts for unmarried parents with children. Similar patterns are uncovered in moving to opportunity analyses of compliers versus noncompliers in an experimental setting that offered poor households housing vouchers to move to better neighborhoods (Kling, Liebman, and Katz 2007). When randomization of pull factors across similar groups of subjects is not possible, studies should consider such sources of selection in the analysis of neighborhood effects.

The presence of cash transfers does little to affect the mobility of most demographic groups with the exception of married couples without children, who tend to move to tribal lands in response to unearned cash transfers. The presence of a casino, with the ensuing changes in potential private market opportunities and expansion of tribal government programs, appears to drive mobility to tribal lands. It has opposite effects for single individuals with and without children, attracting single parents and reducing the probability of moving to tribal lands for singles without children. Children from single-parent households tend to be more disadvantaged than those from married households. This selection, even if coupled with the potential presence of tribally administered programs intended to close gaps in economic background, likely biases estimates of the long-term effects of casino operations on economic outcomes downward in cross-sectional data analyses.

REFERENCES

- Akee, Randall, William Copeland, John B. Holbein, and Emilia Simeonova. 2020. "Human Capital and Voting Behavior across Generations: Evidence from an Income Intervention." *American Political Science Review* 114 (2): 609–16.
- Akee, Randall K. Q., Katherine A. Spilde, and Jonathan B. Taylor. 2015. "The Indian Gaming Regulatory Act and Its Effects on American Indian Economic Development." *Journal of Economic Perspectives* 29 (3): 185–208.
- Bond, Brittany, J. David Brown, Adela Luque, and Amy O'Hara. 2014. "The Nature of the Bias When Studying Only Linkable Person Records: Evidence from the American Community Survey." Center for Administrative Records Research and Applications Working Paper 2014-08.
- Bureau of Indian Affairs. 2019. *Fiscal Year 2020: The Interior Budget in Brief*. Washington, DC: US Department of the Interior.
- Chetty, Raj, John N. Friedman, Nathaniel Hendren, Maggie R. Jones, and Sonya R. Porter. 2018. "The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility." NBER Working Paper 25147.
- Chetty, Raj, and Nathaniel Hendren. 2018a. "The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects." *Quarterly Journal of Economics* 133 (3): 1107–62.
- Chetty, Raj, and Nathaniel Hendren. 2018b. "The Impacts of Neighborhoods on Intergenerational Mobility II: County-Level

- Estimates.” *Quarterly Journal of Economics* 133 (3): 1163–228.
- Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz.** 2016. “The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment.” *American Economic Review* 106 (4): 855–902.
- Chyn, Eric, and Lawrence F. Katz.** 2021. “Neighborhoods Matter: Assessing the Evidence for Place Effects.” *Journal of Economic Perspectives* 35 (4): 197–222.
- Evans, William N., and Julie H. Topoleski.** 2002. “The Social and Economic Impact of Native American Casinos.” NBER Working Paper 9198.
- Harris, Mavis.** 2022. “FY 2022 Indian Gaming Revenue Breaks Records at \$40.9 Billion.” *National Indian Gaming Commission*, July 19, 2023. <https://www.nigc.gov/news/detail/fy-2022-indian-gaming-revenue-breaks-records-at-40.9-billion#>.
- Kling, Jeffrey R., Jeffrey B. Liebman, and Lawrence F. Katz.** 2007. “Experimental Analysis of Neighborhood Effects.” *Econometrica* 75 (1): 83–119.
- Simeonova, Emilia, Randall Akee, and Maggie R. Jones.** 2021. “Gaming Opportunities: American Indian Casinos, Cash Transfers, and Income Mobility on the Reservation.” *AEA Papers and Proceedings* 111: 221–26.
- Taggart, William A., and Thaddieus W. Conner.** 2011. “Indian Gaming and Tribal Revenue Allocation Plans: A Case of ‘Play to Pay.’” *Gaming Law Review and Economics* 15 (6): 355–63.
- Wagner, Deborah, and Mary Lane.** 2014. “The Person Identification Validation System (PVS): Applying the Center for Administrative Records Research and Applications’ (CARRA) Record Linkage Software.” Center for Administrative Records Research and Applications Working Paper 2014-01.
- Wheeler, Laurel.** 2023. “More than Chance: The Local Labor Market Effects of Tribal Gaming.” Center for Indian Country Development Working Paper 2023-02.
- Wolfe, Barbara, Jessica Jakubowski, Robert Haveman, and Marissa Courey.** 2012. “The Income and Health Effects of Tribal Casino Gaming on American Indians.” *Demography* 49 (2): 499–524.