Impacts of Forestry Consultation and Revenue Sharing Agreements on First Nations community wellbeing: Outcomes in British Columbia

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Contents

I Abstract

In Canada, resource revenue sharing agreements allow provincial governments and First Nations to share in the economic benefits of resource extraction in their asserted traditional territories. Through these agreements, First Nations signatories and the Government of British Columbia jointly acknowledge that the funds generated through revenue sharing agreements are intended to advance the socioeconomic outcomes of their communities ("Ashcroft Indian Band Forest Consultation and Revenue Sharing Agreement", 2014; "Tl'azt'en Nation Forest Consultation and Revenue Sharing Agreement", 2014). This study uses a staggered difference-in-difference model to assess the impact of Forest Consultation and Revenue Sharing Agreements (FCRSAs) on Indigenous Services Canada's Community Wellbeing Index (CWBI) for First Nations communities in British Columbia (BC). Using census and community wellbeing data from 1991-2021, supplemented by provincial data on revenue sharing agreements in BC, this study finds that FCRSAs do not have any impact on community wellbeing outcomes, as measured by the CWBI.

Keywords: First Nations, Forestry, Revenue Sharing Agreements, Staggered Difference-in-Difference, British Columbia

II Introduction

Approximately 95% of the forests in British Columbia (BC) are owned by the Government of BC, who is responsible for the sustainable management of the forests (Ministry of Forests, 2025, p.1). Forestry plays a significant role in BC's economy, with forest products accounting for 24% of BC's total value of export commodities (Ministry of Forests, 2022, p.1). Although forestry provides may provide opportunities for job creation and income generation, First Nations communities have historically been excluded from participating in natural resource industries, despite long-standing connections to their traditional territories, leading to a negative impact on economic and cultural systems (Pun, 2016, p. 543; Nelson et al., 2019, p. 2). Court rulings such as the 1997 *Delgamuukw* decision and the 2004 *Haida* decision affirm Indigenous rights and title with respect to land and resources and also establishes the Crown's duty to consult with First Nations on development projects that may impact their traditional territories (*Haida Nation v British Columbia (Minister of Forests)*, 2004). With significant legal and policy advancement over the last 30 years, one of the ways BC First Nations communities have sought to exercise their rights and title over their traditional territories is through the negotiation and implementation of natural resource revenue sharing agreements.

Despite increasing efforts towards self-determination and economic development, wellbeing indicators among First Nations communities remain on average, lower than non-Indigenous communities, as demonstrated through lower educational attainment (Feir, 2016; Indigenous Services Canada, 2024b), lower median income (Indigenous Services Canada, 2024b), and

lower labour market outcomes ("Indigenous Employment and Skills Strategies in Canada", 2018; Indigenous Services Canada, 2024b). The overall Community Wellbeing Index (CWBI)[1] score (out of 100) for First Nations communities in Canada averages 62.4, compared to an average score of 78.7 for non-Indigenous communities (Indigenous Services Canada, 2024b). This difference in CWBI scores (shown in Figure 1 below)[2] highlights the continued socioeconomic gaps between First Nations and non-First Nations communities. Furthermore, CWBI scores for FCRSA signatories are on average, higher than non-FCRSA signatory First Nations. This observation prompts the following central research question: do the implementation of Forest Revenue Consultation and Revenue Sharing Agreements (FCRSAs) have a positive impact on BC First Nations community wellbeing, as measured by the CWBI?

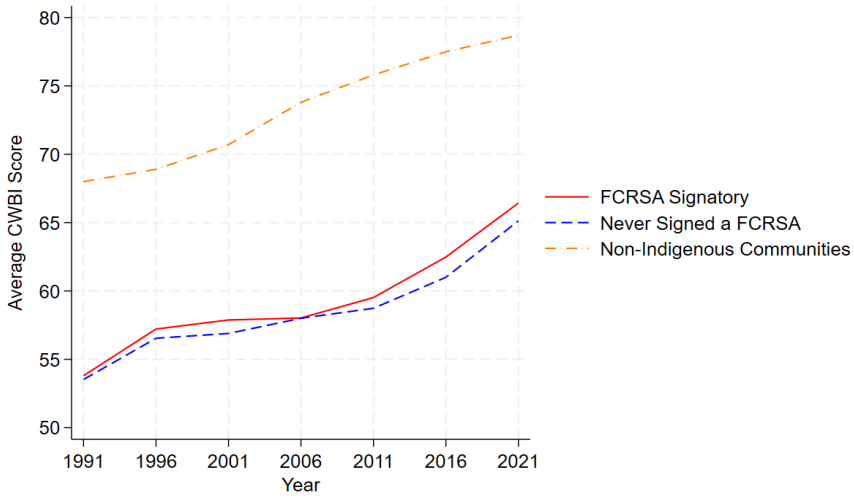

Figure 1: CWBI over time, by FCRSA Signatory Type

[1] A measure of economic wellbeing constructed by Indigenous Services Canada.

[2] CWBI data on FCRSA and non-FCRSA signatories is developed using data from Indigenous Services Canada (2024b) and is based on the sample of CSDs over time (767 observations over 131 BC First Nations). Non-Indigenous community CWBI data is also derived from Indigenous Services Canada (2024b) using the national average due to unavailability of data at the Province-level.

I hypothesize that FCRSA revenues enable First Nations governments to increase spending on socioeconomic programs in areas related the CWBI (income, housing, labour, and education), leading to improvements in the CWBI scores compared to BC First Nations who have never signed an FCRSA. To add to the findings of prior qualitative research on the impact of forestry agreements, I conduct a staggered difference-in-differences (staggered DiD) study using census data on the CWBI, census of population data, and an original dataset for 177 BC First Nations on natural resource revenue sharing agreements.

III Background

I The Acts Governing Forestry Agreements in British Columbia

One of the ways First Nations can gain access to the forestry industry is through the acquisition of forest tenures, which are "legally binding contract[s] that provide the contract holder with specific rights to use public forests over a specific period of time, in exchange for meeting government objectives, including forest management obligations and the payment of fees including stumpage" (Ministry of Forests, 2011, p.2). In 2002, the Provincial government passed the *Forest (First Nations Development) Amendment Act* (2002) (Bill 41), which enabled the Minister of Forests to directly invite applications for various natural resource development licenses in order to implement or further an agreement with First Nations (Ministry of Forests, 2011, p.2). This means that instead of competing in a bidding process to acquire forest tenures, First Nations communities could now bypass the bidding process, reducing barriers to entry

in the natural resource extraction sector. Shortly after the introduction of Bill 41, the *Forest Amendment Act* (2003), or Bill 28, came into force, which reduced 20% of harvesting rights previously allocated to private companies, and reallocated those rights back to the Province (s. 2). The reallocation of harvesting rights created new opportunities for the Province to further distribute these rights through forestry-specific agreements with BC First Nations.

In 2005, following the Supreme Court decision in *Haida* (2004), the Province met with First Nations representatives[3] to co-develop new approaches for consultation and accommodation. The outcome of these meetings was the introduction and implementation of the New Relationship, which established a partnership between the Province and BC First Nations to outline a new vision of co-development, including on matters related to revenue sharing agreements (Ministry of Aboriginal Relations and Reconciliation, n.d.). Through this partnership, BC First Nations committed to "work with government as partners, ... [to] improve economic, social and cultural opportunities for Aboriginal people, involve First Nations in natural resource management, [and] share the benefits from resource-related activities so that First Nations can join in the economic development of British Columbia" (Ministry of Aboriginal Relations and Reconciliation, n.d., p.1). This collaborative framework laid the foundation of co-developing revenue sharing agreements to foster First Nations participation in natural resource sectors.

[3]Participating First Nations bodies include the First Nations Summit, the Union of BC Indian Chiefs, and the BC Assembly of First Nations.

II Court Rulings

Policy regarding the development of forestry agreements with First Nations has been largely shaped by landmark court decisions. In *Calder et al. v. Attorney-General of British Columbia* (1973), the plaintiffs asserted that the Nisga'a Nation still had a standing, unextinguished aboriginal right to the lands that had been seized by the Canadian government (McConville, 2017, p.2). As a result, the *Calder* decision was the first time that the Canadian law recognized aboriginal title to land existed prior to colonization.[4] *Delgamuukw v British Columbia* (1997) reaffirms the existence of Aboriginal title in British Columbia, defining Aboriginal title as the exclusive right of Indigenous peoples to their lands. Additionally, the *Delgamuukw* decision states when dealing with Crown lands, the government "must consult with and may have to compensate First Nations whose rights are affected" (Province of British Columbia, n.d., p.1). The landmark decision in *Haida Nation v British Columbia (Minister of Forests)* (2004) is the first Supreme Court case to formally recognize and affirm the Crown's "duty to consult", establishing that the Crown must engage with First Nations and when required, accommodate First Nations "whenever it proposes a decision or activity that could impact treaty rights or aboriginal rights (including title) - claimed or proven" ("Legal Obligations When Consulting First Nations", 2010, p.3).

Furthermore, the *Tsilhqot'in Nation v. British Columbia* (2014) decision establishes key guidelines that govern FCRSA negotiations. The Court asserted that prevailing forestry legisla-

[4]The decision in *Calder et al. v. Attorney-General of British Columbia* (1973) also sets the stage for the Nisga'a Treaty, the first modern treaty in British Columbia (a Nation who is also signatory to FCRSAs).

tion, including the *Forest Amendment Act* (2003), does not apply to Tsilhqot'in Aboriginal title lands, as the statute specifically pertains to 'Crown timber' (Lawrence, 2015, p.2). While First Nations involvement in the forestry sector is being restored through various mechanisms, such as the expansion of Aboriginal and treaty rights and the resolution of land claims and treaty settlements (First Nations Forestry Program National Council, 2011, slide 11), FCRSAs have become the primary legal arrangements governing the relationship between the Province and First Nations communities.

III Forestry Agreements

Forestry agreements with BC First Nations have shifted in scope and responsibility over time. Early forestry agreements were focused on the awards of forestry tenures, which are the "agreements between a company, a community or an individual and the B.C. government that grant the rights and outlines the conditions (through licences and permits) under which timber is harvested from provincial land" (Ministry of Forests, 2025, para. 3). In accordance with the *BC Forest Act* (1996) and the *Forest Amendment Act* (2003),[5] First Nations may be awarded forest tenures without competition, whether related to interim measures, treaty-related measures, or economic measures agreements (Ministry of Forests, 2011, p.2). Forest tenures with First Nations have been achieved through various agreements, such as Forest and Range Agreements, Forest and Range Opportunity Agreements, and standalone Mountain Pine Beetle

[5]The *BC Forest Act* (1996) is the key piece of legislation governing timber and forest management in BC. Its connection to First Nations has primarily been established through amendments to the *Forest Act* under the *Forest Amendment Act* (2003).

Agreements. However since 2011, FCRSAs have replaced all three of these agreements, and no longer include the direct award of forest tenure opportunities.

One key similarity between the different forestry agreements is that these forestry agreements are all developed bilaterally between the Provincial government and First Nations, as the federal government plays a limited role in the development of forestry agreements. While forestry operations, such as timber harvesting, are permitted on some federal lands,[6], federal lands account for less than 5% of the forested lands in BC and contribute only a small share of the timber supply (Natural Resources Canada, 2015).

The key distinction between FCRSAs and forest tenure agreements[7] is the party responsible for owning and managing forestry operations on the allocated lands. Forest and Range Agreements, Forest and Range Opportunity Agreements, and Mountain Pine Beetle Agreements directly award forest tenure opportunities to First Nations, meaning that the First Nation is responsible for carrying out forest harvesting responsibilities (Ministry of Forests, 2011, p.2). Contrastingly, FCRSAs do not award direct tenure opportunities and instead provide First Nations with a share of the revenue of forestry operations carried out by other organizations in their asserted traditional territory. Although forest tenure agreements provide the opportunity for direct management of resources, FCRSAs offer stable revenue streams without requiring First Nations to develop and maintain their own forest operations. Consequently, revenues generated

[6]Federal laws that may apply to federal lands include *the Forestry Act, Timber Regulations, the Indian Act, the First Nations Land Management Act*, and *the National Parks Act*.

[7]There are a variety of tenure agreements which directly award forest tenure to private companies, communities, and First Nations, such as First Nation Woodland Licence, Community Forestry Agreements, and Replaceable Forest Licenses. For the purposes of this paper, distinguishing and defining each agreement is not necessary.

from forestry can be allocated to other initiatives,[8] including efforts to improve socioeconomic outcomes on-reserve. These additional FCRSAs revenues can then be invested into socioeconomic initiatives on-reserve. As a result, I would expect that the CWBI for FCRSA signatories would increase relative to First Nations who have never signed an FCRSA.

Commitments to closing the socioeconomic gap are further reflected in the language found in the preambles of several FCRSAs, which emphasize the goal of using FCRSA revenues to reduce the disparities between First Nations and non-First Nations communities:

> "This Agreement, and the benefits flowing from it, will assist the Ashcroft Indian Band in achieving progress towards the goals referred to in the previous recitals and in particular help to address the conditions that contribute to economic challenges among Aboriginal people and to ensure that they can more fully benefit from and contribute to British Columbia's prosperity" (Ashcroft Indian Band Forest Consultation and Revenue Sharing Agreement, 2014, para. C).

> "In the spirit of the New Relationship and the Transformative Change Accord, British Columbia and the Tl'azt'en Nation have undertaken a shared commitment to strengthening relationships on a government-to-government basis, and on focusing efforts to close the socio-economic gaps between Aboriginal and non-Aboriginal people" (Tl'azt'en Nation Forest Consultation and Revenue Sharing Agreement, 2014, para. C).

[8] Pun (2016), discusses how managing forest harvesting directly can pose additional barriers to First Nations through high start-up costs and a limited labour force, and can inherently prevent First Nations from seeking authority over forestry.

Although the Province and First Nations share an interest in closing socioeconomic gaps, little quantitative research has been done to address whether the implementation of FCRSAs do have a positive impact on socioeconomic outcomes, relative to BC First Nations who have never implemented FCRSAs. For example, consultations with First Nations have indicated otherwise. In consultations with Tl'azt'en members, Pun (2016) notes that "specific to several provisions of tenure agreements, such as a short-term-based agreement, inadequate timber volume allocation and per capita-based revenue and benefits sharing opportunities, the Tl'azt'en Nation was prevented from achieving their intended socioeconomic objectives" (p. 552). This research aims to explore whether FCRSAs do in fact, have an impact on closing socioeconomic gaps, as measured by the CWBI.

IV Literature Review

Existing literature examines the impact of modern treaties and self-government agreements on Indigenous incomes in Canada. Aragón (2015) investigates the relationship between Indigenous household incomes and legal agreements between Indian Act Bands and the Government of Canada. Using census data from 1991 to 2006, Aragón (2015) demonstrates that Comprehensive Land Claim Agreements (CLCAs) across British Columbia, Yukon, and the Northwest Territories resulted in increased incomes within communities that implemented CLCAs. Given the limited geogrpahic scope of Aragón's (2015) study, Pendakur and Pendakur (2018) extend this research to explore the impacts of other agreements across Canada, such as Sec-

toral Self-Government Agreements, the First Nations Land Management Act (FNLMA), and the First Nations Financial Management Act. In addition to the 1991-2006 census data, Pendakur and Pendakur (2018) also use data from the 2011 National Household Survey[9] to explore how household income varies across Indigenous communities with and without self-government agreements.

In terms of natural resources and First Nations, Keay and Metcalf (2004) examine the economic foundations of conservation decisions made in the Canadian court system's "cautious approach to recognizing Aboriginal rights guaranteeing access to natural resources" (p. 1). Using economic models, including Cournot, Social Planner, and Open Access solutions, Keay and Metcalf (2004) suggest that regulatory frameworks play crucial roles in natural resource industries, and highlight the importance of incorporating understanding of the cultural differences into these industries.

The quantitative literature on revenue sharing agreements in Canada remains limited. Keay and Metcalf (2021) assess the impacts of landmark Supreme Court decisions relating to Indigenous rights and title on the valuation of natural resource firms in Canada. Through an event-study approach, the authors find economically and statistically significant impacts of these landmark cases on the valuation of natural resource firms trading on the Toronto Stock Exchange (TSX). Earlier Supreme Court of Canada decisions, including *Delgamuukw*, were estimated to have economically and statistically significant negative returns on the TSX due to increased costs faced by firms as a result of disruptions to existing resource rights. On the other hand,

[9]In 2011, information previously collected by the mandatory long-form census questionnaire is collected as part of the voluntary National Household Survey (NHS)(Statistics Canada).

more recent court decisions were viewed positively because they reduced uncertainty over rights and consultation processes, and were reflected by increases to the valuation of natural resource firms traded on the TSX.

The qualitative research on natural resource revenue sharing is larger than its quantitative counterpart. Atleo (2023) research uses an Indigenous perspective to assess the recognition of Indigenous law and governance systems within natural resource revenue sharing agreements. The paper explores the opportunities to maintain traditional systems with nonmarket valuation within natural resource management.[10] Atleo (2023) finds that these agreements reveal limited recognition of Indigenous law and traditional governance systems and lack integration of nonmarket valuation methods. Additionally, Bayarsaikhan's (2019) study on mining revenue sharing agreements assesses the characteristics of financial provisions within mining revenue sharing agreements and the opportunities or challenges of implementing these agreements with First Nations. This qualitative study uses semi-structured interviews to collect specific indicators and assess similarities and differences in perspectives to assess good practices and challenges associated with revenue sharing agreements. Bayarsaikhan (2019) finds that mining revenue sharing agreements create an opportunity to provide significant funding sources for Indigenous communities, however, is hindered due to the lack of clear determination of the roles and responsibilities of the First Nations and the Province within these agreements.

Similar to Bayarsaikhan's article, Pun (2016) also examines the implications and limitations of First Nations forestry negotiations in British Columbia through a case study of Tl'azt'en

[10]Nonmarket valuation is an economic approach that provides a method for placing a monetary value on invaluable goods and services (Atleo, 2023).

Nation in northern British Columbia. Through semi-structured interviews with members of Tl'azt'en First Nation, a signatory to numerous forestry agreements in British Columbia, Pun (2016) found that not only did the rigidity and complicated nature of Forest and Range Agreements interfere with the First Nation's holistic approach to resource management, but that due to the "inadequate timber volume allocation and per capita based revenue and benefits sharing opportunities [of Forest and Range Agreements], the Tl'azt'en Nation was prevented from achieving their intended socio economic objectives" (p. 552). Both Bayarsaikhan (2019) and Pun (2016) determine that a lack of clear scop of responsibilities and meaningful policy co-development with First Nations limits the effectiveness of both revenue sharing and non-revenue sharing natural resource agreements.

Within the global context, this research contributes to a broader body of literature examining the intersections of natural resource extraction and economic development. Steinberg (2019) assesses why certain regions in Africa experience protest in response to resource development projects, such as mines. The emergence of corporate social responsibility (CSR) in the 1980s sought to establish a "set of quasi-voluntary behaviors funded through discretionary budget allocations by firms to support the procurement of a social license to operate – often known as "beyond compliance" with host country regulatory regimes" (Steinberg, 2019, p.13). Similarly, Pinheiro et al. (2023) examines the impact of corporate governance mechanisms on CSR in Latin America. Using a fixed effects regression methodology with panel data from 2015-2020 for 371 companies in Latin America, Pinheiro et al. (2023) find that factors such as improved

national governance[11] and other internal factors,[12] contribute to greater social responsibility and environmental risk management - findings that align with the patterns observed by Steinberg (2019) in Africa.

This global discourse intersects with calls on the Canadian federal government, provincial governments, and the corporate sector to improve their CSR commitments to Indigenous peoples in Canada. Section 92 of the Truth and Reconciliation Commission of Canada (2015) Calls to Action highlights the need for stronger CSR policies in corporate Canada in order to conduct meaningful consultation, ensure equitable access to jobs and training, and provide education on the history of Aboriginal peoples.

This research seeks to address a significant gap in the quantitative literature on natural resource revenue sharing agreements and their impacts on socioeconomic outcomes in Canada. While the research from Atleo (2023) and Bayarsaikhan (2019) focus on the clarification of roles within revenue sharing agreements rather than the direct impact on First Nations communities, this paper seeks to evaluate whether CWBI indicators improve among FCRSA signatory First Nations in comparison to non-FCRSA signatory First Nations.

[11] In Pinheiro et al. (2023), national governance is measured through corruption control, government efficiency, and rule of law.

[12] Factors including increased independence of audit committees, independence of boards, and higher presence of women occupying board positions all have positive and statistically significant relationships on CSR.

V Methods

I Data Sources

The empirical analysis portion of this paper draws data from multiple sources. The initial dataset was derived from the dataset used in Aragón and Kessler (2021).[13] In terms of institutional agreements between the Province and First Nations, I collected information on five different kinds of agreements, including the nature of the agreements and the date of the first agreement in each respective sector. This data was collected manually through the Government of British Columbia's First Nations A-Z Database, and covers the five following agreements:[14]

1. Forest Consultation and Revenue Sharing Agreements
2. Tenure agreements (Forest and Range Agreements, Forest and Range Opportunity Agreements)
3. Mountain Pine Beetle Agreements
4. Clean Energy Business Fund Agreements
5. Liquefied Natural Gas Revenue Sharing Agreements

While revenue sharing agreements exist in other provinces, I have opted to limit this research to the BC context for several reasons. First, there are 203 First Nations communities in BC,

[13] Aragon and Kessler's (2021) study examines the role of custom electoral systems in First Nations' local policies and on-reserve living conditions, and includes data from the *First Nations Financial Transparency Act*, water and wastewater risk indices, and Canadian Census data.

[14] see: "First Nations A-Z Listing. Government of British Columbia". Province of BC, https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/first-nations-a-z-listing

representing more than a third of all First Nations communities in Canada. (Crown-Indigenous Relations and Northern Affairs, 2008) Additionally, much of the existing literature on revenue sharing agreements is also limited to the BC context. Limiting the research to the BC context still offers a sufficient sample size for the staggered DiD design and facilitates more direct connections between the qualitative and quantitative analyses of this paper. This sample choice also aims to make FCRSA and non-FCRSAs more comparable. By restricting the model to First Nations only in BC, all sample First Nations that implement FCRSAs are subject to the same FCRSA policy and funding frameworks, while all First Nations, including non-FCRSA signatories, remain eligible for the same provincial policy frameworks.

Indicator variables for each of the five institutional agreements, along with the variables for the dates each agreement was entered into, were created manually for each type of agreement in the dataset. These variables were later converted to panel data consistent with census observation periods. For my dependent variables of interest, I use data from the CWBI, derived from Statistic Canada's Census of Population and the National Household Survey (Indigenous Services Canada, 2024a) over the same time periods as the 1991, 1996, 2001, 2006, 2011, 2016, and 2021 public-use census data. The overall CWBI score for a community is divided into four components: education, income, labour force activity, and housing.[15]

Through this data collection process, I identified 177 First Nations through the Govern-

[15]The Education CWBI score is based on the proportion of community residents aged 20 years and over with at least a high school education and the proportion of those aged 25 and over with a university degree. Labour force activity uses the proportion of community residents (aged 20 to 64) participating in the labour force and the proportion of labour force participants (aged 20 to 64) who are employed. Income is calculated based on a community's total income per capita, and Housing is based on the share of community residents living in homes that do not require major repairs (Indigenous Services Canada, 2024a).

ment of BC's First Nations directory. Other variables were also collected from seven rounds of the Canadian Census public-use data files. This data included population statistics, such as population on reserve, population density per square kilometre, and total private dwellings on reserve. As the dataset from Aragón and Kessler (2021) only included census periods up to 2016, data on Modern Treaties was updated via Crown-Indigenous Affairs and Northern Development Canada's public-use data on Modern Treaty Signatories.[16] Census data is aggregated at the Census Subdivision (CSD) level, which "is the general term for municipalities (as determined by provincial/territorial legislation) or areas treated as municipal equivalents for statistical purposes (e.g., Indian reserves, Indian settlements and unorganized territories)" (Statistics Canada, 2021). While the majority of the dataset is collected at the CSD level, provincial data on institutional agreements was collected at the band level.[17]

II Data Merging

In order to create panel data over the period of study and ensure proper matching between CSDs and band numbers, the dataset only includes CSDs that have not changed over time. Therefore, the number of CSDs associated with any given revenue sharing agreement remains constant. As noted above, CSDs are classified as 'municipal equivalents' for First Nations reserves and do not directly correspond to band numbers, meaning multiple CSDs may belong to a single band number. To match band-level data to the CSD-level data, I use the geographic link-

[16] No new modern treaties were entered into in British Columbia post-2016 [the last observation date in Aragón and Kessler (2021)], so no additional dataset was required to update the Modern Treaty variable.

[17] 'Band' refers to bands under the *Indian Act*, who are given a unique three-digit identifier to identify bands and self-governing First Nations (Crown-Indigenous Relations and Northern Affairs Canada, 2025).

age chart from Aragón and Kessler (2021) to match CSDs to bands. Census data on population was collected by CSD name (as opposed to CSD number) and was linked to its corresponding CSD number via Statistic Canada's (2022) CSD Translator from the 2021 Census Geosuite data package.[18] For clarity, I will use community and First Nations to explain the results, as bands and CSDs are interchangeable for the purposes of this paper. Since FCRSAs are typically negotiated at the band level, all CSDs linked to a band with an FCRSA will be considered 'treated'.

Information on FCRSA implementation was collected on a yearly frequency, whereas census data is collected in five-year intervals. In order to align timing on the model, I generate a time index variable ranging for each of the seven Census periods $(t_1, ..., t_7)$. FCRSA signatories were then categorized into each of the following time indexes, starting between the 2006 and 2011 Census periods (t_5), based on the date of their FCRSA:

1. **Group 1 (FCRSA Index = 5:** Signed FCRSAs in 2008, 2009, 2010
2. **Group 2 (FCRSA Index = 6:** Signed FCRSAs in 2011, 2012, 2013, 2014, 2015
3. **Group 3 (FCRSA Index = 7:** Signed FCRSAs in 2016, 2017, 2018, 2019, 2020

Signatories who signed FCRSAs[19] in 2021 were also dropped from the sample, as the agree-

[18] Statistics Canada's (2021) Geosuite dataset can be accessed here: https://www12.statcan.gc.ca/census-recensement/2021/geo/aip-pia/geosuite/index2021-eng.cfm

[19] Two $(n = 2)$ FCRSAs signatories where their FCRSAs were first implemented in 2021 were dropped from the sample. No other agreements were signed in 2021 and therefore do not require further treatment.

ment may have been implemented after census data collection.

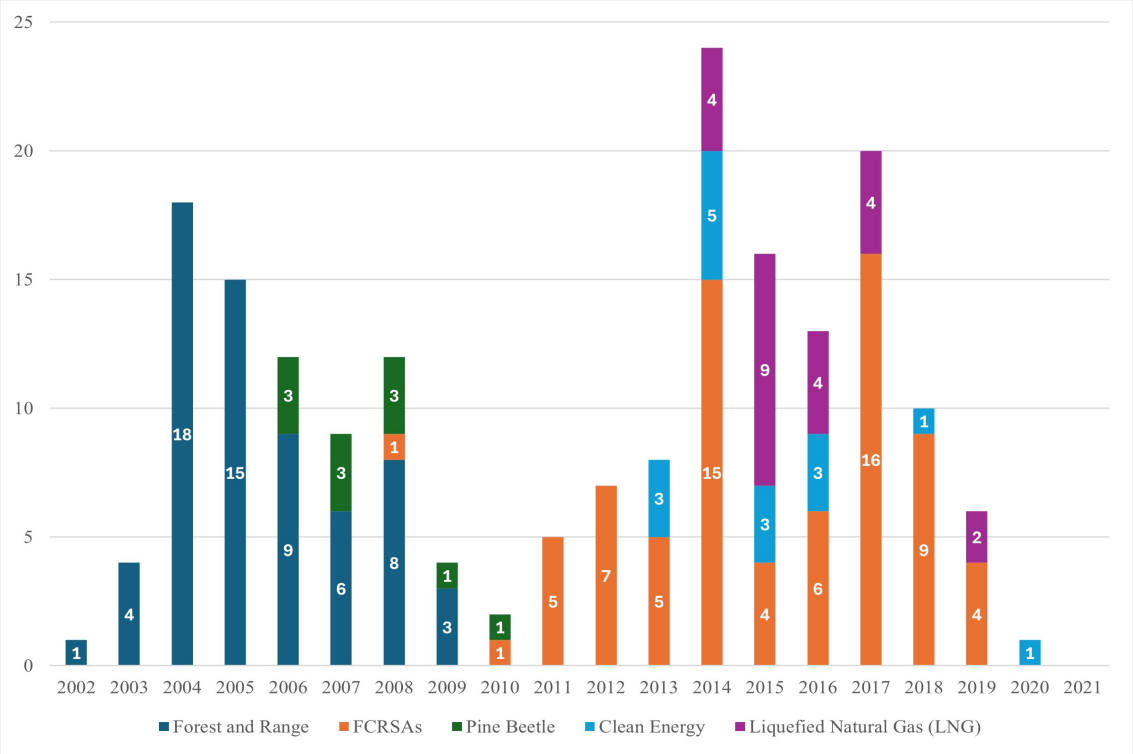

Figure 2: Number of Signed Agreements from 2002-2021, by Agreement Type

From the completed dataset, I built a panel dataset examining a sample of 131 First Nations in BC over 1991, 1996, 2001, 2006, 2011, 2016, and 2021 Census periods, where the CSD identifier did not change over time. As shown in Figure 2, the share of FCRSA signatories has grown significantly over the last 15 years. The first Forest and Range Opportunity Agreement (FRA) was signed in 2002 following the introduction Bill 41, and the last Agreement was signed in 2009. Between 2006 and 2010, 11 Pine Beetle Agreements also came into force. The first FCRSA was signed in 2008, although the majority of FCRSAs were initially completed between 2014 and 2019. This is also the time period where other kinds of revenue

sharing agreements such as Clean Energy Revenue Sharing Agreements and Liquefied Natural Gas (LNG) Agreements have been introduced.[20] I incorporate these additional revenue sharing agreements as control variables throughout my models to account for their potential influence.

III Descriptive Statistics

Table 1 shows descriptive statistics for the CSD-level census, National Household Survey[21], and revenue sharing data. The table presents sample means and percentage shares for all dependent variables and control variables in the sample. I have split the table into two sections to provide sample characteristics for both FCRSA and non-FCRSA signatories. In this framework, FCRSA signatories are the 'treated' group whereas First Nations who have never signed an FCRSA are the 'never-treated' group. Although certain characteristics remain consistent between the two groups, there are certain some key differences. Specifically, FCRSA signatories, on average, demonstrate lower education and housing CWBI scores. Other institutional agreements, such as Clean Energy and FRAs, were implemented earlier than non-FCRSA signatory First Nations. While FCRSA-signatory communities have a higher population, their population density per kilometre is lower than non-signatories. This signals that FCRSA-signatory communities are larger in size and more geographically remote than non-FCRSA signatories. Based on the average dates for FRAs and Clean Energy agreements, FCRSA-signatories tend to implement new kinds of institutional agreements before non-FCRSA signatories. LNG agreements,

[20] Petroleum Natural Gas Agreements are also revenue sharing agreements between the Province of BC and First Nations. They are not included in this model due to the limited amount of agreements.

[21] Information collected previously through the mandatory long-form census was collected through the voluntary National Household Survey in 2011.

on average, have also been signed earlier in non-FCRSA communities, however the sample size of LNG agreement holders is small.

Table 1: Descriptive Statistics of BC First Nations, by FCRSA Signatory

	No FCRSA	**Signed an FCRSA**	**Total**
N	184 (24.0%)	583 (76.0%)	767 (100.0%)
N (by CSD)	32 (24.0%)	99 (76.0%)	131 (100.0%)
Community Well-Being Index (CWBI)	58.625 (10.085)	59.511 (9.413)	59.299 (9.579)
Labor Force Score	70.899 (9.388)	71.526 (9.163)	71.383 (9.205)
Housing Score	80.329 (11.910)	79.188 (11.731)	79.449 (11.765)
Education Score	42.063 (13.822)	38.643 (13.698)	39.426 (13.781)
Income Score	57.582 (16.047)	55.023 (13.023)	55.609 (13.791)
Forest and Range Agreements	10 (1.3%)	105 (13.7%)	115 (15.0%)
Date of Forest and Range Agreement	2007 (1.857)	2005 (1.585)	2005 (1.679)
Liquefied Natural Gas Agreement (LNG)	6 (0.8%)	49 (6.4%)	55 (7.2%)
Date of LNG Agreement	2015 (0.000)	2016 (2.237)	2016 (2.169)
Clean Energy Agreement	4 (0.5%)	37 (4.8%)	41 (5.3%)
Date of Clean Energy Agreement	2018 (1.871)	2014 (1.084)	2015 (1.764)
Pine Beetle Agreement	6 (0.8%)	17 (2.2%)	23 (3.0%)
Date of Pine Beetle Agreement	2008 (0.797)	2007 (1.181)	2007 (1.117)
Modern Treaty Signatory	13 (1.7%)	32 (4.2%)	45 (5.9%)
KM from Closest City	73.917 (58.279)	71.061 (71.670)	71.753 (68.637)
Total Population	410.832 (463.401)	439.654 (768.388)	432.739 (707.142)
Population Density per KM	55.023 (275.641)	51.871 (249.195)	52.601 (255.376)

Notes: Standard deviations are shown (in parentheses) for CWBI scores, dates, population, and geographic variables. Statistics for other institutional agreements (LNG, Clean Energy, Pine Beetle, Modern Treaties) indicate the frequency with which the dummy variable indicates that a CSD has been 'treated' over the observed time periods. Figures in parentheses for these frequencies indicate the percentage share of total observations.

VI Model

The core identification strategy for this study is a staggered DiD using CSD-level panel data to determine whether there is causality between the implementation of FCRSAs and the community wellbeing outcomes, as measured by the CWBI. One possible theory as to why this causal relationship may exist is that FCRSA revenues enable First Nations governments to increase spending in areas related to the subcomponents of the CWBI (income, housing, labour, and education), ultimately leading to improvements in the CWBI scores.

For this study, I have opted to use a staggered DiD approach to account for staggered FCRSA adoption and heterogeneous treatment effects.[22] In the case of FCRSAs, agreements were rolled out on a staggered basis as First Nations opt-in to negotiations with the Provincial government. Alternative models, such as a Two-Way Fixed Effects model (TWFE), may exhibit bias even with random parallel trends due to variation in treatment timing and heterogeneous treatment effects across treatment cohorts over time.[23] Furthermore, TWFE dynamic effect estimations, also called event-study designs, cannot resolve the issue of heterogeneous treatment effects(Sun & Abraham, 2021). Therefore, a staggered DiD design is suitable for this study.

Data used in this model will include census data and CWBI indicators from Statistics

[22]Revenues generated through an FCRSA are based on a percentage of overall forestry revenues from forestry operations occurring on the traditional territory of the First Nation signatory. As a result, this means that each FCRSA signatory receives a different funding amount subject to the forestry operations occurring in a given time period, thus exhibiting heterogeneous treatment.

[23]A TWFE model exploits all 2x2 DiD comparisons, (say 'treated' vs 'never-treated', early-treated vs. later-treated, and later-treated vs. already-treated). However, OLS weights use the sample size and variance to determine the estimated coefficient. This makes the OLS coefficients of the TWFE model difficult to interpret a causal parameter of interest (Sun & Abraham, 2021; Goodman-Bacon, 2021; Callaway & Sant'Anna, 2021).

Canada,[24] as well as a dummy variable for whether a First Nation in BC has signed an FCRSA with the Province. Agreements vary at the community-level and over time. Additional controls, including other revenue sharing agreements such as Clean Energy and LNG Agreements, are implemented to mitigate confounding impacts related to other natural resource revenues.

I have also chosen to control for Mountain Pine Beetle Agreements, even though the last signed Mountain Pine Beetle agreement was implemented prior to the introduction of FCRSAs, as the duration of these agreements coincides with the introduction of the FCRSAs. Similar rationale can also be applied to FRAs, as these agreements serve as the predecessor to FCRSAs. I also control for modern treaties as they "often include greater land settlements than do historical treaties, and can also include additional access to timber rights" (Booth & Skelton, 2011, p.370). This model also controls for factors related to changes in population to ensure that variations in the CWBI are not associated with fluctuations in population size. Employing a staggered DiD approach controls for differences across communities that are fixed over time and time leads in the CWBI, which are common across all First Nations CSDs in BC.

Let $i = 1, \ldots, N$ index all of the CSD numbers of First Nations in BC. Let $s = 1, \ldots, S$ denote the indexation of groups who have entered into FCRSAs over the same period. Let $t = 1991, 1996, 2001, 2006, 2011, 2016,$ and 2021 be the time periods for each census year, where no one is treated in t_1. Let C be a binary variable that is equal to one for CSDs that do not sign FCRSAs in any time period (the control group). Finally, let A_s represent the calendar period when units in group s are first exposed to treatment. In this study, A_s represents defines

[24] Ideally, this data would include census microdata, but may be omitted given limited access and the time constraints of this project. If using census microdata, I would include a richer set of time-varying covariates.

four groups in FCRSA index periods 5, 6, 7 and ∞ (never treated).

As a result, I run regressions of the form:

$$Y_{ist} = \alpha + \sum \beta_s D_{ist} + \gamma X_{it} + \phi + \tau + \epsilon_{it} \tag{1}$$

Where,

- Y_{ist} is the outcome variable, the CWBI, by CSD i in group s at time t
- D_{ist} is an indicator for whether CSD i was treated by an FCRSA in group s at time t
- X_{it} are time-varying controls (introduction of other institutional agreements, modern treaty signatories)
- β_s is the DiD estimator of the causal effect of FCRSAs on the CWBI
- ϕ_i denotes CSD fixed effects
- τ_t denotes time-fixed controls
- ϵ_{it} is noise, capturing unobserved factors

To estimate this model, I use the Callaway and Sant'Anna (2021) csdid package. As the treatment regressors are binary, the coefficient β produces the average treatment effect on the treated (ATT) of the treatment variable (FCRSA) 'switching-on'. Given missing data on the CWBI, the constructed panel dataset is unbalanced. While Callaway and Sant'Anna (2021) csdid package does allow for unbalanced panel data, I have also implemented doubly robust

inverse probability weighting into the staggered DiD model. Sant'Anna and Zhao (2020) discuss two main flexible procedures to estimate the ATT: the outcome regression approach and the inverse probability weighting approach. In this application, double robustness means that the resulting estimand identifies the ATT even if one of either the propensity score model or the outcome regression models are misspecified. Employing a doubly robust methodology here offers a more robust methodology to avoid model misspecification, as opposed to using either outcome regression or the propensity score model. This approach also introduces a semiparametric method, providing flexibility in modeling the causal relationship of FCRSAs and the CWBI.[25]

Consistent with the staggered DiD model used in Callaway and Sant'Anna (2021), the adoption of a staggered DiD design requires various assumptions, including:

1. **Irreversibility of Treatment:** Let D_{ist} be a binary variable equal to one if community i in group s is treated in time period t, and zero otherwise. Staggered DiD requires that the model assumes irreversibility for any treatment variable $D_{t-1} = 1$, then $D_t = 1$. Similar to the standard DiD model, assumption 1 indicates that no one is treated in the first time period. In this case, this means that once a CSD enters into an FCRSA, that CSD will remain as part of the group receiving treatment. To confirm that the model aligns to the

[25]Parametric models (such as a linear regression) introduce strict functional form, whereas a semiparametric model allows certain parts of the model to remain unspecified, allowing for more flexibility with available data. On the other hand, semiparametric models reduce the risk of the 'curse of dimensionality' associated with nonparametric models. Further analysis of semiparametric models is outside the scope of this paper, but is further discussed in Abadie (2005).

assumptions above, one First Nation[26] was dropped from the sample as they had fallen out of an FCRSA.

2. **Exogeneity of Treatment:** Staggered DiD adoption requires that treatment is randomly implemented over time. This assumption holds in this model as implementation of an FCRSA is contingent on reaching consensus on a final agreement, and seeking approvals through each Party's respective approval processes.[27] Unlike other institutional agreements such as modern treaties, FCRSAs provide revenues that are not mandated towards the improvement of community wellbeing indicators (education, labour, or housing) and instead may be spent on other matters such as governance.

3. **No Anticipation:** This assumption restricts the anticipation of treatment for all "eventually-treated groups", which are First Nations who have not yet signed FCRSAs, where:

$$E[Y_{ist}(a) - Y_{ist}(0)|A_s = a] = 0 \tag{2}$$

for periods where $t < c$. As the implementation of revenue sharing agreements are based on several factors, including completion of negotiations and internal approval processes through the Provincial government and the First

[26]Nooaitch First Nation (Band Number 699) was dropped from the sample due to an expired FCRSA.

[27]Fiscal transfers and other awards are subject to Parliamentary Appropriations within the Provincial Government.

Nations government, anticipation of treatment is considered to be negligible.

4. **Parallel Trends:** In the absence of treatment, the average untreated potential outcomes for the 'treated' group and the 'never-treated' group follow parallel paths. In the case where:

$$E[Y_{ist}(0) - Y_{ist-1}(0)|X, A_s = 1] = E[Y_{ist}(0) - Y_{ist-1}(0)|X, C = 1] \quad (3)$$

5. **No Confounding Events:** In order to mitigate bias from confounding events during the observation period, controls for modern treaties and other forms of revenue sharing agreements are applied to mitigate the impact of other institutional agreements on community wellbeing outcomes.

In the staggered DiD framework, First Nations who have never signed an FCRSA serve as the counterfactual group in this model. This includes First Nations that may have signed an FRA or have not signed any forestry agreement at all. Since FRAs do not involve direct revenue sharing but instead provide access to forest tenure opportunities and consultation mechanisms, using non-FCRSA signatories as the control group allows for a comparison that isolates the impact of revenue sharing agreements. However, FRAs and Pine Beetle Agreements still offer economic benefits through timber harvesting rights, and may partially influence socioeconomic outcomes, which is why I have included controls for FRAs and Pine Beetle Agreements.

VII Results

I Main Regression Analysis

Figure 3 presents the results of the csdid model, illustrating the impact of FCRSAs on the CWBI across different FCRSA entry groups. Figure 3 illustrates no discernible treatment effect, as evidenced by the absence of statistically significant coefficients, suggesting that there are no notable trends in CWBI outcomes across the observed communities. The pre-treatment coefficients $(t = -4, t = -3, t = -2, t = -1)$ in all three FCRSA entry groups are insignificant and small in size, suggesting that the estimations for all implementing groups do not violate the parallel trends assumption. The pre-treatment coefficient in the period prior to treatment for Group 7 does show as statistically significant, however seems to be an outlier. Given this increase is only observed in one period, I would not consider this result as violating the parallel trends assumption. Overall, I fail to reject the null hypothesis that the FCRSAs have no impact on First Nations community wellbeing, as measured by the CWBI score.

Figure 4 below shows the aggregated event study of the ATT among all groups, and also demonstrates no discernible impact of implementing an FCRSA in the time period immediately following the implementation date.

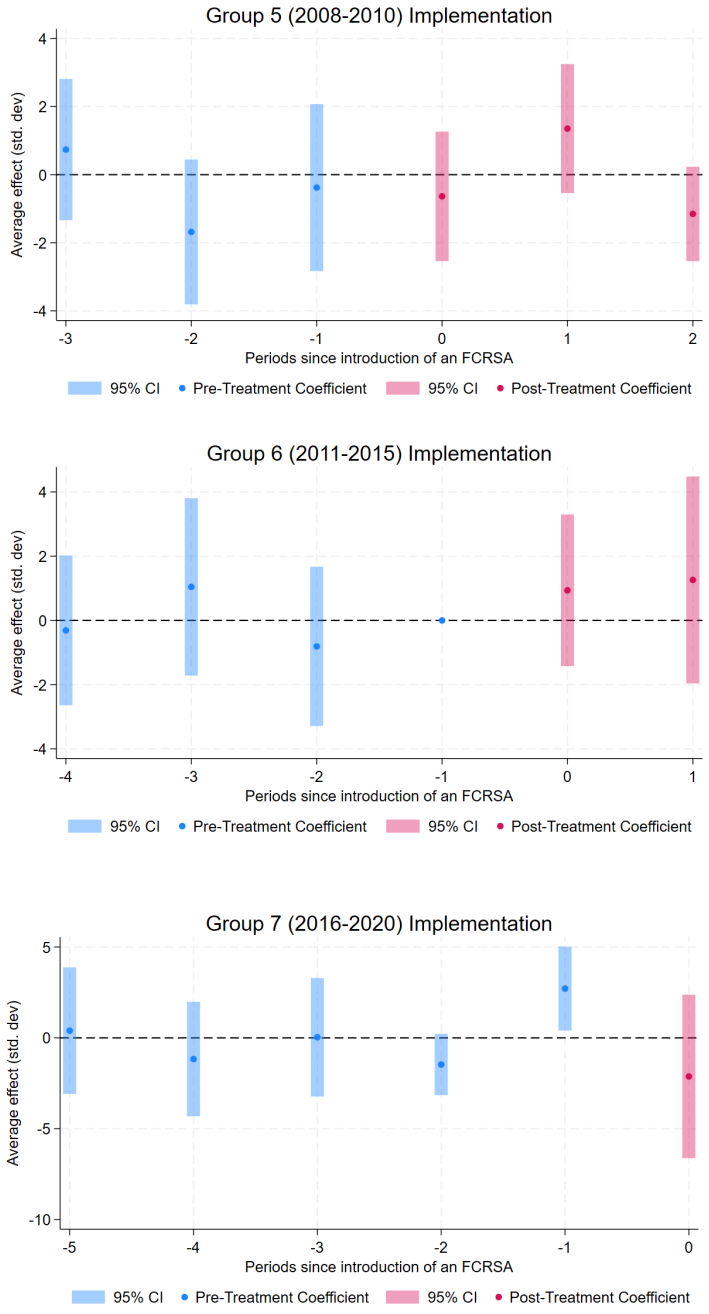

Figure 3: CSDID results of the impacts of FCRSAs on the CWBI (separated by FCRSA entry group). The dependent variable of interest is the CWBI. The time variable is the time index. The bars represent 95 percent confidence intervals. Standard errors are clustered at the CSD level to account for serial correlation in the CWBI within CSDs over time.

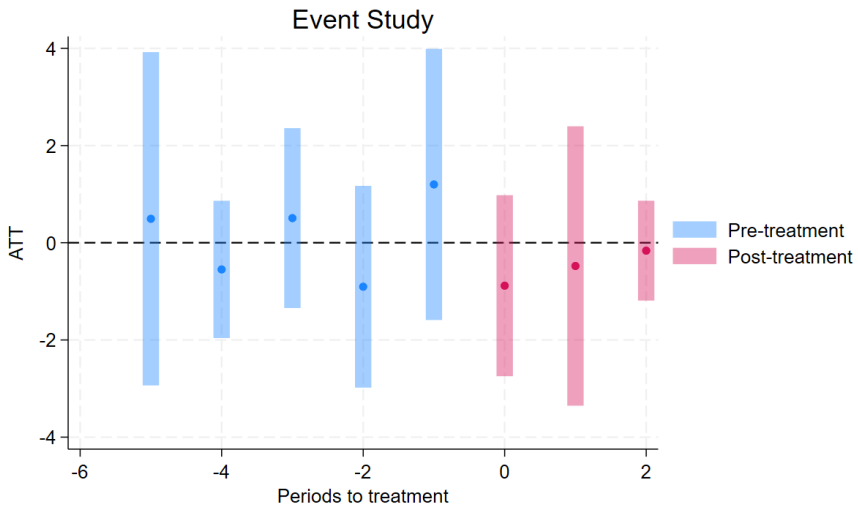

Figure 4: Aggregated event study of the ATT among all FCRSA signatories. The dependent variable of interest is the CWBI. The time variable is the time index. The bars represent 95 percent confidence intervals. Standard errors are clustered at the CSD level.

VIII Robustness Checks

I Using Forest and Range Agreements as the Treatment Variable

To further assess the impact of forestry agreements on the CWBI, I also evaluate the staggered DiD model in the case of using FCRSA's predecessor, Forest and Range Agreements (FRAs) as the treatment variable. In contrast to FCRSAs, where revenue is directly shared with the First Nations community, FRAs give direct benefit to the First Nation to manage their own forestry through the acquisition of tenures. Forest tenures are agreements between a company, community, individual and the Province that outlines the conditions of timber harvesting on provincial land (Ministry of Forests, 2025). As a result, some funding is provided for the negotiation of these agreements, but not for the resources itself. By implementing the same model

as above but replacing FCRSAs as the treatment variable with FRAs can help to further assess the impacts of forestry agreements on First Nations community wellbeing. While FRAs do not provide direct funding for forestry resources, the hypothesis is similar to the hypothesis under FCRSAs: generating new forestry revenues drives First Nations government spending on socioeconomic programs and economic opportunities for First Nations individuals through labour market outcomes and education, thus resulting in increases to the CWBI.

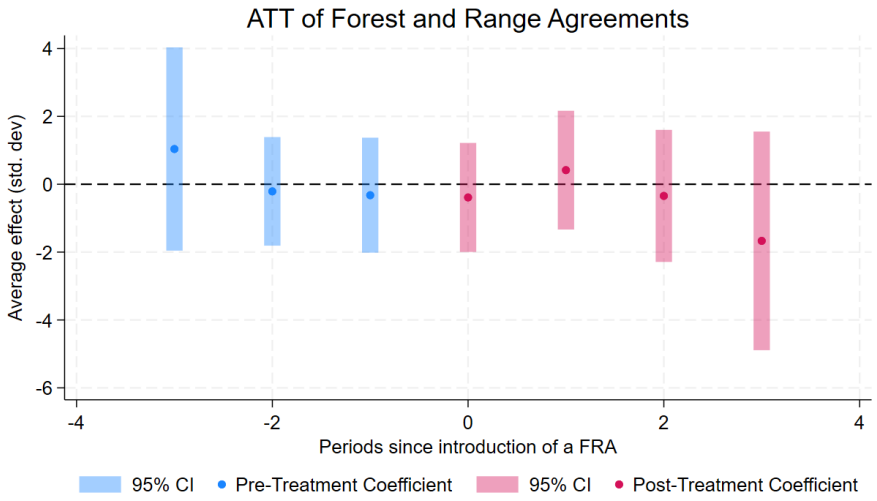

Figure 5: Aggregated event study of Forest and Range Agreements on CWBI over time. The sample size has been reduced $n = 719$ due to missing values (listwise deletion). The dependent variable of interest is the CWBI. The time variable is the time index. The bars represent 95 percent confidence intervals. Standard errors are clustered at the CSD level.

Using the same model outlined in equation (1) as above, I swap FCRSAs with FRAs as the treatment, and control for the FCRSAs as the implementation of FRAs and FCRSAs overlap. A new FRA index was created where communities who signed FRAs from 2002-2006, are assigned to Group 1 (FRA Index=4), and those who signed post 2008 (up until the last FRA in 2011) are assigned to group 2 (FRA Index=5). Figure 5 shows the event study of the FRAs on

community wellbeing. Similar to the figures above, the pre-treatment coefficients ($t = -3, t = -2, t = -1$) for FRAs are insignificant, suggesting that the estimations do not violate the parallel trends assumption. Additionally, Figure 5 shows that the implementation of FRAs also do not have a statistically significant impact on the community wellbeing of First Nations.

II Two-Way Fixed Effects

To introduce additional robustness into this study, I am also adopting a TWFE model to assess the aggregated ATT of FCRSAs on the CWBI. TWFE models include fixed effects at the individual level (in this case, CSDs) over time to control for unobserved heterogeneity across CSDs and time to isolate the effect of the treatment on the dependent variable (CWBI). Using the same sample of 131 First Nations, the following panel regression was utilized to estimate the impact of FCRSAs on the CWBI by leveraging the timing of FCRSA implementation at the CSD level:

$$Y_{it} = \alpha_i + \beta D_{it} + \gamma X_{i_t} + \tau_t + \epsilon_{it} \tag{4}$$

where Y_{it} is the dependent variable (CWBI) for each group s (treated or never treated) in time t. The FCRSA entry variable D_{it} is a binary variable for indicating whether an FCRSA was implemented in CSD i and is set to one if the observations were in the entry/post-entry period, and zero in the pre-entry period. I included α_i to capture time-invariant heterogeneity of CSDs, and time fixed effects τ_t to capture overall trends in the CWBI over time. X_{i_t} con-

Table 2: Two-way fixed effects regression results on CWBI

	Community Wellbeing Index		
Variables	(1)	(2)	(3)
FCRSA	0.436	0.587	0.578
	(0.685)	(0.672)	(0.637)
All controls	X		
Forestry-specific agreements	X	X	
Revenue sharing agreements	X		X
Observations	767	767	767
R-squared	0.540	0.532	0.534
Number of CSDs	131	131	131

Notes: Coefficients represent the effect of FCRSAs on CWBI scores. All controls include controls included in Main Regression Analysis (population, and other institutional agreements [Modern Treaties, Clean Energy Revenue Sharing Agreements, LNG Agreements, Pine Beetle Agreements, and Forest and Range Agreements]). Forestry-specific controls only control for the Pine Beetle and Forest and Range Agreements. Revenue Sharing Agreements control for the considered revenue sharing agreements (Clean Energy, LNG). Standard errors are clustered at the CSD level. Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

trols for other institutional agreements, including Pine Beetle Agreements, FRAs, Clean Energy Revenue Sharing Agreements, and LNG Agreements.[28]

The results of TWFE regressions are shown above in Table 2. Regression (1) controls for all of the same variables as the staggered DiD model in equation (1) and shown in Figure 3. Controls in this model include population, FRAs, Pine Beetle Agreements, Clean Energy Agreements and LNG Agreements. Regression (2) only controls for forestry-specific agreements, which include Pine Beetle and FRAs. Regression (3) only controls for Clean Energy and LNG Agreements. For all three regressions, I find that the coefficients for FCRSAs are insignificant, regardless of which agreements are controlled for. This is consistent with the

[28]Differing from the staggered DID model above, I have omitted Modern Treaty signatory variable as a control in this model due to collinearity from a small sample size (nine CSDs are signatories).

Table 3: Two-way fixed effects regression results on CWBI subcomponents

VARIABLES	Income	Education	Housing	Labour
FCRSA	-0.740	0.0403	1.238	1.242
	(1.352)	(1.116)	(1.620)	(1.322)
Observations	336	336	336	336
R-squared	0.635	0.760	0.046	0.132
Number of CSDs	61	61	61	61

Notes: Coefficients represent the effect of FCRSAs on CWBI subcomponent scores (income, education, housing, and labour force scores). All controls include the controls from the Main Regression Analysis (population, and other institutional agreements [Clean Energy Revenue Sharing Agreements, LNG Agreements, Pine Beetle Agreements, and FRAs]). Sample size is reduced to 336 observations (61 CSDs) due to availability of CWBI data. Standard errors are clustered at the CSD level. Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

findings in the staggered DiD model, further providing evidence that FCRSAs do not cause any significant changes in the CWBI.

To further explore whether FCRSAs impact certain subcomponents of the CWBI, I also run TWFE regressions on the CWBI subcomponents (income, education, labour, and housing). The results of the TWFE regressions on the CWBI subcomponents are presented in Table 3. The dependent variables include income, education, housing, and labour force CWBI scores, with controls consistent with those used in the Main Regression Analysis (institutional agreements such as Clean Energy Revenue Sharing Agreements, LNG Agreements, Pine Beetle Agreements, and FRAs).[29] Across all subcomponents, the estimated coefficients for FCRSAs are statistically insignificant, suggesting that these agreements do not lead to measurable improvements in any specific subcomponent of the CWBI. This again aligns with the findings in the

[29]Similar to the TWFE model in equation (4), I have also omitted the Modern Treaty signatory variable as a control in this model due to collinearity from a small sample size (nine CSDs are signatories).

Main Regression Analysis, reinforcing the conclusion that FCRSAs do not significantly impact socioeconomic conditions measured in the CWBI.

IX Discussion

Based on these findings, this study suggests that FCRSAs do not have a discernible impact on the wellbeing of First Nations communities, as measured by the CWBI. While the results demonstrated above may not show a significant impact of FCRSAs on community wellbeing indicators, these results provide insight. In the study by Pendakur and Pendakur (2018) on the effects of modern treaties and opt-in legislation on household incomes in Aboriginal communities, the authors found that the estimated effect of a sectoral self-government agreement[30] on both log and mean household income is negative and that standalone SGAs had no statistically significant effects on income, a component of the CWBI (p. 152). Similar to standalone SGAs, FCRSAs provide cash transfers from the Federal or Provincial government to the First Nation, and create new responsibilities related to consultation processes (compared to taxation, land, resource management in SGAs). Therefore, like sectoral self-government agreements, FCRSAs come with both responsibilities and resources that may or may not balance.

On a similar note, the FCRSA's predecessor, the FRA, also demonstrated no meaningful impact on the CWBI. Similar to the theories posited by Pendakur and Pendakur (2018) and Booth and Skelton (2011), it is possible that barriers to First Nations forestry development are

[30] At the time of their study, only one sectoral self-government agreement had been implemented (the Mi'kmaq Education Agreement), and the authors note that they "not confident that this is a robust finding for this agreement type because all Mi'kmaq CSDs came under the agreement in the same year" (p. 152).

driven by economies of scale. The small geographic scope of First Nations traditional territories and the costs associated with forestry operation and development may be prohibitive, creating barriers to development. This may suggest that the economies of scale for individual First Nation forestry production is too small to reap a net benefit to the community.

I Limitations

This study has some limitations. First, the constraints imposed on the model resulted in a small sample size (767 observations and 131 First Nations). In a staggered DiD model, a small sample size reduces the statistical power to detect differences across groups and may result in a bias towards the null hypothesis. This is further demonstrated by the large confidence intervals in Figure 3 and Figure 4, which impede the ability to reject the null hypothesis. This limitation restricts the scope of analysis and may be one of the contributing factors in the inability to determine any significant impacts of the FCRSA on the CWBI. Additionally, this panel dataset is unbalanced due to missing CWBI data, which may introduce bias into the model.

Furthermore, the reliance on the CWBI as a measure of socioeconomic wellbeing in First Nations communities may not be adequate in considering culture and other indicators specific to First Nations wellbeing. While the components included in the CWBI are not intended to be comprehensive measures of wellbeing (Indigenous Services Canada, 2024b), considering factors such as language and health indicators could provide a more holistic estimate of the impacts of FCRSAs on wellbeing indicators that more accurately reflect First Nations priorities.

I.1 Incorporation of Indigenous Knowledge Through Two-Eyed Seeing

Given the scope of this project, First Nations perspectives were incorporated via previous case studies and analysis of previous literature. As Quinless (2021) argues, "statistics come with underlying values and methodologies that reflect and constitute the dominant cultural framework and not the values of Indigenous worldviews" (p. 88). Future research should seek to further incorporate a two-eyed seeing approach which would directly engage BC First Nations on a larger-scale basis to better reflect a variety of perspectives across the province. Incorporating qualitative research could provide a more well-rounded analysis to my models by offering insights into socioeconomic factors not captured in the model, such as land stewardship, language revitalization, and the strengthening or weakening of government-to-government relationships between the Province and First Nations governments.

I.2 Exclusion of Other Policies

The Government of Canada has implemented several policies, such as the *Forestry Act* (1985), to address forest management practices on federal lands. However, the significance of these policies on forestry is likely minimal, as the federal government is only responsible for about 1% of land base in British Columbia (Plowright, n.d.). Other kinds of institutional agreements outside of modern treaties, such as the *First Nations Land Management Act*, which also often include jurisdiction over First Nations lands, could also influence wellbeing indicators, such as income (Pendakur & Pendakur, 2021).

Given the time constraints of this study, I have opted to omit some revenue sharing agree-

ments, such as Petroleum and Natural Gas Agreements and Atmospheric Benefits Agreements, from the model due to a small number of signatories for each.[31] Let's assume the intuition that increased revenues from these omitted agreements would drive First Nations government spending on social programs, thus improving socioeconomic outcomes (as shown through the CWBI), and these omitted agreements are positively correlated with FCRSAs. If these cases hold, this may introduce a positive bias into the staggered DiD model, suggesting that the coefficent β in equation (1) may be overestimated. However, given the small sample size of Petroleum and Atmospheric Agreements, these impacts may be minimal. Further research could assess whether these revenue sharing agreements have confounding impact on the CWBI by influencing economic development in community.

I.3 Changes to Funding in Forestry Agreements

In 2022, the Province of BC amended the FCRSA financing formula to increase revenue sharing funding to First Nations by five percentage points of the net profit of forestry harvesting in impacted areas (Meissner, 2022; Ministry of Indigenous Relations and Reconciliation, 2022). As the last period of observation in this study is 2021, the impacts of this funding change cannot be explored until later census data is made available. While I hypothesize that the lack of impact on socioeconomic outcomes may be due to the narrow scope of these agreements, I cannot rule out that the magnitude of funding provided under these revenue sharing agreements may be attributed to changes in socioeconomic outcomes. Another possible explanation may be

[31] A total of 13 First Nations in our sample have signed Petroleum Agreements, whereas there are a total of 9 Atmospheric Agreement signatories.

that there are lags to improvements in socioeconomic indicators presented through the CWBI. Policy to address these factors may require longer time horizons to fully implement, from the time it takes to create and implement policies within community to social policies leading to socioeconomic improvements over the long-term.[32] Further research could seek to elaborate on this topic by investigating the impact of this change on First Nations outcomes.

X Conclusion

This study set out to examine the effects of Forestry Consultation and Revenue Sharing Agreements (FCRSAs) on the wellbeing of First Nations communities in British Columbia. Using a staggered difference-in-differences (DiD) model, I assessed the impact of FCRSAs on the Community Wellbeing Index (CWBI). These findings suggest that FCRSAs do not have a statistically significant impact on community wellbeing outcomes, suggesting that FCRSAs, in their current form, do not significantly contribute to improvements in community wellbeing. Robustness checks, including an analysis of the FCRSA's predecessor, the FRA, similarly yielded no meaningful impact on the CWBI.

These findings raise important policy considerations regarding the design and effectiveness of revenue sharing agreements. Given the lack of measurable impact, policymakers should reconsider how FCRSAs are structured and whether additional support is needed to enhance their

[32] Hahn et al. (2018) find that the introduction of education policies which provide funding to girls in rural communities in Bangladesh improve socioeconomic outcomes of recipients later in life. This may provide evidence that grant-style payments such as FCRSA revenues may require time to manifest in community wellbeing outcomes.

effectiveness. The findings align with existing literature that suggests that the scale of forestry opportunities accessible to individual First Nations may be insufficient to generate significant economic benefits (Pendakur & Pendakur, 2018; Booth & Skelton, 2011). Additionally, the recent amendment to the FCRSA financing formula in 2022 suggests that future assessments will be needed to determine whether higher financial contributions yield more significant socioeconomic benefits. Monitoring future census data will be crucial in evaluating whether increased FCRSA revenues lead to improved community wellbeing outcomes.

With respect to measures of wellbeing, the reliance on the CWBI as a measure of community wellbeing may not fully capture the multidimensional nature of First Nations community wellbeing. Future policy research should consider incorporating Indigenous-defined wellbeing measures, such as cultural continuity, governance capacity, and environmental stewardship, using a two-eyed seeing approach. The study highlights the importance of considering different areas of scope with respect to FCRSAs and FRAs. Consistent with Pun (2016), revenue sharing agreements should be structured to enhance self-determination and ensure that First Nations communities have control over how forestry revenues are allocated and utilized.

Given the limitations of this study, future research should reassess the impact of the revised FCRSA revenue sharing formula as additional census data becomes available to determine whether increased FCRSA revenues influence community wellbeing indicators. Expanding this analysis beyond BC to include revenue sharing agreements in other provinces could offer valuable insights into regional policy differences and their effectiveness. Examining revenue sharing in other natural resource sectors (e.g. mining and petroleum) could help identify whether cer-

tain types of agreements are more effective in generating improved socioeconomic outcomes. While revenue sharing agreements represent an important step toward economic reconciliation and self-determination, this study suggests that FCRSAs, in their current form, do not significantly impact community wellbeing relative to non-FCRSA signatory First Nations. Moving forward, policymakers should consider how to enhance the effectiveness of these agreements through improved financial mechanisms, governance structures, and capacity-building initiatives in future agreements.

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