

Resource Extraction Under Governance and Land Tenure Regimes: Lessons from American Indian Reservations*

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Abstract

This paper uses the formation of tribal governments and policy changes relaxing federal leasing constraints on American Indian reservations to examine the role of land tenure on reservation resource development. Using a reservation-level panel dataset from 1939 - 1978, with information on tribal governments, changes to land tenure, and natural resource production, this paper documents how reservations with more access to federal resources altered their mixture of land tenure following the relaxation of leasing constraints in the 1950s. Next, the paper explores the consequences of these changes in the land tenure mix for oil and gas development. Preliminary results suggest that high federal access reservations retained more land under tribal control at the expense of fee-simple. Reservations that retained more land in tribal ownership experienced more oil and gas development in the subsequent decades.

KEYWORDS: Native American Development, Leasing, Governance

JEL CLASSIFICATION:

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1 Introduction

Property rights influence economic development by defining the criterion for using resources, capturing rents, exchanging goods, and establishing investment and production incentives (Libecap (1986)). The fundamental challenge in evaluating the consequences of changing property rights is that these changes are often endogenously related to the outcome of interest. The establishment of tribal governments on American Indian reservations in the 1930s and subsequent legal changes related to land tenure in the 1950s provide a unique setting to examine the issue of changing land tenure and the consequences of these changes on the development of oil and gas production.

Studying property rights on American Indian reservations is particularly salient for several reasons. First, as a result of federal policies in the early twentieth century, American Indian reservations are organized under several different land tenure types.¹ Different regulations associated with each land tenure type have important consequences for contract costs and agricultural productivity (Anderson and Lueck (1992)). On Canadian aboriginal lands, similar land tenure structure combined with federal involvement leads to increased transaction costs, which ultimately attenuates economic development (Alcantara (2007)). Second, natural resources make up a non-trivial component of reservation economies.

Despite the recognized value of agriculture and resources on reservations, little is known about the evolution of these land tenure systems through time. Using a new panel dataset spanning from 1939 to 1978, this paper documents the trends and distributional shifts in tenure that occurred in Native American land during the 20th century. Congress enacted several policies over the mid-part of the twentieth century as part of the ‘Termination Era’ with the intent of incorporating Native Americans into the same economic, educational, and legal structures as mainstream Americans. One policy targeted at land tenure was the Indian Long-Term Leasing Act (hereafter LTLA) of 1955. This act increased lease lengths and lowered the transaction costs associated with leasing Native American trust land. As a result, the flow of land tenure changed as trustees were more willing to retain their land in trust. This change in land holding behavior suggests that beneficiaries of trust land faced improved economic outcomes due to lower transaction costs and less

¹Fee-simple is the typical private ownership structure found in common law countries. Individual trust land is where the owner is the beneficiary of the land but the land is managed in trust by the federal government. Similarly, tribal trust land is managed by the federal government but the tribe is the beneficiary of the land. The federal government is both the beneficiary and manages the trust on federal trust land.

uncertainty regarding the expected stream of rents available from leasing.

Considering this change in the return to trust land, many tribes were constrained in their ability to capitalize on these benefits. Tribes that previously organized their tribal governments under the Indian Reorganization Act (hereafter IRA) of 1934, faced better prospects for taking advantage of these benefits. IRA reservations received access to credit from the Bureau of Indian Affairs to restore the tribal land holdings, several IRA reservations also established constitutions and charters that allowed for Tribal Land Enterprises to help manage leasing and sales of trust lands. This provide IRA reservations with the governmental institutions necessary to take advantage of the changing leasing conditions in the 1950s.

To estimate the effect of leasing changes under difference governance regimes among American Indian reservations on land holdings, this paper exploits a Difference-in-Difference style model with reservation and year fixed-effects. Preliminary findings indicate that IRA reservations retained more land in trust, particularly tribal trust, while slowing the transfer of land to fee-simple following the relaxation of leasing restrictions with the LTLA.

These changes in land tenure, induced by the LTLA, have important consequences for natural resource development on reservations. Similar to the prior Difference-in-Difference design, I estimate a reduced form model where the outcome of interest is the number of oil and gas wells per capita. The findings suggest that IRA reservations saw larger increases in oil and gas development following the implementation of the LTLA. To more specifically target land tenure as the mechanism, I run a two-stage least squares approach, where I estimate the change in trust land induced by the LTLA for IRA reservations in the first-stage and estimate the effect of these induced changes to land tenure on oil and gas development on reservations. The results suggest that the retention of land in trust status on reservations increased oil and gas development on reservations.

The paper is structured as follows: Section 2 discusses the background of land tenure on reservations. Section 3 describes the data, summary statistics, and land tenure patterns through time. Section 4 introduces the empirical strategy. Section 5 presents the preliminary results and Section 6 discusses upcoming work.

2 Background

2.1 The Indian Reorganization Act and Tribal Governments

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 authority of the Secretary of the Interior over matters of tribal lands and natural resources and established a fund that allowed tribes to restore their reservation land base. The IRA also established a revolving credit account for tribal governments and corporations in an effort to increase the availability of credit (Carlson (1981)). Congress passed the IRA, also known as the Howard-Wheeler Act, on June 18, 1934.

Within 18 months of the IRA passing Congress, each tribe voted on whether or not to adopt the IRA. Each reservation that adopted the IRA was required to form a new tribal constitution or charter, although in practice some did not. These constitutions were reviewed and amended by the BIA. In many instances the resulting IRA constitution imposed a model of tribal governance based on a corporate structure that differed from many of the traditional tribal democratic systems (Rusco (2000)). IRA reservations were subject to more administrative oversight from the Secretary of Interior and the BIA (Clow (1987); Philp (1999)). This administrative oversight occurred in several ways. First, any transactions involving land and natural resources or state and local governments required the approval of the Secretary of Interior. Also any tribal or corporate projects using the revolving credit funds were subject to close supervision from local bureau officials assigned to monitor the funds and minimize losses (Mekeel (1944)). Tribes not electing to adopt the IRA maintained their own tribal governments and constitutions and were not subject to the same set of federal restrictions, however the Secretary of Interior continued to oversee transactions regarding land and leasing.³

²For more information regarding land tenure on Indian reservation see (Anderson and Lueck (1992)), (Anderson and Parker (2009)), (Dippel, Frye, and Leonard (2019)), (Dippel and Frye (2019)), (Leonard, Parker, and Anderson (2018)), and (Leonard and Parker (2017)).

³Frye and Parker (2018) show that this federal oversight slowed development on IRA reservations relative to non-IRA reservations.

2.2 Land Transactions and Government Organization

Land can be legally transferred between any of the tenure types as long as it obtains approval at the local and national level. Local interests involve a tribe or tribal agency.⁴ Following the Indian Reorganization Act, tribal charters and constitutions were responsible for defining each tribe's role in managing their land (Sutton 1975). Several tribes established formal corporate arrangements, called Tribal Land Enterprises (TLEs), in the 1940s to help manage and administrate leasing and sales of trust land at the local level. Tribes without TLEs typically rely on committees within a tribal council to perform many of the same functions. Tribes that adopted the IRA, were given example constitutions and charters to help establish these governmental bodies. Federal oversight is provided at the agency level by a designated Superintendent who reports directly to the Bureau of Indian Affairs and the Secretary of Interior. Every transaction that alters the trust status of reservation land requires final approval from the Secretary of Interior regardless of IRA adoption.

Several legal options are available for transferring trust land to fee-simple. *Indian Land Transactions* (74-75, 1958) describes each method available to individuals or the tribe. Based on transactions between 1947 and 1957 the most common methods of transferring land from trust status were, Sales in Fee, Patents in Fee, and Certificates of Competency.⁵

The Bureau employed appraisers to determine the land value. These values were used for every land transaction. In cases where too much time had expired from the appraisal until the application, approval a new appraisal was required to update the value to reflect the current market value (BIA, 315, 1958). The process from submitting a completed applications to receiving a fee patent could take several months (BIA 1958).

Instituting a leasing agreement requires approval from the same local and national authorities that determine fee patents. The major difference between approving a leasing agreement and issuing a fee patent is the Secretary's authority when partial owners cannot or will not sign the applications. In the case of leasing, the Secretary has the authority to authorize a lease in cases

⁴Agencies were organized geographically to allow for the sharing of administrative resources, often amongst smaller reservations. In some instances, like in California, there are as many as 30 tribes organized into a single agency, whereas in Montana most tribes serve as their own agency.

⁵Sales in Fee transactions occur when trust land is sold conditional on the issuance of the fee patent accompanying the sale. Patents in Fee and Certificates of Competency similarly remove the restriction placed on trust land and transfer it to fee-simple and face similar application processes. From *Indian Land Transactions* it appears Patents in Fee are most useful in multiple ownership situations, particularly when minors with guardians are involved. Certificates of Competency were issued by the Secretary of Interior after an applicant established himself "capable of managing his own affairs and transacting his own business."

where a minor or incompetent individual without a guardian is a partial owner or nearly all major shareholders agree to the terms of the lease. Fee patent applications require signatures from every owner regardless of the ownership share. According to a survey in *Indian Land Transactions*, the Secretary rarely exercises this ability. Most tribes cited consensus among owners as a major issue hindering both leases and sales.

2.3 Indian Long-Term Leasing Act of 1955

The Indian Long-Term Leasing Act (LTLA) of 1955 (25 U.S.C. 415 [August 9, 1955]) was another significant federal change that impacted Native American reservations. Prior to the LTLA, leasing arrangements on individual and tribal trust land were subject to a maximum lease length of 5 years. The LTLA increased the maximum lease length from 5 years to 25 years and allowed for one additional renewal of 25 years subject to BIA approval.⁶ The legislative history of the LTLA indicates that Congress sought to promote economic development by expanding market participation on Indian lands and encouraging long-term development through long-term commercial leases (Chambers & Price, 1074, 1973).

Additionally, instituting a new lease or renewal required BIA approval at several different administrative levels, which greatly increased the transaction costs associated with leasing. The combination of short lease lengths and high transaction costs for lease renewals also reduced the incentive of outside investors to develop long-term projects. The LTLA lowered transaction costs by increasing the term length of leases and reducing federal oversight. Theoretically, lower transaction costs should result in increased economic development on trust land (Alcantara (2007); North (1984)).

Given the perceived benefits of the LTLA, the economic impacts of the Long-Term Leasing Act are less established in the literature. Akee (2009) looks at the effect of the LTLA on the housing market on the Agua Caliente Reservation in Palm Springs, CA. He finds that Agua Caliente landowners were constrained because trust land could not be used as a sole source of collateral to secure bank financing. Akee shows that the LTLA in conjunction with the Agua Caliente Equalization Act of 1959 (25 U.S.C. 951 [September 21, 1959]), which relaxed trust land restrictions, led

⁶Some reservations update their leasing policies to allow for longer leases up to 99 years. My final sample includes seven reservations that allow for these longer leases. The empirical results are robust to dropping these seven reservations.

to a significant investment in housing on trust land. He also shows that home construction levels and property values on trust land converge to those found on fee-simple land.

3 Data

3.1 Land Tenure Panel Dataset

The U.S. Department of Interior, in conjunction with the Bureau of Indian Affairs (BIA), maintains records regarding Native American land tenure. I found and recorded reservation-level land tenure acreages for ten years dating back to 1939. The Office of Indian Affairs published Statistical Supplements to their Annual Report for 1939, 1941, 1942 and 1944, which contain land tenure information for most reservations nationwide. A published senate report from 1958 contains information for over 80 reservations regarding land tenure in 1947 and 1957. The Bureau of Indian Affairs published another statistical supplement, which contains population data, limited demographic information and land tenure information for all reservations in 1963. In 1971 and 1974, the BIA contributed reservation level land tenure information for U.S. Department of Commerce publications on economic development on Indian reservations. My final source for reservation level land tenure information comes from a 1978 report published by the U.S. Department of Interior. The final panel dataset of land tenure information contains a balanced panel of 64 reservations, measured at during ten years, spanning from 1939 to 1978.⁷ This information is supplemented with initial allotment information from a report on land tenure published by the Office of Indian Affairs in 1935. I supplement this with reservation level data on oil and gas development from Anderson and Parker (2009) and IRA adoption information from Frye and Parker (2018).

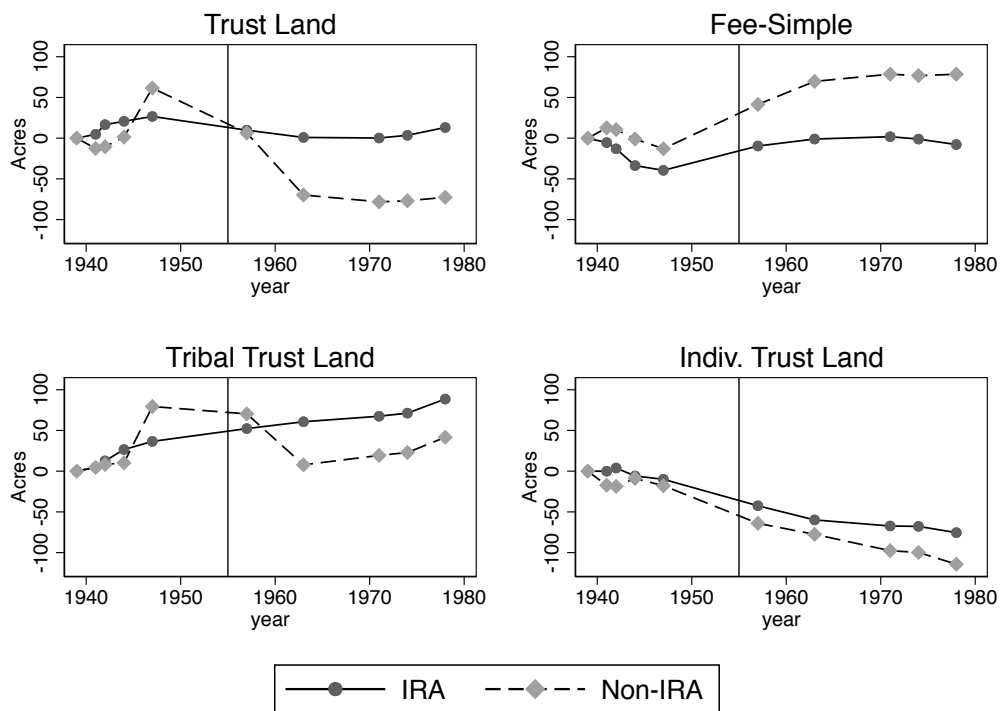
3.2 Changes to Land Tenure

Figures 1 and 2 illustrates the long-run trends in land tenure over the sample period for IRA and non-IRA reservations. Both figures show the changes in land tenure relative to 1939. Figure 1 is measured in acres and Figure 2 is measured as the share of total reservation acreage. Both figures give a similar account to the changes in land tenure documenting growing differences in the land

⁷See the Data Appendix for more details regarding the construction of the panel dataset and selection of the final sample.

tenure between IRA and non-IRA reservations over time. Trust land is declining more rapidly for non-IRA reservations relative to IRA reservations, with this declines becoming more pronounced following the mid-1950s. Splitting the trust land into tribal and individual trust, it appears both categories are declining with the most abrupt declines occurring in tribal trust. These declines appear to be offset by increases in both the quantity and share of acreage devoted to fee-simple in non-IRA relative to IRA reservations.

Figure 1: Trends in Land Tenure by IRA Status (Total Acres)

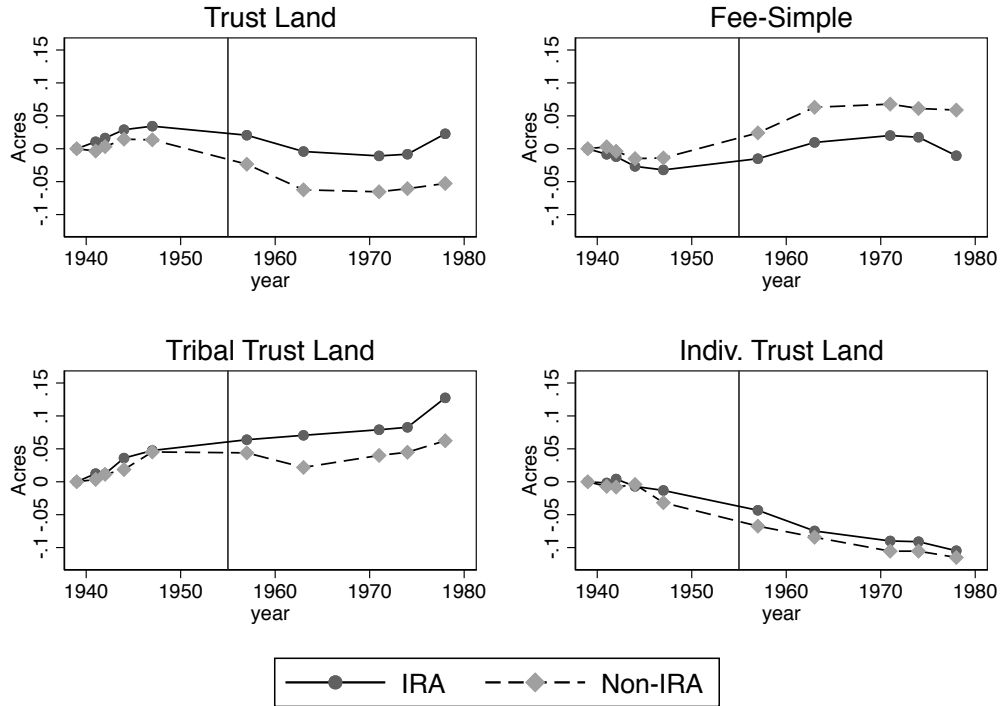


Notes: This figure depicts the trends in land tenure by IRA status for the full sample period relative to the starting year in 1939.

These patterns indicate that policies in the mid-1950s fundamentally altered the land tenure holdings of reservations but in different ways, depending on their prior adoption of the IRA. Prior to the 1950s, the two types appear to be trending very similarly both in levels and in shares, and the separation only becomes pronounced in the second half of the period. These images are consistent with the mechanisms related to credit access and BIA objectives uniquely accessible to IRA reservations, however it was only after the changes in the leasing terms induced by the LTLA

that these changes manifested in land holdings.

Figure 2: Trends in Land Tenure by IRA Status (Land Shares)



Notes: This figure depicts the trends in land tenure by IRA status for the full sample period relative to the starting year in 1939.

4 Empirical Framework

4.1 Changes to Land Tenure

Section 3 provided suggestive visual evidence that IRA and non-IRA reservation altered their land holdings differently in response to the Long-Term Leasing Act. To empirically quantify these differences, I will estimate the following linear regression model:

$$y_{it} = \kappa_i + \tau_t + \theta(IRA_i \times LTLA_t) + \varepsilon_{it} \quad (1)$$

where y_{it} is the outcome of interest in reservation i in period t . My preliminary results examine the four tenure categories in acres and in shares, similar to the figures in Section 3. All

specifications include reservation and year fixed-effects (κ_i and τ_t). The coefficient of interest is θ , which represents the average difference in land tenure in an IRA reservation relative to a non-IRA reservation. The central identifying assumption is that in the absence of the Long-Term Leasing Act, IRA reservations would have experienced similar changes to land tenure that non-IRA experienced. The standard errors are clustered at the reservation level.

5 Results

5.1 Land Tenure

Table 1 presents the estimation results from Equation (1). Panel A shows the effect of the Long-Term Leasing Act for IRA reservations, relative to non-IRA reservations. The results suggest that IRA reservations retained an additional 58 acres in trust land, the majority of which, 39.47 acres, is held in tribal trust. These increases appear to come at the expense of acreage in fee-simple. Panel B reports the effect when considering each tenure as the share of the total reservation land. These results report a similar finding to Panel A, and are also consistent with Figures 1 and 2.

Table 1: Difference-in-Difference Estimates of the Effect of IRA and LTLA on Trust Land

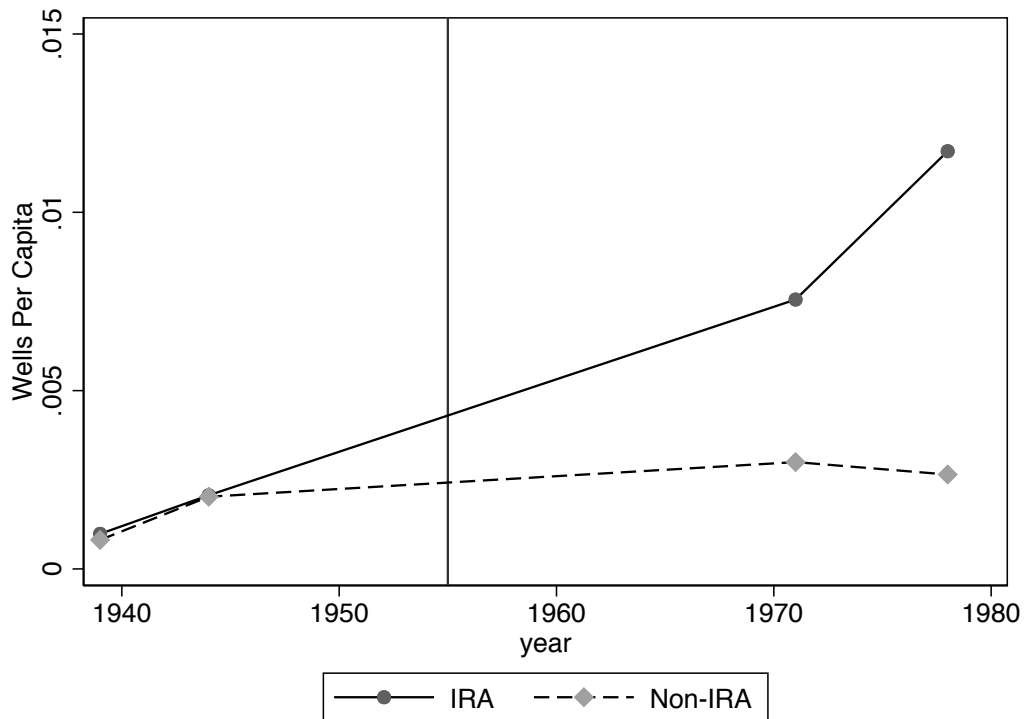
	Trust	Fee-Simple	Tribal Trust	Indiv. Trust
Panel A: Acreage				
IRA X LTLA	58.1766*	-51.6807	39.4752**	18.7015
	(31.6478)	(31.4484)	(17.2790)	(38.0427)
Panel B: Shares				
IRA X LTLA	0.0439*	-0.0397*	0.0346**	0.0093
	(0.0226)	(0.0226)	(0.0137)	(0.0237)
Observations	640	640	640	640

Notes: Standard errors are clustered at the reservation level and reported in parentheses. The results are robust to the inclusion of pre-IRA Dawes Era characteristic trends.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5.2 Oil and Gas Wells Per Capita

Additionally, I estimate the reduced form effect of being an IRA reservation, following the introduction of the Long-Term Leasing Act, on the number of oil and gas wells present on a reservation by estimating Equation (1) with the number of oil and gas wells per capita as the outcome of interest. To motivate my application of the prior specification, Figure 3, a similar Difference-in-Difference style graph. The number of wells per capita was nearly identical between IRA and non-IRA reservations in the early part of the period before a sharp separation in the post-LTLA period.⁸

Figure 3: Trends in Oil and Gas Development by IRA Status



Notes: This figure depicts the trends in land tenure by IRA status for the full sample period relative to the starting year in 1939.

Table 2 presents the reduced form results estimating the effect of the LTLA for IRA reservations relative to non-IRA reservations. The results indicate that there was a significant increase

⁸One limitation of this data series, is it lacks the same frequency as the prior land panel. However in the future, I plan on extended this data series forward into the present.

in the number of wells per capita on IRA reservations following the LTLA compared to non-IRA reservations.

Table 2: Diff-in-Diff Estimate of the Effect of IRA and LTLA on Oil and Gas Wells Per Capita

	Wells Per Capita
IRA X LTLA	0.0073* (0.0043)
Observations	198

Notes: Standard errors are clustered at the reservation level and reported in parentheses. The results are robust to the inclusion of pre-IRA Dawes Era characteristic trends.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

6 Conclusion

6.1 Upcoming Work

This draft provides some preliminary evidence that the Long-Term Leasing Act, in conjunction with the IRA, shaped land tenure on American Indian reservations. These changes also appear to have had large impacts on the development of oil and gas on reservations. In the future, I would like to expand the dataset to include a larger sample of reservations with tenure information. Additionally, I am looking for more contemporary BIA reports that would allow me to extend this sample into the present. Finally, I see the frontier of this paper being the mechanisms behind the oil and gas result.

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Online Appendix

to

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Online Appendix A Data Appendix

Online Appendix A.1 Data Source Guide

Statistical Supplement to the Annual Report of the Commissioner of Indian Affairs for the Fiscal Year Ended June 30, 1939 ([1939](#))

Statistical Supplement to the Annual Report of the Commissioner of Indian Affairs for the Fiscal Year Ended June 30, 1941 ([1941](#))

Statistical Supplement to the Annual Report of the Commissioner of Indian Affairs for the Fiscal Year Ended June 30, 1942 ([1942](#))

Statistical Supplement to the Annual Report of the Commissioner of Indian Affairs for the Fiscal Year Ended June 30, 1944 ([1944](#))

Indian land transactions: memorandum of the chairman to the Committee on Interior and Insular Affairs, United State Senate. An analysis of the problems and effects of our diminishing Indian land base, 1948-57 ([1958](#))

U.S. Indian Population (1962) and Land (1963) ([1963](#))

Federal and State Indian Reservations: An Economic Development Administration Handbook ([1971](#))

Federal and State Indian reservations and Indian Trust Areas ([1974](#))

Annual Report of Indian Lands by the Bureau of Indian Affairs & the Office of Trust Responsibilities ([1978](#))

Online Appendix A.2 Data Composition and Restriction Guide

Fee-simple land amounts are calculated by subtracting the sum of tribal trust, individual trust and federal trust land from the given reservation size following Anderson and Lueck ([1992](#)). The percentage change in the share of a given land tenure was calculated as the difference in the share between year t and $t - 1$ divided by year $t - 1$. I dropped the top and bottom five percent of land tenure changes from my sample to remove outliers. *Indian Land Transactions* ([1958](#)) does not contain information for federal trust land for 1947 and 1957. I chose to replace the missing federal trust acreages in 1947 with the 1944 levels and the 1957 acreages with 1963 acreages. In most cases these values were consistent between 1944 and 1963.