Local versus Central Governance: Long Run Effects of Federal Oversight over American Indian Reservations[*]

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Abstract

This paper studies the decentralization of governance across American Indian reservations and measures the long-run development differences for reservations that were granted less sovereignty through the Indian Reorganization Act (IRA). To mitigate selection concerns regarding IRA adoption, we exploit voting results by restricting our analysis to narrowly determined elections. Results indicate that IRA adoption stifled economic development, resulting in lower per capita income, higher inequality, and a less developed gaming sector. Income differences develop within the first decade of adoption and persist throughout the twentieth century. Legislation in recent decades expanded local control to reservation governments, expanding sovereignty for IRA reservations, as a result income differences diminish by 2010.

Keywords: Political Decentralization, American Indians, Indian Reorganization Act, Income, Gaming, Inequality

JEL Codes: H11, N32, O12

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1   Introduction

Over the last 30 years, decentralized governance has increased in popularity across developing countries. More recently, World Bank support prompted formally centralized economies to experiment with decentralizing fiscal responsibilities, administration, and the delivery of services (World Bank, 2000, 2001). These changes have produced mixed results (Bardhan, 2002; Thornton, 2007; Zhang and Zou, 1998; Lin and Liu, 2000; Akai and Sakata, 2002)). A central challenge in determining the effect of decentralized governance on economic growth is the endogenous adoption of governance policies. To address this limitation, this paper leverages exogenous variation in the formation of tribal governments across American Indian reservations and measures the long-run development differences across two distinct forms of tribal governance.

In 1934, the United States government passed one of the most important pieces of legislation governing American Indian reservations, the Indian Reorganization Act (IRA). The IRA reestablished self-governance for tribes and initiated the modern structure of tribal governments. Adoption was voluntary and each reservation had 18 months to vote on whether or not to adopt the IRA. If adopted, IRA reservations were eligible for certain programs from the Bureau of Indian Affairs (BIA) but were subject to more administrative oversight from the Secretary of Interior and the BIA (Clow, 1987; Philp, 1999). These additional constraints limited the sovereignty of tribal governments (Legters and Lyden, 1994). Tribes that did not organize under the IRA maintained their own tribal governments and constitutions, free from BIA oversight. This created two distinct forms of self-governance among American Indian reservations. This paper empirically measures the impact of these two different types of decentralization on reservation economic conditions by comparing IRA and non-IRA reservations.

Comparing economic outcomes of adopters and non-adopters of the IRA is problematic because tribes may have adopted the IRA for several reasons that may be correlated with economic development. In order to mitigate these selection concerns, we pursue two empirical strategies. First, we exploit IRA voting results from the mid-1930s by restricting the sample to tribes that held narrowly determined IRA elections. By comparing narrow elections, we restrict our sample to those reservations where IRA status is determined by a small fraction of voters, which should influence current economic conditions only through the tribal adoption of the IRA, thus

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providing plausibly exogenous variation in the initial adoption of the IRA. Second, we leverage a reservation-level panel dataset that allows us to measure differences in economic outcomes by focusing on within reservation comparisons before and after adoption and only among narrowly determined elections.

Our preferred empirical specification exploits the narrow voting results in a regression discontinuity (RD) framework to estimate the effect of the IRA on income, population, income inequality, and the development of the gaming sector. Regression results using a reservation-level panel dataset from the 1915 - 2010 indicate that adoption of the IRA stifled economic development among reservations that held close IRA elections. Relative to non-IRA reservations, IRA reservations had lower income per capita by over 30%, higher levels of inequality by over 0.5 standard deviation, and significantly less gaming. The results are consistent with decentralized, local governments having more local knowledge and being able to capitalize on economic opportunities that promote inclusive economic growth. Decentralization has been shown to be particularly beneficial in cases where there are informational or political constraints (Bardhan, 2002; Oates, 1999). This may be particularly true on American Indian reservations, where cultural variation introduces informational barriers.

We evaluate two potential mechanisms that explain the early and persistent development gap induced by the IRA. First, we focus on the additional administrative oversight imposed by the Bureau of Indian Affairs. A series of federal laws reduced the severity of BIA oversight starting in the mid-1970s and continuing through the next few decades (Legters and Lyden (1994)). If BIA oversight, imposed by the IRA, significantly slowed development than this reduction in administrative oversight should have been more beneficial for IRA reservations. Estimates from a panel model support this assertion, where the negative income effect diminishes to near parity. We take this as evidence that BIA oversight is partially responsible for the differences in economic development across reservations.

Second, we use the full history of BIA press releases to document the large difference in involvement by the BIA from the early 1950s to the late 1990s. The BIA was involved in over 40% more projects on IRA reservations over the period, with the highest concentration occurring prior to the mid-1970s, when the first set of self-determination acts altered BIA involvement. We test whether the scale of government, largely connected to BIA, is influenced by the IRA and find

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that IRA reservations have a significantly larger fraction of the population employed in the public sector.

This paper makes two major contributions to the literature on decentralization and economic growth. First, the decentralization programs of the last few decades have only produced short-term results. This environment provides the opportunity to understand the long-run impacts of the decentralization. Second, many of the empirical decentralization studies, particularly cross-country studies, struggle to overcome endogeneity biases. The unique process that allowed tribes to vote on the adoption of the Indian Reorganization Act allows me to identify a causal effect of decentralizing BIA authority to tribal governments.

Our work contributes to a growing literature highlighting the importance of institutional quality on American Indian reservations for development. The empirical findings in this literature have primarily focused on the economic impacts of property rights and jurisdictional quality.[1] Dippel (2014) finds contemporary differences in income are influenced by political infighting rooted in the forced co-integration of formerly autonomous bands during the formation of reservations. Frye, Mollica, and Parker (2019) show that the historic imposition of blood quantum rules have long-run implications for inclusive growth. They highlight the importance of tribal governments during the self-determination era for influencing the distribution of income within reservations.

The role of sovereignty in development on reservations is less well developed. Our paper is most directly related to Akee, Jorgensen, and Sunde (2015), which explores the importance of tribal constitutions for reservation development. Tribal constitutions were a key pathway to development introduced in the aftermath of the IRA. Many of the early constitutions incorporated boilerplate language directly from the BIA, which imposed an executive structure to tribal governments (Cohen, 2007; Wilkins and Stark, 2018). The authors evaluate the possible importance of the IRA in the establishment of constitutions and later growth, and find that these IRA era constitutions are not driving their results. We abstract from the role of constitutions and focus specifically on the persistent effects of the IRA, which established the balance of powers between the BIA and local tribal governments.

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[1]For a review of these topics see (Akee, 2009; Anderson and Parker, 2012; Anderson and Lueck, 1992; Cookson, 2010, 2014; Leonard, Parker, and Anderson, 2018; Parker, 2012).

The paper is organized as follows. Section 2 describes the history of the Indian Reorganization Act and elaborates decentralization of power from the BIA to individual tribes. Section 3 describes the data and controls used to quantify the effect of the IRA and discusses the preliminary differences that exist across reservations. Section 4 elaborates on the selection concerns associated with comparing IRA to non-IRA reservations and introduces the IRA voting records as a solution for overcoming the selection bias. Section 6 introduces the formal empirical strategy and discusses the results. Section 7 shows how limited decentralization, in the form of federal oversight, is the major source behind the economic differences between IRA and non-IRA reservations. Section 8 verifies the robustness of the estimation strategy and Section 9 concludes.

2 The Indian Reorganization Act and Governance

2.1 Implementing the IRA

The Indian Reorganization Act represented a dramatic change in federal Indian policy. In the early 1930s, at the urge of the new Commissioner of Indian Affairs, the IRA proposed restoring tribal self-governance marking a severe departure from the assimilationist policies that had dominated for nearly a century. The IRA ended the allotment of tribal lands, placing allotted and tribal lands in federal trust.[2] It established the Secretary of the Interior's authority over matters of tribal lands and established federally supported funds for restoring tribal land and promoting business development (Carlson, 1981). Congress passed the IRA, also known as the Howard-Wheeler Act, on June 18, 1934.

Within eighteen months of the IRA passing Congress, each tribe held a special election and voted on whether or not to accept the provisions of the IRA. Tribes declining to adopt the IRA maintained their own governance regime, but were ineligible for the special land reacquisition fund and revolving credit accounts. Reservations that organized their governance under the IRA were eligible for both funds and were required to form a constitution or charter. Constitutions were reviewed and amended by the BIA and in several instances, this resulted in the BIA imposing a model of governance based on a corporate structure that differed from traditional tribal

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[2]For more information regarding land tenure on Indian reservation refer to Anderson and Lueck (1992), Anderson and Parker (2009), Leonard et al. (2018)), and Dippel and Frye (2019).

democratic systems (Rusco, 2000). The election to organize under the terms of the IRA was a singular event and tribes were unable to change their decision after the election.

Prior to voting, there was considerable debate over the advantages and disadvantages of organizing tribal governance under the IRA. To address this uncertainty, the BIA organized regional meetings to promote the IRA, which offered tribal leaders the opportunity raise questions about how the IRA would work in practice. These meetings were well attended and included representatives from every reservation. They were also the primary method for learning about the IRA structure and benefits.[3] The benefits were clear and attractive. Tribes organized under the IRA would have access to funding to restore tribal land ownership, which had declined dramatically over the recent decades.[4] Tribal owned enterprises could also access a revolving federal credit account for business development. Many reservations lacked access to traditional credit markets and in the midst of the Great Depression access to credit for business development was very attracting. The debate centered on tribal sovereignty. Questions from tribal representatives focused on which specific powers would be retained by tribal governments and which would be transferred to the Secretary of Interior. This line of inquiry was never fully resolved and tribes held elections with uncertainty to the balance of power between tribal governments and the Secretary of Interior.

Only after adoption did it become clear that IRA reservations were to considerably more administrative oversight from the Secretary of Interior. The oversight manifested in three ways. First, any transaction involving land or natural resources or state and local governments required approval by the Secretary of Interior (Clow (1987)). Instead of transferring sovereignty to tribal governments, the IRA effectively granted the BIA authority over tribal resource governance (Michigan Law Review, 1972). Second, the required IRA constitutions and charters often transferred power to the Secretary of Interior by expanding the number of decisions that required approval (Clow, 1987). Third, any tribal or corporate projects using the revolving credit funds were subject to close supervision from local BIA officials who were assigned to monitor the funds and minimize losses (Mekeel, 1944).

Given these administrative barriers, some historians and legal scholars describe the IRA as

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[3]For more information about these Congresses see Deloria (2002).

[4]See Akee (2019), Carlson (1981), and Dippel and Frye (2019) for more information about the historic effects of the Dawes Act.

granting tribes weak and limited sovereignty (Legters and Lyden, 1994) and claiming that IRA reservations were still under the federal government despite the promise of self-rule (Philp, 1999). In practice, this form of limited sovereignty manifested in the regular operations of tribal governments. Anecdotal accounts from tribal government meetings indicate "Indian service personnel considered the new tribal governments...as mere advisory bodies to the Office of Indian Affairs" (Clow, 1987, 132). Young (1997) describes a similar account from the Southern Ute and Ute Mountain reservations where tribal councils "often appeared as if they were not in control of their affairs" (120). Young portrays the federal government officials as running the local council meetings and exercising considerable oversight. Lemont (2006) claimed that it was not until the early self-determination acts of the mid-1970s that IRA tribes gained authority over their own reservations.

2.2   The IRA and Decentralized Governance

The broader literature on governance and economic development articulates a set of tradeoffs between centralized and decentralized governance regimes, which we can apply to the context of the IRA. One possible advantage of decentralized governance is lower monitoring costs for citizens to hold public officials accountable for their actions and decisions when those officials are local. Also, it is easier for citizens to develop rules, laws, and procedures that match local needs, customs, and social norms through smaller localized units of government, like tribal councils. By contrast, centralized governments, like the BIA, are less responsive and knowledgeable about local needs and norms. Which can result in centralized authorities implementing general policy that does not align with local needs.

Centralized governments can take advantage of economies of scale by coordinating policy across jurisdictions, which allows larger authorities to deliver goods and services at lower costs. Centralization creates uniformity through a single set of rules that govern private activity. Under uniform rules, entrepreneurs and businesses can form clear expectations across locations and do not have to learn a distinct set of rules or laws for each jurisdiction. Centralized authorities typically have established networks of creditors and suppliers, which allow them to undertake larger projects.

We can apply this set of tradeoffs to our comparison of centralized (IRA) versus decentralized (non-IRA) governance regimes. We identified three disadvantages of IRA governance and BIA

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oversight. First, BIA agents were not held accountable by local electorates for pursuing bad development projects or failing to capitalize on economic opportunities. Second, BIA agents may not understand local conditions or resources well enough to identify lucrative economic development projects. Third, requiring approval for any transaction involving trust land, natural resources, or other jurisdictions added an additional cost to the approval process. These transaction costs may have delayed IRA reservations in their attempts to capitalize on economic opportunities (Clow, 1987, 131).

We also identified three advantages to organizing under the IRA. First, IRA tribes have access to centralized funding sources that were not available to non-IRA reservations. Second, IRA tribes were better connected to a larger network of resources and potential business partners through the Department of Interior. Third, the BIA provided guidance to tribes drafting constitutions and charters. This often came in the form of a boilerplate constitution, which may have eased the transition to self-governance. In the remainder of the paper, we quantify the effects of the IRA on reservation development and determine the specific mechanisms, related to the tradeoffs of centralization, that led to the contemporary differences we observe.

3   Data and Preliminary Evidence

3.1   Measures of Reservation Development and Controls for Differences Across Reservations

To measure the long-run effects of the IRA, we use several data sources to create a reservation-level dataset that includes contemporary outcomes, historic census data, and spatial controls. Our primary outcomes of interest are per capita income, population, Gini coefficients of reservation level income inequality, and the number of slot machines per capita, a standard measure for the magnitude of the gaming sector. Income and population information from 1915, 1938, and 1945 was collected from BIA reports housed at the U.S. National Archives. More recent income and population information was collected and reported by the U.S. Census Bureau. The income data contains information regarding the distribution of income within the reservation, which we use to construct a Gini Index previously used in Frye et al. (2019). Income and population data are measured only for individuals that self-identify as Native Americans, which we consider to be the

salient group affected by tribal governments. Following Anderson and Parker (2008) and Cookson (2010), we proxy for gaming incomes available to tribal governments using slot machines per capita.

To address potential confounding factors that may be correlated with contemporary income and IRA status, our empirical analysis will include historical and spatial controls. Given that the IRA was introduced following the Allotment Era, we include land tenure characteristics (Office of Indian Affairs, 1934) and BIA recorded measures of blood quantum. Both of these measures may be correlated with adoption of the IRA. We also control for potential spillover effects onto reservations by accounting for state per capita income, adjacent county per capita income, and distance to the nearest major city.[5]

Our final sample includes 214 current reservations, each with information regarding current economic conditions, spatial controls, 1934 allotment and blood quantum characteristics, and IRA voting records. Figure 1 illustrates the spatial distribution of IRA and non-IRA reservations. In general, IRA and non-IRA reservations are evenly distributed across the western states, with the exception of the southwest.[6]

Figure 1: Map of Current Reservations by IRA Status

(a) Sample Reservation Boundaries   (b) Sample Reservation Centroids

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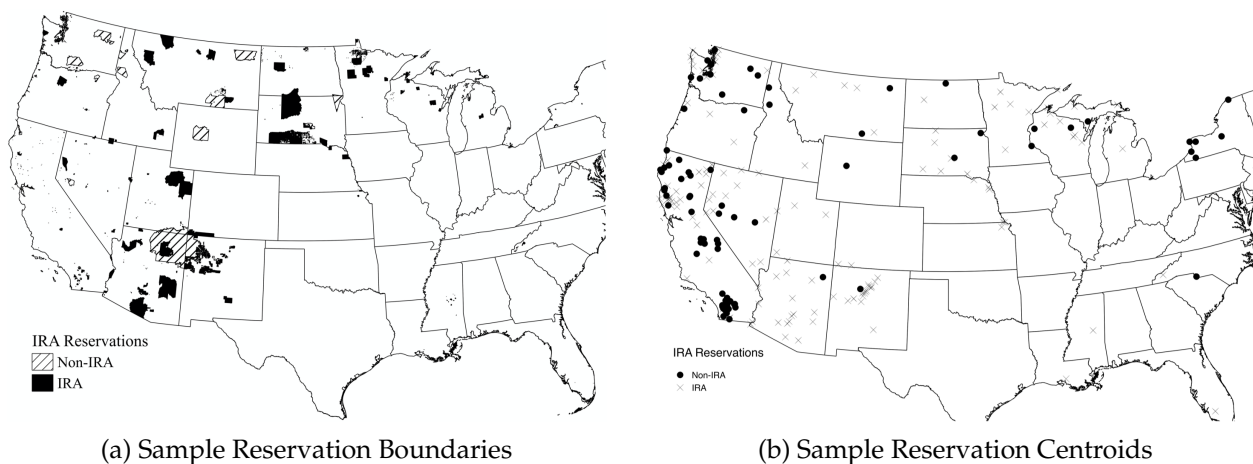
[5]These covariates are used in studies of reservation-level income growth by Anderson and Parker (2008), Dippel (2014), Akee et al. (2015), and Brown, Cookson, and Heimer (2017).

[6]As robustness, we run the analysis both with and without these southwestern reservations and do not see any substantial changes.

3.2 Summary Statistics

Table 1 presents summary statistics for the full sample of reservations. The initial columns indicate the mean and standard error of each variable by IRA status. The final two columns presents the difference between IRA and non-IRA reservations and test whether or not there is a statistical difference between the two groups. Over the entire sample period, non-IRA reservations have significantly higher incomes per capita, populations, and gaming. The second panel illustrates two variations in the voting records described in section 4. The third panel indicates that state per capita income is slightly higher for non-IRA reservations, and IRA reservations had a larger proportion of Full-Blooded Native Americans in the 1938 census.

Figure 2 illustrates the evolution of the outcomes of interest over time. The sample focuses on a nearly balanced of reservations and presents the mean value of each outcome by IRA status for each year. Panel 2a shows that prior to implementation of the IRA in 1915 and 1938, there was a minor income gap between IRA and non-IRA reservations and the gap was closing. We consider 1945 as the first post-IRA period from that period to the present we observe a large and persistent income gap between IRA and non-IRA reservations, where non-IRA reservations have higher incomes per capita. Panel 2b indicates a large and persistent population difference between IRA and non-IRA reservations. The population gap is relative steady over time, with IRA reservations beings slightly larger. Panel 2c illustrates the changes to income inequality over time. Both IRA and non-IRA reservations experienced rising inequality over time, particularly after 1979. This trends is consistent with broader trends in the United States over the same period. The Gini coefficients in 2010 across both groups are similar in magnitude to the broader US Gini coefficient in the same period. The final panel, Panel 2d, presents differences in gaming. In 1989, the gaming sector was in it's infancy and the figure illustrates the rapid expansion in gaming over the following two decades. The large difference by IRA status in slot machines per capita is striking. By 2010, the gaming sector is over 70% larger on non-IRA reservations.

Table 1: Summary Statistics for Full Sample

Panel A: Outcomes	Non-IRA	IRA	Difference
Per Capita Income (2010 USD)	11,743.569	8,502.877	-3,240.692***
	(15,553.277)	(5,677.998)	(1,078.437)
American Indian Population	1,380.428	1,789.943	409.515
	(1,651.187)	(2,277.755)	(314.147)
Gini Index of Per Capita Income	39.577	39.376	-0.202
	(8.906)	(8.140)	(0.829)
Slot Machines Per Capita	0.241	0.193	-0.048
	(1.082)	(0.690)	(0.073)
Percent Employed by Tribal Govt (1989)	6.862	10.187	3.325**
	(5.114)	(7.812)	(1.512)
Panel B: IRA Voting Margins			
IRA Vote Margin (Voters Only)	-0.477	0.699	1.175***
	(0.300)	(0.272)	(0.050)
IRA Vote Margin (Voting Pop)	-0.316	0.403	0.719***
	(0.216)	(0.222)	(0.037)
Panel C: Covariates			
Log Adjacent County Per Capita Income	9.987	9.936	-0.052
	(0.214)	(0.258)	(0.032)
Log State Per Capita Income	10.094	9.997	-0.098**
	(0.592)	(0.591)	(0.045)
Distance to Closest MSA	188.338	177.120	-11.218
	(182.182)	(136.935)	(38.535)
Share of Reservation Acreage in Tribal Trust	0.569	0.586	0.017
	(0.386)	(0.384)	(0.078)
Share of Reservation Acreage in Indiv. Trust	0.152	0.118	-0.034
	(0.178)	(0.171)	(0.036)
Share of Reservation Acreage in Fee-Simple	0.278	0.298	0.020
	(0.315)	(0.337)	(0.065)
Share of 1938 Population with Blood Quantum=1	0.501	0.625	0.124**
	(0.213)	(0.315)	(0.049)
Share of 1938 Population with Blood Quantum<1 & >=0.5	0.331	0.221	-0.110***
	(0.174)	(0.198)	(0.037)
Share of 1938 Population with Blood Quantum<0.5 & >=0.25	0.100	0.114	0.014
	(0.065)	(0.195)	(0.025)
Share of 1938 Population with Blood Quantum<0.25	0.068	0.040	-0.028
	(0.083)	(0.072)	(0.017)
Observations	262	675	937

Notes: Summary statistics are presented for the full sample of 213 reservations where IRA voting results are observed. Data sources are described in detail in the Data Appendix. Standard errors are presented in parentheses and are clustered at the reservation level. * p<0.10, ** p<0.05, *** p<0.01
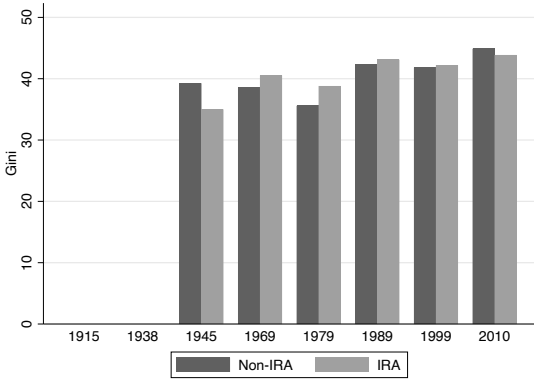
Figure 2: Differences by IRA Status
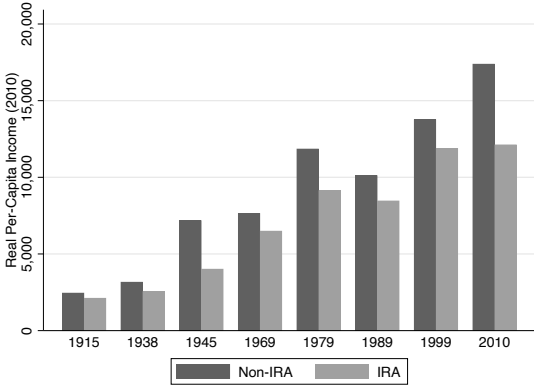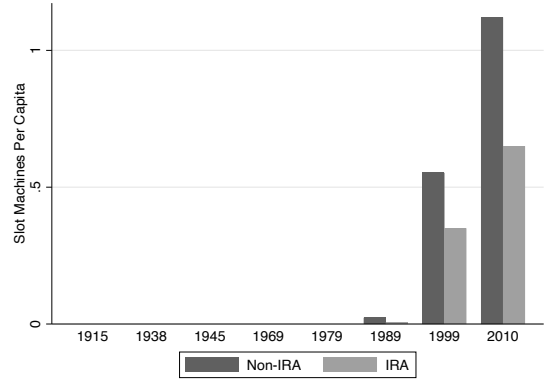

(a) Per Capita Income
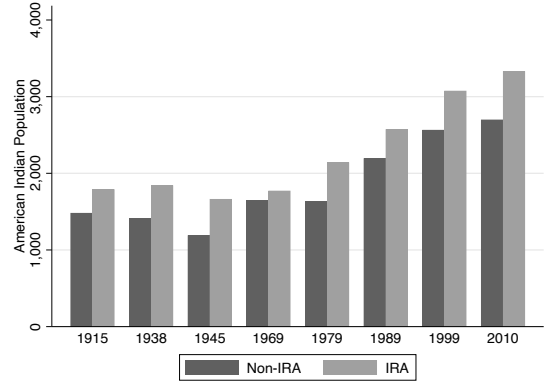
(b) Population of American Indians

(c) Gini Coefficient of Income

(d) Slot Machines Per Capita

4 Selection Concerns and IRA Voting Records

Comparing tribes that adopted the IRA to those that did not is likely to result in a biased estimate. Tribes voted to adopt the IRA for several reasons, which may be correlated with contemporary reservation development resulting in biased OLS estimates. For example, poorly organized tribes in 1934 may have adopted the IRA because of the high organization costs associated with forming their own constitution and government structure. This organizational dysfunction is likely to persist through time and decrease contemporary economic development. Therefore, poorly organized tribes would likely result in negatively biased OLS estimates.

Tribes that were more assimilated in 1934 may have found the structure of the IRA to be a more familiar form of government and therefore may have been more likely to adopt it, however histor-

ical assimilation is likely positively correlated with better economic performance today (Mekeel, 1944). Due to the fast implementation of the IRA, the BIA sent several advocates to reservations to promote and educate tribes about the IRA (Mekeel (1944)). Given the limited time and resources at the BIA's disposal they likely recruited in more receptive or developed areas and therefore have a higher probability of IRA adoption in these areas (Lemont (2006)). If assimilation, receptiveness to federal programs, or development in 1934 is positively correlated with economic development then the OLS estimates will be positively biased.

To mitigate these selection concerns, we exploit IRA voting results from the mid-1930s by restricting the sample to tribes that held narrowly determined IRA elections.[7] Presumably, the decision to vote for or against the IRA by a small fraction of voters should influence current economic conditions only through the tribal adoption of the IRA, thus providing plausibly exogenous variation in the initial adoption of the IRA.

We consider two alternative measures of the voting margin. First, we consider only those individuals that case ballots, where $VoterOnlyMargin = (yes - no)/(yes + no)$. Second, we include those that abstain in the denominator, where $VotingPopMargin = (yes - no)/(yes + no + abstain)$. A practical interpretation of the margin is the percent of individuals that need to change their votes to alter the IRA election outcome. The median IRA election had 185 voters and 344 eligible voters.

5 Regression Discontinuity Design

5.1 Empirical Design

Our preferred empirical specification exploits the narrow IRA voting results in a regression discontinuity (RD) framework to estimate the effect of the IRA on our outcomes of interest. Our preferred RD specification is of the form:

$$Y_i = \beta_0 + \beta IRA_i + f(x_i) + \epsilon_i \tag{1}$$

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[7]We collected IRA voting results from *Ten Years of Tribal Government Under I.R.A.* (Haas, 1947).

$$\forall x_i \epsilon (c - h, c + h)$$

where Y_i is the outcome of interest, IRA_i is the treatment, and h is the bandwidth. The running variable, x_i measures the difference in IRA voting divided by the voting sample. We present all models using two alternative measures of the voting margin, as detailed in Section 4.

The coefficient of interest, β, measures the effect of adopting the IRA. We estimate this equation using a Local Linear Regression, which combines a suitable bandwidth and a linear control function, $f(x_i)$. We select our optimal bandwidth using the methods from Calonico, Cattaneo, and Titiunik (2014).
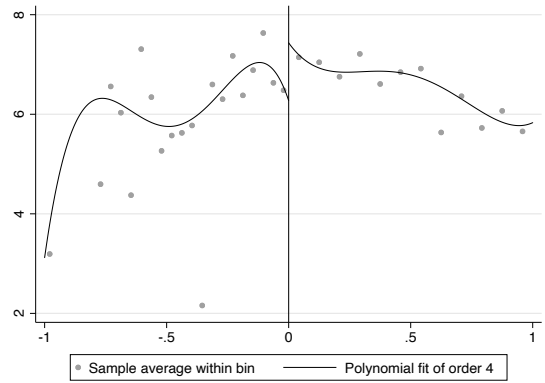
5.2 Results

Figure 3 plots our four outcomes of interest and fits a 4th order polynomial to the data before and after the cutoff. Apparent from the figure is the large discontinuity around the IRA win margin for each outcome. Reservations to the left of the adoption threshold did not adopt the IRA and these reservations have significantly higher incomes. The visible discontinuities indicate that income per capita is higher, population is lower, inequality is lower, and gaming is higher among non-IRA reservations.[8]

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[8]All four figures use the total voting population as the running variable, but using voters only produces a similar set of figures.
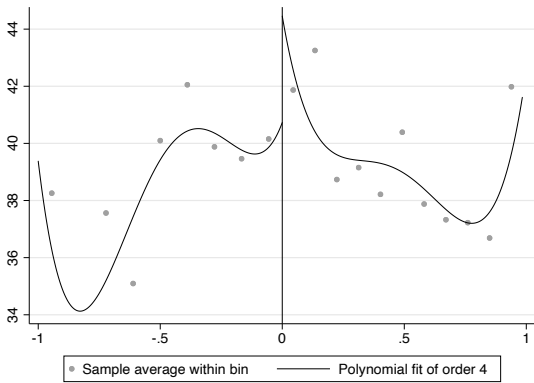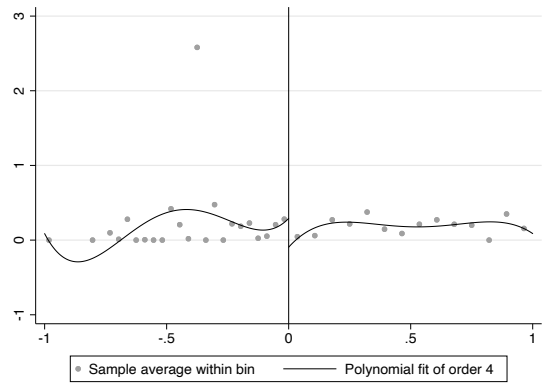
Figure 3: Regression Discontinuity Plots
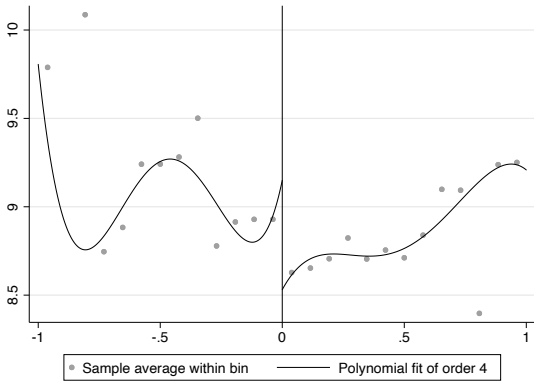
(a) Per Capita Income

(b) Population of American Indians

(c) Gini Coefficient of Income

(d) Slot Machines Per Capita

Table 2 presents the pooled regression discontinuity results for the four outcomes of interest. Column (1) presents results using the voters only running variable, Column (2) presents results using the full voting population as the running variable. Columns (3) and (4) restrict the sample to a panel of reservations that are observed in at least 5 of the 8 possible years and at least once in 1915 or 1938.

Panel A presents the results for per capita income. Consistent with Figure 3a, per capita income on IRA reservations is between 33% and 45% lower than non-IRA reservations. This finding is consistent across the our measures of voting margin and in the more restrictive panel sample. Despite lower incomes, the results in Panel B indicate that the population of Native Americans was significantly higher on IRA reservations.

The results in Panel C indicate that IRA reservations have more unequal income distributions as measured by larger Gini coefficients. The coefficient estimates indicate that the Gini is between

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4.45 and 7.27 points higher on IRA reservations compared to non-IRA reservations. This difference corresponds to between a 0.5 and 0.9 standard deviation in the Gini coefficients from the full sample.[9] The result implies income on IRA reservations is both lower and more unequally distributed. To the extant that local officials are better able to respond to local needs, elevated inequality may be a byproduct of centralized governance.

Panel D shows one potential channel that could be affecting contemporary income and income distributions. Gaming, as measured by slot machines per capita, is significantly lower on IRA reservations compared to non-IRA reservations. In 2010, the mean number of slot machines per capita was 1.55 on IRA reservations and 0.922 on non-IRA reservations. The point estimates in Panel (D) suggest that nearly 50% of this difference can be explained by IRA status. Successful traditions in self-governance may have facilitated a more rapid expansion of tribally managed gaming enterprises. These enterprises give local leaders the ability to influence income distributions through per capita payments and preferential hiring. Both channels would work to raise income and compress the income distribution on non-IRA reservations.[10]

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[9]For perspective, a 6 point difference in the Gini coefficient is similar to the difference between the United States and the Australia, the United Kingdom, and Canada.

[10]For more discussion of trends in income distributions over the twentieth century see Frye et al. (2019).

Table 2: Regression Discontinuity Estimates of the Impact of the Indian Reorganization Act

	(1)	(2)	(3)	(4)
Panel A: Log Per Capita Income (2010 USD)				
IRA	-0.5449**	-0.4037**	-0.5969***	-0.4496***
	(0.2677)	(0.1927)	(0.0773)	(0.1214)
Obs	937	937	624	624
Panel B: Log American Indian Population				
IRA	1.7731*	0.7046	3.1904***	1.4478*
	(0.9282)	(0.6493)	(0.7750)	(0.8267)
Obs	930	930	619	619
Panel C: Gini Coefficient				
IRA	4.8233	4.4479*	7.2746***	6.7403***
	(2.9659)	(2.4877)	(2.4923)	(2.3609)
Obs	681	681	448	448
Panel D: Slot Machines Per Capita				
IRA	-0.3424**	-0.2768*	-0.2539**	-0.1733
	(0.1371)	(0.1497)	(0.1011)	(0.1256)
Obs	935	935	623	623
Vote Margin	Voters Only	Voting Pop	Voters Only	Voting Pop
Panel Sample	N	N	Y	Y

Notes: Each specification is from a pooled sample of reservations. Panel sample requires at 5 observations within the sample period and one observation from either 1915 or 1938. Standard errors are clustered at the reservation level and are reported in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

An alternative approach to running the pooled set of reservations is to estimate the effect separately for each year. Figure 4 plots the coefficient estimates and 90% confidence intervals for each outcome over time. The results confirm our prior findings. IRA reservations consistently have lower incomes per capita, higher population, more inequality, and less gaming.[11] The time paths across the outcomes reveal the estimated effects are relatively steady over time, despite subtle fluctuations in the sample.

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[11]There was not a sufficient level of development in the gaming sector in 1989 to estimate differences.
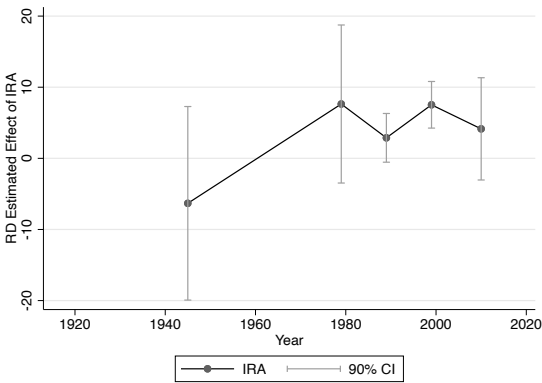
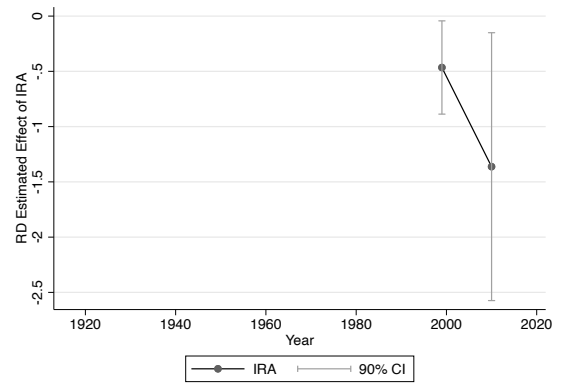Figure 4: Regression Discontinuity Estimates By Year
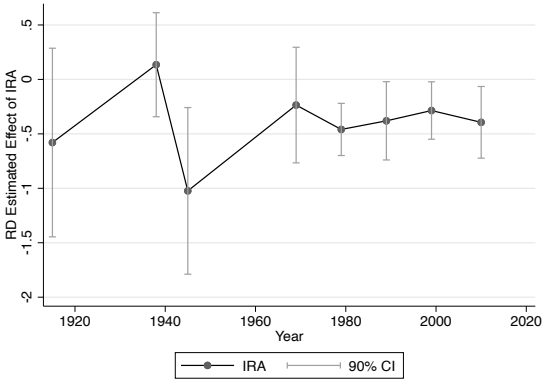
(a) Per Capita Income
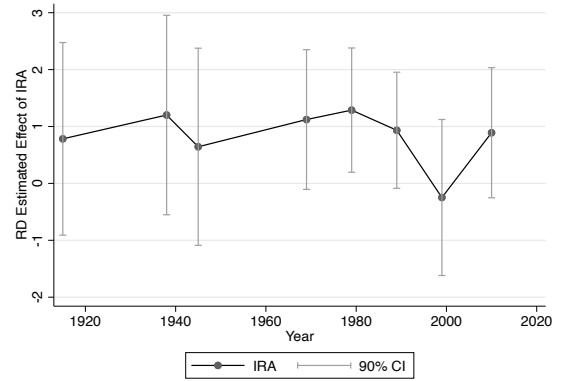
(b) Population of American Indians

(c) Gini Coefficient of Income

(d) Slot Machines Per Capita

6 Panel Estimates

6.1 Empirical Design

Our second model estimates the effect of adopting the IRA using the full reservation-level panel dataset by estimating the following specification,

$$Y_{it} = \gamma_i + \delta_t + \beta IRA_{it} + X'_{it}\theta + Z'_i\mu + \epsilon_{it} \tag{2}$$

where Y_{it} are our primary outcomes of interest related to income and population. The coefficient of interest, β, measures the average effect of adopting the IRA. For these specifications, we allow IRA_{it} to vary over time, by setting $IRA_{it} = 0$ in 1915 and 1938 and 1 otherwise. The

specifications includes reservation fixed-effects, γ_i, and year fixed-effects, δ_t. Our preferred specifications also a vector time varying characteristics, X_{it}, and time invariant traits interacted with binary year dummies, Z_i. The covariates account for differences in land tenure and the ethnic composition of the reservation, both characteristics that could've influenced the adoption of the IRA. Standard errors are clustered at the reservation level to account for serial correlation. Our preferred sample, is nearly balanced and requires at least one reservation-level observation prior to treatment (1915 or 1938) and at least five observations over the century. These restrictions limit the sample to 75 reservations.

The full sample panel specification accounts for any time invariant characteristics associated with reservations correlated with IRA adoption, but there may have been time varying unobservables that are correlated with IRA adoption and current economic performance. The remaining columns in Table 3 further restrict the comparison to those reservations that held narrowly determined IRA elections. We define narrow using the non-parametric techniques described in Calonico et al. (2014) and Calonico, Cattaneo, and Titiunik (2015).

6.2   Results

Columns (1) and (4) of Table 3 presents the results from estimating equation 2 for the full sample for income and population. Both results reveal a statistically weak relationship between IRA adoption and per capita income or population following IRA adoption. Once we restrict the sample to those reservations that held narrow elections, the negative effect of the IRA increases in magnitude and significance. Per capita income among IRA reservations is between 17% and 25% lower compared to Non-IRA reservations. Population is also significantly lower, with the results suggesting that the population of Native Americans is between 20% and 40% lower on IRA reservations. These results suggest that the IRA significantly inhibited income and population growth on reservations over the prior 80 years.

Table 3: Estimating the Effect of the Indian Reorganization Act in Panel Data

	Log Per Capita Income (2010 USD)			Log American Indian Population		
	(1)	(2)	(3)	(4)	(5)	(6)
	Full Samp	Voter Only BW	Voting Pop BW	Full Samp	Voter Only BW	Voting Pop BW
IRA Reservation	-0.0575	-0.1984	-0.2882*	0.0860	-0.2894	-0.1783
	(0.1212)	(0.3787)	(0.1688)	(0.1050)	(0.3420)	(0.2524)
Obs	553	129	205	552	129	205
Reservations	74	17	27	74	17	27

Notes: All specifications include reservation and year fixed-effects, time varying controls for state per capita income, and year interacted controls on distance to nearest MSA, Pct of Land in Tenure Types, and Share of Population with varying BQ as described in the summary statistics. Models (2) and (5) restrict the sample to within the optimal bandwidth for a running variable with only voters. Models (3) and (6) restrict the sample to within the optimal bandwidth for a running variable using all eligible voters. Standard errors are clustered at the reservation level and are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01

7 Evidence of Mechanisms

7.1 Relaxing Restrictive Federal Oversight

To verify that the growth differences between IRA and non-IRA reservations are driven by differences in the degree of decentralization and tribal sovereignty, we exploit legal changes in overall tribal sovereignty that occurred in the 1980s and early 1990s that should have led to a convergence in the sovereignty between IRA and non-IRA reservations. In the late 1980s two important pieces of legislation increased tribal sovereignty, the Indian Gaming Regulatory Act and the Indian Self-Determination and Education Assistance Act (Dippel, 2014). These laws reduced BIA oversight and expanded the ability of tribes to self-govern. We expect relaxing federal oversight would benefit IRA reservations relative to non-IRA reservations after implementation. In order to test this assertion, we run a similar specification to equation 2, but add an additional interaction term to examine whether or not there where differential effects of being an IRA reservation before and after 1980. We estimate the following regression,

$$Y_{it} = \gamma_i + \delta_t + \beta_1 IRA_{it} + \beta_2(IRA_{it} \times Post1980) + X'_{it}\theta + Z'_i\mu + \epsilon_{it} \qquad (3)$$

The coefficients of interest estimate the effect of being an IRA reservation before, β_1, and after,

β_2, the policy changes. We expect IRA reservations to benefit more from relaxing administrative oversight; therefore we expect β_2 to be positive and β_1 to continue to be negative. The specification includes all of the prior fixed-effects and controls from equation 2. In an effort to address the selection issues from before, we present restrict samples within the optimal bandwidths.

Table 4: Indian Reorganization Act and Per Capita Income Post 1980

	Log Per Capita Income (2010 USD)		
	(1)	(2)	(3)
	Full Samp	Voter Only BW	Voting Pop BW
IRA	-0.1317	-0.2284	-0.3899*
	(0.1301)	(0.3835)	(0.2041)
IRA X Post 1980	0.1551*	0.3171	0.3333
	(0.0815)	(0.2479)	(0.2139)
Obs	553	129	205
Reservations	74	17	27

Notes: All specifications include reservation and year fixed-effects, time varying controls for state per capita income, and year interacted controls on distance to nearest MSA, Pct of Land in Tenure Types, and Share of Population with varying BQ as described in the summary statistics. Model (2) restricts the sample to within the optimal bandwidth for a running variable with only voters. Model (3) restrict the sample to within the optimal bandwidth for a running variable using all eligible voters. Standard errors are clustered at the reservation level and are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01

The results, presented in Table 3, suggest that the increased tribal sovereignty led to marginal improvements in incomes among IRA reservations relative to non-IRA reservations after 1980. Column (1) presents the full sample results. Columns (2) and (3) restrict the sample to within the optimal bandwidths. The results are consistent across the different specifications and suggest that the federal oversight faced by IRA reservations was partially responsible for suppressing economic development over the 20th century. The coefficient on the interaction term is consistently positive and large in magnitude. The estimates in Columns (2) and (3) lack precision, but the magnitude of the coefficient estimates suggest the relaxation of BIA constraints nearly reversed the entire negative effect of the IRA. These results support the mechanism, that federal oversight limited the sovereignty granted to tribes and thereby slowed the rate of economic development.

7.2 BIA Influence and Projects

Section 2 provided historical and theoretical context for the role of the BIA in influencing local economic development. In an effort to quantify the difference in BIA involvement across the reservation types, we collected the full history of BIA press releases from 1953 to 1999. We focused on the set of press releases containing information regarding project development, management, or spending, as well as information on contract enforcement or resource management. We excluded all activity related to BIA staffing and administrative changes, choosing to focus on tangible projects on the ground. The majority of projects in our sample involved infrastructure or resource management and development.

Figure 5 visually represents the difference in BIA involvement between IRA and non-IRA reservations. The figure shows plots the number of BIA initiated projects by IRA status over time. Consistent with the prior narrative, the BIA was substantially more active on IRA reservations. Over the entire period, the BIA was involved in 7.83 projects on the average IRA reservation and 5.51 projects on the average non-IRA reservation. The majority of this difference occurs prior to 1980. The timing of the decline in BIA involvement is consistent with the set of self-determination bills that passed beginning in the mid-1970s and continuing into the 1990s. The magnitude of the difference and the timing of the decline in BIA involvement support the assertion of higher levels of BIA involvement on IRA reservations.

Figure 5: Bureau of Indian Affairs Projects

Data presented as a 3-year moving average.
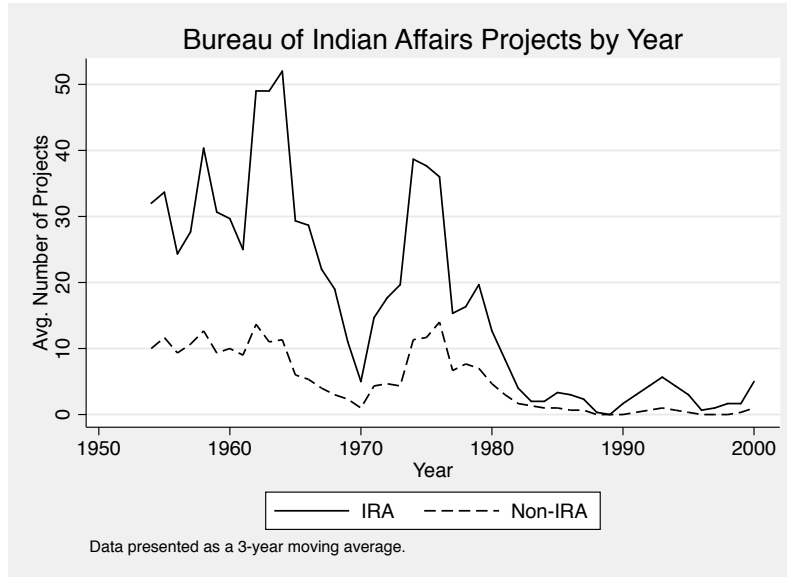
One byproduct of increased BIA involvement could be an expansion of BIA related government employment. Panel A of Table 3.2 compares the percent of workers employed in government by IRA status in 1989. A comparison of means indicates that IRA reservations employ a significantly larger proportion of the working population in government. Table 5 presents RD estimates from equation 1, where our outcome of interest is the share of the working population employed by government in 1989. The point estimates reveal a strong relationship between IRA status and government employment. The magnitude of the estimated effect of IRA adoption corresponds to nearly a two standard deviation increase the share of the Native American population working in government employment.

Table 5: Indian Reorganization Act and Government Employment

	(1)	(2)	(3)	(4)
IRA	16.2810***	18.8996***	15.1947**	18.4022***
	(3.4821)	(3.2816)	(7.7506)	(4.4402)
Obs	101	101	70	70
Vote Margin	Voters Only	Voting Pop	Voters Only	Voting Pop
Panel Sample	N	N	Y	Y

Notes: Each specification is from the sample of reservations we observe in 1989 that report employment in tribal government. Panel sample requires at 5 observations within the sample period and one observation from either 1915 or 1938. Standard errors are clustered at the reservation level and are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01

7.3 Credit Access

In 1939, Congress attempted to repeal the IRA after recognizing the growing cost of offering credit and the administrative burden (Sturtevant, 1978). The repeal attempt failed, but Congress dramatically curtailed the availability of credit so that only about half of the originally promised credit was made available and only half of the IRA reservations satisfied the eligibility requirements (Young, 1997). The extension of credit to support the reacquisition of tribal lands lost during the allotment era and the development of economic opportunities, was a key benefit of organizing under the IRA. By reducing its availability and raising the eligibility requirements, Congress greatly reduced the potential benefits promised to IRA reservations.

We are currently in the process of gathering information about credit eligibility and use. In forthcoming work, we will evaluate the effect of access to credit among IRA reservations on their economic development.

8 Robustness

8.1 Manipulation Around the Threshold

If individuals can manipulate whether or not the tribe passed the IRA, and therefore create a discontinuity around the voting threshold, then RD does not properly correct for the selection

problem. One reason this might be problematic in the case of IRA voting are the anecdotal accusations that the BIA altered elections in favor of the IRA (Johansen and Pritzker (2007)). We estimate a non-parametric test that measures whether or not a discontinuity exists around a threshold developed by McCrary (2008). Figure 6 presents the results from the McCrary Density Test. The overlapping confidence intervals on either side of the voting margin indicate that manipulation around the threshold was not problematic within our RD sample.[12]

Figure 6: McCrary Density Test with IRA Voting

(a) Voters Only Bandwidth

(b) Voting Population Bandwidth
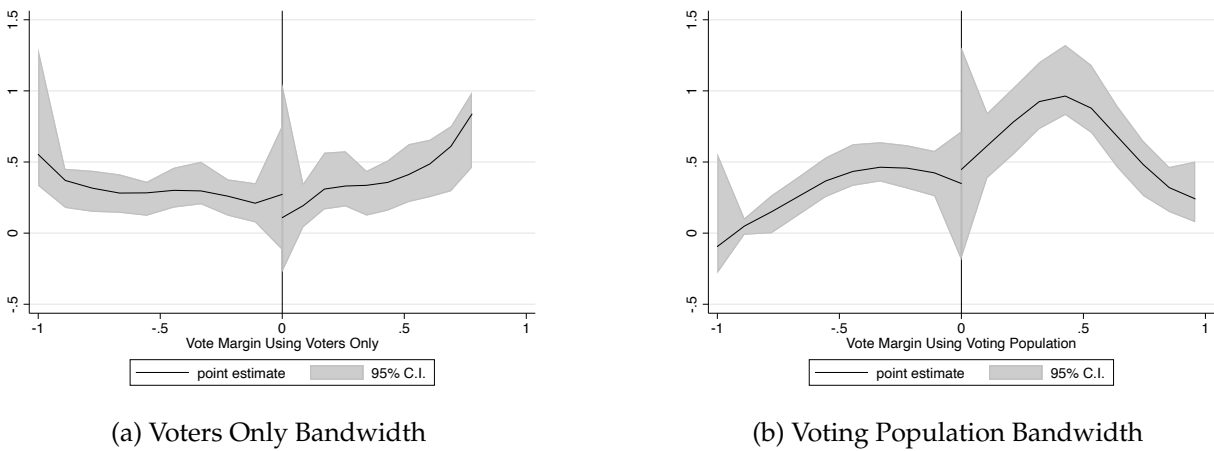
8.2 Alternative Cutoffs

We replicated equation 1 under alternative IRA election thresholds. Our alternative cutoffs range from -0.15 to 0.15 and increases by increments of 0.01. Figure 7 plots the estimated coefficients with 90% confidence intervals at each alternative vote margin. The only coefficient estimates that are statistically different from zero are immediately surrounding the actual IRA vote margin of zero. This suggests that the observed effect of the IRA is critically dependent on the mechanism of adoption, which occurs when the running variable is zero.

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[12]The p-values on the formal hypothesis test exceed 0.50 in both instances.

Figure 7: Indian Reorganization Act and Per Capita Income with Varying Cutoffs
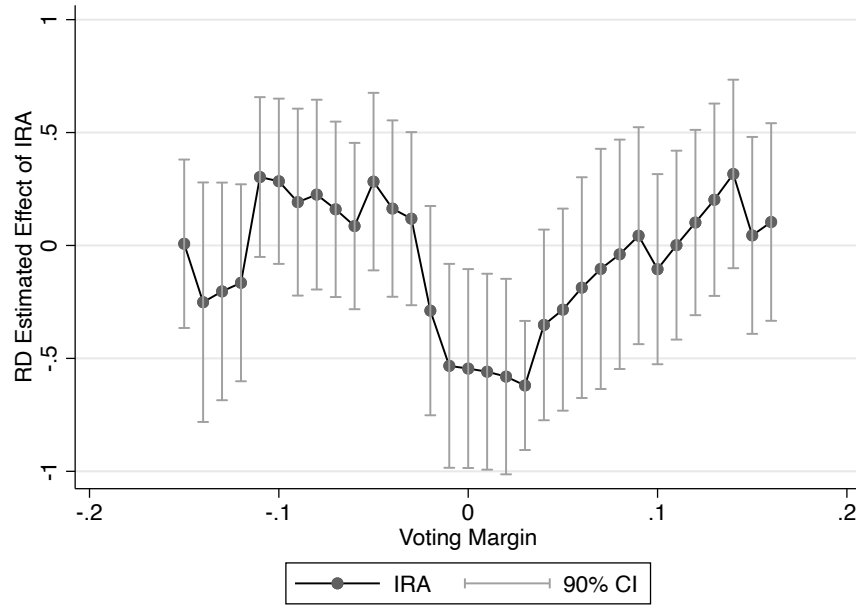
9   Conclusion

This paper measures long-run differences in economic development induced by the decentral-ization of governance between the Bureau of Indian Affairs and Native American tribal govern-ments. We find that limited decentralization, in the form of the Indian Reorganization Act, was detrimental for economic development on American Indian reservations. The findings suggest that among reservations who held narrowly determined elections, the IRA led to lower incomes, more inequality, and slower growth in the gaming sector. This paper contributes to a growing literature on the intersection of legal and social institutions for economic development, particu-larly focusing on the long-run benefits of political decentralization in a setting with strong cultural heterogeneity.

References

Akai, N. and M. Sakata (2002, July). Fiscal decentralization contributes to economic growth: evidence from state-level cross-section data for the United States. *Journal of Urban Economics 52*(1), 93–108.

Akee, R. (2009). Checkerboards and coase: The effect of property institutions on efficiency in housing markets. *Journal of Law and Economics 52*(2), pp. 395–410.

Akee, R. (2019). Land titles and dispossession: Allotment on american indian reservations. *Journal of Economics, Race, and Policy*, 1–21.

Akee, R., M. Jorgensen, and U. Sunde (2015). Critical junctures and economic development–evidence from the adoption of constitutions among american indian nations. *Journal of Comparative Economics 43*(4), 844–861.

Anderson, T. L. and D. Lueck (1992). Land Tenure and Agricultural Productivity on Indian Reservations. *Journal of Law and Economics*.

Anderson, T. L. and D. Parker (2012, July). Lessons in Fiscal Federalism from Indian Country. *research.mpls.frb.fed.us*.

Anderson, T. L. and D. P. Parker (2008, November). Sovereignty, credible commitments, and economic prosperity on american indian reservations. *Journal of Law and Economics 51*(4), 641–666.

Anderson, T. L. and D. P. Parker (2009). Economic development lessons from and for north american indian economies *. *Australian Journal of Agricultural and Resource Economics 53*(1), 105–127.

Bardhan, P. (2002, October). Decentralization of Governance and Development. *The Journal of Economic Perspectives 16*(4), 185–205.

Brown, J. R., J. A. Cookson, and R. Z. Heimer (2017). Courting economic development. *The World Bank Economic Review 30*(Supplement_1), S176–S187.

Calonico, S., M. D. Cattaneo, and R. Titiunik (2014). Robust nonparametric confidence intervals for regression-discontinuity designs. *Econometrica 82*(6), 2295–2326.

Calonico, S., M. D. Cattaneo, and R. Titiunik (2015). Optimal data-driven regression discontinuity plots. *Journal of the American Statistical Association 110*(512), 1753–1769.

Carlson, L. (1981). *Indians, Bureaucrats, and Land: the Dawes Act and the Decline of Indian Farming*. Contributions in economics and economic history. Greenwood Press.

Clow, R. L. (1987). The Indian Reorganization Act and the Loss of Tribal Sovereignty: Constitutions on the Rosebud and Pine Ridge Reservations. *Great Plains Quarterly*.

Cohen, F. S. (2007). *On the drafting of tribal constitutions*, Volume 1. University of Oklahoma Press.

Cookson, J. A. (2010). Institutions and Casinos on American Indian Reservations: An Empirical Analysis of the Location of Indian Casinos. *Journal of Law and Economics 53*(4), 651–687.

Cookson, J. A. (2014). Economic Consequences of Judicial Institutions: Evidence from a Natural Experiment. *Available at SSRN 1893693*.

Deloria, V. (2002). *The Indian Reorganization Act: Congresses and Bills*. University of Oklahoma Press.

Dippel, C. (2014). Forced coexistence and economic development: evidence from Native American Reservations. *Econometrica 82*(6), 2131–2165.

Dippel, C. and D. Frye (2019). The effect of land allotment on native american households during the assimilation era. Technical report.

Frye, D., A. Mollica, and D. P. Parker (2019). Ethnicity, nationalism, and exclusive growth: Evidence from tribal nations.

Haas, T. H. (1947). Ten years of tribal government under I. R. A.

Johansen, B. E. and B. M. Pritzker (2007). *Encyclopedia of American Indian History [4 volumes]*. Abcclio.

Legters, L. H. and F. J. Lyden (1994). *American Indian Policy: Self-Governance and Economic Development*.

Lemont, E. D. (2006). *American Indian Constitutional Reform and the Rebuilding of Native Nations*.

Leonard, B., D. Parker, and T. Anderson (2018). Land quality, land rights, and indegenous poverty.

Lin, J. Y. and Z. Liu (2000). Fiscal Decentralization and Economic Growth in China*. *Economic Development and Cultural Change 49*(1), 1–21.

McCrary, J. (2008, February). Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of Econometrics 142*(2), 698–714.

Mekeel, S. (1944, April). An Appraisal of the Indian Reorganization Act. *American Anthropologist 46*(2), 209–217.

Michigan Law Review (1972, April). Tribal Self-Government and the Indian Reorganization Act of 1934. *Michigan Law Review 70*(5), 955–986.

Oates, W. E. (1999, September). An Essay on Fiscal Federalism. *Journal of Economic Literature 37*(3), 1120–1149.

Office of Indian Affairs (1934). *Indian Land Tenure, Economic Status, and Population Trends. Report on Land Planning*.

Parker, D. P. (2012). The effects of legal institutions on access to credit: Evidence from american indian reservations. *Unpublished manuscript*.

Philp, K. R. (1999). *Termination Revisited: American Indians on the Trail to Self-Determination, 1933-1953*. Lincoln, NE: University of Nebraska Press.

Rusco, E. R. (2000). *A Fateful Time: The Background and Legislative History of the Indian Reorganization Act*.

Sturtevant, W. C. (1978). *Handbook of North American Indians*, Volume 8. Smithsonian Institution Washington, DC.

Thornton, J. (2007). Fiscal decentralization and economic growth reconsidered. *Journal of Urban Economics*.

Wilkins, D. E. and H. K. Stark (2018). *American Indian politics and the American political system*. Rowman & Littlefield.

World Bank (2000). *Entering the Twenty-First Century*.

World Bank (2001). *Decentralization & Subnational Regional Economics*.

Young, R. K. (1997). *The Ute Indians of Colorado in the twentieth century*. University of Oklahoma Press.

Zhang, T. and H. Zou (1998). Fiscal decentralization, public spending, and economic growth in China. *Journal of Public Economics*.

Online Appendix

to

Local versus Central Governance:
Long Run Effects of Federal Oversight over American Indian Reservations

Online Appendix A   Data Documentation

Online Appendix B   Table Appendix