PLEASE DO NOT CITE OR FORWARD. PRELIMINARY RESULTS ONLY.

Tribal Casinos, Economic Success, and Intergenerational Mobility

Randall Akee[†], Maggie R. Jones[‡], Emilia Simeonova[*]

[†]UCLA and NBER
[‡]U.S. Census Bureau
[*]Johns Hopkins University and NBER

February 7, 2024

Abstract

The literature on place-based policies has argued that improvements in local economic conditions for one generation could have long-reaching effects on the socioeconomic success of their children. This study examines two different types of changes in family economic circumstance: improvements in local economic conditions induced by a novel place-based economic development project—tribal casino operations; and unearned income transfers in a subset of these tribal communities. We investigate the effects of these treatments on the adult generation and on the children's generation when they become adults themselves. We use individual-level panel data from the U.S. Census Bureau and the Internal Revenue Service that links the two generations. The advent of tribal casino operations due to the passage of the Indian Gaming Regulatory Act, together with tribe-specific profit-sharing arrangements, provide sources of variation in local economic conditions. We find strong evidence of increases in parental incomes as well as for improvements in the child's outcomes in adulthood in earnings, educational attainment, and family income.

Keywords: Income inequality, earnings inequality, race, ethnicity, casinos, mobility, American Indian
JEL classification: J15, J24, 48, I38

Acknowledgments

Any opinions and conclusions expressed herein are those of the authors and do not reflect the views of the U.S. Census Bureau. Results released under Disclosure Review Board number CBDRB-FY24-CES010-002. Akee and Simeonova acknowledge funding from the WT Grant Foundation. **Author contact information**: Akee: rakee@ucla.edu; Jones: margaret.r.jones@census.gov; Simeonova: esimeon1@jhu.edu.

1 Introduction

There is a strong positive correlation between family resources and children's social and economic outcomes as adults. The intergenerational transmission of socioeconomic status is well documented (Almond et al., 2018; Duncan et al., 2017). However, relatively little is known about how improved economic opportunities and unearned income transfers received by households affect children's long-term outcomes. The literature on geographic differences in economic outcomes suggests that families "moving to opportunity" could improve children's outcomes through relocation to areas experiencing better economic conditions (Chetty, Hendren and Katz 2016; Chetty and Hendren 2018 (1) and (2), but also see Sanbonmatsu et al. 2006). Similarly, studies on the long-term effects of recessions have demonstrated that experiencing worse economic conditions during childhood affects education and labor market success in adulthood (Stuart 2022). Better economic opportunities for households during childhood improve the long-term trajectories of individuals. The rapidly growing body of research on cash (or equivalent) transfers to families and child outcomes has uncovered mixed results on the short-term effects (Akee et al. 2013; Jacob, Kapustin and Ludwig 2015; Akee et al. 2018) and little evidence on the long-term impacts of such policies (Akee, Copeland and Simeonova 2022). We are not aware of any work that examines the combined effects of improved economic opportunity and increases in family income caused by unearned cash transfers.

In this paper, we consider two different types of changes in family economic circumstance and their impacts on the next generation. First, we examine the impact of opening tribal casinos, often described as "engines of economic growth," on the population of individuals residing on reservations and immediately adjacent counties. This analysis includes both American Indians and non-American Indians who resided in these areas in 1989—before the vast majority of casino operations started—whom we follow until 2017. Second, we expand this analysis to explicitly analyze cases in which the tribe distributed unconditional cash transfers to tribal members.

The changes in family economic status we study are directly related to the provisions of the Indian Gaming Regulatory Act (IGRA) taken up by various tribes. IGRA authorized American Indian gaming in 1988 through providing a standardized method for American Indian tribal governments to create casino operations on their federally recognized tribal lands. Research using publicly available data has shown that the IGRA has unlocked successful economic development activity for American Indian tribal governments that is unprecedented in their modern history (Akee et al. 2015; Washburn 2008; National Indian Gaming Commission 2014; Senate Committee on Indian Affairs 1988). Moreover, IGRA outlined how casino profits were to be used for the benefit of the tribe and its members, leading to widespread adoption of profit-sharing plans that provided direct payments to tribal members.

A thorough examination of the industry—especially the impact of its economic development and financial distributions on American Indians—has been hindered by a lack of data on American Indians in longitudinal data sets. Moreover, the findings of the small set of studies that exist may be biased due to the changing composition of tribal reservations as American Indians and non-American Indians respond to casino-driven economic incentives. To overcome these issues, we build a novel panel data set at the individual level for those residing on American Indian reservations in 1989, prior to the start of the Indian Gaming industry. We then follow the same set of individuals and their households over time. We analyse the impact of casino operations on the socioeconomic status of the parents and the long-run economic performance of the children from the same households. To our knowledge, this

study offers the first and only complete evaluation of the Indian Gaming Regulatory Act's impact on the economic well-being of American Indians.

Our data links confidential-use Internal Revenue Service (IRS) Form 1040 data and U.S. Census Bureau data on demographic characteristics, including race and ethnicity. We link the same individuals over time and space in order to create the panel data set used in the analysis. The IRS data provide the longitudinal measures of household income, wage and salary, and some family characteristics for years 1989–2017. We use the geographic information from the IRS data to identify whether an individual is located on or off of an American Indian reservation in 1989 and in all years thereafter.

We find that casino operations resulted in an increase in adjusted gross income; results are strongest for households that initially had children. We find little effect on income for non-American Indians residing on the reservation locations. The existence of a cash transfer led to approximately \$4,800-\$5,900 more in adjusted gross income for American Indians who resided on a reservation in 1989. We find a reduction in reported wages and salary for American Indians receiving the cash transfers approximating \$1,100. The existence of a cash transfer also led to a two percentage point reduction in the reporting of either wage and salary or self-employment on a 1040. We find no systematic effects of the cash transfers on non-American Indians, which is expected since they would not be eligible for these transfers.

When we consider the children of households that were affected by casino operations while the children were minors (younger than 18), we find all of the affected children have higher family incomes and wages at ages 20–26; we also find that they are more likely to be married as well. One additional result is that we find an increase in self-employment for these treated children compared to their non-treated American Indian counterparts. There is little observable difference in the adult outcomes for non-American Indian children who resided on reservations with casino operations during their childhood. We find that the presence of cash transfers had a positive effect on American Indian children's family income and earnings in adulthood. We find little effect for non-American Indian children except for a slight increase in employment probabilities.

Additionally, we find that the presence of a casino operation tends to increase the probability that American Indian children will remain on the reservation in their adulthood. There is no similar retention of non-American Indian children in adulthood on the reservation lands. Finally, we show, for a subsample of observations who linked to the American Community Survey, that casino operations increase educational attainment in the college-plus category for American Indian children residing on reservation lands. The increase is large—nine percentage points—and statistically significant at the five percent level. Overall, results indicate that casino operations improved the economic conditions of American Indian adults and children.

2 Background and Related Literature

Research into the intergenerational transmission of economic advantage has progressed rapidly in recent years. With the advent of linked administrative and demographic data, researchers gained the ability to connect parents and children to detailed income, race-ethnicity, and geographic data in a manner not possible previously. This has led to work showing the persistence of patterns of advantage or disadvantage by race-ethnicity (Chetty et al., 2020), as well as the moderating influence of neighborhood

characteristics, such as poverty, that correlate with economic opportunity (Chetty et al., 2018; Chetty and Hendren, 2018a,b; Chyn and Katz, 2021).

Increasing local opportunity is the primary goal of place-based economic policies[1], which have received a considerable amount of attention in the economics literature (Neumark and Simpson, 2015). While the evidence on the effectiveness of place-based policies tends to be mixed and depends on the specific initiative (Glaeser and Gottlieb, 2008; Kline and Moretti, 2014), research has shown that economic incentives that specifically focus on job creation in distressed areas have an especially large returns (Austin et al., 2018; Bartik, 2020). Increased parental income from higher wages translates into better outcomes for children through greater parental investments (Dahl and Lochner, 2012; Morrissey, 2023) and local spillovers (Chetty et al., 2016; Owens and Candipan, 2019). Providing opportunities for parents to enter the labor market also increases participation in important work-related transfer policies, such as the EITC, leading to even greater income effects for families (Bastian and Michelmore, 2018; Chetty et al., 2011; Dahl and Lochner, 2012; Milligan and Stabile, 2011).The debate on whether there is a causal link between family resources and child long-term outcomes is not settled. In large part this is because (quasi-) experiential interventions that increase family incomes without directly affecting other aspects of household decision-making are unusual, and it is difficult to disentangle the impact of income alone from other family characteristics and other unobserved factors.

In contrast to work-related transfers, unconditional cash transfers are a rarity in the U.S.; because some casino operations created a "bundle" of local labor market stimulation and unconditional per capita profit sharing, they represent a unique opportunity to examine the impacts of these interventions simultaneously. Researchers have found mixed effects for cash-transfers of this type. In a set of related papers (Gennetian et al., 2022; Magnuson et al., 2022), participants of a randomized control trial who received different values of cash transfers spent more time with their children and spent more on child-related inputs such as books, toys, diapers, and clothes; however, these cash transfers did not translate into increased maternal well-being or improved outlook. In contrast, Jaroszewicz et al. (2022) found that short-term funding during the COVID-19 pandemic did little to alleviate financial concerns of treated individuals, a result that has implications for the design of cash transfers in terms of their timing and duration. Similarly Jacob et al. (2015) consider the long-term effects of housing vouchers that were provided through a lottery to low-income families in Chicago. Contrary to other studies, they find no significant effects on children's long-term education, criminality or health outcomes.

Because of the rarity of unconditional cash transfers in the U.S. setting, other related research relevant to our work is centered on the specific case of tribal casinos.

2.1 Literature on Tribal Casinos

The related literature investigating the effects of casino operations flows in two main strands: studies that use publicly available data at the county or reservation level, but do not have individual or migration data; or studies that use individual panels where data are restricted in geographic/tribal coverage. Evans and Topoleski (2002) were the first to assemble a dataset of casino openings and to study the effects of casino operations on incomes and employment on tribal lands.[2] Wolfe et al.

[1] One stated goal of casino operations is the improvement of local economic opportunity for tribal members.

[2] The authors also provide an excellent overview of the history of tribal gaming and the different types of arrangements that have been agreed upon, many times as a result of legal action.

(2012) use the Behavioral Risk Factor Surveillance System to examine the impact of casino openings on health and behavioral outcomes for American Indians in affected counties. Both studies find positive effects of casino operations, although neither of them investigate the potentially confounding effects of associated cash transfers. The main drawback of these pioneer studies relates to data availability. In particular, lack of individual-level panel data precludes them from studying selective migration off and on reservation lands. Thus, some of the effects ascribed to casino openings could be driven by the influx of new residents on tribal lands and adjacent areas.

A series of papers by Jane Costello and co-authors and Randall Akee, William Copeland, and Emilia Simeonova and co-authors[3] use the Great Smoky Mountains Study to investigate how unconditional cash transfers affected children's health and labor-market outcomes. This panel study has followed a sample of Native and non-Native American children for over 25 years, recording a wealth of information on their physical and mental health development over time and their socioeconomic standing. This body of work also finds positive effects of unconditional household cash transfers on children's outcomes. The main question is to what extent these positive effects persist in other tribes and time periods, and whether similar results could be achieved in the absence of unconditional cash transfers by casino operations only.

3 Data

In 1990, there were about 2 million individuals who identified as AIAN[4] in the US, with 0.5 million of them living on reservations. According to publicly available data from the U.S. Census, AIAN individuals residing on tribal lands were less likely to have completed college (3 percent vs 10 percent across all races), significantly more likely to live in poverty (32 percent vs. 19 percent across all races), and more likely to be unemployed (24 percent vs. 14 percent across all races). Even compared to other individuals living on or adjacent to tribal reservations, AIAN individuals in 1990 were poorer and less educated. We construct our data to align with this population of AI and non-AI individuals on or adjacent to reservation lands in the lower 48 states in 1990.

The individual-level panel data in this study come from two main sources: U.S. Census Bureau demographic data and IRS Form 1040, W2, and 1099. We study two generations: The first comprises adults, ages 18 to 45, who filed their 1040 from a census tract or zip code associated with a designated reservation area in 1989. The selection in 1989 is important, as IGRA was passed the year prior, and the casinos we study were established after that year. We trace the same individuals in all subsequent years in the panel data, regardless of whether they continued residing on the reservation or moved away.

We then link census demographic data to these adults. Our demographic data is a multi-year data set that combines the 2000 and 2010 decennial censuses with ACS data from 2001 to 2017. These data were combined specifically to capture race and Hispanic origin reported by U.S. households. We take the most recently reported race or Hispanic identifier for the adults who link to demographic data. Key to our analysis is the identification of American Indians—we code someone as American Indian if he or she reports "American Indian/Alaska Native," or reports a specific tribe, in any one of the fist four race variables on a decennial census or ACS. While this link provides reliable coverage for a large

[3] Akee et al. (2020, 2023, 2010); Simeonova et al. (2011)

[4] We use the term "AIAN" when speaking of the full U.S. population, including Alaska Native individuals, and "AI" to refer to individuals linked to reservation land in the contiguous U.S.

portion of the population, because of the decade-long mismatch between our target year and the first year of demographic data, some individuals may have died before their race could be identified. In these cases, we rely on race data reported in the Social Security Administration's Numident file, where possible. The Numident also provided information on date of birth, date of death, and gender.

Our second generation is the children of any of the adults from the first generation. We link children to 1989 adults by using dependent claiming on 1040s. A child's invariant parent is the earliest claimer of a child, and we first see dependent claiming in tax year 1994. We link children to their demographic information in the same manner as their parents, with the exception of Numident race, which became less reliable after the advent of enumeration at birth beginning in 1987. We then link the children, as adults, to their 1040 filing and W2 information (beginning in 2005). Child race is assigned as AI if either of the parents identified as AI, or the parents' race is missing but the child identified as AI. The children in the sample were born between 1978 and 1991.

Records are linked at the U.S. Census Bureau using a process whereby individuals in each data set were given a unique, protected identification key, called a "PIK." When a Social Security Number (SSN) is available in a data set, the identifier is assigned based on SSN. For records without an SSN, personally identifiable information such as name, address, and date of birth is used in probabilistic matching to assign PIKs.[5] Personal information is then removed from each data set before they may be used for research purposes. Only those observations that received the unique person identifier are used in the analysis.[6]

When we study the adult sample, we use Form 1040 Adjusted Gross Income (AGI) from tax years 1989–2017 for our analyses, which includes all sources of income for a tax unit and all adjustments to income. Our analysis focuses on all income sources for a household and provides a snapshot of the conditions prior to taxation and any potential governmental transfers. It is this particular measure that is used to identify and qualify for many means-tested governmental programs at the state and federal level.[7] For the first generation, we rely on the Form 1040 Wages and Salary field to identify what we call "earnings" and to provide evidence of employment behavior *at the tax unit level*—we are unable to identify individual behavior in the case of joint filers, as wages and salaries may be earned by one or both filers.

When we study the second generation, we consider the same income and earnings measures, but we have the advantage of estimating employment behavior at the individual level via the presence of a W2. We enhance this measure for unmarried individuals by including the presence of forms SE or C on a 1040 filing.

[5]For more information on the linking process, see Chetty et al. 2020; Wagner and Lane 2014.

[6]It is important to note that the record-linkage approach we use to link the data 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 2014). The same issue is present in other research utilizing the linked Census/IRS individual data, including research on income inequality and immobility by race (e.g., Chetty et al. 2020). Because our study covers a panel of multiple years of tax filings (1989 through 2017) we anticipate that selection issues are somewhat less severe as compared to work using fewer years of tax data. If an individual filed taxes in any year during this period, we would capture that return. Still, we cannot completely rule out non-random missing tax information with respect to economic status and we acknowledge that this would result in downward bias of any estimates of inequality and immobility between race and ethnic groups in the present study.

[7]The cash transfers that we study are included in AGI for federal taxation but are not included in state tax calculation. They are also not considered as earned income for the purposed of EITC.

Finally, we also examine the sets of AI adults who did not live on reservation land in 1989 and their children. These populations may have been eligible for unearned cash transfers even though they never lived near a casino, which allows us to further differentiate the ITT effect of the subsidy separate from the impact of an improved labor market.

The distinct advantage of the data in this study is that we are able to create a panel data set at the individual level and trace intergenerational household links across time. One prior limitation of work on this topic has been that the data available—repeated cross-section—could not capture the movement of individuals into or out of the communities being studied. Our panel data set, which pre-dates the advent of casino operations, allows us to follow a fixed set of individuals and households over time, regardless of migration behavior.

For the purposes of our study, we link data on casino operations and, where applicable, associated cash transfers, to the individual-level panel data. The casino data was collected by the authors using publicly available information on the start of casino operations using several online sources.[8] This variable is zero for all years prior to the start of casino operations and is coded as one in the year the casino started operations on the reservation and for every year thereafter. For tribes that opened more than one casino, we use the date of first casino opening. 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 the time and spatial heterogeneity in casino openings. Because we do not observe the tribal decision making process, and tribes who establish a casino (or establish it earlier) likely differ on a number of dimensions from tribes who do not establish a casino (or establish it later). Thus it is important to account for time-invariant unobserved heterogeneity at the tribal level.[9]

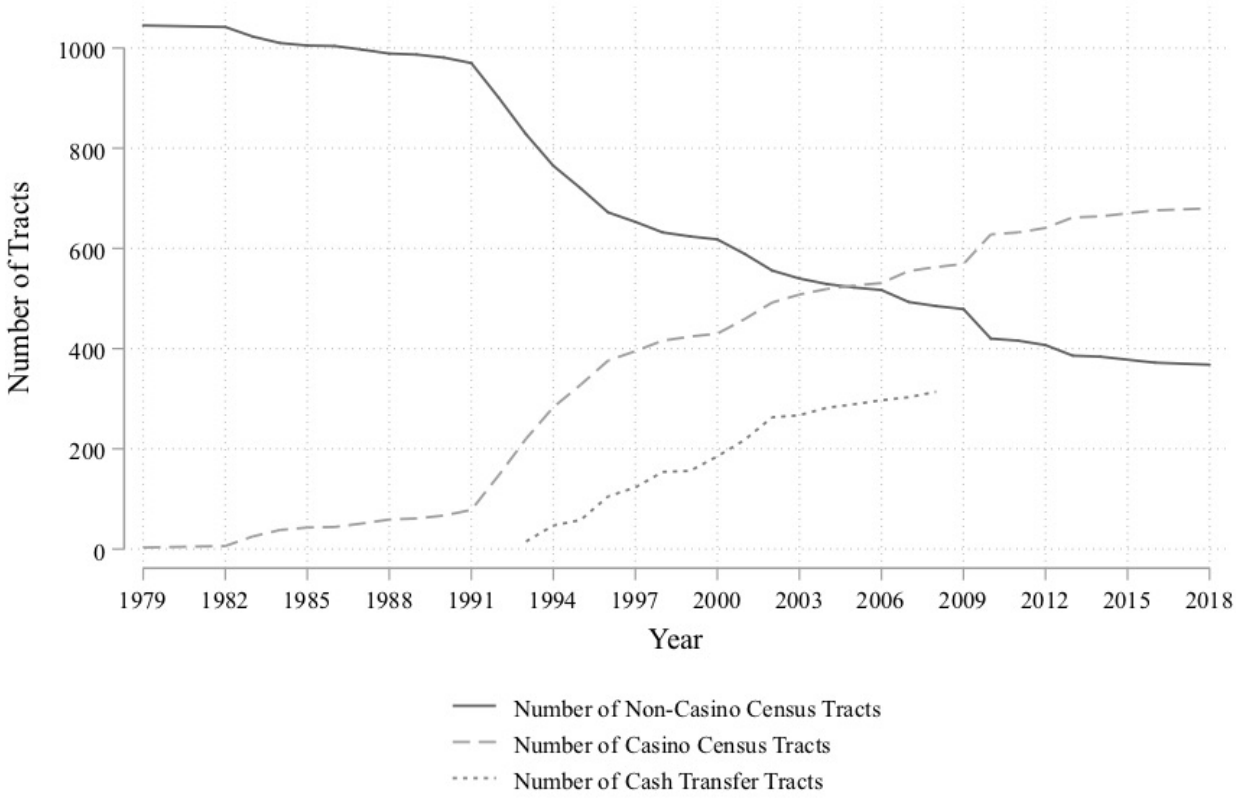
As Figure 1 demonstrates, the share of census tracts that were affected by casino operations among all tribal census tracts takes off in the early 1990s, and by 2005 there are more census tracts with casino operations than without. Per capita transfers start a couple of years after the casino operations, and apply to between one-half to two-thirds of the casino census tracts. Children in our sample were, on average, 12 to 13 years of age when a casino opened.

Casino operations on tribal lands encompass all types of enterprises—from slot machines located in temporary structures to resort-type establishments with associated hotels, pools, and restaurants. Data on the type of operations and the number of employees in tribal casinos are scarce. In Figure 2 we show the growth of tribal casino employment over the period 2001–2018. This data, derived from the Bureau of Labor Statistics Quarterly Census of Employment and Wages, identifies tribally owned casinos as "locally owned" casinos and hotels; for convenience we have labelled the data as tribal owned to avoid confusion. Prior to this period, the data did not include tribal enterprises. Thus, the span of time covered by this data provides the most accurate data on the employment effects of tribal casino operations. We do not have consistent and reliable data for the earlier time period. Nevertheless, the data shown in this figure indicates that over the course of the 2000s there has been a significant increase in employment in tribal casinos with hotels; in fact employment in tribal casinos with hotels is approximately one third the total private casinos with hotel employment for 2018. Additionally,

[8]Those sources are the following: Tribal government websites, Casino City website, various state casino regulatory websites, and the National Indian Gaming Commission website.

[9]Data on cash transfer agreements are not currently available after 2009. We drop all observations from reservations that opened a casino after 2009 for now. We are in the process of attaining this information.

Figure 1: Expansion of Casino Operations and Cash Transfer Programs by Census Tracts by Year



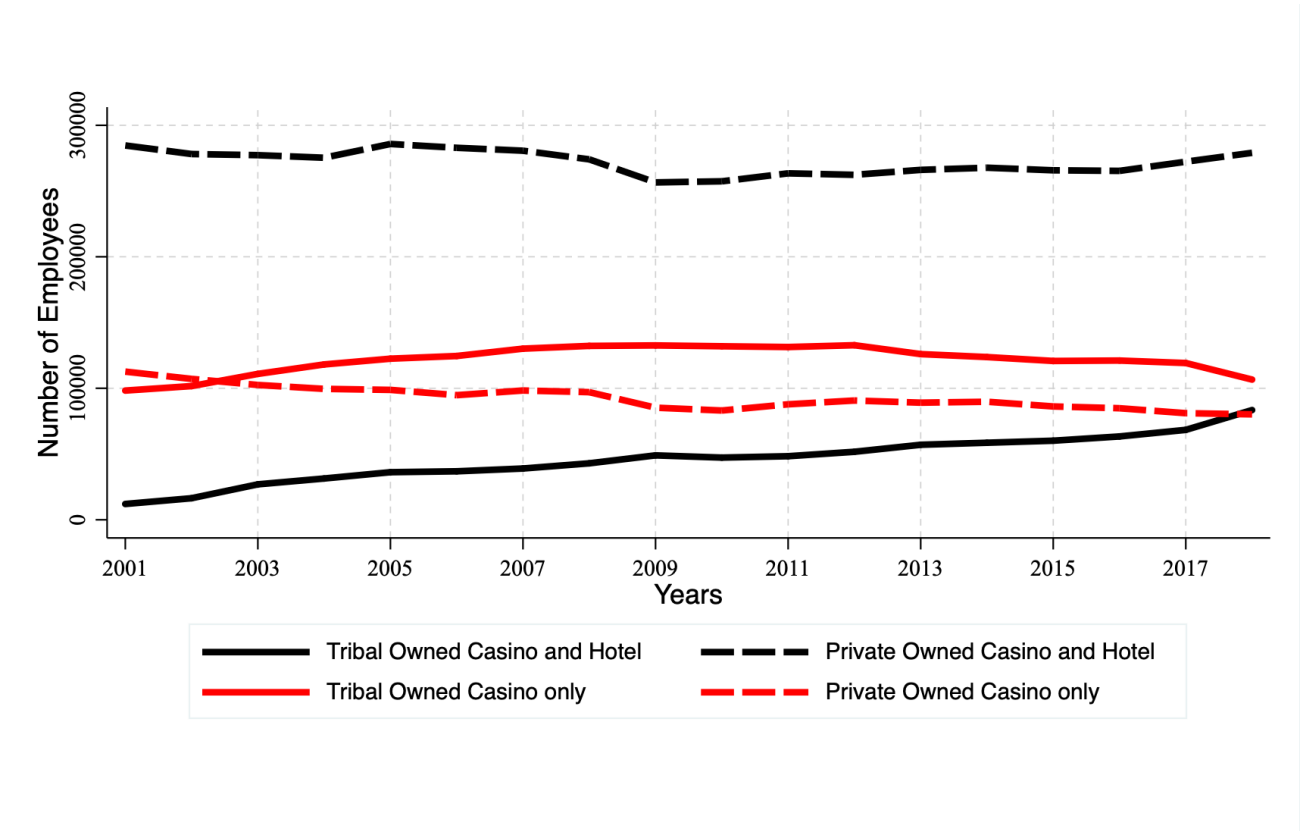
employment in tribally owned casinos (without hotels) exceeds that of private casinos (without hotels) starting in 2003 and persists over all subsequent years. It is clear from the graph that the proportion of casinos with hotels grew relative to casino operations only, implying a significant growth in total employment opportunities. The number of employees in tribal gaming operations doubles between 2000 and 2018, from a little over one hundred thousand in the early 2000s to over two hundred thousand in 2018. Overall, the data indicates that American Indian casino operations are a large and significant force in employment in this industry.

In Figure 3 we plot the real 2018 dollar value of casino revenues for both the American Indian and non-Indian casino industries. There are two notable in this figure. The first is that the size of the American Indian casino industry is quite large and has ranged from approximately 77-85% of the non-Indian casino industry in the past fifteen years. The second item to note is the strong growth in the American Indian casino industry in revenues from the mid 1990s onward. These are the years in which the majority of the individuals in our data will be affected by the casino operations as children themselves.

3.1 Data Description

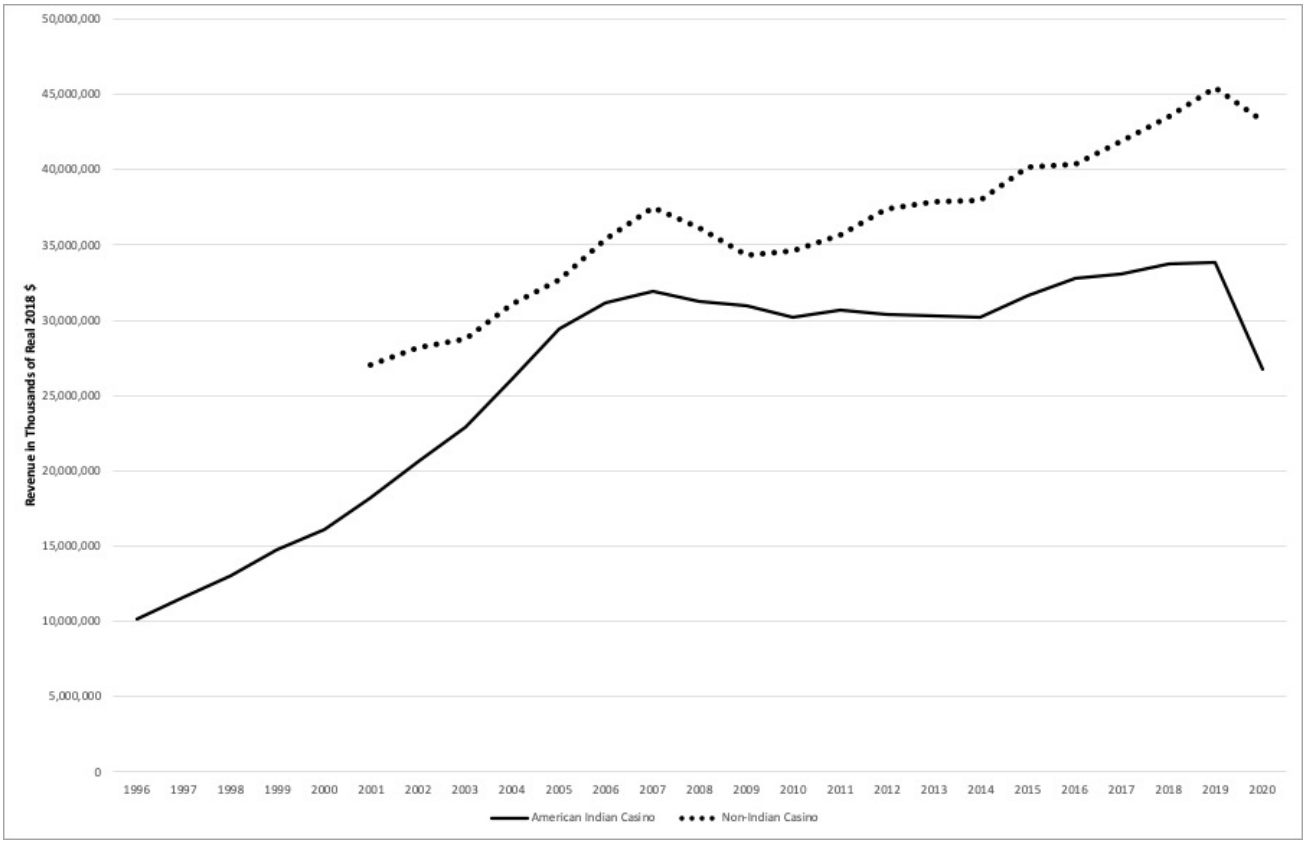
In Table 1 we provide the means for AIAN and non-AIAN adults who resided on an American Indian reservation in 1989. All summary statistics are over our entire range of years with the exception of the education outcome variables which are merged to a single American Community Survey year. In Panel A of Table 1 shows (in the left hand side columns) the average characteristics for the AIAN adults

Figure 2: Measuring the Growth of Employment in Casino Employment, 2001-2018



Source: Bureau of Labor Statistics, U.S. Department of Labor, Quarterly Census of Employment and Wages.

Figure 3: Casino Revenues for American Indian and Non-Indian Owned, 2001-2018



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

that reside on a reservation that would ever open up a tribal casino over our time period; the columns on the right hand side show the same average characteristics for AIAN adults residing on reservations that would not open a tribal casino in our study time period. All dollar amounts are given in year 2000 dollars. We find that adjusted gross incomes and wages are higher on the never casino reservations. Employment is slightly larger for the ever casino reservations but self-employment is higher for the never casino reservations. We find comparable proportions of males and birth years for the AIAN adults. The proportion married on the never casino reservations is higher than on the ever casino reservations, but the number of children is slightly higher for the ever casino reservations. The proportion of the sample remaining on reservation lands over all years is about 25% for the ever casino population indicating that there is off-migration (and perhaps return migration) while it is approximately 87% for never casino reservations. The educational attainment characteristics are approximately similar on average across the two types of reservation populations.

Panel B of Table 1 provides the means for Non-AI adults who resided on American Indian reservations that ever had a casino in 1989 on the left hand side and for those who resided on an American Indian reservation that never had a casino on the right hand side. In general, as compared to the American Indian adult population, the characteristics for non-AIAN adults are much closer to one another. Measures of income, earnings and other household characteristics appear to be fairly similar across the two groups of non-AIAN.

Table 1: Table of Means for Adults by Race and Casino Opening

Panel A: American Indian Adults	Ever Casino			Never Casino		
Variable	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.
Adj Gross	247,000	37,000	30,000	2,311,000	43,000	35,000
Wage Salary	247,000	29,000	26,000	2,311,000	34,000	33,000
Any Employ	247,000	0.931	0.253	2,311,000	0.899	0.301
Self Employ	247,000	0.129	0.335	2,311,000	0.201	0.401
Male	247,000	0.476	0.499	2,311,000	0.488	0.5
Birth Year	247,000	1954	12	2,311,000	1954	12
Casino	247,000	0.572	0.495	2,311,000	0	0
Cash Transfer	247,000	0.084	0.278	2,311,000	0	0
Married in 1989	247,000	0.51	0.5	2,311,000	0.625	0.484
Kids in 1989	247,000	0.609	0.488	2,311,000	0.57	0.495
On Reservation	247,000	0.247	0.431	2,311,000	0.861	0.346
High School Grad	59,000	0.871	0.335	565,000	0.867	0.34
Some College	59,000	0.563	0.496	565,000	0.502	0.5
College Grad +	59,000	0.144	0.351	565,000	0.182	0.385

Panel B: Non-American Indian Adults	Ever Casino			Never Casino		
Variable	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.
Adj Gross	3,483,000	47,000	36,000	29,200,000	51,000	41,000
Wage Salary	3,482,000	34,000	34,000	29,200,000	37,000	38,000
Any Employ	3,483,000	0.851	0.356	29,200,000	0.849	0.358
Self Employ	3,483,000	0.21	0.407	29,200,000	0.21	0.407
Male	3,483,000	0.519	0.5	29,200,000	0.507	0.5
Birth Year	3,483,000	1950	14	29,200,000	1952	14
Casino	3,483,000	0.56	0.496	29,200,000	0	0
Cash Transfer	3,483,000	0.213	0.41	29,200,000	0	0
Married in 1989	3,483,000	0.64	0.48	29,200,000	0.661	0.474
Kids in 1989	3,483,000	0.456	0.498	29,200,000	0.494	0.5
On Reservation	3,483,000	0.238	0.426	29,200,000	0.723	0.447
High School Grad	685,000	0.895	0.306	6,173,000	0.898	0.303
Some College	685,000	0.585	0.493	6,173,000	0.553	0.497
College Grad +	685,000	0.239	0.427	6,173,000	0.243	0.429

Source: Form 1040, Numident, decennial 2000 and 2010, ACS 2005–2019. Census DRB authorization number CBDRB-FY24-CES010-002. All means are averaged over all individuals and years in our data set. Data for educational attainment are merged to single year ACS data for each year in 2006-2019.

We also provide a table of means for both the American Indian and non-American Indian children who initially resided on reservations with their parents in 1989. In Panel A of Table 2 we provide the adult outcome means for children with American Indian parents who resided on American Indian reservations in 1989.[10] The average family income is approximately $14,000 for American Indian children who lived on a reservation that opened a casino, while it is on average about $19,000 for American Indian children who lived on a reservation that did not open a casino. We similar amounts for individual incomes, but the proportion married is twice as large for children from reservations that never opened a casino. Wages are higher for the never casino population as compared to the children from reservations that ever had a casino. Employment is approximately similar across both types of tribal communities but self-employment is twice as large for never casino reservation populations. The family AIAN status and gender measures are approximately similar across both types of communities. The proportion residing on the reservation is much higher at 70% for the never casino community while it is about 46% for the ever casino communities. Finally, the never casino population appears to have higher proportions of high school graduates, some college and college graduates than the ever casino population on average.

Panel B of Table 2 provides a similar set of characteristics for non American Indian children that initially resided on American Indian reservations. In general, the two groups appear to be fairly evenly matched on most of the characteristics. The largest difference exists for remaining on the reservation location where it is approximately 17% for the ever casino population and over 43% for the never casino population.

[10] Children are coded as being AI if any of these three conditions are satisfied: Their mother is AI; their father is AI; their parents' races are missing but the children report being AI.

Table 2: Table of Means for Children as Adults (Ages 20-26) by Race

Panel A: American Indian Children in Adulthood

	Ever Casino			Never Casino		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Family Income	199,000	14,000	21,000	790,000	19,000	23,000
Individual Inc	199,000	11,000	18,000	790,000	11,000	17,000
Married	199,000	0.097	0.295	790,000	0.218	0.413
Wages	116,000	14,000	13,000	469,000	17,000	15,000
Employed	199,000	0.583	0.493	790,000	0.594	0.491
Self-Employed	199,000	0.034	0.181	790,000	0.072	0.258
Casino	199,000	1	0	790,000	0	0
Cash Transfer	199,000	0.215	0.411	790,000	0	0
Child AIAN	199,000	0.697	0.46	790,000	0.555	0.497
Dad AIAN	199,000	0.565	0.496	790,000	0.575	0.494
Mom AIAN	199,000	0.628	0.483	790,000	0.599	0.49
Male	199,000	0.505	0.5	790,000	0.511	0.5
On Reservation	105,000	0.456	0.498	519,000	0.708	0.455
High School Grad	2,000	0.791	0.407	9,000	0.878	0.327
Some College	2,000	0.405	0.491	9,000	0.505	0.5
College Grad +	2,000	0.043	0.203	9,000	0.093	0.291

Panel B: Non-American Indian Children in Adulthood

	Ever Casino			Never Casino		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Family Income	1,596,000	20,000	22,000	6,424,000	20,000	25,000
Individual Inc	1,596,000	14,000	17,000	6,424,000	12,000	41,000
Married	1,596,000	0.161	0.367	6,424,000	0.201	0.401
Wages	1,111,000	19,000	16,000	4,045,000	18,000	16,000
Employed	1,596,000	0.696	0.46	6,424,000	0.63	0.483
Self-Employed	1,596,000	0.064	0.245	6,424,000	0.075	0.263
Casino	1,596,000	1	0	6,424,000	0	0
Cash Transfer	1,596,000	0.487	0.5	6,424,000	0	0
Male	1,596,000	0.511	0.5	6,424,000	0.511	0.5
On Reservation	1,123,000	0.168	0.374	4,648,000	0.437	0.496

Source: Form 1040, Numident, decennial 2000 and 2010, ACS 2005–2019. Census DRB authorization number CBDRB-FY24-CES010-002. All means are averaged over all individuals and years in our data set. Data for educational attainment are merged to single year ACS data for each year in 2006-2019.

4 Empirical Strategy

Our analysis focuses on the effect of American Indian casinos on earnings and incomes for American Indians from two generations. First, we analyze the impact of casino operations on adults aged 18–65 who resided on reservations in 1989. The individual panel nature of the data allow us to run models accounting for individual-level time-invariant heterogeneity through individual fixed effects. We consider the impact of casino operations and separate out the effect of unconditional cash transfers across American Indian race. The main estimating equation is:

$$\begin{aligned} \mathrm{Y}_{it} = \alpha_0 + \beta \times X_{it} + \gamma \times Casino_t + \lambda \times PerCapita_t + \\ + \theta_t + \mu_i + \epsilon_{it} \end{aligned} \tag{1}$$

AI stands for American Indian race, $PerCapita$ indicates the presence of a per capita unearned income transfer. The outcomes of interest are adjusted gross household income (AGI), household earnings, participation in the formal labor market (as proxied by the presence of non-zero wage and salary earnings), and the probability of self-employment (as captured by reported earnings from self-employment). We also test for changes in marital status, and the number of children claimed on the tax return. We consider all persons residing on a tribal reservation and reporting American Indian race as members of the tribe the tribal land belongs to. Clearly, this means that our estimates should be interpreted as intention to treat, and thus likely under-estimate the true effects of the treatment.

We include a vector of variables in X_{it} that change at the individual level over time. We also include a year-of-reported-earnings-specific fixed-effect θ_t to account for unobserved factors that affect everyone at the same time. We also include an individual level fixed-effect μ_i. Only American Indians are included in the main specifications. Estimates from separate regressions including only individuals from other races residing on reservations are reported in the Appendix. For each reservation, we include 5 years of data prior to the casino opening and 6 years of data after. Tribes that opened casinos prior to 1994 are thus excluded from the sample. All tribes and years are included for control reservations that did not open a casino during the observation window (1989-2018). In this set up, outcomes for individuals residing in places that opened a casino are compared to those who resided in locations that never did, and to those that resided in locations that opened a casino later on. Recognizing that generalized two-way-fixed effects may result in biased estimates due to treatment effect heterogeneity over time, and that our setup is not a classic stacked difference-in-differences approach, we also implement CSDID - IS THIS THE CALLAWAY and SANTANA estimator? and report the results.

There are several variables of interest. First, $Casino_t$ and its estimated coefficient, γ, capture the effect of casino operations on all residents of tribal lands that acquired a casino. It is estimated as the difference across time within the same reservation and with reservations that had not opened a casino in the year t. This variable differs over time, t, and across individuals. The next variable of interest is $PerCapita_t$ and its estimated coefficient, δ, which captures the effect of per capita cash transfers on all households residing on tribal lands.

The validity of the model estimates in (1) depends on the assumption of parallel trends in outcomes across reservations that started casino operations earlier and those that started later or never. To test the validity of this assumption, and to investigate the evolution of outcomes over time,

we conduct event-study analyses of the effects of casino operations. In robustness analyses we implement the new estimators developed by Calloway and Sant'Anna (2021). We use Calloway and Sant'Anna's csdid estimator to test the robustness of our findings. We run their staggered panel difference-in-differences model on the sample of American Indians, including person fixed effects as in the main estimating equation.

Next we examine social and economic outcomes for the children of households that resided on tribal lands in 1989. All children that can be traced to these households are included in the estimation. We consider children as "treated" to the casino if they were younger than 19 when the casino operations started IS IT 18 OR 19?. The effect of households casino and cash transfer exposure is identified from comparisons between children of the same cohorts whose parents resided on a reservation that (eventually) opened a casino and those that did not, and across children of different cohorts whose parents resided on the same reservation in 1989. Because children are either treated (casino opened before they turned 18) or not, the setup in this analysis is based on comparisons across children from the same geographic locations who were treated before they turned 18 to those from the same locations who were treated after age 26 and children of the same birth cohorts who were never treated. We chose age 26 (or is it 27?) to maximize the number of cohorts that we could use in the comparisons, and to allow us to use outcomes at adult ages that allow for the completion of college education (ages 23-25). As with the parents' cohorts, we study American Indian children separately from non-AI children. The results from estimations using only the non-AI children are available in the appendix.

The main estimating equation is:

$$\begin{aligned} \mathrm{Y}_i = \alpha_0 + \beta \times X_i + \gamma \times Casino_i + \lambda \times PerCapita_i \\ + \theta_t + \mu_r + \epsilon_i \end{aligned} \tag{2}$$

where i indexes the individual, $Casino$ is an indicator variable equal to one if the casino opened before the person turned 19 and the vector X_i includes indicators for gender and the child's birth cohort. We also include fixed effects for the parents' county of residence in 1989 μ_r and the year in which the outcome is measured θ_t. The variable $PerCapita_t$ and its estimated coefficient, λ captures the effect of the presence of per capita cash transfers that were disbursed while the child was below the age of 19 (ACTUALLY THIS IS NOT THE CASE. WE DO NOT RESTRICT THE CASH TRANSFERS TO START BEFORE AGE 19). Outcomes are measured at age 24 onward(IS THIS CORRECT? ONLY FROM AGE 24 AND 25?), except for teen birth, where the incidence of claiming a child at 20 identifies teenage parenthood.

5 Results

5.1 Adults initially residing on reservations

Our analysis below presents results for American Indian adults and their households who initially resided on American Indian reservations in 1989. We then run separate estimations for individuals who already have children in 1989 and those who do not. We are interested in the effects of casino operations on the next generation. If households with and without children react differently, then our main focus is on those with children. However, fertility itself may be affected by the treatment, which

is why we split the sample based on the presence of children in 1989.

We find that the opening of a tribal casino increased the adjusted gross household income by between $750-$987 per year, although these estimates do not reach statistical significance at conventional levels for the total sample or for those who already have children in 1989. In the next two columns we find that annual wages and salary increase by about a statistically significant amount of $900 for adults who have children by 1989. The corresponding estimate for the full sample is smaller and does not attain significance at conventional levels, suggesting that the effect on those without children in 1989 is much smaller. Thus, casino operations without a corresponding cash transfer lead to significant gains in salaries and earnings for those who report having children in the household in 1989. The effect is around three percent of the mean earnings among those residing in such locations. Combined with the evidence on gainful formal employment presented in columns (5)-(8), this increase is likely due to the increase in self-employment. We see no substantial changes in the probability of reporting salary or self-employment income, yet a significant increase in self-employment in this group. Thus, the estimated gains likely arise from relocating from salaried positions to self-employment, with an associated increase in reported earnings. Casino operations alone do not affect family composition, as we find in columns (9)-(12) - neither the probability of marriage nor the number of children respond meaningfully to casino treatment.

Some casinos have associated cash transfers. Cash transfers may initiate at the same time as casino operations, or at any time after the casino opens. Cash transfers are usually unearned cash transfers that come from casino profits and are disbursed to all tribal members regardless of their income level. Tribal cash transfers have a large and positive effect on adjusted gross income for all family types at $4,800 per year and about $6,000 per year for those with existing children in 1989. These effects are statistically and economically significant, equivalent to an increase of 18 to 20 percent in household income. While casinos increase earnings and salaries, we find that the presence of cash transfers reduces the wages and salaries for both types of households by approximately $1,000; on net, the effect is null. In relative terms, those who experience cash transfers reduce formal work for pay relative to those who do not have the transfers.

There is a clear negative effect on the probability of formal employment for pay associated with the cash transfers. Individuals who are affected by the transfers are less likely to report formal wages from salaries or self-employment. This effect is specific to individuals affected by cash transfers only - the presence of casino operations does not significantly impact this outcome. We note that the coefficient is small in magnitude – approximately 2.5-3 percentage points, while employment was quite high for this population ranging from 90-93%. The effect appears similar for those who had children in 1989 and the full sample.

The cash transfer appears to increase the probability of marriage for all of the observed households by 1 percentage point, and this effect is driven by those initially without children in 1989. The magnitude of the effect is small relative to the mean, however it does suggest endogenous household formation as a response to cash transfers among childless individuals. Fertility does not seem to be significantly affected by cash transfers, despite the increased probability of marriage in this group.

HERE COMMENT ON RESULTS FOR NON-AI FROM THE APPENDIX ?

In Table 4 we provide the regression results from a similar analysis that is restricted to non-American Indians initially residing on a tribal reservation in 1989. There does not appear to be any

Table 3: Main Casino and Transfer Effects for American Indians on Reservations in 1989

	(1)	(2)	(3)	(4)
VARIABLES	Adjusted Gross Income		Wages & Salary	
Casino	750.5	987.9	584.6	904.8*
	(597.1)	(647.1)	(358.2)	(499.7)
Cash Transfer	4,863**	5,982**	-1,196**	-1,072*
	(2,167)	(2,363)	(483.6)	(598.7)
Sample	Total	Init with Kids	Total	Init with Kids
Observations	2,558,000	1,467,000	2,558,000	1,467,000
R-squared	0.14	0.118	0.046	0.034
Number of pik	181,000	100,000	181,000	100,000

	(5)	(6)	(7)	(8)
VARIABLES	Any Employment		Self Employed	
Casino	0.00441	0.00226	0.00282	0.00801**
	(0.00341)	(0.00365)	(0.00366)	(0.00367)
Cash Transfer	-0.0294***	-0.0256***	-0.0037	-0.00944
	(0.00787)	(0.00885)	(0.00452)	(0.00585)
Sample	Total	Init with Kids	Total	Init with Kids
Observations	2,558,000	1,467,000	2,558,000	1,467,000
R-squared	0.075	0.083	0.003	0.003
Number of pik	181,000	100,000	181,000	100,000

	(9)	(10)	(11)	(12)
VARIABLES	Married		Num of Kids	
Casino	-0.00296	-0.00316	-0.0228**	0.0123
	(0.00494)	(0.00524)	(0.00987)	(0.0132)
Cash Transfer	0.0139**	0.00147	0.00794	-0.0712**
	(0.00583)	(0.00834)	(0.0222)	(0.0285)
Sample	Total	Init with Kids	Total	Init with Kids
Observations	2,558,000	1,467,000	2,558,000	1,467,000
R-squared	0.002	0.014	0.093	0.299
Number of pik	181,000	100,000	181,000	100,000

Note: All regressions include an individual-level fixed effect, year fixed effects, and a constant. Standard errors are clustered at the reservation level. Source: Form 1040, Numident, decennial 2000 and 2010, ACS 2005-2019. Census DRB authorization number CBDRB-FY24-CES010-002.

effects of either the casino opening or the cash transfer on the adult adjusted gross earnings or wages and salary for any household type. There is a slightly negative estimated coefficient on wages and salary for households that lived on reservation lands that provide a cash transfer; the estimated coefficient is $-826 and indicates that there is less wages and salary for non-AI households that already have children. In the next two columns, we also observe that cash transfer are associated with a reduction in any employment, but the size of these estimated coefficients are about one sixth the size of those found above in Table 3. Tribal casino operations also appear to reduce the likelihood of self-employment for the non-AI adult population; perhaps this is due to the ability to find new employment within the new casino operations. There is little evidence for an effect on marital status expect for a relatively small effect of cash transfer for the full sample. The number of kids appears to be negatively related to a tribal casino opening and positively related to cash transfers for the full sample.

5.2 Children's Regression Results

In Table 5 we provide the regression results for American Indian (in Panel A) and non-American Indian children (in Panel B) in adulthood. Our analysis focuses on the two treatment effects due to having a tribal casino opening up on the reservation that their parents were residing on in 1989 and whether a cash transfer program was provided as well. We examine the effect on Family Income, Wages, Marital Status, Employment and Self-Employment for all individuals.

In Panel A we find that an American Indian child that is exposed to the opening of a tribal casino on their reservation has an increase in their family income (in adulthood) of approximately $8,263 and has an increased probability of being married of 13.5 percentage points. Finally, we observe an increase in self-employment of three percent as well. We also observe that the presence of a cash transfer increases a child's own family income by about $2,144 and it serves to increase their probability of being married by two percentage points.

In Panel B we provide a similar analysis for the non-American Indian children who initially resided on tribal reservations in 1989 during their own childhood. We find that the tribal casino openings does not appear to have a long-run effect on any of the six outcome variables we examined for this analysis. The cash transfer program appears to have a positive effect on employment - it increases it by 1.7 percentage points.

5.3 Geographic Mobility Measures

One persistent question about the effect of tribal casino operations is the effect that it may have on both in and out migration from the reservation over time. In this analysis, we examine whether the opening of a tribal casino affects whether the children (in adulthood) remain on the reservation.

In Panel A below, we provide the analysis for the probability that an American Indian child will remain on the tribal reservation lands in adulthood. The first column provides outcomes for ages 20-26 and the second column includes ages 20-27. In both cases, we find that the presence of the tribal casino increases the likelihood that an American Indian child remains on the reservation by about nine percentage points. There is no similar increase for non-American Indian children in Panel B. There does not appear to be any effect of the cash transfers on the likelihood of remaining on the reservation lands.

Table 4: Main Casino and Transfer Effects for Non American Indians on Reservations in 1989

Non AIAN Alone Adults	(1)	(2)	(3)	(4)
VARIABLES	Adjusted Gross Income		Wages & Salary	
Casino	-444.4	-254.6	-425.7	-125
	(358.9)	(373.4)	(287.7)	(299)
Cash Transfer	-344	-491.6	-421.4	-826*
	(551.1)	(576.1)	(416.4)	(445.6)
Sample	Total	Init with Kids	Total	Init with Kids
Observations	32,690,000	16,010,000	32,680,000	16,000,000
R-squared	0.129	0.114	0.034	0.032
Number of pik	2,396,000	1,037,000	2,396,000	1,037,000

	(5)	(6)	(7)	(8)
VARIABLES	Any Employment		Self Employed	
Casino	-0.00341	0.000764	-0.00733***	-0.00542*
	(0.00209)	(0.00192)	(0.00262)	(0.00298)
Cash Transfer	-0.00447*	-0.00542*	0.00286	0.00275
	(0.00264)	(0.00306)	(0.00242)	(0.00373)
Sample	Total	Init with Kids	Total	Init with Kids
Observations	32,690,000	16,010,000	32,690,000	16,010,000
R-squared	0.088	0.1	0.002	0.002
Number of pik	2,396,000	1,037,000	2,396,000	1,037,000

	(9)	(10)	(11)	(12)
VARIABLES	Married		Num of Kids	
Casino	0.000424	0.000186	-0.0178**	-0.0538***
	(0.00268)	(0.00185)	(0.00886)	(0.00866)
Cash Transfer	0.00516*	0.0045	0.0248**	0.00964
	(0.00263)	(0.00307)	(0.0104)	(0.0104)
Sample	Total	Init with Kids	Total	Init with Kids
Observations	32,690,000	16,010,000	32,690,000	16,010,000
R-squared	0.003	0.015	0.082	0.343
Number of pik	2,396,000	1,037,000	2,396,000	1,037,000

Note: All regressions include an individual-level fixed effect, year fixed effects, and a constant. Standard errors are clustered at the reservation level. Source: Form 1040, Numident, decennial 2000 and 2010, ACS 2005-2019. Census DRB authorization number CBDRB-FY24-CES010-002.

Table 5: Main Casino and Transfer Effects for American Indian and Non AIAN Children Residing on Reservation Lands

Panel A: American Indian Children's Outcomes in Adulthood, Ages 20-26

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Indiv Inc	Fam Income	Married	Wages	Employed	Self Employ
Casino	2156	8,263***	0.135***	3,277*	-0.0547	0.0317**
	(1,494)	(2,400)	(0.0399)	(1,706)	(0.0358)	(0.0156)
Cash Transfer	1801	2,144***	0.0217*	625.9	0.00872	0.00617
	(1,100)	(824.3)	(0.0114)	(645.5)	(0.0124)	(0.00524)
Year by Res?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	777,000	989,000	989,000	585,000	770,000	777,000
R-squared	0.15	0.155	0.091	0.142	0.081	0.019

Panel B: Non-American Indian Children's Outcomes in Adulthood, Ages 20-26

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Indiv Inc	Fam Income	Married	Wages	Employed	Self Employ
Casino	-456.2	-478.3	0.00598	515.4	-0.00634	-0.00416
	(591.0)	(601.6)	(0.00952)	(482.9)	(0.00758)	(0.00530)
Cash Transfer	44.37	-404.6	0.000366	-65.55	0.0173**	0.000161
	(221.3)	(346.2)	(0.00441)	(235.7)	(0.00691)	(0.00182)
Observations	6,395,000	8,020,000	8,020,000	5,155,000	6,395,000	6,395,000
R-squared	0.022	0.114	0.083	0.154	0.096	0.015

Note: All regressions include year and reservation fixed effect and birth cohort fixed effect and a constant. Additional controls include male indicator, whether the child, mother and father are AIAN. Standard Errors clustered at the reservation level. We restrict analysis to casino openings after 1993. We show results for ages 20-26 only in this analysis. The age at intervention is either 18 years or less or age 29 and older. Source: Form 1040, Numident, decennial 2000 and 2010, ACS 2005-2019. Census DRB authorization number CBDRB-FY24-CES010-002.

Table 6: Main Casino and Transfer Effects for American Indian and Non AIAN Children for Remaining on the Reservation

Panel A: American Indian Children's Outcomes

	(1)	(2)
VARIABLES	Located on Reservation	
Casino	0.0878*	0.0883*
	(0.0479)	(0.0465)
Cash Transfer	0.0115	0.0105
	(0.0181)	(0.0171)
Current age:	20-26	20-27
Observations	624,000	700,000
R-squared	0.181	0.18

Panel B: Non-American Indian Children's Outcomes

	(1)	(2)
VARIABLES	Located on Reservation	
Casino	0.0219	0.0195
	(0.0179)	(0.0170)
Cash Transfer	0.00405	0.00404
	(0.00949)	(0.00900)
Current age:	20-26	20-27
Observations	5,771,000	6,438,000
R-squared	0.203	0.202

Note: All regressions include year and reservation fixed effect and birth cohort fixed effect and a constant. Additional controls include male indicator, whether the child, mother and father are AIAN. Standard Errors clustered at the reservation level. We restrict analysis to casino openings after 1993. We show results for ages 20-26 or 20-27 in this analysis. The age at intervention is either 18 years or less or age 29 and older. Source: Form 1040, Numident, decennial 2000 and 2010, ACS 2005-2019. Census DRB authorization number CBDRB-FY24-CES010-002.

5.4 Educational Attainment Outcomes

In Table 7 we provide the effect of casino and cash transfer programs on the educational attainment for the American Indian children in adulthood. For this analysis we have linked a subset of our American Indian child sample to the American Community Survey for the years 2005-2019. Given the relatively small sample individuals are only linked to a single ACS; therefore, this is a stacked regression analysis.

We examine three different outcome variables that are mutually exclusive. The first indicates whether an individual has only a high school degree and nothing further, the second indicates that a person has a high school degree and some post-secondary course work while the third indicates that the person has graduated from college or more. Our analysis shows that the presence of tribal casino opening during childhood raises the probability of having college degree or higher by about 9.8 percentage points.

Table 7: Main Casino and Transfer Effects for American Indian Children on Educational Attainment

Panel A: American Indian Children Initially on Reservation

AIAN on Reservation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES		High School			Some College			College +	
Casino	-0.0333	-0.0647	-0.0475	0.0492	-0.0623	0.166	0.0983**	0.0939	0.11
	(0.101)	(0.154)	(0.0957)	(0.128)	(0.0919)	(0.290)	(0.0471)	(0.0586)	(0.119)
Cash Transfer	-0.0317	0.0357	-0.0673	-0.0495	0.0344	-0.11	0.00876	0.078	-0.0446
	(0.0379)	(0.0470)	(0.0478)	(0.0488)	(0.0698)	(0.0976)	(0.0351)	(0.0608)	(0.0452)
Current Age	22-27	22-27	22-27	22-27	22-27	22-27	22-27	22-27	22-27
Sample	Total	Male	Female	Total	Male	Female	Total	Male	Female
Observations	9,600	4,800	4,800	9,600	4,800	4,800	9,600	4,800	4,800
R-squared	0.071	0.104	0.091	0.078	0.082	0.08	0.066	0.083	0.086

Note: All regressions include year and reservation fixed effect and birth cohort fixed effect and a constant. Additional controls include male indicator, whether the child, mother and father are AIAN. Standard Errors clustered at the reservation level. We restrict analysis to casino openings after 1993. We show results for ages 20-26 or 20-27 in this analysis. The age at intervention is either 18 years or less or age 29 and older. Data are from prior to 2020. Source: Form 1040, Numident, decennial 2000 and 2010, ACS 2005-2019. Census DRB authorization number CBDRB-FY24-CES010-002.

5.5 Difference in Difference Robustness Checks

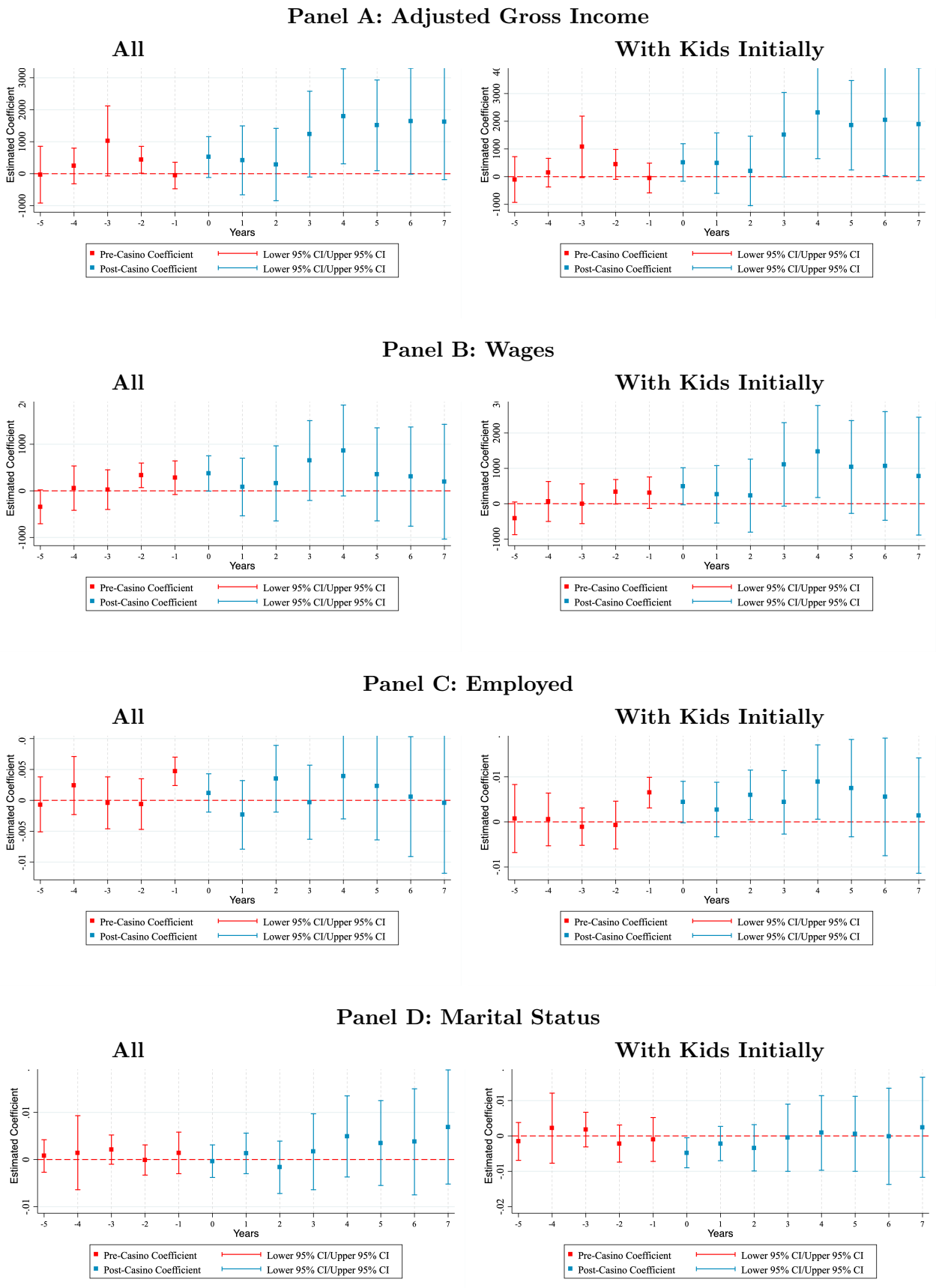
Figure 4 Panels A-D show the event-study graphs from staggered difference-in-differences models using the sample of AI households with children in 1989 (corresponding to Table 3). We provide the main outcome variables - adjusted gross income, wages and salary, employment and marital status. Pursuant to recent work on staggered difference-in-differences, there are at least three reasons to conduct this additional analysis as a robustness check. First, there could be differential trends in outcomes across tribes who do and those who do not pursue casino operations and cash transfers. Second, as the openings of casinos and the adoption of cash transfers happen over a 20 year period, we apply the newest D-i-D estimators that correct of biases arising from this staggered design. Finally, the effects of casino openings or cash transfers may be heterogeneous across time, increasing or decreasing the longer the casino has been in operation.

In Figure 4, we show the event study graphs for the full sample on the left and those with children initially on the right. We examine the presence of the casino operations as the cash transfers are fully dependent on the casino opening. Thus, these figures capture both treatments (casino openings and cash transfer programs when they exist). We provide five years prior to the casino opening and seven years after the casino opening in the figures that follow.

In the years leading to casino openings the estimated coefficients in red are centered on the zero effect horizontal line for all of the outcomes. This indicates that there is no differential trend prior to the start of casino operations. In Panel A of Figure 4 we see that there is a positive and statistically significant increase in the adjusted gross earnings for both the full sample and sample that initially had children around years three or four after the start of the casino operations. This supports the results in Table 3 showing that there was a positive increase in adjusted gross income due to the casino opening (and secondarily through the cash transfer programs).

In Panel B we examine the effect of casino openings on wages and salaries. There does not appear to be a sustained increase in wages after the start of casino operations which was also reflected in Table 3; in fact, there was a slight reduction when the inclusion of cash transfer programs were included. Panels C and D provide results for employment and marital status, respectively. Once again, there does not appear to be large differences over time after the start of the casino operations.

Figure 4: Event Study Using Staggered Differences in Differences for Households with Kids



Note: Source: Form 1040, Numident, decennial 2000 and 2010, ACS 2005-2019. Census DRB authorization number CBDRB-FY24-CES010-002.

5.6 Conclusion

This is the first study to examine the impact of tribal casino operations and associated cash transfers in an intergenerational framework. We link parents to children and construct an individual panel of data spanning the period 1989-2017.

Casino operations resulted in an increase in income for adult American Indians relative to American Indians that resided on tribal reservations without tribal casinos. Cash transfers also appear to provide an increase in the incomes for American Indians ranging in size between $4,800-$5,900. The effect on other outcome variables for the parents appear to be relatively minor; although there is a reduction in wages and salary and employment due to the cash transfers but the magnitudes are small. We find that there is little effect on the income or earnings for the non-American Indian adults residing on reservation lands as a result of casino operations or the cash transfer programs.

Linking the parents to their children allows us to draw the connection to the exposure to the tribal casino (and its accompanying economic development) and the cash transfers on the children's own long-run outcomes in adulthood. We find that the casino treatment results in higher wages and income for the American Indian children in the long-run. Some of this increase may be due to the fact that American Indian children that reside on reservations with a tribal casino have an almost nine percentage point higher probability of having a college degree or higher than their untreated counterparts. Finally, we also find that these same children in adulthood are more likely to reside on the reservation. There is little to no effect on non-American Indian children in adulthood.

References

Akee, R., W. Copeland, J. B. Holbein, and E. Simeonova (2020). Human capital and voting behavior across generations: evidence from an income intervention. *American Political Science Review 114*(2), 609–616.

Akee, R., W. Copeland, and E. Simeonova (2023). Child mental health, family circumstance, and long-term success: The effect of household income. *Journal of Human Resources*.

Akee, R. K., W. E. Copeland, G. Keeler, A. Angold, and E. J. Costello (2010). Parents' incomes and children's outcomes: a quasi-experiment using transfer payments from casino profits. *American Economic Journal: Applied Economics 2*(1), 86–115.

Almond, D., J. Currie, and V. Duque (2018). Childhood circumstances and adult outcomes: Act ii. *Journal of Economic Literature 56*(4), 1360–1446.

Austin, B. A., E. L. Glaeser, and L. H. Summers (2018). Jobs for the heartland: Place-based policies in 21st century america. Technical report, National Bureau of Economic Research.

Bartik, T. J. (2020). Using place-based jobs policies to help distressed communities. *Journal of Economic Perspectives 34*(3), 99–127.

Bastian, J. and K. Michelmore (2018). The long-term impact of the earned income tax credit on children's education and employment outcomes. *Journal of Labor Economics 36*(4), 1127–1163.

Chetty, R., J. N. Friedman, N. Hendren, M. R. Jones, and S. R. Porter (2018). The opportunity atlas: Mapping the childhood roots of social mobility. Technical report, National Bureau of Economic Research.

Chetty, R., J. N. Friedman, and J. Rockoff (2011). New evidence on the long-term impacts of tax credits. In *Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association*, Volume 104, pp. 116–124. JSTOR.

Chetty, R. and N. Hendren (2018a). The impacts of neighborhoods on intergenerational mobility i: Childhood exposure effects. *The Quarterly Journal of Economics 133*(3), 1107–1162.

Chetty, R. and N. Hendren (2018b). The impacts of neighborhoods on intergenerational mobility ii: County-level estimates. *The Quarterly Journal of Economics 133*(3), 1163–1228.

Chetty, R., N. Hendren, M. R. Jones, and S. R. Porter (2020). Race and economic opportunity in the united states: An intergenerational perspective. *The Quarterly Journal of Economics 135*(2), 711–783.

Chetty, R., N. Hendren, and L. 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, E. and L. F. Katz (2021). Neighborhoods matter: Assessing the evidence for place effects. *Journal of Economic Perspectives 35*(4), 197–222.

Dahl, G. B. and L. Lochner (2012). The impact of family income on child achievement: Evidence from the earned income tax credit. *American Economic Review 102*(5), 1927–1956.

Duncan, G. J., K. Magnuson, and E. Votruba-Drzal (2017). Moving beyond correlations in assessing the consequences of poverty. *Annual review of psychology 68*, 413.

Evans, W. N. and J. H. Topoleski (2002). The social and economic impact of native american casinos.

Gennetian, L. A., G. Duncan, N. A. Fox, K. Magnuson, S. Halpern-Meekin, K. G. Noble, and H. Yoshikawa (2022). Unconditional cash and family investments in infants: Evidence from a large-scale cash transfer experiment in the us. Technical report, National Bureau of Economic Research.

Glaeser, E. L. and J. D. Gottlieb (2008). The economics of place-making policies. Technical report, National Bureau of Economic Research.

Jacob, B. A., M. Kapustin, and J. Ludwig (2015). The impact of housing assistance on child outcomes: Evidence from a randomized housing lottery. *The Quarterly Journal of Economics 130*(1), 465–506.

Jaroszewicz, A., J. Jachimowicz, O. Hauser, and J. Jamison (2022). How effective is (more) money? randomizing unconditional cash transfer amounts in the us. *Randomizing Unconditional Cash Transfer Amounts in the US (July 5, 2022)*.

Kline, P. and E. Moretti (2014). People, places, and public policy: Some simple welfare economics of local economic development programs. *Annu. Rev. Econ. 6*(1), 629–662.

Magnuson, K., P. Yoo, G. Duncan, H. Yoshikawa, K. Trang, L. A. Gennetian, S. Halpern-Meekin, N. Fox, and K. Noble (2022). Can a poverty reduction intervention reduce family stress among families with infants? an experimental analysis. *An Experimental Analysis.(May 6, 2022)*.

Milligan, K. and M. Stabile (2011). Do child tax benefits affect the well-being of children? evidence from canadian child benefit expansions. *American Economic Journal: Economic Policy 3*(3), 175–205.

Morrissey, T. W. (2023). The minimum wage and parent time use. *Review of Economics of the Household*, 1–20.

Neumark, D. and H. Simpson (2015). Place-based policies. In *Handbook of regional and urban economics*, Volume 5, pp. 1197–1287. Elsevier.

Owens, A. and J. Candipan (2019). Social and spatial inequalities of educational opportunity: A portrait of schools serving high-and low-income neighbourhoods in us metropolitan areas. *Urban Studies 56*(15), 3178–3197.

Simeonova, E., R. Akee, W. Copeland, A. Angold, and E. J. Costello (2011). Rich dad, poor dad: Short-and long-term effects of quasi-experimental income transfers on children's and young adult well-being.

Wolfe, B., J. Jakubowski, R. Haveman, and M. Courey (2012). The income and health effects of tribal casino gaming on american indians. *Demography 49*(2), 499–524.

Akee, Randall KQ, et al. "Parents' incomes and children's outcomes: a quasi-experiment using transfer payments from casino profits." American Economic Journal: Applied Economics 2.1 (2010): 86-115.

Akee, R., Copeland, W., Costello, E. J., Simeonova, E. (2018). How does household income affect child personality traits and behaviors?. American Economic Review, 108(3), 775-827.

Akee, R., Simeonova, E., Copeland, W., Angold, A., Costello, E. J. (2013). Young adult obesity and household income: Effects of unconditional cash transfers. American Economic Journal: Applied Economics, 5(2), 1-28.

Akee, R., Copeland, W., Holbein, J. B., Simeonova, E. (2020). Human capital and voting behavior across generations: evidence from an income intervention. American Political Science Review, 114(2), 609-616.

Akee, Randall KQ, Katherine A. Spilde, and Jonathan B. Taylor. "The Indian gaming regulatory act and its effects on American Indian economic development." Journal of Economic Perspectives 29.3 (2015): 185-208.

Almond, Douglas, Janet Currie and Valentina Duque. "Childhood Circumstances and Adult Outcomes: Act II" Journal of Economic Literature 2018

Bureau of Labor Statistics, U.S. Department of Labor, The Economics Daily, Trends in casino employment from 2001 to 2018 at https://www.bls.gov/opub/ted/2020/trends-in-casino-employment-from-2001-to-2018.htm (visited February 22, 2022).

Callaway, Brantly and Pedro Sant'Anna. "Difference-in-Differences with multiple time periods" Journal of Econometrics, Vol 225 Issue 2 pp. 200-230

Chetty, Raj and Nathaniel Hendren " The Effects of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects" Quarterly Journal of Economics, 133(3): 1107-1162, 2018

Chetty, Raj and Nathaniel Hendren " The Effects of Neighborhoods on Intergenerational Mobility II: County Level Estimates" Quarterly Journal of Economics, 133(3): 1163-1228, 2018

Chetty, Raj, Nathaniel Hendren, Margaret Jones and Sonya Rastogi-Porter "Race and Economic Opportunity in the United States: An Intergenerational Perspective" Quarterly Journal of Economics, 135(2): 711-783, 2020

Cornell, Stephen, and Joseph P. Kalt. 1992. "Reloading the Dice: Improving the Chances for Economic Development on American Indian Reservations." In What Can Tribes Do? Strategies and Institutions in American Indian Economic Development, edited by Stephen Ellicott Cornell and Joseph Peggs Kalt, 1–59. Los Angeles, CA: American Indian Studies Center, University of California Los Angeles.

Currie, Janet."healthy, Wealthy and Wise: Socioeconomic Status, Poor Health in Childhood, and Human Capital Formation", Journal of Economic Literature, 2013

Duncan, Greg J, Katherine Magnuson, Elizabeth Votruba-Drzal. "Moving Beyond Correlations in Asessing the Consequences of Poverty" Annual Review of Psychology, Vol 68: 413-464

Evans, William N., and Julie H. Topoleski. The social and economic impact of Native American casinos. No. w9198. National Bureau of Economic Research, 2002.

Fletcher, Matthew L. M. 2004. "In Pursuit of Tribal Economic Development as a Substitute for Reservation Tax Revenue." North Dakota Law Review 80(4).

Jacob, B. A., Kapustin, M., Ludwig, J. (2015). The impact of housing assistance on child outcomes: Evidence from a randomized housing lottery. The Quarterly Journal of Economics, 130(1), 465-506.

National Indian Gaming Commission. 2014. Gaming Revenue Reports. http://www.nigc.gov/Gaming˙Revenue˙Reports.aspx.

Reagan, Patricia B, and Robert J. Gitter. 2007. "Is Gaming the Optimal Strategy? The Impact of Gaming Facilities on the Income and Employment of American Indians." Economics Letters 95(3): 428–32.

Lisa Sanbonmatsu, Jeffrey R. Kling, Greg J. Duncan, and Jeanne Brooks-Gunn, 2006. "Neighborhoods and Academic Achievement: Results from the Moving to Opportunity Experiment," Journal of Human Resources, University of Wisconsin Press, vol. 41(4).

Senate Committee on Indian Affairs. 1988. "Senate Report 100-446 on the Indian Gaming Regulatory Act, to Accompany S. 555." In Congres- sional Record 134: 3071–3106. WestLaw.

Stuart, Bryan. 2022 "The Long-Run Effects of Recessions on Education and Income" American Economic Journal - Applied, January 2022, Vol 14 No 1

Taylor, Jonathan B. 2006. The Character and Effects of the Indian Economy in Washington State. (Indian Self-GovernmentinWashington,Vol. 2.)Washington Indian Gaming Association and Taylor Policy Group. http://www.washingtonindiangaming.org/ images/content/WIGA-Vol-2-Report-8-16-06-Lo Res.pdf.

Washburn, Kevin K. 2008. "The Legacy of Bryan v. Itasca County: How an Erroneous $147 County Tax Notice Helped Bring Tribes $200 Billion in Indian Gaming Revenue." Minnesota Law Review 92(4): 919–970.

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.

6 Appendix Tables