

Power to Prosper: Self-Governance and Economic Development

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Abstract

American politics has always stood out, and is often celebrated, for the large role local governments play. Yet the study of local politics is replete with examples of local power gone wrong, where government bodies are too weak or too captured to act for the better good of the community. This paper asks whether the distributed nature of power in the U.S. is an economic boon or burden. To answer this question, I look at one of the most significant expansions of local power in the modern U.S.: American Indian tribal governments. Constructing the largest public dataset on reservation economies, combining nearly forty years of annual remote sensing data to estimate economic development on over 300 reservations, I analyze how the expansion of tribal self-governance power impacted reservation economies. I find that tribal self-governance reduced economic development on average, although the effect fades over time. Using different measures of tribal governance capacity and political institutions, I find tentative evidence for a governance capacity mechanism.

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1 Introduction

Local governance is often exalted as a positive force for supporting democracy and protecting individual and collective rights. Tocqueville believed municipal power was the backbone of liberty and freedom in the United States ([Tocqueville 1835](#)). Vincent Ostrom and colleagues argued against "Gargantua," a single, dominant government, and in support of the effectiveness of polycentric systems with many inter-dependent, self-governing municipalities ([Ostrom, Tiebout and Warren 1961](#)). Later, Elinor Ostrom championed the capacity of local communities to govern themselves collectively without top-down intervention by a central government ([Ostrom 1990](#)).

Beyond the instrumentalism of local self-governance, there is also a strong normative appeal that communities (particularly vulnerable minority communities) deserve the right to determine how their societies are run ([Weinstock 2001](#)). Internationally, this normative argument is the backbone for agreements like the UN Declaration on the Rights of Indigenous Peoples ([United Nations General Assembly 2007](#)). Experiments in decentralization, federalism, and local self-governance across many countries in the later 20th Century emphasizes the belief in the value of self-governance ([Manor 1999](#)).

Yet, as the study of local politics in America has shown, local self-governance comes with drawbacks. Local governments are constrained in their policymaking in many ways by higher levels of government, but do have considerable power over important features of governance ([Gerber and Hopkins 2011](#)). And while this autonomy may sound appealing, local communities left to their own devices often create highly inequitable distributions of goods, often along lines of race ([Trounstin 2016](#); [Trounstin 2020a](#); [Hankinson and Magazinnik 2023](#)). A major source of this inequity is the ability of a subset of local residents (typically wealthier, white homeowners) to capture participatory political processes, often bottle-necking policymaking in a way that would be infeasible at higher levels of government ([Einstein, Glick and Palmer 2019](#); [Anzia 2022](#)). And, in contrast to Tocqueville's romantic image of the citizenry actively engaged in the goings-on of the local township, we know that today's average citizen knows very little about the politics in the local government ([Binder et al. 2016](#)) and participation in local elections is abysmally low ([Hajnal 2009](#)),

raising the question of whether local officials are held as accountable as their federal counterparts are.

This leaves local self-governance at a cross-roads. Theoretically, local self-governance has normative and instrumental appeal for better governance. However, when decision-making is scaled down, it becomes susceptible to a number of flaws that can reduce the efficiency and equity of outcomes. These flaws raise the question, does increasing local self-governance produce better outcomes for local communities compared to more centralized forms of decision-making?

In this paper, I address this question by examining an important modern transfer of political power in the US from the federal government to local communities: the adoption of self-governance compacts in American Indian tribal governments beginning in the early 1990s. Approximately half of all tribal governments use these compacts to take over control of many local programs that were previously managed by the federal government, including vital policies like policing, natural resource management, and job training. In this era, reservation economies have seen significant growth, but there is scant evidence on whether self-governance drove this growth ([Kalt 2022](#)).

I conceptualize the economic effects of local self-governance as the net outcome of two opposing forces. Local autonomy mitigates agency loss by improving electoral control and ideological congruence between voters and policymakers. However, it may lower governance capacity due to reductions in policy experience, fiscal resources, and skilled labor access. This model implies that the net effect of local self-governance depends on which of these countervailing forces is greater. Additionally, it implies that the effect should be more positive as local governance capacity increases.

American Indian tribal governments are some of the most poorly understood and least studied governments in the American federalist system ([Ferguson 2016](#)). This knowledge deficit partially stems from low data availability, leading to studies of American Indian politics often lacking the ability to make many cross-tribe comparisons or examine outcomes over a long period of time. In this paper, I avoid these constraints and construct a panel dataset measuring economic development in almost all federally recognized tribal communities in the contiguous United States for over

three decades. I do so by utilizing remote sensing data on land usage and nightlight density to create yearly estimates of economic development for native reservations. The end result is the largest public dataset ever constructed on American Indian reservation economies, covering 305 reservations and 39 years of economic development for over 11,000 reservation-year observations.

After establishing the validity of these indicators, I apply modern techniques in difference-in-differences analysis to estimate the effect of increased self-governance, focusing on counterfactual-based time series methods proposed by [Liu, Wang and Xu \(2024\)](#). I find that entering into a self-governance compact resulted in *slower* economic development over time, although the effect fades after significant time under a compact. Benchmarking the effect size against the impact of casino gaming, self-governance had an average effect of approximately .9 to 1.8 times the average effect from gaming on reservation economies. Following this result, I test for a governance capacity mechanism by constructing a number of plausible proxies for tribal governance capacity. This includes the collection and coding of hundreds of tribal constitutions to code relevant institutional features like voting restrictions and executive electoral systems. I find tentative evidence pointing towards to expected positive relationship between governance capacity and economic growth under expanded self-governance.

These findings contribute to a broader understanding of local politics in the United States. Because tribal governments faces many of the same policy issues (e.g. land use, business development, public safety) as municipal governments, but have a much wider arrangement of institutions and more dramatic changes in historic power, tribal governments make for a useful case study for American local politics more generally. Additionally, contemporary research on American local political institutions often focuses on questions of representation and distribution ([Trounstone 2020b](#)). This work highlights the more often neglected study of local governance capacity, which has largely been left to public administration scholars (See [Hall 2008](#); [Wang et al. 2012](#), and [Ter-man and Feiock 2015](#) for contemporary examples). Undoubtedly, how the economic pie is sliced is important to understand, but the impact political institutions have on the size of the pie should also be studied. It also speaks to growing arguments for “abundance”-centered politics focusing on

how government can expand the size of public goods offered (Klein and Thompson 2025).

This paper also seeks to incorporate indigenous politics into the literature on local politics. Many of the day-to-day challenges faced by American Indian tribal governments mirror those of local governments. Scholars of American Indian politics have studied how tribes deal with issues like policing and public safety (Crepelle et al. 2022; Crepelle, Fegley and Murtazashvili 2024), business and infrastructure development (Bauer, Feir and Gregg 2022; Ratté and Anderson 2022), community health (Foxworth et al. 2022), and engagement with and lobbying local, state, and federal governments (Witmer and Boehmke 2007; Evans 2011a). Yet rarely do these works draw on ideas developed in local politics literature, nor are their findings incorporated into future local politics work. This paper work attempts to bring these two literatures into a closer dialogue for the future benefit of both.

Tribal governments do, however, rest in a unique position in the United States and this paper speaks to the unique qualities of US indigenous politics. Most clearly, this paper contributes to work examining the institutional determinants to reservation economies (Dippel 2014; Dippel, Frye and Leonard 2020; Leonard, Parker and Anderson 2020; Leonard and Parker 2021). In particular, this work also adds to burgeoning literature examining the effects of tribal institutions, particularly tribal constitutions (Cornell and Kalt 1990; Evans 2011b; Akee, Jorgensen and Sunde 2015; Crepelle, Mahdavi and Parker 2024, Stratmann 2024). Additionally, this study adds to our understanding of the consequences of federal oversight of American Indian tribes (Corntassel and Witmer 2008; Frye and Parker 2016). Overall, the findings of this paper emphasize that reservations bear a sovereignty-development trade-off. (Anderson and Parker 2008; Wellhausen et al. 2017).

2 Self-Governance and Tribes

2.1 Tribal Context

By the early 1900s, indigenous communities in the United States had largely been removed from their homelands and moved to constricted, economically disadvantageous reservations (Wilkins and Stark 2017). Shifting sentiment in Washington lead to interest in uplifting these communities in

order to facilitate assimilation into US culture and society. As part of this push, the Snyder Act of 1921 was signed into law, empowering the federal agency in charge of overseeing reservations, the Bureau of Indian Affairs (BIA), to carry out various local programs on reservations for the supposed benefit of native communities. This power ranged across a variety of policy areas, including health care, agriculture, housing, welfare, employment, and natural resource management. Even as tribal governments were formally reconstituted as recognized governing bodies starting in the 1930s, BIA officials held significant power over public affairs on reservations, often being compared to autocrats or dictators (Castile 1998). Over time, the BIA's mandate to run these local programs has continued. However, federal policy innovation has allowed tribes to take greater control over BIA programs on their reservation.

Today, native communities have three options for how almost any BIA program is administered on their reservation. The first option is to have the BIA administer the program, otherwise known as *direct service*. This functionally resembles what these programs were originally envisioned as in 1921. Programs administered under direct service are centrally controlled. The tribal government has no say in how the programs are run and play no part in executing them.

Under the Johnson administration, the BIA began experimenting with passing funding to tribes to allow them to run programs themselves. By 1975, this policy was permanently instituted with the passage of the Indian Self-Determination and Education Assistance Act (ISDEAA) as self-determination contracting, or simply *contracting*. When a tribe signs a self-determination contract agreement with the BIA, any program included is now executed by the tribe, but based on the BIA's expectations. The tribal government takes on the administration and funding for the program, but is restricted in how they can run the program.¹ Most importantly, the funds for the program cannot be combined with other funding sources, nor can they be transferred from one program to another or carried over to a new year, and the operating procedures and goals must match those of the BIA (Stuart 1990). Functionally, contracting allows the tribe to get experience in executing public policy and generate some local economic benefits through hiring tribe members, but doesn't give tribes

¹ Additional funding for indirect costs tribes incur for overhead would eventually be added as well.

the flexibility to properly adjust the programs to their preferences. Any program that is not deemed an “inherent federal function” can be included in a contract and the BIA is required to allow the program to be contracted if requested by a tribe. As of 2024, 92% of tribes were contracting with the BIA ([Newland 2024](#)).

While ISDEAA was seen as a major policy win for tribal governments, the continued influence of the BIA meant frustrations continued, compounded by perceived BIA feet-dragging in signing contracts ([Strommer and Osborne 2014](#)). Tribal governments continued to push for greater control over these federal programs and eventually won when Congress amended ISDEAA in 1988 to allow tribes to take full control over BIA programs, a policy eventually referred to as self-governance compacting (SGC).² Under a SGC, tribes administer programs like they can under a contract, but they now have much greater control over how the program is run and more flexibility in financing with reduced federal oversight ([Murray, Dortch and Heisler 2025](#)). Programs under a compact can have their goals and operating procedures redesigned by the tribe and can freely move federal money around its budget. For example, a tribe with a compact including law enforcement and housing development programs could decide they didn’t need as much funding for housing and transfer a portion of the housing funds to their law enforcement program. Or the tribe might prefer to have their law enforcement program focus on public outreach campaigns instead of street patrolling and shift their operating procedures and goals accordingly.

Any program that can be included in a contract can also be included in an SGC. However, unlike a contract, a tribe must prove their competence before entering a compact. In order to enter a compact, the tribe must show fiscal stability in running programs under a contract without auditing errors as well as go through a planning phase that includes legal and budgetary research as well as government organizational preparation ([Murray, Dortch and Heisler 2025](#)).

Tribes are able to mix and match direct service, contracting, and compacting. So a tribe could have some programs administered through direct service with the BIA, some under a contract, and the rest in a compact. Alternatively, they could have all BIA programs included under one

²The original 1988 amendment only started a small pilot program for a handful of tribal governments. The program was eventually made permanent and expanded to more tribes in a subsequent amendment in 1994.

of the three categories. Today, approximately 50% of tribes have a compact. In the contiguous United States, 29.5% of recognized tribes have a SGC. Uptake is higher in Alaska where 84.6% of recognized tribes have a SGC. What programs are being contracted/compacted versus left for direct service by each tribe, however, is not public knowledge.

This project focuses on examining the impact of SGCs. There are two primary reasons for this. First, from an empirics practicality standpoint, tracking contracting is very challenging. SGCs, conversely, are much easier to observe because the BIA maintains a list of all tribes with an SGC and the year they entered one. Second, SGCs have greater theoretic interest. Given that the majority of tribes have a contract, most of the empirical comparisons in this paper will be estimating the difference between contracting and compacting, where the only difference is the tribe's assumption of program design and added flexibility. This presents a rare opportunity to isolate the importance of tribal governance quality.

2.2 Benefits of Self-Governance

Classic theories of local self-governance and decentralization focus on heterogeneity in preferences for public goods across different communities to explain the value of local governance. When such preference diversity exists, a uniform level of public goods provided by a central government will likely under-supply goods in some areas and oversupply goods in others. When the provision of public goods is instead determined locally, such inefficiencies are eliminated ([Oates 1972](#)). [Tiebout \(1956\)](#) emphasizes the role of competition between local governments to attract residents and citizen self-sorting to maximize the efficiency gains of local governance. However, even without movement, local governance can still improve the efficiency of public goods provision if preferences broadly vary from one location to another ([Oates 1999](#)). [Oates \(1999\)](#) also argues that while a central government could theoretically provide different levels of public goods to match the specific preferences of each community, this is often political infeasible or unsustainable.

Other arguments in favor of decentralization put forward that it solves a critical principal-agent issue ([Seabright 1996](#)). Under a centralized system, local officials and bureaucrats are accountable not to the population they serve, but to the center which employs them. Only through their power in

the national electorate can a population influence their local officials. Conversely, in a decentralized system, these officials are directly accountable to the local population, increasing the accountability for local officials and decreasing the agency loss of the local population (Faguet 2014). Enhancing the accountability of local decision-makers to the service population increases communities' ability to reward or sanction leadership, thereby promoting more effective governance. Additionally, when local populations have control over who governs them, they have the opportunity to select better leaders whose personal preferences are more aligned with the local population (Fischer 2016).

In application to the tribal context, there is significant reason to believe that these positive arguments to self-governance could have explanatory power. Descriptively, a number of studies have found positive returns to indigenous self-governance. In comparative indigenous politics, for example, Díaz-Cayeros, Magaloni and Ruiz-Euler (2014) and Magaloni, Díaz-Cayeros and Ruiz Euler (2019) find that Mexican cities where traditional governance was formalized saw increased provision of electricity and sewerage. McMurry (2022) finds that recognition of indigenous self-governance in the Philippines increased birth registrations, suggesting that autonomy improved demographic record-keeping. This work, however, largely focuses on native communities in developing countries where central government power is often weaker. In contrast, American Indian communities seek self-governance in the wealthiest country in the world and compete with not only a high capacity federal government, but also relatively strong state and local governments as well. In the US context, it has been noted that the era of self-governance has coincided with significant reservation economic growth (Kalt 2022). However, evidence pointing to self-governance as the driver of this growth is scant, limited to a few early case studies (Krepps and Caves 1994, Harris, Blomstrom and Nakamura 1995).

There is good reason theoretically that tribal governments should expect positive returns to self-governance. First, we should expect preferences around the mixture of public goods will vary significantly across different tribe populations because native nations face a wide variety of issues. For example, tribes face differing levels of threats due to climate change (Provins 2024). Some tribes, like those along the Pacific coast in Washington state, face existential threats from climate

change, including increased flooding and declines in salmon populations, which play vital cultural and economic roles in their communities. Other tribes, such as those in Arizona, may face less pressing environmental concerns and instead struggle maintaining public safety and order as they deal with organized crime and drug smuggling crossing through their reservation from Mexico. Presumably, the Washington tribes would prefer to increase supply of climate change resiliency programs while the Arizona tribe would prefer to increase their supply of law enforcement and public safety policy.

Such nuances, however, are not available to tribal communities when reservation policies are set at the national level by Congress and executed through the BIA. Most reservation populations are simply too small and politically inconsequential to justify policy differentiation at the national level. Without granting significant discretionary power to the BIA, Congress would struggle to properly identify what mix of public goods, say, the Snoqualmie Indian Tribe in Washington prefers compared to Yerington Paiute Tribe in Arizona compared to the other 550+ tribes that are tasked to serve. Likewise, even if they had that discretionary power, the BIA would likely lack the funding and tribe-specific knowledge to understand what each native community preferred. The heterogeneity in preferences across each tribe suggests that there may be efficiency gains to decentralizing federal Indian programs and passing their administration.

The BIA is also unlikely to be responsive to the judgment of a reservation. While the BIA does have a number of cooperative channels to communicate with tribal governments, the BIA is ultimately responsible to Congress and the executive. The work of the BIA is restricted by how Congress appropriates funding and defines its programs, as well as by the directives of the President in how to carry out these programs. Tribal governments who are dissatisfied with how a certain program is run by the federal have to exert enough political power in DC to move the policy preferences of legislators or the President. And while some tribes have successfully adapted to lobbying, tribes are largely electorally weak given their relatively small size compared to other interest groups vying for influence.

Under an SGC, the chain of accountability is shortened. Now instead of going through the

federal government, the tribal government is responsible for the programs. Because most tribal governments are directly elected by the tribe, tribe members now have the opportunity to make their preferences heard when their vote is worth considerably more. As some tribal leaders have remarked, “Self-governance is a two-edged sword. We get more control, but [...] don’t get to blame the feds when my people complain about failure” (Henson 2008, 127). Those administering the program also become naturally more aligned with the preferences of the service population because they themselves are part of the service population. An elected tribal official who lives on their reservation will be closer to the tribe’s preference than a BIA agent who is not part of the community. This fits with findings that tribe members trust their tribal government more than any of government body (Schroedel et al. 2020).

Because reservations should have different policy preferences and struggle to hold the federal government accountable, they seem to be an ideal context to observe positive returns to self-governance. We can summarize this as the naive self-governance hypothesis.

H1a: Reservations governed under a SGC will have higher economic growth than reservations not governed under a SGC.

2.3 Costs of Self-Governance

While the conditions for a positive effect from self-governance seem plausible, this view ignores the downsides of local self-governance. For example, scholars of decentralization worry that decentralized systems create incentives for poor fiscal behavior by local governments. For example, Rodden (2006) argues that cities may recklessly overspend knowing that they will be bailed out by higher governments. Others worry that competition among local governments will create a “race to the bottom” effect for taxes that fund public goods in order to attract private investment (Cai and Treisman 2004).

Perhaps the most notable concern is that increasing accountability closer to the local population will actually make governance worse. For some, the concern is that local governments simply lack the resources and general capacity to supply public goods as efficiently as a centralized government

([Prud'Homme 1995](#), [Carter 2022](#)). Thus the potential gains from a more efficient allocation of public goods are wiped away by the inability of the local governments to actually produce the goods. Others worry that local governments may be more susceptible to corruption ([Bardhan and Mookherjee 2006](#)). In areas where political knowledge and participation are low, or where the population faces significant economic disadvantage, there is a greater risk of elite capture of institutions.

These fears mirror many of the issues with local government that Americanist scholars have noted. Instead of worrying about illicit bribery and corruption reducing the effectiveness of local public policy in favor of a select few, however, American local politics points to the ability of a select group of residents to use legal participatory processes to capture (or at least delay) local decision-making ([Einstein, Glick and Palmer 2019](#), [Anzia 2022](#)). Local elections, a form of participation with a lower barrier to entry, have lower turnout rates compared to federal elections ([Hajnal 2009](#)). This lack of participation leads once again to the over-representation of white, wealthy homeowners interests ([Oliver and Ha 2007](#), [Schaffner, Rhodes and La Raja 2020](#)). In terms of knowledge, at best, voters have about equal levels of knowledge between national and local politics, but other studies point to local knowledge being even lower ([Shaker 2012](#), [Binder et al. 2016](#)). Americans don't even seem to understand what their local officials are responsible for ([de Benedictis-Kessner 2018](#)). Newspapers, one of the key distributors of local political information ([Mondak 1995](#)), have faced significant cutbacks in recent years ([Peterson 2021](#)). The newspaper's successors, television and internet news, heavily emphasize national news ([Hopkins 2022](#)). And not only is information on local politics harder to come by, but the heuristics that many voters rely on in national elections are also not available at the local level, leaving low knowledge voters to make decisions on particularly poor candidate qualities ([Bernhard and Freeder 2020](#)). In terms of aligning public policy with local preferences, there is evidence that state and local governments both set policy away from the median preference with a conservative and liberal bias, respectively ([Simonovits and Payson 2023](#)). When characterized this way, it's almost hard to believe that local governance in America could ever result in a more responsive, efficient government.

Given the mixed arguments surrounding self-governance, it is unsurprising that empirical studies have found mixed results ([Martinez-Vazquez and McNab 2003](#), [Treisman 2007](#), [Faguet and Sánchez 2008](#)). One argument to clarify these results is that not all decentralization is the same. [Weingast \(2009, 2014\)](#) argues that many of the issues and solutions to decentralization lay in how the federalist system is designed. Systems where local authority is protected, but budgets have hard constraints, and where politicians cooperate electorally and respect the powers of different levels of government can preserve the economic benefits of decentralization while avoiding the downsides and preventing a collapse of the system.

Additionally, the principal-agent justification for self-governance assumes that local populations will be able to hold their local officials accountable. This may not always be the case when the local government lacks effective democratic institutions or when the population lacks the civic skills and institutions to wield their influence over local governance ([Faguet 2014](#)). Additionally, weak local governments with inadequate resources or no governance experience will struggle to provide public goods ([Foa 2022](#)). This observation fits in with work on bureaucracies which find that public goods providers need time to learn and develop expertise ([Gailmard and Patty 2012](#)).

These concerns regarding the costs to self-governance are also easy to see in the tribal context. In the grand scheme of American politics, modern tribal governments are young. Tribal governments were only formally recognized by the federal government starting in the 1930s, with many not being acknowledged until much later. And for much of their modern history, tribal governments have lacked significant power or resources until the expansions of tribal self-governance previously outlined and the adoption of tribal gaming. One piece of evidence on tribal inexperience and resource constraints is that tribes frequently try to expand services after contracting or compacting BIA programs, only to realize that more funding from the BIA is not possible and they are forced to scale back their plans ([Henson 2008](#)). On top of this inexperience, many tribal governments adopted constitutions that did not resemble their traditional forms of governance and existing social structures, leading to a mis-match between *de jure* rules and *de facto* power ([Cornell and Kalt 1992](#), [Lemont 2009](#)).

Additionally, expanding self-governance might lead to outside investors being less likely invest on the reservation out of uncertainty over the tribe's ability to govern ([Anderson and Parker 2008](#), [Wellhausen et al. 2017](#)). Evidence from past legislation controlling tribal governments shows that tribes who accepted greater federal oversight had moderate long-run growth while tribes who eschewed oversight had much greater variability in their development, both positive and negative ([Frye and Parker 2016](#)). Thus, expanding self-governance might increase downside economic risk on reservations.

This potential loss in governance capacity gives us the opposite prediction regarding the effect of self-governance compacting:

H1b: Reservations governed under a SGC will have lower economic growth than reservations not governed under a SGC.

Taken together, these two theoretic perspectives mean that the observed effect of tribal self-governance depends on which competing effect is greater. If the gains from reducing agency loss and increasing policy alignment are greater than the costs from governance capacity on average, then we should observe a positive effect for tribes that enter an SGC. If the reverse is true, then we should observe a negative effect. This also implies that as tribal governance capacity increases, the costs to self-governance are reduced, and therefore we should observe that the effect of entering an SGC becomes more positive.

H2: As tribal governance capacity increases, the economic effect of entering an SGC should become more positive.

3 Data and Methods

3.1 Unit of Analysis

This paper uses American Indian federal reservations as the unit of analysis. This excludes state-recognized reservations, off-reservation trust land belonging to a tribe, almost all Oklahoma native nations, and Alaskan Native communities. Reservation boundaries occasionally change which

present potential issues for estimating changes in development using remote sensing. To avoid this problem, I use reservation boundaries from 2000, the earliest digitized boundaries available for all reservations.³ For reservations created between 1985 (the earliest year in my outcome variables) and 2000, I rely on [Tiller \(2015\)](#) and other historical news, tribe, and federal sources to estimate the creation year. Most tribes control one reservation, but there are a handful of tribes with more than one reservation. In total, my dataset includes 305 reservations belonging to 282 tribes.

3.2 Self-Governance Compacts

The key treatment variable is adoption of a self-governance compact, drawn from a BIA Office of Self-Governance list identifying compacting tribes and their year of adoption.⁴ Tribes can also enter into separate compacts with the Indian Health Service (IHS) or, more recently, the Department of Transportation (DOT). I focus on BIA SGCs over IHS compacts because BIA policies are more clearly relevant to economic growth. DOT compacting began only in 2020 and therefore provides too few cases and too little time under treatment for meaningful analysis.

In total, 102 federally recognized tribes in the contiguous United States have a SGC as of 2024. This translates to a total of 78 reservations, approximately 25% of reservations included in the study. There is no treatment reversal as no tribe has ever completely left a SGC. In theory, tribes may have moved previously compacted programs back to direct service or a contract, but that granularity is not available.

This highlights a key limitation of the data: the specific programs covered by each SGC are not public. As previously discussed, tribal governments can choose to mix-and-match direct service, self-determination contracting, and self-governance compacting. This means that treatment intensity will have unobserved variation. A tribe with a SGC that covers every compactable BIA program and a tribe with a SGC that covers just one minor BIA program will have the same treatment status.

³Reservation boundaries were taken from U.S. Census Bureau's TIGER/Line files, as collected by IPUMS NHGIS ([Schroeder et al. 2025](#)).

⁴An archive of the online list can be found at https://web.archive.org/web/20250704122056/https://www.bia.gov/sites/default/files/media_document/2024_self_governance_tribes_alphabetically_as_of_07.24.24.pdf.

Figure 1 shows the spatial distribution of SGC adoption by reservation, along with the cumulative number of SGC reservations over time. Three patterns stand out. First, adoption was fastest in the first decade of self-governance: just over half of treated reservations adopted an SGC before 2000. Second, adoption and its timing are geographically clustered. Around Washington’s Puget Sound, adoption is common and many reservations were early adopters; the reservations of the Minnesota Chippewa Tribe’s constituent bands in northern Minnesota were also early adopters. Several California tribes have entered into SGCs, but generally later than in other regions. By contrast, adoption is rare in the Eastern United States and the Great Plains. Third, SGCs are uncommon among the largest reservations. Aside from the large Minnesota Chippewa reservations, only Warm Springs (Oregon), Flathead (Montana), and Osage (Oklahoma) are particularly large reservations with an SGC.

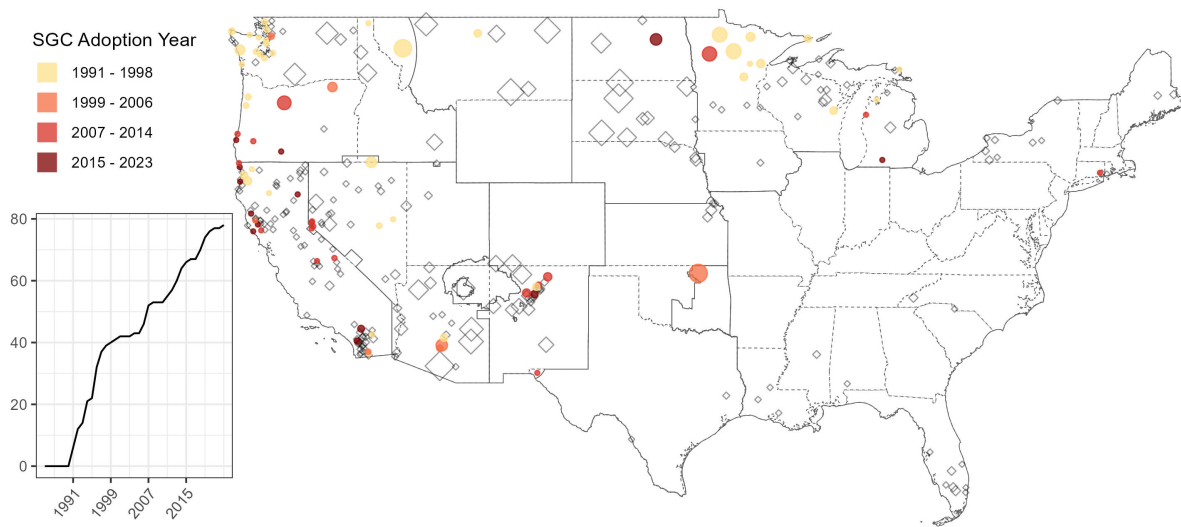


Figure 1: Map depicting SGC adoption timing by reservation. Untreated reservations are marked with diamonds, treated reservations are marked as circles and colored by timing of SGC adoption. Size of all points based on relative geographic size of the reservation. Line graph in the bottom-left corner displays the cumulative number of SGC reservations over time.

3.3 Measures of Economic Development

One of the most difficult challenges to studying American Indian politics is the paucity of quality data available. Measures of economic development are no different in this regard. Census income

data reported at the reservation level extends back to 1970. However, Census data can only give once-a-decade snapshots of economic performance, which makes estimating pre-treatment trends difficult to analyze. Given that many panel data methods rely on pre-treatment trends to justify identification assumptions, the low number of time periods is not ideal. The American Community Survey (ACS) also reports reservation-level data, but these data have issues with sampling small reservation populations and only go back to the mid-2000s ([Connolly and Jacobs 2020](#)).

The lack of high quality, frequent economic measures makes constructing large panel datasets of reservation economies challenging. An increasingly popular answer to this lack of data has been to rely on remote sensing measures. Nightlight (NTL) intensity has become a particularly popular measure of economic development in a wide range of contexts (e.g. [Min 2015](#), [Kroth, Larcinese and Wehner 2016](#), [Zhou and Shaver 2021](#)). Data on land use-land cover (LULC) has also become increasingly common for analyzing phenomena like natural resource management ([Baragwanath and Bayi 2020](#); [Sanford 2023](#); [Gulzar, Lal and Pasquale 2024](#)) and urban development ([Burchfield et al. 2006](#); [Saiz 2010](#)). Early work to incorporate remote sensing data into American Indian studies has also started using LULC data. [Dippel, Frye and Leonard \(2020\)](#) use LULC data to measure long-run development of reservation land in 5 time periods spanning almost 50 years. I expand on these applications of remote sensing by constructing two yearly indicators of reservation economic development using nightlight density and land cover data extending almost 40 years.

I use land use-land cover data from the U.S. Geological Survey’s National Land Cover Database (NLCD) ([U.S. Geological Survey \(USGS\) 2024](#)). The NLCD integrates legacy land cover maps with deep learning methods to generate nationwide land use–land cover maps at a 30×30 meter resolution for each year from 1985 to 2023. Each pixel is classified into one of 16 categories. Four categories capture different levels of developed land, ranging from low-intensity uses like parks and large-lot homes to high-intensity uses like apartment complexes and industrial sites. The NLCD also includes land used for crop cultivation and livestock grazing. I treat all of these categories as development, in contrast to categories representing natural biomes not transformed by human economic activity.

From these data, I calculate each reservation's yearly share of land classified as developed. Specifically, I sum all pixels intersecting the reservation in the developed or cultivated categories and divide by the total number of non-water pixels in the reservation to obtain the share of developed land. This measure can theoretically range from 0, meaning no land is classified as developed, to 1, meaning every non-water pixel in the reservation is classified as developed.

For nighttime light intensity, I rely on harmonized data from [Chen et al. \(2024\)](#) which spans from 1992 to 2023. This dataset use a deep learning U-NET model to increase the resolution of NTL data from 1992 to 2011 to higher quality NTL data available starting in 2012. This process is ideal because not only does it give a harmonized measure over most of the time period of interest in this study, but also gives the highest resolution pixels possible for NTL intensity, 500times500-meter cells. After removing pixels covering water, I take the average NTL intensity value of each cell, divide it by the brightest pixel in the United States at any time in the data, and multiply by 100.⁵ I then take the average of this value across all pixels on the reservation. Each value of this measure then represents the average relative nighttime light intensity on the reservation. For example, a reservation with value of 1 would indicate that the average pixel in that reservation had 1% of the NTL intensity as the brightest pixel in the US.

For many reservations, the NTL data is very noisy, jumping up and down year-to-year in a way that seems unlikely to represent the true development this measure is meant to capture. To avoid issues related to this noise, I use an imputation approach to replace the more extreme outliers for each reservation. Specifically, I fit a loess line for each reservation's NTL estimate and replace any value further than one standard deviation away from the line. Figure 2 presents how imputation changed the NTL values for a particularly noisy reservation. In total, just over 22% of observations are imputed using this method. Largely, this imputation had little effect on the ultimate estimates of the analysis. I also remove two reservations from analyses using NTL as an outcome because of extreme outlier estimates. Results for models using the original estimates and with the full sample

⁵This is potentially confusing given that I do not multiple the percentage of land developed measure by 100. I only multiply the NTL measure by 100 to avoid exceedingly small coefficient magnitudes. There is an added benefit to multiplying the NTL data but not the land data in that they generate superficially similar numbers, which makes plotting both less distracting.

are available in the appendix.

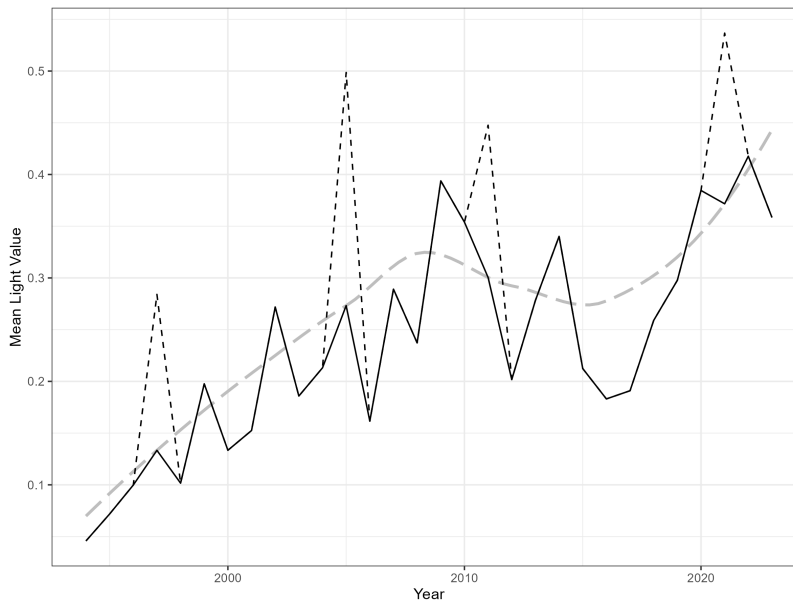


Figure 2: Example NTL raw and imputed values from Little Traverse Bay reservation. The solid lines represent yearly NTL estimates after imputation. The dashed lines represent NTL estimates prior to imputation. The long-dashed gray line represents the LOESS line used for imputation.

As a brief, stylized example to give a sense of what the underlying data looks like and what these estimates are capturing, I present the Lac du Flambeau reservation in Wisconsin as observed through these data in Figure 3. In map A, we see a direct satellite image of the entire reservation, showing us what this reservation looks like in reality. In map B, the NLCD data over the exact same area and year is plotted. We see clearly many of the features from the satellite imagery transferring over the the land use categories, most notably the various lakes and woodlands, as well as the city of Lac du Flambeau in the center of the reservation. Map C presents the same NLCD data, except now all water pixels have been removed and the pixels have been recoded to either developed/cultivated or undeveloped. This helps us see exactly what the NLCD is picking up as developed, which in this case seems to be mostly the urban areas around Lac du Flambeau city and the various roads on the reservation. Finally, map D presents the NTL data for the same area and year, with the water areas already removed. Fairly consistent with map C, we see a relatively high luminosity in the urban part of the reservation, and almost no luminosity in the rural areas.

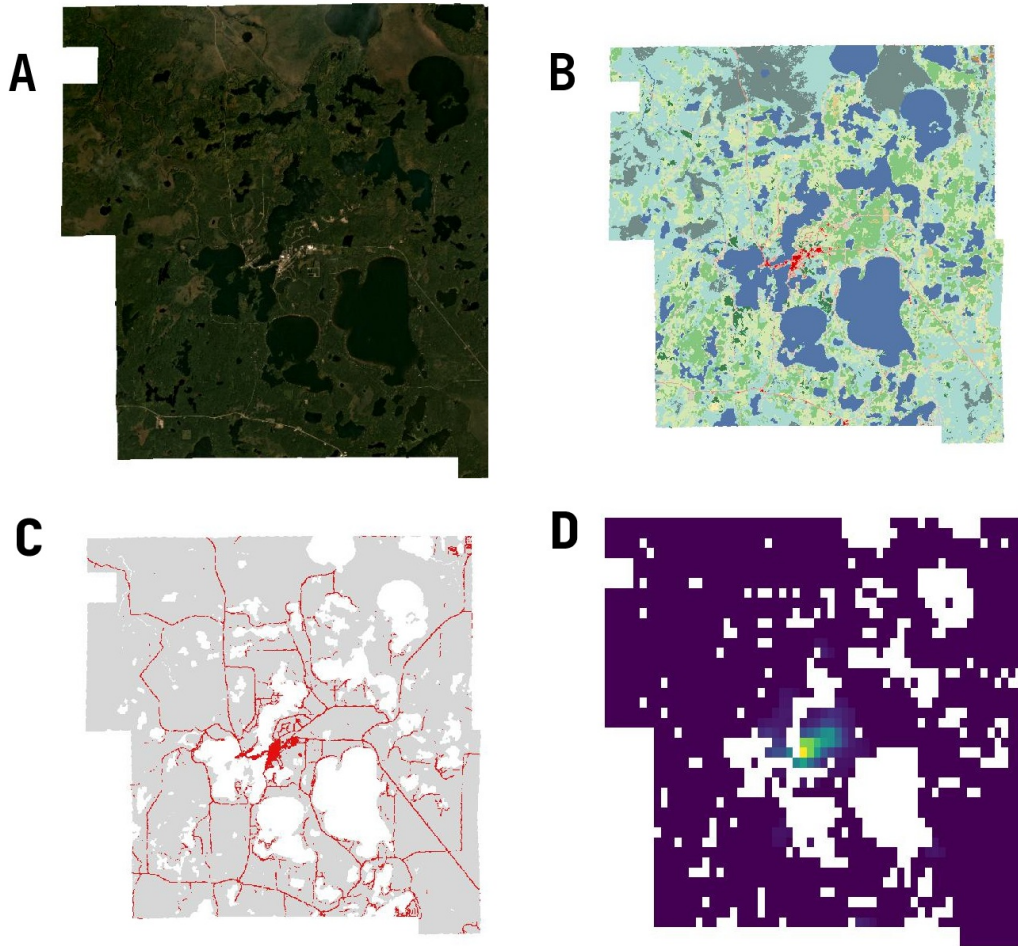


Figure 3: Example of NLCD and NTL data using the Lac du Flambeau reservation. Map A depicts the reservation through a basic satellite composite image to use as a quality reference for the other data. Map B presents the NLCD data from the same year as map A with all categories presented. Map C depicts the same NLCD data, but with water pixels removed and the categories flattened to only developed/cultivated or undeveloped. Map D presents the NTL data for the same year, with water removed.

Overall, change in both the land and NTL measures vary greatly across reservations. Figure 4 present the change in both outcomes for each reservation. Some reservations experienced astronomical growth. For example, Dry Creek Rancheria, a small reservation in Northern California saw an increase in average relative NTL intensity from 0.000002 in 1992 to 0.0397 by 2023, an over 18,000% increase. Conversely, 36.7% and 18.6% of reservations had a change in their share of developed land and average relative NTL intensity change by less than 10% by 2023, respectively. More broadly, while some reservations show clear, significant growth, others have essentially flat

growth. On average, the share of developed land on reservations increased by 0.050 (SD = 0.110) between their first observed year and 2023, while average relative NTL increased by 0.037 (SD = 0.123).

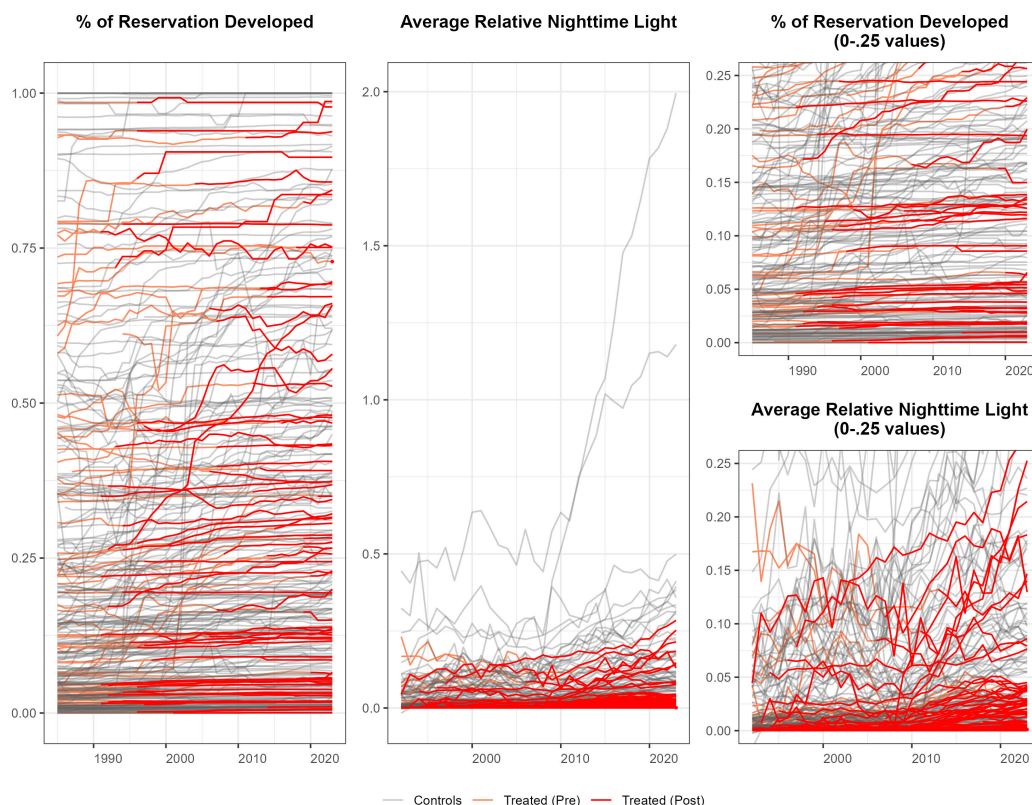


Figure 4: Change in economic development indicators. The leftmost panels depict the share of developed land and average relative nighttime light intensity for all reservations in sample. The two panels in the rightmost column present these same measures zoomed into the 0-0.25 range.

3.4 Measures of Governance Capacity

In order to test whether tribal governance capacity drives the relationship between SGCs and economic growth, I need to find measures that can serve as meaningful proxies. This is very challenging, given both the lack of data availability and uniqueness of tribes. For example, some common measures of governance capacity are the size of a governments bureaucracy or its efficiency in tax collection. In the tribal context, data on the former would be theoretically meaningful, but is not available. The latter measure, meanwhile, is not applicable to the tribal context because most

tribal governments do not rely on taxation to generate revenue and most tribes do not make their budget publicly available.

In general, measuring tribal governance capacity is a largely unexplored concept. Thus, I collect 8 different potential measures to evaluate in this study. I categorize them into two groups: measures of resource sufficiency and institutional quality.

For resource sufficiency, these measures are meant to indicate whether the tribal government had adequate resources to cover the programs it runs. The measures of resource sufficiency I use are reservation size, population size, enrollment size, and median reservation income.

First, I consider the size of the reservation. While larger reservations may have more opportunities for natural resource extraction, the size of reservations more likely indicates greater demands on tribal resources. Small reservations will have lower monitoring costs and fewer, if any, natural resources to manage. Functionally, the scale of demand will be significantly smaller as reservation size decreases. Thus, I assume that larger reservations have greater financial costs to govern and are less likely to be adequately funded. To measure reservation size, I calculate the area of each reservation. I then binarized this measure to code all reservations at or above the median size as 1, and those below the median as 0.

The second and third factors I consider are the service population and enrollment size of the tribe. The service population represents the number of American Indians living on or near the reservation that qualify for many federal programs. Tribal enrollment counts all members of tribe, regardless of whether they live on or off the reservation. Similar to reservation size, these two factors could be characterized as increasing the manpower resources available to the tribe. In theory, these are key populations the tribe would draw on to carry out policy. However, these are also the consumers of many of the public goods being produced, so a greater population or enrollment also represents a greater demand on tribal resources. And unlike most local governments, taxation of tribe members is not a primary revenue generator for most tribal governments ([Ratté and Anderson 2022](#); [Wilkins 2024](#)). Thus, a larger population does not necessarily lead to significantly more government revenue. Given these assumptions, I assume that larger populations and enrollments

actually represent greater costs to governance and thus make tribes less likely to be adequately funded.

Service population and tribal enrollment are taken from the Department of Housing and Urban Development's (HUD) Indian Housing Block Grant (IHBG) Formula data.⁶ HUD uses a formula partially based on need to allocate housing funding to every tribe. Data on need is gathered HUD, BIA, and Census Bureau sources with participation from tribes submitting their own data and corrections. The service population of a tribe is defined as the total amount of American Indian and Alaskan Native people living within the service area of a tribe. The tribal enrollment is updated by the tribes themselves and represents to total number of people who are members of the tribe, regardless of whether they live in the tribe's service population.

For both these measures, I take their averages across all measured years to estimate a tribe's relative service population and enrollment and also binarized these measures as above or below the median average. I do this for three reasons. First, IHBG data only extends back to 1999. Second, while this is the best measure of enrollment for tribes, it is notably inaccurate and only updates once every few years for most tribes (Akee et al. 2020). Third, there is some concern for post-treatment bias here where lower economic development leads to reduced populations and enrollment. Instead of thinking about these as yearly measures, then, it makes more sense to categorize reservations as roughly large vs. small populations/enrollments, groups which are unlikely to change significantly.

Finally, I consider household incomes on the reservation. Again, because tribal governments don't utilize typical income or property taxes of their members, higher reservation incomes won't increase government revenue. However, higher household incomes represent greater economic opportunity on or around the reservation, either through successful on-reservation businesses or jobs within commuting distance of the reservation. In the former case, tribal government revenues would presumably be higher if they are tribally-owned businesses are the source of higher household incomes. The latter suggests greater market access to off-reservation populations for tribally-owned businesses. The key here is that household incomes proxy for the broader economic opportunity of

⁶Data available at this archive: <https://web.archive.org/web/20250831195217/https://www.hud.gov/helping-americans/public-indian-housing-ihbgformula>.

the reservation which in turn benefits tribal government revenue. Thus, I assume that reservations with higher household incomes will be more likely to have sufficient resources to provide public goods under an SGC.

To measure household income, I take the median household income for American Indian and Native Alaskan residents on a reservation the ACS estimates. As previously mentioned, ACS data is a flawed source for reservation communities. Additionally, there is even more obvious post-treatment bias concerns here given that economic development most likely correlates with household income. To deal with these issues, I also take the average of this estimate across all ACS five-year rolling estimates for each reservation.

For institutional quality, these measures are meant to indicate whether the tribal government's political infrastructure is set up in a way which allows for effective policy crafting and execution, as well as responsive to the reservation population. Measuring tribal institutions has also been a major challenge in the study of American Indian tribal governments. No comprehensive dataset has been put together on their political institutions and tribes don't report their institutions to any kind of third-party. One avenue some scholars have pursued is looking at tribal constitutions to identify institutions (e.g. [Tatum et al. 2014](#), [Cordell et al. 2020](#), [Piano and Rouanet 2024](#)).

I build on this work by collecting and coding 183 tribal constitutions. These constitutions were obtained from a number of online public sources, most notably from the websites of tribal nations, as well as through online repositories like the National Indian Law Library, the Library of Congress, and the University of Arizona. When possible, I take the latest version of each tribe's constitution, but the constitutions included were last ratified from as early as the 1930s and as late as 2024. From these constitutions, I code three important institutions: direct vs. indirect election of the chief executive, the presence of a direct democracy-style assembly system, and residency voting requirements.

Most tribes are governed by a small council with an executive that is elected either directly by voters or indirectly by members of the council. Previous work has found that direct elections for tribal executives increased long-run incomes on reservations, although the mechanism behind

this is un-theorized (Akee, Jorgensen and Sunde 2015). Directly elected executives have greater discretion to act than those who are elected through the governing body where they can be more easily removed from office. This job safety may allow them to take more aggressive, efficient decisions. Direct elections may also make the executive more responsive to voters instead of the interests of the council. Thus, tribal governments with directly elected executives should be more efficient policy-makers and more responsive to tribe voters.

Direct democracy-style assemblies are a common but not universal feature of tribal governance where all adult members can participate and directly shape government decisions. The strength of these institutions vary, the weakest assemblies act more like rubber stamps to a small executive council, the strongest have exclusive power to pass legislation for the tribe. Such participatory processes can be costly and vulnerable to capture by those most dedicated to attending. This would lead to assemblies making government less responsive to the average reservation resident. Additionally, stronger assemblies may reduce the efficiency of decision-making because major policy decisions would require organizing an assembly and coordinating potentially many more ‘legislators’ than a typical council structure. Thus, tribal governments with assemblies should have lower governance capacity.

Residency voting requirements are another institution that alters the responsiveness of tribal governments. In many tribes, a large share—often a majority—of enrolled members live off-reservation. Yet some tribes restrict voting in tribal elections to residents of the reservation. This requirement should shift government responsiveness heavily towards those who live on the reservation. However, this is a shift that might actually be positive for reservation economies. If we assume that on-reservation voters have more pro-development preferences compared to potential off-reservation voters, a reasonable theory given on-reservation voters benefit most from reservation development, voting restrictions should increase government responsiveness to the reservation.

Each institution is coded thusly: Constitutions with a directly elected executive are coded as 1, indirectly elected executives are coded as 0. For the direct democracy assemblies, I code any political body that automatically included all adults of the tribe as 1, regardless of the power

or importance of that body (i.e. the ability to pass resolutions or ordinances, the frequency of meetings, etc.), otherwise this is coded as 0. Similarly, any type of geographic requirement to voting is considered for the residency requirements and coded as 1.

In order to code these constitutions, two research assistants and I coded 89 constitutions by hand. I then used ChatGPT to increase coding speed, using the 89 hand coded constitutions as a training set to measure the quality of the AI coding. Using a prompt that achieved a high level of accuracy in coding the three variables described, I coded all 183 constitutions with ChatGPT.

Finally, I also consider one other institution-style measure developed in past literature. When most reservations were created in the 19th Century, some reservations were constituted by bringing together many bands that had previously governed themselves separately. In contrast, other reservations were created around a single, already unified tribe. As [Dippel \(2014\)](#) argues, the former reservations experienced weaker long-run economic growth due to persistent social divisions that fostered conflict within tribal government. Such divisions leave governments less effective, as voter preferences are sharply split.

I use the data collected by [Dippel \(2014\)](#), which relies on information from [Tiller \(2015\)](#) and other historical sources to code for whether a reservation was created with an already unified or previously unrelated tribal groups. 182 of the reservations in my dataset are included in Dippel's dataset. Reservations where multiple tribes were brought together are coded as 1, reservations where the government was already unified are coded as 0.

3.5 Empirical Strategy

The primary empirical strategy I employ in this study is the FEct estimator, as proposed by [Liu, Wang and Xu \(2024\)](#). This estimator builds off traditional two-way fixed effects (TWFE) methods, but also takes in some of the logic from synthetic control methods like [Xu \(2017\)](#). The key identification strategy in this method is to generate counterfactual control observations for all treated unit-year observations and estimate unit level effects by taking the difference between the observed outcome under treatment and the counterfactual control outcome.

In order to generate counterfactual control observations, FEct fits a model with the following

functional form assumption.

$$Y_{it}(0) = f(\mathbf{X}_{it}) + h(\mathbf{U}_{it}) + \varepsilon_{it} \quad (1)$$

Where $\mathbf{X}_{it}$ represents a vector of exogenous covariates, $\mathbf{U}_{it}$ represents attributes that are not directly observed, and ε_{it} is the idiosyncratic error term. For my analyses, we can transform this into what resembles a classic TWFE estimator.

$$\hat{Y}_{it}(0) = \beta_1 \text{Gaming}_{it} + \alpha_i + \xi_t + \varepsilon_{it} \quad (2)$$

Where $\hat{Y}_{it}(0)$ is the estimated share of developed land or average relative NTL intensity for reservation i , in year t . $\beta_1 \text{Gaming}_{it}$ controls for a reservation's tribe owning a gaming establishment in the same year. α_i represents the reservation FE and ξ_t represents the year FE. Importantly, this model is only fit using untreated observations. All treated tribe-years are hidden from this model to prevent the negative weighting problem in classic TWFE models. The estimand we are seeking to estimate is the average treatment effect on the treated (ATT) for all units which we observe both pre- and post-treatment.

$$ATT = \mathbf{E}[Y_{it}(1) - Y_{it}(0) | D_{it} = 1, C_i = 1] \quad (3)$$

In other words, this method seeks to estimate the average difference between a unit's outcome under treatment and control in a given time period, conditional on being treated ($D_{it} = 1$) and being a unit that switched from control status to treatment status ($C_i = 1$). Combining this with the counterfactual control estimator written in Equation 2, we get the following estimator for the overall ATT:

$$\widehat{ATT}_s = \frac{1}{|M|} \sum_M Y_{it} - \hat{Y}_{it} \quad (4)$$

Where M represents all observations under treatment. Functionally, we are estimating out-

comes under control for treated observations, taking the difference between the observed treated outcome and the estimated control counterfactual, and averaging this difference across all treated observations.⁷ To obtain uncertainty estimates, a block bootstrap clustered at the unit level is used. I run 1,000 bootstraps in every model presented in this study.

The key identification assumption of FEct is that there must be some quasi-random element to treatment assignment (Chiu et al. 2023). More exactly:

$$Y_{it}(0) - Y_{is}(0) \perp D_{it}, \forall s, t \quad (5)$$

In other words, the treatment status should be orthogonal to the change in untreated outcomes. This may seem hard to justify in a case where my treatment, adopting a self-governance compact, is done through tribal self-selection into the program. Undoubtedly, there are some selection effects at play in this environment that may bias any results. However, I argue that my data generating process reasonably meets this identification assumption. In particular, I believe decisions around entering a self-governance compact largely revolve around beliefs and preferences of a tribal community regarding its relationship to the federal government. Very few, if any, tribal government officials who I discussed SGCs with thought of it as a matter of economic development, almost universally it was seen as an expression of tribal sovereignty and a rejection of perceived BIA incompetence. These preferences may in turn partially correlate with economic development on the reservation, but I think these preferences are also deeply rooted in the historical experience of different tribes and the network of other tribes they exist in, both of which are not necessarily correlated with changes in untreated outcomes.

Additionally, one of the primary advantages of the FEct estimator, besides its flexibility and ability resolve issues with the traditional TWFE estimator, is that it provides two clear, easily implemented diagnostic tests to analyze the credibility of the identifying assumption: a placebo test and a pre-trends test.

⁷We can also consider the ATT is a specific post-treatment time period. We would rewrite the estimator as $\widehat{ATT}_s = \frac{1}{|S|} \sum_{(it) \in S} Y_{it} - \hat{Y}_{it}$, where S represents treated observations in a specific time period post-treatment beginning.

The placebo test shifts treatment timing for all treated units a specific number of periods early (I use five placebo years in all of my models) and tests to see if the estimated ATT in this period is statistically different from zero. In theory, assuming no anticipation effects, if the model does an accurate job estimating outcomes under control and is not over-fitting to the pre-treatment data, there should be no detectable effect. The pre-trend test uses an F test to jointly test a set of null hypotheses that the average of residuals for any pre-treatment period is zero.

Because there is no treatment reversal in compacting, FEct should return similar estimates as the traditional TWFE estimator and other newer innovations to the approach. For full transparency, however, I also report estimates from the traditional TWFE estimator and other innovations, including stacked DID, CSDID, and the interaction-weighted (IW) estimator proposed by [Cengiz et al. \(2019\)](#), [Callaway and Sant'Anna \(2021\)](#), [Sun and Abraham \(2021\)](#), respectively. The estimated effect of compacting is largely robust to all of these estimators.

4 Validating Measures of Economic Growth

In order for any finding in this study to be valid, the remote sensing measures I have outlined in the previous section must function as a reasonable indicators for economic development on the reservation. While both land-use land cover and NTL intensity measures have been used successfully to measure economic growth, it isn't certain that these measures will accurately capture development on reservations. Many reservations have significant portions of land that will never been developed due to cultural/historical importance or economic unsuitability. Additionally, many reservations have significant portions of which are actually held privately by non-native residents where the tribal government will have little influence.

To validate that these measures will accurately capture the economic development I are interested in, I first look to estimate the effect of tribal gaming using these outcome measures. The economic benefits of gaming to reservations are well understood and often discussed. The uncontroversial nature of gaming's overall effect makes it a good test to check the validity of my two economic growth indicators. This exercise is also useful for benchmarking the effect sizes I estimate after in the main results. It is hard to, apriori, know the magnitude of these effects on what are relatively

abstract measures. How much is a lot of change? How much is a little? Getting an estimated effect for gaming gives a solid frame of reference for contextualizing the estimated effects of self-governance.

In order to estimate the effect of gaming, I rely on reservation and year fixed effects to estimate the counterfactual outcomes under control. This can be written out as:

$$\hat{Y}_{it}(0) = \alpha_i + \xi_t + \varepsilon_{it} \quad (6)$$

Table 1 presents the estimated overall effects of gaming on the share of developed land and average relative NTL intensity across all post-treatment time periods. It also shows the estimated effect in certain post-treatment time periods to give a sense of the change in the effect over time. Both outcomes estimate a positive effect to gaming, although only the NTL measure estimates consistently positive results. We can interpret the overall NTL finding as that in a given post-treatment year, a reservation with a gaming establishment had a relative nighttime light intensity of 0.014 percentage points higher than it would have been without the gaming establishment. This effect grew over time, from essentially zero immediately after opening to 0.026 24 years later, suggesting continuing returns to gaming.

Table 1: Effect of Gaming on Economic Development

Outcome	(1)	(2)
Developed Land	0.009 (0.007)	
Developed Land, % (1 Yr Post)	0.004 (0.003)	
Developed Land, % (8 Yr Post)	0.010 [†] (0.006)	
Developed Land, % (16 Yr Post)	0.012 (0.008)	
Developed Land, % (24 Yr Post)	0.010 (0.011)	
Avg. NTL		0.014** (0.003)
Avg. NTL, % (1 Yr Post)		0.002 (0.001)
Avg. NTL, % (8 Yr Post)		0.007** (0.002)
Avg. NTL, % (16 Yr Post)		0.015** (0.004)
Avg. NTL, % (24 Yr Post)		0.026** (0.008)
Placebo F Test	0.895	0.652
Pre-trend F Test	0.163	0.325
Total Reservations	282	218
Treated Reservations	210	149
Total Years	39	32

Notes: All coefficients estimated using FEct method. Standard errors are calculated using 1000 unit-clustered bootstraps.

[†] $p < 0.1$, * $p < 0.05$, ** $p < 0.01$.

The placebo F test p-value is much higher than the critical value of 0.05, so we can safely say for both models that there was no detected effect in the five years prior to treatment even after removing those observations from the counterfactual estimator. Similarly, the pre-trend F test is also above the critical value, which tells us that in the prior 10 years before treatment the difference between our estimated outcomes and observed outcomes exhibited no pre-trends. These results indicate that the model is not over-fitting to the pre-treatment data and counterfactual estimator can accurately estimate outcomes under control. This gives confidence to the post-treatment effect

results because it makes the post-treatment control counterfactuals more believable.

While it is troubling that the developed land measure did not detect a statistically significant effect, these results do give some confidence to the ability for these measures to accurately capture economic development. And the diagnostic checks suggest that these results are believable, making them solid benchmarks for the effects of self-governance.

5 Effect of SGCs

I now estimate the effect of self-governance compacting on the remote sensing measures. As a reminder, I estimate counterfactual treatment observations using the following model:

$$\hat{Y}_{it}(0) = \beta_1 Gaming_{it} + \alpha_i + \xi_t + \varepsilon_{it} \quad (7)$$

In Table 2, I report the estimated findings for both measures using the previous discussed estimators. The clear trend, regardless of outcome measure or panel analysis method used, is that the adoption of a self-governance compact led to a decrease in economic development. To use the estimated effect of gaming as a benchmark to the FEct results in Table 2, self-governance had an effect almost twice the magnitude of gaming on the share of developed land (-0.017 to 0.009) or around 10% smaller of an effect on average relative NTL intensity (-0.012 to 0.014). If these results are to be believed, a reservation with a self-governance compact had 1.7 percentage points fewer developed land share than it would have with a compact. Similarly, the reservation would be .012 percentage points darker on average compared to the brightest point in the United States under a compact than it would have been without.

Notably, however, when we look at the diagnostics test, our fit is not as clearly strong as it was when looking at gaming. Model 1, which uses developed land share as the outcome, easily passes the placebo F test, but falls below the threshold for the pre-trend test. The reverse is true in model 2, which uses NTL intensity as the outcome. This model fails the placebo test, but passes the pre-trend F test.

To adjudicate between which, if either, outcome is giving a believable estimate, it is helpful to

Table 2: Effects of Self-Governance on Economic Development

Outcome	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Developed Land, %	-0.017* (0.007)		-0.015** (0.005)		-0.016** (0.006)		-0.013* (0.005)		-0.016** (0.004)	
Developed Land, % (1 Yr Post)	-0.004 (0.003)		-0.001 (0.001)		-0.001 [†] (0.001)		-0.001 (0.000)		-0.001 (0.001)	
Developed Land, % (8 Yr Post)	-0.013** (0.005)		-0.008** (0.003)		-0.011** (0.003)		-0.009** (0.003)		-0.009** (0.002)	
Developed Land, % (16 Yr Post)	-0.025** (0.008)		-0.019** (0.006)		-0.021** (0.007)		-0.018** (0.006)		-0.019** (0.005)	
Developed Land, % (24 Yr Post)	-0.025* (0.011)		-0.022* (0.010)		-0.026* (0.012)		-0.022* (0.010)		-0.022** (0.008)	
Avg. Nightlights, %		-0.012** (0.004)		-0.015** (0.005)		-0.010* (0.004)		-0.008 [†] (0.005)		-0.017** (0.003)
Avg. Nightlights, % (1 Yr Post)		-0.008** (0.002)		-0.003* (0.001)		-0.002* (0.001)		-0.001 (0.002)		-0.003* (0.001)
Avg. Nightlights, % (8 Yr Post)		-0.011** (0.003)		-0.007* (0.003)		-0.008* (0.003)		-0.006 (0.004)		-0.007** (0.002)
Avg. Nightlights, % (16 Yr Post)		-0.017** (0.005)		-0.014** (0.005)		-0.014** (0.005)		-0.010 [†] (0.005)		-0.014** (0.003)
Avg. Nightlights, % (24 Yr Post)		-0.015 [†] (0.009)		-0.020* (0.009)		-0.016 (0.010)		-0.016* (0.007)		-0.020** (0.005)
Estimator	FEct	FEct	TWFE	TWFE	CSDID	CSDID	IW	IW	Stacked	Stacked
Placebo F Test	0.764	0.003								
Pre-trend F Test	0.037	0.278								
Reservations	305	278	305	293	305	293	305	293	305	293
Treated Reservations	78	61	78	76	78	76	78	76	78	76
Years	39	32	39	32	39	32	39	32	39	32

Notes: Standard errors for FEct models (1 and 2) calculated using 1,000 block bootstraps clustered at the unit level. Standard errors for all other models use the standard recommended method for each method.

[†] p < 0.1, * p < 0.05, ** p < 0.01.

examine the dynamic treatment plots for both models. Presented in Figure 5, the estimated effect of self-governance is plotted over time. Overall, the pre-treatment trend in the NTL model has a concerning negative effect in the years prior to treatment onset, suggesting that the counterfactual estimates are missing some factor impacting NTL intensity in these years. The developed land model, on the other hand, actually shows a solid pre-treatment fit. While there are some pre-treatment years with noticeable variation from 0, the trend largely hovers over zero. Overall, it is not ideal that the developed land model fails the pre-trend F test, but the pre-trend fit otherwise seems believable.

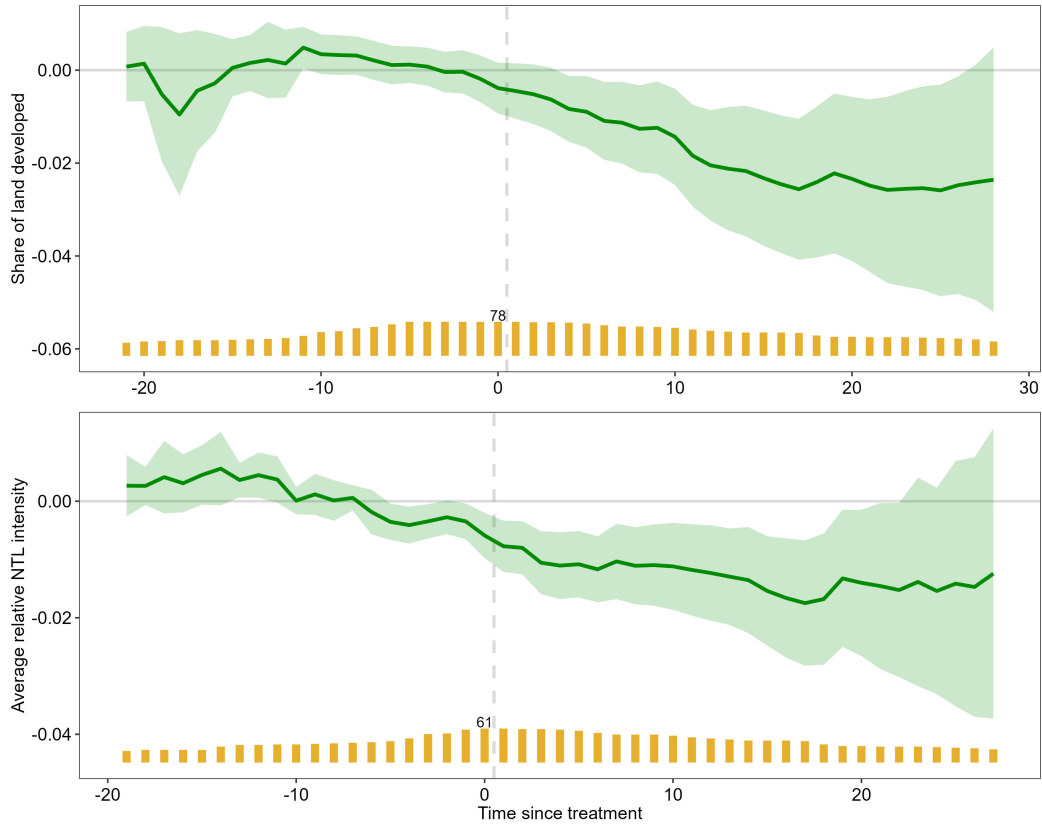


Figure 5: Dynamic treatment effects of self-governance. Plots generated using estimates from FECT models using the share of developed land (top) and average relative NTL intensity (bottom) as the outcome. Each point estimate represents average difference between the estimated control counterfactual and the observed outcome value for all treated units at a given time relative to treatment onset. 95% confidence intervals generated by 1,000 block bootstraps clustered at the unit level. The histogram at bottom of each plot depict the number of treated units observed at each period. Only time periods where at least 30% of treated units are used in the estimate are plotted.

Also interesting in these plots is that the negative effect in both models flattens over time. While there is an initial drop in expected economic growth soon after self-governance adoption, the difference between treated outcomes and estimated control outcomes does not continue to widen after approximately a decade. This is in contrast with the gaming result where, when using NTL as the outcome, the difference continues to grow over time. This suggests that while tribes may pay some initial cost to self-governance, this cost eventually fades (although the lost development in the early years is not recuperated). This could be a sign that tribes potentially learn to better handle the self-governance programs they take on or find a better mix between direct service, contracting,

and compacting.

Overall, these results point to the governance capacity reductions outweighing the agency-loss minimization benefits. To explore further whether capacity is the underlying mechanism in this relationship, I now turn to comparing this effect across tribes of different capacity.

6 Capacity Mechanism

Because the FEct strategy calculates unit-level treatment effects, it is easy to visualize the variance in treatment effects across units. In Figure 6, the estimated effects for each reservation over time is plotted. While there are some outliers in both positive and negative directions, the majority of observations fall somewhere between zero and slightly negative. Very few reservations saw a consistent, positive effect from self-governance.

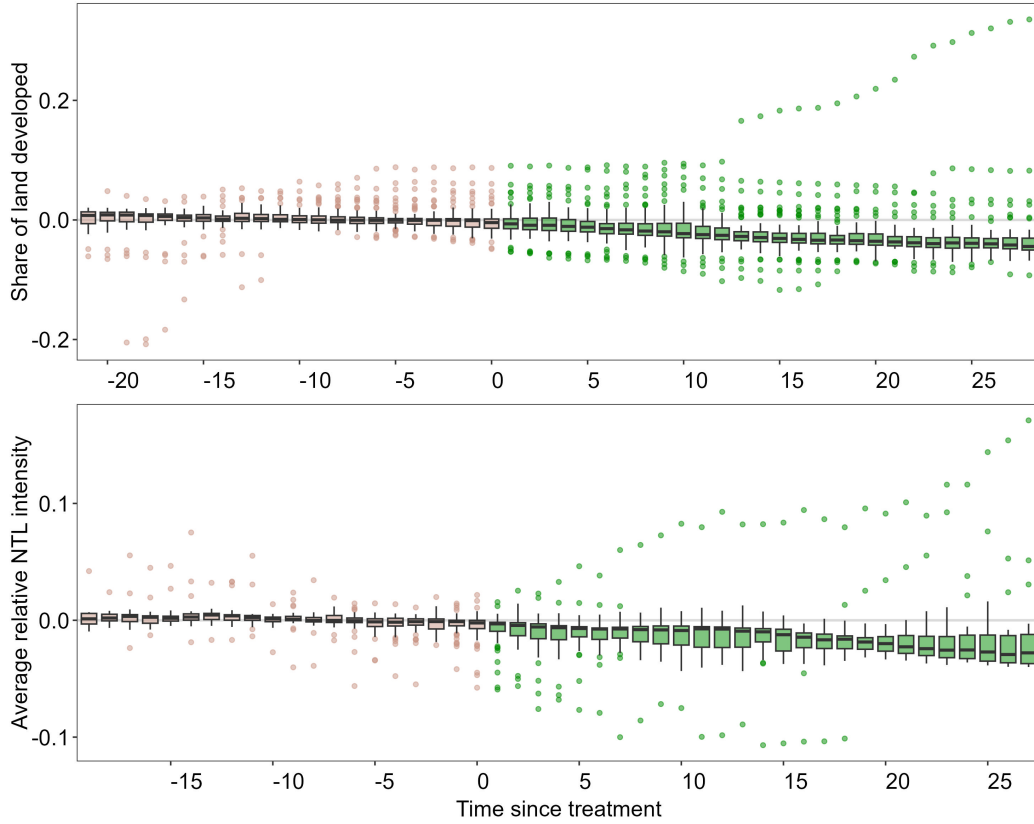


Figure 6: Individual effects of self-governance. Plots generated using estimates from FEct models using the share of developed land (top) and average relative NTL intensity (bottom) as the outcome. Depicts the difference between the observed Y_{it} and $\hat{Y}_{it}(0)$ for every treated unit relative to treatment start. Boxes represent the range of the middle 50% of effects, the horizontal line represents the median effect, and the whiskers show the 2.5% and 95.5% quantiles. Only time periods where at least 30% of treated units are used in the estimate are plotted.

This variation is less than I anticipated, ex ante. However, this does not automatically invalidate the governance capacity mechanism. While positive effects were rare, some reservations also see no negative effect from self-governance. The question becomes what separates the reservations where development was unaffected by self-governance from the reservations that saw a decrease in self-governance?

As a reminder, I have two sets of capacity measures to answer this question: resource sufficiency and institutional quality. Regarding resource sufficiency, I theorize that when the amount of resources available to a tribal government to provide public goods is below the necessary level, self-governance should have a more negative effect. I operationalize the concept of resource sufficiency

in four measures: reservation size, service population size, enrollment size, and reservation income. I assume that the first three measures indicate a greater demand for public goods and therefore an increased likelihood that the tribal government will have insufficient resources for self-governance. I assume the reservation income measure indicates reservations with stronger economic opportunity and therefore more likely that the tribal government to have sufficient resources for self-governance.

To test these predictions, I estimate separate ATTs for each subgroup within the same FEct models. Essentially, the model is estimated using the entire sample and then the ATTs are estimated by averaging the treatment effects for only those units within the subgroup. This does not test for the statistical significance between the subgroups. However, it does allow for diagnostic testing for each subgroup effect while maintaining the entire sample for counterfactual generation.

In Table 3, I present the results for the 8 total different subgroups using both outcome measures. The subgroup ATTs in models using the share of developed land as the outcome present notable differences. Reservations with a larger geographic size, larger service populations, larger enrollments, and lower median incomes had much more clearly negative outcomes under self-governance compared to reservations with smaller geographic size, smaller service populations, smaller enrollments, and higher median incomes.

This pattern does not match the NTL outcome results. While the same trend in statistical significance remained, the estimated coefficients are very similar across subgroups. However, when looking at the diagnostic tests, the NTL models still struggle with pre-treatment fit in almost every subgroup estimate. The land-use measures, on the other hand, have a few models where the pre-treatment trend looks strong. Most notably, the pre-treatment trends for both enrollment subgroups and both median income subgroups passed the diagnostic checks.

I also theorize that tribes with higher quality institutions, ones which are efficient and responsive, but less liable to capture by specific interests, will have better outcomes under self-governance. I operationalize the concept of institutional quality in four measures: executive selection, residency voting restrictions, direct democracy assemblies, and ethnic division. I assume that when executives are directly elected, this increases the autonomy of the executive and enables them to take more

Table 3: Heterogeneous effects of self-governance by resource sufficiency

Outcome	Reservation Size				Population Size				Enrollment Size				Median Income			
	Small	Large	Small	Large	Small	Large	Small	Large	Small	Large	Small	Large	Low Income	High Income	Low Income	High Income
Developed Land, %	-0.006 (0.011)	-0.026** (0.005)			-0.002 (0.017)	-0.022** (0.006)			-0.005 (0.013)	-0.024** (0.006)			-0.019* (0.007)	-0.014 (0.010)		
Developed Land, % (1 Yr Post)	0.001 (0.005)	-0.010** (0.003)			0.000 (0.006)	-0.007* (0.003)			0.003 (0.005)	-0.010** (0.003)			-0.003 (0.004)	-0.008* (0.004)		
Developed Land, % (8 Yr Post)	-0.005 (0.007)	-0.020** (0.005)			-0.005 (0.010)	-0.015** (0.005)			-0.002 (0.008)	-0.018** (0.005)			-0.012† (0.006)	-0.015* (0.006)		
Developed Land, % (16 Yr Post)	-0.016 (0.013)	-0.031** (0.006)			-0.008 (0.019)	-0.030** (0.007)			-0.012 (0.014)	-0.032** (0.008)			-0.027** (0.009)	-0.019† (0.011)		
Developed Land, % (24 Yr Post)	-0.009 (0.022)	-0.037** (0.007)			-0.001 (0.035)	-0.033** (0.009)			-0.011 (0.024)	-0.034** (0.009)			-0.032** (0.011)	-0.016 (0.017)		
Avg. Nightlights, %			-0.009 (0.008)	-0.015** (0.003)			-0.010 (0.010)	-0.013** (0.003)			-0.010 (0.008)	-0.014** (0.004)			-0.012** (0.003)	-0.009 (0.006)
Avg. Nightlights, % (1 Yr Post)			-0.010* (0.004)	-0.006** (0.002)			-0.009* (0.005)	-0.007** (0.002)			-0.009* (0.004)	-0.007** (0.002)			-0.007** (0.002)	-0.007* (0.003)
Avg. Nightlights, % (8 Yr Post)			-0.013* (0.006)	-0.010** (0.003)			-0.008 (0.009)	-0.012** (0.003)			-0.009 (0.007)	-0.012** (0.003)			-0.010** (0.002)	-0.010* (0.005)
Avg. Nightlights, % (16 Yr Post)			-0.018 (0.011)	-0.016** (0.004)			-0.014 (0.017)	-0.017** (0.004)			-0.013 (0.011)	-0.019** (0.005)			-0.016** (0.004)	-0.013† (0.008)
Avg. Nightlights, % (24 Yr Post)			0.006 (0.018)	-0.026** (0.007)			-0.002 (0.025)	-0.019* (0.008)			-0.008 (0.016)	-0.019* (0.009)			-0.019** (0.007)	-0.004 (0.011)
Placebo F Test	0.321	0.008	0.044	0.002	0.540	0.366	0.087	0.001	0.500	0.034	0.004	0.004	0.963	0.315	0.007	0.023
Pre-trend F Test	0.265	0.461	0.452	0.503	0.590	0.229	0.992	0.189	0.500	0.181	0.573	0.336	0.675	0.226	0.593	0.252
Treated reservations	40	38	29	32	24	54	20	41	31	47	24	37	34	40	27	31
Total Reservations	305	305	278	278	305	305	278	278	305	305	278	278	273	273	252	252
Total Years	39	39	32	32	39	39	32	32	39	39	32	32	39	39	32	32

Notes: All coefficients estimated using FEct method. Standard errors are calculated using 1,000 block bootstraps clustered at the unit level. Models use either the percentage of reservation land coded as developed or the average relative nighttime light intensity on the reservation as the outcome. Reservation size, service population size, enrollment size, and AIAN HH median income are split between reservations below the median (small) and at or above the median (large). Reservation size is calculated by author. Service population and enrollment size are taken from HUD IHBG formula data. AIAN HH median income taken from averaged ACS data.

† p < 0.1, * p < 0.05, ** p < 0.01.

efficient, decisive action that enables greater success in self-governance. Conversely, I assume that direct democracy assemblies and ethnic division reduce the decision-making efficiency of the tribe and lead to worse outcomes under self-governance. Finally, I argue that residency voting requirements shift the responsiveness of the tribal government towards reservation voters and that these voters are most incentivized to increase development on the reservation. This makes it an institution where the special interest capture should actually improve reservation economic growth.

In Table 4, I present the results for each subgroup. Once again, a similar pattern to the the resource sufficiency analysis emerges. Directly elected executives, residency voting restrictions, and direct democracies all see significant decreases in economic development under self-governance. Their counter-institutions have much smaller point estimates and are not statistically different from zero. The ethnic division subgroups partially follow this pattern, although the larger negative effect for tribes with more shallow ethnic divisions does not meet the typical critical threshold to reject the null hypothesis that the effect was different from zero. And once again, when using the NTL outcome measure, the estimated effects for both subgroups were very similar. The NTL models

also struggle to pass the diagnostic checks, but the land-use models do not have this same issue.

Table 4: Heterogeneous effects of self-governance by institutional quality

Outcome	Executive Selection				Residency Voting				Direct Democracy				Ethnic Division			
	Parliamentary	Presidential	Parliamentary	Presidential	Unrestricted	Restricted	Unrestricted	Restricted	None	Exists	None	Exists	Shallow	Deep	Shallow	Deep
Developed Land, %	-0.007 (0.020)	-0.017* (0.008)			-0.009 (0.011)	-0.023* (0.010)			-0.007 (0.014)	-0.021* (0.008)			-0.011* (0.007)	-0.006 (0.006)		
Developed Land, % (1 Yr Post)	0.001 (0.006)	-0.003 (0.004)			0.002 (0.008)	-0.011 [†] (0.005)			0.000 (0.008)	-0.004 (0.007)			-0.005 [†] (0.005)	0.000 (0.006)		
Developed Land, % (8 Yr Post)	-0.006 (0.010)	-0.012 [†] (0.007)			-0.005 (0.008)	-0.021* (0.008)			-0.006 (0.008)	-0.014 [†] (0.007)			-0.007 (0.005)	-0.001 (0.006)		
Developed Land, % (16 Yr Post)	-0.014 (0.021)	-0.025* (0.010)			-0.016 (0.013)	-0.032* (0.013)			-0.014 (0.015)	-0.029* (0.011)			-0.015 (0.010)	-0.008 (0.007)		
Developed Land, % (24 Yr Post)	-0.010 (0.031)	-0.027* (0.013)			-0.019 (0.019)	-0.024 (0.016)			-0.011 (0.023)	-0.031* (0.012)			-0.018 (0.013)	-0.012 (0.008)		
Avg. NTL, %			-0.014** 0.005	-0.014** 0.005			-0.015** 0.004	-0.012* 0.006			-0.012** 0.005	-0.016** 0.005			-0.009** 0.003	-0.007** 0.003
Avg. Nightlights, % (1 Yr Post)			-0.003 (0.002)	-0.010** (0.003)			-0.007* (0.003)	-0.011* (0.005)			-0.005 [†] (0.003)	-0.011** (0.004)			-0.004* (0.002)	-0.004 [†] (0.002)
Avg. Nightlights, % (8 Yr Post)			-0.010* (0.004)	-0.012** (0.004)			-0.010** (0.003)	-0.014** (0.005)			-0.009* (0.004)	-0.014** (0.004)			-0.007* (0.004)	-0.007** (0.002)
Avg. Nightlights, % (16 Yr Post)			-0.014** (0.005)	-0.019** (0.006)			-0.015** (0.005)	-0.023** (0.007)			-0.017** (0.005)	-0.019** (0.006)			-0.011** (0.004)	-0.008* (0.003)
Avg. Nightlights, % (24 Yr Post)			-0.020 [†] (0.012)	-0.020* (0.010)			-0.026** (0.010)	-0.008 (0.014)			-0.023* (0.011)	-0.018 [†] (0.010)			-0.016* (0.007)	-0.007 (0.006)
Placebo F Test	0.577	0.841	0.395	0.009	0.191	0.217	0.067	0.018	0.307	0.642	0.280	0.003	0.113	0.572	0.044	0.009
Pre-trend F Test	0.980	0.270	0.994	0.613	0.298	0.846	0.587	0.978	0.417	0.861	0.949	0.785	0.963	0.414	-	0.693
Treated reservations	15	39	9	30	37	17	26	13	26	28	19	20	13	32	11	24
Total Reservations	205	205	185	185	205	205	185	185	205	205	185	185	182	182	169	169
Total Years	39	39	32	32	39	39	32	32	39	39	32	32	39	39	32	32

Notes: All coefficients estimated using FEct method. Standard errors are calculated using 1,000 block bootstraps clustered at the unit level. Models use either the percentage of reservation land coded as developed or the average relative nighttime light intensity on the reservation as the outcome. All four institutions are originally coded as binary. Executive selection, residency voting, and direct democracy are collected by author from tribal constitutions. Ethnic division variable is taken from [Dippel \(2014\)](#).

[†] p < 0.1, * p < 0.05, ** p < 0.01.

Overall, the land-use results give tentative evidence that tribal capacity matters. To just focus on subgroups that passed their diagnostic checks, larger service populations, larger enrollments, and lower median incomes all saw significant reductions in economic development under an SGC. All these subgroups should be less likely to have sufficient resources for public goods provision. Conversely, subgroups more likely to have sufficient resources (smaller service populations, smaller enrollments, higher median incomes) did not detect as strong of an effect.

In regards to institutional quality, the results were more mixed. As predicted, direct democracy assemblies did see a negative effect to self governance and reservations without them did not. But the other measures did not have the predicted relationship. It was the reservations with directly elected executives, voting restrictions, and less ethnic division that estimated negative effects under self-governance.

It is important to note, however, that while many of the variables match the predicted relationship, we cannot statistically distinguish these effects. For example, Figure 7 shows the treatment effect over time between the small and large service population subgroups. While the large service

population reservations have a clear, negative effect, the smaller population reservations have an effect close to zero, but also a much larger confidence intervals. This trend is common for almost all of the subgroups that find null results. They all typically have very large variance estimates that encompass the estimated effect for their mirror subgroup. Thus, while this is suggestive of the theorized mechanism, it may be that the remote sensing outcome measures are not capable of distinguishing between the effect sizes.

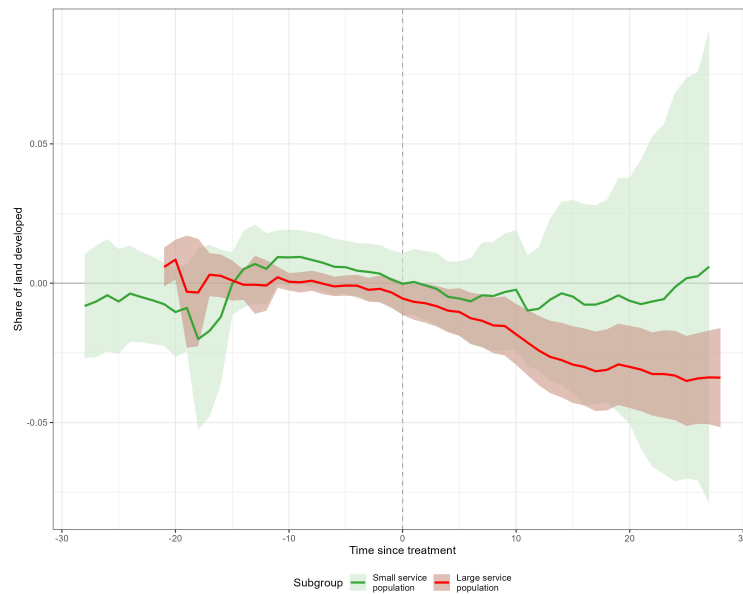


Figure 7: Dynamic treatment effects for small and large service populations. Each point estimate represents average difference between the estimated control counterfactual and the observed outcome value for all treated units at a given time relative to treatment onset. 95% confidence intervals generated by unit-clustered bootstrapping. The green line depicts the treatment effect for reservations below the median average service population. The red line depicts the treatment effect for reservations at or above the median average service population.

7 Conclusion

This study examined whether local self-governance improves community outcomes by analyzing the economic effects of expanded self-governance for American Indian tribal governments. Contrary to prevailing assumptions in both policy and academic discourse, the findings indicate that compacting significantly reduced reservation economic performance. The results also suggest that governance capacity plays a critical mediating role in this relationship.

These findings contribute to broader debates about the limits and potential of local governance. They underscore that greater autonomy does not automatically translate into improved outcomes; the institutional and administrative capacity of local governments is a central determinant of success. This insight extends to the study of American local politics more generally, where similar questions about capacity, resources, and autonomy remain pressing.

For scholars of American Indian politics, the results highlight persistent challenges in building and sustaining tribal governance capacity. They align with prior work suggesting that sovereignty carries costs that Native nations may willingly bear for the sake of self-determination. The findings therefore call for policies and institutional support aimed at strengthening tribal administrative and fiscal capacity so that self-governance produces both political and economic benefits.

Finally, this study suggests opportunities for cross-fertilization between the study of Indigenous governance and local politics. Issues commonly analyzed in local political studies—such as housing, education, and land use—have direct analogues in the Indigenous context. Incorporating insights from these literatures could deepen understanding of how governance capacity shapes outcomes across diverse local settings.

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