

KEYS TO UNLOCKING BUSINESS DEVELOPMENT IN INDIAN COUNTRY

Office of Policy Analysis and Development



MINORITY BUSINESS
DEVELOPMENT AGENCY
U.S. DEPARTMENT OF COMMERCE

Keys to Unlocking Business Development in Indian Country

U.S. Department of Commerce, Minority Business Development Agency

by
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Foreword

“Native communities are no longer economically defined by natural resource projects and gaming facilities. They are pursuing business development in manufacturing, professional services, and renewable energy, among others.”

With 574 Federally Recognized Native American tribes in the United States, Native American-owned businesses are often economic and social anchors for their communities across Indian Country. They create jobs, a sense of place, and generate income and growth.

Most tribal reservations are in rural areas making economic geography a defining feature of Native American business development. Today, however, Native economies are no longer solely defined by natural resource projects and gaming facilities. Tribes are pursuing business development in manufacturing, professional services, and renewable energy, among other growth sectors. This dynamism reflects the determination of Native American entrepreneurs and increased self-governance.

What's standing in the way of higher growth for Native economies?

The Minority Business Development Agency commissioned research to examine the effects of remoteness, which is a reality for many of the 574 Tribal Nations in the United States.

Our research reaffirms that digital infrastructure and educational attainment are two key factors that hold the potential to unlock more business opportunities, better jobs, and sustained growth for businesses in Indian country. Equally important, this report concedes there is a need for greater data collection by statistical agencies to understand tribal business development.

The Keys to Unlocking Business Development in Indian Country report also shines light on the current constraints to business development in Indian Country. Understanding these constraints relative to emerging markets and evolving industries exposes new opportunities for business development in Indian Country.

We encourage business leaders, tribal leaders, academics, and other stakeholders to engage us on the question of how to stimulate Native American businesses and tribal economies.

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Key Sections



Business and Workers in Indian Country

A defining feature of tribal reservations is economic geography: most tribal reservations are located in rural or remote areas.



Key variables across tribal areas

Even a large gaming facility or major natural resource project cannot make up for the disadvantages of remoteness.



Econometric analysis and results

Two key explanatory factors for economic and business development that can help to overcome disadvantages of remoteness are educational attainment and internet infrastructure.

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Executive Summary

This report examines the key determinants of business development on tribal reservations. A defining feature of tribal reservations is economic geography as most tribal reservations are located in rural or remote areas. Not surprisingly, many economic and socioeconomic characteristics of tribal reservations mirror that of the rural United States. In terms of business development and overcoming the economic disadvantages associated with remoteness, the empirical results point to the importance of tribal areas having a skilled workforce, internet connectivity, a sound digital infrastructure, and access to a sufficiently large market and labor market pool. Our field research also revealed a general consensus on the importance of self-governance in overcoming the unique regulatory issues surrounding tribal trust land and business development.

Business development in Indian Country, similar to business development in remote or rural areas, relies on access to outside capital, labor, and markets, and policies that facilitate such access should be a priority. These policies may include but are not limited to building out digital infrastructure in tribal areas, tribal business capacity building in e-commerce and digital platforms, skills training and workforce development, increasing opportunities for higher education, and identifying and maximizing government contract opportunities. Another policy priority should be raising awareness of the ways self-governance can facilitate tribal business development.

It must be noted that different tribes have different priorities and business development is not a primary concern of every tribe. Notwithstanding, tribal businesses across the country are developing expertise in areas such as advanced manufacturing, professional and technical services, online retail, renewable energy, and ecotourism. The growth and diversification are in part a result of tribes leveraging opportunities and benefits designed specifically for tribal businesses, but they also reflect the dynamism and determination of Native American-owned and tribal businesses and increased prevalence of self-determination and self-governance.



KEY FINDINGS

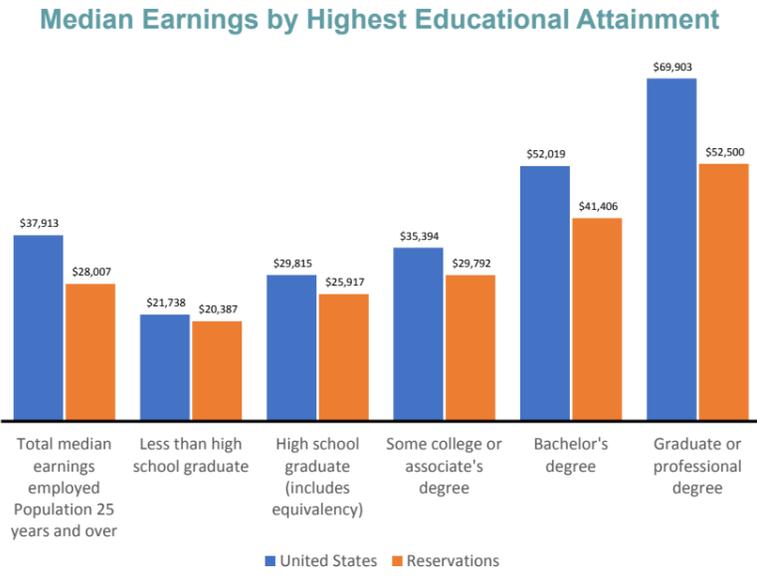


“Tribal businesses across the country are developing expertise in areas such as advanced manufacturing, professional and technical services, online retail, renewable energy, and ecotourism.”

Economic geography is an important feature of the dynamics of tribal business development, as most tribal reservations are located in rural or remote areas. Even a large gaming facility like a casino or major natural resource project cannot make up for the disadvantages of remoteness.



The share of self-employed is positively and significantly associated with educational attainment, which reflects the need for a well-trained workforce to support business development.



Self-governance can facilitate business development on trust land by expediting the often-exhaustive process of project development from beginning to end at the local-level all while complying with the code of federal regulations regarding land use restrictions for tribal trust land.

Data collection efforts by statistical agencies that can track business establishment by reservation, and/or follow individual tribal businesses over time would greatly further our understanding of business development in Indian Country. Information on the enterprise's cost structure, the types of intermediate goods and services, labor occupations, physical asset types, and other fixed factors that are used would provide insight into the different types of barriers to business development in Indian Country across industries and enable a more targeted policy discussion. Workforce characteristic data on mobility in terms of movement on or off the reservation would also be beneficial.



Two key factors for economic and business development that can help to overcome disadvantages of remoteness are educational attainment and internet infrastructure.



High-speed internet and a personal computer are key determinants to economic development and business development in tribal areas and point to the need for greater investment in connectivity in these remote areas.

Introduction

Indian Country is evolving and tribes are finding ways to overcome longstanding challenges and create new opportunities to foster business development and economic well-being on tribal reservations.

This report examines the key determinants of business development on tribal reservations. First, the analysis considers key economic characteristics across tribal reservations and compares these characteristics to the broader U.S. economy as well as other segments of the population, such as regional and rural areas. Second, the report includes statistical and econometric analysis to examine key determinants of business ownership on tribal reservations, and the key determinants of unemployment on tribal reservations.

Most tribal reservations are in rural or remote areas (Figure 1). The findings in this report shed light on key characteristics and policies that can help tribal businesses overcome the disadvantages of being in a remote area and, in some cases, even take advantage of the remoteness.

Some tribes are focusing on self-governance to reacquire land, regain direct control of their services, lower regulatory burdens, and facilitate business development. Others are forming tribal companies to leverage government and business opportunities.

The findings indicate that educational attainment and digital infrastructure are key determinants of economic performance and business development in Indian Country. Economic geography is a defining feature, as most tribal reservations are located in rural or remote areas, and even a casino or major natural resource project cannot make up for the disadvantages in business development. Access to a computer is both economically and statistically important in reducing unemployment. In addition, educational attainment and digital infrastructure (internet connectivity or access to a computer) are two important factors for self-employment or ownership of an incorporated business. The results also point to the importance of access to larger markets outside the immediate reservation, which underscores the essential role of digital platforms and government contracts as ways to expand the reach of tribal businesses, especially those in remote areas.

A tribal reservation-level dataset was developed for this report (see Appendix A) and includes select characteristics of federally recognized tribes, such as workforce characteristics of people that live on the reservation (which may include tribal members and non-members), business development, and other variables obtained from the American Community Survey. The dataset also includes distance from an urban area, and indicators of whether a tribe has a casino, a major natural resource project, and a tribal college or university.

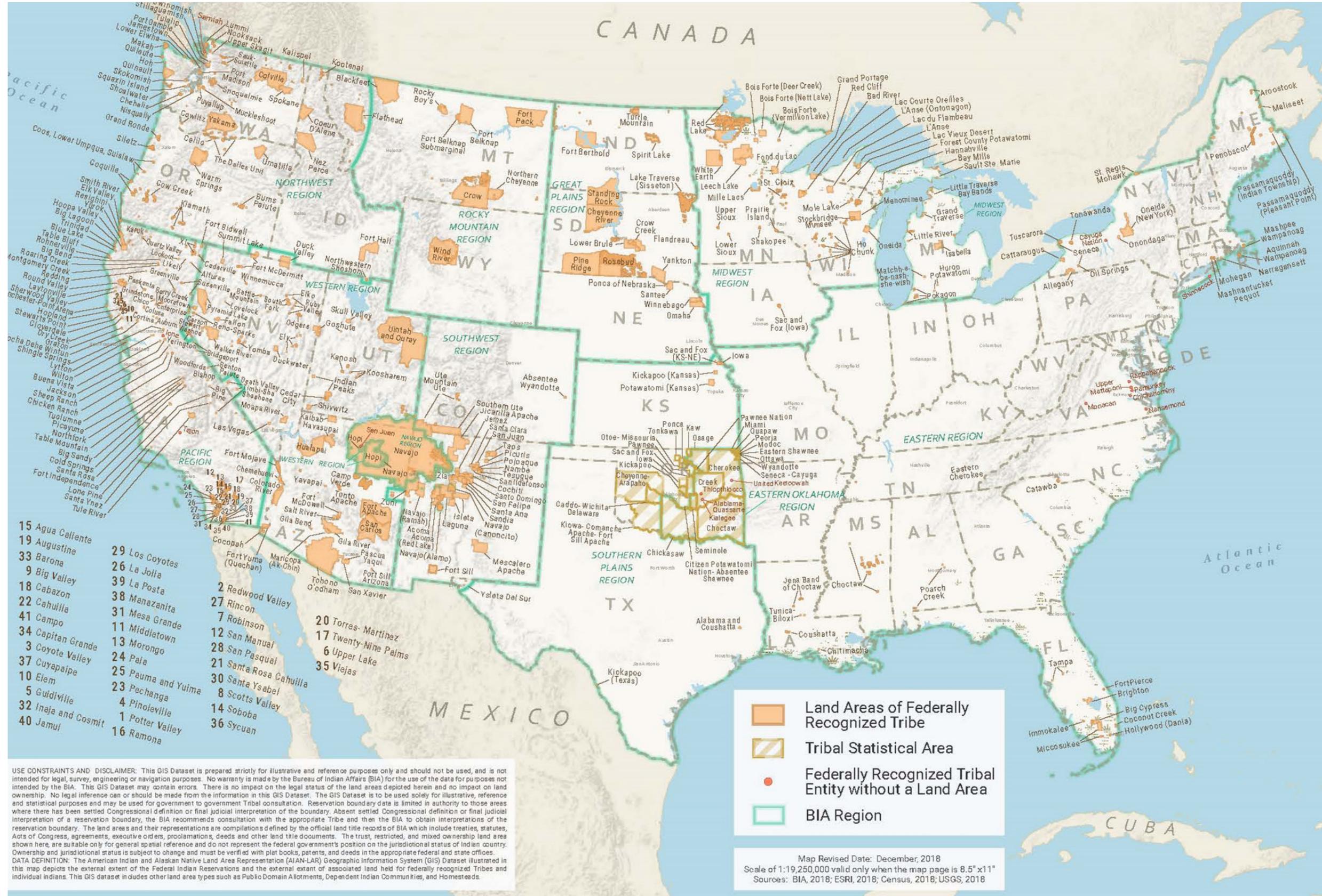


The primary data sources for this report include desk research and publicly available data from U.S. statistical agencies, including the American Community Survey, the Survey of Business Owners, the System for Award Management's database, and the National Indian Gaming Commission's casino database, among others. Secondary data sources include data and information gathered from on-site interviews, strategic meetings and discussions with members of tribal reservations, and information gathered from face-to-face meetings and phone calls with Native American entrepreneurs including the members of the Flathead Reservation of Montana; Native American business owners at RES 2020 in Las Vegas, Nevada; and economists at the Minneapolis Federal Reserve Bank. We also met with Don Chapman, Senior Vice President of Federal Operations at Cayuse Technologies, LLC, and first ever Senior Policy Advisor on Native American Affairs at the U.S. Department of Commerce; Marvis Aragon, Executive Director, American Indian Chamber of Commerce of New Mexico; Michael Peacock, President and CEO, Southwest Business Development Consultants, LLC; Amy Yeung, Founder of Orenda Tribe, Albuquerque, New Mexico; Kimberly Davis, Customer Liaison & Marketing Services Office, Data Dissemination and Training Branch, Census Bureau; and Dr. Traci Morris, Director of the American Indian Policy Institute, Arizona State University.

The purpose of this report is to support evidence-based policy discussions regarding business development in Indian Country. The analysis is rooted in an economic data-driven approach including basic statistical and econometric analysis and can complement ongoing and future policy discussions in this area.



Figure 1. Tribal Lands of the Continental United States



Source: Bureau of Indian Affairs

Business and Workers in Indian Country

This section examines key economic characteristics across tribal reservations and compares these characteristics to the broader U.S. economy as well as other segments of the population, such as regional and rural areas. The data are obtained from the American Community Survey (ACS) on workforce and economic characteristics on tribal reservations, the Survey of Business Owners (SBO) on the characteristics of business activity for Native Americans, and other sources.¹ The availability of data on the business development experience of Native American people and in tribal areas has been, and remains, limited:² the degree of data sparsity makes the extraction of actionable, targeted policy insights difficult. In addition, the ACS and SBO data are limited in terms of comparability—the ACS reports on community-related factors for tribal reservations, while the SBO reports on characteristics of Native American-owned businesses. Notwithstanding, these two sources provide some of the best publicly available coverage of community-focused and business-focused metrics for the purposes of this report.

Produced by the U.S. Census Bureau, the ACS reports data on community-related factors for tribal reservation areas in the lower 48 states and on a selection of characteristics of the workforce employed in Indian Country³ for 356 federally recognized tribal areas (i.e., excluding Alaska and Hawaii); the ACS also reports such data for the United States as a whole.⁴ The ACS data are novel in reporting observations on aspects of communities' social and economic experiences on the reservation, but do not – strictly speaking – differentiate by race. Data on worker by race and by reservation is lacking, and there is no distinction between Indian and non-Indian labor employed in Indian businesses on reservations.

Workforce characteristics for tribal reservations may include workers who are not Native American but are employed in tribal or non-tribal businesses on the reservation. Similarly, business variables may include firms owned and operated by non-Native Americans yet located on a tribal reservation.

The U.S. Census Bureau's Annual Business Survey (ABS)/ Survey of Business Owners (SBO) data provides fairly comprehensive coverage of a small set of metrics for classifiable businesses for (up to) 6-digit NAICS industry classifications at the national, state, and – for a limited subset of data – county level. The ABS/SBO also distinguish business ownership by race and ethnic groups, but in the current context did not distinguish between Native American people living and working on the reservation versus those living off-reservation. Because approximately 78 percent of Native American people live off-reservation in the United

States, the SBO data do not serve as a direct guide to business development on reservations.

Federal statistical agencies like the U.S. Census Bureau and the Bureau of Labor Statistics regularly report economic and social statistics that differentiate based on race and ethnicity in the ACS, ABS, SBO, and Current Population Survey. Data from tribal reservations however is less comprehensive and less regular than data for other race- and ethnicity-based data. This lack of data has been attributed to logistical and cultural barriers.⁵ What is available for tribal reservations, such as the ACS, relates more directly to individual, personal, and (to some extent) labor force characteristics rather than to business characteristics, and is released less frequently. The ability to draw conclusions from the existing data on reservations is limited for the purposes of understanding the nature of business and business development in Indian Country, and this will continue to be true while data availability remains low.

Reservation communities are, on average, located in rural and remote regional areas to a higher degree than the average for the United States.⁶ The lack of regional data for reservation economies and communities typically allows only national-to-reservation comparisons for the categories we discuss below. In this way, the basis for comparison is inherently biased to the extent a better measure of comparative Native American business and labor force experience would be proximately sourced regional community data rather than national data. Hence, we include data for rural areas where comparable data are available. (In comparing the national and regional economies more generally, we would expect to see many of the comparative patterns discussed below hold true regardless of whether the regional data was on-reservation or off-reservation. This expectation is born out, at least descriptively, by the ACS data.) Unless otherwise stated, the reservation statistics below are based on reservation-specific data.

Understanding Workforce Characteristics of Tribal Reservations

Some immediate observations that can be drawn from the ACS data on the characteristics of the workforce on reservations are the relatively high rates of unemployment (figure 2)

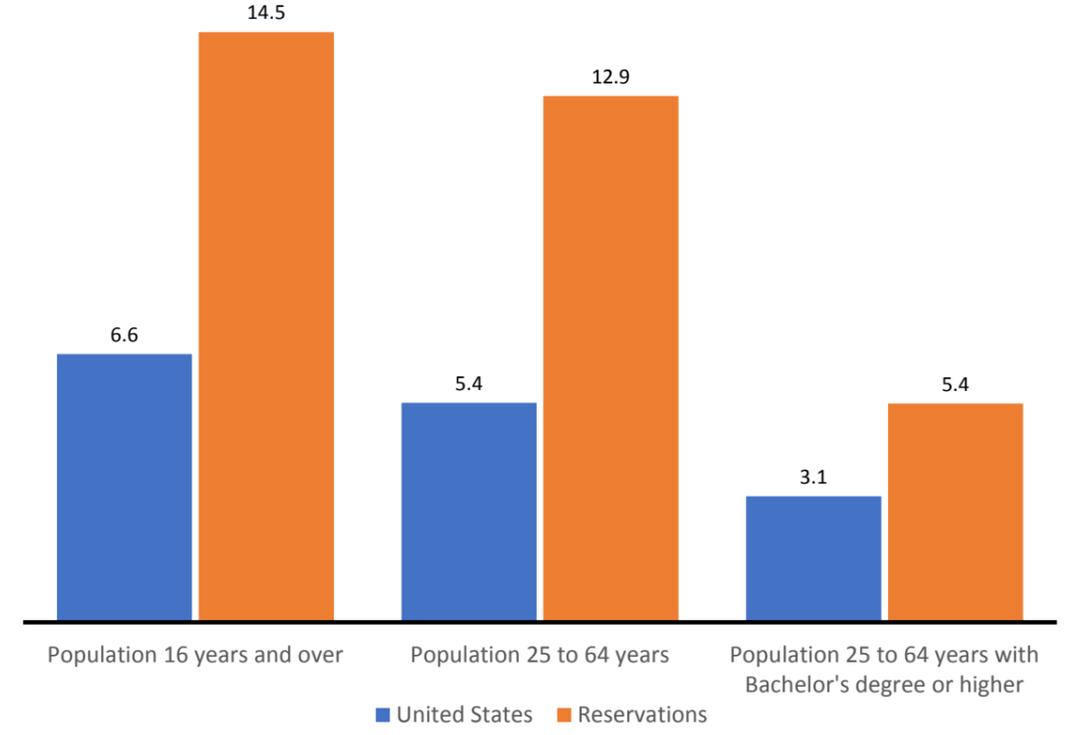
and low rates of labor force participation (figure 3) compared to the overall U.S. economy.

The labor force of the United States is defined by the Bureau of Labor Statistics (BLS) as the level of the civilian noninstitutional population age 16 and over that is currently employed or unemployed (persons who are not employed, available for work, and actively seeking it). The labor force participation rate measures the labor force as a percent of the civilian noninstitutional population age 16 and over. The unemployment rate measures the number of unemployed persons as a percent of the labor force.

Unemployment rates are a function of both the demand and supply sides of the labor market. Year-to-year fluctuations in the unemployment rate tend to be driven predominantly by demand-side factors like expenditure behavior by households, investors, government, and foreigners (via exports). Supply side factors of unemployment include demographics (e.g., population growth, age-distribution), social factors (e.g. teens shifting away from work, health among older demographics), and labor-market factors such as a skills mismatch where the skills held by the unemployed are not sought by employers with job openings.⁷

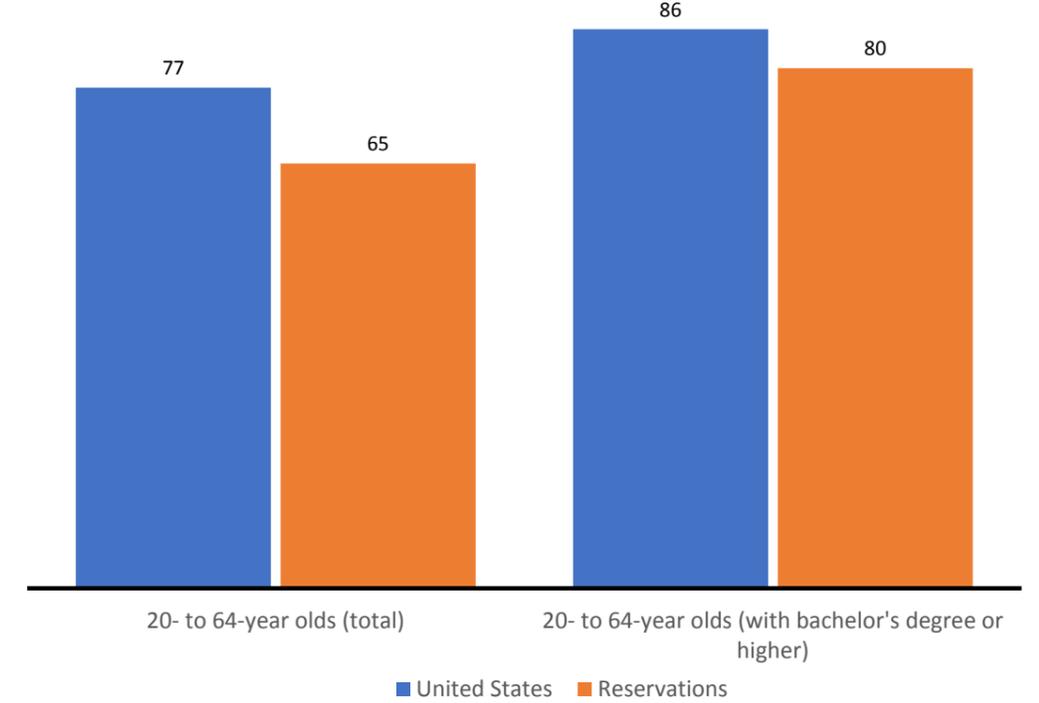
“This all underscores the importance of access to markets outside Indian Country for workforce and business development inside Indian Country.”

Figure 2. Unemployment Rate of Select Groups (%), United States and Reservations, 2013-2017 Average



Source: American Community Survey 2013-2017 5-year data release
Data Note: Reservations data represent the 356 federally recognized tribal areas.

Figure 3. Labor Force Participation Rate of Select Groups (%), United States and Reservations, 2013-2017 Average



Source: American Community Survey 2013-2017 5-year data release.
Data note: Reservations data represent the 356 federally recognized tribal areas.

Labor force participation rates are driven by many of the same factors, including labor market policies, changes in educational attainment, technological advances such as automation, as well as the age distribution of the labor supply.

It is common for statistical agencies to provide a range of labor force participation rates across demographic groups defined by age, race, Hispanic ethnicity, and educational attainment, among other factors. In the ACS data, one base used for the calculation of the labor force participation rate is the population 20-64 years of age, and the population age 20 to 64 with a bachelor's degrees or higher.

Unemployment rates are higher on the reservation than for the United States as a whole, and across these demographic groups (figure 2). The unemployment rate is more than double for the population (16 years and over, as well as 25 to 64 years), but the gap narrows for those with at least a bachelor's degree.

The empirical norm across regions of the U.S. and the global community that more highly educated cohorts exhibit greater levels of labor force participation and lower levels of unemployment holds true for tribal areas. Lower unemployment rates among those with higher educational attainment is driven by a complex set of interdependent variables from region-to-region and through time but is particularly evident during times of rapid economic change. As economies traverse periods of rapid and structural change driven by factors such as technological progress or changing international trading patterns, lower-skilled cohorts are often the first to lose employment. This generality appears to be reflected in the workforce of Indian Country for at least two reasons. One, because factors

driving national economic outcomes should also impinge on workforce characteristics on reservations; and two, because the time range of the ACS survey – 2013 through 2017 – traces a period of U.S. economic history in which recovery from a historically significant and structurally disruptive U.S. economic recession was still underway.

Labor force participation rates for the reservation are lower than for the overall U.S. population, both overall and with a bachelor's degree or higher; although again the gap narrows for those with greater educational attainment (figure 3).

The participation rate gap between the U.S. and reservations falls markedly for higher-educated workers. That said, a smaller share of the reservation labor force holds higher educational qualifications. ACS data show that 31 percent of the U.S. labor force and 20 percent of the reservation labor force hold bachelor's degrees or higher (table 1). The lower labor force participation rate and higher unemployment rate in Indian Country is accounted for in part by its smaller share of the workforce that is highly educated.

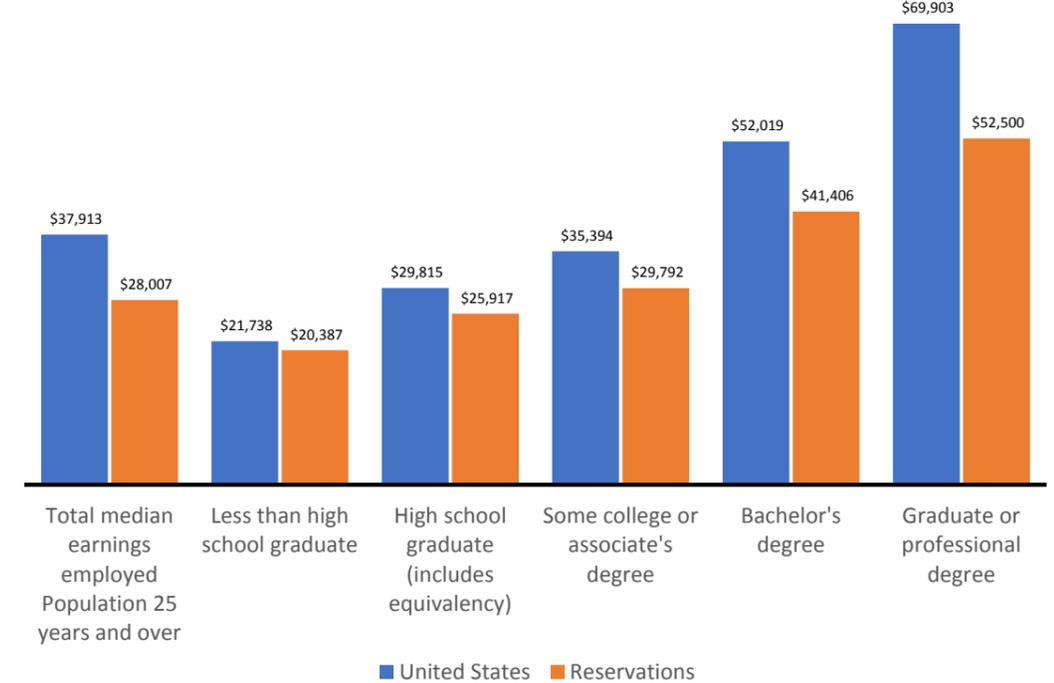
But more importantly for the purposes of this report, the composition effect has important implications for business development in Indian Country, which effectively ends up limiting the local labor force available to businesses in Indian Country, and the nature of the local markets for their products and services. This all underscores the importance of access to markets outside Indian Country for workforce and business development inside Indian Country.

Table 1: Distribution of U.S., Reservation, and US Rural Labor Force by Educational Attainment, 2017

Category	Less than high school	High school	Some College and Associate's Degree	Bachelor's Degree or Higher
United States	13%	27%	29%	31%
Reservations	14%	34%	32%	20%
U.S. rural	14%	36%	30%	20%

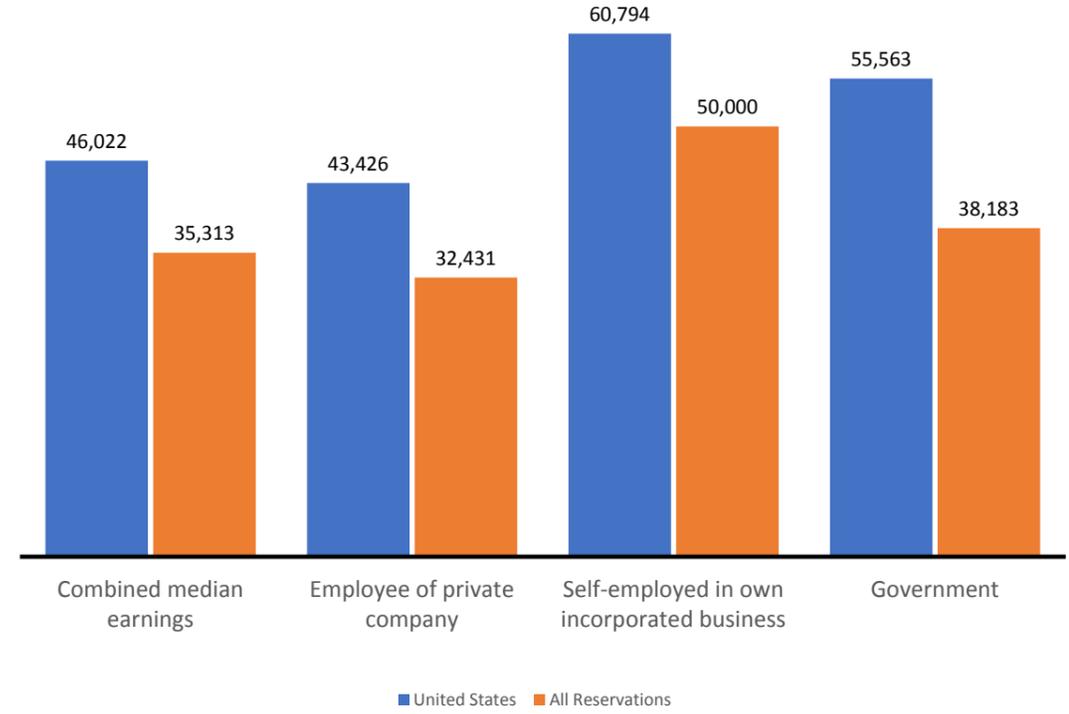
Source: American Community Survey 2013-2017 5-year data release and "Rural Education at a Glance, 2017 Edition," USDA, Economic Research Service
 Data note: Reservation data represent the 356 federally recognized tribal areas.

Figure 4. Median Earnings by Highest Educational Attainment, United States and Reservations, 2013-2017 Average



Source: American Community Survey 2013-2017 5-year data release
 Data note: Reservations data represent the 356 federally recognized tribal areas.

Figure 5. Median Earnings Overall, and by Selected Class of Worker, United States and Reservations, 2017 (\$)



Source: American Community Survey 2013-2017 5-year data release
 Data note: Reservations data represent the 356 federally recognized tribal areas. The "Government" category is simply an average of state, local, and federal.

Smaller Wage Gap with Higher Educational Attainment

Tribal workforces have lower levels of education and earn lower incomes compared to workers off-reservation. The wage gap is the smallest for workers with less than a high school degree and the largest for workers with a graduate or professional degree. Figure 4 shows that across all measured educational attainment categories, median earnings for on-reservation workers are less than U.S. averages, and this gap increases with educational attainment. This may reflect the similar nature of occupations requiring no high-school qualification across regions. At the higher end of the education and qualification spectrum, a finance degree used on tribal lands is unlikely to generate the same levels of income as one employed off-reservation. In addition, the categories “bachelor’s degree” and “graduate or professional degree” leave room for enormous in-sample variation in earned

incomes, for example between a master’s degree in social work or public administration versus a doctoral degree in aerospace engineering or finance. Also, the off-reservation wage premiums, particularly at the higher end of educational attainment, may reflect the specific types of qualifications gained, or the occupations available on reservations in which the qualifications can be applied. The higher the level of educational attainment, the greater the marginal benefits (in terms of wages) for working off the reservation, and this has implications for business owners that seek a more highly skilled labor.

The Structure of Reservation Economies

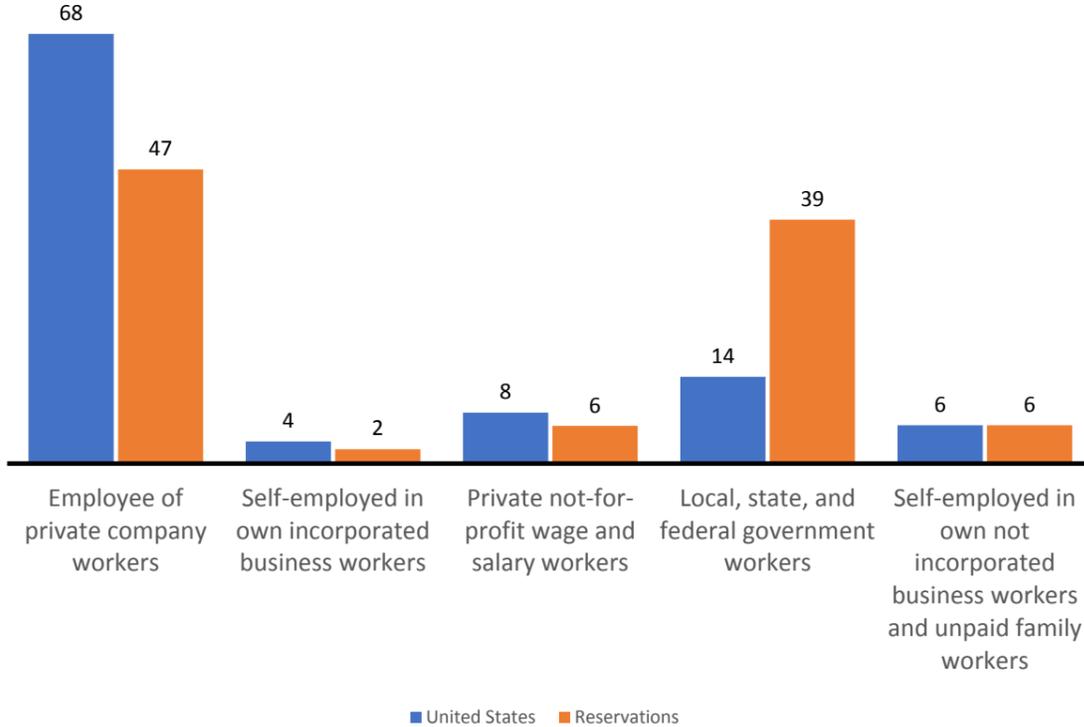
Median earnings for private sector, self-employed, and government workers are lower for Indian Country than for the U.S. overall (figure 5). The largest proportional gap occurs for government workers, a category

in which the share of reservation labor is relatively high. In the breakdown of the sectoral composition of employment, 39 percent of the reservation workforce is employed in local, state, or federal government, compared to 14 percent for the U.S. economy overall (figure 6). Correspondingly, reservation economies employ a smaller share of their workforce in the private sector (47 percent) than the U.S. economy overall (68 percent).

The predominance of the local public sector activity in reservation communities may reflect a minimum amount of public administration work on a reservation that needs to be conducted combined with relatively small populations.⁸ There is no data on occupational characteristics of employees in this sector (to compare with similar county-level data). Based on our in-person visits and telephone discussions with tribal councils, these roles encompass land management issues, tribal–federal government relations, coordination efforts regarding the different offices of tribal

“Three sectors with the greatest potential to grow and take advantage of access to external markets are mining; arts, entertainment, and recreation; and administrative and support and waste management.”

Figure 6. Employment Distribution of Class of Worker, United States and Reservations, 2013-2017 Average (%)



Source: American Community Survey 2013-2017 5-year data release
 Data note: Reservations data represent the 356 federally recognized tribal areas.

Table 2: Sectoral Distribution of Self-Employed Incorporated Individuals in the United States and on Reservations, 2017 (in descending order for reservations), percent

Sector	Reservation	US
Professional, Scientific, and Management, and Administrative and Waste Management Services	17.73	23.05
Construction	16.09	14.59
Retail Trade	10.29	9.37
Agriculture, Forestry, Fishing and Hunting, and Mining	9.08	3.34
Other Services (except public administration)	8.78	7.77
Educational Services, and Health Care and Social Assistance	8.71	10.48
Finance and Insurance, and Real Estate and Rental and Leasing	8.22	9.51
Manufacturing	5.96	4.95
Arts, Entertainment, and Recreation, and Accommodation and Food Services	5.40	7.14
Transportation and Warehousing, and Utilities	4.77	4.48
Wholesale Trade	3.46	3.58
Information	1.30	1.73

Source: American Community Survey 2013-2017 5-year data release
 Data note: Reservation data is based on 356 federally recognized tribes.

government, execution of government projects, and management of the day-to-day operations of the tribe. Administrators may also act as supervisors for the many employees of the tribal government, which can include those in the social services, education, public works, and accounting departments.

The Self-Employed Category

The sectoral distribution of the self-employed category is similar across reservations and the United States as a whole (table 2) although some differences appear. “Agriculture, forestry, fishing and hunting, and mining” is larger in the reservation cohort, whereas “Professional, scientific, and management, and administrative and waste management services” is lower in the reservation cohort.

Within the self-employment category, the ACS distinguishes owners of incorporated and non-incorporated enterprises. Firms incorporate for a range of potential reasons, but a few fundamental factors generally hold true: minimization of taxation, the creation of a legal shield for personal assets and financial liability and other factors in the management of

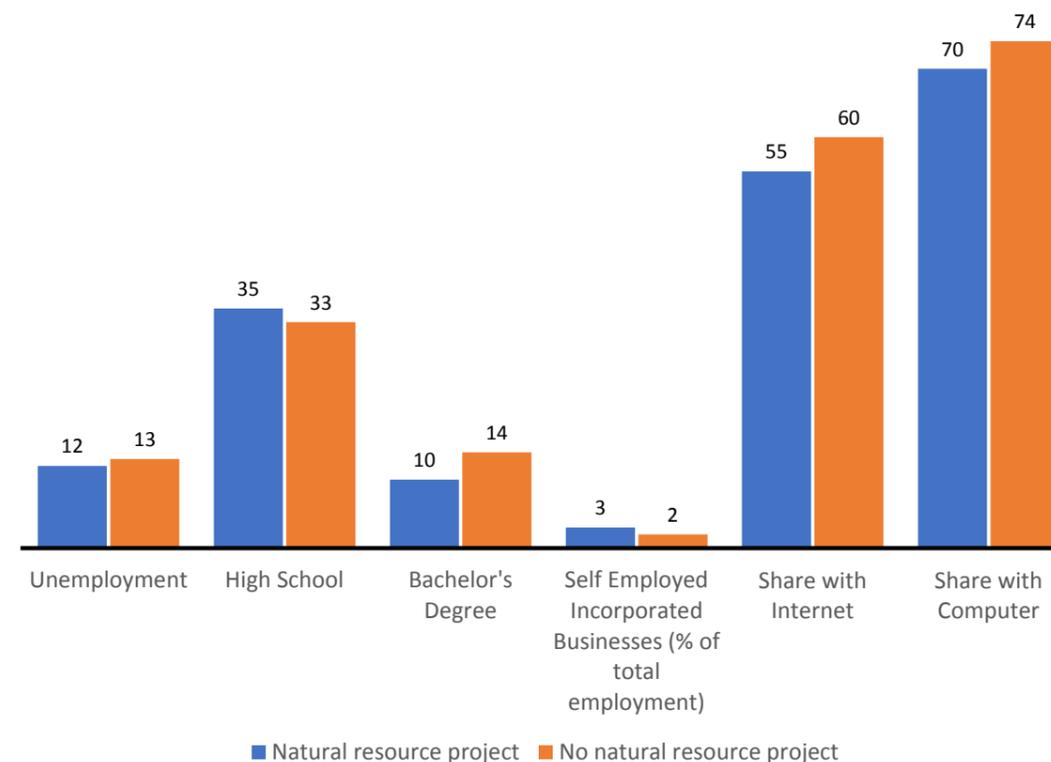
“Agriculture, forestry, fishing and hunting, and mining” is much larger (nearly three times as large) in the reservation cohort than in the U.S. overall.”



Box 1. Self-Governance in Action: Compacting the Land Titles and Records Office

The Confederated Salish Kootenai Tribes (CSKT) compacted the Land Titles and Records Office in 1995 and it was the first tribally managed Land Titles and Records office in the nation. Producing a certified title status report takes that office anywhere from 3 to 10 days. In comparison, the BIA can take months or years in complicated cases to produce a title status report. Such a report is required in order to obtain a mortgage on Trust land, whether you are borrowing from a bank or the Tribal Credit Program. (See GAO May 2019, and House Subcommittee on Housing and Community Opportunity July 2006.)

Figure 7. Selected Characteristics of Reservations With and Without Natural Resource Projects, 2017



Source: American Community Survey 2013-2017 5-year data release. Data note: Reservations data represent the 166 federally recognized tribal areas with a civilian labor force over 220. Natural resource project n= 17; No natural resource project n=149.

risk, required ownership structures relative to contributing investors (particularly for start-up enterprises), and the notion that incorporation can have a branding and market-positioning advantage. Incorporated enterprises, in comparison to unincorporated firms, tend to have higher gross receipts, employ more people, and have more complex legal, tax, and administrative structures and obligations. The benefits and costs to incorporation vary across businesses in terms of ownership structure, market sector, and location, as is reflected in the proportion of incorporated firms in each industry/sector.

Relevant data for these characteristics is limited and the current discussion makes use of data on self-employed incorporated individuals as a proxy for a small selection of firm characteristics. Table 2 presents a side-by-side comparison of the sectoral distribution of self-employed between reservations and the United States. Of the 12 broad industry sectors reported in table 2

(ignoring public administration which has no private ownership), three notable alignments and differences emerge. First, the two cohorts have the same top two sectors, “Professional, scientific, and management, and administrative and waste management services” and “Construction.” Second, “Agriculture, forestry, fishing and hunting, and mining” is almost three times as large in the reservation cohort than the national average (9.1 percent compared to 3.3 percent, respectively). Third, the share of the self-employed in “Professional, scientific, and management, and administrative and waste management services” is higher in the U.S. overall than in the reservation cohort (23.1 percent compared to 17.1 percent, respectively).

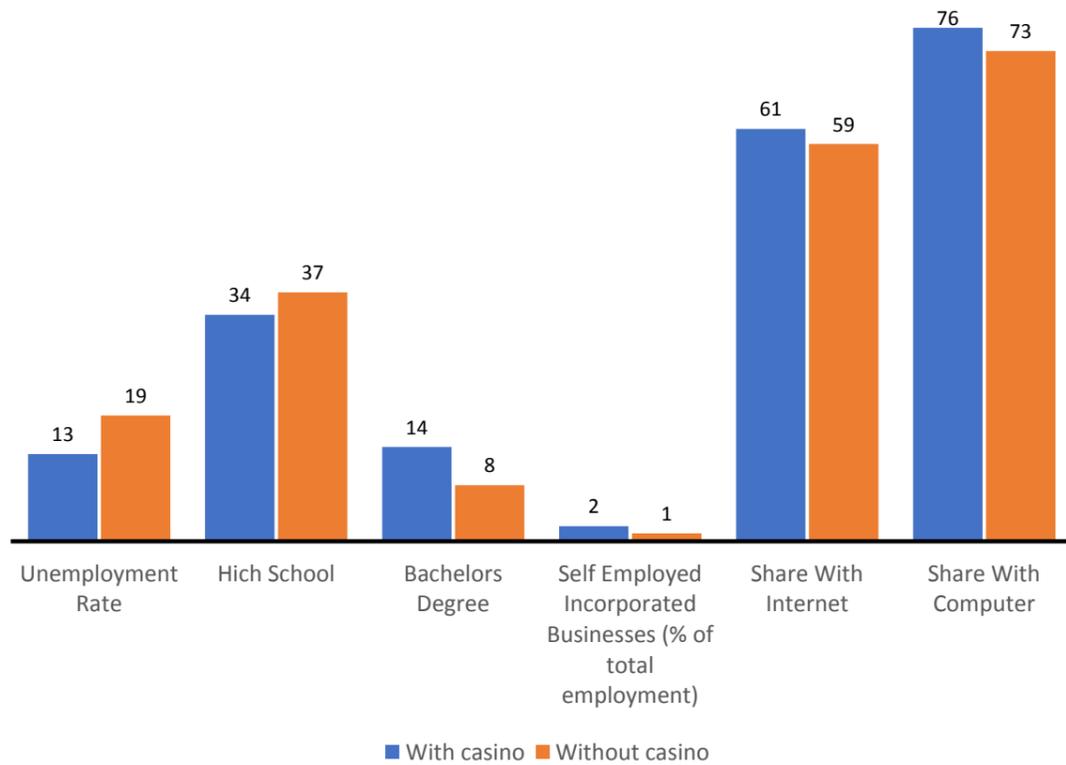
The figures in table 2 are shares within cohorts. That is, 16.1 percent of the self-employed on tribal reservations are in construction, compared with 14.6 percent of the self-employed in the United States.

Table 3: Sector Distribution of Self-Employed Individuals on Reservations With and Without a Natural Resource Project, 2017 (n=166, Over 220)

Sector	With NR project	Without NR project
Agriculture, Forestry, Fishing and Hunting, and Mining	22%	8%
Construction	13%	16%
Manufacturing	2%	6%
Wholesale Trade	2%	4%
Retail Trade	6%	11%
Transportation and Warehousing, and Utilities	4%	5%
Information	1%	1%
Finance and Insurance, and Real Estate and Rental and Leasing	4%	8%
Professional, Scientific, and Management, and Administrative and Waste Management Services	11%	18%
Educational Services, and Health Care and Social Assistance	16%	9%
Arts, Entertainment, and Recreation, and Accommodation and Food Services	9%	5%
Other Services (except public administration)	11%	9%

Data note: Reservations are 166 with civilian labor force over 220. With natural resource project n=17, without n=149.

Figure 8. Selected Characteristics of Reservations With and Without Casino (%)



Source: American Community Survey 2013-2017 5-year data release
 Data note: Reservations data represent the 166 federally recognized tribal areas with a civilian labor force over 220. With casino n=139; Without casino n=27.

Three sectors with the greatest potential to grow and take advantage of access to external markets are mining; arts, entertainment, and recreation; and administrative and support and waste management. The SBO data point to this in three ways. First, there is a relatively large share of Native-owned mining firms with paid employees, but they tend to be smaller firms (smaller in terms of number of employees and receipts). Specifically, 20.5 percent of Native American-owned mining firms have paid employees (compared to the 9.6 percent for Native firms overall and compared to 16 percent for White-owned mining firms). Second, the share of firms with employees in arts, entertainment, and recreation is relatively small, but those that exist have few employees but large receipts. Only 1.8 percent of Native-owned firms in this sector have paid employees, with smaller average employment but much larger gross receipts. Third, there are not many Native-owned firms with paid employees in administrative and support and waste management, but those few firms are relatively large in terms of employees and gross receipts.

Economic Geography and Other Salient Dimensions

Below we discuss how tribes compare when examined along economic geography and other salient dimensions. The set of reporting variables in the ACS combined with other data and information allows a degree of comparability across characteristics of a tribal reservations for factors such as economic geography, the presence of significant economic activities like a natural resource project or a casino, and whether a tribe is self-governing.⁹ In this context – within-cohort comparisons across reservations – data like that reported in the ACS has higher utility.

A Major Natural Resource Project

An often-cited feature of reservations is having a natural resource project, such as renewable energies or mining for fossil fuels. Out of the 166 tribes in our dataset, 17 of them were found to have a major natural resource project, and seven have a major renewable energy project such as solar, wind, or hydropower.

Tribes with a major natural resource project have slightly lower levels of educational attainment and less access to computing resources and the internet; factors normally associated with lower incomes (Figure 7). The driving factor may be location: reservations with natural resource projects tend to be located farther from major urban areas, related markets, and infrastructure.

The sector distribution of the self-employed group looks different on reservations with a major natural resource project. On average, the shares of self-employed individuals in agriculture and mining, and education are higher on reservations with a natural resource project, while the shares in professional services, and finance and insurance are lower (Table 3).

Gaming

Tribal reservations with a major gaming facility have a slightly more educated workforce and slightly higher shares of households with a computer and internet (Figure 8). The difference in industry concentration is more visible: construction, professional services, finance, insurance, real estate, and retail all exhibit higher concentration on tribal reservations with a casino and are generally associated with running a casino. In comparison, agriculture, wholesale, and transportation and warehousing have higher concentrations on reservations without a casino (Table 4). The data in the table are for just one year (2017) but Evans and Topoleski (2003) find interesting, lagged effects of casinos for tribal reservations—after at least four years of operation, young adults move back to reservations, there is an increase in adult employment, and a decrease in the working poor.

Self-Governance

Of the 166 tribes in our dataset, we found 52 to be self-governing, as defined by having entered into some type of self-determination contract or a self-governance compact to operate a federal program, function, or services such as realty, land titling, appraisals, health and human services, forestry, and law and order, among other areas.

In principle, self-governance can facilitate business development on trust land and anecdotal evidence suggests that it does.

Table 4: Industry Share of Self-Employed Individuals on Reservations With and Without Casinos (%), 2017

Sector	With Casinos	Without Casinos
Agriculture, Forestry, Fishing and Hunting, and Mining	22	8
Construction	13	16
Manufacturing	2	6
Wholesale Trade	2	4
Retail Trade	6	11
Transportation and Warehousing, and Utilities	4	5
Information	1	1
Finance and Insurance, and Real Estate and Rental and Leasing	4	8
Professional, Scientific, and Management, and Administrative and Waste Management Services	11	18
Educational Services, and Health Care and Social Assistance	16	9
Arts, Entertainment, and Recreation, and Accommodation and Food Services	9	5
Other Services (except public administration)	11	9

Data note: Reservations are 166 with civilian labor force over 220. With Casinos n=139, without n=27.

Tribes with self-governance can expedite the often-exhaustive process of project development from beginning to end at the local-level all while complying with the code of federal regulations regarding land use restrictions for tribal trust land (as opposed to being subject to often excessively long wait and processing times of BIA offices performing tasks). An example is given in Box 1. Self-governance enables tribes to gain more control over their land titles and records, public health services, and other government services.¹⁰ There is a clear need for further in-depth analysis on the different types of self-governance contracts and compacts as well as their effect on business development in Indian Country.

The characteristics are similar across the 52 tribes that are self-governing and the 114 that are not. The self-governing reservations exhibit slightly lower unemployment rates (12 percent compared to 13 percent), higher educational attainment levels (15 percent with at least a bachelor's degree compared to 14 percent), higher shares of self-employed (2.4 percent compared to 1.9 percent). Self-governing tribes have a greater degree of digital connectivity (63 percent with internet connectivity compared to 58 percent; and 76 percent with access to a computer compared to 72 percent). There is no large difference in geographic locations between the two groups (self-governing reservations are an average of 90 miles away from urban area compared to 123 miles for tribes without self-governing compacts, with similar ranges).

“There is a clear need for further in-depth analysis on the different types of self-governance contracts and compacts as well as their effect on business development in Indian Country.”



Determinants of Economic Performance in Indian Country:

Statistical and Regression Analysis

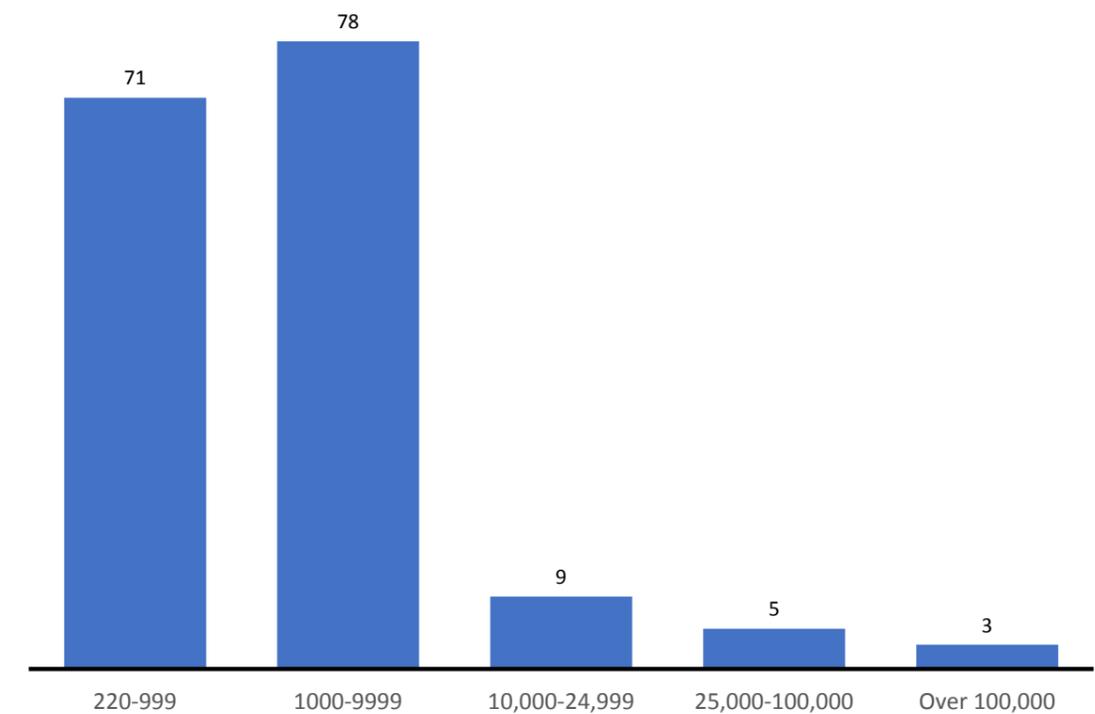
This section considers the role of economic geography more formally and examines the key determinants of the economic performance of tribal reservations such as unemployment and the share of the labor force that is self-employed and owns an incorporated business. Below is a description of the data used in the statistical and regression analysis. The findings underscore the role of economic geography, but also suggest that core characteristics like educational attainment, workforce quality, and digital infrastructure can trump the effects of remoteness. Also, there is no evidence that a natural resource project or a casino by itself can overcome the economic disadvantages of remoteness.

Description of the Data and the Variation of Key Variables Across Tribal Areas

The ACS reports the margin of error for each variable and tribal reservations with a civilian labor force of 220 or less tend to have a relatively large margin of error in many of our variables of interest. The dataset for the regression analysis consists of the 166 reservations in the lower 48 states (excluding Alaska and Hawaii) with civilian employment of at least 220 people.¹¹

The American Community Survey (5-year averages for 2013-2017) reports a wide variety of socioeconomic characteristics for tribal

Figure 9. Number of Tribal Reservations by Total Civilian Employment



Source: American Community Survey

areas, including information on a reservation's labor force, educational attainment, household internet access, mobility of reservation members, and earnings, among other characteristics.

Civilian Labor Force

The size of the civilian labor force for this analysis varies across reservations from 220 persons up to 369,006. The average size is 8,847 although the median (midpoint) is 1,251. In other words, while there are a few large tribes, most are on the smaller end of the scale. 71 reservations have a labor force of less than 1,000; 149 reservations have a labor force of less than 10,000; and just three reservations have a labor force above 100,000 (Figure 9).

Overall, 53 percent of the tribal labor force is concentrated in 3 sectors: public administration, arts and entertainment, and education. The concentration is more prevalent on smaller reservations with these three sectors comprising 40 percent of employment

for tribes with more than 25,000 and 55 percent of employment for tribes with less than 5,000.

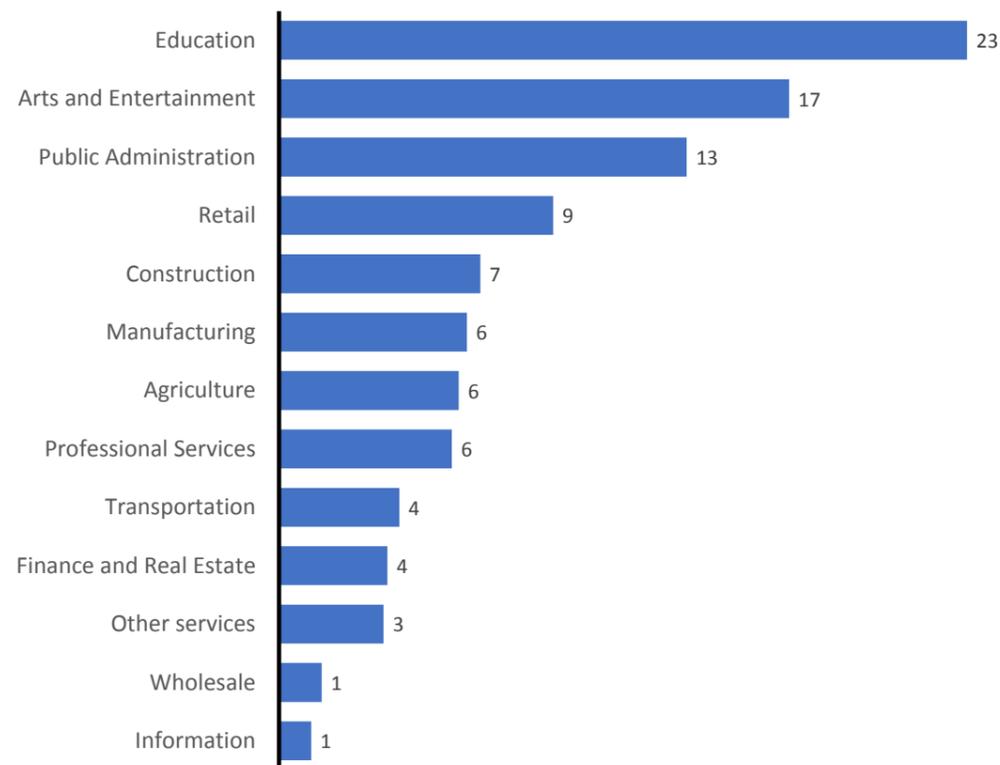
Education

Educational attainment rates vary greatly across reservations, with the share of the population with at least a high school diploma ranging from 25 to 96 percent and with a bachelor's degree or higher ranging from 1 to 40 percent. The share of 25-year-olds on tribal reservations with at least a high school degree is 83 percent on average across all tribes, and the average share with a bachelor's degree (or higher) is 14 percent.

Median Earnings

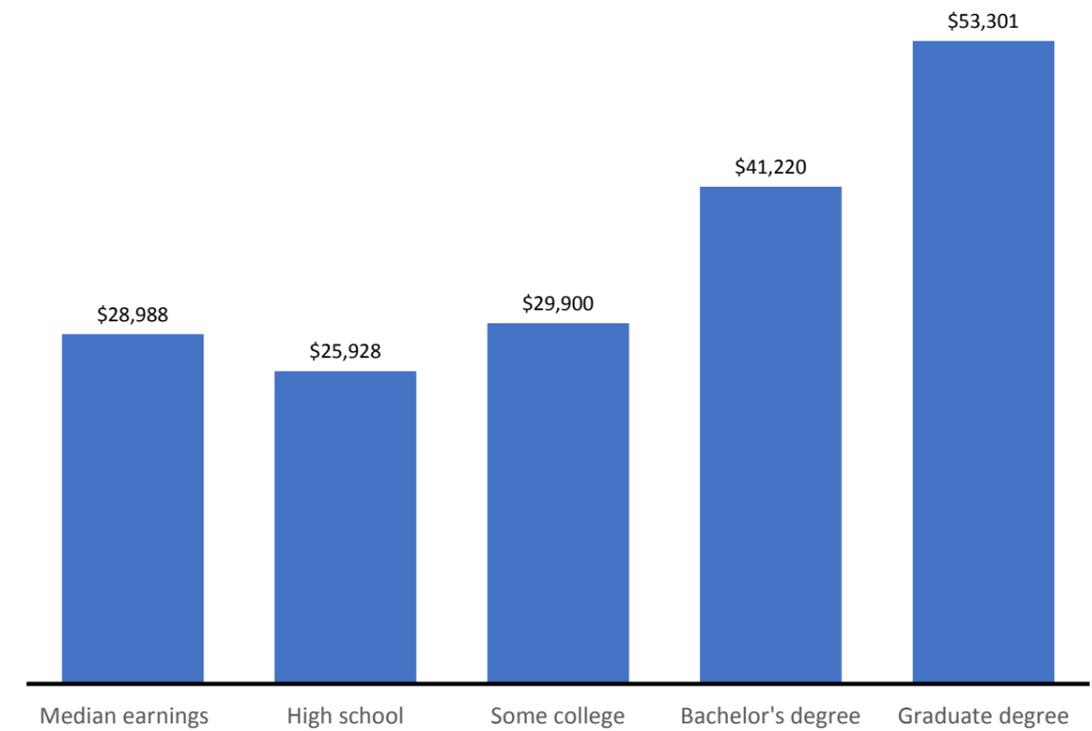
The average of the median earnings across all tribal areas was \$28,988 in 2017 and increases with educational attainment (figure 11).¹² Individuals on the reservation with a high school degree or less had median earnings of \$25,928, slightly less than the overall median. Individuals with some college have slightly higher median earnings, and median earnings

Figure 10. Civilian Labor Force on Reservations, by Sector (%), 2017



Source: American Community Survey, Census. n=166

Figure 11. Median Earnings by Educational Attainment on Tribal Areas, 2017



Source: American Community Survey 2017 5-year estimate

Data note: Median earnings in 2017 dollars, 25 years and over with earnings, by educational attainment. American Community Survey, 2017. n=166 for median earnings; n=164 for high school and some college; n=150 for bachelor's degree; n=134 for graduate degree.

increases with each level of educational attainment reaching \$53,301 for those with a graduate degree.

Unemployment

The unemployment rate has an average of 12.8 percent (median 11.2 percent), with a wide range from 3 to 36 percent.

Computer and Internet Access

The share of households with a computer in Indian Country ranges from 42 to 95 percent, with an average of 74 percent and median of 75 percent. The share of Indian households with an internet subscription is less, ranging from 21 to 89 percent, with an average of 59 percent and median of 61 percent.

Mobility

Mobility is difficult to measure; however, it seems that mobility is driven by moving for college or a different job opportunity, rather than ability to work across reservation lines. The ACS collects data on whether an individual resided in a different location one year ago, including the share of individuals that report having moved from a different location within the last 12 months. There are breakdowns of having moved within the county, within the state (and across county lines), and across state lines. The data show that 5.7 percent report moving within the county over the past 12 months, 2.9 percent report moving within the state and across county lines; and 1.5 percent report moving from out of state.

Distance

Proximity to an urban location can offer many advantages to businesses such as access to larger markets and the ability to realize

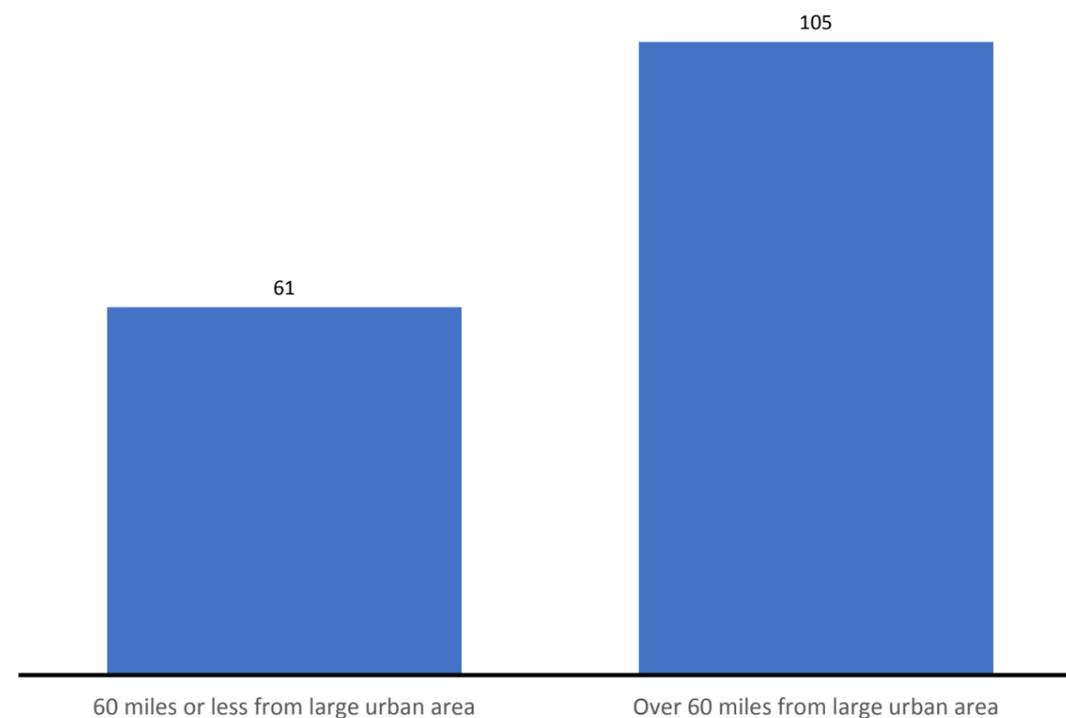
scale economies, access to a broader and deeper labor market pool, and digital and transportation infrastructure.¹³ On the flip side, distance from an urban area can bring similar economic disadvantages. To try to capture the effects of economic geography, we developed a distance variable that measures remoteness by the distance (in miles) from an urban area. Figure 12 shows the number of reservations within 60 miles and over 60 miles to a large urban area. A large urban area here is defined by a population of at least 100,000; and at least 75,000 for the New England area (Census methodology).

ACS also reports the share of households on reservations that reside in an urban area although the data have many missing observations. Out of the 166 tribal reservations in the dataset used for the statistical analysis, the urban share statistic is reported for only 91 reservations. Forty-seven of those 91 reservations have no households in an urban area, 14 have less than one-quarter of households in urban area, and 7 report having

100 percent of households in an urban area (including Bishop Reservation of California and Chitimacha Reservation of Louisiana). So, while the urban household data is incomplete, it paints a similar picture to that of the distance variable—most tribal reservations are in rural or remote areas.

Internet access (defined as maintaining an internet subscription) and having a computer were more prevalent on urban reservations than on rural reservations (e.g., according to the Federal Communications Commission (2019), 93 percent of residents on urban reservations have internet connectivity compared with 47 percent of residents on rural reservations; the overall national average was over 80 percent). Internet connectivity however can sometimes simply indicate usage of a smart phone with a limited data plan. For instance, a survey of residents on tribal lands showed individuals predominantly use smart phones to access the internet.¹⁴

Figure 12. Number of Reservations by Distance from Large Urban Area



Source: Census, American Community Survey, and authors' calculations

Data note: A large urban area is defined as a city with at least 100,000 population (75,000 population for the area of New England).

Descriptive Statistics

Table 6 below reports the major descriptive statistics for the dataset, including the mean, standard deviation, minimum and maximum, and the number of observations available by variable.

Econometric Analysis

Next, we examine the key determinants of unemployment on tribal reservations and the key determinants of business ownership as measured by share of incorporated self-employed workers. Our data is cross sectional, for 166 tribal reservations from the ACS 5-year estimates for 2013-17. The key explanatory variables, such as distance to an urban area, educational attainment, infrastructure, size of labor force, business climate, and other tribal characteristics, vary across tribes as discussed above. We would expect the effects of culture and macroeconomic factors such as the business cycle to be similar across tribal reservations and hence do not control for those factors.

Key Determinants of Self-Employment

We examine the share of the self-employed individuals with an incorporated business, which is sometimes seen as a measure of business ownership or entrepreneurship.¹⁵ In contrast, unincorporated self-employed workers have not established a corporation and often operate alone, such as freelancers, jewelry-makers that sell their crafts informally.

Research has shown that the key explanatory variables for business development include factors such as the business climate, quality of labor market pool, market size, infrastructure, access to capital, and opportunity costs, as well as individual characteristics such as individual skills and education, among other factors.¹⁶

Our basic econometric specification for self-employed is denoted as:

$$selfemp_i =$$

$$\alpha_0 + \beta \cdot educ_i + \gamma \cdot infra_i + \theta \cdot mkt_i + \mu \cdot char_i + e_i$$

Selfemp is the share of the total civilian employed population that is self-employed with an incorporated business; *educ* denotes

Box 2. On the Ground Efforts to Skill Up the Workforce

The need to harness the skills and improve the productivity of the labor force on the reservation is broadly recognized. For instance, the American Indian Chamber of Commerce of New Mexico has pivoted their efforts towards improving labor productivity on the reservation. The Chamber provides classes on how current business owners can leverage policies such as the Buy Indian Act and the Indian Incentive Program. The Chamber also coaches businesses on individual, organizational and financial capacity building; and they connect individual and tribal businesses to government and private sector opportunities. (Based on discussions with Mr. Marvis Aragon, Jr., Executive Director of the American Indian Chamber of Commerce of New Mexico, Albuquerque, New Mexico, Feb. 17, 2020.)

variables that measure educational attainment such as share of 25-year-olds and over with a high school diploma as the highest degree, the share with some college or more, and the share with a bachelor's degree or higher; and *infra* denotes variables that measure infrastructure including the share of households with an internet subscription, which we take as a reasonable proxy for digital and internet infrastructure on reservations. We also include home access to a computer and mobility of the population (as a proxy for dynamism of the labor force on the reservation).¹⁷ *Mkt* denotes market size such as population of the reservation, and *char* denotes other key tribal characteristics such as whether the tribe has a casino or a major natural resource project. *e* denotes the error term and the subscript *i* denotes the tribal reservation level of observation.

Discussion of Self-Employment Regression Results

Using an OLS estimation method, we begin with an equation relating self-employment to educational attainment of the population of 25-year-olds and over; infrastructure variables including the share of households with an internet subscription and a computer; market

Table 6: Descriptive Statistics for Key Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Distance	166	112.37	93.14	4.6	487
Employment	166	8847	36300	220	369006
Agriculture share	166	0.059	0.06	0	0.592
Construction share	166	0.066	0.03	0.005	0.187
Manufacturing share	166	0.062	0.05	0	0.405
Wholesale share	166	0.014	0.01	0	0.064
Retail share	166	0.09	0.04	0	0.239
Transportation share	166	0.04	0.02	0	0.117
Information share	166	0.011	0.01	0	0.136
Professional share	166	0.057	0.04	0	0.211
Education share	166	0.227	0.07	0.037	0.42
Art share	166	0.168	0.08	0.026	0.449
Other share	166	0.035	0.02	0	0.097
Public admin. share	166	0.135	0.08	0	0.474
Finance share	166	0.036	0.02	0	0.11
Knowledge and digital share	166	0.103	0.05	0.02	0.269
High school	166	83.2	8.39	25.46	95.68
Bachelor's degree	166	14.03	6.9	1.24	39.98
Median earnings	166	28988	5904	15031	58172
Median earnings high school	164	25928	5284	11607	54000
Median earnings bach. degree	164	41220	8398	19063	62821
Computer	166	73.88	10.69	41.8	94.7
Internet	166	59.44	13.69	21	88.8
Urban share	91	25.6	35.64	0	100
Labor force participation	166	55.96	7.3	29	72
Unemployment rate	166	12.8	7	3	36.4
Move in-county	166	5.7	3.13	0	19.65
Move in-state	166	2.86	2.45	0	20.63
Move out-state	166	1.49	1.31	0	7.73

Source: ACS and authors' calculations

size; the share of the population that has moved within past 12 months; and other tribal characteristics such as the presence of a casino and major natural resource project:

$$[1] \quad \widehat{selfemp} = \hat{\beta}_0 + \hat{\beta}_1 educ + \hat{\beta}_2 internet + \hat{\beta}_3 lpop + \hat{\beta}_4 mobility + \hat{\beta}_5 casino + \hat{\beta}_6 natres + \hat{\beta}_7 ldist$$

The estimates of equation [1], obtained using our dataset of 166 tribal reservations, are given in Table 7. Robust standard errors are reported in parentheses. Four specifications are reported in Table 7 and nearly all the results were as expected. Column (1) reports the regression of equation [1] using all the explanatory variables, with *educ* as the share of 25-year-olds and over with a bachelor's degree or greater, *internet* as the share of households with an internet subscription, *lpop* as the logarithm of the reservation population, *mobility* as the share of households that moved within the past 12 months. *casino* is a binary variable equal to one if the reservation has a casino on site; and *natres* is a binary variable equal to one if the reservation has a major natural resource project. *ldist* is the logarithm of the distance in miles between reservation headquarters and the nearest urban area. Educational attainment, internet connectivity, and market size are all positively associated with self-employment and statistically significant. The estimated coefficient on *mobility* is negative but insignificant, and *casino*, *natres*, and *ldist* were each insignificant. Column (2) drops *ldist*, which does not change any of the results in terms of the signs or statistical significance. Results from a joint F-test indicated the tribal characteristic variables *casino* and *natres* were jointly insignificant and column (3) drops those variables. The results in column (3) are robust to dropping *mobility* and hence specification (3) is our preferred specification.

Higher levels of education indicate higher levels of incorporated self-employment. The estimation results reported in column (3) indicate that share of the population with a bachelor's degree is positively associated with the share of the employed population that is self-employed with an incorporated business. A one percentage point increase in the share of the population with a bachelor's degree is associated with a 0.12 percentage point

increase in the share of the self-employed. This may reflect that business owners are attracted to an educated workforce, or that individuals with a bachelor's degrees are more likely to be business owners, or both. Detailed data on characteristics of business owners would be required to explore this further.

The education effect is consistent across levels of educational attainment but stronger for higher levels of educational attainment. We estimated this regression with the share of the population with at least some college or more (not reported for sake of brevity) and found similar results; although, the magnitude of the effect of education was cut in half: a one percentage point increase in the share of the population with at least some college or more is associated with a 0.05 percentage point increase in the share of the self-employed. In other words, the higher the level of educational attainment the greater the relationship between educational attainment and self-employment (i.e., a somewhat skilled workforce is good, but a more highly skilled workforce is much better for self-employment).

Internet connectivity is another significant factor in higher levels of self-employment. The share of households with an internet subscription is positively and significantly associated with self-employment, that is, holding education, population and mobility constant, a higher share of the population with internet subscriptions is associated with a higher share of incorporated self-employed. Internet subscription rates did not have a statistically significant effect on the share of non-incorporated self-employed individuals (results are not reported here), suggesting internet access is more important for incorporated business establishments than for the non-incorporated self-employed.

Specifically, a one percentage point increase in the internet subscription rate is associated with a 0.03 percentage point increase in the share of self-employed. In other words, a change in the share of households with an internet subscription from, say, 50 percent to 70 percent, holding all else equal, would be expected to yield a 0.6 percent point increase in the share of self-employed.

The population of the reservation is also positively and significantly associated with self-employment, which reflects the positive effect of the local market size. Larger populations also tend to have a larger labor force, and a broader and deeper labor market pool from

Table 7: Determinants of Tribal Reservation Self-Employment

Dependent variable: selfemp				
Independent variables	(1)	(2)	(3)	(4)
bach	.119*** (.021)	0.118*** (.021)	0.120*** (.021)	.127*** (.021)
internet	0.032*** (.011)	0.031*** (.011)	0.029** (.011)	0.019** (.008)
lpop	.252*** (.079)	0.250*** (.078)	0.266*** (.077)	.221*** (.077)
mobility	-.049 (.031)	-0.048 (.029)	-0.052* (.030)	
casino	-.162 (.363)	-0.153 (.362)		
nat res	0.513 (.455)	0.564 (.431)		
ldist	0.048 (.132)			
intercept	-3.13*** (.914)	-2.91*** (.688)	-2.97*** (.738)	-2.59*** (.715)
Observations	166	166	166	166
R-squared	0.467	0.466	0.457	0.442
F-statistics	18.75	21.49	29.11	39.10
Prob > F	0.000	0.000	0.000	0.000

Data note: OLS estimation results are reported with robust standard errors. * denotes statistical significance at the 10 percent level; ** denotes statistical significance at the 5 percent level; *** denotes statistical significance at the 1 percent level.

which to hire, which can be important for business owners with paid employees. Ideally, future researchers will have better data and detail on the size of business establishments on the reservation.

Contrary to expectations, mobility was not a statistically significant determinant of self-employment. In fact, the results suggest that mobility is negatively associated with self-employment but only marginally significant (significant only at the 10 percent level). To the extent mobility is an indicator of labor force dynamism, this was unexpected. Decomposing mobility into the three underlying measures—the share of households that moved within county, within state, and across state lines—did not shed any further light on this curious result.

Mobility on and off the reservation may be a more meaningful measure of labor force mobility in the context of trying to understand the underlying dynamics of business development on reservations. To be clear, for future data gathering, a better measure of labor mobility here would be whether an individual moved on or off the reservation in the last 12 months or a longer period.

Key Determinants of Unemployment

Next, we examine the unemployment rate, which can reflect the economic vigor of a tribal reservation. Our basic econometric specification for unemployment is denoted as:

$$unemp_i = \alpha_0 + \delta \cdot geo_i + \beta \cdot educ_i + \gamma \cdot infra_i + \theta \cdot mkt_i + \mu \cdot char_i + e_i$$

Unemp is the unemployment rate among a tribal reservation's population 16 years and over; *geo* represents economic geography or remoteness such as the distance from an urban center or the share of households that reside in an urban area; *educ*, *infra*, *mkt* and *char* are the same as described above. *e* denotes the error term and the subscript *i* denotes the tribal reservation level of observation.

Discussion of Results

We begin with an equation relating unemployment to educational attainment, specifically the share of 25 year-olds and over with a bachelor's degree and the share with a high school degree; infrastructure variables including the share of households

with an internet subscription, and the share of households with a computer; mobility is the share of the population that has moved within past 12 months; and other tribal characteristics such as the presence of a casino or a natural resource project:

$$[2] \quad unemp = \hat{\beta}_0 + \hat{\beta}_1 ldist + \hat{\beta}_2 bach + \hat{\beta}_3 hs + \hat{\beta}_4 internet + \hat{\beta}_5 comp + \hat{\beta}_6 mobility + \hat{\beta}_7 ltotcivemp + \hat{\beta}_8 casino + \hat{\beta}_9 natres$$

The estimates of equation (2), obtained using our dataset of 166 tribal reservations, are given in table 8. Robust standard errors are reported in parentheses. *ldist* is positively and significantly associated with unemployment, as expected. Educational attainment is negatively related to unemployment, although only when the share of the population with at least a bachelor's degree is used (neither some college nor only high school degrees are not statistically significant). *internet* and *comp* capture digital infrastructure, although only *comp* (the share of households with a computer) is significant: the share of households with a computer is negatively and significantly related to unemployment. Market size, as captured here by size of the total civilian labor force, is negatively and significantly associated with unemployment. The estimated coefficients on tribal characteristics *casino* and *natres* are negative but insignificant and results from a joint F-test indicated those two variables were jointly insignificant. Column (2) excludes those two variables while the estimated coefficients on the remaining variables are robust to their exclusion. The estimated coefficients on *hs* and *internet* are each insignificant and column (3), which excludes those two variables, is our preferred specification.

The regression results indicate that location is statistically significant and economically important in unemployment. A one percent increase in the distance from an urban area is associated with a 0.01 increase in the unemployment rate, or a 25 percent increase in distance from an urban area is associated with a quarter point increase in unemployment. At the average distance of 112 miles, a 50 percent decrease in the distance from an urban area would be associated with a half point decrease in unemployment.

Educational attainment is both statistically significant and economically important in terms

Table 8: Determinants of Tribal Reservation Unemployment

Dependent variable: unemp			
Independent variables	(1)	(2)	(3)
ldist	1.177**	1.041**	1.062**
	(.567)	(.502)	(.504)
bach	-.252***	-.257***	-.242***
	(.081)	(.079)	(.085)
internet	0.040	0.048	
	(.088)	(.087)	
comp	-.178*	-.184*	-.136**
	(.100)	-0.099	(.058)
mobility	-.205	-.201*	-.185*
	(.125)	(.118)	(.109)
ltotalcivemp	-0.503	-.568*	-.588*
	(.321)	(.302)	(.307)
casino	-0.278		
	(1.57)		
natres	-1.217		
	(1.94)		
intercept	28.03***	28.83***	27.85***
	(5.43)	(5.27)	(4.99)
Observations	166	166	166
R-squared	0.288	0.286	0.283
F-statistics	6.05	15.55	17.96
Prob > F	0.000	0.000	0.000

Data note: OLS estimation results are reported with robust standard errors. *denotes statistical significance at the 10 percent level; ** denotes statistical significance at the 5 percent level; ***denotes statistical significance at the 1 percent level.

of explaining unemployment rates on tribal reservations. The estimated coefficient on *bach* is positive and significant and indicates that a one-point increase in the share of the population with a bachelor's degree or higher is expected to decrease unemployment by 0.24 percentage points. Similarly, for each five-percentage point increase in *bach*, unemployment is expected to decrease by 1.2 percentage points.

Computer access is a significant driver of lowering unemployment. The share of households with a computer is negatively and significantly associated with unemployment: a five-percentage point increase is associated with over a one-half percentage decrease in unemployment, which is a statistically significant and practically important effect.

The size of the labor force on the reservation is also positively and significantly associated with unemployment, which reflects market and labor market size. Table 8 indicates that going from a labor force size at the median, or 50th percentile (1,251) to the 75th percentile (3,014) yields a 0.84 percentage point decrease in unemployment, which is statistically significant and economically meaningful. This result is consistent with the notion that larger populations of labor, including skilled laborers, are better able to exchange knowledge, ideas, and information. This labor market pooling effect has been shown to facilitate economic vigor of a community, and these results for tribal reservations are consistent with that finding.

Mobility is negatively associated with unemployment but is not as important as education, computer access, and size of the labor force. Mobility is negatively associated with unemployment but only marginally significant. That is, a higher share of households that have moved either within or across county or state lines in the past 12 months is negatively associated with the unemployment rate on the reservation. This may reflect that people move for a job.

“The results also indicate that, all else equal, self-employment is greater in areas that have more economic activity and employment in agriculture, construction, and manufacturing sectors, and less economic activity and employment in public administration and government.”

Summary of Results

Overall, these econometric results suggest that educational attainment and internet infrastructure are two key explanatory factors for incorporated self-employment, holding other important variables such as market size, educational attainment, and digital infrastructure fixed. The statistically significant and positive relationship between the share of self-employed and market size reflects the need for a sufficiently large local market and underscores the need to access the market beyond the immediate reservation through e-commerce (see Box 3 for example) and/or exporting. In addition, the statistically significant and positive relationship between the share of self-employed and educational attainment reflects the need for a well-trained workforce to support business development. Similarly, the importance of internet subscriptions points to the need for sound digital infrastructure in business development. The results also indicate that, all else equal, self-employment is greater in areas that have more economic activity and employment in agriculture, construction, and manufacturing sectors, and less economic activity and employment in public administration and government.

Economic geography is a key determinant in unemployment on tribal reservations, with the greater distance from urban areas associated with greater unemployment, holding other key factors constant. The negative and statistically significant relationships between educational attainment and unemployment, and between access to a computer and unemployment suggest that a well-trained workforce with some degree of technical expertise (as measured here by access to a computer or access to internet) are both statistically and economically important factors in reducing unemployment on tribal reservations. The effect of the size of the labor force on the reservation is also a key determinant in unemployment, in statistically significant and economic importance, which points to the importance of access to large and skilled labor market pools for businesses on the reservation.

Box 4. Digital Trade Connecting a Reservation to the World

Reservation economies tend to be small and in remote areas and are likely to be constrained by access to capital and skilled labor. It makes sense, therefore, that their production structures are built on a foundation of highly tradable goods and services. Moreover, via this path businesses can access demand in more populous and higher income cohorts off-reservation, expanding the potential revenue base and accessing opportunities to scale-up more quickly (potentially leveraging finance from off-reservation sources). By using a larger external demand cohort to relax demand-side limitations on revenue growth and expand opportunities for capital deepening through external financing, local-level economic constraints can be relaxed.

One example of an on the ground effort to establish connections to outside capital and reach more customers off the reservation through digital platforms and ecommerce is the experience of Ms. Amy Yeung of Orenda Tribes. Ms. Yeung works to harness her Los Angeles business connections, which she developed during a former successful fashion executive career, to now grow fundraising, organizational, and communication skills for people on the Navajo Reservation. She found the online apparel business Orenda Tribes, which is an upscale showroom of products made by indigenous artisans and tribal members of Navajo Reservation. Approximately 95 percent of Orenda Tribes' sales are online. (Based on discussions with Ms. Amy Yeung of Orenda Tribes, Albuquerque, New Mexico, Feb. 18, 2020.)



Concluding Remarks

Individuals on tribal reservations wishing to start a new business or grow an existing one face common and in some cases extraordinary struggles around access to capital and turning land into collateral, among other challenges. Each tribe has a unique history, however, and the socio and economic characteristics of the people, the workforce, and other economic characteristics differ across tribes. In some ways the challenges for Indian Country mirror those of rural America with overall lower levels of digital connectivity, great distances to hospitals and business centers, and higher unemployment. But in other ways business owners on tribal reservations face unique opportunities and challenges related to the status of tribal land.

Indian Country is evolving and tribes are finding ways to overcome some longstanding challenges and create new opportunities to foster business development and economic well-being on tribal reservations. Some tribes are focusing on self-governance to reacquire land, regain direct control of their services, and lower regulatory burdens for business development. Others are forming tribal companies to leverage government and business opportunities.

In our field research we encountered a general consensus that self governance can overcome at least some of those challenges and facilitate business development in tribal areas. The econometric analysis did not provide strong support for this; however, it is possible with a more in-depth analysis with a time dimension and lagged variables would be useful here.

Any policy discussion on business development in Indian Country should recognize the remoteness as a defining feature of most tribal reservations. Factors that can help businesses overcome the disadvantages of remoteness include educational attainment, workforce development, and digital infrastructure. Policy efforts that aim to eliminate barriers to larger markets outside the immediate reservation should be a priority. Digital platforms and government contracts can also expand the reach of tribal businesses.

Finally, this report focuses on business development across Indian Country through a fairly straightforward economic lens. Areas of useful future empirical research in this area includes understanding the unique challenges and benefits of the usage of trust land in the context of business development.

More Data Needed

Data collection efforts by statistical agencies that can track business establishment by reservation, and/or follow individual tribal businesses over time would greatly further our understanding of business development in Indian Country. Information on the enterprise's cost structure, the types of intermediate goods and services, labor occupations, physical asset types, and other fixed factors that are used would provide insight into the different types of barriers to business development in Indian Country across industries and enable a more targeted policy discussion. Workforce characteristic data on mobility in terms of movement on or off the reservation would also be beneficial.

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References

- Bakerlof, Rose, and Yellen. (1988). "Job Switching and Job Satisfaction in the U.S. Labor Market." *Brookings Papers on Economic Activity*, 2, 495-594.
- Camerer, Colin, Linda Babcock, George Loewenstein, Richard Thaler. "Labor Supply of New York City Cabdrivers: One Day at a Time." *Quarterly Journal of Economics* (May 1997).
- Christnacht, Cheridan, Adam Smith, and Rebecca Chenevert. (2018). "Measuring Entrepreneurship in the American Community Survey: A Demographic and Occupational Profile of Self-Employed Workers." Working paper 2018-28. Washington, DC: US Census Bureau, Social, Economic, and Housing Statistics Division.
- Davis, Steven J., and John Haltiwanger. 2014. "Labor Market Fluidity and Economic Performance." NBER Working Paper 20479.
- Ellison, Glenn, Edward Glaeser, and William Kerr. 2010. "What Causes Industry Agglomeration? Evidence from Coagglomeration Patterns." *American Economic Review* 1195-1213.
- Evans, William and Julie Topoleski. 2003. "The Social and Economic Impact of Native American Casinos," NBER Working Paper 9198.
- European Commission. "Entrepreneurship Determinants: Culture and Capabilities." 2012 edition.
- Frye, Dustin and Dominic Parker. "Indigenous Self-Governance and Development on American Indian Reservations." *AEA Papers and Proceedings* vol. 111 (May 2021).
- Government Accountability Office (GAO). 2019. "Agricultural Credit Needs and Barriers to Lending on Tribal Lands." GAO-19-464
- House Subcommittee on Housing and Community Opportunity. 2006 July 31. "Removing Barriers to Homeownership for Native Americans." Testimony of the Confederated Salish and Kootenai Tribes of the Flathead Reservation.
- Howard, Brian and Traci Morris, 2019. "Tribal Technology Assessment: The State of Internet Service on Tribal Lands."
- OECD. 2017. "Entrepreneurship at a Glance." OECD Publishing, Paris.
- OECD. 2018. "A Taxonomy of Digital Intensive Sectors," OECD Science, Technology and Industry Working Papers.
- U.S. Department of Housing and Urban Development. "Who Counts? Identifying Native American Populations." (Spring 2015).

Verheul, Ingrid, Niels Bosmaa, Fonne van der Nol, and Tommy Wong. "Determinants of Entrepreneurship in the United States," *Economics of Science, Technology and Innovation* (2002).



End Notes

1. Throughout the report, “the reservation” refers to tribal lands in the lower 48 states.
2. Limited data may reflect a number of factors, for instance, the number of American Indians and Alaska Natives is small relative to some other major race categories; the number of people and businesses residing in Tribal areas also is small; Congress has not funded surveys large enough to provide this kind of data; and the use of administrative or private “big” data instead of survey data is limited.
3. Interested readers will find a detailed comparison of AIAN-owned business to other minorities and all U.S. firms in the forthcoming MBDA report, “Emerging Technologies and Implications for Minority Business Enterprises in the U.S. Economy.”
4. The National Congress of American Indians indicates there are 574 federally recognized tribes in the United States (including Alaska and Hawaii) as of February 2019.
5. See U.S. Department of Housing and Urban Development, “Who Counts? Identifying Native American Populations,” (Spring 2015).
6. ACS tracks the share of households that reside in an urban location although this measure does not exist for all tribes. For instance, for the 166 federally recognized tribes that also have a civilian labor force of at least 220, this measure is only reported for 91 of them. Of those 91, just 22 tribes have over half of their households residing in urban areas.
7. Another labor market factor is long-term unemployment, defined by the BLS as workers who have not looked for work in the last 4 weeks because they believe their skills and qualifications are not in demand. At some point these workers may drop out of the workforce, which would lead to a decline in the labor force participation rate.
8. Akee, Mykerezi, and Todd (2018) discuss this industry concentration in “Reservation Nonemployer and Employer Establishments: Data from U.S. Census Longitudinal Business Databases,” CICD Working Paper April 2018.
9. A reservation is classified as having a casino if at least one tribe on that reservation is operating a casino, regardless of whether it is located on the reservation or off-reservation.
10. For formal background, see NCAI, “Tribal Governance”; for development issues in the context of self-governance, see Dustin Frye and Dominic Parker, “Indigenous Self-Governance and Development on American Indian Reservations,” AEA Papers and Proceedings vol. 111 (May 2021).
11. Large margins of error could introduce a relatively large amount of measurement error in the data and regression analysis. If the measurement error is random, that is, if the error is just as likely to be above the true value as it is below it, then on average the errors cancel each other out. But if the measurement error is not random then it can lead to inconsistency in the estimated coefficients. Since there is no way of knowing if the measurement error is random, we do not include those reservations with fewer than 220 in the labor force..
12. These figures are in 2017 dollars and for individuals 25 years and over with earnings.
13. Glenn Ellison, Edward Glaeser, and William Kerr, “What causes industry agglomeration? Evidence from coagglomeration patterns,” American Economic Review, June 2010; and Enrique Moretti, *The New Geography of Jobs* (2012).
14. Brian Howard and Traci Morris (2019).

15. See Christnacht, Smith and Chevner (2018). Also, note that data on the number of business establishments by reservation are scarce or nonexistent. Research in this area would greatly benefit from statistical agencies gathering and reporting on the number of business establishments by tribal reservation along with key characteristics of the owner (race, gender, educational attainment, etc.) and the business (sector, number of employees, sales, etc.).
16. For instance, see Ingrid Verheul, Niels Bosmaa, Fonne van der Nol, and Tommy Wong, "Determinants of Entrepreneurship in the United States," *Economics of Science, Technology and Innovation*, 2002, Kluwer Academic Publishers; OECD, *Entrepreneurship at a glance*, 2017; European Commission, *Entrepreneurship determinants: culture and capabilities*, 2012 edition.
17. Akerlof, Rose, and Yellen (1988) note that fluid labor markets yield better job-worker matching with respect to non-pecuniary characteristics in their paper, entitled "Job Switching and Job Satisfaction in the U.S. Labor Market," *Brookings Papers on Economic Activity*, 2, 495-594. See also Davis, Steven J., and John Haltiwanger. 2014. "Labor Market Fluidity and Economic Performance." NBER Working Paper 20479.



Appendix

Appendix A. Tribal Reservations in the Research Data Set

Acoma Pueblo and Off-Reservation Trust Land, NM

Agua Caliente Indian Reservation and Off-Reservation Trust Land, CA

Allegany Reservation, NY

Bad River Reservation, WI

Bay Mills Reservation and Off-Reservation Trust Land, MI

Bishop Reservation, CA

Blackfeet Indian Reservation and Off-Reservation Trust Land, MT

Bois Forte Reservation and Off-Reservation Trust Land, MN

Cabazon Reservation, CA

Caddo-Wichita-Delaware OTSA, OK

Catawba Reservation, SC

Cattaraugus Reservation, NY

Chehalis Reservation and Off-Reservation Trust Land, WA

Cherokee OTSA, OK

Cheyenne River Reservation and Off-Reservation Trust Land, SD

Cheyenne-Arapaho OTSA, OK

Chickasaw OTSA, OK

Chitimacha Reservation, LA

Choctaw OTSA, OK

Citizen Potawatomi Nation-Absentee Shawnee OTSA, OK

Cocopah Reservation, AZ

Coeur d'Alene Reservation, ID

Colorado River Indian Reservation, AZ--CA

Colville Reservation and Off-Reservation Trust Land, WA

Creek OTSA, OK

Creek/Seminole joint-use OTSA, OK

Crow Creek Reservation, SD

Crow Reservation and Off-Reservation Trust Land, MT

Duck Valley Reservation, NV--ID
Eastern Cherokee Reservation, NC
Eastern Shawnee OTSA, OK
Elko Colony, NV
Fallon Paiute-Shoshone Reservation and Off-Reservation Trust Land, NV
Flathead Reservation, MT
Fond du Lac Reservation and Off-Reservation Trust Land, MN--WI
Fort Apache Reservation, AZ
Fort Belknap Reservation and Off-Reservation Trust Land, MT
Fort Berthold Reservation, ND
Fort Hall Reservation and Off-Reservation Trust Land, ID
Fort McDowell Yavapai Nation Reservation, AZ
Fort Mojave Reservation and Off-Reservation Trust Land, AZ--CA--NV
Fort Peck Indian Reservation and Off-Reservation Trust Land, MT
Fort Yuma Indian Reservation, CA--AZ
Gila River Indian Reservation, AZ
Grand Portage Reservation and Off-Reservation Trust Land, MN
Grand Traverse Reservation and Off-Reservation Trust Land, MI
Ho-Chunk Nation Reservation and Off-Reservation Trust Land, WI--MN
Hollywood Reservation, FL
Hoopa Valley Reservation, CA
Hopi Reservation and Off-Reservation Trust Land, AZ
Hualapai Indian Reservation and Off-Reservation Trust Land, AZ
Iowa OTSA, OK
Isabella Reservation and Off-Reservation Trust Land, MI
Isleta Pueblo, NM
Jemez Pueblo, NM
Jicarilla Apache Nation Reservation and Off-Reservation Trust Land, NM

Kaw OTSA, OK
Kaw/Ponca joint-use OTSA, OK
Kickapoo (KS) Reservation, KS
Kickapoo OTSA, OK
Kiowa-Comanche-Apache-Fort Sill Apache OTSA, OK
Kiowa-Comanche-Apache-Ft Sill Apache/Caddo-Wichita-Delaware joint-use OTSA, OK
L'Anse Reservation and Off-Reservation Trust Land, MI
Lac Courte Oreilles Reservation and Off-Reservation Trust Land, WI
Lac du Flambeau Reservation, WI
Laguna Pueblo and Off-Reservation Trust Land, NM
Lake Traverse Reservation and Off-Reservation Trust Land, SD--ND
Leech Lake Reservation and Off-Reservation Trust Land, MN
Lower Brule Reservation and Off-Reservation Trust Land, SD
Lummi Reservation, WA
Makah Indian Reservation, WA
Maricopa (Ak Chin) Indian Reservation and Off-Reservation Trust Land, AZ
Menominee Reservation and Off-Reservation Trust Land, WI
Mescalero Reservation, NM
Miami/Peoria joint-use OTSA, OK
Mille Lacs Reservation and Off-Reservation Trust Land, MN
Mississippi Choctaw Reservation and Off-Reservation Trust Land, MS
Muckleshoot Reservation and Off-Reservation Trust Land, WA
Nambe Pueblo and Off-Reservation Trust Land, NM
Navajo Nation Reservation and Off-Reservation Trust Land, AZ--NM--UT
Nez Perce Reservation, ID
Nisqually Reservation, WA
Nooksack Reservation and Off-Reservation Trust Land, WA
Northern Cheyenne Indian Reservation and Off-Reservation Trust Land, MT--SD
Ohkay Owingeh, NM

Omaha Reservation, NE--IA
Oneida (WI) Reservation and Off-Reservation Trust Land, WI
Osage Reservation, OK
Otoe-Missouria OTSA, OK
Ottawa OTSA, OK
Pala Reservation, CA
Pascua Pueblo Yaqui Reservation and Off-Reservation Trust Land, AZ
Pawnee OTSA, OK
Penobscot Reservation and Off-Reservation Trust Land, ME
Peoria OTSA, OK
Picuris Pueblo, NM
Pine Ridge Reservation, SD--NE
Pleasant Point Reservation, ME
Ponca OTSA, OK
Port Madison Reservation, WA
Prairie Band of Potawatomi Nation Reservation, KS
Pueblo de Cochiti, NM
Pueblo of Pojoaque and Off-Reservation Trust Land, NM
Puyallup Reservation and Off-Reservation Trust Land, WA
Pyramid Lake Paiute Reservation, NV
Quapaw OTSA, OK
Quinault Reservation, WA
Red Cliff Reservation and Off-Reservation Trust Land, WI
Red Lake Reservation, MN
Reno-Sparks Indian Colony, NV
Rincon Reservation and Off-Reservation Trust Land, CA
Rocky Boy's Reservation and Off-Reservation Trust Land, MT
Rosebud Indian Reservation and Off-Reservation Trust Land, SD

Sac and Fox OTSA, OK
Sac and Fox/Meskwaki Settlement and Off-Reservation Trust Land, IA
Salt River Reservation, AZ
San Carlos Reservation, AZ
San Felipe Pueblo, NM
San Ildefonso Pueblo and Off-Reservation Trust Land, NM
San Pasqual Reservation, CA
Sandia Pueblo, NM
Santa Ana Pueblo, NM
Santa Clara Pueblo and Off-Reservation Trust Land, NM
Santee Reservation, NE
Santo Domingo Pueblo, NM
Sault Ste. Marie Reservation and Off-Reservation Trust Land, MI
Seminole OTSA, OK
Seneca-Cayuga OTSA, OK
Skokomish Reservation, WA
Soboba Reservation and Off-Reservation Trust Land, CA
Southern Ute Reservation, CO
Spirit Lake Reservation, ND
Spokane Reservation and Off-Reservation Trust Land, WA
St. Croix Reservation and Off-Reservation Trust Land, WI
St. Regis Mohawk Reservation, NY
Standing Rock Reservation, SD--ND
Stockbridge Munsee Community and Off-Reservation Trust Land, WI
Susanville Indian Rancheria and Off-Reservation Trust Land, CA
Swinomish Reservation and Off-Reservation Trust Land, WA
Taos Pueblo and Off-Reservation Trust Land, NM
Tesuque Pueblo and Off-Reservation Trust Land, NM
Tohono O'odham Nation Reservation and Off-Reservation Trust Land, AZ

Tonawanda Reservation, NY
Tonkawa OTSA, OK
Torres-Martinez Reservation, CA
Tulalip Reservation and Off-Reservation Trust Land, WA
Tule River Reservation and Off-Reservation Trust Land, CA
Turtle Mountain Reservation and Off-Reservation Trust Land, MT--ND--SD
Tuscarora Nation Reservation, NY
Uintah and Ouray Reservation and Off-Reservation Trust Land, UT
Umatilla Reservation and Off-Reservation Trust Land, OR
Ute Mountain Reservation and Off-Reservation Trust Land, CO--NM--UT
Walker River Reservation, NV
Warm Springs Reservation and Off-Reservation Trust Land, OR
Washoe Ranches Trust Land, NV--CA
White Earth Reservation and Off-Reservation Trust Land, MN
Wind River Reservation and Off-Reservation Trust Land, WY
Winnebago Reservation and Off-Reservation Trust Land, NE--IA
Wyandotte OTSA, OK
Yakama Nation Reservation and Off-Reservation Trust Land, WA
Yankton Reservation, SD
Yavapai-Apache Nation Reservation, AZ
Ysleta del Sur Pueblo and Off-Reservation Trust Land, TX
Yurok Reservation, CA
Zia Pueblo and Off-Reservation Trust Land, NM
Zuni Reservation and Off-Reservation Trust Land, NM--AZ



