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EVIDENCE FROM HISTORICAL TREATIES

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WORKING PAPER 31713

NBER WORKING PAPER SERIES

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Working Paper 31713  
<http://www.nber.org/papers/w31713>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
September 2023

Portions of this research were supported by the Social Sciences and Humanities Research Council of Canada (Insight Development Grant #430-2021-0653). The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 31713

September 2023

JEL No. J15,N31,N32,P14

**ABSTRACT**

For nearly three centuries, Indigenous peoples within the borders of present-day Canada engaged in treaty-making with the British Crown and other European powers. These treaties regularly formed the colonial legal basis for access to Indigenous lands. However, treaties were not negotiated everywhere, including in regions subsequently settled by Europeans. Consequentially, there is substantial regional variation in the legal status of occupied lands, jurisdiction over natural resources, and state commitments to Indigenous nations. We study how these legal institutions have shaped the path of economic development in Indigenous communities. Using restricted-access census data, we show that historical treaties substantially lower income in Indigenous communities today. We argue that this results from the constitutional and legal recognition of Aboriginal rights and title, which have dramatically increased bargaining power and, consequently, income growth in non-treaty Indigenous communities.

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During the colonization of North America, European powers engaged with Indigenous nations through violence and negotiation. As with other European powers and the United States government, the British Crown pursued both of these strategies; however, the British ultimately colonized much of the land that would become Canada through a succession of treaties with Indigenous nations. These treaties consist of a set of clauses, some of which promise physical goods, cash payments, the provision of public goods, rights to hunt or fish, or the maintenance of peace in exchange for land. Formally, treaties set expectations for both parties, including access to land and resources and the establishment of legal and political jurisdictions. The treaties outline the rules for repeated interaction between the Crown and Indigenous nations and underpin the legal framework for what would become the Canadian state.

Taken at face value, historical treaties generated the kind of clearly defined property rights that are generally thought to be important for efficiency and growth, at least from the perspective of settler governments.<sup>1</sup> They exchanged land from Indigenous nations to the Crown, established what lands belonged to Indigenous peoples, and clarified land use rights for both parties. Importantly, treaties were only signed in some regions of Canada and among Indigenous nations that did sign these agreements, the nature of treaties differed substantially over time and space. This work shows how the impact of these treaties has depended critically on the broader institutional and legal context along with the distribution of bargaining power between Indigenous peoples and the state.

Given the clear delineation of land rights in treaty regions, we might expect income and well-being to be higher for Indigenous nations that signed treaties compared to those that did not; however, a simple comparison of communities with and without treaties confounds a variety of other fundamental causes of growth, including differences in other institutions, geographic endowments, and cultural traits that predate colonization. Our empirical analysis combines two strategies to evaluate the impact of these historical treaties while accounting for these potential confounders. First, we construct a detailed dataset from primary sources to assess whether observable factors, suggested to be important by historians and economists, are empirically associated with the likelihood of signing a historical treaty.<sup>2</sup> We merge this historical dataset with restricted-access census data on contemporary outcomes. Since many of these factors may also be associated with long-run growth in the absence of treaties, we include this set of baseline controls in all our long-run specifications. Second, we adopt a contiguous border approach in the spirit of [Dube et al. \(2010\)](#) that leverages the fact that Indigenous nations whose ancestral territories bordered one another may have shared similar unobservable characteristics but differed in whether they signed treaties. This strategy allows us to hold location-specific geographic and cultural characteristics constant by including pairwise fixed effects. The remaining variation in income can then be attributed to

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<sup>1</sup>See for example the classic arguments of [North \(1991\)](#), [Besley \(1995\)](#), [De Soto \(2000\)](#), [Acemoglu et al. \(2001\)](#), and [Acemoglu and Johnson \(2005\)](#) and summaries by [Levine \(2005\)](#) and [Besley and Ghatak \(2010\)](#). More recent examples include [Fetzer and Marden \(2017\)](#), [Leonard et al. \(2020\)](#), and [Bu and Liao \(2022\)](#).

<sup>2</sup>These include the desire to exploit natural resources like furs, settle lands, and secure a strategic advantage over other colonial powers or Indigenous nations ([Miller, 2009](#)).

the institutional differences associated with treaties.

Contrary to our priors, we find that Indigenous communities that signed historical treaties have an income per capita that is \$7,000 lower than otherwise similar Indigenous communities as of 2016. This is an empirically robust finding that holds across alternative specifications and when conditioning on a wide range of possible explanatory factors.<sup>3</sup> After ruling out standard channels of income divergence that operate through labor markets, migration, or demographics, we explore how the evolution of political and legal institutions has shaped the path of development in treaty and non-treaty communities.<sup>4</sup>

While early legislation established the importance of treaties in securing land under the jurisdiction of the Dominion of Canada, three factors may have limited their role in shaping the path of development for Indigenous nations. First, the *Indian Act* of 1876 uniformly treated all “Indians” as wards of the state, regardless of treaty status, potentially super-ceding elements of treaties. Second, guaranteed treaty obligations often went unhonoured or only partially honoured by the Canadian state.<sup>5</sup> Finally, the Supreme Court decision in *St. Catharines Milling and Lumber Co v R.* [1888] established that Aboriginal title existed only at the discretion of the Crown. This decision effectively extinguished Aboriginal title for all Indigenous nations regardless of their treaty status. In practice, this court decision equalized Indigenous property rights across treaty and non-treaty nations for the better part of a century. Using newly digitized data from historical Indian Affairs reports from 1913 to 1939, we show limited discernible differences in the economic conditions of treaty and non-treaty Indigenous nations. Further, we show that treaties did not preclude non-Indigenous settlement, which is consistent with limited initial differences in the realized structure of property rights between treaty and non-treaty lands.

The importance of treaties and the economic trajectory of Indigenous nations shifted dramatically when Canada repatriated its constitution in 1982. Section 35(1) of the newly patriated constitution formally recognized and affirmed existing Aboriginal and treaty rights.<sup>6</sup> As such, Section 35(1) created the conditions for a series of subsequent court cases that increased uncertainty over property rights concerning land and natural resources in regions that were never covered by historical treaties.<sup>7</sup> On the whole, these court decisions strengthened the bargaining position of

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<sup>3</sup>Other specifications include a doubly robust LASSO procedure, a nearest-neighbor matching procedure, and an instrumental variable strategy that uses the fact that Indigenous nations whose neighbors signed treaties in a previous period may have been more likely to sign treaties in subsequent periods. We also show that our results are robust to using province and cultural grouping fixed effects even though this strategy substantially diminishes the variation we can exploit.

<sup>4</sup>Specifically, we show that differences in education, age profiles, the industrial composition of the labor force, historical and contemporary settlement patterns, economic activity in surrounding areas, individual treaty clauses, intensive or extensive margins of labor supply, migration, or the presence of modern (post-1970) treaties do not explain the income gap between treaty and non-treaty communities.

<sup>5</sup>There is also considerable evidence that the written versions of treaty texts did not always reflect their negotiated spirit (Craft, 2013; Krasowski, 2019). In this work, we take the text of treaties as given. We discuss this in more detail in Section 2.

<sup>6</sup>Although in the 1970s Indigenous nations led a successful social and legal movement towards the recognition of Indigenous rights, the enshrinement of these rights in the constitution was a watershed moment.

<sup>7</sup>These cases affirmed the existence of Aboriginal title in unceded areas and clarified the duty to consult and accommodate in areas where Aboriginal title may still exist. While it is true that these rights may have impacted

non-treaty nations in negotiations with the Government of Canada relative to the power of treaty nations. We demonstrate that the income gap between treaty and non-treaty communities only emerged in the years following the patriation of the constitution. Thus, we identify a setting where the obfuscation of property rights, at least from the state’s perspective, drives improved economic outcomes among some groups. The relative improvement in Indigenous nations’ bargaining power outweighs any costs associated with ill-defined property rights.<sup>8</sup>

Our results directly align with work in comparative institutional economics that stresses the interplay between the choice set at a particular point in time and the institutional change that led to the choice set (North, 1990; Engerman and Sokoloff, 2005; Capoccia, 2015; Acemoglu and Robinson, 2012). Specifically, the mechanism underlying our empirical results matches the arguments in Acemoglu and Robinson (2012). They argue that historical processes generate institutional drift—that is, changes in institutions over time—which become important during critical junctures in history.<sup>9</sup> In the case of historical treaties, differences across Indigenous nations before colonization led to further institutional differences through the treaty-making process. In theory, the difference between a treaty nation and a non-treaty nation could be considered large. Still, in practice, these differences were initially small due to the restrictions on Aboriginal title imposed through *St. Catharines Milling and Lumber Co v R* in 1888 and the legislative framework governing the interaction of the state and Indigenous peoples. Although seemingly unimportant for economic outcomes in the early twentieth century, these institutional differences became salient over time following the patriation of the constitution, which shifted the economic and political balance of power in society. Thus, it was not until this critical juncture that the pre-existing institutional differences resulted in divergent economic trajectories.

We also join a growing body of work that questions the “good institutions” narrative of the development of the Americas by reframing the discussion to include Indigenous nations (Dell, 2010; Angeles and Elizalde, 2017; Redish, 2020; Carlos et al., 2021).<sup>10</sup> In many cases, the institutions that promoted growth among settler economies are precisely the same institutions that have limited the growth of Indigenous nations. While “good” institutions are typically thought to provide a structure to everyday life which aids in reducing uncertainty (North, 1990), at least from the Canadian state’s perspective, the patriation of the constitution generated more uncertainty. Public discourse from the period and into the present has been rife with predictions that the uncertainty brought by the court rulings strengthening Aboriginal rights and title would impede economic growth (Keay and Metcalf, 2021). However, we argue that the uncertainty is also associated with a shift in bargaining power, which has resulted in substantial gains among some of the most marginalized in society. We should emphasize that our argument is not that unclear property

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treaty communities, we take the position that they disproportionately impacted non-treaty communities.

<sup>8</sup>Some scholars argue that these court decisions increased uncertainty related to settler investment; Keay and Metcalf (2021) suggest that various court decisions both increased and decreased market perceptions of legal clarity regarding land rights.

<sup>9</sup>For other notions of institutional drift see Hacker et al. (2015).

<sup>10</sup>Other recent work has also examined this notion from a global perspective, e.g., Sinding Bentzen et al. (2017); Giuliano and Nunn (2020).

rights are desirable. Instead, the setting in which ambiguous property rights cause more rapid economic growth among impacted Indigenous nations highlights the exclusionary nature of existing institutions.

We are not the first scholars to note that the structure of colonial property rights has important implications for economic development among Indigenous nations in North America;<sup>11</sup> however, much of this literature has focused explicitly on the structure of property rights on reservations.<sup>12</sup> In particular, much of this work touches on land fractionation with implications for the potential gains associated with conversion to fee simple status in promoting growth. Our analysis differs in that we focus on property rights over lands that are typically outside of reserve areas and that are large in magnitude—often the size of entire European countries.<sup>13</sup> Further, we find that stronger Indigenous land ownership in a communal or cooperative form leads to substantially greater economic development in contrast with much of the existing literature.<sup>14</sup>

Finally, our work contributes to the broader literature in economic history that has sought to explain variation in incomes between Indigenous and non-Indigenous nations and across Indigenous nations in North America. These include work on the impact of forced co-existence of distinct political groups on reservations (Dippel, 2014), the legacy of residential schools (Feir, 2016b,a; Gregg, 2018; Jones, 2021), the loss of resources (Feir et al., 2023b), federal oversight (Frye and Parker, 2021), and constitutional design (Akee et al., 2015). Together, these papers provide essential insights into how colonial processes have impacted economic development in Indigenous communities. In our analysis, we suggest that the substantial income gap between treaty and non-treaty nations is primarily a marker of the economic harm associated with the perceived legal land cession on the part of settlers. Rather than converging over time, the relative value of unceded land has increased as the bargaining position improved among Indigenous nations over time. As a result, the income gap between treaty and non-treaty nations has substantially widened since the 1980s. These findings have implications for other nations engaged in the modern treaty-making process, the recognition of Aboriginal title, and the development of policies to improve economic conditions for Indigenous peoples.

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<sup>11</sup>See, for example, Akee (2019); Carlson (1978, 1981, 1983); Miller (2015); Dippel and Frye (2019); Dippel et al. (2020); Leonard et al. (2020).

<sup>12</sup>In the United States, this has included work on trust status (Akee and Jorgensen, 2014; Leonard et al., 2020; Dippel et al., 2020), leasing (Akee, 2009; Frye, 2012), and fractionalization (Russ and Stratmann, 2014, 2016; Leonard et al., 2018, 2020; Dippel et al., 2020). In Canada, it has been related to forms of land tenure on reservations (Pendakur and Pendakur, 2018; Aragón and Kessler, 2020; Pendakur and Pendakur, 2020).

<sup>13</sup>The largest treaty, Number Treaty 8 covers approximately 850,000 km-squared, whereas Number Treaty 7 covers roughly 130,000 km-squared. For context, England, Germany, and France are approximately 130,000, 360,000, and 640,000 km-squared, respectively.

<sup>14</sup>Aragón (2015)'s work considering the importance of modern treaties in clarifying property rights, lowering transaction costs, and generating growth in First Nations communities in Canada is consistent with this existing US-based literature.

## 2 Institutional Background

### 2.1 A Brief Overview of Historical Treaty-Making

Our work evaluates the treaties signed between Indigenous nations and the British, and, subsequently, Canadian governments between 1725 and 1929. By this point, settlers were in North America to stay, and these treaties typically established the formal rules for repeated interaction between Indigenous nations and European settlers.<sup>15</sup> Here, we provide a brief background on the major episodes of treaty-making during this period. Figure 1 displays the geographic location of the primary treaties that we consider in our analysis. More details can be found in our companion piece (Feir et al., 2023a) and in the works of historians Miller (2009); Daschuk (2013); Krasowski (2019). We then outline how we might expect the major legislative changes affecting Aboriginal rights and title to impact economic growth over time.

The first formal treaties we include in our analysis are the Peace and Friendship treaties, signed between 1725 and 1779 along the east coast of Canada and America, between the British Crown and groups of Mi'kmaq and Maliseet. These treaties did not explicitly involve land transfer from Indigenous nations to the Crown. Instead, they normalized relations between Indigenous groups and Europeans in the region. Importantly, these treaties were signed mainly before the explicit recognition of Aboriginal rights and title by the British Crown. In recognition of the fact that the continued success of Britain's American colonies depended on their relations with Indigenous peoples, the British issued the Royal Proclamation of 1763, which established a boundary separating "Indian Territory" from the eastern settlements, as displayed in Figure A.1 of the Online Appendix. Settlement west of the Atlantic watershed was forbidden, and all purchase of lands was to be done by the Crown through representatives from the Indian Department (Slattery, 1983). The Royal Proclamation of 1763 was the first significant recognition of Indigenous property rights in North America by the British government and was ratified by 27 Indigenous governments at the Treaty of Niagara (Redish, 2020).<sup>16</sup> Importantly, the Royal Proclamation of 1763 remains relevant concerning property rights over unceded Indigenous lands and extends to other regions that were eventually brought under the jurisdiction of Canada (Redish, 2020). Figure 2 shows the timing of the Royal Proclamation in relation to other major legislative changes regarding Aboriginal rights and title.

The Royal Proclamation set a precedent for future treaty-making between Indigenous nations and either British or Canadian governments (Slattery, 1979). Although "Indian Territory" was technically not designated for settlement, pressure to make space for British loyalists who fled from America during the Revolutionary War led the government to negotiate a series of land surrender

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<sup>15</sup>While there were early instances of diplomatic relations between settlers and Indigenous nations in the 17th and early 18th centuries, these were generally less formal and often related to military competition between France and the United Kingdom in North America. These earlier agreements can mostly be viewed as normalizing relations or forms of military alliance. Oral treaties and other forms of diplomacy also existed between Indigenous nations before European settlement.

<sup>16</sup>We exclude this treaty from our analysis since it represents an in-spirit agreement that would form the basis for individualized treaty-making with Indigenous nations.



agreements in what is now Southern Ontario and Quebec. This episode marks the second treaty-making period that we consider in our analysis. Land surrenders were most often one-time land purchases, usually in exchange for cash or the equivalent value of goods.

By the 1840s, interest from mining companies along the Great Lakes and from the Hudson Bay Company in Vancouver Island led to several new treaties in these regions. The Robinson and Douglas treaties, as they came to be known, were similar in nature, despite dealing with vastly different regions of the country. Through these treaties, land was ceded by Indigenous nations in exchange for the right to hunt and fish in ceded territories, as well as the establishment of reserves, the promise of annuity payments, and other provisions. These treaties marked the beginning of a period of “comprehensive” treaty-making that reflected the increasingly paternalistic nature of the state. In many respects, the Robinson and Douglas treaties served as blueprints for the eleven Numbered Treaties, in which most lands across Western Canada were ceded between 1871 and 1921. The Numbered Treaties ceded large swaths of land in exchange for annuities, reserve lands, the provision of public goods, and other commitments on the part of the state. These treaties have many commonalities with modest variations in clauses according to the individual circumstances of the nations at the time of signing.

Ultimately, adhesions were made to the Numbered Treaties until 1929 when the federal government halted its formal treaty-making program. Several factors coalesced to result in this decision, including changes in public and government sentiment towards Indigenous peoples, and the Great Depression placing added fiscal burdens on the federal government. Treaty-making remained dormant for nearly 50 years until jurisprudence on Aboriginal rights and title began to shift in the 1970s.

Whether it be the Peace and Friendship treaties, Land Surrenders, or Comprehensive Treaties, in each case, treaties outlined the “rules of the game”. At least from the Crown’s perspective, treaties formed clarity over land rights and outlined a commitment on the part of the state to deliver certain public goods and annuities to Indigenous nations. Absent any other legislative changes, one might speculate that, at least in comparison to other Indigenous nations that did not sign treaties, those that did should be economically advantaged through both stronger property rights and the provision of goods. The reality is substantially more complex and depends on the evolution of legislation regarding Aboriginal rights and title.

## 2.2 The Impact of Treaties in Light of the Evolution of Aboriginal rights and Title

The Royal Proclamation was the first formal recognition of Aboriginal rights and title by the British Crown. It set a precedent for how land could be formally transferred from Indigenous nations to the state through a nation-to-nation relationship. However, legislation and judicial decisions at the end of the 19th century effectively equalized both property rights and the provision of services across treaty and non-treaty communities, irrespective of treaty signing until the late 20th century.

The *Indian Act* of 1876 consolidated and expanded upon existing legislation relating to the state’s interactions with Indigenous peoples. Under the Indian Act, all matters of Indigenous lives

were regulated by the federal government, including education, health services, and the structure of Indigenous governments on reserves. This has meant that, regardless of treaty status, a similar set of national institutions have been applied broadly to First Nations communities.<sup>17</sup> Thus, even if we think that treaties may have affected economic development through the individual clauses included within, the effect on long-run outcomes in Indigenous communities is ambiguous.<sup>18</sup> The Indian Act continues to be the primary piece of legislation that defines how the federal government interacts with First Nations peoples, especially concerning the provision of services and funds.

In addition to legislation, the courts created conditions that equalized conditions across treaty and non-treaty nations. In 1888, a jurisdictional dispute between the Province of Ontario and the federal government was brought before the Supreme Court of Canada. The case ultimately hinged on the court’s interpretation of Aboriginal rights and title. The Supreme Court decided that Aboriginal title over unceded land existed at the discretion of the Crown. In delivering the Privy Council’s judgment, Lord Watson stated, “the tenure of the Indians was a personal and usufructuary right, dependent upon the goodwill of the sovereign.” [St. Catharines Milling and Lumber Co. v. R., 1887 CanLII 3 (SCC), 13 SCR 577]. In practice, this decision extinguished Indigenous property rights over the majority of lands in Canada in Canadian law for decades.

Nearly 80 years later, the legal status of Aboriginal rights and title began to change gradually through grassroots and subsequently, judicial, movements. In 1967, Frank Calder, and other elders from the Nisga’a Nation sued the BC government over the claim that their title to their lands had never been lawfully extinguished.<sup>19</sup> The case escalated to the Supreme Court of Canada, and in 1973, the Supreme Court ruled that the Nisga’a Nation did hold title to their lands and that this title preceded colonial assertions of dominion (Redish, 2020). The Nisga’a case was instrumental in the recognition of Aboriginal rights and title and was followed by several other significant legislative changes.

In 1982, Canada formally broke from Great Britain and patriated its constitution to federal and provincial legislatures. Section 35(1) of the constitution states that “the existing aboriginal and treaty rights of the aboriginal peoples of Canada are hereby recognized and affirmed.” Importantly, Section 35 recognized existing Aboriginal rights, but did not define them. Over time, a series of landmark legal decisions following the patriation of the constitution have sought to clarify what it meant by the concept of Aboriginal rights and title. For example, do Indigenous groups have jurisdiction over unceded traditional lands? Does Aboriginal title to the land require regular occupancy of the land? This is an ongoing process, and even today, there is still uncertainty over the definition of “Aboriginal rights and title”. We outline the timing of some of the most important

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<sup>17</sup>It is important to recognize that the Indian Act, at least initially, only applied to First Nations individuals and not to Métis or Inuit groups. Thus, the state’s treatment of First Nations groups may have differed substantially from that of other groups, none of whom signed historical treaties. For this reason, in our empirical analysis, we verify that our results also hold when we restrict our analysis to First Nations communities.

<sup>18</sup>As others have noted, even in the absence of the Indian Act, if treaty promises were ignored, then this could also result in no difference in economic outcomes across both types of communities.

<sup>19</sup>Calder v. Attorney-General of British Columbia [1973]. In this case, the court was split on whether title had actually been subsequently extinguished.

Supreme Court cases relating to Aboriginal rights and title, as well as the timing of the Indian Act, in Figure 2.

In 1984, *R v Guerin* established that “the fiduciary relationship is rooted in the concept of Aboriginal title... ..the Aboriginal interest in the land may be alienated only via surrender to the Crown”.<sup>20</sup> This decision reaffirmed the principles underlying the 1763 Royal Proclamation; however, the first major ruling that was specifically about Section 35 of the constitution occurred in *R v Sparrow* (1990). During the Sparrow case, the court determined that existing Aboriginal rights are protected under Section 35 of the constitution and, therefore, cannot be infringed on without justification. Thus, the government of Canada has a fiduciary duty to First Nations.

Concerning Aboriginal title, the most comprehensive Supreme Court decision came from *Delgamuukw v British Columbia* (1997), which established the potential duty to consult, compensate, and accommodate. The duty to consult was further solidified in *Haida Nation v British Columbia* (2004). This case established a strict duty to consult and accommodate any concern even if Aboriginal title may only potentially exist (Brideau, 2019). While these court decisions affirm both treaty rights and Aboriginal title, Aboriginal title in the land—even if not yet established in court—contains a much broader scope of potential rights to land: “ownership rights similar to those associated with fee simple, including the right to decide how the land will be used; the right of enjoyment and occupancy of the land; the right to possess the land; the right to the economic benefits of the land; and the right to pro-actively use and manage the land.”<sup>21</sup> Although these cases affirmed the duty to consult with both treaty and non-treaty nations, the extent of consultation was a product of the strength of asserted interests by Indigenous claimants, which may be perceived to be greater in the case of territories without written treaties.<sup>22</sup>

Given the substantial variation over time in the degree to which Settlers believed it was necessary for the Crown to sign treaties,<sup>23</sup> it is plausible that the effect of signing a treaty may vary substantially over time. For example, before favorable legal rulings regarding the status of Indigenous title over lands, these non-treaty nations may have experienced similar land dispossession to treaty nations that received something in return. As such, we might expect the value of not engaging in the treaty-making process to have improved meaningfully with time.

### 3 Data Sources and Variable Construction

We combine a wide variety of data sources to empirically evaluate the dynamic impact of historical treaties. Many of these sources are primary documents, including treaty texts, maps, and other historical documents. Below, we briefly outline these sources and how we integrate them into our analysis. Additional details can be found in Section C and in Feir et al. (2023a).

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<sup>20</sup>[1984] 2 S.C.R. 335.

<sup>21</sup>*Tsilhqot’in Nation v. British Columbia* [2014], supra, note 2, at para. 73. *Tsilhqot’in Nation v British Columbia* (2014) was the first court ruling to declare Aboriginal title to lands outside a reserve.

<sup>22</sup>The degree of potential infringement also affects the duty to consult (Tzimas, 2005).

<sup>23</sup>There is increasing evidence that even some of the most substantial treaty clauses, such as annuity payments, went unhonoured by the state. For example, 21 Anishinaabe communities recently reached a \$10 billion settlement with the Government of Canada over the failure to pay appropriate annuities post-1850.

### 3.1 Observational Units and Historical Treaties

Our first objective is to evaluate whether there are contemporary differences in economic outcomes between Indigenous communities whose members signed a historical treaty and those whose members did not sign a historical treaty. To do this, we need to identify the set of Indigenous communities. In Canada, communities are defined by Statistics Canada in terms of census subdivisions (CSDs). CSDs are municipalities or regions equivalent to municipalities, including Indian reserves and Indigenous settlements. “First Nations communities” are CSDs that Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Indigenous Services Canada (ISC), and Statistics Canada classify as “on-reserve”. They include all CSD types legally affiliated with “Indian bands”, commonly referred to as First Nations. We use the terms “band” and “First Nation” interchangeably.<sup>24</sup> Inuit communities are included in similar census definitions. The communities included in our analysis are those CSDs identified as “Indigenous,”—which includes both First Nations and Inuit communities—based on 2011 geographic boundaries.

Next, for Indigenous communities affiliated with a First Nation, we match each community to their First Nation using the 2011 band-to-community linkage file provided by CIRNAC. With the exception of a small number of communities, most reserves can be mapped one-to-one to a First Nation. In the handful of cases where there are multiple bands on a reserve, we duplicate the observation, so that our primary unit of analysis is the reserve-band level.<sup>25</sup> For this step, we do not observe variation across Inuit communities, although, many Inuit communities are associated with broader cultural groupings, which we describe below.

We then obtain a list of bands that signed historic treaties and the date each treaty was signed from CIRNAC’s Map Room website and the associated treaty texts through the treaty-making section of the CIRNAC website.<sup>26</sup> Since an argument could be made that the content of the treaties may matter for long-run economic development, we also identify the terms of each treaty from their historical texts. In addition to hand-coding the clauses contained in each treaty, we construct a measure of “sentiment” based on natural language processing. More detail on the construction of these measures, including the steps we followed to process the text, can be found in Feir et al. (2023a).

In total, our analysis includes 21 different treaties. This is because most treaties were signed between the state and several bands simultaneously and because we consider the Upper Canada Land Surrenders and Douglas Treaties as one treaty each in our analysis. In practice, multiple land surrenders and multiple Douglas treaties were signed with different nations within a short period of time. The content of these treaties did not vary. The modal treaty community signed shortly after Confederation, in 1874, whereas the mean and the median treaty communities signed in 1870

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<sup>24</sup>Note that this language is fraught. Many First Nations people see their nation as broader than their legally defined band, but the term First Nation is commonly used interchangeably with the term band in practice.

<sup>25</sup>These duplicates only comprise 4% of the total communities in our data.

<sup>26</sup>A list of bands and their treaties is found by accessing the notes corresponding to each of the regional pre-1975 treaties maps: <https://www.aadnc-aandc.gc.ca/eng/1290453474688/1290453673970>; the historical texts are found at <https://www.aadnc-aandc.gc.ca/eng/1370373165583/1370373202340>.

and 1875, respectively. In Table 1, reproduced in Feir et al. (2023a), we display the breakdown of treaty clauses among communities that signed a historic treaty. Most communities that signed a historic treaty retained the rights to hunt, trap, and fish as part of their treaty (87%). In contrast, very few treaty communities had treaty provisions that allowed them to retain their villages (4%). Only 4% of communities are part of treaties that only discussed a land surrender, and 65% of communities signed treaties that contained a blanket extinguishment clause. In our companion paper, Feir et al. (2023a), we demonstrate that the sentiment of treaty texts does not systematically improve or decline over time.

### 3.2 Historical Determinants and Additional Controls

To account for the fact that treaty nations may have differed from non-treaty nations based on a series of observable characteristics, we compile a detailed dataset of additional factors that have been suggested as important determinants of the treaty-making process by both historians (Miller, 2009; Daschuk, 2013), and through the economic logic presented in existing work (North, 1989, 1991; Acemoglu et al., 2001; Nunn and Puga, 2012).

Constructing measures of these factors requires us to rely on information we observe at a higher level of aggregation than the individual community, First Nation, or Inuit group. First Nations in Canada are associated with larger ethnographic groups, referred to as “tribes” in historical and government documentation. The term “tribe” is not currently used to refer to Indigenous societies in Canada; however, since many of the historical variables we construct are derived from sources that use this terminology, we will use the term “tribe” to be consistent with these documents. Although Indigenous groups within a tribe may not have historically lived together in a community, they often shared common languages, traditions, culture, and, in some cases, a traditional governance structure. Inuit communities may also have been part of these broader cultural groups, which we refer to as tribes. We match Indigenous groups to tribes as follows.

CIRNAC provided us with a list of bands matched to tribes that they have compiled over several decades through discussions with individual First Nations.<sup>27</sup> In this dataset, the tribe associated with each band is the cultural group with which the band identifies. We can match the majority of bands using this file. For communities that were not included in the CIRNAC file (mostly Inuit), we overlay Statistics Canada’s geographic boundary file for CSDs with digitized maps of traditional tribal territories from the Smithsonian Handbook of the North American Indian to identify the tribal territory in which the Indigenous community is currently located.<sup>28</sup>

We identify several factors as potentially important determinants of the treaty-making process. We discuss these determinants, the timing, and the content of treaties in greater detail in Feir et al.

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<sup>27</sup>A small number of communities were not located in any traditional territory. We assume that nations located in these communities identify with the tribal territory that is closest to their reserve. In some instances, bands identified as “Cree” or “Ojibway”, even though there are many different Cree and Ojibway tribes. In these circumstances, we assume they are part of the Cree or Ojibway tribe that is closest to their reserve. For instance, if a community is identified as “Cree”, and “Western Woods Cree” is the closest tribal territory to their reserve, then we assume this community’s tribe is “Western Woods Cree”.

<sup>28</sup>The full digital reproduction of traditional territories is found in Figure 4 of (Feir et al., 2023a).

(2023a). Guided by the literature and based on a variety of historical sources, we construct a set of controls at the tribe level that measures reliance on the bison, historical involvement in trapping, ruggedness, the size of nations’ traditional territories, and factors affecting the transaction cost of signing a treaty, such as the information one obtains from their neighbors’ experiences with treaty-making. To generate each of these variables, we overlay digital reproductions of several secondary data sources with the digital reproductions from the Smithsonian maps.

Measures of historical reliance on the bison are constructed by overlaying the Smithsonian maps with a digitized version of William Hornaday’s depiction of the bison’s range at various points in time (Hornaday, 1889). We calculate the difference in the share of tribal territory covered by the bison’s range in 1870 and 1730, the time period during which the bison’s range gradually declined. We also compute the difference in the share of tribal territory covered by the bison’s range in 1889 and 1870, the time period during which European hide-hunters slaughtered the remaining bison to near extinction.<sup>29</sup> These variables indicate which communities initially had access to a stable economic resource which was then lost during the rapid slaughter. Similarly, to proxy for a nation’s involvement in the fur trade, we compute the share of tribal territory covered by the beaver’s range from a digitization of the Canadian Geographic map of trapping ranges.

To classify the historical networks through which information may have flowed, we construct indices based on geographic boundaries and linguistic origin. The geographic classification of a neighbor is based on the geographic boundaries in the tribal maps of the Handbook of North American Indians. If the ancestral territories of two tribes shared a historical border, then we code them as neighbors in this classification. We also consider a linguistic classification based on whether a tribe’s geographic neighbor shared the same linguistic grouping, defined by the Ethnographic Atlas of Murdock (1967).

As a proxy for the value of a tribe’s ancestral land, we use the digitized Smithsonian maps to construct the size of ancestral territories. To generate a measure of ruggedness, we overlay the Smithsonian maps with global elevation files from the Food and Agriculture Organization of the United States and compute the terrain ruggedness index of Riley, DeGloria, and Elliot (1999).

Differences in tribal experiences with colonization are captured by computing the date the earliest rail entered a tribe’s traditional territory using ESRI Canada’s historic railway data, as well as the distance between each community and the closest trading post, and the population at that trading post in 1823. We additionally construct the length of primary canoe routes in a tribe’s traditional territory by digitizing the Edinburgh Geographical Institute’s map of historical canoe routes. Since some tribal territories intersected the US-Canada border, we incorporate an indicator for these cases.<sup>30</sup> We account for population change in tribal territories prior to colonization by computing population over time using the HYDE Gridded Population of the World Database

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<sup>29</sup>A more detailed account of the bison’s decline and its impact on Native economies can be found in Feir et al. (2023b).

<sup>30</sup>For these tribes we have also constructed measures of railway penetration into tribal territories using information on the earliest date an American rail entered a tribe’s traditional territory using data from (Atack, 2016). Since this way of measuring makes little difference to our empirical findings, we do not use it in our main set of controls.

(Goldewijk et al., 2010). We use this same dataset to account for settler population growth during the treaty-making era.

Finally, we account for other cultural differences using a set of variables from Murdock’s Ethnographic Atlas. These include whether the tribe had a history of centralized governance, the percent of calories a tribe consumes from agriculture, whether tribes lived in permanent or semi-nomadic villages, a measure of jurisdictional hierarchy, and whether tribes had land rights and wealth distinctions. We have chosen these factors in line with previous work on Indigenous economic history (Dippel, 2014; Leonard et al., 2020).

Table 2 displays summary statistics for the set of historical controls. Column (1) displays these statistics for Indigenous communities who are not part of a historical treaty and column (2) displays them for Indigenous communities who did sign a historical treaty. Column (3) reports difference-in-means tests. Treaty and non-treaty communities differ substantially along the dimensions we have identified as being potentially important determinants of signing a treaty. Aside from the portion of calories obtained from agriculture, and the population density in ancestral territories in 1800, there are statistically significant differences between treaty and non-treaty communities across all other determinants. Notably, treaty communities are associated with larger ancestral territories that have less rugged terrain. They tend to be more impacted by the decline of the bison (rows 3 and 4) and were likely more involved in trapping, as indicated by the greater share of their territory covered by the primary beaver’s range. Treaty communities are more likely to have a neighbor who signed a treaty and especially so if that neighbor was part of the same language network as them. Interestingly, treaty communities are comprised of tribes that were less likely to have individual land rights and wealth distinctions. We return to a discussion of the correlates of treaty-making in Section 5.

Given that several of the historical controls could be correlated, Table 3 shows the conditional correlations of treaty-making. Specifically, we regress an indicator for whether the community has a historic treaty on each determinant or set of determinants. Then, in the final column, we include all determinants together. This exercise helps clarify which determinants matter and the direction of the relationship between each control and the probability of signing a treaty and reiterates some points made in Feir et al. (2023a). For example, if we consider the descriptive statistics in Table 2, we see that nations were more likely to sign a treaty when they were impacted by both the gradual and rapid decline of the bison. By controlling for both of these factors in the same specification (column (2) of Table 3) we see that, out of these two controls, the primary determinant is the rapid loss of the bison. By focusing on column (8), where we include the full set of controls, we can see that the primary factors that remain statistically related to the probability of signing a treaty are the ruggedness of ancestral territory, the gradual and rapid loss of the bison, whether a neighbor signed a treaty, proximity to and the population at trading posts, and the presence of individual land rights. These results suggest that controlling for the historical determinants of treaty signing is important when considering their long-run effects. It also gives rise to the possibility that initial conditions may have indirect long-run effects through their impacts on institutional development.



The descriptive analysis presented in this section makes it clear that any analysis of the long-run impacts of treaties must also take into account the fact that treaty nations had different observable characteristics than non-treaty nations. We return to this point as we outline our empirical methodology in the next section.

### 3.3 Settlement Patterns and Early Twentieth Century Outcomes

To understand whether there were meaningful differences between treaty and non-treaty communities during and immediately following the period of treaty-making, we compile outcomes using a variety of sources that document settlement patterns, as well as economic, social, and demographic conditions in the early twentieth century. We first examine settlement patterns in tribal territories using the HYDE population database (Goldewijk et al., 2010).<sup>31</sup> To construct these measures, we overlay population density from the HYDE database with the tribal territory maps from the Smithsonian Institute. We are cautious with our interpretation of these data, as recent work by Guinnane (2021) has called into question the reliability of McEvedy and Jones (1978), one of the underlying sources used in the HYDE database.

To obtain information on the population of individual nations, as well as mortality, and religiosity in the early twentieth century, we have digitized the Indian Census table from the Annual Report of the Department of Indian Affairs from 1912-1913. Of all the early 20th-century annual reports, this report provides the most granular data on the greatest number of bands. Figure C.1 provides an example of the table we digitized from this report. The Indian Affairs Annual Reports also allow us to measure population, as well as income by source, between 1921 and 1939; however, these data are only reported at the level of the superintendency. The sources of income we observe are total income, interest and trust funds, labor, agriculture, hunting, fishing, trapping, and “other”.

One impetus for signing treaties was to access natural resources in Indigenous lands. We evaluate whether treaties resulted in disproportionate mining activity by digitizing several maps of the location of minerals across Canada from the 1915 Atlas of Canada.<sup>32</sup> We overlay them with our traditional territory maps to generate an indicator that equals one if the territory had any gold by 1915 and another that equals one if the territory had any silver by 1915. For gold, we include gold districts, gold in quartz, and gold placer. For silver, we include silver districts and silver deposits.

Finally, because many treaties included language that indicated the state would provide some form of education for Indigenous students, we examine whether treaty communities differed in their proximity to residential boarding schools. Established through the 19th and 20th centuries, these schools forced more than one hundred thousand Indigenous children, frequently without parental consent, to attend live-in institutions where they were stripped of their cultures and traditions. We

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<sup>31</sup>This is the same source we use to construct pre-contact measures of population density in ancestral territories.

<sup>32</sup>The Atlases of Canada can be viewed online here: <https://www.nrcan.gc.ca/earth-sciences/geography/atlas-canada/explore-our-maps/map-archives/16868>. Figure C.2 shows an example of these maps for Western Canada.



take the distance between each community and the closest residential school from Jones (2021).

### 3.4 Modern Outcomes and Additional Controls

To understand how signing a historic treaty impacts economic development in the long run, we merge our historical dataset with restricted-access data from the 1981-2016 Censuses of Population in the Statistics Canada Research Data Centre. This merge is conducted at the CSD level, but our models are estimated using individual-level microdata. We consider several long-run outcomes, though our focus is on the kinds of income generated in treaty versus non-treaty communities. For this reason, in all long-run specifications, we restrict our analysis to the working-age population, which we define as individuals aged 25-64.

We consider employment income, after-tax income, total income, investment income, and government transfers.<sup>33</sup> We also examine labor market status, that is, whether an individual is not in the labor force, has at least a high school degree, and has at least a post-secondary degree. The Census of Population does not include many cultural outcomes; however, we can analyze whether individuals in communities that signed a historic treaty are more or less likely to speak an Indigenous language at home or be band members. These results can be found in the Online Appendix. In general, we find treaties have a limited impact on these outcomes. In addition to the historical controls that we described previously, in some of our long-run specifications, we also condition on the latitude and longitude of the centroid of each CSD, as well as the geodetic distance to the closest Census Metropolitan Area (CMA) to proxy for geographic isolation.

## 4 Empirical Methodology

Our empirical strategy seeks to quantify the relationship between historical treaties and long-term outcomes for Indigenous communities. Importantly, for identification, we must account for all confounding factors, some of which may be observable and others unobservable. Ideally, we would estimate specifications of the following form:

$$y_{icg} = \beta_0 + \beta_1 T_{cg} + \mathbf{X}_g \boldsymbol{\theta} + \mathbf{Z}_{ic} \boldsymbol{\Phi} + \epsilon_{icg}, \quad (1)$$

where  $y_{icg}$  is the contemporary economic outcome of individual  $i$  in community  $c$  associated with cultural group (tribe)  $g$ .  $T_{cg}$  stands for “treaty” and is coded as one if a band signed any type of historic treaty with the federal government. The matrix  $\mathbf{X}_g \boldsymbol{\theta}$  includes a set of observable factors that are related to the likelihood of signing a treaty and may also be related to long-run outcomes.

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<sup>33</sup>Total income is defined before tax income from all sources, including employment and wage income, investment income, government transfers, and one-time receipts such as inheritances. Employment income can consist of amounts you receive as salary, wages, commissions (see line 10120), bonuses, tips, gratuities, and honoraria. After-tax income includes all taxes and transfers and is reported by the Census from administrative tax and benefit records received from the Canada Revenue Agency. Investment income consists of a form of interest from deposits in financial institutes, interests on savings certificates, bonds and debentures, dividends from both Canadian and foreign stocks, net rental income from real estate, mortgage and loan interest received, regular income from an estate or trust fund, interest from insurance policies and net partnership income for a limited or non-active partner. This variable does not include net capital gains or losses. Government transfers include all cash benefits received from federal, provincial, territorial, or municipal governments during the reference period. For more details, see <https://www12.statcan.gc.ca/census-recensement/2016/ref/guides/004/98-500-x2016004-eng.cfm>.

As described in Section 3, the set of controls included in the matrix  $\mathbf{X}_g\boldsymbol{\theta}$  were selected based on the historical narrative as well as literature which we evaluate more extensively in Feir (2016a). Additional contemporary controls measured at the community or individual level are included in  $\mathbf{Z}_{ic}\boldsymbol{\Phi}$ .

Even though we condition on a rich set of historical controls, estimating equation 1 as is would still produce biased estimates of the coefficient of interest,  $\hat{\beta}_1$ , if the act of signing a treaty was correlated with other unobservable factors that are simultaneously correlated with economic development outcomes today. To alleviate this concern, our preferred specification uses a contiguous border approach drawn from the labor literature (Dube et al., 2010). This approach is summarized in Figure 3. Panel (a) displays all ancestral territories that overlap with the present-day borders of Canada. Purple territories indicate territories of groups that did not sign a historic treaty, and light green territories depict those that did sign a historic treaty. The aqua-colored territories represent groups where some bands that shared this cultural grouping signed a treaty, but others did not. The first sample restriction used in this approach is to remove territories that belong to groups that signed treaties and do not have a neighbor, defined as a bordering tribe, who did not sign a treaty. This restriction is shown in panel (b). Finally, we treat territories where some bands signed treaties and others did not as part of the “control” group. This is displayed in panel (c). This leaves us with a group of treatment territories—those where all bands signed treaties—and a group of control territories—those where all bands did not sign a treaty *or* where some bands signed treaties and other bands did not. We then construct a sample of matched pairs between the treatment and all control territories.<sup>34</sup>

The matched strategy allows us to rewrite equation 1 using a pairwise fixed-effects model:

$$y_{icgp} = \beta_0 + \beta_1 T_{cg} + \mathbf{X}_g\boldsymbol{\theta} + \mathbf{Z}_{ic}\boldsymbol{\Phi} + \gamma_p + \epsilon_{icgp}, \quad (2)$$

we have added the fixed effects  $\gamma_p$  to allow unobservable factors that are the same across matched pairs to be held constant. Variation in this specification, therefore, comes from differences in treaty signing within pairs of geographically proximate nations. We include the set of controls that we have identified as being historically important in  $\mathbf{X}_g$ , as well as other factors related to contemporary development, such as the distance to the closest census metropolitan area in  $\mathbf{Z}_{ic}$ . In some specifications,  $\mathbf{Z}_{ic}$  also includes individual characteristics, like education or labor force participation. Standard errors are clustered by pair.

We verify that our results are robust to a variety of alternative empirical approaches. We use a specification that includes province and tribe fixed effects so that variation in signing a treaty comes from variation in historical factors within the same province and same tribe. These fixed effects may account for provincial-specific policies that affect Indigenous groups differentially across provinces but suffer from the fact that there is very little within-province and within-tribe variation. We also use a nearest-neighbor strategy that matches individuals in the census across

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<sup>34</sup>If an ancestral territory in the treatment group borders two ancestral territories in the control group, two pairs are created.

historical and contemporary factors;<sup>35</sup> a doubly-robust LASSO procedure that selects the controls that best predict treatment (signing a treaty) and outcomes and then includes the overlap of these two sets as the main set of controls; and an IV specification that leverages tribes’ neighbors’ past experiences with treaty-making to predict whether a tribe signs a treaty.<sup>36</sup> Our results are generally robust across all of these specifications, though the IV specification is not precisely estimated.

## 5 Results

If historical treaties had binding consequences for Indigenous property rights when they were signed, then we would expect to see a difference in the settlement patterns across territories that were ceded and those that were not. The traditional narrative in Canadian history is that treaties preceded the European settlement of a region and that if the English, French, or eventually, Canadians wanted to settle in an area, they would first need to negotiate a treaty (Washburn, 1995; St. Germain, 2001; Miller, 2009). However, as we outlined in Section 2, early legislation regarding Aboriginal rights and title suggest that settlement may have proceeded similarly in both treated and untreated lands. Further, the presence of the *Indian Act* of 1876 suggests that, at least among First Nations communities, we might not expect other measurable differences in services or public good provision in the early twentieth century. If, as we argue, the presence of historical treaties became salient as courts affirmed Aboriginal rights and title following the patriation of the constitution in 1982, then we would expect a difference in the incomes of treaty and non-treaty communities to have emerged by the present day. We evaluate the legitimacy of these claims in the empirical analysis that follows.

### 5.1 Early Settlement Patterns and Economic Outcomes

Figure 4 uses the HYDE database to show population density in traditional territories relative to the time of signing a treaty. Panel (a) of Figure 4 displays population density in a tribe’s traditional territory if members of the tribe signed a treaty. Here, we see that population density breaks discontinuously around the time a treaty was signed, consistent with the narrative that treaties preceded settlement. However, panel (b) of Figure 4 offers a different perspective. Panel (b) displays the average population density for *all tribal territories* over time, whether or not they signed a treaty. The markers indicated by a circle display the density for tribes who signed a treaty, normalized around the earliest date the treaty was signed. The markers indicated by a

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<sup>35</sup>In this specification, at the community level, we use a logit model that regresses an indicator for whether a community signed a historic treaty on our complete set of historical controls. From here, we generate propensity scores and only keep communities that fall within 0.1 and 0.9 of the propensity score, as suggested by Imbens (2015). Next, we merge this chosen set of communities with the individual-level restricted access data, keeping only individuals in communities that meet the propensity score criteria. We then use the nearest neighbor methodology to estimate average treatment effects using the four nearest neighbors.

<sup>36</sup>Specifically, the first stage uses two indicators: one for whether a tribe’s geographic neighbor signed a treaty in a previous year and whether a tribe’s geographic neighbor who is in the same language network signed a treaty in a previous year. This first stage is then used to predict having signed a historic treaty. The second stage uses the predicted value from this specification in place of the indicator for having signed a historic treaty. The intuition for this instrument is that a nation may learn from its neighbors about the potential benefits and costs associated with treaty-making, influencing the probability of signing a treaty.

triangle display the average population density for all tribes that did not sign a treaty, with the data normalized around the average date treaties were signed. One can think of this exercise as creating a placebo test of whether settlement required a treaty in practice, with the triangle markers indicating a counterfactual. The data plotted for tribes that did not sign treaties shows that population density was the same or slightly higher in areas that would eventually sign a treaty and increased similarly to those that did sign a treaty over the next 100 years.<sup>37</sup>

To the extent that the HYDE data accurately represent the settlement of Canada, this suggests that the timing of settlement was more coincidental with the signing of treaties than the result of signing treaties. In particular, settlement appears to have proceeded in areas without treaties, similar to those with treaties. The key insight we take from the data presented in Figure 4 is that while treaty timing is correlated with settlement, the act of settlement, at least in the period during which most treaties were signed, did not always occur with treaty. This empirical evidence is consistent with the Supreme Court of Canada decision, *St. Catharine's Milling and Lumber Co. v. R* (1888), where it was determined that Aboriginal title of the land existed at the discretion of the Crown. Thus, treaty or no treaty, this precedent indicated that Aboriginal title did not exist as an inherent right.

The notion that treaties did not appear to bind in practice is echoed in other data sources from the early twentieth century. Table 4 uses the contiguous borders strategy, outlined in equation 2, to estimate the impact of signing a treaty on various additional outcomes from this earlier period. Columns (1)-(3) examine population, births per 100 people, and deaths per 100 people. Columns (4) and (5) look at the presence of gold and silver by 1915. Column (6) uses the natural logarithm of the distance to the closest residential school. We see very few statistically or economically significant differences between treaty and non-treaty communities. Consistent with the logic that, due to the Supreme Court decision in *St. Catharine's Milling and Lumber Co. v. R*, the state did not respect Indigenous title, we do not find any statistical differences in the probability that gold or silver was discovered by 1915 in the ancestral lands of Indigenous nations that signed treaties compared to those that did not. Further, we see that treaty communities were slightly larger, had fewer births per 100 people, fewer deaths per 100 people, and were located farther from residential schools. However, only the coefficient estimate on births per 100 people is statistically significant. One might expect some of these outcomes to differ across treaty and non-treaty communities as a result of the individual clauses contained in the treaties; however, since the *Indian Act* of 1876 effectively treated all First Nations people as wards of the state independent of treaty status, the lack of a statistically detectable effect of signing a treaty on any of these outcomes is likely a reflection of this fact.

As a final piece of evidence, we consider additional data from the Department of Indian Affairs Annual Reports for the years 1921-1939 which includes population and income by source at the superintendency level. Superintendencies often oversaw federal operations for multiple bands, so

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<sup>37</sup>We have also generated a placebo date for those nations that did not sign a treaty drawing randomly from the distribution of dates treaties were signed with similar results.

for this exercise, we compare superintendencies where all bands signed treaties to those where all bands did not sign a treaty.<sup>38</sup> We pool all years of data and regress each of our outcomes on an indicator that equals one if all bands in the superintendency signed a treaty. All specifications include year fixed effects, and when the dependent variable is an income source, we condition on the log of population. These specifications are descriptive only because the aggregation to superintendencies does not lend itself to the contiguous border strategy.

Figure 5 presents coefficient estimates from these OLS specifications. As with the band-level specifications, population differences are negligible. Total income is slightly higher for treaty communities, but this coefficient estimate is not statistically significant. The key difference in income sources between treaty and non-treaty nations comes from the annuity payments and trust account funds paid to treaty communities.<sup>39</sup> It is also important to note that the value of these annuity payments was substantially eroded over time through inflationary pressures which were not explicitly accounted for in the treaties. For example, today, members of some nations that signed specific historical treaties continue to receive \$5 CAD every two years as part of the state's treaty obligations to their nations.<sup>40</sup>

## 5.2 Contemporary Income in Treaty Communities

Despite the fact that treaties do not appear to have had a substantial point-in-time impact, they may have impacted the overarching path of development in the following decades, as the institutional environment changed. We turn our attention to this possibility in this section, where we examine the impact of historical treaties into the present day. Table 5 reports the effect of signing a historical treaty on several sources of income in 2016. Each specification is estimated using our preferred contiguous border strategy, which includes pairwise fixed effects and conditions on sex, a quadratic in age, and our full set of historical controls.<sup>41</sup>

Column (1) shows that communities that signed a historical treaty had approximately \$7,000 lower incomes in 2016. Given that the mean total income among *all* Indigenous people in the 2016 Census was \$42,281, this income difference is substantial.<sup>42</sup> The next columns examine which sources of income generate the largest differences between treaty and non-treaty communities. Column (2) shows that, after taxes and transfers, the income gap is smaller, as expected; however, the magnitude is still substantial and suggests that individuals in treaty communities have approximately \$4,700 lower after-tax income than those in non-treaty communities. The next column suggests that most of the difference in total income results from differences in employment income

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<sup>38</sup>The results are similar if we construct a measure of treaty exposure that is the percent of bands that signed a treaty within a superintendency.

<sup>39</sup>While trust account monies were available to all nations if the government used their land for commercial or government purposes, annuities were explicitly tied to treaty signing. Thus, it is not surprising that the major income differences appear with annuity payments.

<sup>40</sup>See, e.g., here: <https://www.sac-isc.gc.ca/eng/1100100032294/1581869772685>.

<sup>41</sup>Figures A.3, A.4, and A.5 of the Online Appendix shows that the results are robust to using each of our additional empirical specifications.

<sup>42</sup>This value is almost surely an upper bound, as this number is the average income among Indigenous people living both in and outside of Indigenous communities, whereas our analysis only includes people who live in Indigenous communities where incomes tend to be lower.

(3). Investment income is also lower (column (4)), in the realm of \$790. Interestingly, government transfers are not statistically different between treaty and non-treaty individuals (column (5)). This result is surprising because one would expect that if total income is lower, then government transfers would be higher by the structure of Canada’s tax and transfer system. Additional analysis using quantile regression reveals that the largest differences in income are located among those at the top of the income distribution and are, therefore among individuals least likely to qualify for additional government transfers. These results are presented in Online Appendix Figure A.6.

One potential explanation for the difference in incomes across treaty and non-treaty communities is related to differences in the characteristics of workers in both types of communities. For example, communities with younger or less educated workers may mechanically have lower incomes because they are either on different parts of the age-earnings profile or on a lower age-earnings profile. Alternatively, the structure of labor markets may differ in terms of the industrial composition of the labor force or the availability of jobs. Other reasons include the differential presence of non-Indigenous people, geographic isolation, the existence of a modern treaty, and different rates of out-migration. Figure 6 displays the coefficient estimates from an extensive set of specifications that evaluate the plausibility of these candidate explanations. In short, none of these factors appears to be the channel through which treaties affect contemporary income differences.

The baseline coefficient estimate from column (1), Table 5 is depicted by the blue square alongside the estimates from 17 additional specifications. Coefficient estimates and standard errors are reported in Tables B.1, B.2, and B.3 of the Online Appendix. Since the set of checks we perform is substantial, we describe them in more detail in the Online Appendix. That being said, there are a few points worth mentioning. First, in specification 14, we restrict our analysis to include only First Nations communities by excluding Inuit communities. This sample of communities is more closely aligned with the analysis we performed in the previous section using data from the 1913 Department of Indian Affairs Annual Report. This restriction does not meaningfully alter our results.

Specification 11 includes industry fixed effects, which means that the income differences in this specification are attributed to within-industry variation in treaty signing. The fact that the coefficient estimate is still large in magnitude and statistically significant suggests that differences in the industrial composition of the workforce across communities do not drive the effect. Suppose the treaty penalty is caused by within-industry variation. In that case, it must be that, within an industry, either the return to work is different in treaty communities or that people supply different quantities of labor in treaty communities. Specification 8 accounts for both the intensive and extensive margins of labor supply: in addition to the industry fixed effects, we control for an indicator that equals one if the individual is in the labor force and the number of hours worked. This specification also conditions on age and education.<sup>43</sup> Again, our main coefficient estimate is

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<sup>43</sup>Section D of the Online Appendix provides a more detailed analysis of education, including the presence of residential schools, as a possible channel. We do not find evidence that differential educational attainment explains the long-run differences in income.



almost identical to the baseline estimate, which indicates that the income penalty is likely driven by differences in the return to work rather than differences in labor supply.

To summarize, we find a substantial income penalty among Indigenous communities that signed a historical treaty. Differences in surrounding economic environments do not explain the differences in income between treaty and non-treaty communities, the probability of having signed a modern treaty, industrial structure, education, labor supply, identity and the presence of non-Indigenous people, or migration. Since these factors do not appear to drive the observed income gap, we next examine whether the structure of property rights, both historically and in more recent years, provides a plausible explanation for the divergent incomes between treaty and non-treaty communities.

## 6 Mechanisms: The Institutional Roots of Income Divergence

Our analysis of initial settlement patterns and early economic outcomes suggests that notions of Indigenous property rights grounded in the Royal Proclamation of 1763 were not respected in the decades following the initial treaty-making window. Between the Supreme Court decision in *St. Catharine's Milling and Lumber Com. v. R.* (1888) and the *Indian Act* (1876), Indigenous nations with treaties were treated similarly to those without treaties. Aside from differences in annuity payments, there were limited differences in economic conditions between both groups, and settlement proceeded in a similar fashion in both treated and untreated lands. However, beginning in the 1970s, the legal landscape surrounding Aboriginal rights and title began to shift, notably after the patriation of the constitution in 1982. If the changing legal landscape following the patriation of the constitution led to a meaningful shift in bargaining power in favor of Indigenous nations that never engaged in the treaty-making process, we would expect the distribution of resources to shift accordingly.

As outlined in more detail in Section 2, Canadian jurisprudence began to shift with *Calder et al. v. British Columbia* in 1970. This sentiment was crystalized in the subsequent patriation of the Canadian constitution in 1982, which “recognizes and affirms the existing Aboriginal and treaty rights of the Aboriginal peoples of Canada.” These changes effectively shifted Canadian law towards delineating property rights expressed in the Royal Proclamation of 1763, which recognized that Aboriginal title existed until ceded by treaty. Following the patriation of the constitution, several important court cases were settled by the Supreme Court during the 1990s. Importantly for our discussion, *Delgamuukw v British Columbia* (1997) expressed the duty to consult when Aboriginal rights may be adversely impacted. It was not until 2004, in *Haida Nation v. British Columbia*, that it was established that the Crown has a duty to consult Indigenous peoples when it intends to act in a manner that may impact established *or potential* Aboriginal rights (Brideau, 2019). In conjunction with recognising the potential existence of Aboriginal title in areas *not* covered by treaty, this may have created a legal environment in which nations who were not perceived to cede their land via treaty are in a superior bargaining position today with federal, provincial, and municipal governments and individual firms.

To evaluate this claim empirically, we extend our contemporary data on income backward to 1981, using quinquennial data from the restricted access censuses of population between 1981 and 2016. Using these data, panel (a) of Figure 7 displays income per capita in treaty and non-treaty communities over time. Vertical grey dashed lines indicate the timing of the patriation of the constitution and *Haida v. BC*. Two facts are immediately evident. First, this was a period of income growth for both types of communities. Second, two notable breaks in the income growth trend among non-treaty communities aligned with the patriation of the constitution and the *Haida v. British Columbia* ruling. This is consistent with the central role played by the intersection of jurisprudence and the maintenance of rights and title through not engaging in the treaty-making process.

To evaluate whether the trends in income changed differentially following these important legislative changes, we estimate an event study specification that evaluates the treaty penalty over time. Specifically, we pool all waves of census data and estimate the following specification:

$$y_{icgt} = \alpha + \sum_{t=1981}^{2016} \gamma_t T_{cg} \times \mathbb{1}(\text{Year}=t) + \mathbf{X}_g \boldsymbol{\theta} + \mathbf{Z}_{ict} \boldsymbol{\Phi} + \delta_t + \epsilon_{icgt}, \quad (3)$$

where, as before,  $y_{icgt}$  is the income of individual  $i$  in community  $c$  that is part of cultural group  $g$  measured in year  $t$ . We have replaced the indicator for whether the community signed a historical treaty with a set of indicators that interact the treaty dummy with each census year to evaluate how the treaty penalty evolves. We are interested in the coefficient estimates on the treaty  $\times$  year interactions,  $\gamma_t$ , which represent the treaty penalty in each year, conditional on the matrix of determinants,  $\mathbf{X}_g \boldsymbol{\theta}$ , a matrix of individual characteristics,  $\mathbf{Z}_{ict} \boldsymbol{\Phi}$ , and census year fixed effects,  $\delta_t$ . To interpret the coefficients this way, the model does not include a constant. This sample includes a consistent panel of nations, so the coefficient estimates will differ from our 2016 specifications, which include all nations in the data in 2016.

Panel (b) of Figure 7 presents the coefficient estimates of  $\gamma_t$  from equation 3. Conditional on the full set of historical factors, income per capita in treaty communities was statistically no different from that in non-treaty communities before the patriation of the constitution. Gradually, through the 1990s, the income gap emerged and accelerated after *Haida v. British Columbia* when it was established that there is a duty to consult where Aboriginal title is either known to exist or may potentially exist because it was never ceded through a treaty.

Evidence from case studies supports these empirical findings. For example, [McCreary et al. \(2016\)](#) contrasts the experience of an association of Indigenous nations in a non-treaty area with a First Nation in a treaty area during negotiations with mining companies (and the provincial government) that wished to extract resources within their respective traditional territories. In the first case, the Labrador Inuit Association and Innu Nations, none of which signed a historic treaty, negotiated over the opening of the Voisey’s Bay mine, which sought to extract nickel, copper and cobalt. In this case, the initial environmental assessment process determined that the mining firm could only move forward with the nations’ consent due to the uncertainty related to Aboriginal



title. As a result, the nations and the firm privately negotiated an agreement that ultimately included Indigenous hiring coordinators and training plans. [McCreary et al. \(2016\)](#) also note that, while the Voisey’s Bay agreement did not include this specific provision, there are agreements that also include a 10% price preference for Aboriginal enterprises.<sup>44</sup>

In the second case, the McLeod Lake Indian Band, who signed historic Treaty 8, negotiated over the Mount Milligan mining firm opening that sought to extract copper and gold. While ultimately an agreement was signed with the First Nation, [McCreary et al. \(2016\)](#) argue that the McLeod Lake First Nation was at a “relative disadvantage legally and unable to leverage the forms of influence that flow from them,” ([McCreary et al., 2016](#), p. 220) suggesting the private terms of their agreement may have been less beneficial.

The cases outlined in [McCreary et al. \(2016\)](#) suggest that the increasing strength of Indigenous property rights claims is functionally meaningful. Indeed, [Figure A.7](#) of the Online Appendix uses a sample of mining agreements with Indigenous nations from Natural Resource Canada to show that the number of these agreements increased substantially after *Haida Nation v. British Columbia* established the duty to consult. Our empirical findings are consistent with a generalization of these case studies wherein the bargaining position of nations that never signed treaties was strengthened through the court cases.

## 7 Discussion and Conclusion

This work shows that over the long run, historic treaties have dramatically shaped the path of economic development for Indigenous communities, driving substantially lower income among signatory nations into the present. While there is contemporary recognition that differences over right and title to land matter for Indigenous outcomes, the extent of this gap—approximately \$7,000—is startling, as is the rapid pace at which it has widened since the mid-1980s. Perhaps even more startling is how little impact these historic treaties had in the decades after their initial signing. We demonstrate that in the decades after their signing, treaties had virtually no effect on First Nations income or even the path of white settlement in Indigenous lands.

So how do we end up with large income differences between treaty and non-treaty nations in the present? We argue that this is driven through a property rights channel grounded in changes to the constitutional and legal landscape regarding Aboriginal rights and title. In particular, a series of court decisions that began in the 1970s and gained momentum after the patriation of the Constitution in 1982 increasingly enabled non-treaty communities to benefit from the economic value of their lands. This has manifested in a widening income gap between treaty and non-treaty communities into the present.

This is an important result as, for the existing settler population and their legal institutions, the post-1982 environment has, on net, led to less clearly defined property rights. However, for Indigenous peoples, any costs associated with obfuscating these property rights are easily outweighed by the distributional effects of stronger Indigenous property rights over land not perceived to be

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<sup>44</sup>Unfortunately, because of the private nature of many of these contracts, we can not access their terms.

ceded land by historical treaties.<sup>45</sup> This finding indicates that Indigenous well-being can be meaningfully improved through collective ownership and rights rather than some policy prescriptions that rely on private ownership.<sup>46</sup>

Historical treaties have provided a core piece of the legal foundation for economic and institutional development in the majority of the territory in North America. The original intent of the treaties, as understood by Indigenous signatories, was to provide the framework for the shared use of lands. Instead, these treaties have dramatically limited bargaining power for Indigenous signatories, resulting in a divergence in well-being across Indigenous nations. In addition, the divergence of treaty and non-treaty nations has created a substantial public policy challenge for federal, provincial, and Indigenous governments. Our findings also indicate there are strong incentives for treaty nations, particularly signatories to Peace and Friendship treaties, to attempt to establish rights and title through the courts where possible.

This is an important example of institutional drift. Initial small differences before colonization, in geography, culture, or food production, shaped the development of treaty-based institutions; however, treaties did not bind initially, and, as a result, long-run outcomes for Indigenous peoples were only practically impacted by treaties following a series of court decisions that recognized Aboriginal rights and title nearly a century later.

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<sup>45</sup>This suggests that there might be space for substantial additional gains among First Nations people if Aboriginal title is fully established over these lands, meeting the requirement for clearly defined property rights.

<sup>46</sup>These findings suggest that “land back” policy efforts could drive substantial, material gains through improvements to Indigenous bargaining power.

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## 8 Figures

Figure 1: Land Covered by Historic Treaties within the Present-Day Borders of Canada



Notes: The dates on the map correspond to the year each treaty was signed. Note that the date, 1779, on the East Coast marks the last date in a series of Peace and Friendship Treaties signed between the British and Mi'kmaq and Maliseet groups.



Figure 2: Timeline of Legislative Changes Relating to Aboriginal rights and Title

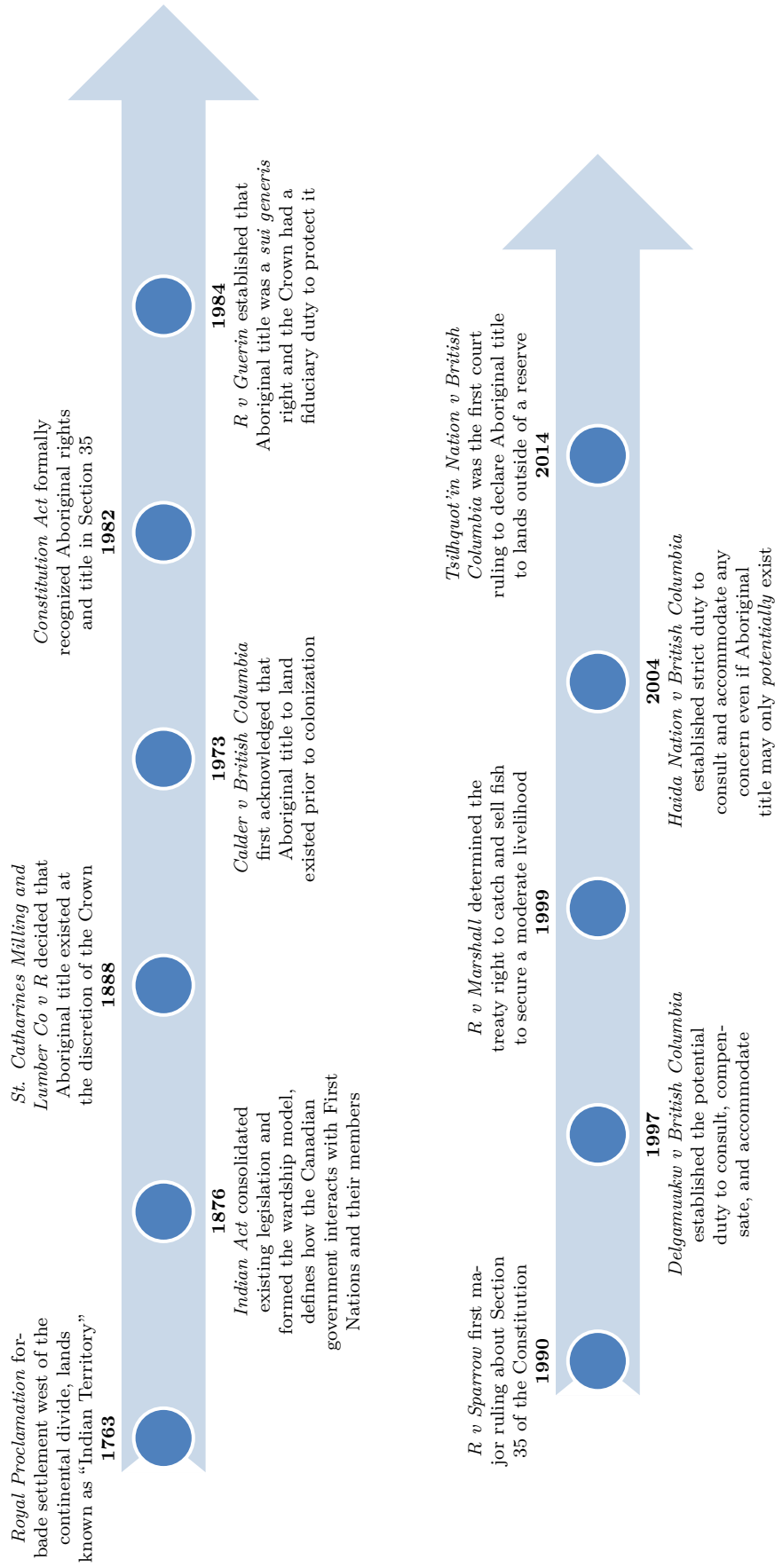
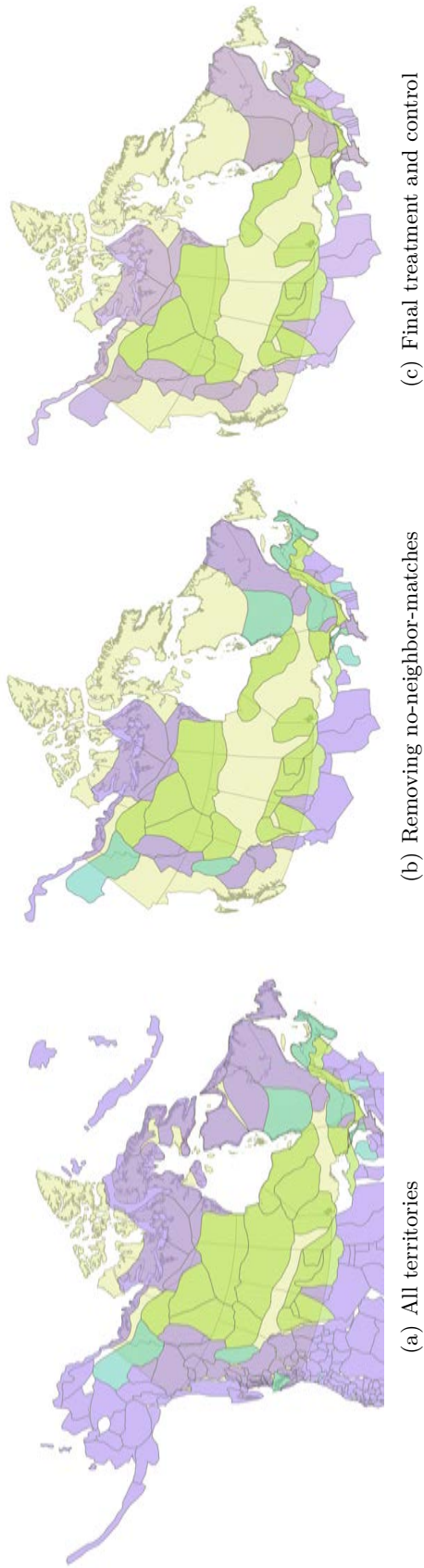
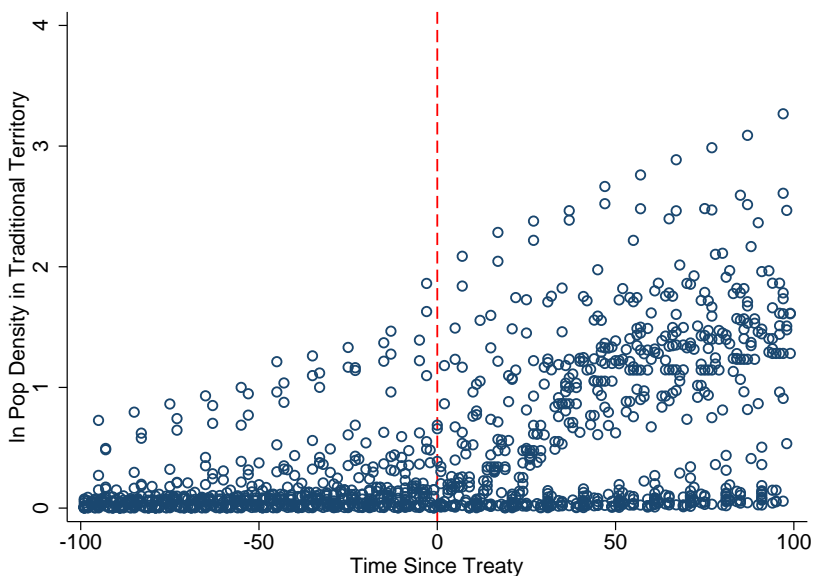


Figure 3: The Contiguous Borders Strategy

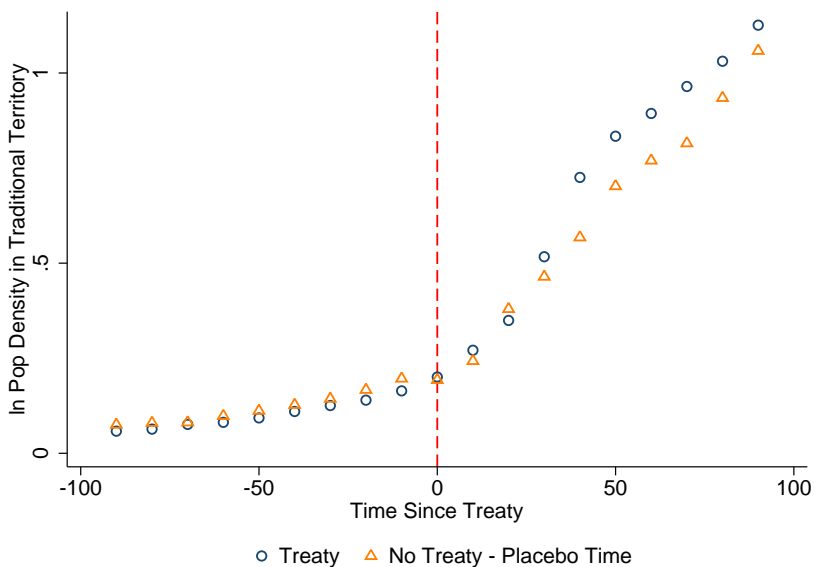


Notes: These maps display the construction of treatment and control territories for the contiguous border strategy. Figure (a) shows all tribal territories that intersect with present-day Canada. Purple regions represent ancestral territories where no associated bands ever signed a historic treaty, light green show those territories where treaties were signed on behalf of all bands, and aqua territories are those where some bands signed a treaty and other bands did not. In figure (b) we show the ancestral territories that are removed from the paired-analysis since all of their neighbors also consist of territories where all associated bands signed treaties. Figure (c) displays how our contiguous pairs are ultimately classified with purple representing “control” and light green representing “treatment”. Here, we allow control territories to include those where “some signed” and treatment territories are always those where “all signed”.

Figure 4: Population Density in Traditional Territories Relative to Time of Signing a Treaty



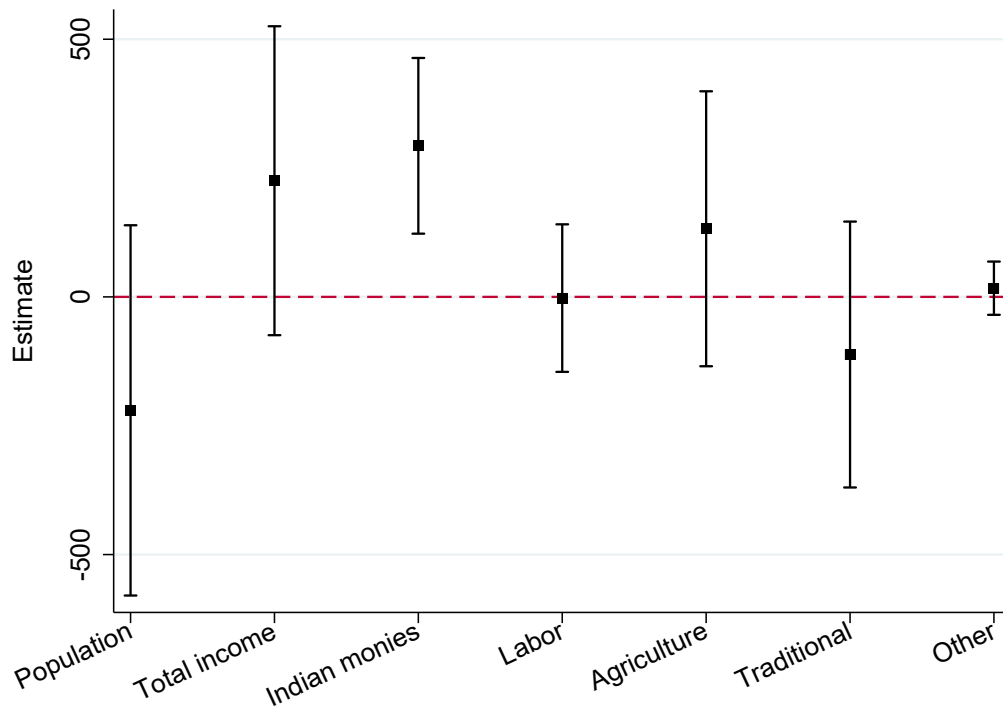
(a) Treaty signatories by First Nation



(b) Averaged by treaty status

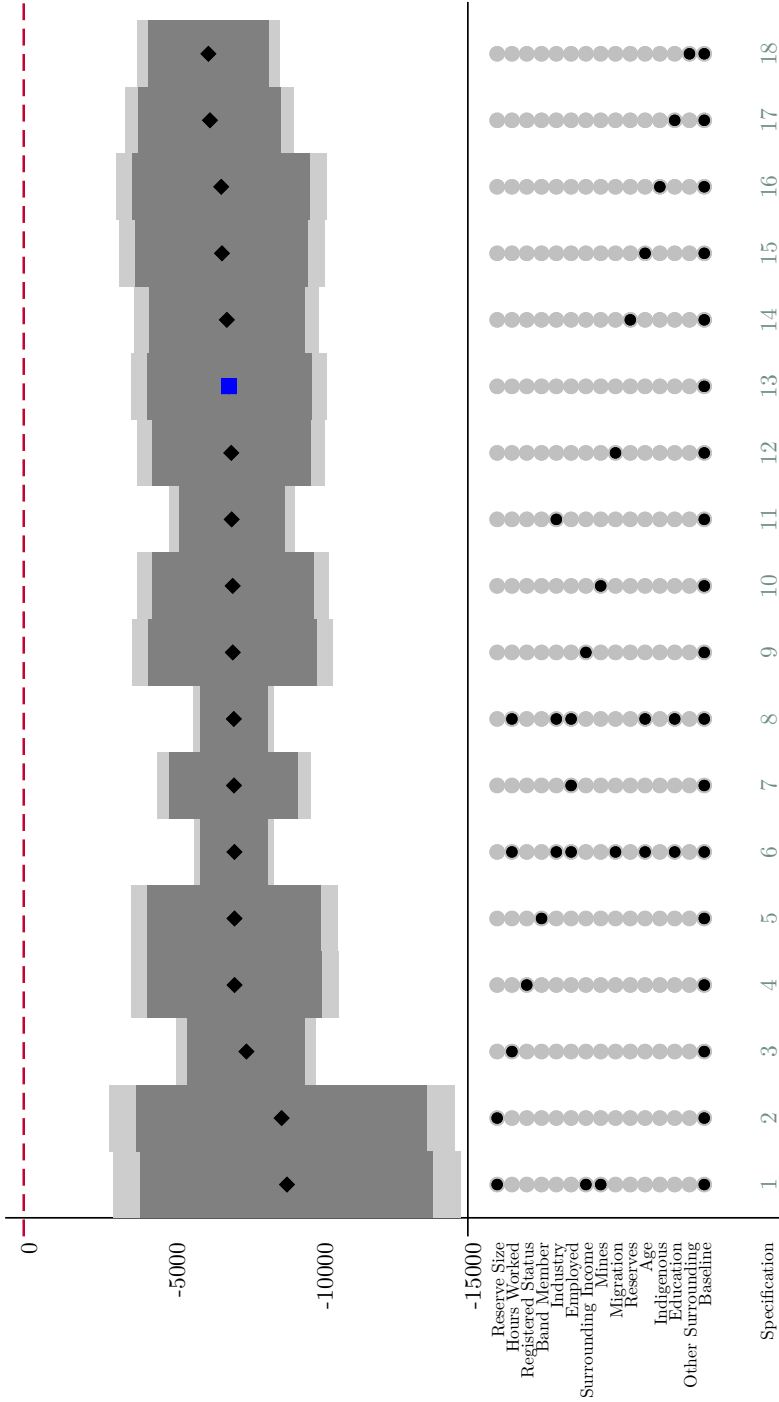
Notes: Panel A shows the average population density by tribal traditional territory for all tribal groups that would sign a treaty and the date is the date of the earliest treaty signed. Panel B is the average population density for all tribes who signed a treaty normalized around the earliest date the treaty was signed and the average population density for all tribes who did not sign a treaty with the data normalized around the average date treaties were signed.

Figure 5: Differences in Real Income From Various Sources Between 1921 to 1939 by Treaty Status



Notes: Figure shows differences in outcomes between treaty and non-treaty nations using data from the Department of Indian Affairs Annual Reports with pooled data from 1921 to 1939. All regressions control for year fixed effects and the  $\ln(\text{population})$  if they are an income outcome. Incomes are all in real 2020 terms. “Interest and trust fund” income are annuities from these sources. “Other” includes sources of income from mining, forestry, and land rentals.

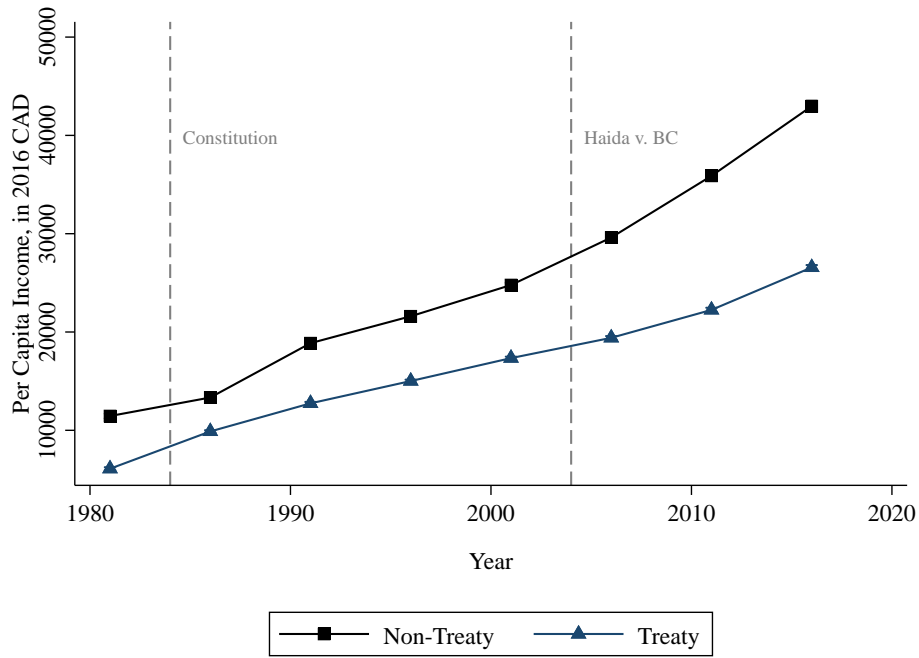
Figure 6: The Impact of Historical Treaties on Income: Robustness



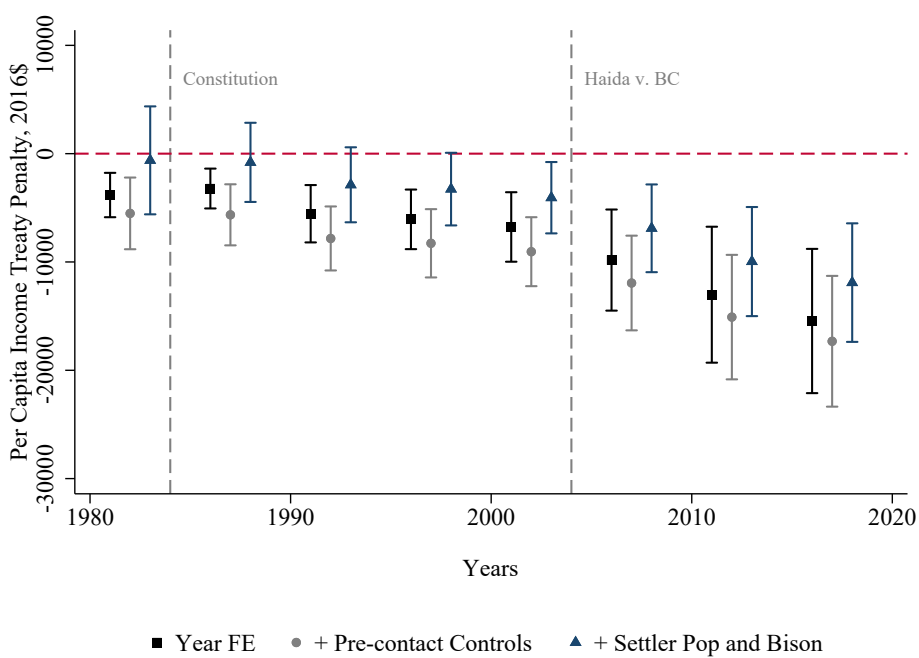
Notes: This figure displays a number of specifications that estimate the long-run effect of signing a treaty. The outcome in each specification is income per capita in 2016 Canadian dollars. Income is regressed on an indicator for signing a historic treaty and these coefficient estimates are presented in the graph above with 90% confidence intervals in dark grey and 95% confidence intervals in light grey. All columns are estimated using the contiguous border strategy, include contiguous border pair fixed effects, and condition on the full set of historical determinants: share of bison territory lost between 1790 and 1870, share lost between 1870 and 1889, whether a neighbor signed, whether a neighbor in the same language network signed, share territory covered by primary trapping range, the territory area, historical centralization, calories from agriculture, semi-permanent villages, no property or land rights, egalitarian society, length of waterway in territory, distance to the closest trading post, log of population at the closest trading post, missing population at trading post, distance to the closest railway station, population density in territory in 1800, and whether the nation spans the US border. The coefficient estimate found in specification 13, demarcated by a blue square, is from our baseline specification.



Figure 7: Differences in Income from 1982-2016, by Treaty Status



(a) Income per capita in treaty and non-treaty communities



(b) Coefficient estimates and 95% confidence intervals of the treaty penalty over time

Notes: Panel (a) depicts income per capita in treaty communities (blue circles) and non-treaty communities (black squares) between 1982 and 2016. Panel (b) depicts the estimated impact of having a treaty on total individual income. The dashed lines correspond to the patriation of the Canadian Constitution in 1982 and Haida Nation vs. British Columbia in 2004. Both panels use restricted access census data from the Censuses of Population.

## 9 Tables

Table 1: Summary Statistics: Treaty Clauses and Sentiment

	(1)	(2)
	Mean	St. Dev
<i>Panel A: Treaty Clauses</i>		
One Time Cash for Land	.04	.204
No Liquor	.55	.498
Only Teacher Salary	.24	.424
Maintain Com. School	.38	.485
Retain Village	.04	.184
Hunt/Fish/Trapping Rights	.87	.333
Medicine Chest Clause	.17	.377
One Time Cash for Chief	.37	.484
Farm Land Offered	.80	.400
Amount of Farm Land	456	273.99
Blanket Extinguishment	.65	.477
<i>Panel A: Treaty Sentiment</i>		
Sentiment Score	34.07	9.706
Fraction Positive Words	.76	.056
Total Words in Treaty	65.77	19.547

Notes: Means and standard deviations for communities that signed treaties. The number of observations is 600 in all rows.



Table 2: Summary Statistics: Historical Controls

	(1)	(2)	(3)
	No Treaty	Treaty	Difference
Ln Ruggedness Ancestral Territory	5.43 (0.94)	3.22 (0.71)	2.21***
Loss of Bison 1790-1870	0.04 (0.13)	0.36 (0.38)	-0.32***
Loss of Bison 1870-1889	0.05 (0.15)	0.48 (0.45)	-0.43***
Primary Beaver Range	0.10 (0.28)	0.36 (0.45)	-0.26***
Neighbor Signed	0.50 (0.50)	0.76 (0.43)	-0.26***
Neighbor Signed (Same Language)	0.29 (0.46)	0.69 (0.46)	-0.40***
Area of Ancestral Territory	0.10 (0.13)	0.24 (0.21)	-0.14***
Historic Centralization	0.33 (0.47)	0.18 (0.38)	0.16***
% Calories from Agriculture	0.07 (0.48)	0.08 (0.51)	-0.00
Permanent/Semi Villages	0.34 (0.48)	0.02 (0.13)	0.33***
No Individual Land Rights	0.46 (0.50)	0.34 (0.47)	0.12***
No Wealth Distinctions	0.34 (0.47)	0.95 (0.21)	-0.62***
Length of Waterways in Territory (KM)	308.90 (368.69)	831.41 (766.23)	-522.51***
Closest Trading Post	219.23 (239.16)	88.62 (66.86)	130.61***
Ln Pop Closest Trading Post	2.21 (1.58)	1.26 (2.23)	0.94***
Hist Trading Pop Missing	0.04 (0.20)	0.18 (0.39)	-0.14***
Avg. pop density in territory 1800	0.15 (0.77)	0.19 (0.43)	-0.04
Closest Railway Station	381.50 (486.13)	187.49 (235.75)	194.01***
Never Had Rail in Territory	0.33 (0.47)	0.05 (0.21)	0.28***
First Year Rail Entered	1276.26 (892.10)	1802.10 (399.69)	-525.84***
Tribe Spans U.S Border	0.28 (0.45)	0.20 (0.40)	0.08**
Observations	534	600	1134

Notes: This table displays summary statistics for our full set of historical controls. Column (1) displays means and standard deviations in parentheses for communities that are not covered by historic treaty; Column (2) displays these statistics for communities that are covered by historic treaty; Column (3) displays difference in means tests—column (1) minus column(2)—with standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 3: The Determinants of Signing a Treaty

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln Ruggedness Ancestral Territory	-0.290*** (0.015)							-0.243*** (0.051)
Loss of Bison 1790-1870		-0.213 (0.174)						-0.531*** (0.172)
Loss of Bison 1870-1889		0.816*** (0.165)						0.677*** (0.140)
Primary Beaver Range			0.407** (0.165)					0.0913 (0.123)
Neighbor Signed				-0.0858 (0.183)				-0.212** (0.086)
Neighbor Signed (Same Language)				0.461** (0.180)				0.0895 (0.087)
Area of Ancestral Territory					0.945*** (0.236)			0.237 (0.513)
Length of Waterways in Territory (KM)						0.000221*** (0.000)		-0.0000922 (0.000)
Closest Trading Post						-0.000265 (0.000)		-0.000481*** (0.000)
Ln Pop Closest Trading Post						-0.0114 (0.035)		0.0198** (0.010)
Hist Trading Pop Missing						0.185 (0.236)		0.129** (0.065)
Pop Density 1800						0.00659 (0.051)		-0.0193 (0.044)
Closest Railway Station						-0.000108 (0.000)		-0.0000343 (0.000)
Never Had Rail in Territory						-8.621 (7.200)		-1.540 (3.467)
First Year Rail Entered						-0.00442 (0.004)		-0.000713 (0.002)
Tribe Spans U.S Border						-0.158 (0.195)		-0.0983 (0.061)
Historic Centralization							-0.163 (0.127)	0.109 (0.094)
% Calories from Agriculture							-0.0566 (0.050)	0.0133 (0.062)
Permanent/Semi Villages							-0.0180 (0.070)	0.0589 (0.084)
No Individual Land Rights							-0.232* (0.128)	-0.0981* (0.058)
No wealth distinctions							0.687*** (0.079)	0.0681 (0.092)
Constant	1.766*** (0.079)	0.349*** (0.092)	0.430*** (0.121)	0.352*** (0.122)	0.368*** (0.116)	8.920 (7.196)	0.214*** (0.072)	2.970 (3.390)
Observations	1134	1134	1134	1134	1134	1134	1134	1134
Adjusted $R^2$	0.641	0.285	0.105	0.161	0.132	0.314	0.479	0.798

Notes: The dependent variable is an indicator equal to 1 if csd-band signed a historic treaty. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 4: The Impact of Historical Treaties on Intermediate Outcomes

	1913 Indian Affairs Report			Mining Maps		Res Schools
	(1) Pop Census	(2) Births/100	(3) Deaths/100	(4) Gold By 1915	(5) Silver By 1915	(6) Ln(Res School)
Signed Treaty	23.10 (37.158)	-3.203** (1.321)	-0.510 (0.411)	0.00903 (0.050)	0.00708 (0.020)	-0.284 (0.214)
Observations	1867	1684	1684	1857	1857	1857
Adjusted $R^2$	0.868	0.115	0.028	0.938	0.954	0.330

Notes: The dependent variable in column (1) is the population reported in the IAR age tables; (2) is the number of births per 100 people; (3) is the number of deaths per 100 people; (4) is an indicator that equals 1 if gold was discovered by 1915; (5) is an indicator that equals 1 if silver was discovered by 1915; and (6) is the log distance to the closest residential school. All columns are estimated using the contiguous border strategy, include contiguous border pair fixed effects, and condition on the full set of historical determinants: share of bison territory lost between 1790 and 1870, share lost between 1870 and 1889, whether a neighbor signed, whether a neighbor in the same language network signed, share territory covered by primary trapping range, the territory area, historical centralization, calories from agriculture, semi-permanent villages, no property or land rights, egalitarian society, length of waterway in territory, distance to the closest trading post, log of population at the closest trading post, missing population at trading post, distance to the closest railway station, population density in territory in 1800, and whether the nation spans the US border. Standard errors clustered by contiguous border pair are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 5: The Impact of Historical Treaties on Income, by Source

	(1)	(2)	(3)	(4)	(5)
	Total	After Tax	Employment	Investment	Government
	Income	Income	Income	Income	Transfers
Signed Historic Treaty	-6938.6***	-4732.1***	-5354.7***	-790.2***	-272.3
	(1683.015)	(1079.269)	(1601.149)	(263.668)	(382.399)
Adjusted $R^2$	0.041	0.046	0.041	0.008	0.037

Notes: The dependent variable in column (1) is total income; (2) after-tax income; (3) employment income; (4) investment income; (5) income from government transfers. All columns are estimated using the contiguous border strategy, include contiguous border pair fixed effects, and condition on the full set of historical determinants: share of bison territory lost between 1790 and 1870, share lost between 1870 and 1889, whether a neighbor signed, whether a neighbor in the same language network signed, share territory covered by primary trapping range, the territory area, historical centralization, calories from agriculture, semi-permanent villages, no property or land rights, egalitarian society, length of waterway in territory, distance to the closest trading post, population bins for settlement at the closest trading post, missing population at trading post, distance to the closest railway station, population density in ancestral territories as of 1600, 1700, 1750, 1800, 1850 and 1900, and whether the nation spans the US border. The number of observations are suppressed for confidentiality reasons. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

ONLINE APPENDIX: THE DETERMINANTS AND IMPACTS OF  
HISTORICAL TREATY-MAKING IN CANADA

D. L. FEIR

ROB GILLEZEAU

MAGGIE E.C. JONES

**Last Updated: September 15, 2023**

# A Additional Figures

## A.1 Descriptive Figures

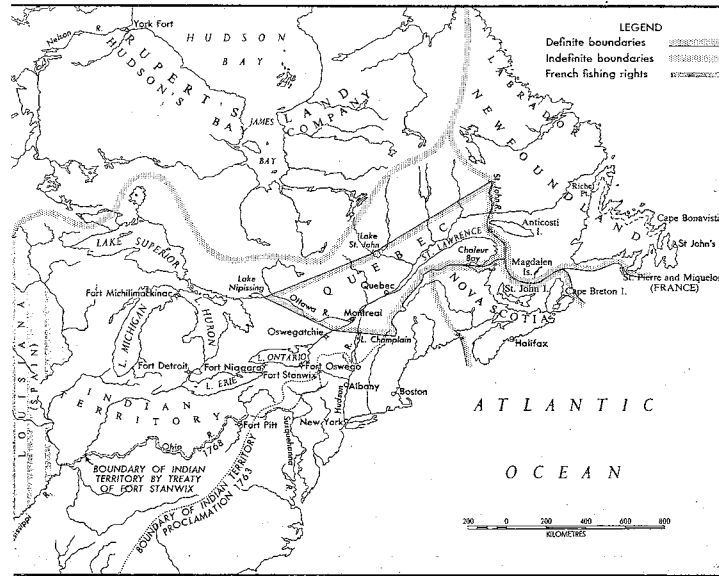


Figure A.1: North America as of the Royal Proclamation of 1763, reproduction from the Historical Atlas, 3rd edition, page 31.

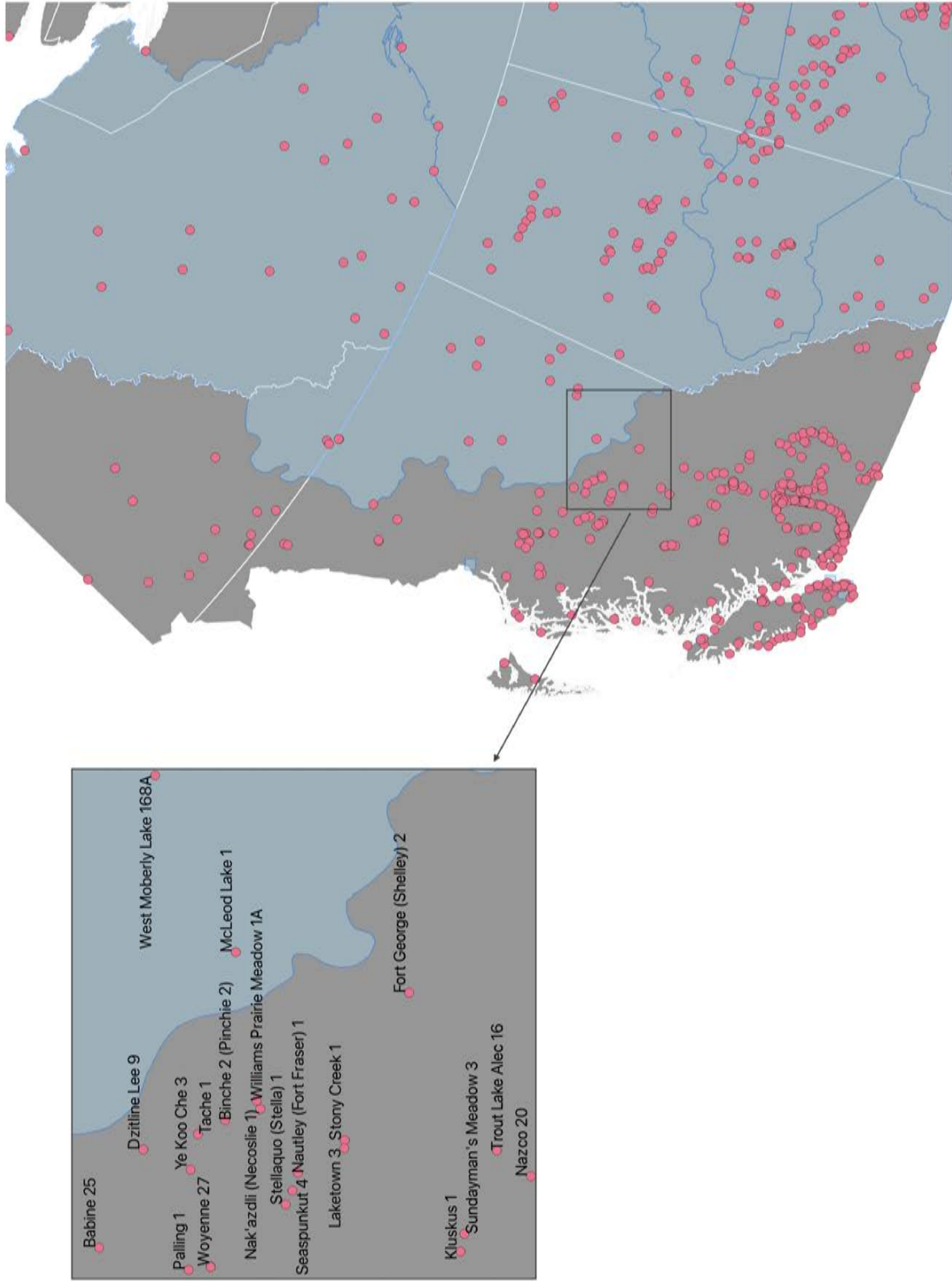


Figure A.2: Example of Comparison Communities Using Contiguous Borders Strategy

## A.2 All Outcomes and All Specifications

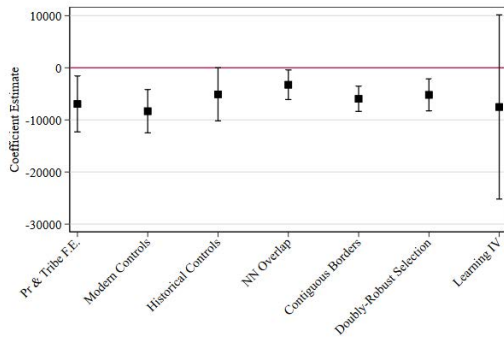
The first outcome we consider is total income in 2016. Figure A.3(a) displays the estimates of the long-run impact of signing a historic treaty using a variety of empirical specifications. The first coefficient estimate uses province and tribe fixed effects. The second, labelled “Modern Controls”, adds these controls to the fixed effects specification, and the third estimate replaces tribe fixed effects with historical controls.<sup>47</sup> The fourth estimate, labelled “NN Overlap” uses the nearest neighbor matching approach. The fifth estimate is from the contiguous border strategy (equation 2), which is described above, and is our preferred empirical specification. The sixth estimate is from a doubly-robust LASSO procedure, which selects variables that best predict treatment (in this case, signing a historic treaty) as well as the outcome, and includes the intersection of controls in the OLS regression of total income on the treaty indicator. Finally, the last estimate is from an IV specification that uses the learning indicators—whether your geographic neighbor signed a treaty in a period before you and whether your geographic neighbor who shares a similar language to you signed a treaty in a period before you—to estimate the impact of signing a treaty.<sup>48</sup>

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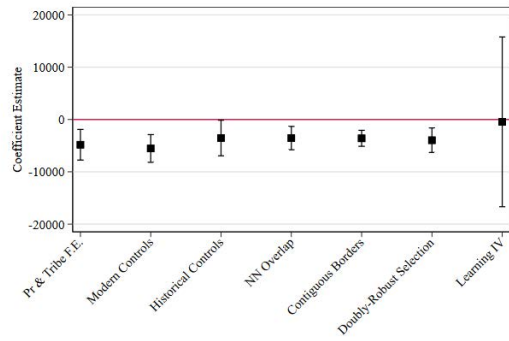
<sup>47</sup>It should be noted, that we report the tribe fixed effects estimates for comparison; however, due to limited variation in treaty-making within tribes, our preferred specifications do not include tribe fixed effects.

<sup>48</sup>Our IV specification only includes modern controls, in addition to the two instruments, but the estimate is actually reasonably similar using the full set of controls or no controls. Statistics Canada confidentiality concerns prevented the release of these specifications.

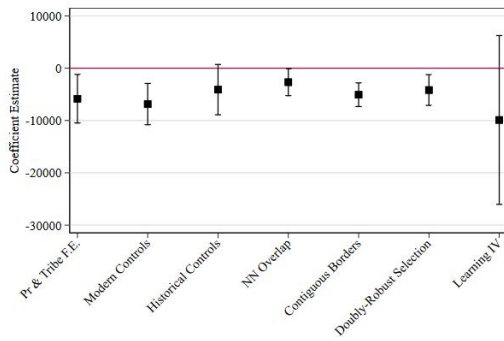




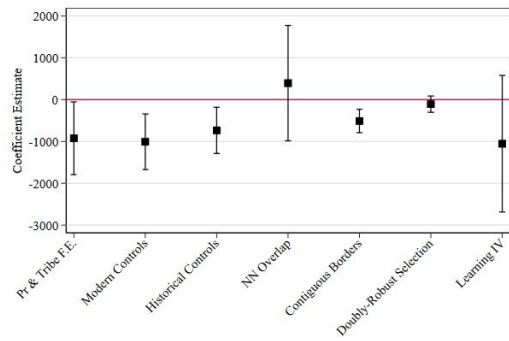
(a) Total Income (Incl net capital gains)



(b) Total Income after tax

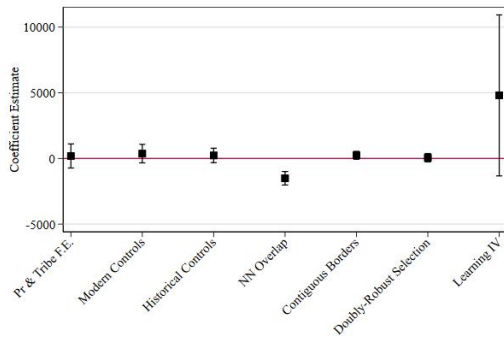


(c) Employment Income

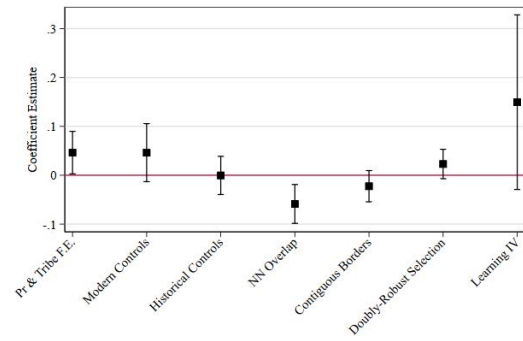


(d) Investment Income

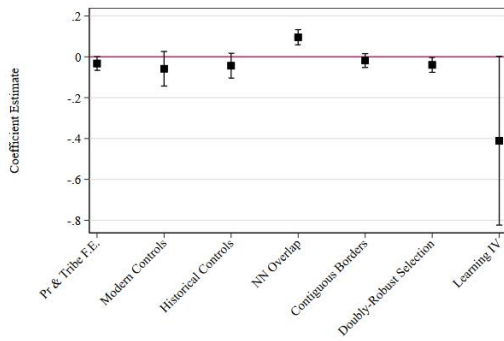
Figure A.3: Each panel show the estimated effect of signing a treaty for each estimation strategy on the outcome indicated at the bottom of each panel.



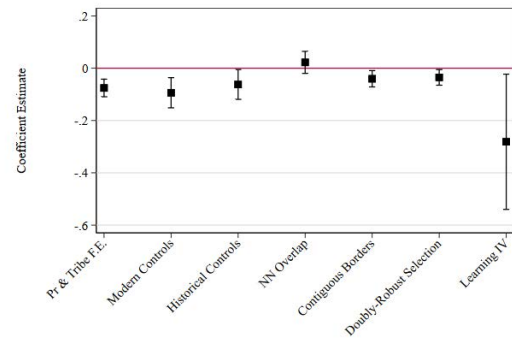
(a) Government Transfers



(b) Not in labor Force

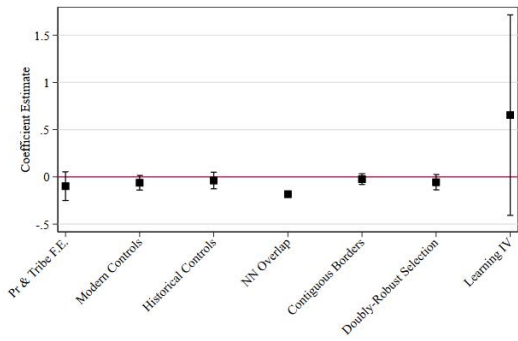


(c) At Least High School

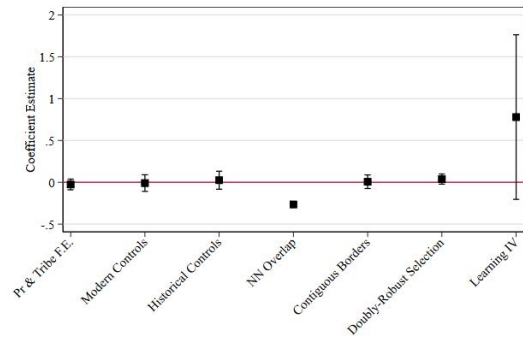


(d) At Least Post Secondary

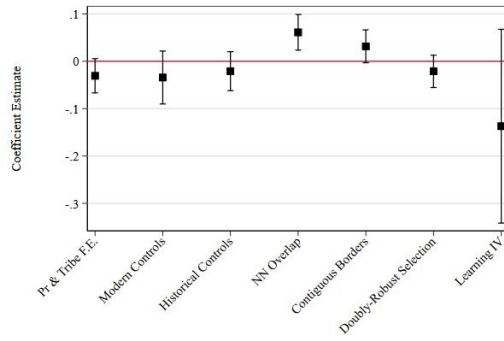
Figure A.4: Each panel show the estimated effect of signing a treaty for each estimation strategy on the outcome indicated at the bottom of each panel.



(a) Speaks an Indigenous Language at Home



(b) Member of a Band



(c) Probability of Being Employed

Figure A.5: Each panel show the estimated effect of signing a treaty for each estimation strategy on the outcome indicated at the bottom of each panel.

### A.3 Quantile Treatment Effects

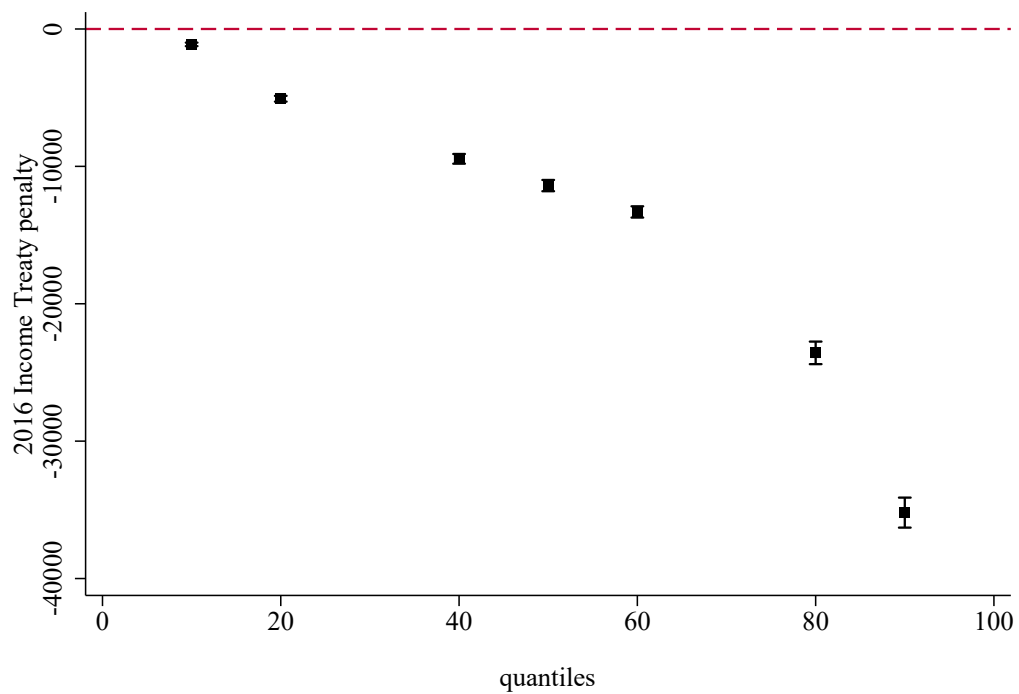


Figure A.6: Unconditional Quantile Regressions: Show the estimated effect of signing a treaty by income quantile in the 2016 Census conditional on gender and a quadratic in age using unconditional quantile regression (Firpo et al., 2009).

## A.4 Impact Benefit Agreements

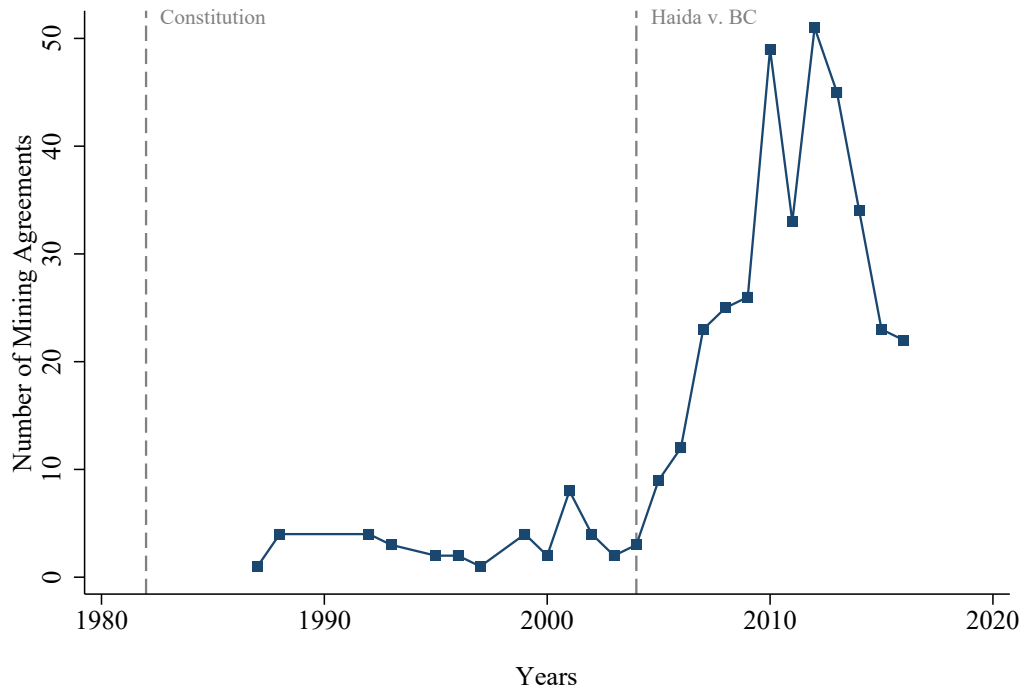


Figure A.7: The figure depicts the number of agreements between Indigenous nations and mining firms over time. These agreements include formal impact benefit agreements and other revenue sharing agreements from mining projects. The outcome is total per capita income estimated using data from Indigenous Service’s Canada Community well-being index over each year available. Data on agreements come from Natural Resources Canada: <https://atlas.gc.ca/imaema/en/index.html>.

## B Additional Tables

### B.1 Coefficient Estimates and Standard Errors for Robustness of Long-Run Estimates

From Table 5, it is clear differences in historical controls we control for, and differences in age structures and sex composition don't drive the income penalty. In Table B.1 we explore how identity factors and the presence of non-Indigenous people may influence the historic treaty penalty. In column (1) we replicate the result on total income from column (1) in 5 for the ease of comparison. In the second column we control for whether a person observed on reserve declares some indigenous identity or not, in the next column whether they are a member of a First Nation, a specification that excludes First Nations settlements that do not have reserve status, and whether an individual has status under the *Indian Act*. In all cases, the estimated effect is statistically equivalent to the baseline model.

In Table B.2 we explore how surrounding economic development may or may not drive the difference. If areas that were covered by a historical treaty were more likely to be developed by colonists to the disadvantage of local Indigenous communities, then this force could drive our result. Again in column (1) we present the baseline result, followed by column (2) which controls for whether the reserve is located next to a small population center, a medium population center, or a large urban area with those in a rural area as the excluded category. In column (3) we control for the number of mines surrounding the reserve in a buffer of 30km, column (4) the average income in the surrounding census division, and in column (5) all of the controls. After controlling for these differences, if anything the treaty penalty is larger.

In Table B.3<sup>49</sup> we control for a host of other institutional, geographic, and labor force factors that could influence the treaty penalty. In column (1) we present the baseline. In column (2) we condition on other measures of geographic isolation and development not controlled for in Table B.2, including whether the nation signed a modern treaty (since Aragón (2015) demonstrates modern treaties are associated with higher income for Indigenous and non-Indigenous people in the areas they are signed), modern geographic controls including distance to the closest CMA, surrounding light density in 2011, and the log ruggedness of the reserve. In column (3) we control for a set of 20 industry dummies including whether someone did not report an industry of work. In column (4) we condition on whether the respondent had a high school degree and any post-secondary degree. In column (5) we control for whether an individual is employed, in column (6) the hours worked, and in column (7) all these controls. Again, none of these factors seem to be driving the treaty penalty. In the final two columns, we consider whether migration may be the driving explanatory force. The census asked individuals whether they have lived in the same census subdivision (which is equivalent to a reserve or Indigenous settlement in our context) in the past five years. We control for whether an individual has moved in column (8) and then include this with a full set of controls in column (9). The treaty penalty is extremely stable across all these specifications.

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<sup>49</sup>All specifications control for age and sex, as well as the historical factors included in Table 5.

Table B.1: The Impact of Historical Treaties on Total Income, Conditional on Identity

	(1)	(2)	(3)	(4)	(5)
Signed Treaty	-6938.6*** (1683.015)	-6673.7*** (1814.017)	-6863.9*** (1591.086)	-7122.3*** (1779.867)	-7124.8*** (1787.259)
Indigenous		-25446.7*** (2232.927)			
Member of First Nation				-19221.9*** (2106.568)	
Registered Status					-18974.7*** (2120.317)
Just Reserves			X		
Adjusted $R^2$	0.041	0.061	0.030	0.041	0.041

Notes: All columns are estimated using the contiguous border strategy and condition on the full set of historical determinants and additional controls. Determinants include These controls include an indicator for historical centralization, calories from agriculture, whether the Nation was semi-permanent, whether they had property rights, whether they were egalitarian, the distance of waterways in ancestral territories, the closest railway station, the closest historical trading post, population bins for settlement at the closest trading post, the earliest date a railway entered the ancestral territory and an indicator equal to 1 if the Nation never had a railway enter their territory, an indicator for sharing a border with the United States, population density in ancestral territories as of 1600, 1700, 1750, 1800, 1850 and 1900, and our determinants of treaty-making: log of ruggedness in ancestral territory, indicators for whether your geographic neighbor or neighbor in your language network signed a treaty in a previous period, the gradual and rapid loss of the bison, and share of ancestral territory covered by the primary trapping range. Number of observations are suppressed for confidentiality reasons. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table B.2: The Impact of Historical Treaties on Total Income, Conditional on Surrounding Characteristics

	(1)	(2)	(3)	(4)	(5)
Signed Historic Treaty	-6938.6*** (1683.015)	-8714.5*** (2974.509)	-7060.4*** (1651.652)	-7064.3*** (1726.466)	-8896.0*** (2994.767)
Reserve Near Small Center		-687.1 (687.216)			-808.8 (715.024)
Reserve Near Medium Center		28262.7*** (4769.204)			28554.5*** (4791.244)
Reserve Near Large Center		21210.7*** (978.049)			21444.7*** (913.606)
# Mines			104.4 (71.101)		164.4** (64.484)
Avg Total Surrounding Income				0.0216 (0.035)	-0.00404 (0.032)
Adjusted $R^2$	0.041	0.048	0.041	0.041	0.048

Notes: All columns are estimated using the contiguous border strategy and condition on the full set of historical determinants and additional controls. Of the indicators for isolation, the base group are rural reserves. Small population centres have a population between 1,000 and 29,999, medium population centres have a population between 30,000 and 99,999 and large urban population centres have a population of 100,000 or more. The average total surrounding income is of the surrounding Census division of a reserve. The historical determinants controls include an indicator for historical centralization, calories from agriculture, whether the Nation was semi-permanent, whether they had property rights, whether they were egalitarian, the distance of waterways in ancestral territories, the closest railway station, the closest historical trading post, population bins for settlement at the closest trading post, the earliest date a railway entered the ancestral territory and an indicator equal to 1 if the Nation never had a railway enter their territory, an indicator for sharing a border with the United States, population density in ancestral territories as of 1600, 1700, 1750, 1800, 1850 and 1900, and our determinants of treaty-making: log of ruggedness in ancestral territory, indicators for whether your geographic neighbor or neighbor in your language network signed a treaty in a previous period, the gradual and rapid loss of the bison, and share of ancestral territory covered by the primary trapping range. Number of observations are suppressed for confidentiality reasons. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$



Table B.3: The Impact of Historical Treaties on Total Income, Conditional on labor Market Characteristics and Migration

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Signed Historic Treaty	-6938.6 <sup>*****</sup> (1683.015)	-6239.6 <sup>****</sup> (1231.411)	-7026.8 <sup>****</sup> (1084.323)	-6293.1 <sup>***</sup> (1456.411)	-7105.6 <sup>****</sup> (1320.081)	-7524.9 <sup>****</sup> (1206.592)	-7098.6 <sup>****</sup> (690.482)	-7013.9 <sup>****</sup> (-1617.893)	-7120.7 <sup>****</sup> (687.254)
Modern Treaty		X					X		X
Modern Geo Controls		X					X		X
Industry F.E			X				X		X
Education Controls				X			X		X
Hours Worked						X	X		X
Employed					X		X		X
Moved in Past 5 yrs								X	X
Adjusted $R^2$	0.041	0.046	0.107	0.072	0.100	0.105	0.142	0.043	0.142

Notes: All columns are estimated using the contiguous border strategy and condition on a quadratic control in age and sex and the full set of historical determinants and additional controls. These controls include an indicator for historical centralization, calories from agriculture, whether the Nation was semi-permanent, whether they had property rights, whether they were egalitarian, the distance of waterways in ancestral territories, the closest railway station, the closest historical trading post, population bins for settlement at the closest trading post, the earliest date a railway entered the ancestral territory and an indicator equal to 1 if the Nation never had a railway enter their territory, an indicator for sharing a border with the United States, population density in ancestral territories as of 1600, 1700, 1750, 1800, 1850 and 1900, and our determinants of treaty-making: log of ruggedness in ancestral territory, indicators for whether your geographic neighbor or neighbor in your language network signed a treaty in a previous period, the gradual and rapid loss of the bison, share of ancestral territory covered by the primary trapping range, territory area, any gold or silver discovered in ancestral territory by 1915 and the number of mines in ancestral territory. “Modern Treaty” controls include an indicator of whether a nation has ever signed a modern treaty, “Modern Geo Controls” include distance to the closest CMA, the log of light density in the surrounding area as of 2011, and the log ruggedness of the reserve. Industry fixed effects include twenty categories with no industry among them. Education Controls include indicators for graduating high school and having any post-secondary degree. Number of observations are suppressed for confidentiality reasons. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## B.2 Different Fixed Effects and Controls

Table B.4 reports coefficient estimates on the “Signed Treaty” indicator where we investigate whether different levels of fixed effects or controls change the coefficient estimate in a meaningful way. Column (1) only includes province fixed effects. Using this within-province variation in signing a treaty yields a coefficient estimate of -4055.9, suggesting that the average adult in Indigenous communities with historic treaties had roughly \$4,000 lower total income than the average adult in Indigenous communities without historic treaties. Column (2) uses within-tribe variation in treaty-making to identify the impact of signing a historic treaty and we see the coefficient estimate doubles in magnitude; however, we are hesitant to employ tribe fixed effects as our preferred specification owing to the small number of tribes that actually had variation in signing a historic treaty. Column (3) uses province and tribe fixed effects in the same specification, but we also do not prefer this specification owing to the same concern as with column (2). Column (4) adds our modern controls on top of the province and tribe fixed effects and column (5) replaces tribe fixed effects with our tribe-level historical controls. Throughout each specification, the coefficient estimate on “Signed Treaty” remains relatively stable and both statistically and economically significant.

Table B.4: The Impact of Signing a Historical Treaty on Total Income

	(1)	(2)	(3)	(4)	(5)
Signed Treaty	-4055.9* (1885.116)	-8010.0*** (1305.194)	-6090.7** (2338.573)	-7134.0*** (1874.379)	-4446.2* (2336.824)
Province F.E.	X		X	X	X
Tribe F.E.		X	X	X	
Modern Controls				X	X
Historical Controls					X
Adjusted $R^2$	0.046	0.064	0.066	0.068	0.062

Notes: The dependent variable in all columns is individual total income including net capital gains and losses. Number of observations are suppressed for confidentiality reasons. Modern controls include the distance between an individual’s community and the closest Census Metropolitan Area, the log average nighttime light density in an individual’s surrounding area, the log ruggedness of the community, and an indicator for whether the community is part of a modern treaty. Historical controls include an indicator for historical centralization, calories from agriculture, whether the Nation was semi-permanent, whether they had property rights, whether they were egalitarian, the distance of waterways in ancestral territories, the closest railway station, the closest historical trading post, population bins for settlement at the closest trading post, the earliest date a railway entered the ancestral territory and an indicator equal to 1 if the Nation never had a railway enter their territory, an indicator for sharing a border with the United States, population density in ancestral territories as of 1600, 1700, 1750, 1800, 1850 and 1900, and our determinants of treaty-making: log of ruggedness in ancestral territory, indicators for whether your geographic neighbor or neighbor in your language network signed a treaty in a previous period, the gradual and rapid loss of the bison, share of ancestral territory covered by the primary trapping range, territory area, any gold or silver discovered in ancestral territory by 1915 and the number of mines in ancestral territory. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

### B.3 Treaty Type and Long-Run Outcomes

Table B.5: The Impact of Treaty Type on Income and Employment

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Income	After Tax Income	Employment Income	Investment Income	Government Transfers	Not in labor Force
Comprehensive	-3248.6*** (827.733)	-2430.5*** (686.794)	-2360.0*** (844.421)	-299.1*** (83.763)	-358.0 (260.105)	-0.0283* (0.015)
Peace and Friendship	-10858.7** (4578.262)	-9676.5** (3985.031)	-6118.7 (4068.654)	-379.9** (178.422)	-4444.3*** (461.451)	0.174*** (0.039)
Land Surrender	-7263.0*** (1756.279)	-6083.2*** (1576.579)	-6242.4*** (1698.083)	-164.6** (81.099)	-853.4*** (318.635)	0.0404*** (0.014)
Adjusted $R^2$	0.071	0.068	0.071	0.003	0.032	0.040

Notes: The dependent variable in all columns is individual total income including net capital gains and losses. Number of observations are suppressed for confidentiality reasons. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table B.6: The Impact of Treaty Type on Education and Culture

	(1) High School	(2) Post- Secondary	(3) Speaks Indigenous Lang.	(4) Band Member
Comprehensive	0.00636 (0.017)	-0.0153 (0.014)	-0.169** (0.069)	0.0294 (0.042)
Peace and Friendship	0.0977* (0.058)	-0.0259 (0.044)	0.109 (0.110)	-0.0967 (0.077)
Land Surrender	-0.00240 (0.018)	-0.0525*** (0.012)	-0.144** (0.070)	0.0336 (0.035)
Adjusted $R^2$	0.057	0.036	0.450	0.494

Notes: The dependent variable in all columns is individual total income including net capital gains and losses. Number of observations are suppressed for confidentiality reasons. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## B.4 Treaty Clauses and Long-Run Outcomes

Table B.7: The Impact of Treaty Clauses on Income and labor Force Participation

	(1)	(2)	(3)	(4)	(5)	(6)
	Total	After Tax	Employment	Investment	Government	Not in labor
	Income	Income	Income	Income	Transfers	Force
No Liquor	-2264.3 (1856.120)	-1962.2 (1656.980)	-1943.5 (1601.297)	89.28 (89.553)	-460.0** (206.034)	0.0432 (0.038)
Hunt/Trap/Fish	-4178.8 (2795.639)	-3881.5* (2283.134)	-3502.6 (2454.819)	-40.03 (160.182)	-638.3 (512.832)	-0.0230 (0.038)
Retain Village	-97.90 (2492.534)	585.4 (2183.891)	-116.6 (2099.070)	-382.7*** (124.198)	377.7 (662.609)	0.0233 (0.032)
Contains Farmland	-501.8 (1997.142)	517.5 (1812.100)	8.886 (1904.898)	-326.7** (163.457)	1155.7 (701.679)	-0.0190 (0.042)
Cash for Chief	267.8 (1730.416)	278.2 (1511.365)	0.912 (1466.788)	55.84 (86.091)	141.1 (302.971)	0.00201 (0.029)
Land Surrender	-5009.2** (2468.559)	-4754.7** (2330.623)	-4534.0** (2084.834)	214.6** (88.612)	-869.6* (515.111)	0.0613*** (0.022)
Education	1691.1 (2213.636)	939.1 (1926.979)	1070.3 (2007.281)	214.8 (154.285)	-463.1 (352.417)	-0.0168 (0.032)
Adjusted $R^2$	0.071	0.068	0.072	0.003	0.032	0.040

Notes: All columns are estimated using the contiguous border strategy and condition on the full set of historical controls. These controls include an indicator for historical centralization, calories from agriculture, whether the Nation was semi-permanent, whether they had property rights, whether they were egalitarian, the distance of waterways in ancestral territories, the closest railway station, the closest historical trading post, population bins for settlement at the closest trading post, the earliest date a railway entered the ancestral territory and an indicator equal to 1 if the Nation never had a railway enter their territory, an indicator for sharing a border with the United States, population density in ancestral territories as of 1600, 1700, 1750, 1800, 1850 and 1900, and our determinants of treaty-making: log of ruggedness in ancestral territory, indicators for whether your geographic neighbor or neighbor in your language network signed a treaty in a previous period, the gradual and rapid loss of the bison, share of ancestral territory covered by the primary trapping range, territory area, any gold or silver discovered in ancestral territory by 1915 and the number of mines in ancestral territory. Number of observations are suppressed for confidentiality reasons. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## C Data Appendix

### C.1 Treaties & Historical Controls

1. Treaty texts, dates: Collected from Historic Treaty information on Government of Canada website. See "Pre-1975 Treaties" section: <https://www.aadnc-aandc.gc.ca/eng/1290453474688/1290453673970>
2. Sources used to match across datasets
  - (a) Tribal names book: Clark (2009)
  - (b) Band number: Provided to us directly from CIRNAC
  - (c) Tribe: Provided to us directly from CIRNAC
3. Additional data sources
  - (a) Ancestral territory maps: Smithsonian Handbook of the North American Indian
  - (b) Waterway length: historical atlas of Canada Map of Historic Canoe Routes: <https://www.fadedpage.com/books/20140220/html.php>
  - (c) Average population density from HYDE: <https://themasites.pbl.nl/tridion/en/themasites/hyde/>
  - (d) Ethnographic Atlas: language network, handbook map
  - (e) Closest trading post, population at the closest trading post, distance to closest railway station: ESRI Aboriginal People, European Settlement and Trading Posts 1823: <https://www.arcgis.com/home/item.html?id=5bc10f68263d4116a700d33fb5405c23>
  - (f) Modern treaties: <https://www.rcaanc-cirnac.gc.ca/eng/1100100028574/1529354437231#chp4>
  - (g) Incompletely enumerated reserves: <https://www12.statcan.gc.ca/census-recensement/2011/ref/aboriginal-autochtones-eng.cfm>
  - (h) Bison: <https://www.loc.gov/resource/g3301d.ct000308/?r=-0.385,-0.062,1.776,1.402,0>
  - (i) Trapping: <https://www.canadiangeographic.ca/article/rethinking-beaver>
  - (j) Ruggedness on reserves and ancestral territories: Computed in GIS with overlay of DEM files and ancestral territory files from Smithsonian Handbook
  - (k) Area of territory: Computed in GIS from Smithsonian files
  - (l) Earliest rail: Provided to us from an ESRI representative. Can be viewed online here: <https://www.arcgis.com/home/item.html?id=89044dbd4e7a4ec288d18b2b477237d4andAmericanra>  
<https://my.vanderbilt.edu/jeremyatack/data-downloads/>
  - (m) Statistics Canada geographic boundary files: <https://www12.statcan.gc.ca/census-recensement/2011/geo/bound-limit/bound-limit-eng.cfm>
  - (n) Shared border with USA: coded by hand by overlaying map of North American with our Smithsonian shapefiles
  - (o) Neighbor signed: coded by hand by identifying neighbors from the Smithsonian maps. Augmented with language group from Ethnographic Atlas for "neighbor from same language network signed"

C.2 Indian Affairs Annual Report of 1913

Figure C.1: Two Pages of the Indian Census from the Indian Affairs Annual Report of 1913

10 DEPARTMENT OF INDIAN AFFAIRS

4 GEORGE V., R. 1914  
CENSUS OF INDIANS  
ARRANGED under Departmental Inspectorates, Agencies and

Agency and Band.	Popula- tion.	Religion.						Pages.
		Anglican.	Presbyterian.	Methodist.	Roman Catholic.	Baptist.	Other Chris- tian Denom.	
<b>BRITISH COLUMBIA AGENCIES—Cm.</b>								
<b>Osweston Agency—Cm.</b>								
Panakeet	135				135			
Quamichan	287			30	207			
Shuswap	47			42				
Shuswap	41			40				
Sonwanan	13							
Sonwanan	101			10	91			
Songhwan	53			50				
Soke	31				31			
Tashtee	62			60				
Tawwan	91				91			
Tawwan	21							
Tawwan	55				55			
<b>Total</b>	<b>1,719</b>		<b>20</b>	<b>267</b>	<b>1,383</b>			<b>13</b> <b>19</b>
<b>Kootenay Agency.</b>								
Adams Lake	136				136			
Ashcroft	31				31			
Bonaparte	102				102			
Cook's Ferry	127				127			
Isadore's Creek	123				123			
Kamloops	257				257			
Little Lake Shuswap	87				87			
Nasawitsh	174				174			
North Thompson	11				11			
Oregon Jack Creek	1				1			
<b>Total</b>	<b>1,341</b>				<b>1,115</b>			
<b>Kootenay Agency.</b>								
Arrow Lake (West Kootenay)	21				21			
Kimbasket (Shuswap)	65				65			
Lower Columbia Lake	100				100			
Lower Kootenay (Flat Bow)	212				212			
St. Mary's	50				50			
Talawa Plains	20				20			
<b>Total</b>	<b>503</b>				<b>503</b>			
<b>Kwakiwilt Agency</b>								
Klaskanin and Nattipi	94				94			
Kwakiwilt	119				119			
Kwakiwilt	119				119			
Kwakiwilt	26				26			
Kwakiwilt	14			14				
Manalikilla	87				87			
Nawakho	136				136			
Nawakho	52				52			
<b>Total</b>	<b>747</b>				<b>747</b>			

11 CENSUS

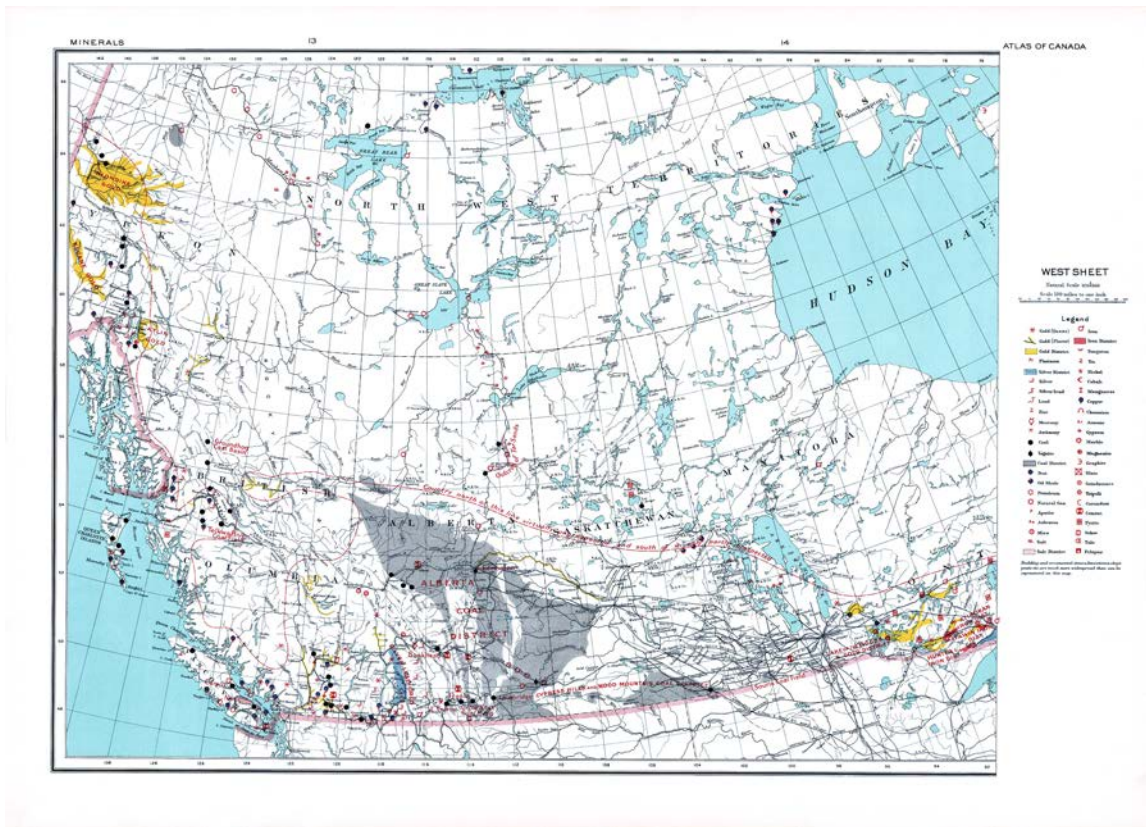
SESSIONAL PAPER No. 27  
AND ESKIMOS  
Districts, for the Year ended March 31, 1913.

Under 6 years.		From 6 to 15 years inclusive.		From 16 to 20 years inclusive.		From 21 to 65 years inclusive.		From 65 years upwards.		Births and Deaths.	
Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Births.	Deaths.
135	128	162	100	111	108	428	450	12	18	41	55
119	114	144	156	62	72	306	304	38	41		
8	8	7	6	2	1	17	5	1	1		
1	1	2	1	1	1	17	5	1	1		
6	2	6	10	4	6	18	18	3	4		
12	19	26	30	4	5	45	45	6	12		3
7	7	6	8	1	1	16	15	4	4		
8	8	7	6	2	1	17	5	1	1		
12	10	21	23	1	1	45	45	4	4		
4	4	3	2	1	1	14	14	1	1		
12	11	21	23	1	1	45	45	4	4		
4	4	3	2	1	1	14	14	1	1		

To match the bands in this dataset to treaties, we first matched bands to their contemporary equivalents using a variety of sources that can be found in the documentation on our websites. Some bands matched easily to a contemporary band for which we already had treaty information. For a subset of bands (approximately 120 out of the roughly 650 bands) we were unable to match them to a modern equivalent. Through our match process, we learned about the history of these bands that did not match and, for many of them, were able to code whether they entered into a treaty with the crown or not according to the sources we referenced. Still, some bands remained unmatched. For unmatched bands in Atlantic Canada, we assumed they were part of the Peace and Friendship treaties. We assumed that unmatched bands in Quebec were not signatory to a treaty, unless they were Mi'kmaq or Maliseet, in which case, we assumed they were signatory to a Peace and Friendship treaty. We also assumed that unmatched bands in the Yukon were not signatory to a treaty. Finally, unmatched bands in the "Treaty 8 Inspectorate" were assumed to be signatories to Treaty 8 of the Numbered Treaties.

### C.3 Mining in Traditional Territories

Figure C.2: The Location of Minerals Across Western Canada From the 1915 Atlas of Canada

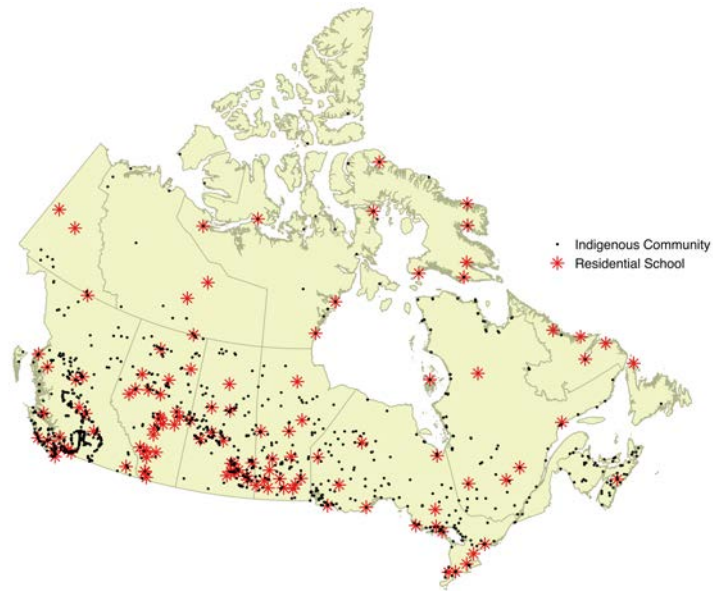




## C.4 Residential Schools

The location of residential schools was provided by Jones (2021). Figure C.3 reproduces an image of the location of residential schools and Indigenous communities that was originally included in Jones (2021). The location of residential schools was obtained from the Aboriginal Healing Foundation and supplemented with records from the Anglican Church of Canada, and court documents from the Newfoundland and Labrador Lawsuit Against Residential Schools.

Figure C.3: The Location of Indigenous Communities and Residential Schools in Canada



## D Differences in Education as an Explanation for Differences in Income

One possible explanation for the difference in income between treaty and non-treaty communities is that the education clauses contained in treaties had direct effects on educational attainment. Although conditioning on education does not impact the coefficient estimate of signing a treaty, we provide an additional analysis of education here.

The federal government was responsible for providing education on all reserves; however, treaty clauses might have influenced how this education was delivered. For example, if nations with education clauses were first to be impacted by the residential school system or were closer to residential schools, this may have led to persistently lower levels of educational attainment into the present. Existing work has shown that the distance to residential schools was a predictor of the intensity with which residential schooling impacted community-members. Feir (2016b) shows that educational attainment among those forced to attend was higher, but that this was associated with a loss of culture which has led to lower levels of educational attainment among subsequent generations (Feir, 2016a; Jones, 2021). Figure D.1 shows that treaty nations and treaty nations with an education clause were both located closer to residential schools.

Table D.2 presents results that indicate that nations that signed treaties with an education clause were located further away from residential schools. Further, conditioning on an individual's level of education directly does not change the results for total income or employment income.

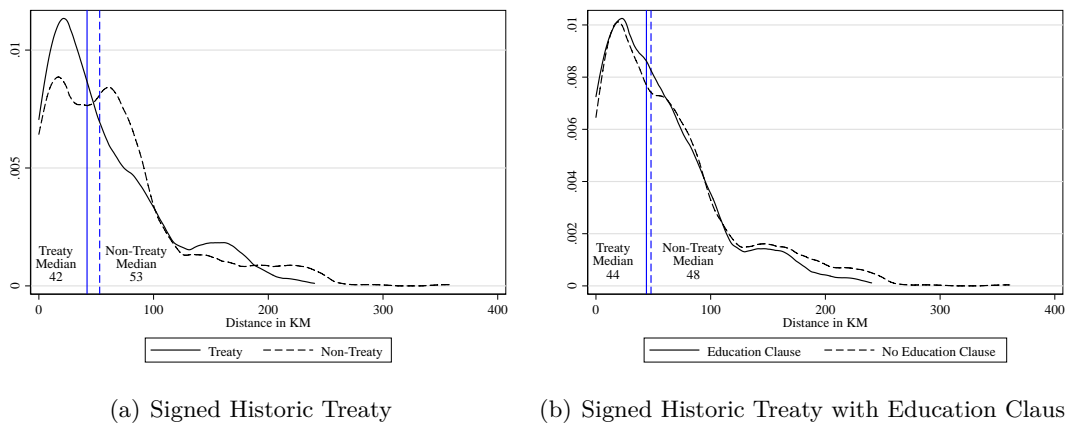


Figure D.1: The top panel shows kernel densities of distance to the closest residential school by community treaty status. The bottom panel shows kernel densities of distance to the closest residential school by education clause status.

Table D.1: The Impact of Treaty Clauses on Education

	(1)	(2)
	High School	Post-Secondary
No Liquor	-0.0182 (0.035)	-0.0355 (0.028)
Hunt/Trap/Fish	0.0537* (0.031)	-0.00595 (0.029)
Retain Village	-0.0261 (0.026)	0.0000343 (0.025)
Contains Farmland	-0.0150 (0.029)	0.0247 (0.025)
Cash for Chief	0.0314 (0.029)	0.00922 (0.024)
Land Surrender	-0.00562 (0.016)	-0.0444*** (0.017)
Education	-0.0871*** (0.031)	-0.0554* (0.032)
Adjusted $R^2$	0.058	0.037

Notes: All columns are estimated using the contiguous border strategy and condition on the full set of historical controls. These controls include an indicator for historical centralization, calories from agriculture, whether the Nation was semi-permanent, whether they had property rights, whether they were egalitarian, the distance of waterways in ancestral territories, the closest railway station, the closest historical trading post, population bins for settlement at the closest trading post, the earliest date a railway entered the ancestral territory and an indicator equal to 1 if the Nation never had a railway enter their territory, an indicator for sharing a border with the United States, population density in ancestral territories as of 1600, 1700, 1750, 1800, 1850 and 1900, and our determinants of treaty-making: log of ruggedness in ancestral territory, indicators for whether your geographic neighbor or neighbor in your language network signed a treaty in a previous period, the gradual and rapid loss of the bison, share of ancestral territory covered by the primary trapping range, territory area, any gold or silver discovered in ancestral territory by 1915 and the number of mines in ancestral territory. Number of observations are suppressed for confidentiality reasons. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table D.1 shows the relationship between treaty clauses and the probability of having a high school degree (column 1) or a post-secondary degree (column 2) in 2016. We condition on the full set of historical controls and we again use the contiguous border strategy to estimate the impact of individual clauses, so that pair fixed-effects are included in all specifications. We see that individuals in communities that signed treaties with education clauses have notably lower educational attainment than those in communities that did not sign historical treaties. Signing a treaty with an education clause is associated with decreases of 8.7 percentage points in the probability of completing high school and 5.5 percentage points in the probability of completing a post-secondary degree.

Although education clauses are associated with lower levels of contemporary educational attainment, this does not appear to be what is driving the differences in per capita income across communities, as Table B.7 reveals that communities that signed treaties with education clauses do not actually have statistically different levels of income. Further, the coefficient estimate on the education clause indicator in these specifications is positive, suggesting, if anything, the opposite.

Table D.2: Relationship between signing a treaty and distance to nearest residential school

	(1)	(2)	(3)	(4)	(5)	(6)
Signed Historic Treaty	-0.223 (0.234)	-0.192 (0.241)	-0.0114 (0.227)			
Signed Treaty with Education Clause				-0.370 (0.250)	-0.366** (0.165)	-0.321* (0.181)
Historical Controls		X	X		X	X
Province F.E.			X			X
Observations	1134	1134	1134	1134	1134	1134
Adjusted $R^2$	0.007	0.190	0.274	0.017	0.196	0.279

Notes: The dependent variable in all columns is the natural logarithm of the distance (in KM) to the closest residential school. Standard errors clustered by geographic tribe grouping are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$