

The Long-Term Effects of American Indian Boarding Schools*

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Abstract

This paper explores some long-standing questions of the legacy of American Indian boarding schools by comparing contemporary Indian reservations that experienced differing impacts in the past from boarding schools. Combining recent reservation-level census data and school enrollment data from 1911 to 1932, I find that reservations that sent a larger share of students to off-reservation boarding schools have higher high school graduation rates, higher per capita income, lower poverty rates, a greater proportion of exclusively English speakers, and smaller family sizes. These results are supported when distance to the nearest off-reservation boarding school that subsequently closed is used as an instrument for the proportion of past boarding school students. I conclude with a discussion of the possible reasons for this link.

Keywords: Education; Development; Assimilation; American Indians.

JEL Codes: I25, J15, N30, O15, Z10

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1 Introduction

Economists have become increasingly interested in studying how assimilation policies impact the integration of minorities.¹ Education is often used as the tool for assimilation and one of the most controversial examples of such policy was the practice of sending American Indian children to off-reservation boarding schools during the early twentieth century.² While this event has received much attention by sociologists, anthropologists, and historians, the effects of this historical episode have been largely overlooked by economists.³

The stated purpose of off-reservation boarding schools was to remove Indian children from their communities in order to train them to look and act like their white counterparts, but many of these students eventually returned to their home reservations.⁴ In this paper, I explore the long-run effect of historical exposure to off-reservation boarding schools on contemporary social and economic outcomes of American Indians living on reservations.⁵ I first collect reservation-level data from 1911 to 1932 to measure the proportion of Indian students who attended off-reservation boarding schools. I also collect a wide range of tribal, historical, and contemporary variables to control for other factors that can influence modern reservation outcomes. I then link these historical variables to several outcomes that could be affected by past boarding school enrollment rates: (1) high school graduation rate, (2) per capita income; (3) poverty rate; (4) share of strictly English speakers; and (5) family size.

The lone econometric study of boarding schools is by [Feir \(2016\)](#), who explores the effect of attending a Canadian residential school on adult outcomes by exploiting variation in school proximity and the local share of non-aboriginal Catholics (interacted with national trends in residential

¹The initial work in this literature focused on the theoretical possibilities of cultural opposition to forced assimilation ([Bisin and Verdier, 2000, 2001](#)). More recently, empirical work has found casual evidence of the effect of cultural assimilation on the outcomes of affected individuals. For example, [Fouka \(2015\)](#) uses a difference-in-differences approach to show that German immigrants who were affected by a German language ban in U.S. schools after World War I were more likely to marry endogamously, less likely to volunteer in World War II, and less likely to adopt Americanized names for their children. Additionally, [Meyersson \(2014\)](#) implements a regression discontinuity design to show that females, especially from poor and religiously conservative families, increased their educational attainment in Turkish cities under Islamic political control in large part to loosening restrictions on religious expression in local schools.

²The removal of indigenous children from their families to boarding or residential schools also occurred in Canada and Australia. Unlike the United States, both Canada and Australia have formally apologized for their country's past policies of forcefully separating indigenous children from their parents.

³The key exception is the work by [Feir \(2016\)](#) on the impact of Canadian residential boarding school system. This work will be discussed in greater length later in this paper.

⁴Statistical evidence confirm that boarding school exposure did not differentially alter the link to a reservation's ancestral population. Table A1 in the online appendix shows that reservations with larger share of boarding school students from 1911 to 1932 saw a greater share of out-migration during the mid-1940s. However, by 1980, the share of enrolled tribal members living on the reservation was unaffected by the past boarding school experience. Tribal membership is assigned to a lineal descendant of someone listed on the tribe's base roll. Many of those base rolls were enumerated during the early twentieth century, which correspond to the historical era used in this paper to estimate the long-run effects of boarding schools.

⁵For the sake of brevity, I will commonly refer to off-reservation boarding schools simply as boarding schools. Most Indian reservations contained boarding schools within their boundaries, but the attention in the historiography has been focused on the larger and distinctly unique off-reservation boarding schools. Hence, the variable of interest discussed throughout this paper will refer to the proportion of Indian students on a reservation who attended off-reservation boarding schools.

school enrollment). Using detailed cross-sectional individual data, residential schooling is shown to increase the likelihood of graduating high school, to reduce reliance on government transfers, to increase the probability of being employed and of living off an Indian reserve, and to decrease the probability of speaking an Aboriginal language at home.

In many ways, my paper is a formal investigation into the robustness of these results, with the key difference that this paper estimates the effect of boarding schools over multiple generations. Yet, there are two noticeable differences between the Canadian and American residential systems. First, the decision to attend an Indian boarding school in America required parental consent by 1911, whereas the local Indian agent selected children from Canadian reserves. Second, most Canadian residential schools were run by the Catholic Church, whereas the American boarding schools were funded and run by the federal government (Miller, 1996; Adams, 1995). Thus, issues of selection and the religious content of the curriculum suggest possible differences in the long-run effects of the two systems could exist.

The key findings from my analysis are as follows. I find that reservations who were most affected by boarding schools are less poor, more educated and more linguistically assimilated today. For example, I find that an increase of one standard deviation in the proportion of past boarding school students increases the current high school graduation rate by 2.1 percentage points, increases per capita income by 7.3 percent, decreases the poverty rate by 3.6 percentage points, increases the share of individuals who exclusively speak English at home by 3.6 percentage points, and lowers family size by 2.0 percent. These findings are robust to a host of model specifications and the inclusion of historical and tribal controls.

I also draw inferences about the impact of boarding schools using proximity to a nearest boarding school that has since closed as an instrument for the proportion of boarding school students. While the historical literature suggests that the location of the schools was largely exogenous to the characteristics of nearby reservations, this assertion is confirmed by multiple falsification tests and placebo distances. The resulting IV estimates are consistent with the earlier results: the estimated long-run assimilation effects caused by past boarding school exposure are larger in absolute size than their OLS counterparts.

The remainder of the paper looks at the channels that can explain how these effects operate. Unfortunately, there is no known evidence of variation in educational inputs across boarding schools; therefore, I cannot isolate a particular boarding school characteristic that might explain these assimilation gains. I do, however, lump the potential channels of causality into two broad categories: factors internal to the individual and factors external to the individual. Internal factors include parental education, skills, norms and beliefs that can be passed down through generations, where external factors include economic and political institutions that may have been altered due to past boarding school exposure.

I find that reservations that were most affected by boarding schools had higher literacy rates by the mid-twentieth century. Those mid-century gains in literacy have persisted to the present and explain between 10–30 percent of the long-run assimilation effect. I also find that children living

on reservations most affected by boarding schools are more likely to have a parent who graduated high school, less likely to have family members who speak in a Native language, yet there is no relationship between past boarding school exposure and school-based characteristics such as the likelihood to elders speak about tribal traditions at school. Finally, I show that controlling for contemporary variation in institutions, such as casino operations or self-governance projects, do not influence the long-run assimilation effect. Thus, the long-run assimilation effects are largely driven by factors internal to individuals.

My findings relate to at least three literatures. The first concerns the effects of historical investments in assimilation on long-run development. For example, many studies have uncovered positive long-run effects of historical missionary activity throughout the world, including in Africa (Gallego and Woodberry, 2010; Nunn, 2014; Woodberry, 2004), Mexico (Waldinger, 2016), The Netherlands (Akçomak et al., 2016), India (Mantovanelli, 2013), and South America (Caicedo, 2014). This richness of my dataset will allow me to control for missionary activity while still estimating long-run assimilation effects caused by boarding schools. Second, these findings add to the growing appreciation by economists that historical events can influence development today through its impact on human capital and culture (for a survey of this literature, see Nunn, 2009). Third, these findings contribute to the literature on American Indian economic development, which has attributed economic growth to variations in land tenure (Anderson and Lueck, 1992; Akee, 2009), tribal sovereignty (Anderson and Parker, 2008), leadership (Cornell and Kalt, 1992b,a, 1995, 1998, 2000, 2006), and constitutional design (Akee et al., 2015). Within this growing literature, Dippel (2014) is the lone study to emphasize the role of history on current economic development by isolating the institutional origins of current political conflicts.

The paper is organized as follows. Section 2 provides background on the history of Indian boarding schools. Section 3 discusses the data, and section 4 explains the empirical strategy. Section 5 reports the results and section 6 sheds light on the channels through which this historical effect operates. Last, section 7 offers conclusions.

2 Background

While the U.S. policy toward Indian education has historically been driven by the desire to “civilize” Indians in Euro-American ways, the methods used by the U.S. government have significantly changed since 1790. In the period from 1790 to 1869, the management of Indian education was effectively placed in the hands of Christian missionaries (Henson et al., 2008, 200). Limited federal appropriations combined with Indian resistance to proselytism kept the number of formally educated Indians low during this era. In 1824, for example, enrollment in mission-run schools totaled 900 students, which corresponded to 0.2% of the American Indian population (Hurt, 1987, 101; Thornton, 2000, 24).⁶ Only a limited number of tribes, among them the Cherokees and Choctaws,

⁶One explanation for the low number of schools on reservations was the proclivity of Indian leaders to reject educational clauses in treaties. For example, during the Treaty of Medicine Lodge negotiations in 1867, Kiowa chief *Satanta* rejected the idea of building schools on his reservation: “I don’t want any of the medicine lodges within this

managed their own schools, which they did thanks to ear-marked appropriations in treaties (Szasz, 1999, 9).

From 1869 to 1878, Indian education remained decentralized under President Ulysses S. Grant's "Peace Policy." Driven by the increased number of Indian-white conflicts and the geographical limits to removing Indians to new reservations, the government increased funding to mission schools in order to increase enrollment (Fritz, 1959). The U.S. government also responded to widely-publicized incidents of corruption within the Office of Indian Affairs by creating the Board of Indian Commissioners, a religious body tasked with nominating Indian agents who would promote both Christianity and schooling. The bureaucratic demands of patronage and the slow process of Indian acculturation, however, brought the "Peace Policy" to an end in less than a decade (Adams, 1995, 6–7).

A sea change in Indian education then occurred in 1879 with the establishment of centralized, federally-managed K–12 schools. Many mission schools were converted to federal day and boarding schools (called agency schools), but the creation of large, off-reservation boarding schools was the centerpiece of this reform. As explained by General Richard H. Pratt, the founder of the prototypical off-reservation school of this era, this kind of schooling was aimed at "bringing the Indian to civilization and keeping him there" (Prucha, 1984, 816).⁷ As laid out in the "Uniform Course of Study," each school day was split into academic instruction in the morning and occupational training in the afternoon (Trafzer et al., 2006, 179). The academic subjects comprised a mix of literature, history, English, and mathematics, while vocational training was given to boys to prepare them to become laborers and to girls to become homemakers.

Off-reservation boarding schools differed from other types of institutions that enrolled Indian children in four important ways. First, there was the obvious difference in terms of location. The high costs of transporting children off reservations and the limited funding provided by Congress meant that students often spent from three to five years away from their families (Meriam, 1977). During school breaks, boarding school students participated in the outing system, which placed Indian children (mainly boys) in local white homes, where they were assigned either household chores or work in local industry (Fear-Segal, 2007, 172–176). The family of any boarding school student who desired to spend breaks at home instead of participating in the outing program was required to pay for the round-trip costs of transportation and, given the impoverished conditions on many Indian reservations, the cost was often prohibitive (Gram, 2015, 33). This extended stay was unlike the experience of agency boarding students, who typically spent breaks at home.

Second, off-reservation boarding schools were substantially larger than agency schools. The Carlisle Indian Industrial School in Pennsylvania, the paradigm for all off-reservation schools, had the largest capacity, 800 students, followed by the Phoenix School with 600 students. Even the smaller boarding schools in places such as Greenville, CA, and Springfield, SD, were larger than

country. I want the children raised as I was" (Fear-Segal, 2007, 49).

⁷General Pratt is more famously associated with his claim that the only way to educate an Indian was to "kill the Indian in him and save the man" (Adams, 1995, 52). This quotation has been adopted by Churchill (2004) as the title of his book-length survey of the atrocities committed against Indians in the name of civilization.

agency schools, which, on average, had a capacity of only 20 students. These high enrollments led to numerous problems, including poor nutrition, overcrowding, and a lack of sanitation (Davis, 2001). As a result, communicable diseases such as trachoma and tuberculosis were common at off-reservation boarding schools (Allen and Semba, 2002; DeJong, 2007).

A third major difference concerns the curricula. Since agency schools often served as feeder schools for off-reservation boarding schools, off-reservation boarding schools were responsible for the grammar school curriculum, and some boarding schools provided two-year “advanced” courses after completion of grade eight.⁸ By 1909, superintendents of off-reservation schools were being told by the Indian Office to accept no children under the age of 14. Eventually, by the late 1920s, several off-reservation boarding schools became accredited high schools.⁹ For Indians during the period from 1910 to 1940, the choice in attending high school was between off-reservation boarding schools and public schools (Hoxie, 1984, 208).

Lastly, off-reservation boarding schools were, by design, intertribal, in part so that students would be forced to speak English as a common language (Adams, 1995, 142; Vučković, 2008, 73). Several historians have speculated that this situation led to two unintended consequences. First, the intertribal composition of students may have helped to create such pan-Indian movements as the American Indian Movement of the 1970s and to promote political self-determination during the 1980s (Gibson, 2016; Gram, 2015; Fear-Segal and Rose, 2016).¹⁰ Second, Lomawaima (2000), Woolford (2015), and McBeth (1983) suggest that the interactions of students from different tribes may have reinforced tribal identity.

It is worth noting that many aspects of off-reservation boarding schools were shared with other types of Indian schools. To begin with, on- and off-reservation boarding schools alike were highly regimented; thus, students at both types of schools participated in daily military drills (Vučković, 2008, 67). Further, while reservation schooling was compulsory, Indian families were not forced to send their children to a particular school; and after 1891 children could not attend an off-reservation boarding school without the “full consent” of their parents (Adams, 1995, 65; Lomawaima, 1994, 36). Moreover, corporal punishment was practiced at all schools that enrolled Indians (i.e., agency schools, off-reservation boarding schools, and public schools). The Indian Office policy at this time advocated the use of corporal punishment but “only in cases of grave violation of rules” (Adams, 1995, 121). An independent investigation conducted by the Indian Rights Association (an Eastern reform association) suggested that practice differed from official policy, but many of the allegations of abuse were against agency schools (Association, 1899).

The failures of off-reservation boarding schools were detailed in the Meriam (1928) Report, a

⁸Anecdotal evidence suggests that Indian nations understood the quality difference between off-reservation boarding schools and agency schools. For example, leaders of the Confederated Tribes of Warm Springs objected to the possible closure of the Chemawa boarding school in Oregon, claiming it would deprive “Indian youth of our reservation of higher educational advantages” (Szasz, 1999, 31-32).

⁹In 1926, the Albuquerque, Chilocco and Salem boarding schools offered courses at the grade 10 through 12 level (Adams, 1995, 320).

¹⁰For example, prominent leaders of the American Indian Movement of the 1970s, such as Dennis Banks, George Mitchell and Leonard Peltier, were former all off-reservation boarding school students (Davis, 2001).

study conducted by the Institute of Government Research (forerunner of the present-day Brookings Institution), which cited poor nutrition, overcrowding, menial student labor, unruly teachers, and rigid curricula as reasons to curtail boarding-school enrollment. This critique, along with the passage of the 1934 Indian Reorganization Act, effectively phased out boarding schools as coercive assimilation institutions (Smith, 1971). Boarding schools that adopted the reforms called for in the Meriam Report were allowed to continue, but many closed during the 1930s.

I have identified three mechanisms by which past boarding school experience might have adversely affected generation after generation of American Indian families. First, the trauma associated with isolating children from their families and restricting traditional cultural practices has been linked to a greater incidence of illicit drug use (Evans-Campbell et al., 2012; Lemstra et al., 2012; Pearce et al., 2008), Post Traumatic Stress Disorder (PTSD) (Bombay et al., 2011; Elias et al., 2012), and alcohol dependency among the American Indian population (Dick et al., 1993). These studies often rely on first-hand interviews so the samples are understandably small and the effects may not be representative of the larger population. Studies that rely on larger samples have generated less convincing results. For example, Henderson et al. (1998) interviewed over 1,000 Navajo Indians and found that high school dropouts and alcohol dependence are highly correlated but found no relationship between alcohol use and past boarding school experience. Koss et al. (2003) recorded interviews with 1,660 individuals across seven tribes and found a positive relationship between alcohol dependency and past boarding school attendance for women but not for men.

Second, there may be a negative relationship between educational outcomes and exposure to boarding schools. In a study of children on First Nation reserves, Bombay et al. (2014) found that children who had a parent who attended a residential school were eight percentage points more likely to report learning difficulties in school, and 12 percentage points more likely to repeat a grade. Huffman (2013) surveyed 21 elementary and secondary educators who work at reservation schools and found evidence of a “reverse racism mentality,” which led some American Indian students to dismiss western education as for white students. One teacher, in particular, linked this attitude to factors that “stem from the early education of Native people and the boarding school system” (Huffman, 2013, 35). Using interview data from 31 American Indian grandparents who raised their grandchildren, Mooradian et al. (2007) found evidence, albeit limited, that past boarding school attendance increased elder’s reluctance to trust government and educational systems.

Third, sending children to boarding schools removed Indian parents as traditional role models, and research has linked contemporary family violence and perverse child-rearing practices to early twentieth-century boarding schools. Kawamoto (2001) examined family health problems among the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians and traced the use of shaming and negative child disciplining techniques to their experiences at boarding schools. Irwin and Roll (1995) documented cases of child abuse at boarding schools and found that a link between past child abuse and abusive behavior as an adult. The authors speculate that the size and intimacy of Indian reservations might perpetuate this cycle of abuse.

On the other hand, however, there are at least two mechanisms through which boarding school students and future generations may have benefited. First, off-reservation boarding schools provided an alternative to neighboring, mostly non-Indian public schools. There are few positive reports of the treatment of Indian students at public high schools, and racism appears to have been omnipresent. Child (2000) summarizes the calculus of attending a school that offered upper grades: “When students felt unwelcome in nearby public institutions due to racism against Indians, government boarding schools offered a less threatening environment.” Thus, for some students, a boarding school was the lesser of two evils. For example, Hirshberg et al. (2005) interviewed 61 Alaska Natives and found that roughly 60 percent spoke positively about their boarding school experience. For these reasons, boarding school students may have achieved a higher level of education than non-boarding school students.

Second, boarding schools allowed students to escape the volatile environment on reservations. For example, when Congress established the Chilocco School, the goal was to educate children from “Indian tribes located in the Indian Territory who are least provided for under existing treaties or laws” (Kappler, 1975, 198). Alumni from this school often claimed that homeless children benefited the most from the boarding school experience (Lomawaima, 1994, 38). Thus, as historian Brenda J. Child explains, “In times of family crisis or economic hardship, Indians could turn to boarding schools for help” (Child, 2016, 24).

3 Data

3.1 Historical Data

To measure the legacy of boarding schools on Indian reservations, I use historical data on school enrollment from the Annual Report of the Commissioner of Indian Affairs.¹¹ Figure 1 illustrates trends in off-reservation boarding school enrollment and total enrollment in the period from 1880 to 1930. At the beginning of this period, 153 children were enrolled in a single boarding school. As more boarding schools were established, enrollment grew from 1,000 children (9% of all Indians participating in schooling at the time) in 1884 to 10,000 children (or 18%) in 1913. During the second and third decades of the twentieth century, as discussed, the federal government slowly changed course and advocated on-reservation day schools and neighboring off-reservation public schools. Student enrollment increased rapidly at this time, with total enrollment nearing 83,000 in 1932. Despite this policy reform, total boarding-school enrollment still hovered around 10,000 students per year from 1910 to 1930.

From 1911 to 1932, Indian agents reported annually the number of Indian children enrolled at the government-run off-reservation boarding schools, agency boarding and day schools, mission-run boarding and day schools, and neighboring public schools. These data are measured at the level of the Indian agency which, on average, held jurisdiction over 1.5 reservations. Since contemporary

¹¹These reservation-level data have been adopted by others, most notably Carlson (1981) who estimated the impact of allotment on American Indian farming.

Indian data are measured at the reservation level, I link all historical data to individual reservations by weighting the agency school data by the reservation's share of the total agency population.¹² Therefore, my boarding school variable is computed as the proportion of students from 1911 to 1932 who attended off-reservation boarding schools.

Two characteristics of this variable are worth remarking. First, the average reservation in the sample contains 19 (out of a possible of 22) years of schooling data. Thus, this variable is quite representative of this entire era in Indian education. Second, from 1911 to 1932, this variable is highly stationary. To illustrate, using a balanced panel of 55 reservations from 1911 to 1932, a [Levin et al. \(2002\)](#) unit root yields a bias-adjusted t -statistic of -3.308 (p -value<0.001), which easily rejects the null hypothesis that the boarding school share variable has a unit root.¹³

The sample is constructed in the following ways. From the universe of federally-recognized reservations with historical education data (N=150), I omit reservations with a modern population of less than 100 inhabitants.¹⁴ This is in line with other papers that use cross-reservation data and is identical to the population threshold used in [Dippel \(2014\)](#). Additionally, in the spirit of [Dippel \(2014\)](#), I drop the reservations that contain multiple tribes.¹⁵ This restriction helps control for long-standing characteristics that are shared across reservations managed by the same tribe. Last, I omit reservations with historical schooling data that were terminated during the 1950s but later restored. After applying these restrictions, I am left with 113 reservations covered by 80 historical Indian agencies across 18 states.¹⁶

The Annual Reports of the Commissioner of Indian Affairs also contain a wide range of historical controls. I first control for missionary activity with a per capita Protestant missionary measure. Second, I include a measure of early social integration, defined as the proportion of the population that is full-blooded. Third, I include the share of reservation land that was allotted by 1920 since

¹²There are three notable exceptions to this matching strategy. First, the Navajo Nation belonged to four Indian agencies over these years: The Eastern Navajo, Northern Navajo, San Juan and Pueblo Bonito Indian agencies. For this reservation, the agency data needed to be aggregated together rather than disaggregated. Second, some states (New York, Michigan, Florida and Maine) contained only one Indian agency over the entire data window. In these cases, the variation in the proportion of students enrolled in boarding schools would be identical to the variation in reservation size. For this reason, I did not include any reservations from these states in the sample. Third, the Albuquerque Indian Agency and Santa Fe Indian Agency did not report population figures by reservation; therefore, population-weighted boarding school proportions could not be calculated for the reservations under these agencies.

¹³Alternatively, a fixed-effects regression of the form $S_{it} = \mu_i + \beta t + \epsilon_{it}$, where S_{it} is the variable of interest measured on reservation i in year t , μ_i is the reservation fixed-effect term, t a continuous time trend, yields a coefficient of -0.001 (s.e. =0.002) on the time trend. Therefore, constructing the variable of interest as the average proportion of students enrolled in off-reservation boarding schools from 1911 to 1932 will not lose valuable information, since there was very little time-series variation in this proportion.

¹⁴There are also 25 tribal areas in Oklahoma with historical educational data. These tribal areas are not included in the sample since those tribes lost their reservations during the establishment of Oklahoma as a state in 1907. Even though the Census Bureau collects modern data on these tribes within their former reservations, these areas are not considered reservations and, as a consequence, the tribes have limited governmental powers ([Cornell et al., 1998](#)).

¹⁵Because there are no historical schooling data in Michigan, South Carolina, Texas, Florida and Maine, [Dippel \(2014\)](#)'s sample of 182 reservations is larger than the one used in this paper.

¹⁶Table A2 in the online appendix reports the balancing tests between the sample used in this paper and the sample of all historical reservations with schooling data. On average, my sample contains larger reservations, both in terms of population and area, which is to be expected. However, the mean differences in the other control variables are statistically indistinguishable.

previous work suggests that the myriad of property rights systems which emanated from the era of Indian allotment affects contemporary economic development (Anderson and Lueck, 1992). Lastly, I control for average population size. Data on early assimilation was recorded intermittently, so these variables are averaged over all available data from 1911 to 1932.

To control for pre-contact tribal traditions that may have influenced assimilation, I link these reservations to tribal information contained in the *Ethnographic Atlas*. The dependence of agriculture in subsistence is controlled for by coding a variable equal to one if a tribe depended on agriculture for subsistence at any level above the lowest listed in the *Atlas* (i.e., above 0-5% dependence). Second, I measure the size of the local community, which equals one if tribes were organized into extended families, zero otherwise. Third, I control for the level of social stratification, which equals one if a tribe was non-egalitarian, zero if egalitarian. Last, I adopt Dippel (2014)'s forced coexistence variable, which equals one if a reservation contains multiple bands from the same tribe, zero otherwise. In sum, the historical controls will contain eight variables, four of which relate to tribal characteristics.

3.2 Current Reservation Development

The long-run outcomes are taken from the 1990 and 2000 decennial censuses and the 2006-2010 five-year American Community Survey. The economic outcomes include the proportion of individuals on reservations aged 25 and older with at least a secondary education (i.e., the high school graduation rate), the per capita income, and the share of Native-only families living in poverty. The census data are somewhat limited in its collection of social outcomes but, for this paper, I am able to use the share of the population aged five and older that speaks only English at home and the mean family size as measures of social assimilation. All outcomes are measured for the Native-only population (defined as individuals who claim to be American Indian, Alaskan, or Aleut) living on reservation or trust land.

Following Dippel (2014), I adopt neighboring economic conditions as contemporary controls, namely the unemployment rate and per capita income of neighboring counties and the distance to the nearest city with a population of at least 50,000. Last, two reservation controls are used in the paper. First, the median age of the American Indian population is used to account for differences in the age distribution. Second, I control for differences in reservation size by including the population density, which is defined as the log of the total population divided by reservation's area measured in square kilometers.

Table 1 presents the descriptive statistics for the variables used in the main section of the paper. The sample reveals the limited degree of integration during this historical era. On average, reservations sent 20% of their total students from 1911 to 1932 to off-reservation boarding schools. The number of Protestant missionaries averaged two per thousand, while roughly 70% of the population was comprised of full-blooded Indians. Additionally, the majority of tribes held traditions that were dissimilar to Euro-American socio-economic traditions. Only half of the tribes had experience with agriculture, 16% were non-egalitarian and 63% traditionally lived in larger, extended families.

With respect to the contemporary outcomes, the sample averages reveal the well-known poverty of American Indians on reservations. For example, the per capita income on neighboring counties is 2.5 times larger than that of the average reservation. This paper, however, exploits the less well-known but considerable variation in cross-reservation economic development. For example, the share of the Native-only population who strictly uses English at home ranges from 3% to 100%, while the high school graduation rate ranges from 27% to 98% of the adult population. Even reservations of similar size had different economic outcomes. For example, the high school graduation rate in 2000 on the San Ildefonso Pueblo in New Mexico was fifty-one percentage points higher than the high school graduation rate on the Cocopah Reservation in Arizona, despite sharing the same median age and population size.

4 Identification Strategy

The goal of this paper is to estimate the reduced-form relationship between off-reservation boarding schools and reservation-level development outcomes. The simplest way to estimate this effect is to run the following OLS regression:

$$y_{i,t} = \beta S_i + \mathbf{X}'_{i,t} \Omega + \tau_t + \phi_s + \epsilon_{i,t} \quad (1)$$

where $y_{i,t}$ is one of the five development outcomes on reservation i in year t . The variable of interest, S_i , is the proportion of students who attended boarding schools from 1911–1932 from reservation i . The vector $\mathbf{X}_{i,t}$ contains historical controls, tribal controls, contemporary and reservation-specific controls, all of which are explained in Section 3. The decadal fixed effects are denoted as τ_t and the state fixed effects are denoted as ϕ_s . The standard errors are clustered at the historical agency level. The coefficient of interest, β , captures the extent to which differences in modern reservation outcomes are attributable to past boarding school exposure. My initial question concerns whether reservations who were most affected by boarding schools are more or less integrated than reservations who were less affected.

In order to capture the effect of the legacy of boarding schools on modern outcomes, the model needs to include long-run factors that might be correlated with S_i . The large set of controls attempts to address this concern. Nevertheless, my OLS estimates could still be biased if unobservable differences across reservations are correlated to S_i . For example, if internal conflicts on reservations drove families to send their children to off-reservation schools, and, to the extent that those issues persisted to the present, then the association between boarding school exposure and long-run assimilation would be spurious.

In response to such considerations, I use distance from the reservation's centroid to the nearest off-reservation boarding school in operation from 1911 to 1932 as an instrument. In order to ensure that the instrument picks up the distance to historical boarding schools, I also control for the distance to the nearest off-reservation boarding school that is still open today. Therefore, the proximity to a historically open school that has since closed is used as the identifying source of

variation in the proportion of boarding school students. The locations of these schools are displayed in Figure 2 and trends in boarding school closures are displayed in Figure 3. A total of 25 schools were open during the historical sample years, seven of which remain open today.¹⁷ Since six schools closed over the period from 1911 to 1932, distance to the nearest school is measured as an average across the sample years.¹⁸

The validity of this instrument rests on two assumptions. The first is that proximity to the nearest boarding school is correlated with the boarding school share. A negative relationship between school proximity and boarding school share is intuitively appealing, for historical evidence suggests that families were more willing to send their children to nearby schools as opposed to Eastern schools. Additionally, boarding school recruiters tried to attract pupils from nearby reservations in an effort to reduce the cost of transportation (Gram, 2015; Szasz, 1999; Vučković, 2008; Woolford, 2015).

Second, conditional on the controls, the distance instrument needs to be uncorrelated with $\epsilon_{i,t}$. The locations of boarding schools were determined largely by the government's desire to minimize the threat of runaways while minimizing the cost of transporting students. Major James N. Haworth, superintendent of Indian Schools, reflected on this tradeoff when the Chilocco (OK) School was built: "At that time I was not favorably impressed with the idea of a school in that neighborhood [near the Ponca and Pawnee reservations], thinking trouble would arise from pupils running off" (Lomawaima, 1994, 1). The Indian Office also wanted the schools to be located "not so far away [from a reservation] that they would lose all understanding and appreciation for the conditions to which they must someday return" (Adams, 1995, 57).

Another important variable that constrained decisions regarding the location of off-reservation boarding schools was the availability of dormitory space. The government set up six schools in abandoned army barracks and one in buildings originally built to house Pawnee students before that tribe was permanently removed to present-day Oklahoma. These factors are probably not related to unobserved characteristics of reservations that may have driven long-run development. Nevertheless, I test this assumption using falsification tests and placebo distance exercises and find that the distance to the nearest school in fact does not capture locational advantages that drive long-run economic development.

Under the IV specification, the first-stage equation is therefore:

$$S_i = \pi \log(D_i) + \mathbf{X}'_{i,t} \Omega + \tau_t + \phi_s + v_{i,t} \quad (2)$$

¹⁷Enrollment in these schools is trivial compared to that of American Indians in public schools. Using Bureau of Indian Education data from 2010, roughly 0.4% of all current American Indian/Alaska Native (AIAN) K–12 students were enrolled in boarding schools that operated in the historical era (author's calculations). Additionally, in 2010, only 0.06% of AIAN college students attended the Haskell Indian Nations University, which is located on the site of the former Haskell (KS) Boarding School.

¹⁸For 88 of the 113 reservations in the sample, school proximity is unchanged from 1911 to 1932. To illustrate, take the Carlisle School in Pennsylvania which closed in 1918. Because it was located in the Eastern U.S., the proximity to the nearest school changed for only one reservation (the Eastern Cherokee Reservation in North Carolina) in the sample.

where I regress the boarding school share variable on $\log(D_i)$, which is the logarithm of the distance in miles from the centroid of reservation i to the nearest off-reservation boarding school.¹⁹ The control variables and fixed effect terms are the same as in equation (1) with the inclusion of the distance to an off-reservation boarding school that has remained open. The parameter π captures the impact of the proximity of a boarding school that subsequently closed by 1990, the first year of contemporary data.

The second-stage equation becomes

$$y_{i,t} = \beta' \hat{S}_i + \mathbf{X}'_{i,t} \Omega + \tau_t + \phi_s + \epsilon_{i,t} \quad (3)$$

where \hat{S}_i is the predicted value of the proportion of boarding school students from Equation (2). The resulting second-stage parameter, β' , will capture the local average treatment effect of boarding schools on modern outcomes for those reservations for which distance to the school provided the biggest deterrent to enrollment.

It is worth remarking that from 1911 to 1932, the choice of schools (whether off-reservation school, on-reservation school or public school) required family consent. Therefore, assuming the instrument is valid, the estimated reduced-form relationship between the legacy of boarding schools and modern outcomes will be identified on the set of *compliers*, whose boarding school effect may differ from that of the entire population.²⁰

5 Empirical Results

5.1 Selection into Boarding Schools

Before I discuss the main results, I use three different methods to determine whether the proportion of boarding school students varied systematically with other reservation characteristics. First, I use stature data to determine whether boarding school students were positively or negatively selected from the American Indian population. Second, I use reservation-level data prior to 1911 to determine if schooling outcomes at agency schools were related to the proportion of students

¹⁹The main results are robust to different specifications of the instrument. For example, both a quadratic and cubic specification of D_i lead to similar results. The results for those specifications are located in Table A6 in the online appendix.

²⁰The qualitative literature some provides insight on how the boarding school effect may differ for Indian families whose decision to enroll their children in off-reservation boarding schools depended on the school's proximity to their home reservation. First, families who wanted to spend summers with their children would have been less likely to send their children to boarding schools if the round-trip costs of school breaks were high. For example, the total expense of a round-trip ticket from the Haskell (KS) School to an Ojibwa reservation in Minnesota averaged \$30 during this era, which corresponds to roughly 40% of the per capita income of Indians during this era (Child, 2016, 2). Therefore, being in close proximity to an off-reservation boarding school allowed poorer families access to boarding schools without losing complete contact with their children. Living on a reservation close to a boarding school would have also enabled families to enroll their children in the same boarding school as friends and relatives. For example, off-reservation schools close to reservations like the Flandreau (SD) School mainly enrolled students from nearby reservations and subsequently "had a particularly strong Dakota influence" (Child, 2016, 24). If the transition from boarding schools to reservation life was easier for students who attended a boarding school with relatives, and those families, who were likely negatively selected from the population, had the most to gain from boarding schools, then the IV estimates should be larger in absolute terms to the OLS estimates.

enrolled in off-reservation boarding schools. Third, I use the control variables in the main dataset to determine if observed differences across reservations are related to both long-run assimilation and the proportion of boarding school students.

To estimate self-selection into boarding schools, I compare the stature of children at off-reservation boarding schools to the stature of their respective birth cohorts by adopting height data collected by Franz Boas from 1890–1893. I limit the sample to tribes that sent children to off-reservation boarding schools and were large enough to have at least thirty observations in Boas’s data. This leaves me with 2,364 total observations of which 354 children, or 14% of the sample, were located on one of the seven off-reservation boarding schools that operated during those years. Using the height of children aged 6 to 17 normalized by the mean and standard deviation of birth cohorts, boarding school students were on average 0.09 standard deviations taller than their birth cohort means, but this difference is not statistically significant at conventional levels (coef. = 0.088, t -stat. = 0.85). When I compare the heights of children *within* the same tribe, I find no difference between the mean height of children at boarding schools compared to the mean height of children living on reservations (coef. = -0.019, t -stat. = -0.17). When I control for the degree of Indian blood, the *within-tribe* difference in mean height becomes even smaller and more insignificant (coef. = -0.011, t -stat. = -0.08). Thus, using statute data, I find no compelling evidence of positive (or negative) selection during the early years of boarding schools.

I next examine whether on-reservation schooling outcomes prior to 1911, the first year of the historical dataset, varied systematically with the proportion of boarding school students. Since the data in Indian Affairs’ Reports are highly aggregated before 1911, I can link schooling data to 64 reservations over the years 1880 to 1910. During these years, Indian agents collected data on the average attendance rate, average class size, average real spending per student and average months in session for schools located *inside* reservations. I examine the relationship between these four pre-1911 reservation outcomes and the boarding school share from 1911 to 1932, conditional on the historical reservation and tribal characteristics.

The partial correlation plots between each outcome and the proportion of boarding school students is reported in Figure 4. Each Panel in Figure 4 shows that there is an insignificant association between all four schooling outcomes and the proportion of boarding school students from 1911 to 1932. Therefore, there is no evidence of systematic differences between the boarding school share and the characteristics of agency schools prior to the collection of the historical dataset.

Third, I test for the balancedness of the sample by performing an omnibus test on the main dataset used in the paper. I first use the controls describe in Equation (1) to compute the predicted value of each long-run development outcome. I then regress each predicted value on the proportion of boarding school students from 1911 to 1932. The purpose of this test to determine if the determinants of the proportion of boarding school students on a reservation are also related to factors that influence long-run assimilation. When I regress the predicted long-run outcome on the boarding school share, the coefficient on the boarding school share is insignificant in all five regressions. For example, the regression of predicted educational attainment on boarding school

share yields a coefficient of -0.019 (p -value=0.721) when the full set of controls are added. Therefore, after including the full set of controls, there is no evidence that the characteristics of the sample will skew the results in a particular direction.

5.2 OLS Estimates

Table 2 presents the OLS estimates of equation (1). Columns 1–3 report the impact on the high school graduation rate; column 1 includes only state and year fixed effects, column 2 includes historical and tribal controls, and column 3 includes historical, tribal, and geographical controls. In columns 4–8, I report the boarding school effect on each of the five main outcomes under the most restrictive specification – with historical, tribal, geographical and reservation controls – which is referred to throughout the paper as the baseline specification.

The general picture that emerges from this table is that reservations with a relatively greater share of boarding school students from 1911 to 1932 are significantly more assimilated today. For example, across the first three specifications, the effect of boarding schools on the high school graduation rate is positive, highly significant, and relatively stable. The stability of the coefficient on the boarding school share from column 2 to column 3 is worth noting since the inclusion of population density and median age, two potentially “bad controls,” do not influence the OLS coefficient. In the baseline specification, an increase of one standard deviation in the historical share of boarding school students is associated a 0.17 standard deviation increase in the current high school graduation rate (or a 2.1 p.p. increase). Additionally, conditional on historical, tribal, and additional controls, an increase of one standard deviation in the historical boarding school share is associated with a 0.20 standard deviation increase in log per capita income (or a 7.3% increase in per capita income) and a 0.25 standard deviation decrease in the poverty rate (or a 3.6 p.p. decrease). With respect to social assimilation, an increase of one standard deviation in the historical share of boarding school students is associated with a 0.14 standard deviation increase in the share of individuals who exclusively speak English at home (or a 3.6 p.p. increase) and a 0.16 standard deviation reduction in family size (or a 2.0% increase).²¹

It is reassuring that the coefficients on the historical controls are of the expected sign. For example, Protestant missionaries per capita are positively associated with the share of strictly English language speakers while the historical share of full-blooded Indians is negatively related. Forced integration is also negatively related to per capita income and educational attainment, while positively related to the poverty rate. There is also evidence of a negative association between tribes traditionally organized in larger, extended families and economic assimilation.²²

²¹The assimilation effects are mainly driven by the numerator of S_i , e.g., the total number of off-reservation boarding school students. The effect of total enrollment in on-reservation schools and public schools is small and mostly insignificant; however, enrollment in other schools is negatively related to per capita income and statistically significant. These results are reported in Table A3 in the online appendix.

²²It is feasible that the boarding school effect varied by intertribal structure. Table A9 in the online appendix reports the coefficients on the interaction terms between the boarding school share and the three tribal characteristics. The interaction term between the boarding school share and each tribal characteristic is insignificant in 13 out of a possible 15 regressions. Thus, there is little evidence of heterogeneous effects with respect to tribal structure.

To test the role of unobservables, I compute Altonji et al. (2005) (AET) ratios for each outcome using the baseline specification. These ratios provide an idea of how large the selection on unobservables needs to be if it is to invalidate the results. If the ratio is greater than one, then the role of unobservables needs to be larger than the role of observables to invalidate the results. If the ratio is less than one, then the opposite is true and there should be concern that the results are driven by unobserved heterogeneity.

The AET ratios are reported in Table 2. Each ratio is computed by comparing the results from the baseline specification to a specification with only state and year fixed effects. These ratios range from 2.5 to 4.7, which implies that the influence of an unobservable factor needs to be between three and five times as large as the influence of observed factors to fully account for these results.²³

5.3 IV Estimates

While the AET ratios suggest that the OLS estimates are unbiased, the role of unobservables is more formally addressed by instrumenting the boarding school share with the distance to the nearest historical school. I first report in Table 3, Panel A, the reduced-form estimates of the effect of the instrument on the outcomes. The first four columns reveal that the effect of the instrument on high school graduation rates is stable across model specifications. For example, moving from a model of no controls to a model with the baseline controls changes the coefficient on the distance instrument from -0.032 to -0.027. The stability of this coefficient is important since instruments that are orthogonal to the controls are more likely to be orthogonal to unobservable factors. The last four columns reveal that the reduced-form estimates are highly significant, suggesting that, as the distance to a boarding school, conditional on the distance to a still open school, increases, the degree of economic and social assimilation on a reservation decreases.

Table 3, Panel B shows the IV estimates of the impact of past boarding school enrollment rates on each measure of assimilation. The IV estimates in columns 1–8 are about twice as large as the analogous OLS estimates. For example, in the baseline specification, an increase of one standard deviation in the boarding school share increases the high school graduation rate by 3.9 percentage points and increases per capita income by 9.1%. Put differently, an increase of one standard deviation in the boarding school share would have moved a reservation like the Navajo Nation from 17th out of 113 reservations with respect to per capita up 12 positions to the position of the Fort Yuma Reservation who is ranked 29th.

The last three columns reveal a similar story. An increase of one standard deviation in the boarding school share decreases the poverty rate by 4.4 percentage points, increases the share of strictly English language speakers by 9.3% and lowers the family size by 7.5%. Despite the larger size of the IV estimates, I fail to reject the null of identical OLS and IV estimates in all but one

²³An alternative to OLS is matching estimation, which relaxes the linearity assumption in OLS. By forming comparison groups of reservations whose proportion of boarding school students was above and below the median, matching estimation compares a reservation with an above-average boarding school share to a reservation with a below-average share that is most similar. The results from various matching strategies are presented in Appendix Table A4. The sign and significance of the boarding school coefficient are identical to those reported in Table 2.

specification. This provides suggestive evidence that the instrument is not picking up a direct effect on long-run assimilation, but rather an indirect effect as a determinant of the boarding school share.

The first-stage estimates in Panel C show that there is a negative and highly significant association between school proximity and the proportion of boarding school students. The first-stage F-statistic for the excluded instrument in the baseline specification is 33.8, which is greater than the weak instrument critical values of maximum bias of 10% discussed by [Stock and Yogo \(2005\)](#). These first-stage estimates are also economically significant; in the baseline specification, an increase of one standard deviation in the logged distance to the nearest school decreased the proportion of students attending boarding schools by 0.65 standard deviations.²⁴

5.4 Falsification Tests

So far, the influence of an unobserved factor has been formally addressed through the use of IV estimation. The IV estimates on all five outcomes suggest that reservations with higher historical proportion of boarding school students are more integrated today than reservations with a lower historical proportion of boarding school students. However, those results rest on the assumption that the distance to a closed boarding school only affects modern assimilation through its influence on past boarding school enrollment.

To test the validity of the exclusion restriction, I conduct two falsification tests. First, in the spirit of [Feir \(2016\)](#) who links her distance instrument to the outcomes of Métis people, who were not forced to participate in Canadian residential schools, I re-run the reduced form regressions using the same five assimilation outcomes of non-Indians who live just outside a reservation in neighboring counties.²⁵ The motivation behind this test is that if boarding schools were located closer to reservations that had better prospects of future economic development, then non-Indians living just off those reservations would likely have higher income and more education than non-Indians living just off of reservations that were located more remotely from boarding schools.

The results of this test are reported in Table 4. For each model, I include the full set of historical and tribal controls, state fixed effects, distance to the nearest city, the size of the county, and the median age of the non-Indian population. Panel A shows the association between the distance from a neighboring county's centroid to the nearest closed boarding school and the assimilation of non-Hispanic whites. Conditional on this set of controls, there is an insignificant link between distance to the nearest school and each non-Indian assimilation outcome. As a robustness check, I run the same falsification tests using the outcomes of African-Americans and non-white Hispanics living in neighboring counties. Panels B and C show that there is no evidence that the distance instrument

²⁴The online appendix reports results from a host of robustness checks. Changes in specifications ranging from clustering to the tribal level, omitting the smallest reservations from the sample, and adding data from the 1980 Census do not dramatically change the size and significance of the boarding school share coefficient with respect to each assimilation outcome. See Table A5 in the online appendix for the results.

²⁵If there are externalities between reservations and neighboring counties, then this is also a test of spillovers. A more direct test of spillovers is to compare the distance instrument to non-Indians living *inside* the boundaries of a reservation. Table A7 in the online appendix reports the results from this test. Across all specifications, the distance instrument is unrelated to the economic and social outcomes of whites living on reservations.

is correlated with an unobserved factor that influences non-Indian socio-economic outcomes.

The second falsification test adopts placebo distances to determine if the distance instrument is capturing an unobserved factor that is linked to reservation assimilation. I pick two logical distances: (1) the distance from a reservation to the nearest off-reservation boarding school that closed prior to 1911, and (2) the reservation's proximity to the nearest U.S. Army fort. The motivation behind the first placebo distance is as follows: if boarding schools were established near reservations that shared specific unobserved factors that influenced assimilation, then there should be an association between the location of the quickly abandoned schools and future economic development. The logic behind the second placebo distance is that since some boarding schools were operated on army barracks, the U.S. government may have placed forts farther away from hostile reservations to minimize Indian-white conflict. If this is true, then reservations located closer to forts would have been more willing to assimilate in the long run. Therefore, if the exclusion restriction is violated, then the reduced-form estimates of the placebo distances should have the same sign as the reduced-form estimates in Table 3, Panel A.

The results of these two placebo tests are reported in Table 5. Panel A reports the association between the five outcomes and proximity to the nearest abandoned school. The controls enter the models in the same fashion as Table 3. The distance to an abandoned boarding school is not statistically associated with three of the five long-run outcomes. There is a statistically significant association between this placebo distance and family size, but it is of the wrong sign to overturn the exclusion restriction. If the distance instrument is picking up an unobservable factor that promoted assimilation, then this coefficient should be positive. Instead, the negative coefficient in column 8 means that, conditional on the set of controls, reservations close to abandoned school held larger families than reservations farther from those schools. The same logic holds for the significant positive association between the share of English language speakers and the placebo distance. Thus, there is no evidence that the government placed off-reservation boarding schools closer to reservations that were able to assimilate; rather, there is some evidence that the opposite was true.

Panel B contains the estimated coefficients on distance to the nearest U.S. Army fort under the same eight specifications as Table 3. Again, the distance to the nearest fort is not statistically associated with four of the five outcomes. In the only specification where the distance variable is statistically significant, the sign of the coefficient is of the wrong sign to overturn the exclusion restriction. This positive association between the proximity of a fort and per capita income means that reservations that have lower income today were located closer to historical forts. Both falsification tests, therefore, provide support that the distance instrument is not picking up an unobservable trait that directly influences assimilation.

6 Mechanisms

My main finding shows that reservations that were most affected by boarding schools in the past are more economically and socially assimilated today. In this section, I focus my attention on two potential channels of causality that help explain this result. I first investigate the extent to which factors internal to the affected population explain the assimilation gains from boarding schools. Second, I examine the extent to which reforms to reservation institutions during the era of Indian self-determination are driving the boarding school effect. If the boarding school experience affects assimilation through its influence on reservation institutions, then institutional variables should pick up a sizable amount of the estimated boarding school effect.

6.1 The Short-Run Effects of Boarding Schools

There is a long-standing literature in economics on the intergenerational elasticity of income and education (see, e.g., [Black and Devereux, 2011](#)). Ideally, individual data linking parents with past boarding school experience to their child's economic outcomes would be used, but no such data currently exist. I am therefore left to analyze the correlation between early gains in assimilation and boarding school exposure at the reservation level. The short-run effects of boarding schools are estimated by collecting information on assimilation levels on reservations in the 1940s and early 1950s.²⁶ In particular, I use the 1952 literacy rate, defined as the number of individuals who can read English per capita, and in the 1952 employment rate, which mainly accounted for off-reservation work. I also adopt data on the boarding school share, which was last measured in 1945, and the high school graduation rate in 1952. I regress each mid-century outcome on the historical proportion of boarding school students and the full set of historical and tribal controls.

In Table 6, I present the results of the short-run effects of boarding schools. In column 1, the proportion of boarding school students from 1911 to 1932 is positively associated with the literacy rate in 1952. This effect is relatively sizable: an increase of one standard deviation in the proportion of boarding school student is associated with an increase in literacy by 2.8 percentage points (or 16% of its mean). The mid-century high school graduation rate and employment rate are both positively correlated with the boarding school share but both relationships are statistically insignificant. Last, column 4 shows that higher shares of historical boarding schools from 1911 to 1932 beget higher boarding school shares during the 1940s; however, the point estimate is imprecisely measured. Thus, there is evidence that boarding schools increased linguistic assimilation during a period when there were little to no immediate return to those skills. This is also evidence that boarding schools affected linguistic assimilation prior to the era of Indian self-determination.

I next focus on the extent to which early differences in literacy explain the long-run boarding school effect. OLS estimates of the boarding school effect with both the boarding school share

²⁶The short-run outcomes used in this paper come from the *Statistical Supplement of the Annual Report of the Commissioner of Indian Affairs* in 1945 and a U.S. House of Representatives investigation into the conditions of Indians on reservations in 1952 ([Indian Affairs, 1945, 1952](#)). Unlike the modern census data, these data were collected by Indian agents.

and the mid-century literacy rate are reported in the last five columns in Table 6. The estimates of the boarding school share is robust in the inclusion of the mid-century literacy rate in four of the five specifications. In columns 5–8, the coefficient on the boarding school share decreases by between 10–20 percent when the mid-century literacy rate is included. The effect of the boarding school share on family size decreases by 30 percent and becomes insignificant. The coefficients on the literacy rate share the same sign as the coefficient on the boarding school share and is highly significant in four of the five long-run regressions. These results suggest that a sizable amount of the boarding school effect can be attributed to the assimilation of first- and second- generation students who remained on the reservation.

6.2 Evidence from the National Indian Education Study

The extent to which the boarding school effect is driven by factors internal to an individual versus factors external to an individual can be directly tested using the 2005–2011 National Indian Education Study (NIES) of eighth-grade students. This study, which is an extension of the larger National Assessment of Educational Progress (NAEP) survey, asks American Indian students at public, private and Bureau of Indian Education (BIE) schools a host of questions regarding their family background which are linked to characteristics of their school. This data has some unfortunate limitations so matching students to specific reservations depends heavily on a student's write-in answers to the question, “name your Indian nation or tribe.” I was, however, able to link 4,891 students to 95 reservations (out of 113 sample reservations).²⁷

I isolate five variables that can be considered internal to the individual: mother's education, National School Lunch Program eligibility, family members who talk in Native language, knowledge of Native traditions, and discussions of coursework with family. I then isolate two variables that are measured at the school-level: whether tribal elders discuss traditions in school, and whether the school contains American Indian-Alaska Native (AIAN) courses in its curriculum. Each outcome is regressed on the boarding school share, a full set of historical and tribal controls, state fixed effects, and gender and birth year indicators taken from the NIES data. The goal is to determine if children on reservations with varying legacies of boarding schools differ with respect to individual characteristics, school-based characteristics, or both.

OLS estimates are reported in Table 7. The results in the first three columns are consistent with the main results of the paper. In particular, students from reservations most affected by boarding schools are more likely to have a mother who graduated high school, less likely to be eligible to receive free lunches or reduced-price meals, and less likely to have a family member who can speak a Native language. Column 4 shows that the probability that there is family involvement in the educational process increases as the proportion of historical boarding school students increases. Despite the lower probability of having family members who speak a Native language, students on the most affected reservations are more likely to have a basic understanding of tribal history

²⁷Full details of the sampling method used to link American Indian students to specific reservations are discussed in the online Appendix.

and cultural traditions. This result is consistent with Native American studies scholars refer to as “cultural survival” (Champagne, 1989).

The last two columns in Table 7 show that there is no significant association between the probability of elders visiting schools or the likelihood of attending a school with AIAN courses in the curriculum and the boarding school share. Thus, students are equally likely to attend a school that promotes tribal-based education on reservations with high and low proportion of historical boarding school students. Taken together, these results suggest that external environment to the American Indian student is less important than the role of internal factors in explaining the boarding school effect.

6.3 The Role of Institutions

As alluded to, the small but growing literature on reservation economics has focused on differences in contemporary institutional quality as the main driver of economic development. For example, Dippel (2014) finds that divergence in per capita income caused by the initial formation of reservations occurred only after the major regulatory changes inaugurated during the 1990s. Throughout this paper, this particular channel has been controlled for with the inclusion of a forced coexistence indicator. In this section, I examine the extent to which tribal self-rule is linked to the legacy of boarding schools. I also determine if the link between past boarding school exposure and assimilation today is driven by changes in tribal sovereignty.

I first examine the correlation between the legacy of boarding schools and the probability of operating a casino on a reservation. Studies linking the opening of casinos to American Indian outcomes have found improvements in health (Wolfe et al., 2012), increases in employment and social integration (Evans and Topoleski, 2002), and mixed evidence on educational attainment.²⁸ Second, I examine the relationship between the reservation’s legacy with boarding schools and the likelihood that the reservation participates in self-governance projects. Through two recent enactments (The Indian Self-determination and Educational Assistance Act of 1975 and the Tribal Self-Governance Act of 1994), tribal governments have been empowered to administer public goods that have traditionally been provided by the federal government. These projects include the maintenance of tribal roads, schools and health centers. Third, I examine the relationship between the proportion of boarding school students and the probability that the tribe was organized under the Indian Reorganization Act (IRA).²⁹ Non-IRA tribes were allowed to organize under their own traditional structures, whereas a tribe that agreed to the IRA were governed by constitutions developed by

²⁸Indian gaming, whether through per capita payments or educational scholarships, have lowered the cost of education, which increased youth educational attainment (Akee et al., 2010). However, to the degree that casinos improved the local labor conditions, casinos may have also raised the opportunity cost of remaining in school through the improvement in local labor market conditions (Evans and Kim, 2006).

²⁹This act was a multifaceted approach to addressing Indian poverty established in the 1930s. It extended the trust period on land, returned “surplus” land back to the tribes, authorized an annual appropriation of \$2 million to assist landless Indians, made a \$10 million revolving credit fund available to tribes that established business charters, assisted Indian students through a loan program, and altered reservation governance by forcing tribes to accept a boilerplate constitution designed by the federal government (Koppes, 1977; Philp, 1983).

the U.S. government.

The results from the institutional channel hypothesis are shown in Table 8. I find no evidence that reservations most affected by boarding schools are linked to casino operations or IRA governments. I do find that the boarding school share is positively associated with the probability of participating in a self-governance program. I then determined whether these institutional variables affect the boarding school effect by restricting the sample to outcomes measured in 2000 and 2010, since tribal self-rule started during the 1990s. The last five columns in Table 8 show that controlling for these three institutions do not influence the coefficient on the boarding school share. In fact, depending on the long-run outcome, the coefficient on the boarding school share increases by 20–40 percent once these institutional variables are included. Thus, there is little evidence that differences in political and economic institutions are related to the assimilation gains from boarding schools.

7 Conclusion

In this paper, I explore some long-standing questions of the legacy of American Indian boarding schools by comparing contemporary Indian reservations who experienced differing impacts in the past from boarding schools. Using data from 1990 to 2010, I find that reservations who were most affected by boarding schools are less poor, more educated and more linguistically assimilated today. It is unlikely that these effects are attributable to other observed factors since the results cannot be overturned when a host of historical, tribal, geographical and contemporary controls are included. Additionally, the estimated effects of boarding schools are not invalidated when the historical proportion of boarding school students is instrumented by the distance to a nearest off-reservation boarding school that has since closed, which, I argue, satisfies the conditions of a valid instrument.

One interpretation of these results is that they reflect the net impact from the boarding school legacy and reveal the relative contributions of the positive and negative consequences of boarding schools. Under this interpretation, my results suggest that boarding schools succeeded in integrating American Indians into the Euro-American culture. Yet, two characteristics of the data might reveal why these results do not reflect the long-run negative consequences documented in the qualitative literature. First, due to data availability, the boarding school experience on reservations is measured during an era when boarding school attendance required parental consent. If student resistance at school, and subsequent punishment, was linked to forced removal, then the negative consequences of boarding schools during this era may have been mitigated.³⁰ Second, the historical literature suggests that the smaller off-reservation boarding schools, which were located in the American West, held a student population that was dominated by the tribes of nearby reservations. If the adverse effects of returning to a reservation were lessened when a large fraction of the enrolled

³⁰Unlike Feir (2016), I cannot disentangle the long-run effects of the abuse environment at boarding schools from other inputs in the education of boarding school students. Feir (2016) gathered evidence on the rate of filed abuse claims across Canadian residential schools and finds that while residential school attendance did substantially increase the probability of finishing high school, becoming employed and not speaking an Aboriginal language, attendance at the most abusive residential schools led to opposite effects.

students came from the same tribe (or reservation), then the assimilation effects should be greater on reservations who sent their students to nearby schools. The study shows that the assimilation effects identified off of these reservations are in fact greater in absolute terms than the average effect across all reservations in the sample.³¹

Another interpretation is that even though these estimates suggest boarding schools were successful in integrating American Indians, the results might mask some methods in which American Indians maintained their cultural identity. For example, recent work by linguists have found that American Indians on reservations exposed to boarding schools use features of the English language that are shared across reservations but are distinct from those taught at schools (Hornberger and McKay, 2010; Newmark et al., 2016). Newmark et al. (2016) concludes that American Indians today are using English as source of shared identity across diverse tribes. Unfortunately, the limitations of census data do not allow me to uncover a relationship between boarding school exposure and rates of “Native American English” speakers. However, as shown in Section 6, individual data from eighth-grade American Indian students do suggest that reservations that were most affected by reservations are more likely to have students with knowledge of tribal traditions. Future research on how affected populations maintain cultural identity while integrating into mainstream culture would be helpful.

Last, the link drawn here between higher boarding school share and assimilation should not be misinterpreted as an endorsement of coercive assimilation. Unobserved costs generated by the first generation of students might outweigh the estimated gains in long term assimilation. The program itself was extremely costly, which is one of the reasons for the change in policy towards on-reservation schooling during the 1930s. These results do, however, suggest that the assimilation gains from boarding schools are sizable, but, due to data limitations, this study does not reflect a complete assessment of the trade-offs of boarding school attendance.

Despite the data limitations, this study, along with recent work by Feir (2016), takes a small step towards better understanding the costs and benefits of boarding schools through the use of statistical methods. Many outstanding issues will hopefully be addressed in future research. For example, the particular characteristics of boarding schools that drive the relationship between boarding school enrollment and long-run outcomes need to be better understand. Hopefully, micro-level data on the American Indian experience with boarding schools will be uncovered and analyzed in the future.

³¹To illustrate, take the Fort Mojave Reservation, which is mostly located in Arizona, and the Fort McDowell Reservation, which is entirely located in Arizona. Both reservations sent roughly the same proportion of students to boarding schools from 1911 to 1932, yet a boarding school was located just outside of the Fort Mojave Reservation while in operation whereas the nearest off-reservation school to the Fort McDowell Reservation was located roughly 30 miles away in Phoenix. This study identifies the assimilation effects off reservations where distance to the nearest school played an important role in the relative share of students. If nearby schools generated more positive experiences, then one would expect the assimilation effects on those reservations to be larger than those on all reservations. This is one reason why the IV estimates in this study are larger in absolute terms to the OLS estimates.

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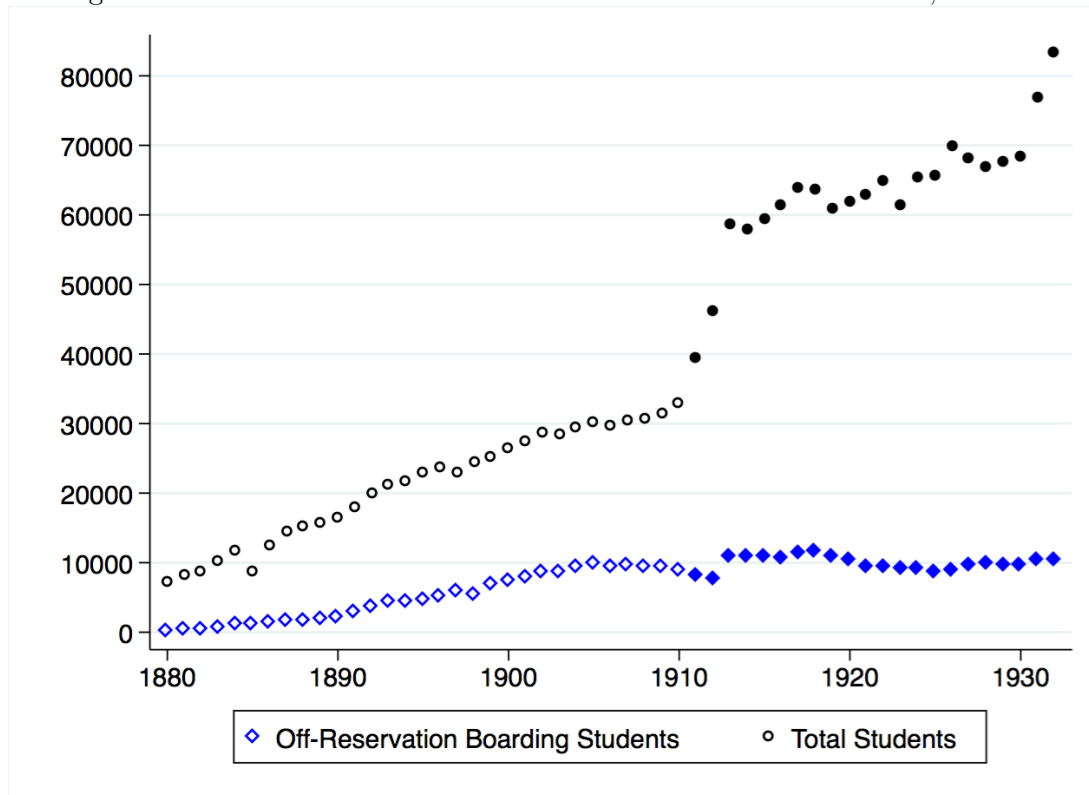
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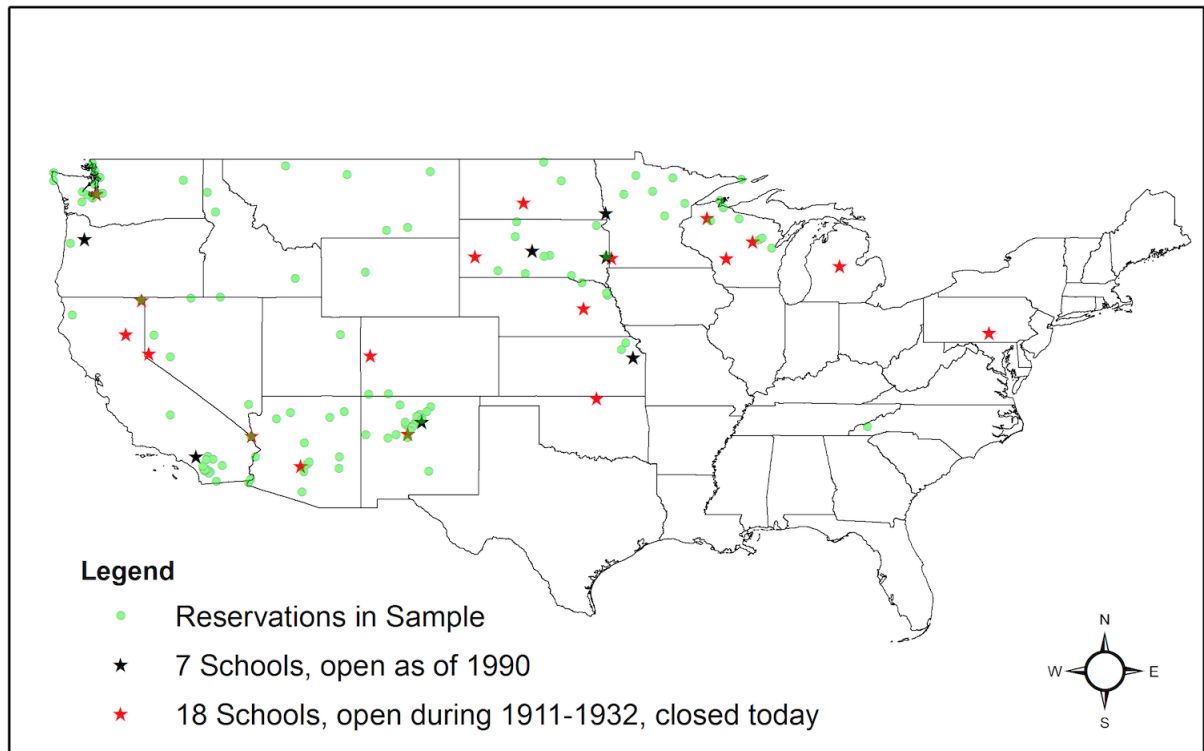
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Figure 1: Trends in School Enrollment of American Indian Children, 1880–1930



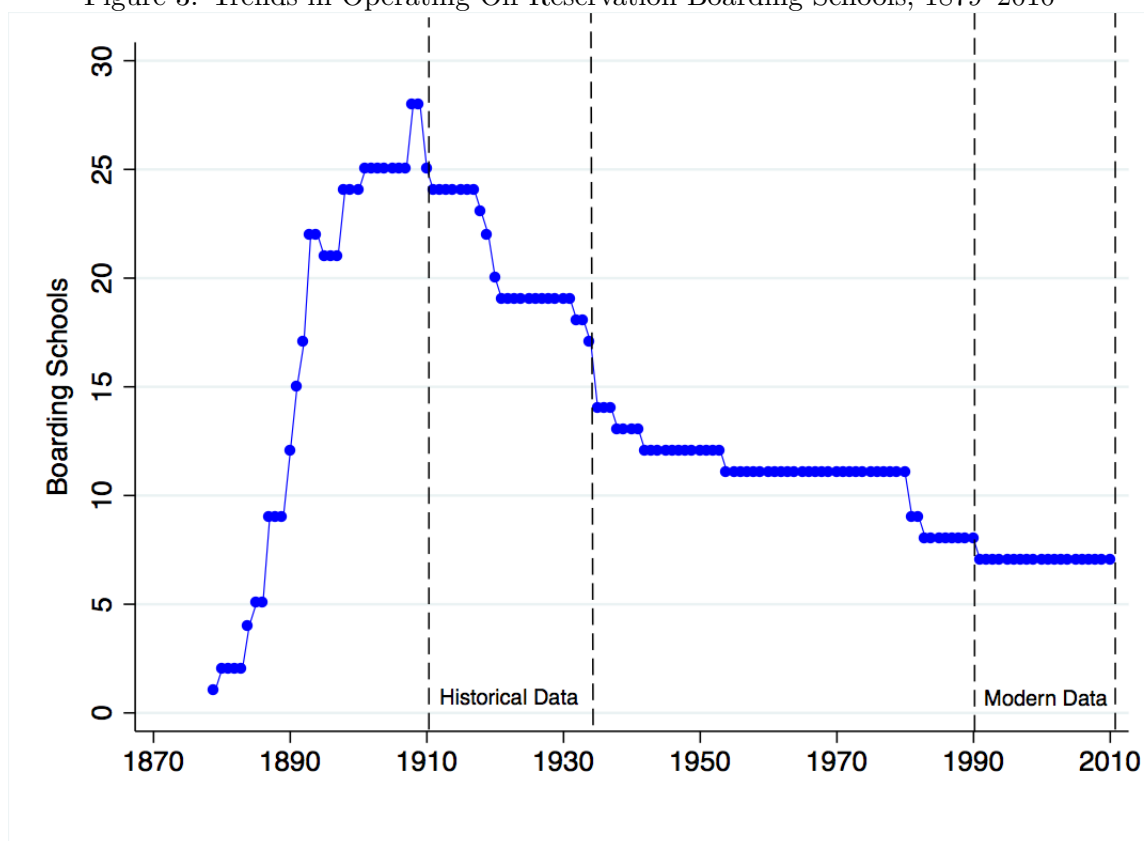
Notes: The black circles represent the total enrollment of school-age Indian children in all schools (i.e., off-reservation boarding schools, boarding schools, day schools, mission-run schools and public schools). The blue diamonds represent the enrollment in off-reservation boarding schools. For data availability reasons, the shaded data points reflect the years that are the focus of this paper. The calculations come from data in the Office of Indian Affairs' *Annual Reports*, 1880–1930.

Figure 2: Location of Indian Reservations and Off-Reservation Boarding Schools



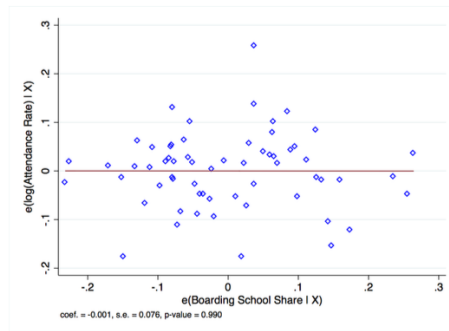
Notes: The centroid of the 113 reservations in the sample are in green. The location of the off-reservation boarding schools that were open during the historical era but later closed are in red, and the location of the boarding schools that remained open by 1990 are in black.

Figure 3: Trends in Operating Off-Reservation Boarding Schools, 1879–2010

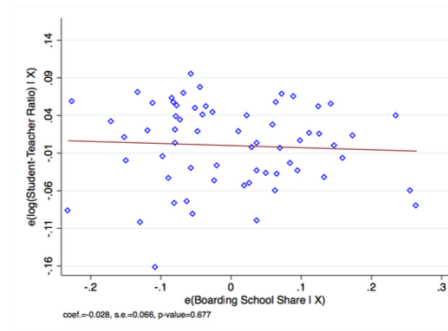


Notes: The vertical axis is the number of off-reservation boarding schools in operation. The years 1911 to 1932 reflect the data window in which the proportion of boarding school students per reservation is calculated, and the years 1990 to 2010 reflect the years in which the long-run outcomes are measured.

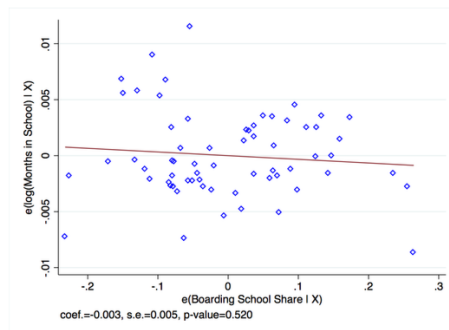
Figure 4: Partial Correlation Plots



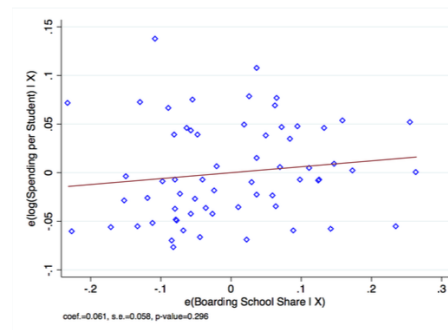
(a) Attendance Rate



(b) Student-Teacher Ratio



(c) Months in School



(d) Spending per Student, in 1900 dollars

Notes: Each figure reports a partial correlation plot where the dependent variable is: (a.) log attendance rate; (b.) log student-teacher ratio; (c.) log months in school; and (d.) log spending per student, in 1900 dollars. All specifications include a full set of historical and tribal controls: Protestant missionaries per capita, full-blooded population share, share of land allotted, log population, an indicator for the community size, an indicator for agricultural dependence for subsistence, an indicator for social stratification and an indicator for forced coexistence.

Table 1: Descriptive Statistics

	Obs.	Mean	Std. Dev.	Min.	Max.
Boarding School Share, 1911–1932	338	0.211	0.108	0.05	0.51
Historical Controls					
Share of Land Allotted	338	0.486	0.440	0.00	1.00
Full-blooded Population Share	338	0.718	0.272	0.03	1.00
Protestant Missionaries, per 1,000	338	2.013	2.441	0.00	14.89
Log Population	338	6.356	1.347	1.25	10.24
Forced Coexistence	338	0.574	0.495	0.00	1.00
Local Community Size	338	0.627	0.484	0.00	1.00
Agrarian Society	338	0.577	0.495	0.00	1.00
Social Stratification	338	0.157	0.364	0.00	1.00
Contemporary Outcomes					
High School Graduation Rate, share of pop \geq 25	338	0.699	0.124	0.27	0.98
Log Income per capita, in 1999 dollars	338	9.069	0.367	8.25	10.89
Living below Poverty, share of families	337	0.344	0.145	0.00	0.808
Speaks only English at home, share of pop \geq 5	338	0.710	0.261	0.03	1.00
Log Family size	338	1.351	0.129	1.03	2.00
Contemporary Controls					
Neighbor's Unemployment Rate	338	6.394	3.065	1.00	17.00
Neighbor's Log Income pc, in 1999 dollars	338	9.993	0.192	9.48	10.54
Distance to Major City, logged	338	3.601	1.019	1.26	5.42
Reservation Controls					
Median Age	338	27.354	7.246	8.00	67.50
Population Density, logged	338	1.930	1.681	-2.83	6.63

Notes: The boarding school share is compiled from data in the Annual Reports of the Commissioner of Indian Affairs (CIA), 1911–1932. The five outcomes (high school graduation rate, per capita income, poverty rate, rate at which English alone is spoken, and family size) are measured in census years 1990, 2000 and 2010 for self-identified Native-only individuals. The historical controls (share of allotted land, full-blooded population share, Protestant missionaries per capita, and historical population) are measured from 1911–1932 from the CIA's Annual Reports with the exception of the share of allotted land, which is measured in 1920. The size of local community, agrarian society, and social stratification indicators are taken from the *Ethnographic Atlas*. The forced coexistence indicator comes from [Dippel \(2014\)](#). The neighboring unemployment rate and per capita income are measured from 1990–2010 at the county level, where neighboring counties are defined as those bordering a reservation but not containing a federally-recognized Indian reservation. Distance to a major city is defined as the straight-line distance, measured in log miles, from the center of a reservation to the nearest city with a population of at least 50,000. The median age and population density come from the 1990–2010 censuses.

Table 2: The Long-Run Effects of Boarding Schools: OLS Coefficients

	Baseline Specification							
	High School Graduation Rate			High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Boarding School Share	0.238*** (0.067)	0.222*** (0.074)	0.197*** (0.070)	0.197*** (0.072)	0.676*** (0.208)	-0.329*** (0.109)	0.330** (0.163)	-0.188** (0.088)
Historical Controls:								
Missionary Presence		0.007 (0.005)	0.007 (0.004)	0.007 (0.004)	0.022 (0.015)	-0.003 (0.003)	0.013** (0.005)	-0.004 (0.005)
Share Land Allotted		0.024 (0.019)	0.023 (0.018)	0.023 (0.018)	-0.048 (0.083)	0.021 (0.042)	0.038 (0.052)	0.002 (0.028)
Full-Blood Share		-0.081** (0.036)	-0.078** (0.036)	-0.078** (0.036)	-0.184 (0.127)	0.059 (0.044)	-0.277*** (0.086)	0.198*** (0.067)
Log Historical Population		0.005 (0.008)	0.006 (0.007)	0.006 (0.007)	-0.023 (0.022)	0.011 (0.007)	-0.016 (0.015)	0.023** (0.011)
Forced Coexistence		-0.042** (0.021)	-0.042* (0.022)	-0.042* (0.022)	-0.147** (0.062)	0.054** (0.026)	0.016 (0.040)	0.017 (0.023)
Community Size		-0.055*** (0.018)	-0.057*** (0.019)	-0.057*** (0.020)	-0.055 (0.070)	0.014 (0.016)	-0.026 (0.032)	0.116*** (0.041)
Agriculture		-0.010 (0.027)	-0.002 (0.027)	-0.002 (0.027)	-0.109 (0.097)	0.034 (0.027)	0.048 (0.087)	-0.033 (0.039)
Social Stratification		0.055 (0.034)	0.057 (0.035)	0.057 (0.038)	0.064 (0.124)	-0.058* (0.035)	0.095 (0.062)	-0.063 (0.051)
Contemporary Controls:								
Neighbor's U-Rate			0.002 (0.003)	0.002 (0.003)	0.002 (0.008)	-0.002 (0.003)	-0.012** (0.005)	-0.000 (0.003)
Neighbor's pc Income			0.070* (0.040)	0.070* (0.040)	0.139 (0.139)	-0.159*** (0.051)	-0.183* (0.110)	0.072 (0.079)
Distance to City			-0.004 (0.008)	-0.004 (0.008)	-0.068** (0.029)	0.025*** (0.009)	0.001 (0.017)	-0.032*** (0.011)
Reservation Controls:								
Median Age				0.000 (0.001)	0.007** (0.003)	-0.002** (0.001)	-0.001 (0.001)	-0.004*** (0.001)
Log Population Density				0.000 (0.005)	-0.011 (0.016)	0.014** (0.006)	0.017 (0.012)	-0.006 (0.008)
AET Ratio				4.707	2.450	4.082	4.331	2.720
R ²	0.555	0.605	0.611	0.611	0.619	0.544	0.767	0.500
State fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Decadal fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Observations	338	338	338	338	338	337	338	338

Notes: ^a Both outcomes are logged. In columns 1–4, the dependent variable is the share of Native-only individuals aged 25 and older who has completed a secondary education. In columns 5–8, the dependent variable is log per capita income (measured in 1999 dollars), share of Native-only families who are living below the poverty rate, the population share who speak only English at home, and log family size. All outcomes are measured for self-reported “Native-only” individuals. The historical controls include the number of missionaries per 1,000 individuals, the full-blooded population share, the share of Indian land allotted by 1920, logged population, and an indicator for forced coexistence. The tribal controls are an indicator for the size of the local community, an indicator for the importance of agriculture in subsistence, and an indicator for pre-contact class distinctions. The contemporary controls include the distance to a major city, and the economic conditions of neighboring counties. The reservation controls include the median age on the reservation and logged population density. Each regression contains decadal fixed effects and state fixed effects. The state of each reservation was determined by the location of the reservation's centroid. The standard errors in parentheses are clustered at the historical agency level. Significance levels: *** p < 0.01, ** p < 0.05, * p < 0.10.

Table 3: The Long-Term Effects of Boarding Schools: Reduced-Form & IV Estimates

	Baseline Specification							
	High School Graduation Rate			High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Reduced-Form Estimates								
Distance to Nearest School	-0.032*** (0.010)	-0.031*** (0.010)	-0.027** (0.011)	-0.027** (0.011)	-0.061* (0.031)	0.030** (0.014)	-0.063** (0.029)	0.051*** (0.013)
R ²	0.565	0.610	0.612	0.613	0.634	0.554	0.777	0.528
Panel B: IV Estimates								
Boarding School Share	0.412*** (0.135)	0.429*** (0.149)	0.363*** (0.138)	0.365*** (0.139)	0.836** (0.375)	-0.408** (0.170)	0.859** (0.365)	-0.693*** (0.192)
Endogeneity Test <i>p</i> -value	0.059	0.078	0.153	0.154	0.384	0.336	0.230	0.034
Panel C: First-Stage Estimates								
Distance to Nearest School	-0.077*** (0.013)	-0.071*** (0.013)	-0.074*** (0.013)	-0.073*** (0.013)	-0.073*** (0.013)	-0.073*** (0.013)	-0.073*** (0.013)	-0.073*** (0.013)
1 st -stage F-statistic	36.086	29.723	33.488	33.875	33.875	33.810	33.875	33.875
State fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Decadal fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Historical & Tribal Controls	no	yes	yes	yes	yes	yes	yes	yes
Contemporary Controls	no	no	yes	yes	yes	yes	yes	yes
Reservation Controls	no	no	no	yes	yes	yes	yes	yes
Observations	338	338	338	338	338	337	338	338

Notes: ^a Both outcomes are logged. Each specification includes the log distance to the nearest boarding school that never closed. The standard errors are clustered at the agency level. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 4: Falsification Tests

	High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
	(1)	(2)	(3)	(4)	(5)
Panel A: Non-Hispanic Whites Only, Neighboring Counties					
Distance to Nearest School	0.002 (0.003)	0.013 (0.008)	-0.003 (0.002)	-0.001 (0.001)	0.002 (0.001)
R ²	0.563	0.486	0.575	0.584	0.725
Observations	183	183	183	183	183
Panel B: African-Americans Only, Neighboring Counties					
Distance to Nearest School	-0.001 (0.012)	0.039 (0.025)	-0.013 (0.009)	-0.009 (0.006)	0.001 (0.023)
R ²	0.246	0.325	0.368	0.213	0.198
Observations	142	150	122	158	152
Panel C: Non-White Hispanics Only, Neighboring Counties					
Distance to Nearest School	0.002 (0.016)	-0.014 (0.026)	-0.015 (0.012)	-0.009 (0.021)	-0.005 (0.009)
R ²	0.242	0.273	0.317	0.428	0.383
Observations	179	180	169	181	182

Notes: ^a Both outcomes are logged. The observations are U.S. counties that share a boundary with a reservation in the sample but do not contain another federally-recognized reservation. The data are taken from the 2000 Census. Each regression model contains state fixed effects, a full set of historical and tribal controls of the nearest reservation, the median age of the selected population, distance to a major city, county size, measured in logged square kilometers, and the distance to the nearest boarding school that is still open. These distances are measured from the centroid of a county to the nearest boarding school. The standard errors are in parentheses and clustered at the state level. Significance levels: *** p < 0.01, ** p < 0.05, * p < 0.10.

Table 5: Reduced-Form Estimates of the Effect of Placebo Distances

	Baseline Specification							
	High School Graduation Rate			High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Distance to Early Abandoned Boarding School								
Distance to Abandoned School	-0.014 (0.019)	-0.013 (0.018)	-0.018 (0.019)	-0.018 (0.019)	0.033 (0.057)	0.012 (0.025)	0.087* (0.049)	-0.046** (0.021)
R ²	0.555	0.602	0.607	0.608	0.631	0.549	0.777	0.516
Panel B: Distance to Nearest Military Post								
Distance to Nearest Fort	-0.007 (0.008)	-0.002 (0.008)	-0.000 (0.008)	-0.000 (0.008)	0.047* (0.026)	-0.010 (0.009)	-0.003 (0.021)	-0.004 (0.011)
R ²	0.556	0.601	0.606	0.606	0.637	0.550	0.769	0.506
State fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Decadal fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Historical & Tribal Controls	no	yes	yes	yes	yes	yes	yes	yes
Contemporary Controls	no	no	yes	yes	yes	yes	yes	yes
Reservation Controls	no	no	no	yes	yes	yes	yes	yes
Observations	338	338	338	338	338	337	338	338

Notes: ^a Both outcomes are logged. The model specifications are identical to the IV regressions in Table 3. The standard errors are clustered at the historical Indian agency. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.10.

Table 6: The Short-Run Effects from Boarding Schools

	Short-Run Effects				Long-Run Baseline Specification				
	Literacy Rate, 1952	Employment Rate, 1952	High School Graduation Rate, 1952	Boarding School Share, 1945	High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Boarding School Share	0.261** (0.120)	0.202 (0.141)	0.099 (0.130)	0.354 (0.214)	0.159** (0.069)	0.486** (0.210)	-0.250*** (0.087)	0.295* (0.175)	-0.125 (0.085)
Literacy Rate, 1952					0.182** (0.088)	1.032*** (0.249)	-0.369** (0.150)	0.136 (0.185)	-0.351*** (0.095)
Mean Dep. Var. R ²	0.176 0.754	0.131 0.489	0.080 0.417	0.179 0.520	0.613	0.643	0.570	0.764	0.517
State fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Decadal fixed effects	no	no	no	no	yes	yes	yes	yes	yes
Historical & Tribal Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Contemporary Controls	no	no	no	no	yes	yes	yes	yes	yes
Reservation Controls	no	no	no	no	yes	yes	yes	yes	yes
Observations	111	82	58	111	332	332	331	332	332

Notes: ^a Both outcomes are logged. In column 1, the dependent variable is the literacy rate in 1952. In column 2, the dependent variable is the employment rate in 1952. In column 3, the dependent variable is the high school graduation rate (as a share of the population aged 18 and over) in 1952. In column 4, the dependent variable is the share of students enrolled in off-reservation boarding schools in 1945. The first four columns include a full set of state indicators as well as historical and tribal controls. The last five columns include the baseline controls. The standard errors are clustered at the historical Indian agency level. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.10.

Table 7: Evidence from the 2005-2011 National Indian Education Study

	Mother's Education	Free Lunch Eligible	Family Speaks Native Language	Knowledge of Tribal Traditions	Discuss Coursework with Family	Elders Visit School	AIAN courses in curriculum
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Boarding School Share	0.177* (0.089)	-0.389*** (0.109)	-0.473** (0.220)	0.066** (0.030)	0.186* (0.101)	0.033 (0.195)	0.383 (0.417)
R ²	0.026	0.058	0.204	0.028	0.026	0.033	0.099
Mean Dep. Var.	0.840	0.850	0.365	0.960	0.615	0.443	0.423
state indicators	yes	yes	yes	yes	yes	yes	yes
individual controls	yes	yes	yes	yes	yes	yes	yes
historical & tribal controls	yes	yes	yes	yes	yes	yes	yes
Observations	3,874	4,847	4,891	4,887	4,518	4,884	3,044

Notes: The individual data come from the 2005–2011 National Indian Education Survey of eighth-grade American Indian students. “Mother’s Education” equals one if a student’s mother graduated high school, zero otherwise. “Free Lunch Eligible” takes a value of one if the student is eligible for a free lunch or a reduced-price lunch through the National School Lunch Program, zero otherwise. “Family Speaks in Native Language” takes a value of one if the student’s family talks in traditional language “all or most [of the] time”, zero otherwise. “Knowledge of Tribal Traditions” equals one if a student has good to excellent knowledge of the traditions of tribe, zero otherwise. The variable “Discuss Coursework with Family” equals one if the student talks about studies at home at least once a week, zero if once every few weeks or never. “Elders Visit School” takes a value of one if elders visit the student’s class to share history or traditions, zero otherwise. “AIAN Courses in Curriculum” takes a value of one if the school courses more than one year-long AIAN course, zero otherwise. The state indicators correspond to the location of the school. The individual controls include a gender indicator and birth-year indicators. The historical and tribal controls are discussed in Table 2. The standard errors are clustered at the historical Indian agency level. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 8: The Role of Institutions

	Endogenous Institutions			Long-Run Outcomes				
	Casino	Self-Governance	IRA Adoption	High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Boarding School Share	-0.329 (0.326)	0.679* (0.397)	0.082 (0.404)	0.234*** (0.071)	0.862*** (0.228)	-0.458*** (0.116)	0.416*** (0.155)	-0.218** (0.086)
R ²	0.486	0.424	0.488	0.561	0.628	0.533	0.793	0.636
Institutional Controls	no	no	no	yes	yes	yes	yes	yes
State fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Decadal fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Historical & Tribal Controls	yes	yes	yes	yes	yes	yes	yes	yes
Contemporary Controls	yes	yes	yes	yes	yes	yes	yes	yes
Reservation Controls	yes	yes	yes	yes	yes	yes	yes	yes
Observations	226	226	222	222	222	222	222	222

Notes: ^a Both outcomes are logged. The casino variable is taken from Taylor and Kalt (2005), the IRA vote is taken from Haas (1947), and the self-governance indicator is taken from information located at the www.tribalselfgov.org. Each specification contains the baseline controls. The standard errors are clustered at the historical Indian agency level. Significance levels: *** p < 0.01, ** p < 0.05, * p < 0.10.

In this appendix, Section 8 contains the appendix tables discussed in the paper. Section 9 contains a discussion on how I matched students in the 2005–2011 NIES data to individual reservations. Last, Section 10 lists the names and locations of the off-reservation boarding schools used as the source of identification, and the names and associated Indian agencies of the 113 reservations used in the sample

8 Additional Tables

Table A1, column 1 and 2, reports the correlation between the population share of enrolled Indians living outside the Indian agency’s jurisdiction in 1945 and the boarding school share from 1911 to 1932. Conditional on a full set of state indicators, there is a positive and significant link between the boarding school share and the population share living off the reservation. The correlation is strengthened when the boarding school share is instrumented. The next two columns show a robust and positive association between the share of the reservation population in 1980 born in a different state and the historical boarding school share. The final two columns show that, by 1980, there is no longer a link between the share of enrolled Indians living on the reservation and the boarding school share. Thus, the results taken together suggest that the off-migration driven by boarding schools was later followed by return migration.

Table A1: Population Changes on Reservations: Evidence of Out- and In-Migration

Estimation Procedure	Share Living Outside of Jurisdiction, 1945		Share of Population Born in Different State, 1980		Share of Rez Population Enrolled in the Tribe, 1980	
	OLS	IV	OLS	IV	OLS	IV
Boarding School Share	0.284* (0.154)	0.523* (0.298)	0.508** (0.200)	2.057** (1.013)	0.013 (0.143)	0.026 (0.205)
Observations	106	106	100	100	106	106

Notes: The outcome in columns 1-2 is the share of the total population who are enrolled in the tribe but live off the reservation in 1945. The outcome in columns 3-4 is the share of the 1980 American Indian population who live on a reservation but were born in a different state. Last, the outcome in columns 4-5 is the share of the American Indian population on a reservation that are enrolled with the tribe. All specifications contain a full set of state indicators. The instrument in columns 2, 4 and 6 is defined as the mean distance to the nearest off-reservation boarding school which was open from 1911–1932 to the reservation’s centroid. The IV specifications also include the distance to the nearest boarding school that was open when the dependent variable was collected. Robust standard errors are in parenthesis. *, **, and *** reflect significance at the 10%, 5% and 1% levels.

Table A2 contains the difference-in-means tests between the main sample used in the paper and the population of all federally-recognized reservations with historical educational data. As allude to

in the paper, the samples differ with respect to reservation size. However, the means of the control variables, as well as the boarding school share, are not significantly different across samples.

Table A2: Balancing Tests

Dependent Variable:	coefficient on main-sample indicator	standard error	t-statistic	Observations
Boarding School Share, 1911–1932	0.032	0.019	1.647	150
Log Population, 1911–1932	0.751***	0.281	2.673	150
Reservation Size	-11.465***	0.583	-19.66	150
Share Allotted	0.090	0.079	1.133	150
Full-blooded Pop Share	0.065	0.045	1.429	150
Missionary Presence	0.083	0.071	1.168	150
Distance to Nearest Open School	-0.175	0.164	-1.066	150
Distance to Major City	-0.208	0.141	-1.473	150
Median Age	-1.348	1.506	-0.895	150
Neighboring Unemployment Rate	-0.685	0.426	-1.609	150
Neighboring Per Capita Income	-0.005	0.029	-0.165	150

Notes: Each row contains the coefficient and inferences from an OLS regression of the specified dependent variable on an indicator equals to one if the reservation was in the main sample, zero otherwise. Each regression contains 150 observations (113 reservations in the sample, 37 omitted). The standard errors are robust to heteroskedasticity. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

To determine whether assimilation gains reported in Table 2 are due to the “positive” effects from the legacy of boarding schools or the “negative” effects from the legacy of attending on-reservation (and public) schools, I split the variable of interest into its two components: log number of off-reservation boarding school students from 1911 to 1932 and the log number of Indian students at all other types of schools from 1911 to 1932. Table A3 reports the results from the OLS regressions under the same specifications at Table 2. In all but one specification, the coefficient on logged boarding school enrollment is significant and the same sign of the coefficient on S_i in Table 2. When the share of strictly English language speakers is the dependent variable, both logged boarding school enrollment and logged enrollment in other schools are insignificant but the coefficient on log boarding school enrollment is roughly 20 percent larger. These results show that the assimilation effects from the proportion of boarding school students is driven by the numerator of S_i .

Table A3: Decomposing the Effects of S_i on Five Outcomes

Dependent Variable:	Baseline Specification							
	High School Graduation Rate			High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Boarding School Enrollment	0.029** (0.013)	0.035** (0.016)	0.036** (0.016)	0.035** (0.016)	0.077* (0.045)	-0.037* (0.021)	0.051 (0.032)	-0.030* (0.017)
Log Enrollment, On-Reservation & Public Schools	-0.025** (0.010)	-0.004 (0.018)	0.008 (0.016)	0.008 (0.016)	-0.075* (0.040)	0.021 (0.020)	0.042 (0.040)	-0.001 (0.023)
R ²	0.546	0.600	0.611	0.611	0.614	0.532	0.767	0.497
State fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Decadal fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Historical & Tribal Controls	no	yes	yes	yes	yes	yes	yes	yes
Contemporary Controls	no	no	yes	yes	yes	yes	yes	yes
Reservation Controls	no	no	no	yes	yes	yes	yes	yes
Observations	338	338	338	338	338	337	338	338

Notes: ^a Both outcomes are logged. The standard errors in parentheses are clustered at the historical agency level. Significance levels: *** p < 0.01, ** p < 0.05, * p < 0.10.

The following two tables address the robustness of the main results. I first show in Table A4 that propensity score matching yields similar results. For each matching estimation procedure, I use an indicator that takes the value of one when the boarding school share is above the median, and zero otherwise. Each row of Table A4 reports the results from each matching strategy. These coefficients show the mean difference of each long-run outcome between reservations above and below the median boarding school share. The coefficients on the boarding school indicator are all the same sign as those in Table 2 and each coefficient is highly significant.

Table A5 investigates the sensitivity of the results to a range of alternative samples and specifications. The top row of panels A and B reports the OLS and IV coefficients from the baseline specifications in Tables 2 and 3. Each subsequent row contains the coefficient on the boarding school share to a change in specification.

The sensitivity to the level of clustering is first examined. Clustering at the tribal-level rather than agency-level does not change the significance of the coefficient in the OLS and IV models. The sensitivity of the results to changes in the sample is next examined. Omitting the Navajo Nation, which is an extreme outlier with respect to population size, impacts the OLS or IV coefficients only marginally. The omission of smaller reservations (defined as those with Native-only populations of less than 250 individuals) from the sample increases the economic significance of the results while leaving the statistical significance unchanged. The addition of reservation-level data from the 1980 Census also leaves the results largely unchanged. Lastly, altering the specifications to include state-by-year fixed effects and weighting the data by population size do not change the size and significance of the OLS and IV estimates.

Table A6 reports the IV estimates under two different specifications of the distance instrument (D_i). Panel A shows the IV estimates when a quadratic polynomial of the distance instrument is used and Panel B reports the IV estimates using a cubic polynomial of the distance instrument.

Table A4: Average Treatment Effect on the Treated

Matching Variables	Coefficient on the boarding school indicator ^a when the dependent variable is				
	High School Graduation Rate	Income per Capita ^b	Poverty Rate	English Language at Home	Family Size ^b
State & Year Indicators	0.085*** (0.013)	0.225*** (0.041)	-0.096*** (0.020)	0.111** (0.038)	-0.088*** (0.017)
Historical Controls	0.105*** (0.023)	0.323*** (0.046)	-0.135*** (0.019)	0.181*** (0.025)	-0.104*** (0.017)
Historical & Contemporary Controls	0.084*** (0.015)	0.234*** (0.054)	-0.111*** (0.025)	0.062** (0.023)	-0.078*** (0.018)
Baseline Controls	0.077*** (0.015)	0.195** (0.070)	-0.110*** (0.023)	0.072** (0.024)	-0.085*** (0.017)
Exact Matching on Tribal Controls	0.050*** (0.014)	0.189*** (0.053)	-0.091*** (0.022)	-0.059** (0.021)	-0.051*** (0.014)
Observations	338	338	337	338	388

Notes: ^a The boarding school indicator takes the value of one when S_i is above the median, zero otherwise. ^b Both outcomes are logged. Each row presents the average treatment effect on the treated, based on propensity score matching using one nearest neighbor. Reservations are matched using the following choices: Row 1 matches only on state and year indicators, Row 2 adds the historical controls to matches on those controls as well, Row 3 matches on historical and contemporary controls, Row 4 matches on the baseline controls. Row 5 matches reservations based on the baseline controls and reservations are exactly matched on their tribal traditions. *, **, and *** represent significance at the 10%, 5% and 1% levels.

The distance to a boarding school that has remains open is also modified accordingly in order to keep the source of identification the same (i.e., the geographic variation to the nearest boarding school that has closed). Under all five long-run assimilation outcomes, the IV coefficients are larger in absolute size to those reported in Table 3. One reason is that these specifications do not find the data as well as the logged distance instrument. Thus, each Kleibergen-Paap rk Wald F statistic is slightly below 10. As shown in Figure A1, a linear-log model fits the data fits well.

Table A5: Robustness Checks

Specification	Coefficient on the boarding school share when the dependent variable is				
	High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
Panel A: OLS Estimates					
Baseline	0.197*** (0.072)	0.676*** (0.208)	-0.329*** (0.109)	0.330** (0.163)	-0.188** (0.088)
Clustered at Tribal Level	0.197** (0.080)	0.676*** (0.238)	-0.329*** (0.112)	0.330** (0.153)	-0.188** (0.080)
Omit Navajo Nation	0.194*** (0.071)	0.688*** (0.209)	-0.333*** (0.110)	0.310* (0.162)	-0.188** (0.088)
Omit Smaller Reservations ^b	0.201** (0.078)	0.745*** (0.208)	-0.333*** (0.107)	0.375** (0.157)	-0.190* (0.096)
Include 1980 Data (N=445)	0.212** (0.081)	0.556** (0.255)	-0.278** (0.109)	— —	-0.175* (0.093)
State-Year Fixed Effects	0.200** (0.077)	0.675*** (0.221)	-0.331*** (0.115)	0.330* (0.172)	-0.189** (0.094)
Weighted	0.198*** (0.068)	0.671*** (0.199)	-0.310*** (0.100)	0.326** (0.161)	-0.226** (0.086)
Panel B: IV Estimates					
Baseline	0.365*** (0.139)	0.836** (0.375)	-0.408** (0.170)	0.859** (0.365)	-0.693*** (0.192)
Clustered at Tribal Level	0.365*** (0.139)	0.836** (0.336)	-0.408** (0.177)	0.859** (0.384)	-0.693*** (0.170)
Omit Navajo Nation	0.356** (0.141)	0.888** (0.385)	-0.430** (0.174)	0.782** (0.355)	-0.699*** (0.200)
Omit Smaller Reservations ^b	0.385** (0.160)	1.154*** (0.424)	-0.414** (0.181)	0.953*** (0.320)	-0.655*** (0.206)
Include 1980 Data (N=445)	0.473*** (0.166)	1.022** (0.504)	-0.382** (0.181)	— —	-0.663*** (0.183)
State-Year Fixed Effects	0.386*** (0.143)	0.822** (0.374)	-0.441*** (0.170)	0.882** (0.358)	-0.705*** (0.192)
Weighted	0.331*** (0.127)	0.665* (0.385)	-0.347** (0.174)	0.850** (0.366)	-0.683*** (0.189)

Notes: ^a Both outcomes are logged. ^b This sample omits all reservations with an average population size of less than 250 Native-only individuals, which shrinks the sample to 311 observations. Each regression contains historical, tribal, contemporary and reservation controls and state and year fixed effects, unless otherwise noted. These are the same controls as in the fully specified model in Table 3. The standard errors are clustered at the historical agency level, unless otherwise noted. *, **, and *** represent significance at the 10%, 5% and 1% levels.

Table A6: Alternative Specifications of the Distance Instrument

	High School Graduation Rate	ln(income per capita)	Poverty Rate	English Speakers per capita	Family Size
	(1)	(2)	(3)	(4)	(5)
Panel A: Distance to the Nearest School, measured as a quadratic					
Boarding School Share	0.576*** (0.210)	1.460** (0.580)	-0.480** (0.211)	0.843** (0.372)	-0.972*** (0.326)
1 st -stage F-statistic	7.481	7.481	7.458	7.481	7.474
Endogeneity Test p-value	0.1384	0.3541	0.7517	0.1220	0.0046
Panel B: Distance to the Nearest School, measured as a cubic					
Boarding School Share	0.556*** (0.177)	1.048** (0.424)	-0.454*** (0.170)	0.562* (0.310)	-0.622*** (0.194)
1 st -stage F-statistic	7.977	7.977	7.983	7.977	7.979
Endogeneity Test p-value	0.0233	0.1733	0.0605	0.2933	0.1064
Observations	338	338	337	338	338

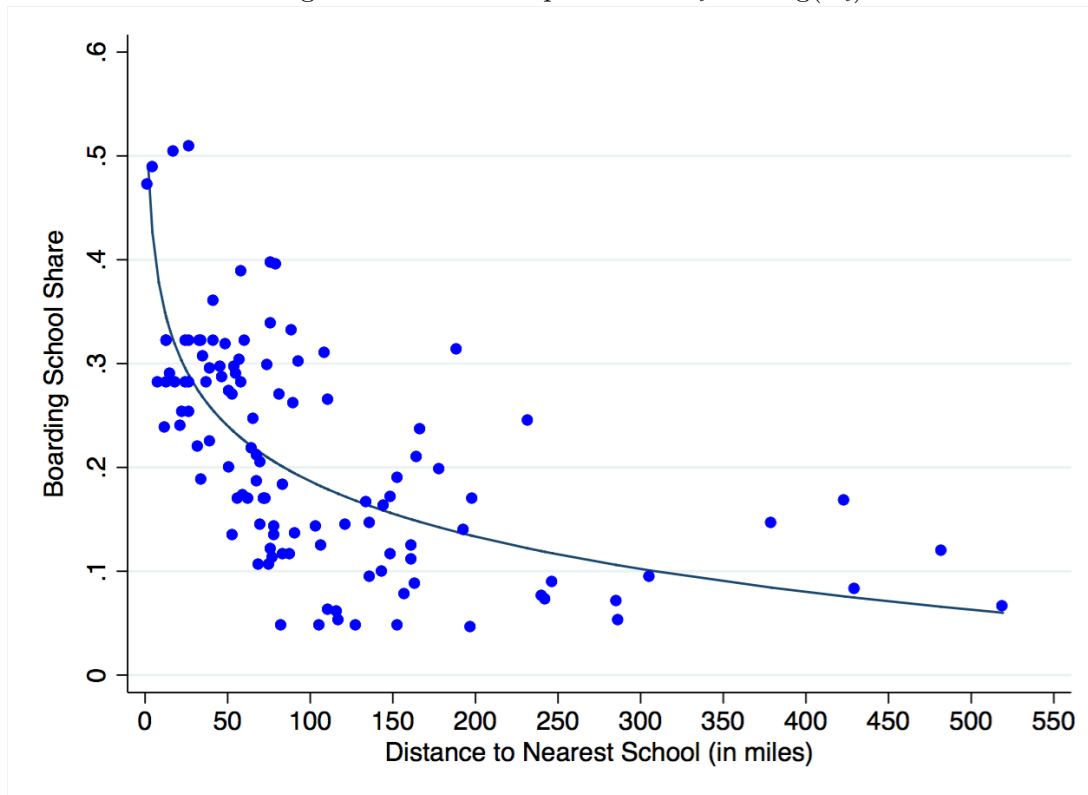
Notes: The baseline specifications are discussed in Table 2. Significance levels: *** p < 0.01, ** p < 0.05,

* p < 0.10.

Table A7 reports another falsification test. In this case, I use the outcomes of whites (both Hispanic and non-Hispanic) living on the reservations to determine the extent of spillovers from past boarding school exposure. This data come from the 2000 Census. This is also a test to determine the extent to which factors external to the American Indians can explain the long-run results. In Panel A, the results show that there is an insignificant association between the boarding school share and each long-run assimilation outcomes of the white-only population living on reservations. When the boarding school share is instrumented, Panel B shows that four of the five assimilation outcomes of whites living on reservations are still insignificantly related to the boarding school share. The only significant relationship suggests that as the boarding school share increases, the share of the white-only population speaking strictly English at home decreases. This is the opposite sign of the estimated effect in Table 3. Thus, there is no evidence that the assimilation gains from boarding schools have spilled over to the white population living on reservations. This is also additional evidence against the hypothesis that the channel of causality is linked to reservation-wide factors.

Table A8 provides evidence on the extent to which the boarding school effect varied with respect to tribal traditions. Each Panel contains the results from a different interaction term. Across the majority of specifications, there is no evidence that the boarding school effect varied by intertribal structure.

Figure 5: Relationship between S_i and $\log(D_i)$



Notes: The fitted values of S_i from a logarithmic regression of the form $S_i = \pi_1 + \pi_2 \log(D_i) + e_i$ are in black.

9 The Creation of the NIES sample

There are a total of 35,211 eighth-grade students located in four waves of surveys from 2005 to 2011 in the National Indian Education Study. I was able to link 5,013 individuals to 95 reservations in my sample. Some students left questions blank and, hence, the number of observations per model specification in Table 7 varies.

The difficulty in matching individuals to reservations comes from the vague answers students gave to the question, “name your tribe (or nation)”. Many students wrote “Native American” or “Indian” or more specific answers like “Chippewa” or “Lakota” to this question, or simply left the answer blank. Since there are many Chippewa and Lakota reservations, I cannot use these answers to determine the student’s reservation of origin. However, if the student describes a specific tribe or, better yet, a band within a tribe, and if that student attends a school in the same state as the tribally-affiliated reservation, then the student is added to the sample.

In all, I was able to link 9,290 individuals to federally-recognized tribal areas and reservations, of which 5,013 were located on reservations in the sample. Some of these students could be living

Table A7: Spillover Effects: Evidence from Whites Living on Reservations

Specification	Coefficient on the boarding school share when the dependent variable is				
	High School Graduation Rate	Income per Capita ^a	Poverty Rate	English Language at Home	Family Size ^a
Panel A: OLS Estimates					
Baseline	-0.190 (0.136)	-0.392 (0.435)	-0.043 (0.174)	-0.244 (0.189)	-0.157 (0.296)
R ²	0.498	0.548	0.534	0.552	0.464
Panel B: IV Estimates					
Baseline	-0.289 (0.190)	-0.493 (0.683)	-0.324 (0.471)	-0.461* (0.253)	-0.225 (0.308)
1 st -Stage F-statistic	27.018	27.095	21.364	26.908	26.487
Endogeneity Test <i>p</i> -value	0.6774	0.8387	0.2446	0.5885	0.8525
Observations	109	108	104	110	111

Notes: ^a Both outcomes are logged. Each regression contains historical, tribal, contemporary and reservation controls and state and year fixed effects, unless otherwise noted. These are the same controls as in the fully specified model in Table 3. The standard errors are clustered at the historical agency level, unless otherwise noted. *, **, and *** represent significance at the 10%, 5% and 1% levels.

Table A8: Heterogenous Effects with Tribal Traditions

	High School Graduation Rate	ln(income per capita)	Poverty Rate	English Speakers per capita	Family Size
	(1)	(2)	(3)	(4)	(5)
Panel A: Integrated with the Agrarian Society Indicator					
Boarding School Share	0.142 (0.127)	0.812** (0.345)	-0.224* (0.133)	0.275 (0.243)	0.134 (0.142)
Boarding School Share × Agr	0.0889 (0.165)	-0.222 (0.426)	-0.172 (0.181)	0.0910 (0.310)	-0.525*** (0.185)
Panel B: Interacted with the Social Stratification Indicator					
Boarding School Share	0.205*** (0.0754)	0.682*** (0.228)	-0.357*** (0.116)	0.379** (0.172)	-0.203** (0.0980)
Boarding School Share × Wealth	-0.0734 (0.266)	-0.0507 (0.536)	0.253 (0.186)	-0.441 (0.295)	0.137 (0.245)
Panel C: Interacted with the Local Community Indicator					
Boarding School Share	0.250** (0.0981)	1.145*** (0.318)	-0.472** (0.194)	0.379 (0.233)	-0.397** (0.174)
Boarding School Share × Size	-0.0843 (0.115)	-0.737* (0.380)	0.225 (0.198)	-0.0763 (0.313)	0.330 (0.213)
Observations	338	338	337	338	338

Notes: The baseline specifications are discussed in Table 2. Significance levels: *** $p < 0.01$, ** $p < 0.05$,

* $p < 0.10$.

off the reservation but within the same state as their home reservation. Unfortunately, linking Indian students who live off a reservation to a specific tribe or band is difficult. I was only able to link 436 students who lived in a different state to a specific reservation.

10 List of Schools, Reservations & Indian Agencies used in Paper

Table A9 lists the names, location, opening and closing dates of the off-reservation boarding schools. Additionally, Table A10 contains the name of the Indian agency it belonged to and the corresponding years under which the agency occupied authority over the reservation. For space considerations, the reservation-by-year weights are not listed but are available upon request.

Table A9: Government Off-Reservation Boarding Schools, 1879–1930

School Name	Location	Capacity ¹	Starting Date ²	Closing Date
Carlisle Indian Industrial School	Carlisle, PA	800	1879	1918
Salem (Chemawa) Indian School	Salem, OR	300	1880	still open
Chilocco Indian Agricultural School	Newkirk, OK	450	1884	1980
Genoa Indian Industrial School	Genoa, NE	300	1884	1934
Haskell Institute	Lawrence, KS	500	1885	still open ³
Grand Junction Indian School	Grand Junction, CO	150	1887	1911
Albuquerque Indian School	Albuquerque, NM	300	1887	1982
Wittenberg Indian School	Wittenberg, WI	140	1887	1917
Morris Industrial School	Morris, MN	100	1887	1909
Santa Fe Indian Industrial School	Santa Fe, NM	200	1890	still open
Fort Mojave Indian School	Fort Mojave, AZ	150	1890	1931
Carson/Stewart Indian School	Carson City, NV	125	1890	1980
Fort Stevenson School	Garrison, SD	70	1891	1894 ⁴
Pierre Indian School	Pierre, SD	150	1891	still open
Phoenix Indian School	Phoenix, AZ	600	1891	1982
Fort Lewis Indian School	Hesperus, CO	300	1892	1909
Fort Shaw Indian School	Fort Shaw, MT	250	1892	1910
Sherman Institute	Riverside, CA	100	1893 ⁵	still open
Flandreau Indian School	Flandreau, SD	250	1893	still open
Pipestone Indian School	Pipestone, MN	100	1893	1953
Tomah Indian School	Tomah, WI	125	1893	1941
Mount Pleasant Indian School	Mount Pleasant, MI	160	1893	1934
Chamberlain Indian School	Chamberlain, SD	75	1898	1909
Rapid City Indian School	Rapid City, SD	80	1898	1933
Fort Bidwell Indian School	Fort Bidwell, CA	150	1898	1919
Hayward Indian School	Hayward, WI	200	1901	1934
Wahpeton Indian School	Wahpeton, ND	150	1908	still open ⁶
Greenville Indian School	Greenville, CA	50	1908	1919
Bismarck Indian School	Bismarck, ND	80	1908	1937
Cushman Indian School	Tacoma, WA	300	1912	1920

¹ The total student capacity varied by year. The majority of these capacity figures are taken from the Statistics of Indian Tribes, Agencies and Schools (1899).

² The starting date is defined as the first year the Indian Affairs annual reports listed any enrollment at this school. Therefore, these dates differ from the year the school was established.

³ In 1970, Haskell Institute became a junior college and in 1993 became a 4-year intertribal university.

⁴ A fire destroyed this school and was never rebuilt.

⁵ This school was originally located in Perris, CA but concerns over water quality led the OIA to abandon this site and built a new school in 1902 in Riverside, CA.

⁶ This school is now called the Circle of Nations School, an intertribal elementary and middle school.

Table A10: List of Reservations and corresponding Indian Agencies

Reservation	State	Indian Agency (year)
1. Cocopah Reservation	AZ	Fort Yuma (1919–1932)
2. Colorado River Reservation	AZ–CA	Colorado River (1911–1932)
3. Fort Apache Reservation	AZ	Fort Apache (1911–1932)
4. Fort McDowell Reservation	AZ	Camp McDowell (1911–1912), Salt River (1913–1928)
5. Fort Mojave Reservation	AZ–CA–NV	Fort Mojave (1911–1914, 1920–1922), Colorado River (1916–1919, 1923–1928)
6. Fort Yuma Reservation	AZ–CA	Fort Yuma (1911–1932)
7. Gila River Reservation	AZ	Pima (1911–1932)
8. Havasupai Reservation	AZ	Havasupai (1911–1932)
9. Hopi Reservation	AZ	Moqui (1911–1923), Hopi (1923–1932)
10. Hualapai Reservation	AZ	Truxton Canon (1911–1932)
11. Navajo Nation Reservation	AZ–NM–UT	Western Navajo (1911–1932), Navajo (1911–1932), Leupp (1911–1932), Pueblo Bonito (1911–1926), , Eastern Navajo (1927–1932) Northern Navajo (1927–1932), San Juan (1911–1926)
12. Salt River Reservation	AZ	Camp McDowell (1911–1912), Salt River (1913–1932)
13. San Carlos Reservation	AZ	San Carlos (1911–1932)
14. Tohono O’odham Reservation	AZ	Sells (1911–1932), Pima (1914–1932)
15. Yavapai-Apache Nation	AZ	Camp Verde (1911–1932)
16. Agua Caliente Reservation	CA	Malki (1911–1919), Mission (1925–1932)
17. Campo Reservation	CA	Campo (1911–1920), Mission (1925–1932)
18. Fort Bidwell Reservation	CA	Fort Bidwell (1911–1931), Sacramento (1932)
19. Hoopa Valley Reservation	CA	Hoopa Valley (1911–1932)
20. La Jolla Reservation	CA	La Jolla (1911), Pala (1912–1920), Mission (1921, 1925–1932)
21. Mesa Grande Reservation	CA	Mission (1911), Volcan (1912–1913) Soboba (1914–1919), Pala (1920) Mission (1921–1932)
22. Morongo Reservation	CA	Malki (1911–1919), Mission (1925–1932)
23. Pala Reservation	CA	Pala (1911–1920), Mission (1925–1932)
24. Pechanga Reservation	CA	Pechanga (1911–1913), Pala (1915–1920), Mission (1921, 1925–1932)
25. Rincon Reservation	CA	Rincon (1911), Pala (1912–1920), Mission (1921, 1925–1932)
26. San Pasqual Reservation	CA	Mesa Grande (1911), Pala (1915–1920), Mission (1921, 1925–1932)
27. Santa Ysabel Reservation	CA	Mesa Grande (1911), Volcan (1913), Soboba (1914–1919), Pala (1920), Mission (1921, 1925–1932)
28. Soboba Reservation	CA	Soboba (1911–1919), Mission(1925–1932)
29. Torres-Martinez Reservation	CA	Martinez (1911–1912), Malki (1913–1919), Mission (1925–1932)
30. Tule River Reservation	CA	Tule River (1911–1923), Sacramento (1929–1932)
31. Southern Ute Reservation	CO	Southern Ute (1911–1923), Consolidated Ute (1924–1932)
32. Ute Mountain Reservation	CO–NM–UT	Navajo Springs (1911–1914), Ute Mountain (1915–1922), Consolidated Ute (1924–1932)
33. Duck Valley Reservation	NV–ID	Western Shoshone (1911–1932)

34. Coeur d'Alene Reservation	ID	Coeur d'Alene (1911-1932)
35. Fort Hall Reservation	ID	Fort Hall (1911-1932)
36. Nez Perce Reservation	ID	Fort Lapwai (1911-1932)
37. Kickapoo (KS) Reservation	KS	Kickapoo (1911-1921, 1932), Potawatomi (1922-1931)
38. Prairie Band Potawatomi	KS	Potawatomi (1911-1919, 1922-1932), Kickapoo (1920-1921)
39. Bois Forte Reservation	MN	Nett Lake (1911-1919), Fond du Lack (1920), Red Lake (1921-1922), Consolidated Chippewa (1923-1932)
40. Fond du Lac Reservation	MN-WI	Fond du Lac (1911-1920), Red Lake (1921-1922), Consolidated Chippewa (1923-1932)
41. Grand Portage Reservation	MN	Grand Portage (1912-1919), Fond du Lac (1920), Red Lake (1921-1922), Consolidated Chippewa (1923-1932)
42. Leech Lake Reservation	MN	Leech Lake (1912-1922), Consolidated Chippewa (1923-1932)
43. Mille Lacs Reservation	MN	White Earth (1912-1922)
44. Red Lake Reservation	MN	Red Lake (1911-1932)
45. White Earth Reservation	MN	White Earth (1912-1922), Consolidated Chippewa (1923-1932)
46. Blackfeet Reservation	MT	Blackfeet (1911-1932)
47. Crow Reservation	MT	Crow (1911-1932)
48. Fort Peck Reservation	MT	Fort Peck (1911-1932)
49. Northern Cheyenne Reservation	MT-SD	Tongue River (1911-1932)
50. Rocky Boy's Reservation	MT	Rocky Boy's (1918-1932)
51. Eastern Cherokee Reservation	NC	Eastern Cherokee (1911-1932)
52. Spirit Lake Reservation	ND	Fort Totten (1911-1932)
53. Standing Rock Reservation	ND-SD	Standing Rock (1911-1932)
54. Turtle Mountain Reservation	ND-MT-SD	Turtle Mountain (1911-1932)
55. Omaha Reservation	NE-IA	Omaha (1911-1924, 1927-1932), Winnebago (1925)
56. Santee Reservation	NE	Santee (1911-1917, 1927-1932), Yankton (1918-1926)
57. Winnebago Reservation	NE-IA	Winnebago (1911-1932)
58. Acoma Pueblo	NM	Southern Pueblos (1925-1932)
59. Cochiti Pueblo	NM	Northern Pueblos (1925-1932)
60. Isleta Pueblo	NM	Southern Pueblos (1925-1932)
61. Jemez Pueblo	NM	Southern Pueblos (1925-1932)
62. Jicarilla Apache Reservation	NM	Jicarilla Apache (1911-1932)
63. Laguna Pueblo	NM	Southern Pueblos (1925-1932)
64. Mescalero Reservation	NM	Mescalero (1911-1932)
65. Nambe Pueblo	NM	Northern Pueblos (1925-1932)
66. Picuris Pueblo	NM	Northern Pueblos (1920-1930), Santa Fe (1931-1932)
67. Pojoaque Pueblo	NM	Northern Pueblos (1920-1930), Santa Fe (1931-1932)
68. San Felipe Pueblo	NM	Southern Pueblos (1925-1932)
69. San Ildefonso Pueblo	NM	Northern Pueblos (1920-1930), Santa Fe (1931-1932)
70. San Juan Pueblo	NM	Northern Pueblos (1920-1930), Santa Fe (1931-1932)
71. Sandia Pueblo	NM	Southern Pueblos (1925-1932)
72. Santa Ana Pueblo	NM	Southern Pueblos (1925-1932)
73. Santa Clara Pueblo	NM	Northern Pueblos (1920-1930), Santa Fe (1931-1932)
74. Santo Domingo Pueblo	NM	Northern Pueblos (1925-1928), Southern Pueblos (1929-1932)
75. Taos Pueblo	NM	Northern Pueblos (1920-1930), Santa Fe (1931-1932)
76. Tesuque Pueblo	NM	Northern Pueblos (1920-1930), Santa Fe (1931-1932)

77. Zia Pueblo	NM	Southern Pueblos (1925–1932)
78. Zuni Reservation	NM–AZ	Zuni (1911–1932)
79. Moapa River Reservation	NV	Moapa River (1911–1932)
80. Pyramid Lake Reservation	NV	Nevada (1911–1922), Carson (1927–1931), Pyramid Lake (1932)
81. Walker River Reservation	NV	Walker River (1911–1932)
82. Fort McDermitt Reservation	NV–OR	Fort McDermitt (1911–1922), Carson (1926–1932)
83. Siletz Reservation	OR	Siletz (1911–1925), Salem (1927–1932)
84. Cheyenne River Reservation	SD	Cheyenne River (1911–1932)
85. Crow Creek Reservation	SD	Crow Creek (1911–1932)
86. Flandreau Reservation	SD	Flandreau (1911–1932)
87. Lake Traverse Reservation	SD–ND	Sisseton (1911–1932)
88. Lower Brule Reservation	SD	Lower Brule (1911–1932)
89. Pine Ridge Reservation	SD–NE	Pine Ridge (1911–1932)
90. Rosebud Reservation	SD	Rosebud (1911–1932)
91. Yankton Reservation	SD	Yankton (1911–1932)
92. Uintah and Ouray Reservation	UT	Uintah and Ouray (1911–1932)
93. Chehalis Reservation	WA	Cushman (1911–1920), Taholah (1921–1932)
94. Lummi Reservation	WA	Tulalip (1911–1932)
95. Makah Reservation	WA	Neah Bay (1911–1932)
96. Muckleshoot Reservation	WA	Tulalip (1911, 1922–1932), Cushman (1912–1920), Taholah (1921)
97. Nisqually Reservation	WA	Cushman (1911–1920), Taholah (1921–1932)
98. Port Madison Reservation	WA	Tulalip (1911–1932)
99. Puyallup Reservation	WA	Cushman (1911–1920), Taholah (1921)
100. Quileute Reservation	WA	Neah Bay (1911–1927)
101. Skokomish Reservation	WA	Cushman (1911–1920), Taholah (1921–1932)
102. Spokane Reservation	WA	Colville (1911, 1925–1926), Spokane (1912–1924, 1927–1932)
103. Squaxin Island Reservation	WA	Cushman (1911–1920), Taholah (1921–1932)
104. Swinomish Reservation	WA	Tulalip (1911–1932)
105. Tulalip Reservation	WA	Tulalip (1911–1932)
106. Bad River Reservation	WI	La Pointe (1911–1930), Bad River (1931–1932)
107. Lac Courte Oreilles Reservation	WI	Hayward (1911–1932)
108. Lac du Flambeau Reservation	WI	Lac du Flambeau (1911–1932)
109. Menominee Reservation	WI	Keshena (1911–1932)
110. Oneida (WI) Reservation	WI	Oneida (1911–1919), Keshena (1920–1932)
111. Red Cliff Reservation	WI	La Pointe (1911), Red Cliff (1912–1922), La Pointe (1923–1930), Red Cliff (1932)
112. Stockbridge-Munsee Community	WI	Keshena (1911–1924)
113. Wind River Reservation	WY	Shoshone (1911–1932)