Power to Prosper:

Self-Governance and Economic Development

NR Brouwer*

13 September 2025

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 that the negative effect is not moderate by any intra-tribal factor.

*Ph.D. Candidate, UC Merced, Email: nbrouwer@ucmerced.edu

I thank my committee—Nathan Monroe, Aditya Dasgupta, Jessica Trounstine, Tessa Provins, and Tesalia Rizzo—for their invaluable feedback on this project. I am also grateful to many other scholars who offered comments and suggestions on this dissertation, including Jeff Jenkins, Melissa Rogers, Jean Schroedel, Dominic Parker, Laura Evans, Burke Hendrix, Rick Witmer, Ruth Bloch Rubin, Joseph Warren, Christopher Ojeda, Anil Menon, Marco Alcocer, Elise Blasingame, Alex Zhao, and Natalie Jones-Kerwin. I appreciate the support of the Center for Analytic Political Engagement, especially Delfina Solorio and Elena Navarro. Finally, I thank the many Native leaders and advocates who generously shared their time and insights with me.

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 (Trounstine 2016; Trounstine 2020*a*; 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 programs that were previously managed by the federal government, including vital programs 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).

Based on previous work on self-governance compacts (Brouwer 2024), I argue that tribal self-governance will lead to improved economic outcomes by reducing agency loss reservations residents suffer by shifting control of important local programs from an unresponsive federal government to a more responsive tribal government. However, I further posit that the benefits to self-governance are contingent on the governance capacity of the tribal government. As costs to governance rise, tribal governments need sufficient resources to adequately govern. Likewise, tribal governments need institutions that enable sound, efficient decision-making. With inadequate resources to meet the needs of the reservation or institutions that produce poor (or inequitable) decisions, the benefits to reducing agency loss will be swamped by the losses from lower governance capacity.

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 potentially 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 use traditional and modern techniques in difference-in-differences designs to estimate the effect of increased self-governance, focusing on counterfactual-based time series methods proposed by Liu, Wang and Xu (2024). Surprisingly, counter to my expectations, I find that entering into a self-governance compact resulted in *lower* 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 negative result, I estimate variation in treatment effects among different subgroups of reservations based on different measures of resource availability/need and institutional quality. Most notably, I code almost 200 tribal constitutions to measure three relevant institutional features of tribal governments. I find that while certain institutions predict more clearly negative effects, no institutional difference predicts a substantively different result.

These findings contribute to a broader understanding of local politics in the United States. Because tribal governance 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 (Trounstine 2020*b*). 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 Terman and Feiock 2015 for contemporary examples). While distributional questions are important,

understanding the determinants and value of local governance capacity is useful for debates regarding how much power local governments should hold. It also speaks to growing arguments for "abundance"-centered politics that focus 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 2011*a*). 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 bourgeoning literature examining the effects of tribal institutions, particularly tribal constitutions (Cornell and Kalt 1990; Evans 2011*b*; 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 Theory

2.1 Theories of Decentralization and Self-Governance

To develop a general theory of self-governance and economic development, I draw from broader work on decentralization and federalism. Classic theories of decentralization focus on heterogeneity in preferences for public goods across different locals 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 citizens self-sorting in maximizing the efficiency gains of local governance by making citizen preferences more observable. 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).

However, some scholars have argued that local governance may actually have a net negative impact on the provision of public goods. Some 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 the accountability of agents 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). When characterized this way, its 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). Thus, the positive effect of self-governance is contingent on local governments having strong democratic governments with politically engaged populations and competent bureaucracies to carry out policy.

2.2 General Theory of Self-Governance and Economic Growth

From this literature, we can construct a general theory for how self-governance impacts economic development. The presence of heterogeneous preferences and/or a relatively unaccountable central administrator creates the conditions necessary for efficiency gains in the provision of public goods. Without heterogeneous preferences, a central government could set a uniform level of public

goods that maximized the utility of all communities. Without imperfect accountability, the central government would simply adjust the public goods provision to the satisfaction of each community. At least one of these conditions must be present, then, for self-governance to be an efficiency gain.

Assuming at least one of these conditions is present, self-governance can improve the provision of public goods by allowing the subnational government to increase, decrease, or reallocate spending to fit the specific needs of a more localized community. This is possible because the agency loss suffered by the community is now reduced. Under a centralized system, the principal local community cannot directly hold their agents accountable. Instead, accountability flows through an intermediary in the central government government where programs are defined, funded, and managed. Without significant influence over central government policymaking, which most subnational governments are unlikely to hold given their relative size, the less recourse they have to deal with bad local officials or poorly designed programs. With self-governance, the chain of accountability is shortened. Those administering the programs are now directly responsible electorally to the service population. This allows the community to more easily reward good results and punish bad results in a way that would not be possible when the community made up only one of many constituencies represented in the central government.

From these premises comes the straight-forward, naive prediction that economic growth will increase under self-governance.

> **H1:** Communities with local self-governance will have higher rates of economic development compared to communities without local self-governance.

However, even with certain structural designs to avoid the incentivization of bad fiscal behavior that Weingast (2009) suggests, self-governance carries a significant risk. While central governments may lack the flexibility and accountability of subnational governments, they typically possess a number of important advantages. Central governments often control vast bureaucracies with experienced policymakers who have access to resources and influence that subnational governments lack.

In order for the gains of greater accountability to be enjoyed, the costs generated by lower governance capacity need to be minimized. This means that subnational governments need a sufficient level of resources to support a given level of government activity. Subnational governments also need political institutions that facilitate timely, smart policymaking. This means that these institutions should be efficient in enacting policy and responsive to the needs of the community while resistant to capture by particularized interests. I describe institutions meeting these criteria with the broad term 'quality institutions.' These premises give two more hypotheses.

> **H2:** Subnational governments with sufficient resources will have higher economic growth under self-governance compared to subnational governments with insufficient resources.

> **H3:** Subnational governments with quality institutions will have higher economic growth under self-governance compared to subnational governments with inadequate resources.

2.3 American Indian Tribal Government Context

2.3.1 Value of Self-Governance

American Indian tribal governments present an interesting case for self-governance. The broader study of comparative indigenous politics has highlighted the positive effects on public goods provision. 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 study of American Indian tribes, 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 finding that self-governance did not hinder timber extraction (Krepps and Caves 1994; Harris, Blomstrom and Nakamura 1995). One concern with self-governance is that outside investors might be less likely to invest on the reservation out of uncertainty for how the empowered tribal government will responsibly 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). Overall, the impact of the modern self-governance era for tribal governance has been understudied.

The first point of comparison to my general theory of self-governance and economic growth is to establish that preference heterogeneity and/or government unresponsiveness is characteristic of the tribal reservation context. 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 Bureau of Indian Affairs (BIA). Most tribal 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 are 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.

It seems, then, fair to assume that different reservation communities will have different preferences regarding the composition of the bundle of public goods being provided through federal programs and the federal government is unlikely to be particularly responsive to these preferences. This means that under the naive view self-governance in the tribal context will result in better economic growth. Before assuming that, however, it is worth considering what exactly self-governance in this context looks like and how it would reduce the agency loss suffered by the reservation community, the proposed mechanism for how self-governance improves economic growth.

2.3.2 Economic Benefits of Compacting

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*. Programs administered under direct service are centrally controlled. The tribe has

no control over the program and simply accepts what the BIA provides.

The second option is to have the tribe administer the program, but based on the BIA's expectations, typically referred to as self-determination contracting or just *contracting*. Under contracting, the tribal government takes on the administration and funding for the program,[1] but is restricted in how they can run the program. 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 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. Contracting was instituted in 1975 with the Indian Self Determination and Education Assistance (ISDEAA) act following experimentation with similar programs over the preceding decade. As of 2024, 92% of tribes were contracting with the BIA (Newland 2024).

The third option is for the tribe to take on the program completely through a self-governance compact (SGC). Under a SGC, tribes get to administer the program 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. Compacting was brought about through amendments to ISDEAA, first on trial run in 1988 and then made permanent in

[1] Additional funding for indirect costs tribes incur for over head would eventually be added as well.

1994. The motivation behind this policy reform was rooted in the failures of the BIA to adequately execute the contracting process. A small number of tribes were able to convince Congress that further reducing BIA oversight was necessary for tribal governance to function (Strommer and Osborne 2014).

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 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.

Given this structure, how do contracting and compacting fit into the general theory previously described? Under a direct service arrangement, programs are run according to a uniform standard set at the national level for all tribes. Assuming, as previously stated, that preferences for how these programs are run and where funding is directed varies across tribal communities, bringing a program into an SGC should result in a shift in allocation of resources. A tribe with an SGC can move resources away from programs they want less of and fund the programs they want more from to better meet the needs of the reservation. The programs that can be included in an SGC often deal with vital parts of reservation life, from law enforcement and education to natural resource management and welfare support. When tribal governments have the ability to tailor these important programs to the tribe's needs, the result is a reservation that better supports the economic and health needs of the community. Without self-governance, these programs will be less efficiently allocated

according to the needs of the community, resulting in lower levels of development.

Additionally, tribes should see significant increases in agency control under a compact versus direct service. Under direct service, the principal (tribe members on the reservation) cannot directly hold their agents (local BIA officials) accountable directly. Instead, accountability flows through the federal government where BIA programs. And as previously mentioned, because most tribes are relatively small, they hold very limited influence at a national level and would expect little accountability.

Under a compact, 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).

Taking into account contracting is slightly more complicated, but is very important to consider. Contracting is very common and a necessary step before compacting, so the difference in governance between contracting and compacting is what would likely drive many of the effects of compacting. The inflexibility of contracted programs means that there should not be significant efficiency gains compared to direct service. A program under a contract should be administered in similar ways to how it would be under direct service. However it is possible that the tribe could more efficiently produce public goods under the same funding and procedures as the BIA. Additionally, there could be greater accountability for poor performance. While a BIA agent who exhibits malfeasance or incompetence to the tribe may not be fired, a tribe official, either elected by tribe members

or hired by the tribal government, could presumably be removed from their role more efficiently. Broader accountability, however, for how programs are run may be less likely given the lack of control the tribe has when contracting. Overall, contracting may deliver some of the benefits of self-governance, but in a much more limited fashion than a SGC.

With self-governance compacting now understood, we can transform the initial hypothesis of my theory into a more specific form.

> **H1a:** Reservations with a self-governance compact will have higher rates of economic development compared to communities without a self-governance compact.

2.3.3 Heterogeneous Effects

In order for self-governance to improve economic growth, a tribal government needs a requisite level of governance capacity. Tribal governments, unsurprisingly given the variation in contexts, also vary significantly in their capacity. My theory conceptualizes capacity as comprising two broad dimensions: sufficient resources to meet demand for public goods and quality institutions capable of creating and enacting policy responsive to the needs of the reservation.

Tribal governments frequently face severe resource limitations in delivering public goods. While SGCs transfer federal funding to the tribal government, this funding is often inadequate for their purpose and dependent on federal budget increases to expand. Tribes frequently try to expand services after contracting or compacting BIA programs, only to realize that more funding from the BIA is not possible (Henson 2008). Managing millions of acres of forests or policing rural communities stretched over areas larger than Rhode Island or Delaware are challenges that demand substantial investment to manage successfully.

In order to analyze how resources impact the economic benefits of self-governance, I focus on 4 indicators for tribal resources. 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.

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.

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 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 summarize, these are the four hypotheses I consider for resource sufficiency:

H2a: Larger reservations will have lower economic growth under a self-governance compact compared to smaller reservations.

H2b: Reservations with larger service populations will have lower economic growth under a self-governance compact compared to reservations with smaller service populations.

H2c: Reservations with larger enrollments will have lower economic growth under a self-governance compact compared to reservations with smaller enrollments.

H2d: Reservations with lower income households will have lower economic growth under a self-governance compact compared to reservations with higher income households.

Under a self-governance compact, tribal political institutions become more important because they are now the relevant bodies for enacting public policy. However, tribal governments possess a great variety of institutional designs, perhaps greater than seen in traditional municipal governments. My theory states that institutions need to be effective in crafting and executing policy decisions and responsive to the reservation population. For this reason, I consider four relevant tribal institutions that may influence the responsiveness and effectiveness of tribal governance.

The first institution I consider is the selection method for chief executive of the tribe. 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 untheorized (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. Regardless of the exact mechanism, these arguments suggest that self-governance should return stronger benefits under directly elected executives.

Another common but not universal feature of tribal governance is the presence of direct democracy-style assemblies, 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 see weaker returns to self-governance.

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, then residency restriction should increase the benefits of self-governance.

The final institutional feature I consider differs from the first three. 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. Under an SGC, then, these tribes with deep social divisions should have weaker returns to self-governance.

To summarize, these are the four hypotheses I consider regarding institutional quality:

H3a: Reservations where the tribe executive is directly elected will have higher economic growth under a self-governance compact compared to reservations where the executive is indirectly elected.

H3b: Reservations with a tribal assembly body will have lower economic growth under a self-governance compact compared to reservations without an assembly body.

H3c: Reservations with residency voting requirement will have higher economic growth under a self-governance compact compared to reservations without residency restrictions.

H3d: Reservations with deep social divisions will have lower economic growth under a self-governance compact compared to reservations without deep social divisions.

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.[2] 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.

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

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.[3] 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 translate 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.

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,

[3] An 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.

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.

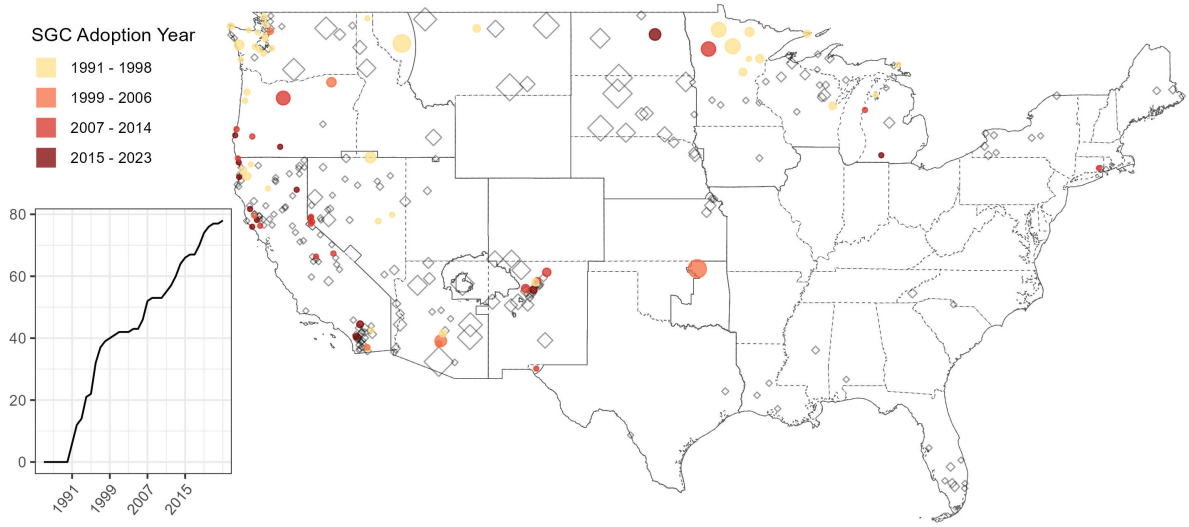

Figure 1: Map depicting SGC adoption timing by reservation. Untreated reservations are marked with diamonds, treated reservations are marked as circles and colored by timing of SGC adoption. Size of all points based on relative geographic size of the reservation. Line graph in the bottom-left corner 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, $500 times 500$-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.[4] 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 are available in the appendix.

[4]This 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.

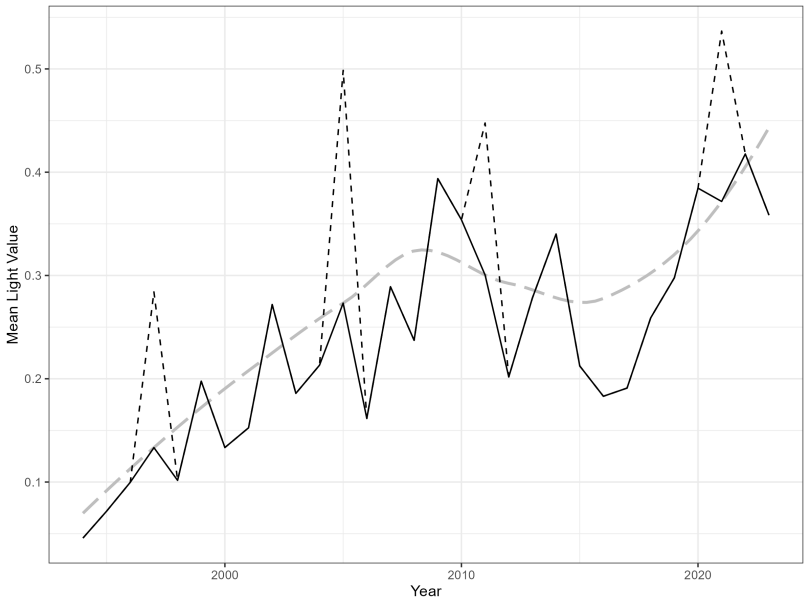

Figure 2: Example NTL raw and imputed values from Little Traverse Bay reservation. The solid lines represent yearly NTL estimates after imputation. The dashed lines represent NTL estimates prior to imputation. The long-dashed gray line represents the LOESS line used for imputation.

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.

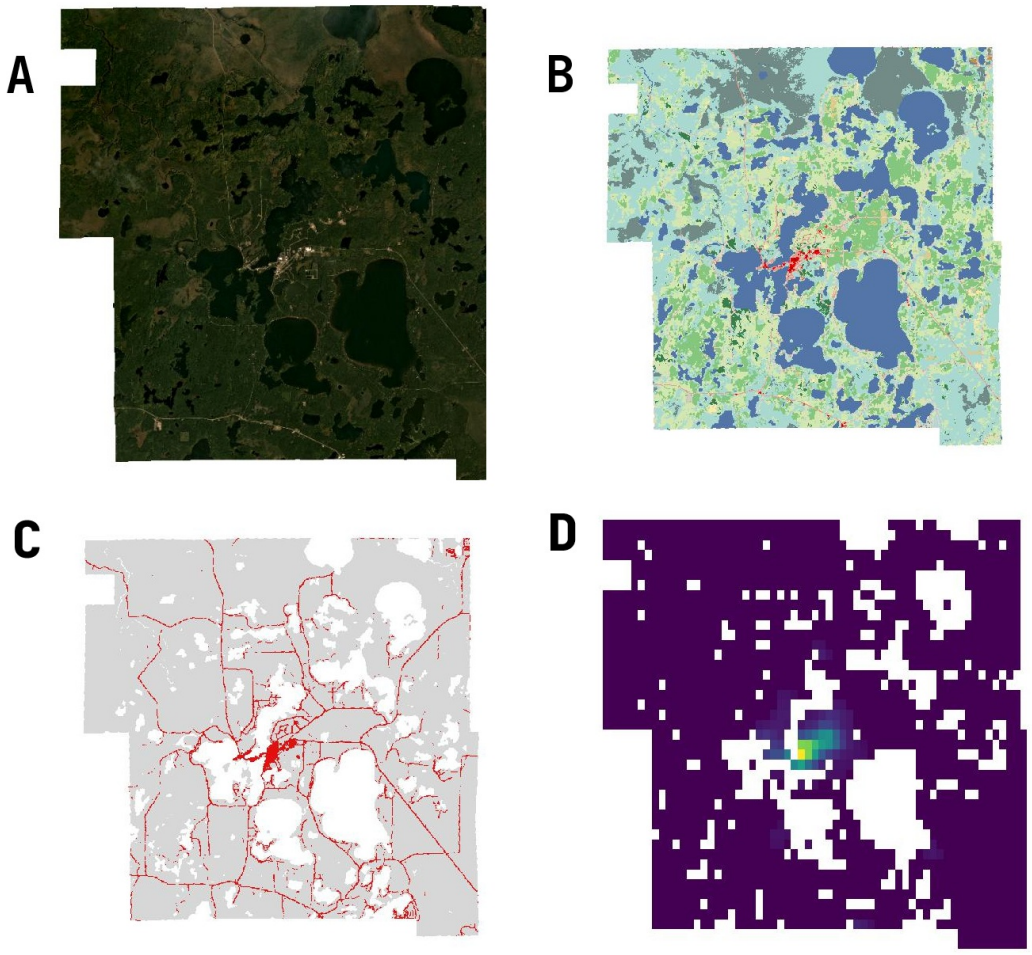

Figure 3: Example of NLCD and NTL data using the Lac du Flambeau reservation. Map A depicts the reservation through a basic satellite composite image to use as a quality reference for the other data. Map B presents the NLCD data from the same year as map A with all categories presented. Map C depicts 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).

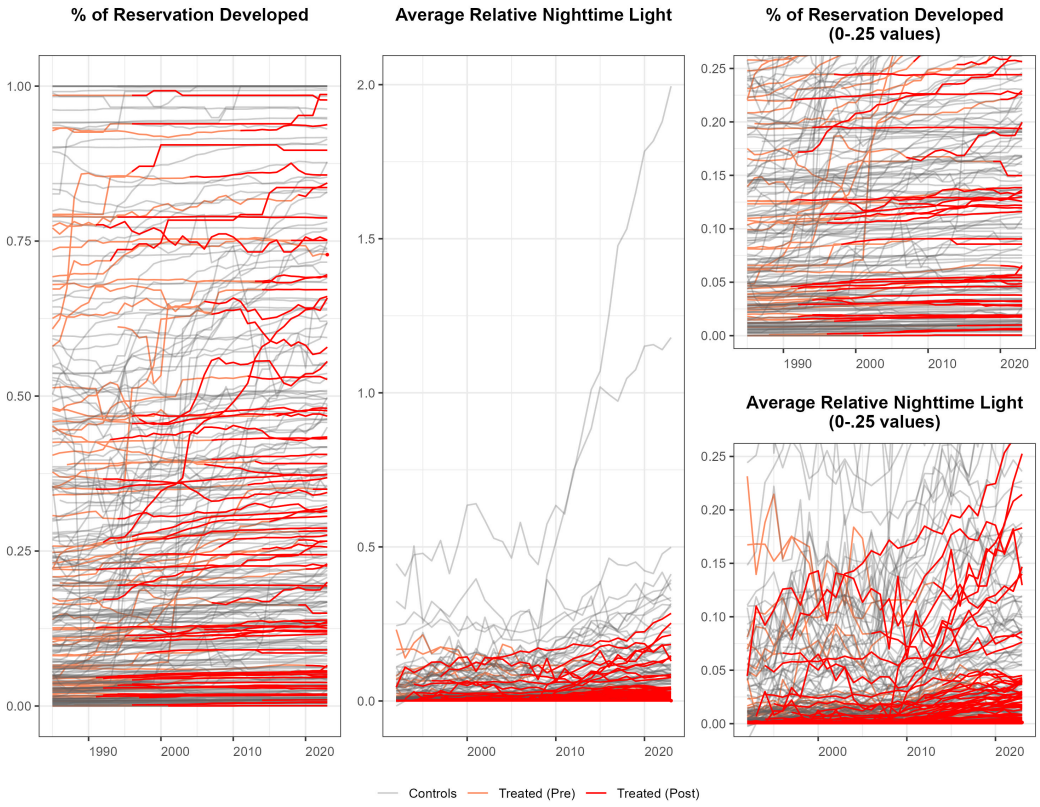

Figure 4: Change in economic development indicators. The leftmost panels depict the share of developed land and average relative nighttime light intensity for all reservations in sample. The two panels in the rightmost column present these same measures zoomed into the 0-0.25 range.

3.4 Measures of Resource Sufficiency

I gather four indicators of resource sufficiency: reservation size, average service population, average tribal enrollment, and participation in gaming industry.

Measuring reservation size is done through calculating the area of each reservation in my spatial data. I then binarized this measure to code all reservations at or above the median size as 1, and those below the median as 0.

Service population and tribal enrollment are taken from the Department of Housing and Urban

Development's (HUD) Indian Housing Block Grant (IHBG) Formula data.[5] 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 are roughly large vs. small populations/enrollments, groups which are unlikely to change significantly.

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.

One of the most important other factors to consider in this analysis is tribal involvement with gambling. The gaming industry is a major revenue driver for reservations, although the vast major of said revenue is concentrated among a few tribes (National Indian Gaming Commission 2023). Regardless, numerous studies have found that gaming has had a positive impact on the economic develop of reservations and native communities (e.g. Akee et al. 2010, Conner and Taggart 2013,

[5]Data available at this archive: https://web.archive.org/web/20250831195217/https://www.hud.gov/helping-americans/public-indian-housing-ihbgformula.

Akee, Spilde and Taylor 2015).

I gather data on gaming ownership and opening dates from an industry-based directory which extend back to 2001.[6] A small amount of establishments did not have an opening date listed. For these, I use a variety of historical sources to best estimate their opening year. I then link every establishment to their tribe and create a binary variable measuring whether the tribe had an open casino in a given year. One notable case of missingness to this data collection strategy is that any casino that opened and closed prior to 2001 is not observed. I use this yearly measuring of gaming participation in my validation exercise, as well as in the primary results models as a control variable.

Measures of Political Institutions

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.

For each constitution, I code three important, binary institutions: direct vs. indirect election of the chief executive, the presence of a direct democracy-style assembly system, and residency voting requirements. 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

[6]Data can be found at Casino City's GamingDirectory.com (https://gamingdirectory.com/)

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 switched to 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 s high level of accuracy in coding the three variables described, I coded all 183 constitutions with ChatGPT.

For the final institution I consider, the degree of social division on the reservation, I utilize data collected by Dippel (2014). That project 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.

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.

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

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.

$$\hat{Y}_{it}(0) = \beta_1 Gaming_{it} + \alpha_i + \xi_t + \varepsilon_{it} \tag{2}$$

Where $\hat{Y}_{it}(0)$ is the estimated share of developed land or average relative NTL intensity for reservation ,i, in year ,t. $\beta_1 Gaming_{it}$ 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.

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

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:

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

Where M represents all observations under treatment. Functionally, we are estimating outcomes 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:

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

[7] We 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.

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.

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 mesure 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. As previously discussed, the economic benefits of gaming to reservations are well understood and often discussed The economic benefits to tribal gaming are well understood in American Indian studies. The uncontroversial nature of gaming's overall effect make 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:

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

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 safetly 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 exihibited 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 Results

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:

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

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*		−0.015**		−0.016**		−0.013*		−0.016**	
	(0.007)		(0.005)		(0.006)		(0.005)		(0.004)	
Developed Land, % (1 Yr Post)	−0.004		−0.001		−0.001†		−0.001		−0.001	
	(0.003)		(0.001)		(0.001)		(0.000)		(0.001)	
Developed Land, % (8 Yr Post)	−0.013**		−0.008**		−0.011**		−0.009**		−0.009**	
	(0.005)		(0.003)		(0.003)		(0.003)		(0.002)	
Developed Land, % (16 Yr Post)	−0.025**		−0.019**		−0.021**		−0.018**		−0.019**	
	(0.008)		(0.006)		(0.007)		(0.006)		(0.005)	
Developed Land, % (24 Yr Post)	−0.025*		−0.022*		−0.026*		−0.022*		−0.022**	
	(0.011)		(0.010)		(0.012)		(0.010)		(0.008)	
Avg. Nightlights, %		−0.012**		−0.015**		−0.010*		−0.008†		−0.017**
		(0.004)		(0.005)		(0.004)		(0.005)		(0.003)
Avg. Nightlights, % (1 Yr Post)		−0.008**		−0.003*		−0.002*		−0.001		−0.003*
		(0.002)		(0.001)		(0.001)		(0.002)		(0.001)
Avg. Nightlights, % (8 Yr Post)		−0.011**		−0.007*		−0.008*		−0.006		−0.007**
		(0.003)		(0.003)		(0.003)		(0.004)		(0.002)
Avg. Nightlights, % (16 Yr Post)		−0.017**		−0.014**		−0.014**		−0.010†		−0.014**
		(0.005)		(0.005)		(0.005)		(0.005)		(0.003)
Avg. Nightlights, % (24 Yr Post)		−0.015†		−0.020*		−0.016		−0.016*		−0.020**
		(0.009)		(0.009)		(0.010)		(0.007)		(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 instensity 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.

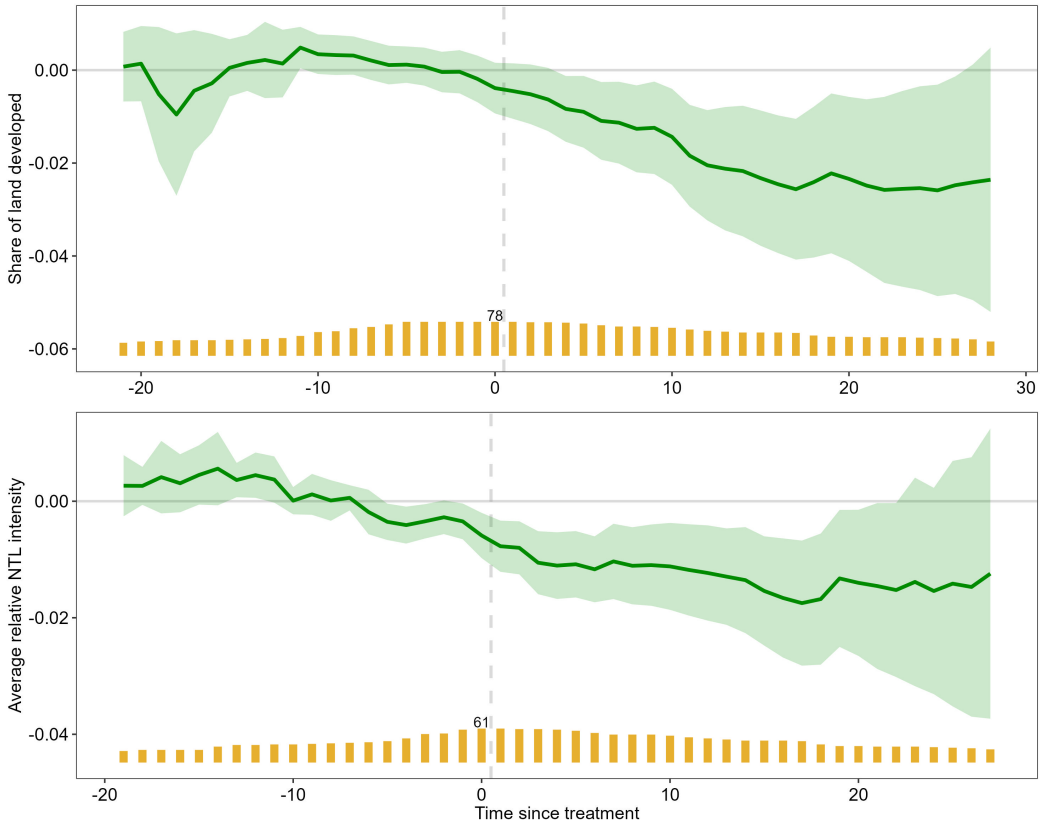

Figure 5: Dynamic treatment effects of self-governance. Plots generated using estimates from FEct models using the share of developed land (top) and average relative NTL intensity (bottom) as the outcome. Each point estimate represents average difference between the estimated control counterfactual and 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 model 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. It could also be a sign that the initial change may scare away investment for a time.

Overall, these results run counter to my expectation first hypothesis that economic development would increase under self-governance. Instead, self-governance led to a reduction in economic development just as large or larger than the positive impact of gaming. However, the negative effect from self-governance only lasts for approximately a decade. This may explain why I find positive correlations between self-governance and internet availability in my previous work. That study focused on the 2014-2019 time period. By that point, a majority of self-governance reservations would have been under an SGC for at least a decade and a half. Therefore, that improved learning may have enabled better future governance.

6 Heterogeneity

My second set of hypotheses concern how resource sufficiency and institutional quality determine outcomes under self-governance. Because the FEct strategy calculates unit-level treatment effects, observing heterogeneity in effects across different reservations is easy to visualize. 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.

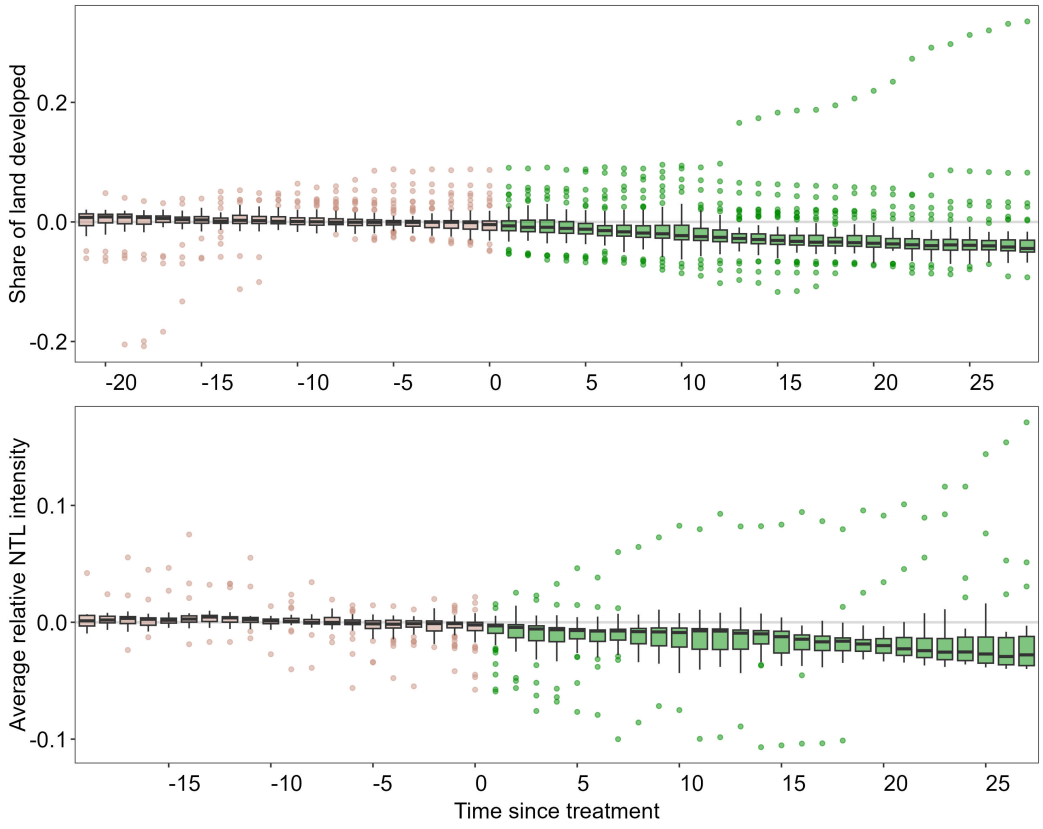

Figure 6: Individual effects of self-governance. Plots generated using estimates from FEct models using the share of developed land (top) and average relative NTL intensity (bottom) as the outcome. Depicts the difference between the observed Y_{it} and $\hat{Y}_{it}(0)$ for every treated unit relative 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 my theory and hypotheses on the determinants of self-governance success. 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 predictions 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 allows 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

	Reservation Size				Population Size				Enrollment Size				Median Income			
Outcome	Small	Large	Small	Large	Small	Large	Small	Large	Smalll	Large	Smalll	Large	Low Income	High Income	Low Income	High Income
Developed Land, %	−0.006	−0.026**			−0.002	−0.022**			−0.005	−0.024**			−0.019*	−0.014		
	(0.011)	(0.005)			(0.017)	(0.006)			(0.013)	(0.006)			(0.007)	(0.010)		
Developed Land, % (1 Yr Post)	0.001	−0.010**			0.000	−0.007*			0.003	−0.010**			-0.003	−0.008*		
	(0.005)	(0.003)			(0.006)	(0.003)			(0.005)	(0.003)			(0.004)	(0.004)		
Developed Land, % (8 Yr Post)	-0.005	−0.020**			-0.005	−0.015**			-0.002	−0.018**			−0.012†	−0.015*		
	(0.007)	(0.005)			(0.010)	(0.005)			(0.008)	(0.005)			(0.006)	(0.006)		
Developed Land, % (16 Yr Post)	-0.016	−0.031**			-0.008	−0.030**			-0.012	−0.032**			−0.027**	−0.019†		
	(0.013)	(0.006)			(0.019)	(0.007)			(0.014)	(0.008)			(0.009)	(0.011)		
Developed Land, % (24 Yr Post)	-0.009	−0.037**			-0.001	−0.033**			-0.011	−0.034**			−0.032**	-0.016		
	(0.022)	(0.007)			(0.035)	(0.009)			(0.024)	(0.009)			(0.011)	(0.017)		
Avg. Nightlights, %			-0.009	−0.015**			-0.010	−0.013**			-0.010	−0.014**			−0.012**	-0.009
			(0.008)	(0.003)			(0.010)	(0.003)			(0.008)	(0.004)			(0.003)	(0.006)
Avg. Nightlights, % (1 Yr Post)			−0.010*	−0.006**			−0.009*	−0.007**			−0.009*	−0.007**			−0.007**	−0.007*
			(0.004)	(0.002)			(0.005)	(0.002)			(0.004)	(0.002)			(0.002)	(0.003)
Avg. Nightlights, % (8 Yr Post)			−0.013*	−0.010**			-0.008	−0.012**			-0.009	−0.012**			−0.010**	−0.010*
			(0.006)	(0.003)			(0.009)	(0.003)			(0.007)	(0.003)			(0.002)	(0.005)
Avg. Nightlights, % (16 Yr Post)			-0.018	−0.016**			-0.014	−0.017**			-0.013	−0.019**			−0.016**	−0.013†
			(0.011)	(0.004)			(0.017)	(0.004)			(0.011)	(0.005)			(0.004)	(0.008)
Avg. Nightlights, % (24 Yr Post)			0.006	−0.026**			-0.002	−0.019*			-0.008	−0.019*			−0.019**	-0.004
			(0.018)	(0.007)			(0.025)	(0.008)			(0.016)	(0.009)			(0.007)	(0.011)
Placebo F Test	0.321	0.008	0.044	0.002	0.540	0.366	0.087	0.001	0.219	0.057	0.034	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

	Executive Selection				Residency Voting				Direct Democracy				Ethnic Division			
Outcome	Parliamentary	Presidential	Parliamentary	Presidential	Unrestricted	Restricted	Unrestricted	Restricted	None	Exists	None	Exists	Shallow	Deep	Shallow	Deep
Developed Land, %	-0.007	−0.017*			-0.009	−0.023*			-0.007	−0.021*			−0.011†	-0.006		
	(0.020)	(0.008)			(0.011)	(0.010)			(0.014)	(0.008)			(0.007)	(0.006)		
Developed Land, % (1 Yr Post)	0.001	-0.003			0.002	−0.011†			0.000	-0.004			−0.005†	0.000		
	0.006	0.004			0.004	0.005			0.005	0.004			0.003	0.004		
Developed Land, % (8 Yr Post)	-0.006	−0.012†			-0.005	−0.021*			-0.006	−0.014†			-0.007	-0.001		
	(0.010)	(0.007)			(0.008)	(0.008)			(0.008)	(0.007)			(0.005)	(0.006)		
Developed Land, % (16 Yr Post)	-0.014	−0.025*			-0.016	−0.032*			-0.014	−0.029*			-0.015	-0.008		
	(0.021)	(0.010)			(0.013)	(0.013)			(0.015)	(0.011)			(0.010)	(0.007)		
Developed Land, % (24 Yr Post)	-0.010	−0.027*			-0.019	-0.024			-0.011	−0.031*			-0.018	-0.012		
	(0.031)	(0.013)			(0.019)	(0.016)			(0.023)	(0.012)			(0.013)	(0.008)		
Avg. NTL, %			−0.014**	−0.014**			−0.015**	−0.012*			−0.012**	−0.016**			−0.009**	−0.007**
			0.005	0.005			0.004	0.006			0.005	0.005			0.003	0.003
Avg. Nightlights, % (1 Yr Post)			-0.003	−0.010**			−0.007*	−0.011*			−0.005†	−0.011**			−0.004†	−0.004†
			(0.002)	(0.003)			(0.003)	(0.005)			(0.003)	(0.004)			(0.002)	(0.002)
Avg. Nightlights, % (8 Yr Post)			−0.010*	−0.012**			−0.010**	−0.014**			−0.009*	−0.014**			−0.007†	−0.007**
			(0.004)	(0.004)			(0.003)	(0.005)			(0.004)	(0.004)			(0.004)	(0.002)
Avg. Nightlights, % (16 Yr Post)			−0.014**	−0.019**			−0.015**	−0.023**			−0.017**	−0.019**			−0.011**	−0.008*
			(0.005)	(0.006)			(0.005)	(0.007)			(0.005)	(0.006)			(0.004)	(0.003)
Avg. Nightlights, % (24 Yr Post)			−0.020†	−0.020*			−0.026**	-0.008			−0.023*	−0.018†			−0.016*	-0.007
			(0.012)	(0.010)			(0.010)	(0.014)			(0.011)	(0.010)			(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, on their face, seem to support some of my hypotheses. 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.

There should be caution in reading to far into these results, however. The significance testing in these results is not comparing the estimated effects between the two subgroups, but between each

subgroup estimate and zero. While the pattern is notable, looking at the variance in effects tells a different story. 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. This suggests not that the subgroups with null effects truly saw no negative impact under self-governance, just that reservations of this type had much greater variance in outcomes. So it is hard to take away from these results that any institution made a meaningful difference in the effect of self-governance.

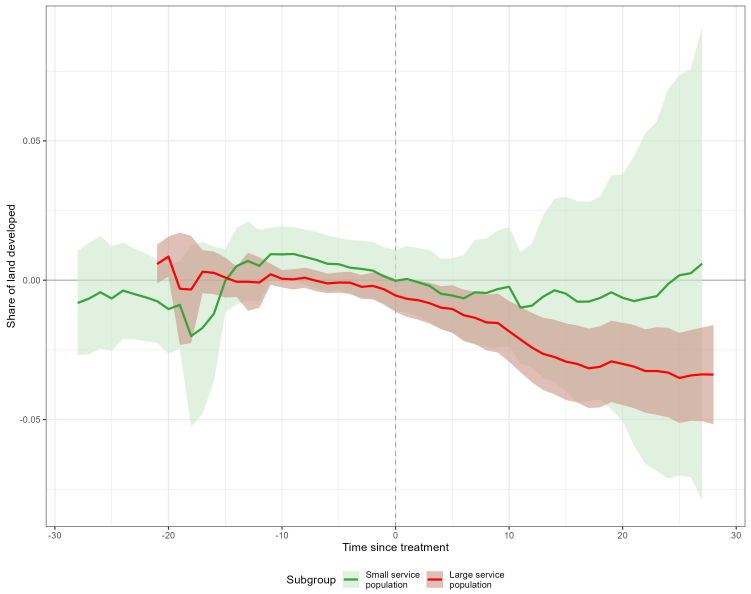

Figure 7: Dynamic treatment effects for small and large service populations. Each point estimate represents average difference between the estimated control counterfactual and the observed outcome value for all treated units at a given time relative to treatment onset. 95% confidence intervals generated 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

To answer the question of whether local self-governance improves outcomes for local communities, I analyzed the effect of expanding self-governance for American Indian tribal governments on the economic development of their reservations. I find, contrary to expectation and previous work, that self-governance had a significant, negative impact on reservation economies. Furthermore, I find that no institutional feature of tribal governance meaningfully moderated the effect.

These results raise questions for the broader literature on American local politics. When does local governance capacity stand in the way of better outcomes for local communities? What features make for higher capacity local governments? In general, by looking at a case outside the typical wheelhouse of local politics, this study raises broader questions about the layered system of subnational governance in the United States that oftentimes is just assumed without question. In return, the study of American Indian politics could also learn from local politics. Many of the issues local politics scholars discuss like housing, education, and land use, have clear parallels in the indigenous context. However, these topics remain understudied. Perhaps drawing more on local politics work could spark more research activity.

In regards to what these results say about tribal self-governance, this study points to challenges in tribal governance. These findings fit with other work suggesting that native nations pay a cost for their self-governance, one that native populations may be happy to pay for their sovereignty. In relation to the compacting process specifically, further research is needed to understand what drives the negative effect of self-governance. Are tribal governments making poor policy decisions? Are tribal governments unable to carry out their policy preferences? Do tribal populations have a preference for policies that slow development? Is there a wider issue with how funding was passed onto to tribes?

It should also be kept in mind that in the grand scheme of American governance, modern tribal governments are relatively young. Tribal governance was not formally accepted until the 1930s and not empowered to actually function until the 1960s at the earliest. We are still in the early period of native self-governance and future work should keep this in mind and consider more

deeply the broader arc of tribal governance development in the United States. We have very little work detailing how tribal governments have built themselves up, what different political institutions mean both affectively and effectively in these communities, and where tribal governance could go in the future. The answers to how tribal self-governance could work better for reservations may lie in these historical details.

References

Akee, Randall KQ, Eric Henson, Miriam Jorgensen and Joseph Kalt. 2020. "Dissecting the US Treasury Department's Round 1 Allocations of CARES Act COVID-19 Relief Funding for Tribal Governments.".

Akee, Randall KQ, Katherine A Spilde and Jonathan B Taylor. 2015. "The Indian gaming regulatory act and its effects on American Indian economic development." *Journal of Economic Perspectives* 29(3):185–208.

Akee, Randall KQ, William E Copeland, Gordon Keeler, Adrian Angold and E Jane Costello. 2010. "Parents' incomes and children's outcomes: a quasi-experiment using transfer payments from casino profits." *American Economic Journal: Applied Economics* 2(1):86–115.

Akee, Randall, Miriam Jorgensen and Uwe Sunde. 2015. "Critical junctures and economic development–Evidence from the adoption of constitutions among American Indian nations." *Journal of Comparative Economics* 43(4):844–861.

Anderson, Terry L and Dominic P Parker. 2008. "Sovereignty, credible commitments, and economic prosperity on American Indian reservations." *The Journal of Law and Economics* 51(4):641–666.

Anzia, Sarah F. 2022. *Local interests: politics, policy, and interest groups in US city governments*. University of Chicago Press.

Baragwanath, Kathryn and Ella Bayi. 2020. "Collective property rights reduce deforestation in the Brazilian Amazon." *Proceedings of the National Academy of Sciences* 117(34):20495–20502.

Bardhan, Pranab and Dilip Mookherjee. 2006. "Decentralisation and accountability in infrastructure delivery in developing countries." *The Economic Journal* 116(508):101–127.

Bauer, Anahid, Donn L Feir and Matthew T Gregg. 2022. "The tribal digital divide: Extent and Explanations." *Telecommunications Policy* 46(9):102401.

Bernhard, Rachel and Sean Freeder. 2020. "The more you know: Voter heuristics and the information search." *Political Behavior* 42(2):603–623.

Binder, Michael, Matthew Childers, Andrew Hopkins and Colleen Hampsey. 2016. In voters' minds, are all politics really local? Comparing voters' knowledge of national and local politics.

In *conference proceedings of the state politics and policy*. pp. 19–21.

Brouwer, NR. 2024. "Exploring the Influence of Tribal Governance Capacity: Evidence from Internet Availability in Indian Country." *Journal of Political Institutions and Political Economy* 5(2):179–207.

Burchfield, Marcy, Henry G Overman, Diego Puga and Matthew A Turner. 2006. "Causes of sprawl: A portrait from space." *The Quarterly Journal of Economics* 121(2):587–633.

Cai, Hongbin and Daniel Treisman. 2004. "State corroding federalism." *Journal of Public Economics* 88(3-4):819–843.

Callaway, Brantly and Pedro HC Sant'Anna. 2021. "Difference-in-differences with multiple time periods." *Journal of econometrics* 225(2):200–230.

Carter, Christopher L. 2022. "The autonomy-representation dilemma: Indigenous groups and distributive benefits in the Americas." *Journal of Race, Ethnicity, and Politics* 7(2):294–315.

Cengiz, Doruk, Arindrajit Dube, Attila Lindner and Ben Zipperer. 2019. "The effect of minimum wages on low-wage jobs." *The Quarterly Journal of Economics* 134(3):1405–1454.

Chen, Xiuxiu, Zeyu Wang, Feng Zhang, Guoqiang Shen and Qiuxiao Chen. 2024. "A global annual simulated VIIRS nighttime light dataset from 1992 to 2023." *Scientific Data* 11(1):1380.

Chiu, Albert, Xingchen Lan, Ziyi Liu and Yiqing Xu. 2023. "Causal panel analysis under parallel trends: lessons from a large reanalysis study." *American Political Science Review* pp. 1–22.

Conner, Thaddieus W and William A Taggart. 2013. "Assessing the impact of Indian gaming on American Indian nations: Is the house winning?" *Social Science Quarterly* 94(4):1016–1044.

Connolly, Michele and Bette Jacobs. 2020. "Counting Indigenous American Indians and Alaska Natives in the US census." *Statistical Journal of the IAOS* 36(1):201–210.

Cordell, Rebecca, Kristian Skrede Gleditsch, Florian G Kern and Laura Saavedra-Lux. 2020. "Measuring institutional variation across American Indian constitutions using automated content analysis." *Journal of Peace Research* 57(6):777–788.

Cornell, Stephen and Joseph P Kalt. 1990. "Pathways from poverty: Economic development and institution-building on American Indian reservations." *American Indian Culture and Research*

Journal 14(1).

Corntassel, Jeff and Richard C Witmer. 2008. *Forced federalism: Contemporary challenges to indigenous nationhood*. Vol. 3 University of Oklahoma Press.

Crepelle, Adam, Paasha Mahdavi and Dominic Parker. 2024. "Effects of per capita payments on governance: evidence from tribal casinos." *Public Choice* 199(3):319–340.

Crepelle, Adam, Tate Fegley and Ilia Murtazashvili. 2024. "Military societies: Self-governance and criminal justice in Indian country." *Public Choice* 199(3):367–385.

Crepelle, Adam, Tate Fegley, Ilia Murtazashvili and Jennifer Brick Murtazashvili. 2022. "Community policing on American Indian reservations: a preliminary investigation." *Journal of Institutional Economics* 18(5):843–860.

de Benedictis-Kessner, Justin. 2018. "How attribution inhibits accountability: evidence from train delays." *The Journal of Politics* 80(4):1417–1422.

Díaz-Cayeros, Alberto, Beatriz Magaloni and Alexander Ruiz-Euler. 2014. "Traditional governance, citizen engagement, and local public goods: Evidence from Mexico." *World development* 53:80–93.

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

Dippel, Christian, Dustin Frye and Bryan Leonard. 2020. Property rights without transfer rights: a study of Indian land allotment. Technical report National Bureau of Economic Research.

Einstein, Katherine Levine, David M Glick and Maxwell Palmer. 2019. *Neighborhood Defenders*. 1 ed. Cambridge: Cambridge University Press.

Evans, Laura E. 2011*a*. "Expertise and scale of conflict: Governments as advocates in American Indian politics." *American Political Science Review* 105(4):663–682.

Evans, Laura E. 2011*b*. *Power from powerlessness: Tribal governments, institutional niches, and American federalism*. Oxford University Press.

Faguet, Jean-Paul. 2014. "Decentralization and governance." *World Development* 53:2–13.

Faguet, Jean-Paul and Fabio Sánchez. 2008. "Decentralization's effects on educational outcomes

in Bolivia and Colombia." *World development* 36(7):1294–1316.

Ferguson, Kennan. 2016. "Why does political science hate American Indians?" *Perspectives on Politics* 14(4):1029–1038.

Fischer, Harry W. 2016. "Beyond participation and accountability: Theorizing representation in local democracy." *World Development* 86:111–122.

Foa, Roberto Stefan. 2022. "Decentralization, historical state capacity and public goods provision in Post-Soviet Russia." *World Development* 152:105807.

Foxworth, Raymond, Laura E Evans, Gabriel R Sanchez, Cheryl Ellenwood and Carmela M Roybal. 2022. ""I hope to hell nothing goes back to the way it was before": COVID-19, marginalization, and native nations." *Perspectives on Politics* 20(2):439–456.

Frye, Dustin and Dominic P Parker. 2016. "Paternalism versus Sovereignty." *Unlocking the Wealth of Indian Nations* p. 224.

Gailmard, Sean and John W Patty. 2012. *Learning while governing: Expertise and accountability in the executive branch*. University of Chicago Press.

Gerber, Elisabeth R and Daniel J Hopkins. 2011. "When mayors matter: estimating the impact of mayoral partisanship on city policy." *American Journal of Political Science* 55(2):326–339.

Gulzar, Saad, Apoorva Lal and Benjamin Pasquale. 2024. "Representation and forest conservation: Evidence from India's scheduled areas." *American Political Science Review* 118(2):764–783.

Hajnal, Zoltan L. 2009. *America's uneven democracy: race, turnout, and representation in city politics*. Cambridge University Press.

Hall, Jeremy L. 2008. "The forgotten regional organizations: Creating capacity for economic development." *Public Administration Review* 68(1):110–125.

Hankinson, Michael and Asya Magazinnik. 2023. "The supply-equity trade-off: The effect of spatial representation on the local housing supply." *The Journal of Politics* 85(3):1033–1047.

Harris, Richard R, Greg Blomstrom and Gary Nakamura. 1995. "Tribal self-governance and forest management at the Hoopa Valley Indian reservation, Humboldt county, California." *American Indian culture and research journal* 19(1).

Henson, Eric C. 2008. *The state of the native nations: Conditions under US policies of self-determination*. Oxford University Press, USA.

Hopkins, Daniel J. 2022. *The increasingly United States: How and why American political behavior nationalized*. University of Chicago Press.

Kalt, Joseph. 2022. "American Indian Self-Determination Through Self-Governance: The Only Policy That Has Ever Worked." *Testimony before the Alyce Spotted Bear and Walter Soboleff Commission on Native Children* .

Klein, Ezra and Derek Thompson. 2025. *Abundance*. Simon and Schuster.

Krepps, Matthew B and Richard E Caves. 1994. "Bureaucrats and Indians: Principal-agent relations and efficient management of tribal forest resources." *Journal of economic behavior & organization* 24(2):133–151.

Kroth, Verena, Valentino Larcinese and Joachim Wehner. 2016. "A better life for all? Democratization and electrification in post-apartheid South Africa." *The Journal of Politics* 78(3):774–791.

Leonard, Bryan and Dominic P Parker. 2021. "Fragmented ownership and natural resource use: Evidence from the Bakken." *The Economic Journal* 131(635):1215–1249.

Leonard, Bryan, Dominic P Parker and Terry L Anderson. 2020. "Land quality, land rights, and indigenous poverty." *Journal of Development Economics* 143:102435.

Liu, Licheng, Ye Wang and Yiqing Xu. 2024. "A practical guide to counterfactual estimators for causal inference with time-series cross-sectional data." *American Journal of Political Science* 68(1):160–176.

Magaloni, Beatriz, Alberto Díaz-Cayeros and Alexander Ruiz Euler. 2019. "Public good provision and traditional governance in indigenous communities in Oaxaca, Mexico." *Comparative Political Studies* 52(12):1841–1880.

Manor, James. 1999. *The political economy of democratic decentralization*. World Bank.

Martinez-Vazquez, Jorge and Robert M McNab. 2003. "Fiscal decentralization and economic growth." *World development* 31(9):1597–1616.

McMurry, Nina. 2022. "From recognition to integration: Indigenous autonomy, state authority,

and national identity in the Philippines." *American Political Science Review* 116(2):547–563.

Min, Brian. 2015. *Power and the vote: Elections and electricity in the developing world*. Cambridge University Press.

Mondak, Jeffery J. 1995. "Newspapers and political awareness." *American Journal of Political Science* pp. 513–527.

Murray, Mariel J., Cassandria Dortch and Elayne J. Heisler. 2025. "Tribal Self-Determination Authorities: Overview and Issues for Congress." Congressional Research Service Report No. R48256.

National Indian Gaming Commission. 2023. "FY 2022 Gross Gaming Revenue Report.".

Newland, Bryan. 2024. "Statement before the Committee on Natural Resources Subcommittee on Indian and Insular Affairs, House of Representatives." U.S. Congress, 118th Congress, 2nd Session. Hearing on "Advancing Tribal Self-Determination: Examining Bureau of Indian Affairs' 638 Contracting".

Oates, Wallace E. 1972. *Fiscal federalism*. New York: Harcourt.

Oates, Wallace E. 1999. "An essay on fiscal federalism." *Journal of economic literature* 37(3):1120–1149.

Oliver, J Eric and Shang E Ha. 2007. "Vote choice in suburban elections." *American Political Science Review* 101(3):393–408.

Ostrom, Elinor. 1990. *Governing the commons: The evolution of institutions for collective action*. Cambridge university press.

Ostrom, Vincent, Charles M Tiebout and Robert Warren. 1961. "The organization of government in metropolitan areas: a theoretical inquiry." *American political science review* 55(4):831–842.

Peterson, Erik. 2021. "Paper cuts: How reporting resources affect political news coverage." *American Journal of Political Science* 65(2):443–459.

Piano, Ennio E and Louis Rouanet. 2024. "The calculus of american indian consent: the law and economics of tribal constitutions." *Public Choice* 199(3):341–366.

Provins, Tessa. 2024. "The political economy of climate action in Indian Country." *Public Choice*

199(3):257–283.

Prud'Homme, Remy. 1995. "The dangers of decentralization." *The world bank research observer* 10(2):201–220.

Ratté, Kathy and Terry L Anderson. 2022. *Renewing Indigenous Economies*. Hoover Press.

Rodden, Jonathan. 2006. *Hamilton's paradox: the promise and peril of fiscal federalism*. Vol. 2 Cambridge University Press Cambridge.

Saiz, Albert. 2010. "The geographic determinants of housing supply." *The Quarterly Journal of Economics* 125(3):1253–1296.

Sanford, Luke. 2023. "Democratization, elections, and public goods: the evidence from deforestation." *American Journal of Political Science* 67(3):748–763.

Schaffner, Brian F, Jesse H Rhodes and Raymond J La Raja. 2020. *Hometown inequality: Race, class, and representation in American local politics*. Cambridge University Press.

Schroedel, Jean, Aaron Berg, Joseph Dietrich and Javier M. Rodriguez. 2020. "Political Trust and Native American Electoral Participation: An Analysis of Survey Data from Nevada and South Dakota." *Social Science Quarterly* 101(5):1885–1904.

Schroeder, Jonathan, David Van Riper, Steven Manson, Katherine Knowles, Tracy Kugler, Finn Roberts and Steven Ruggles. 2025. "IPUMS National Historical Geographic Information System: Version 20.0.". [dataset].

Seabright, Paul. 1996. "Accountability and decentralisation in government: An incomplete contracts model." *European economic review* 40(1):61–89.

Shaker, Lee. 2012. "Local political knowledge and assessments of citizen competence." *Public Opinion Quarterly* 76(3):525–537.

Stratmann, Thomas. 2024. "A reservation economic freedom index." *Public Choice* 199(3):213–231.

Strommer, Geoffrey D and Stephen D Osborne. 2014. "The history, status, and future of tribal self-governance under the Indian Self-Determination and Education Assistance Act." *Am. Indian L. Rev.* 39:1.

Stuart, Paul H. 1990. "Financing self-determination: Federal Indian expenditures, 1975–1988." *American Indian culture and research journal* 14(2).

Sun, Liyang and Sarah Abraham. 2021. "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects." *Journal of econometrics* 225(2):175–199.

Tatum, Melissa L., Miriam Jorgensen, Mary E. Guss and Sarah Deer. 2014. *Structuring sovereignty : constitutions of native nations*. Los Angeles, California: American Indian Studies Center.

Terman, Jessica N and Richard C Feiock. 2015. "Improving outcomes in fiscal federalism: Local political leadership and administrative capacity." *Journal of Public Administration Research and Theory* 25(4):1059–1080.

Tiebout, Charles M. 1956. "A pure theory of local expenditures." *Journal of political economy* 64(5):416–424.

Tiller, Veronica E. Velarde. 2015. *Tiller's guide to Indian country : economic profiles of American Indian reservations*. Third edition. ed. BowArrow Publishing Company.

Tocqueville, Alexis de. 1835. *Democracy in America*. London: Saunders and Otley.

Treisman, Daniel. 2007. *The architecture of government: Rethinking political decentralization*. Cambridge University Press.

Trounstine, Jessica. 2016. "Segregation and inequality in public goods." *American Journal of Political Science* 60(3):709–725.

Trounstine, Jessica. 2020*a*. "The geography of inequality: How land use regulation produces segregation." *American Political Science Review* 114(2):443–455.

Trounstine, Jessica. 2020*b*. "Local political economy: The state of the field: Past, present, and future." *Journal of Political Institutions and Political Economy* 1(3):319–340.

United Nations General Assembly. 2007. "United Nations Declaration on the Rights of Indigenous Peoples.". Resolution adopted by the General Assembly on 13 September 2007, A/RES/61/295.

U.S. Geological Survey (USGS). 2024. "Annual NLCD Collection 1 Science Products.". U.S. Geological Survey data release.

Wang, XiaoHu, Christopher V Hawkins, Nick Lebredo and Evan M Berman. 2012. "Capacity to

sustain sustainability: A study of US cities." *Public Administration Review* 72(6):841–853.

Weingast, Barry R. 2009. "Second generation fiscal federalism: The implications of fiscal incentives." *Journal of urban economics* 65(3):279–293.

Weingast, Barry R. 2014. "Second generation fiscal federalism: Political aspects of decentralization and economic development." *World Development* 53:14–25.

Weinstock, Daniel. 2001. "Towards a normative theory of federalism." *International Social Science Journal* 53(167):75–83.

Wellhausen, Rachel L et al. 2017. "Sovereignty, law, and finance: Evidence from american indian reservations." *Quarterly Journal of Political Science* 12(4):405–436.

Wilkins, David E. 2024. *Indigenous Governance: Clans, Constitutions, and Consent*. Oxford University Press.

Witmer, Richard and Frederick J Boehmke. 2007. "American Indian political incorporation in the post-Indian Gaming Regulatory Act era." *The Social Science Journal* 44(1):127–145.

Xu, Yiqing. 2017. "Generalized synthetic control method: Causal inference with interactive fixed effects models." *Political Analysis* 25(1):57–76.

Zhou, Yang-Yang and Andrew Shaver. 2021. "Reexamining the effect of refugees on civil conflict: a global subnational analysis." *American Political Science Review* 115(4):1175–1196.