Post-Secondary Funding and the Educational Attainment of Indigenous Students *

Maggie E. C. Jones †

August 1, 2023

Abstract

This paper uses cutbacks to a post-secondary funding program for Indigenous peoples in Canada to understand how changes in the costs of higher education affect the educational attainment and labour market outcomes of Indigenous groups. I exploit exogenous variation in exposure to student aid across cohorts and ethnicities to show that increasing the costs of post-secondary education not only affects post-secondary attainment but can also lead to a sizable decrease in high school graduation rates. After reductions in targeted student aid in the late 1980s, high school graduation rates declined by five percentage points on Indian reserves. I suggest that this finding is consistent with a model of human capital acquisition in which the return to a high school degree is low. In this framework, some students complete high school in order to attend a post-secondary institution. When post-secondary education is no longer affordable, some students may no longer find it worthwhile to complete high school. In the long-run, the program cutbacks had lasting adverse effects on labour supply.

JEL Codes: I22, I24, I28, J15
Keywords: Education, post-secondary funding, student aid, high school graduation, labour supply

*This paper was previously titled, "Student Aid and the Distribution of Educational Attainment." Thank you Doug Webber and several anonymous referees for valuable feedback. Thanks also to Abel Brodeur, Rob Clark, Chris Cotton, Donn Feir, Kelly Foley, Rob Hancock, Taylor Jaworski, Ian Keay, Steve Lehrer, Blair Long, James MacKinnon, Krishna Pendakur, Vincent Pohl, Michal Popiel, Emilia Simeonova, Dick Todd, Matt Webb, Mutlu Yuksel, and seminar and conference participants at Dalhousie University, Lakehead University, Queen's University, the 2015 CLEA meetings, 2016 CEA meetings, 2016 ACEA meetings, 2017 Doctoral Workshop in Applied Econometrics, 2017 CPEG Meetings, 2018 Unsettling Economics Conference, and the 2019 NBER Workshop on Health, Wellbeing and Children's Outcomes for Indigenous Populations. Additional thanks go to Matthew Edwards for excellent research assistance. This research was supported by funds to the Canadian Research Data Centre Network (CRDCN) from the Social Science and Humanities Research Council (SSHRC), the Canadian Institute for Health Research (CIHR), the Canadian Foundation for Innovation (CFI) and Statistics Canada. Although the research and analysis are based on data from Statistics Canada, the opinions expressed do not represent the views of Statistics Canada or the Canadian Research Data Centre Network (CRDCN). All errors are my own.

†Department of Economics, Emory University, and NBER. E-mail: maggie.ec.jones@gmail.com.

Between 1980 and 2016 tuition at colleges in the United States and Canada increased by over 200% (College Board, 2017b; Statistics Canada, 2016b, 2017b), leading some scholars to contend that, despite a growing return to post-secondary education, limited access to colleges for some marginalized groups is contributing to rising inequality within countries (Carnevale and Strohl, 2013; Chetty, Friedman, Saez, Turner, and Yagan, 2017).[1] In light of this, billions of dollars of student aid are distributed each year in the form of tax credits, need-based scholarships, tuition vouchers, and merit awards (Collin and Thompson, 2010; College Board, 2017a). Existing literature has used both quasi-experimental and experimental methods to show that college enrolment and completion are responsive to price changes, although there is substantial heterogeneity in the policy response across aid programs and demographic groups (see Dynarski (2004), Deming and Dynarski (2009), Dynarski and Scott-Clayton (2013), Page and Scott-Clayton (2016), and Angrist et al. (2022) for overviews).

This paper contributes to our understanding of how marginalized groups are affected by changes in the costs of higher education using variation in cutbacks to post-secondary funding for Indigenous students in Canada.[2] Existing studies that have shown that minority groups are sensitive to student aid policies have typically focussed on African American and Hispanic people in the United States (Kane, 1994; Turner and Bound, 2003; Abraham and Clark, 2006; Angrist, Autor, Hudson, and Pallais, 2014, 2016; Denning, 2017), even though Indigenous peoples in both the United States and Canada have lower levels of educational attainment than all other ethnic groups (Wilson and Macdonald, 2010; National Center for Education Statistics, 2017; Statistics Canada, 2017a). On top of this, other pecuniary and non-pecuniary factors that are influenced by educational attainment, like income, mortality, and incarceration rates, are also worse for Indigenous populations (Indian Health Service, 2019; Michael Tjepkema and Bougie, 2019). Given that Indigenous groups in both countries face unique barriers to obtaining post-secondary education, understanding how this population responds to variation in the cost of higher education is important for designing effective student aid policies.

The student aid program I evaluate was implemented by the Canadian government in 1977 and

[1] The increasing return to post-secondary education is well documented in both countries. See, e.g., Acemoglu (2002); Boudarbat, Lemieux, and Riddell (2010); Acemoglu and Autor (2011); Oreopoulos and Petronijevic (2013).

[2] Throughout this paper, I also use the terms "Aboriginal", "Indian", and "Native" when they refer to government legislation or documents that pertain to Indigenous peoples.

to this date remains the largest source of post-secondary funding for Indigenous students in the country. Initially, it covered all costs of schooling for Registered Status Indians and Inuit students.[3] By 1989, the costs of the program were unsustainable and the federal government cut back aspects of the program, effectively increasing the expected cost of schooling in two ways. First, it imposed a cap on the total amount of funding. Per-student funding which, before 1989, had been increasing in tandem with tuition, levelled off at just over $14,000 per year. At the same time, average tuition in Canada increased in real terms from $2,160 in 1989 to $3,760 in 1996. Therefore, after paying the cost of tuition, students had less funding to pay for other living expenses. Second, if there were more eligible students than funding available, students were placed on a deferment list, which decreased the probability of receiving funding, sometimes by as much as one-third.

Using confidential microdata from the 2006 Census of Population, I implement a difference-in-differences specification that uses variation in exposure to student aid across cohorts and ethnicities to uncover the causal effects of the program on educational attainment. I find that reductions in student aid decreased community college completion by 2.9 percentage points relative to the non-eligible group.[4] Trade attainment also declined among the eligible population relative to the non-eligible population. Accounting for differential pre-treatment trends reveals that the funding cutbacks did not affect university attainment.

In addition to the expected declines in post-secondary completion, I also find that the cutbacks resulted in a sizeable decline in high school graduation rates on reserves, a result that is particularly salient for Indigenous peoples in North America, where over twenty percent still live on reserves or reservations today (Statistics Canada, 2016a; Norris et al., 2012a). I suggest that this result may be related to the lower economic return associated with high school degrees on reserves during this time period (George and Kuhn, 1994; Feir, 2013). The insight is that if students make decisions about educational attainment in a forward-looking manner, then students who live in areas where the return to a high school degree is low, and thus where it only makes sense to complete high school

[3]There are three broad Indigenous groups in Canada: First Nations, Métis and Inuit. Registered Status Indians are First Nations people who have been recognized by the federal government as "Indian" under the Indian Act.

[4]I use the term "community college" to refer to two- or three-year degrees below the bachelor level, whereas "bachelor's programs" are four-year degree-granting institutions, referred to as universities in Canada. Some bachelor's programs in Canada take three years to complete. I code these as "community college". In practice, adding 3-year degrees to "bachelor's programs" makes little difference to the results. See Table B.2 of the Online Appendix for a description of each level of educational attainment.

if there is an option to attend a post-secondary institution, may respond to reductions in post-secondary funding by also dropping out of high school. This result is in contrast to the signalling model which predicts that increases in the cost of higher education can lead to an increase in the high school graduation rate if low-ability high school graduates are able to pool with high-ability high school graduates who would have attended university in the absence of price changes.

Given that there are generally positive non-market returns to high school graduation—improved health (Grossman, 2006; Campbell, 2009), reduced criminal behaviour (Lochner and Moretti, 2004), and greater civic participation (Dee, 2004; Campbell, 2009)—this result suggests that focussing solely on post-secondary outcomes will understate the full impact of access to post-secondary funding for some groups. Those most likely to be affected include individuals living in areas where the return to a high school degree is low or individuals whose perceptions of the return to high school are low. The low return to a high school degree is directly applicable to Indigenous students living on reserves in Canada or reservations in the United States; however, the perception of low returns to high school may be more generalizable. For instance, Nguyen (2008) shows that, among a sample of students from Madagascar, those from low-income households perceive the returns to higher education to be high and the returns from lower levels of educational attainment to be low, whereas students from higher income backgrounds assume they can earn a high income regardless of their level of education.

In the final section of the paper, I evaluate the impact of the cutbacks on labour market outcomes. Since the policy affected different levels of educational attainment, this exercise evaluates the effect of the policy, rather than that of a specific degree, on outcomes. In the long run, the program cutbacks led to a decline in the likelihood of being in the labor market, the number of weeks worked, and the number of hours worked. I estimate that the reduction in post-secondary funding can explain roughly 10 percent of the contemporary difference in hours worked between Indigenous and non-Indigenous people in Canada. Thus, the final contribution of this paper is to provide empirical support for the claim that unequal access to college is perpetuating inequality along this dimension.

2 Institutional Background and Related Literature

2.1 Background on Post-Secondary Funding for Indigenous Students

This section describes the evolution of post-secondary funding to First Nations and Inuit students as described in Paquette and Fallon (2010) and Stonechild (2006). The Indigenous population in Canada is comprised of three broad groups: First Nations, Inuit, and Métis.[5] First Nations peoples are either Registered Status Indians under Canada's *Indian Act*, or are non-Status. The post-secondary program in this analysis was available to Registered Status Indians and the Inuit population but not to Métis or non-Status Indigenous peoples.

In 1977 the federal government implemented the first formal post-secondary funding program for Status Indians and Inuit groups in response to increasing demand for post-secondary education from Indigenous groups. To qualify, students had to be registered with the federal government as Status Indians or Inuit and they must have been accepted into a program at a valid post-secondary institution (Program Circular, E.12, page 3). Funding under the program was comprehensive and included tuition, training, shelter, travel, equipment, books, supplies, and other living expenses.[6] At the onset of the program, those who qualified applied for funding through the Education Counsellor at the nearest Band Council Office or office of the Department of Indian Affairs and Northern Development, and then received compensation for the full cost of post-secondary education.

Figure 1(a) shows that after the PSEAP was implemented in 1977 the number of Indigenous students who obtained post-secondary funding this way increased from 3,599 in the first year to 14,242 by 1987 (Stonechild, 2006).[7] The federal government viewed the increased demand for the PSEAP as financially unsustainable and, after meeting with Indigenous leaders in May of 1987, it was decided that a new funding program would replace the PSEAP in the spring of 1989. It was named the Post-Secondary Student Support Program (PSSSP) to reflect the differences from the PSEAP.

[5] This section focuses primarily on First Nations and Inuit individuals. A broader description of Métis people can be found in Section C of the Online Appendix.

[6] Table B.1 of the Online Appendix summarizes these allowances as they are described in official government documentation.

[7] A contributing factor to the increase was likely the passage of Bill C-31 in 1985, which reinstated Indian Status for women and their children who had previously lost Status under the discriminatory sections of the Indian Act. However, as Figure 1(a) shows, there was no discontinuity in the number of individuals funded after 1985.

In general, the types of allowances available under the PSSSP did not change from the PSEAP, rather the PSSSP changed the expected costs of schooling in two fundamental ways. First, it imposed a cap on the total amount of funding available to students. Figure 1(b) displays the average per-student funding and Figure 1(c) shows the average university tuition in Canada in 2016 CAD. The initial cap led to a substantial decline in the per-student funding, which was met with backlash from Indigenous groups. The federal government responded by increasing total funding in the following year, allowing per-capita funding to return to its 1988 level, at which point a 2% annual cap was imposed on spending increases. The 2% growth was not sufficient to cover rising demand for the program, leading per-student funding to level off at around the same time that tuition rates began soaring. Thus, with rising tuition, it became increasingly challenging for Indigenous students to cover their entire schooling expenses with the funding they were allotted.

Second, the new funding program lowered the likelihood that an eligible student received funding. The PSSSP required the federal government to allocate funding directly to each band and students applied to their band for funding, rather than to the federal government directly. If there were more students eligible than funds available, applications could be deferred (Norris et al., 2012b). Although the Department of Indian Affairs asked regional administration offices to keep deferred files, they did not require offices to submit any type of record on the number of eligible students denied funding. Anecdotal evidence, however, suggests that the number of students who were denied funding or had their application deferred may have been quite large. In 1995, Eskasoni First Nation's Director of Education reported:

> *"[Eskasoni] has funding for approximately eighty students per year. Routinely, they get applications of 120 to 150. They have to turn away forty to seventy students per year."*
> (No Higher Priority, 1995)

Both the reduction in per-student funding and the reduction in the likelihood of obtaining funding can be viewed as an increase in the expected cost of schooling. In Section D of the Online Appendix, I estimate that, as a result of the cutbacks, the expected cost of schooling increased by $5,360 (2016 CAD). Put simply, the average student would have to cover just over $5,000 more of their post-secondary costs compared to the pre-cutback period. Given that there were very few additional post-secondary funding programs for Indigenous students during this time period

and that a lack of access to credit on reserves was a significant barrier for many, this additional financial burden may have led some students to re-evaluate their schooling choices.

Even today these issues continue to constrain the educational choices available to Indigenous students. Currently, the other major post-secondary funding program for Indigenous students in Canada is *Indspire*. In 2018-2019, Indspire distributed more than $16.3 million in bursaries and scholarships (Indspire, 2019), but was much smaller in scope during the time period in my analysis. Known then as the *National Aboriginal Achievement Foundation* it awarded just under $30 million in scholarships and bursaries between 1985 and 2008 (National Aboriginal Achievement Foundation, 2008). Regarding credit constraints, both the 1996 Royal Commission on Aboriginal Peoples and the 2007 Standing Senate Committee on Aboriginal Peoples recommended improving Indigenous access to credit, suggesting that lack of access to credit was a barrier to economic development on Indigenous lands (National Aboriginal Economic Development Board, 2017). In light of these constraints, the empirical analysis that follows, while focussed on a particular episode of post-secondary funding cutbacks, continues to be relevant.

2.2 Relation to Existing Literature on Student Aid

There is a large empirical literature that has examined the impacts of student aid on educational outcomes. Much of this work is summarized in Dynarski (2004), Deming and Dynarski (2009), Dynarski and Scott-Clayton (2013), Page and Scott-Clayton (2016), and Angrist et al. (2022). Overall, the impact of student aid on educational outcomes greatly depends on context and tends to be quite heterogeneous across demographic groups. Abraham and Clark (2006) show that Black students were more likely to send their SAT scores to an out-of-state public 4-year college or university after the District of Columbia implemented a Tuition Assistance Grant Program, but this treatment effect was smaller than the estimated effect for White students. In contrast, Denning (2017) finds that discounts for community college tuition in Texas increased the probability that African American students enrolled in a community college and graduated with a community college degree while diverting their enrolment away from universities. The community college effect was larger for Black students than for White students, and the diversion effect was non-existent for White students. Hispanic students did not respond in a manner that was statistically different from White students. More recently, Angrist et al. (2022) partnered with the Susan Thompson

Buffett Foundation (STBF) to randomly assign student aid awards to high school graduates in Nebraska. They also found a substantial amount of heterogeneity across demographic groups. Non-White recipients were 9 percentage points more likely to complete their BA within 6 years, while White recipients were 7 percentage points more likely.

Angrist et al. (2022) highlight the long history of empirical work on student aid provision. Indeed, they include a table of 24 studies published between 2003 and 2020 on the impacts of student aid on educational attainment.[8] Only one of these papers, DesJardins et al. (2010), included any analysis of the impacts of student aid on outcomes for Indigenous peoples. While DesJardins et al. (2010) does not directly examine the impact of student aid on educational attainment, they do find that Indigenous recipients of the Gates Millennium Scholarship report 14 fewer hours of work during their junior years, suggesting that the scholarship relaxed financial constraints for these individuals.

Other studies of historical student aid programs, like those evaluating the G.I. Bills, are methodologically similar to my analysis. The consensus of this work is that the G.I. Bills increased average educational attainment (Angrist, 1993; Lemieux and Card, 2001; Bound and Turner, 2002; Stanley, 2003; Angrist and Chen, 2011; Barr, 2019), though the effects were primarily concentrated among white men (Turner and Bound, 2003) and people of higher socioeconomic status (Stanley, 2003). Like the work examining more recent policy changes, the literature on the G.I. Bills does not include a discussion of impacts for Indigenous groups.

The vast majority of the student aid literature has, understandably, focussed on the post-secondary margin. However, many scholarship programs are implemented with the goal of increasing high school graduation, in addition to college-level outcomes (Erwin and Binder, 2020). This can occur through changes in student effort at the high school level, which is reflected in higher ACT (Pallais, 2009) and SAT (Henry et al., 2004) scores.[9] As the results in this paper demonstrate, the high school margin becomes relevant when the return to a high school degree is low in

[8] These studies were selected based on a set of criteria: they focussed on named scholarship programs at the state, institution, or private level; studied traditional students; and were published in peer-reviewed journals or working paper series.

[9] Henry et al. (2004) and Pallais (2009) do not separately evaluate the impact of college aid on high school graduation. Dynarski (2008) examined the effect of merit aid programs in Arkansas and Georgia on the full distribution of educational attainment and found that high school graduation was not the relevant margin impacted by these scholarships. However, it is possible that these aggregate effects mask some underlying sub-group heterogeneity.

a given local labour market.

What is clear from the immense body of literature evaluating the impacts of student aid provision is that there is very little evidence on how Indigenous peoples are impacted by the rising costs of college or the availability of financial aid. This is likely due to the fact that Indigenous peoples represent a relatively small fraction of the college-going population in both Canada and the United States and therefore sample sizes in empirical analyses may be too small to conduct inference (Postsecondary National Policy Institute, 2019). That being said, Indigenous peoples in both countries are among the fastest-growing demographic groups.[10] Evidence from both countries suggests that the fraction of Indigenous people with post-secondary credentials has increased in recent years, although there is some evidence that points to falling enrolment rates among Indigenous students in the United States (Arriagada, 2021; Postsecondary National Policy Institute, 2022). Furthermore, Indigenous people often face unique constraints that mean that off-the-shelf studies of the provision of student aid may not be representative. This point underscores the need for more research to examine the impacts of student aid for Indigenous groups. The national scope of the scholarship program in Canada and the large number of students funded each year provide an opportunity to evaluate how variation in the costs of higher education affects educational attainment among this demographic in a way that has not been possible in previous work.

3 Data Sources, Sample Restrictions, and Descriptive Statistics

The primary empirical strategy applies a difference-in-differences approach that uses cross-cohort and cross-ethnicity variation in program eligibility to study the effect of student aid on educational attainment and labour market outcomes. This section describes the data sources and sample restrictions used to evaluate each outcome.

The 2006 Census of Population is the principal data source used in the empirical analysis. A detailed discussion of this choice can be found in Section F of the Online Appendix. Although the funding cutbacks occurred in 1989, I use date of birth combined with provincial school attendance rules at each point in time to group students into cohorts based on the year in which they should

[10] According to the U.S. Censuses, the number of people who identified as American Indian and Alaska Native alone increased by 27% between 2010 and 2020. According to the Canadian Censuses, the number of people who identified as Indigenous increased by 8% between 2016 and 2021.

have graduated high school.[11] To ensure that I am making comparisons between individuals who faced similar educational institutions in their youth, I exclude individuals who immigrated after they turned 10. I focus on cohorts who should have graduated high school between 1982 and 1995.[12]

The program was available to all Registered Status Indians or Inuit who had been accepted into a recognized post-secondary institution. Since only First Nations are able to apply to become Registered Status Indians and to avoid defining treatment based on a variable that is potentially selected, I group students as eligible for the program (treatment) if they report First Nations or Inuit identity, and not eligible for the program (control) if they identify as non-Indigenous. This classification deliberately excludes all Métis from the analysis based on inconsistencies in how people identify as Métis in Canada. More information on this decision can be found in Section C of the Online Appendix.

To construct the outcome variables relating to educational attainment I refer to the "highest certificate, diploma, or degree" attained by the respondent. From this variable, I can construct indicators for whether an individual's highest level of education is no school, high school, trade school, community college, or a bachelor's degree. Although there is an implied hierarchy in the classification of the "highest certificate, diploma, or degree" variable, there are some cases where a tradesperson may not have graduated high school. Since this likely represents a small fraction of those obtaining trades, I code an individual as having graduated high school if they indicate that their highest level of education is a high school degree or above.

There are three costs students face that may affect their choice of educational attainment: fixed costs (tuition and distance), psychic costs (effort and social pressures), and opportunity costs (forgone wages). To account for differences in the cost of tuition faced by students across provinces and across levels of education, I construct education-level estimates of the cost of tuition in each province and year of the analysis. I set the cost of tuition to be equal to 0 for the outside option (no school) and high school in all provinces and time periods. I obtain the average cost of tuition in bachelor's programs for each province for the duration of my analysis from the Tuition and Living Accommodations Cost (TLAC) Survey implemented by Statistics Canada.

[11] A summary of these entry and exit rules is located in Table B.3 of the Online Appendix.
[12] The results are unchanged when using a slightly longer window.

This survey does not include the average cost of community colleges, nor the price of trade school and apprenticeships. I, therefore, construct an estimate of the cost of community college tuition by dividing total government expenditures on community colleges financed from student fees by total community college enrolment.[13] For provinces and territories that do not have community college expenditure and enrolment data, I replace their tuition costs by the national average in that year. I construct the same estimate for university tuition and verify the estimates against the true values of university tuition from the TLAC survey. The results of this verification exercise are found in Figure A.1 of the Online Appendix and show a remarkably close match. The estimates for each level of post-secondary education are found in Figure A.2 of the Online Appendix. The same expenditure and enrolment data is not available for trade school and apprenticeship programs so I assume that the cost of these programs is equal to a fixed fraction of the cost of university.

I address differences in travel costs by computing the geodetic distance between each census subdivision (CSD) and the closest census metropolitan area (CMA) using Statistics Canada geographic boundary files. I also calculate the latitude and longitude of the centroid of each CSD and include these variables as controls to proxy for other geographic characteristics that may affect educational attainment. To the extent that students from different provinces and time periods may face different psychic costs, I do not directly control for this in the econometric specification.

As a rough approximation for variation in opportunity costs, I include CMA X province fixed effects. Individuals in CMAs will have their own fixed effects and individuals outside of CMAs will have a "province X outside-CMA" fixed effect. All regression results are weighted by the composite sample weights included in the census files.

One potential problem with using any of the geographic variables included in the 2006 census is that they assume that individuals are living in the same area in 2006 as when they went to high school. While the inclusion of these controls could also be viewed as a useful proxy for regional differences in educational attainment or labour market conditions, rather than opportunity or travel costs, I discuss why outmigration is unlikely to confound my results in Section G of the Online Appendix.

Table 1 displays summary statistics and difference-in-means tests for eligible and non-eligible

[13] Total expenditures on education is obtained from Statistics Canada CANSIM table 478-0001 and total enrolment figures are from CANSIM table 477-0006 for 1982-1996.

populations in the time periods before (1983-1989) and after (1990-1996) the funding cutbacks. Educational differences between the two groups are large. In both time periods, a greater portion of the eligible group does not have a high school degree. Community college and bachelor's degree completion is also higher for the non-eligible group; however, there are only small differences in trade completion between groups. In general, labour market outcomes are also lower among the eligible population in both time periods. The eligible group is more likely to be out of the labour force and to rely on government transfers, works fewer hours and weeks, and is less likely to make above the median income.

For all groups and time periods, there is a higher share of men than women, though the gender ratio is particularly skewed towards women for the eligible population.[14] Finally, geographic isolation is more pronounced among the eligible group, who are more likely to live on a reserve or in a northern community and are located farther from a CMA.

4 Empirical Methodology

To estimate the effects of funding cutbacks on educational attainment, I use a difference-in-differences framework that compares educational attainment across cohorts and across students who, based on their ethnicity, are eligible for funding through the post-secondary funding program and those who are not. To formalize this comparison, consider each highest level of schooling r which, may be either "no school", "high school", "trade school", "college", or "university". Let $r_{i,g,t} = 1$ if r is the highest level of schooling of individual i from eligibility group g belonging to graduation cohort t, and consider the following equation that relates r to student aid eligibility:

$$\mathrm{r}_{i,g,t} = \gamma_0 + \gamma_1 \mathrm{after}_t \times \mathrm{eligible}_g + \mathbf{X}_{i,g,t}\boldsymbol{\Theta} + \psi_g + \zeta_t + \epsilon_{i,g,t}, \tag{1}$$

where, the indicator after_t is equal to 1 if individual i from cohort t should have graduated high school in any year after 1989, and $\mathrm{eligible}_g$ is an indicator equal to 1 if individual i belongs to an ethnic group that is eligible for the program.[15] The coefficient of interest, γ_1, measures the differential change in the share of the population whose highest level of education is r between

[14] This is possibly a result of high rates of homelessness and institutionalization among First Nations men in Canada (Feir and Akee, 2017).

[15] In each specification $t \in \{0, \pm 6\}$ years from the policy change so that all regressions consider cohorts spanning a 13 year period surrounding the policy change. Using a wider or narrower time frame does not change the results qualitatively.

eligible and non-eligible students after the funding cutbacks. Since I do not observe whether students actually obtained post-secondary funding, γ_1 can be interpreted as an estimate of the *intent-to-treat* (ITT).

The interpretation of $\hat{\gamma}_1$ as the causal effect of the policy on educational attainment is conditional on several underlying assumptions. First is the common support condition, which relies on the legitimacy of the non-Indigenous population as a control group. While there are certainly demographic differences between the treatment and control groups, we can mitigate this concern by including a matrix of controls, $\mathbf{X}_{i,g,t}$. This matrix includes gender, whether someone is a Status Indian, tuition of education level r in province p at time t, the distance between an individual's CSD and the closest CMA, and the latitude and longitude of the centroid of individual i's CSD. Ethnic group dummies, ψ_g, control for variation in educational attainment across groups that is constant over time. Year of graduation dummies, ζ_t, account for secular changes in educational attainment across time that are common across groups.[16] I also include CMA-province, tribe, and birth quarter fixed effects.[17]

For γ_1 to have a causal interpretation, the common trend assumption also must hold: in the absence of treatment, educational attainment among both groups would have followed parallel trends. It is impossible to formally test this assumption, nevertheless, I can test whether there are differential pre-treatment trends between the eligible and non-eligible groups to lend support to my identification strategy. To do this, I present two sets of specifications. The first is a non-parametric event study that interacts eligibility with each year before and after the policy change:

$$\mathrm{r}_{i,g,t} = \gamma_0 + \sum_{t=-6, t\neq -1}^{6} \delta_t \mathrm{eligible}_g \times \mathrm{cohort}_t + \mathbf{X}_{i,g,t}\boldsymbol{\Theta} + \psi_g + \zeta_t + \epsilon_{i,g,t}, \tag{2}$$

where the set of dummies, $\{\mathrm{eligible}_g \times \mathrm{cohort}_t\}_{t=\{-6,\ldots,-2,0,\ldots,6\}}$, are the interaction of eligibility with cohort dummies. They control for the change in educational attainment between eligible and non-eligible groups for cohorts who are born ± 6 years from the policy change, excluding $t = -1$, so that the coefficient estimates are measured with respect to one graduation cohort prior to the policy change. Testing whether the pre-treatment trends are different amounts to checking whether

[16] Ethnic group dummies control for whether an individual identifies as either Inuit, First Nation, or non-Indigenous.

[17] Today, the term "tribe" is not generally used in Canada. The 2006 Census includes this variable, which is a more aggregated grouping than the First Nation.

each of δ_t, $t = \{-6, \ldots, -2\}$ are statistically different from 0.

The second specification is a parametric event study in the spirit of Dobkin et al. (2018), subsequently used by others, including Beheshti (2022), that allows for differential linear trends in the pre-treatment period:

$$\mathrm{r}_{i,g,t} = \gamma_0 + \sum_{G=1,0} \sigma_G \mathbf{1}(g = G) \times t + \sum_{t=0}^{6} \delta_t \text{eligible}_g \times \text{cohort}_t + \mathbf{X}_{i,g,t}\boldsymbol{\Theta} + \psi_g + \zeta_t + \epsilon_{i,g,t}, \qquad (3)$$

where in this specification, the pre-treatment $\text{eligible}_g \times \text{cohort}_t$ dummies have been replaced by linear trends for the eligible and non-eligible groups. Thus, the post-treatment $\text{eligible}_g \times \text{cohort}_t$ dummies now measure deviations from the linear trends in the post-treatment period. This specification relaxes the parallel trends assumption slightly so that now identification relies on the assumption that, in the absence of the funding cutbacks, educational attainment in eligible and non-eligible populations would have continued on their pre-treatment trends. I present the results from both event studies in the results section.

The third identifying assumption is that there cannot have been any anticipation effects prior to the policy change. The historical accounts suggest that the cutbacks were discussed as early as 1987. If anticipation effects were present, in the sense that high school students began dropping out of school early in anticipation of the fact that they would not have post-secondary funding available to them, then the treatment effects will be larger in magnitude than those presented in the results section. However, if more students in the 1988 cohort applied for the program to secure funding in anticipation of a lack of future funds, then it is possible the results will overstate the true effect on educational attainment. The event study framework in equation 2 assists in ruling out anticipation effects of this type.

Finally, there cannot have been any anticipation effects on the part of the federal government. That is, the funding cutbacks cannot have been a response by the federal government to an anticipation that there would be a reduction in demand for the post-secondary funding program. This assumption rules out the potential for reverse causality, wherein the federal government's cutbacks were actually a response to declining demand. If anything, the historical accounts suggest the opposite is true; the federal government felt costs were unsustainable due to high demand for post-secondary support and cut back funding accordingly.

Given the ordered nature of the education choice, a natural estimation framework would be to use an ordinal regression model, like an ordered probit or logit. However, identification in the difference-in-differences model requires a linear specification. Following other similar studies, like Dynarski (2008) I estimate each equation separately using OLS as linear probability models.[18] In the Online Appendix, I also show that the results are largely robust to using an ordered logit specification, although there are some slight differences in the magnitudes of the coefficient estimates. OLS specifications are also used when examining high school graduation rates. In the final section of the paper, I expand the analysis to include labour market outcomes. These are also estimated using OLS.

In all specifications, standard errors are clustered at the province/territory level, which is the jurisdictional level of education-related policy in Canada.[19] Since there are only 10 provinces and 3 territories in Canada, all tables also report p-values constructed using the wild cluster bootstrap using the `boottest` Stata package of Nielsen et al. (2019). The wild cluster bootstrap accounts for cases when there are a small number of clusters as well as when there are clusters of varying sizes (MacKinnon and Webb, 2017).

5 Results

5.1 The Distribution of Educational Attainment

This section presents the effects of the program cutbacks on the distribution of educational attainment. Figure 2 displays the coefficient estimates and 95% confidence intervals from the event study framework of equations 2 and 3. Black squares represent estimates from the non-parametric event study (equation 2) and grey circles represent estimates from the parametric event study (equation 3). Because the parametric event study does not estimate pre-treatment event study coefficients, I follow Dobkin et al. (2018) and Beheshti (2022) and present pre-treatment estimates that were constructed by netting out the pre-treatment linear trends from the non-parametric

[18] Since each specification includes an identical set of control variables, a simultaneous equations model that could be used to account for cross-equation correlation of the errors, like SUR, collapses to OLS. That being said, results using SUR, conditioning only on college tuition in the college equation and university tuition in the university equation, yields nearly identical results.

[19] Indian reserves fall under federal jurisdiction so an argument could also be made to refrain from clustering, or to cluster by CSD. That being said, my analysis includes many living off-reserve, where education is a provincial responsibility, so I have chosen to cluster by province. Standard errors clustered by CSD tend to be smaller in magnitude.

event studies. These specifications allow for a visual analysis of the pre-treatment trends and thus provide a more accurate assessment of whether the parametric model sufficiently removes the differential pre-treatment trends.

Each of the coefficients in Figure 2 measures the differential change in the share of the population with education level r between eligible and non-eligible groups relative to one year prior to the cutbacks. Each subplot displays the results for a different level of educational attainment. All columns include the full set of controls and fixed effects. Point estimates with standard errors and wild bootstrap p-values are found for the non-parametric models in the Online Appendix in Table B.4.[20]

Looking first at the non-parametric event study estimates (those represented by black squares), we see that, prior to the funding cutbacks there were no statistically different trends in the share of the population whose highest degree was no certification, a trade degree, and community college degrees; however, there appears to be pre-trends present for the share whose highest degree was a high school degree and the share whose highest degree was a university degree. Indeed, accounting for differential pre-trends (estimates represented by grey circles) effectively eliminates these pre-trends and makes it clear that there was no impact of the funding cutbacks on the fraction of the population whose highest degree was a high school degree or university degree. That being said, although the standard errors are larger in this more parametric model, the patterns in the post-treatment coefficient estimates continue to support the finding that the funding cutbacks increased the share of the population with no certification and decreased the fraction whose highest degree was a trade or college certification. The discussion that follows will focus on the highest levels of educational attainment that were affected by the funding cutbacks: no certification, trade completion and community college completion.

After the new guidelines of the PSSSP came into effect, there were declines in trades and community college completion and increases in the share of the population with no formal schooling. A notable feature of the treatment effects is that they increase in magnitude over time. Relative to the control group, the share of the population with a community college degree declined by 3.7

[20]Table B.5 of the Online Appendix presents point estimates for pooled difference-in-differences specifications for a variety of subsamples. The table also reports bootstrap p-values. Table B.6 displays the corresponding marginal effects from an ordered logit estimation for the full sample for comparison. The pooled estimates should be interpreted with caution for "at most high school" and "at most university", as the discussion in this section reveals.

percentage points in the first two years after the funding cutbacks. For cohorts completing high school six years after the cutbacks, community college completion had declined by 4.3 percentage points, relative to the non-eligible population. This is consistent with the institutional details of the program cutbacks wherein the probability of receiving funding decreased over time, as more students were deferred.

One concern with this interpretation is the possibility that the gradual decline may actually be the result of differences in time-to-completion or age-at-entry between eligible and ineligible groups. For example, Liebert (2018) finds that the median age of entry of American Indian college students in Minnesota is 24, compared to a median age of 21 among whites. However, this seems to be an unlikely explanation for two reasons. First, college programs are generally 2-3 years long in Canada. The students who should have graduated high school 6 years post-program cutbacks would have been 18 in 1995 and thus would have been 29 in 2006 when the census was enumerated. If the median age of entry among Indigenous college students was 24, the majority would have finished their degrees by 2006, even with a 1-2 year lag over the average time-to-completion. Second, the decline in college completion is accompanied by an increase in the share of the population with no degree, or alternatively a decline in the high school graduation rate. The intuition behind this result is discussed in more detail below, but it would be unlikely that differences in time-to-completion would continue to affect high school graduation rates among those aged 29 in 2006.

To put these results in context, consider the magnitude of the change in college completion. The pooled treatment effect for the full sample was -2.9 percentage points for college completion. Given that, prior to 1989, the share of the eligible population with a community college degree was 32.8%, this coefficient implies that the funding cutbacks led to about a nine percent decline in completion, relative to the non-eligible population. Furthermore, Section D of the Online Appendix approximates that the expected cost of university changed by $5,360 (2016 CAD) after the funding cutbacks. Since the estimated college costs were approximately half the university costs, and using the CAD-US exchange rate in 2016 to compare my findings to the existing work on student aid suggests that a $1,000 (2016 USD) decline in student aid was associated with a 0.35 percentage point decline in college completion. The existing studies in the United States that have evaluated how changes in the cost of college affects *enrolment* generally find a $1,000 change in the cost of

college to be associated with a 3-5 percentage point change in enrolment (Dynarski, 2002, 2003; Deming and Dynarski, 2009; Castleman and Long, 2016; Denning, 2017). Since enrolment does not translate one-for-one to completion, these findings are not directly comparable to the results in this paper. That being said, the analysis in Dynarski (2008) finds an increase of college completion in the realm of 1.2 percentage points in response to a $1,000 increase in student aid in two Southern states during the 1990s.

Aside from the parallel trends assumption, the results of this section can be interpreted causally if nothing else occurred around the time that the funding was cut back which may have also affected educational attainment. To convincingly attribute the changes in educational attainment to the effects of funding cutbacks, I address several potential issues with my empirical analysis in Section G of the Online Appendix. Specifically, I conducted a keyword search of the LexisNexis database designed to flag major education-related policies that occurred around the same time as the funding cutbacks. Then, in Figure G.1 of the Online Appendix, I show that the trends presented in Figure 2 are robust to dropping the province of Québec which lifted a tuition freeze in 1989, and the province of Alberta, which cut back education grants in 1987. They are robust to dropping communities that settled land claims or specific claims with the federal government around the same time as the funding was cut back and thus may have experienced a positive income shock as a result. They are also robust if the analysis is restricted to individuals who never moved provinces.

Mechanically, the decrease in post-secondary completion must be accompanied either by an increase in the share of the population whose highest degree is no school or the share whose highest degree is a high school diploma. As shown in Figure 2, even after allowing for differential pre-trends, the declines in trade and college completion were accompanied by an increase in the share of the population with no certification. This suggests that, following the cutbacks to post-secondary funding, some students decided it was no longer worthwhile to complete high school. Thus, by construction, the high school graduation rate decreased. . In the sections that follow, I provide a detailed analysis of when and why the post-secondary funding cutbacks affected high-school graduation.

5.2 High School Graduation Rates

This section focusses on "high school graduation" as the main outcome of interest. Here, I evaluate why the share of the population with no certification increased—or alternatively, why the high school graduation rate increased—following the cutbacks to post-secondary funding. As was shown in Figure 2, the share of the population with no certification did not display differential pre-treatment trends, which, by construction, implies that high school graduation rates also did not display differential pre-treatment trends.

In the context of Becker's human capital model (Becker, 1964), high school graduation might respond to changes in the cost of higher education if the return to a high school degree is low. In this case, some students may only graduate high school in order to obtain a post-secondary degree to enter the post-secondary labour market. Increasing the cost of post-secondary such that it is no longer affordable for some students could result in a number of students leaving high school if there is a low return to a high school degree in their communities. Section E of the Online Appendix formalizes this intuition in a theoretical model that is grounded in Becker (1964)'s human capital model and extends the framework in Charles, Hurst, and Notowidigdo (2016) to include the high school graduation decision. This result is in contrast to the signaling model, wherein changes in the cost of higher education can also lead to a change in high school graduation, but in the opposite direction, and due to a different mechanism.

The post-secondary funding program did not change the cost of graduating high school, yet it led to an increase in the fraction of individuals with no certification, thereby decreasing the high school graduation rate, a result that is consistent with the human capital model under the assumption that the return to a high school degree is low. Table 2 explores this idea by presenting estimates of the effect of funding cutbacks on the high school graduation rate for a number of subgroups. Standard errors, clustered by province, are reported below coefficient estimates in parentheses, and p-values from the wild cluster bootstrap are reported below coefficient estimates in brackets.

Column (1) reiterates the estimate from the standard difference-in-differences model of equation 1, where I only include controls for whether the individual belongs to a cohort affected by the cutbacks, whether they belong to the eligible group, and CMA-province fixed effects, while column

(2) adds the full set of controls. This exercise confirms that it is not the inclusion of controls that is driving the results. The next three columns examine the effects by whether the individual lives on- or off-reserve. Here, we see that the entire high school effect is driven by those living on reserve. After the cutbacks, the high school graduation rate on reserves declined by 5 percentage points relative to the control group. Column (3) pools the on- and off-reserve samples and shows that the effect is statistically different for those living on-reserve compared to those living off-reserve.

One concern with these estimates is that they are intent-to-treat estimates. If the share of the treated group who actually received treatment is disproportionately different for those living on- versus off-reserve, then the average treatment effect on the treated could potentially be the same across regions. Given the data limitations, we have no way of knowing whether an individual actually received funding or not. That being said, we can at the very least, scale the ITT estimates by the share of the eligible population who identifies as Inuit or a Registered Status Indian to better approximate the average treatment effect on the treated (ATET). In the pre-treatment period, 74.7% of the eligible population living off-reserve and 98.6% of the eligible population living on-reserve was either Inuit or a Registered Status Indian. Scaling by these factors yields ATETs of -0.0512 and -0.0141 for those living on- and off-reserve, respectively.

The finding that high school graduation rates declined in response to the post-secondary funding cutbacks is consistent with the human capital model under the assumption that the return to just a high school degree is low. Existing evidence suggests that this was likely the case on reserves during this time period, where the returns to completing high school were lower than in urban areas (George and Kuhn, 1994; Feir, 2013). In accordance with this hypothesis, Figure A.3 shows that in 1990, the unemployment rate on reserves was much higher than elsewhere. Furthermore, conditional on being employed, the composition of low-skilled jobs was lower on reserves compared to CMAs, and even other rural areas, while the composition of high-skilled jobs was over 5 percentage points higher than in CMAs. Together, these results suggest that the composition of labour markets was different on reserves during this time period, and that the lack of low-skilled jobs combined with high unemployment may be a potential reason why high school graduation rates declined on reserves after post-secondary funding was cut back. One particular example from the Standing Committee on Aboriginal Affairs and Northern Development (2007) highlights the

qualitative nature of the educational challenges faced by Indigenous students on reserves:

> *"If our students struggle through their childhood to get to the point where they can go on to advanced training, advanced education, and then find that the resources aren't there for them to move on, the tragedy is so painful we simply cannot allow it to happen."* - Roberta Jamieson, President and Chief Executive Officer, National Aboriginal Achievement Foundation

An alternative explanation as to why high school graduation declined in response to the post-secondary funding cutbacks has to do with the potential general equilibrium effects of the program cutbacks. If the program cutbacks led to a reduction in the number of students pursuing post-secondary education, these students would now form part of the body of high school graduates. As the supply of students with a high school degree increases, the wage paid to high school graduates should decrease relative to high school dropouts. This effect would likely be larger on reserves than elsewhere, as the size of the labor market on reserves is comparatively smaller. Table B.7 of the Online Appendix presents evidence against the general equilibrium explanation. It pools the 1986, 1991, and 1996 Census of Populations to show the return to a high school degree (relative to those with no school) on reserves. If anything, the return to a high school degree had increased slightly by 1996.

Returning to Table 2, columns (6) through (8) show the effects for men and women separately and then pool the sample to test whether the difference is statistically significant. Here, we see that both men and women experienced a decline in high school graduation, but that the effect is larger for men than for women. This difference is statistically significant, according to the results in column (5). Columns (9) through (11) show that the high school graduation effect is driven by First Nations individuals.

The decline in high school graduation on reserves is troubling and indicates that it is often those who are most vulnerable who are most adversely affected by cutbacks to social programs. Furthermore, understanding exactly who is vulnerable to cutbacks to post-secondary funding can help target scarce funding accordingly. In Section H of the Online Appendix I examine several additional dimensions of heterogeneity in relation to the high school graduation effect to better understand which community members were most affected by funding cutbacks. I show that indi-

viduals who lived in provinces where tuition was highest, and therefore who would have experienced the largest increases in expected costs, also saw the largest declines in high school graduation. I do not find that those who were most geographically isolated saw the largest declines in high school graduation. High school graduation declined for individuals in the poorest Indigenous nations, and those with low rates of baseline high school and post-secondary graduation, suggesting that the high school dropout effect was largest among those most vulnerable.

5.3 The Long-Run Returns to the Policy

It is well-established that additional educational attainment increases earnings later in life (Card, 1999, 2001). Moreover, obtaining a credential, like a high school degree, can be accompanied by its own wage premium that exceeds the typical premium for an additional year of schooling (Hungerford and Solon, 1987). Given the link between education and labour market outcomes, this section examines the long-term effects of the cutbacks to funding. An important consideration is that the funding cutbacks affected many levels of educational attainment simultaneously, so this section evaluates the long-run effects of the policy change, instead of the return to a specific level of education or an additional year of schooling.

Figure 3 displays event study estimates of the effects of funding cutbacks on the probability of earning above the median income, the amount of government transfers received, the number of weeks worked, the number of hours worked, and the probability of being out of the labour force. I present estimates from both non-parametric event studies (black squares) and parametric event students that account for differential linear pre-trends (grey squares).[21]

While there is some evidence that affected individuals actually received fewer government transfers and were no more likely to earn above the median income than unaffected individuals, there is evidence that labour supply declined among the eligible population. Weeks worked and hours worked declined, and the probability that an individual was not in the labour force increased differentially for individuals in the eligible population. Consistent with the gradual decline in educational attainment observed in the previous sections, the changes in employment were largest among later cohorts. These results show that, post cutbacks, labour supply was reduced along

[21] Table B.8 displays the corresponding point estimates for the non-parametric event study specifications presented in Figure 3. It also includes estimates for total market income and the probability of receiving government transfers, which are not reported in the figure for space considerations.

both the intensive and extensive margins.

Table 3 summarizes the intent to treat effect for labour supply. At the extensive margin, cohorts affected by the cutbacks to funding were 2.7 percentage points less likely to be in the labour force, relative to those who were not eligible for funding. At the intensive margin, the number of hours and weeks worked declined by an average of 1.03 and 1.4 respectively. Each of these estimates is statistically significant at the one percent level. The decline in hours worked is also confirmed through an application of the changes-in-changes model (Athey and Imbens, 2006), a non-linear version of difference-in-differences that allows one to estimate treatment effects across the entire distribution of outcomes but relies on different underlying assumptions. A discussion of this model and the results can be found in the Online Appendix in Section I.

Taken as a whole, the results of this section show that the cutbacks to student aid in the late 1980s had lasting effects on labour market outcomes, with particularly strong effects on labour supply.

6 Discussion

This paper uses cutbacks to a post-secondary funding program for Indigenous students in Canada to contribute to our understanding of how the rising costs of college affect the educational attainment and labour market outcomes of marginalized populations. Using exogenous variation in the costs of higher education induced by a program reform in 1989 that cut back the amount of post-secondary funding available to certain Indigenous groups, I show that the program cutbacks led to a decline in post-secondary completion among affected cohorts relative to a control group. A back-of-the-envelope calculation shows that this response is slightly smaller in magnitude in comparison to similar studies focussed in the United States, with an approximate $1,000 (2016 USD) increase in the cost of college translating to a 0.35 percentage point decline in college completion. In the final section of the paper, I show that the funding cutbacks led to an increase in the likelihood of being out of the labour force, and at the intensive margin, the cutbacks resulted in a decline in the number of weeks and hours worked.

Admittedly, the non-experimental identification strategy in this study relies on a number of assumptions that would not hold if there were other policy changes that occurred simultaneously. To address this concern, I show that the results are robust when I drop provinces that experienced

education-related policy changes around the same time as the funding cutbacks and when I drop communities that settled large land claims or specific claims with the federal government at the same time as the funding cutbacks. Further, to account for possible migration effects of the policy change, I show that the results hold when I restrict the sample to include only people who never moved provinces. While it is impossible to rule out every possible confounder, the results of the robustness exercises reveal a stable pattern in educational trends—namely, that in the early 1990s, high school graduation, college completion, and trade completion declined among Status First Nation and Inuit groups relative to non-Indigenous people. Given that Indigenous peoples continue to state that financial stress is a considerable barrier to accessing and completing higher education (Truth and Reconciliation Commission of Canada, 2015; Herkimer and Summers, 2022), understanding the sources and consequences of financial hardship is an important step towards addressing this barrier to higher education.

In many post-colonial countries, including Canada, Indigenous peoples have been economically marginalized by institutions that have largely operated to serve the settler population. In part to facilitate economic participation, post-secondary funding programs that are similar to the PSSSP have been implemented by the federal governments of Australia (National Indigenous Australians Agency, 2023) and the United States (US Federal Government, 2023). These funding programs, however, are clearly not sufficient to meet the growing demand for post-secondary education among Indigenous groups, as evidenced by the plethora of non-governmental organizations that provide post-secondary funding for Indigenous students, as well as university-specific scholarships for Indigenous students within these countries. Indigenous cultures across the globe are unique and, even within a country, Indigenous groups face different environments, contexts, and institutional constraints, which may mean it is inappropriate to generalize the results of this study to other countries. However, the results in this paper may be relevant for Indigenous groups or other individuals that are in similar circumstances. For example, I find that high school graduation was adversely impacted by the program cutbacks, a result that I show is entirely driven by students living on Indian reserves. I suggest that this finding is potentially related to the low return to a high school degree on reserves. In this case, some students may not find it worthwhile to complete high school unless they have the option to attend a post-secondary institution.

Aside from having direct implications for Indigenous populations in North America—over 20% of whom still live on reserves or reservations today—these results are also of importance to other students who may live in isolated regions where the return to a high school degree is low, or for those who perceive the return to a high school degree to be low (Nguyen, 2008). These findings are not dissimilar from other work that has shown that high school students adjust their effort in response to variation in the costs of higher education (Henry et al., 2004; Pallais, 2009). They provide insights into when these adjustments might be large enough to affect the marginal high school graduate. This is important for estimating the overall return to student aid policies, which will understate the benefits of student aid if they ignore the potential impacts on high school outcomes.

References

Abraham, K. G. and M. A. Clark (2006). Financial aid and students' college decisions: Evidence from the district of columbia tuition assistance grant program. *The Journal of Human Resources 41*(3), 578–610.

Acemoglu, D. (2002). Technical change, inequality, and the labor market. *Journal of Economic Literature 40*(1), 7–72.

Acemoglu, D. and D. Autor (2011). Skills, tasks and technologies: Implications for employment and earnings. *Handbook of Labor Economics 4*(B), 1043–1171.

Angrist, J. (1993). The effect of veterans benefits on education and earnings. *Industrial and Labor Relations Review 46*(4), 637–652.

Angrist, J., D. Autor, S. Hudson, and A. Pallais (2014). Leveling up: Early results from a randomized evaluation of post-secondary aid. *NBER Working Paper No. 20800*.

Angrist, J., D. Autor, S. Hudson, and A. Pallais (2016). Evaluating post-secondary aid: Enrollment, persistence, and projected completion effects. *NBER Working Paper No. 23015*.

Angrist, J., D. Autor, and A. Pallais (2022, 12). Marginal Effects of Merit Aid for Low-Income Students*. *The Quarterly Journal of Economics 137*(2), 1039–1090.

Angrist, J. D. and S. H. Chen (2011). Schooling and the Vietnam-era GI Bill: Evidence from the draft lottery. *American Economic Journal: Applied Economics 3*(2), 96–118.

Aragón, F. M. (2015). Do better property rights improve local income?: Evidence from First Nations treaties. *Journal of Development Economics 116*, 43–56.

Arriagada, P. (2021). The achievements, experiences and labour market outcomes of First Nations, Métis and Inuit women with bachelor's degrees or higher. Technical report, Statistics Canada. `https://www150.statcan.gc.ca/n1/pub/75-006-x/2021001/article/00009-eng.htm`.

Athey, S. and G. W. Imbens (2006). Identification and inference in nonlinear difference-in-differences models. *Econometrica 74*(2), 431–497.

Barr, A. (2019). Fighting for education: Financial aid and degree attainment. *Journal of Labor Economics 37*(2), 509–544.

Becker, G. S. (1964). *Human Capital* (3 ed.). The University of Chicago Press.

Beheshti, D. (2022). The impact of opioids on the labor market: Evidence from drug rescheduling. *Journal of Human Resources*.

Boudarbat, B., T. Lemieux, and C. Riddell (2010). The evolution of the returns to human capital in canada, 1980-2005. *Canadian Public Policy 36*, 63–89.

Bound, J. and S. Turner (2002). Going to war and going to college: Did World War II and the G.I. bill increase educational attainment for returning veterans? *Journal of Labor Economics 20*(4), 784–815.

Campbell, D. E. (2009). Civic engagement and education: An empirical test of the sorting model. *American Journal of Political Science 53*(4), 771–786.

Card, D. (1995). *Aspects of Labor Market Behavior: Essays in Honour of John Vanderkamp*, Chapter Using Geographic Variation in College Proximity to Estimate the Return to Schooling. University of Toronto Press.

Card, D. (1999). The causal effect of education on earnings. *Handbook of Labor Economics 3*(A), 1901–1863.

Card, D. (2001). Estimating the return to schooling: Progress on some persistent econometric problems. *Econometrica 69*(5), 1127–1160.

Carnevale, A. P. and J. Strohl (2013). *Rewarding Strivers*, Chapter How Increasing College Access is Increasing Inequality, and What to Do about It. Century Foundation Press.

Caron-Malenfant, Éric., S. Coulombe, E. Guimond, C. Grondin, and A. Lebel (2014). Ethnic mobility of aboriginal peoples in canada between 2001 and 2006 censuses. *Population 69*(1), 29–54.

Castleman, B. L. and B. T. Long (2016). Looking beyond enrollment: The causal effect of need-based grants on college access, persistence, and graduation. *Journal of Labor Economics 34*(4), 1023–1073.

Charles, K. K., E. Hurst, and M. J. Notowidigdo (2016). Housing booms and busts, labor market opportunities, and college attendance. *Working Paper*.

Chetty, R., J. N. Friedman, E. Saez, N. Turner, and D. Yagan (2017). Mobility report cards: The role of colleges in intergenerational mobility. *NBER Working Paper No. 23618*.

College Board (2017a). Total grant aid by source over time.

College Board (2017b). Tuition and fees and room and board over time.

Collin, C. and D. Thompson (2010). Federal investments in post-secondary education and training. *Library of Parliament Research Publications*.

Dee, T. S. (2004). Are there civic returns to education? *Journal of Public Economics 88*(9-10), 1697–1720.

Deming, D. and S. M. Dynarski (2009). Into college, out of poverty? Policies to increase the postsecondary attainment of the poor. *NBER Working Paper No. 15387*.

Denning, J. T. (2017). College on the cheap: Consequences of community college tuition reductions. *American Economic Journal: Economic Policy 9*(2), 155–188.

DesJardins, S. L., B. P. McCall, M. Ott, and J. Kim (2010). A quasi-experimental investigation of how the gates millennium scholars program is related to college students' time use and activities. *Educational Evaluation and Policy Analysis 32*(4), 456–475.

Dobkin, C., A. Finkelstein, R. Kluender, and M. J. Notowidigdo (2018, February). The economic consequences of hospital admissions. *American Economic Review 108*(2), 308–52.

Dynarski, S. (2002). The consequences of merit aid. *NBER Working Paper No. 9400*.

Dynarski, S. (2004). *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It*, Chapter The New Merit Aid. The University of Chicago Press.

Dynarski, S. (2008). Building the stock of college-educated labor. *The Journal of Human Resources 43*(3), 576–610.

Dynarski, S. and J. Scott-Clayton (2013). Financial aid policy: Lessons from research. *The Future of Children 23*(1), 67–91.

Dynarski, S. M. (2003). Does aid matter? Measuring the effect of student aid on college attendance and completion. *American Economic Review 93*(1), 279–288.

Erwin, C. and M. Binder (2020, 01). Does Broad-Based Merit Aid Improve College Completion? Evidence from New Mexico's Lottery Scholarship. *Education Finance and Policy 15*(1), 164–190.

Feir, D. (2013). Size, structure, and change: Exploring the sources of the Aboriginal earnings gaps in 1995 and 2005. *Canadian Public Policy 39*(2), 309–334.

Feir, D. and R. Akee (2017). Excess mortality, institutionalization and homelessness among Status Indians in Canada. *IZA DP No. 10416*.

Fryer, R. G. (2005). An economic analysis of "acting white". *The Quarterly Journal of Economics 120*(2), 551–583.

Fryer Jr., R. G. and P. Torelli (2010). An empirical analysis of 'acting white'. *Journal of Public Economics 94*(5-6), 380–396.

Galloway, G. and S. Fine (2016, April). Métis, non-status Indians win Supreme Court battle over rights. *The Globe and Mail*.

Garner, R., E. Guimond, and S. Senécal (2013). The socio-economic characteristics of First Nation teen mothers. *The International Indigenous Policy Journal 4*(1), 1–25.

George, P. and P. Kuhn (1994, 42). The size and structure of the Native-White wage differentials in Canada. *The Canadian Journal of Economics 27*(1), 20.

Goldin, C. and L. Katz (2008). *The Race Between Education and Technology*. The Belknap Press of Harvard University Press.

Grossman, M. (2006). *Handbook of the Economics of Education*, Volume 1, Chapter Education and Nonmarket Outcomes, pp. 577–633. Elsevier, Amsterdam.

Guimond, E. (1999). Ethnic mobility and the demographic growth of Canada's Aboriginal populations from 1986 to 1996. *Report on the Demongraphic Situation in Canada Statistics Canada Catalogue no. 91-209*, 187–200.

Guimond, E. (2009). *L'explosion démographique des populations autoctones du Canada de 1986 à 2001*. Ph. D. thesis, University of Montréal.

Henry, G. T., R. Rubenstein, and D. T. Bugler (2004). Is hope enough? impacts of receiving and losing merit-based financial aid. *Educational Policy 18*(5), 686–709.

Herkimer, J. and K. Summers (2022). Story as knowledge: Experiences of early leaving & persistence from Indigenous post-secondary students. Technical report, Indspire. https://indspire.ca/wp-content/uploads/2023/03/Story-as-Knowledge-Experiences-of-Early-Leaving-and-Persistence-from-Indigenous-Post-Seconda pdf.

Hungerford, T. and G. Solon (1987). Sheepskin effects in the return to education. *Review of Economics and Statistics 69*(1), 175–177.

Indian Health Service (2019). Indian health disparities. https://www.ihs.gov/newsroom/factsheets/disparities/.

Indspire (2019). Annual report 2018-2019. Technical report, Indspire.

Kane, T. J. (1994). College entry by blacks since 1970: The role of college costs, family background, and the returns to education. *Journal of Political Economy 102*(5), 878–911.

Kane, T. J. and C. E. Rouse (1995). Labor-market returns to two- and four-year college. *American Economic Review 85*(3), 600–614.

Kelly-Scott, K. and K. Smith (2015). Aboriginal peoples: Fact sheet for Canada. Technical report, Statistics Canada, ISBN 978-0-660-02908-5.

Lemieux, T. and D. Card (2001). Education, earnings, and the 'Canadian G.I. Bill'. *The Canadian Journal of Economics 34*(2), 313–344.

Liebert, A. (2018). The experience of American Indian students in the Minnesota labor market. *Minnesota Employment Review* (August), 1–12.

Lochner, L. and A. Monge-Naranjo (2011). The nature of credit constraints and human capital. *American Economic Review 101*(6), 2487–2529.

Lochner, L. and E. Moretti (2004). The effect of education on crime: Evidence from prison inmates, arrests, and self reports. *American Economic Review 94*(1), 155–189.

MacKinnon, J. G. and M. D. Webb (2017). Wild bootstrap inference for wildly different cluster sizes. *Journal of Applied Econometrics 32*(2), 233–254.

Michael Tjepkema, T. B. and E. Bougie (2019). Life expectancy of First Nations, Métis and Inuit household populations in Canada. Technical report, Statistics Canada. https://www.census.gov/history/pdf/c2010br-10.pdf.

National Aboriginal Achievement Foundation (2008). Annual report 2007-2008. Technical report, National Aboriginal Achievement Foundation.

National Aboriginal Economic Development Board (2017). Recommendations report on improving access to capital for Indigenous Peoples in Canada. Technical report, The National Aboriginal Economic Development Board.

National Center for Education Statistics (2017). *Table 104.20*, Volume 144. U.S. Department of Education.

National Indigenous Australians Agency (2023). Indigenous student success program. https://www.niaa.gov.au/indigenous-affairs/education/indigenous-student-success-program.

Nguyen, T. (2008). Information, role models and perceived returns to education: Experimental evidence from Madagascar. *Working Paper*.

Nielsen, M. Ø., J. G. MacKinnon, D. Roodman, and M. D. Webb (2019). Fast and wild: Bootstrap inference in stata using boottest. *The State Journal 19*(1).

Norris, T., P. L. Vines, and E. M. Hoeffel (2012a). The American Indian and Alaska Native population: 2010. Technical report, U.S. Census Bureau. https://www.census.gov/history/pdf/c2010br-10.pdf.

Norris, T., P. L. Vines, and E. M. Hoeffel (2012b). Seven Generations Education Institute Post-Secondary Student Support Program administrative handbook. Technical report, Seven Generations Education Institute. https://www.7generations.org/wp-content/uploads/2020/12/PSSSP-Administrative-Handbook-April-2012.pdf.

Oreopoulos, P. and U. Petronijevic (2013). Making college worth it: A review of the returns to higher education. *The Future of Children 23*(1), 41–65.

Page, L. C. and J. Scott-Clayton (2016). Improving college access in the united states: Barriers and policy responses. *Economics of Education Review 51*, 4–22. Access to Higher Education.

Pallais, A. (2009). Taking a chance on college. *Journal of Human Resources 44*(1), 199–222.

Paquette, J. and G. Fallon (2010). *First Nations Education Policy in Canada: Progress or Gridlock?* University of Toronto Press, Scholarsly Publishing Division.

Pendakur, K. and R. Pendakur (2015). An analysis of the socio-economic outcomes of Aboriginal peoples living in communities associated with self-government agreements, 1991-2011. *Working Paper*.

Postsecondary National Policy Institute (2019). Native american students in higher education. Technical report, Postsecondary National Policy Institute. https://pnpi.org/wp-content/uploads/2019/11/2019_NativeAmericanFactsheet_Updated_FINAL.pdf.

Postsecondary National Policy Institute (2022). Native american students in higher education. Technical report, Postsecondary National Policy Institute. https://pnpi.org/wp-content/uploads/2022/11/NativeAmericanFactSheet-Nov-2022.pdf.

Rice, D. (2016). The impact of education decentralization on high school attendance and completion: Evidence from First Nation education self-government agreements in Canada. *Working Paper*.

Saku, J. C. (1999). Aboriginal census data in Canada: A research note. *The Canadian Journal of Native Studies 19*(2), 365–379.

Standing Committee on Aboriginal Affairs and Northern Development (2007). No higher priority: Aboriginal post-secondary education in Canada. Technical report, Parliament of Canada.

Stanley, M. (2003). College education and the mid- century G.I. bills. *The Quarterly Journal of Economics 118*(2), 671–708.

Statistics Canada (2015). The 2011 national household survey—the complete statistical story. https://www.statcan.gc.ca/en/blog-blogue/cs-sc/2011NHSstory.

Statistics Canada (2016a). Aboriginal population profile, 2016 census. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E.

Statistics Canada (2016b). Tuition and living accommodation costs for full-time students at Canadian degree-granting institutions, 1993-2015. *Scholars Portal Dataverse, V1*.

Statistics Canada (2017a). Table 282-0228 - labour force survey estimates (lfs), by Aboriginal group, educational attainment and age group, Canada and selected regions. *CANSIM (database)*.

Statistics Canada (2017b). Table 477-0122 - Canadian students, tuition and additional compulsory fees, by level of study, annual (dollars). *CANSIM (database)*.

Stinebrickner, R. and T. Stinebrickner (2008). The effect of credit constraints on the college dropout decision: A direct approach using a new panel study. *American Economic Review 98*(5), 2163–2184.

Stonechild, B. (2006). *The New Buffalo: The Struggle for Aboriginal Post-Secondary Education in Canada*. University of Manitoba Press.

Truth and Reconciliation Commission of Canada (2015). Truth and Reconciliation Commission of Canada: Calls to Action. Technical report, Truth and Reconciliation Commission of Canada. https://ehprnh2mwo3.exactdn.com/wp-content/uploads/2021/01/Calls_to_Action_English2.pdf.

Turner, S. and J. Bound (2003). Closing the gap or widening the divide: The effects of the G.I. bill and World War II on the educational outcomes of black Americans. *The Journal of Economic History 63*(1), 145–177.

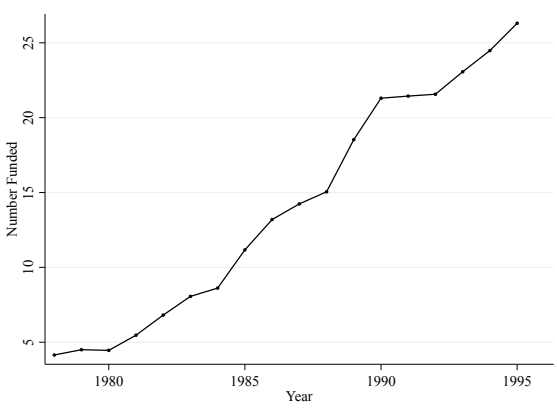
US Federal Government (2023). Indian higher education grant program. https://www.benefits.gov/benefit/796.

Vowel, C. (2016). *Indigenous Writes: A Guide to First Nations, Métis, and Inuit Issues in Canada*. Highwater Press: Winnipeg.

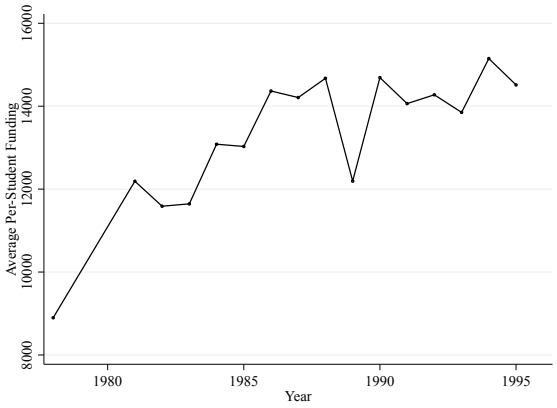
Walter, M. (2013). *Indigenous statistics : a quantitative research methodology*. Walnut Creek, CA: Left Coast Press.

Wilson, D. and D. Macdonald (2010). The income gap between Aboriginal peoples and the rest of Canada. Technical report, The Canadian Centre for Policy Alternatives.

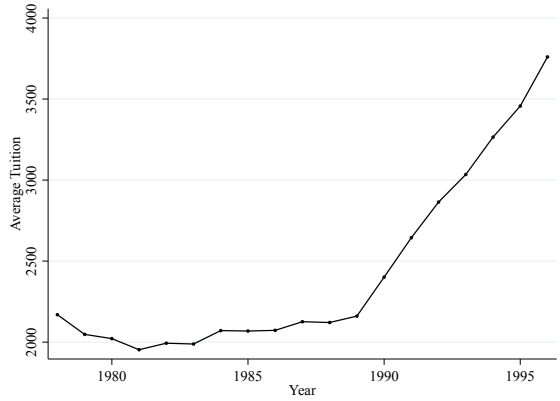
7 Figures



(a) Number Funded

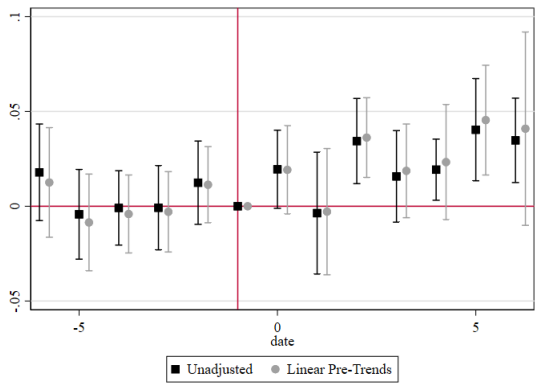


(b) Average Per-Student Funding

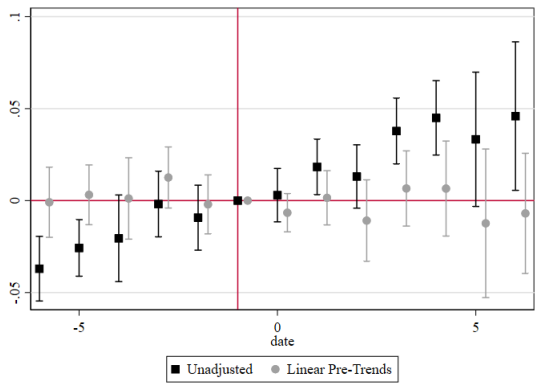


(c) Average University Tuition

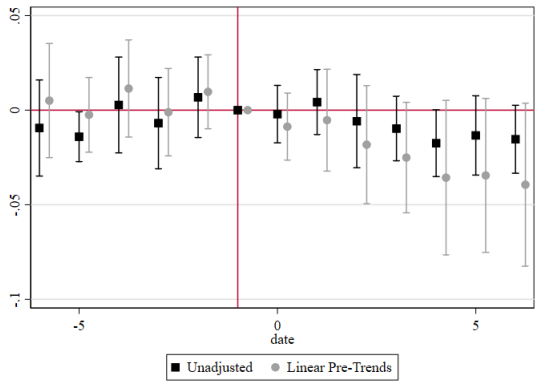
Figure 1: Number of students funded under the PSEAP and the PSSSP, the average amount of funding per student (in 2016 CAD), and university tuition (in 2016 CAD). Data for the number of students funded from *DIAND: Basic Departmental Data, 2004,* and data for the total and per student funding from Stonechild (2006) (1977, 1978, 1981-1989), Annual Indian Affairs Reports (1990), Indian and Northern Affairs Canada 1996 Performance Report (1991-1995). Data for Registered Status Population from *Basic Departmental Data, 2004, DIAND.* Tuition data from Tuition and Living Accommodations Cost Survey.



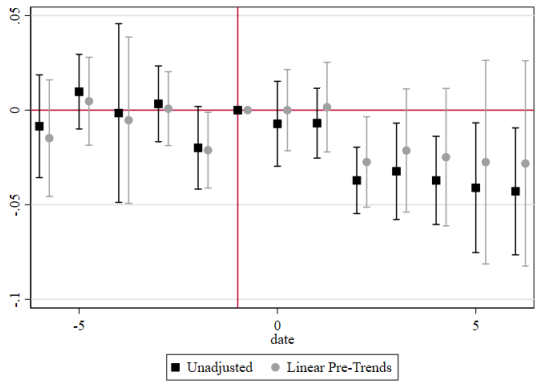
(a) No Certification



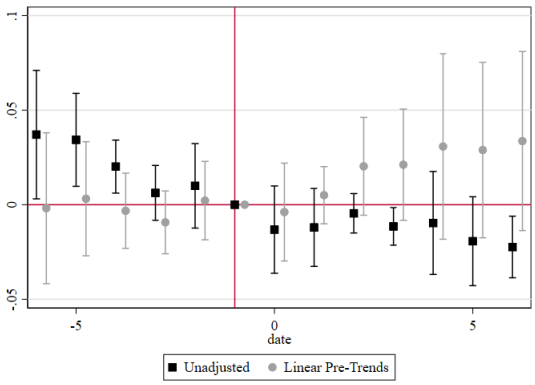
(b) At Most High School



(c) At Most Trade/Apprenticeship

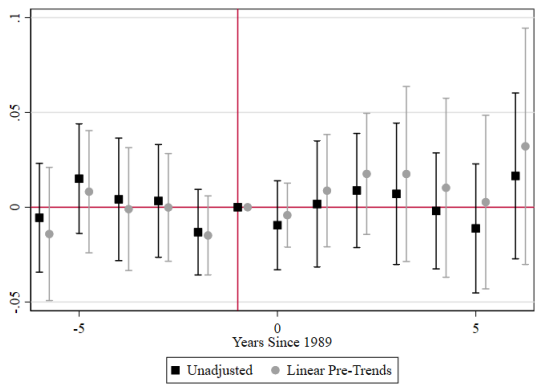


(d) At Most College

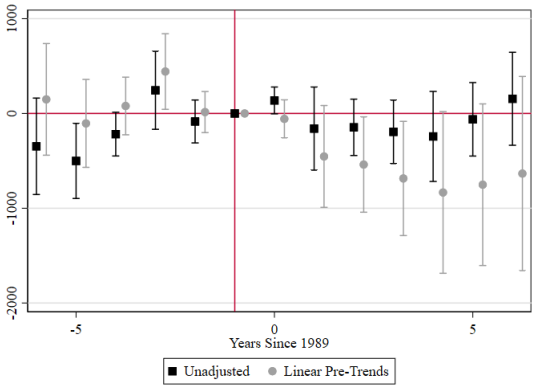


(e) At Most University

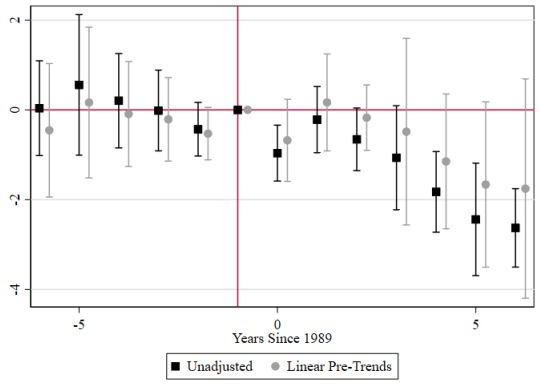
Figure 2: The figure plots estimated coefficients on the interactions between "eligible" and event-time dummies for 6 years before and after the funding was cut back. Time -1 is omitted so that all coefficients are measured with respect to one year prior to the cutbacks. Each panel presents the results from using a different level of education as the dependent variable. Each regression controls for gender, whether an individual lives on a reserve or northern community, whether the individual is a Status Indian, distance to the closest CMA, latitude and longitude of CSD, tuition of college and university in province p at time t, and I include fixed effects for CMA-province, year of graduation, and birth quarter. Black squares represent unadjusted event-time estimates from equation 2 and grey circles represent the pre-trend adjusted estimates from equation 3.



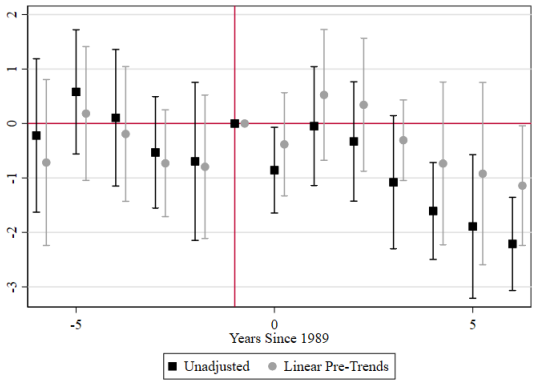
(a) Pr(> Median Market Income)



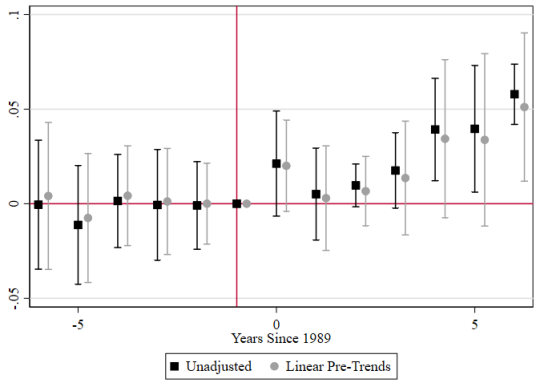
(b) Government Transfers



(c) Weeks Worked



(d) Hours Worked



(e) Pr(Not in Labour Force)

Figure 3: Each plot displays the coefficients from a difference-in-differences event study with 95% confidence intervals. Each equation is estimated by OLS with standard errors clustered by province. I include controls for gender, whether an individual lives on a reserve or northern community (in panel a and d), whether the individual is a Status Indian, distance to the closest CMA, latitude and longitude of CSD, tuition of college and university in province p at time t, and I include fixed effects for tribe, CMA-province, aboriginal group, year of graduation, and birth quarter. Black squares represent unadjusted event-time estimates from equation 2 and grey circles represent the pre-trend adjusted estimates from equation 3.

8 Tables

Table 1: Summary Statistics Pre- and Post-1989

	Pre-1989			Post-1989		
	Eligible (1)	Non-Eligible (2)	Diff (1) - (2)	Eligible (4)	Non-Eligible (5)	Diff (4) - (5)
Panel A: Educational Outcomes						
No Certification	.361	.11	.251	.373	.099	.274
	(.003)	(.001)	(.004)	(.004)	(.001)	(.004)
High School Degree	0.20	.227	-.027	.243	.22	.022
	(.003)	(.001)	(.003)	(.004)	(.001)	(.004)
Trade/Apprenticeship	.138	.129	.008	.115	.115	0
	(.003)	(.001)	(.003)	(.003)	(.001)	(.003)
Community College	.328	.374	-.045	.287	.363	-.076
	(.004)	(.001)	(.004)	(.004)	(.001)	(.004)
University	.071	.25	-.178	.067	.279	-.212
	(.002)	(.001)	(.002)	(.002)	(.001)	(.003)
High School Graduate	.639	.89	-.251	.627	.901	-.274
	(.003)	(.001)	(.004)	(.004)	(.001)	(.004)
Panel B: Tuition						
Tuition College	695.354	671.783	23.571	1212.246	1095.344	116.902
	(2.876)	(.688)	(2.957)	(5.082)	(1.191)	(5.22)
Tuition University	1123.521	1070.506	53.014	1974.942	1881.73	93.212
	(2.426)	(.659)	(2.514)	(3.741)	(.991)	(3.87)
Panel C: Labour Market Outcomes						
Above Median Income	.15	.321	-.171	.097	.22	-.123
	(.003)	(.001)	(.003)	(.003)	(.001)	(.003)
Government Transfers	.599	.277	.323	.663	.358	.305
	(.004)	(.001)	(.004)	(.004)	(.001)	(.004)
Hours Worked	23.607	33.176	-9.569	21.643	32.23	-10.587
	(.174)	(.034)	(.177)	(.19)	(.038)	(.194)
Weeks Worked	30.014	41.361	-11.348	27.567	40.442	-12.875
	(.164)	(.03)	(.167)	(.181)	(.033)	(.184)
Not in Labor Force	.255	.104	.151	.278	.098	.18
	(.003)	(.001)	(.003)	(.004)	(.001)	(.004)
Panel D: Additional Controls						
Distance to Closest CMA	142.065	24.143	117.922	146.304	22.994	123.31
	(1.32)	(.057)	(1.321)	(1.498)	(.06)	(1.499)
Male	.464	.495	-.031	.465	.498	-.033
	(.004)	(.001)	(.004)	(.004)	(.001)	(.004)
Inuit	.067	·	·	.071	·	·
	(.001)	·	·	(.002)	·	·
North American Indian	.933	·	·	.93	·	·
	(.001)	·	·	(.002)	·	·
On Reserve or Northern Community	.383	.001	.382	.384	.001	.383
	(.003)	(0)	(.003)	(.003)	(0)	(.003)
Registered Status Indian	.774	.001	.773	.769	.001	.768
	(.003)	(0)	(.003)	(.004)	(0)	(.004)

Notes: Sample means for eligible and non-eligible groups in the pre- and post-cutback time periods. Standard deviations are displayed in parentheses and difference-in-means tests are also computed. All statistics are weighted by the same weights provided in the census of population.

Table 2: Effects of Funding Cutbacks on High School Graduation

			Reserve			Gender			Group		
	No Controls	Full Controls	On-Reserve	Off-Reserve	Pooled	Men	Women	Pooled	Inuit	First Nation	Pooled
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Treatment (Tr)	-0.02115***	-0.01712**	-0.05049***	-0.01057	-0.00692	0.02032*	-0.02031**	-0.01363**	-0.00611	-0.01967**	0.01764*
	[0.0050]	[0.0330]	[0.0090]	[0.3934]	[0.5355]	[0.0681]	[0.0440]	[0.4384]	[0.0490]	[0.0370]	[0.0621]
	(0.00589)	(0.00599)	(0.00871)	(0.01031)	(0.00964)	(0.00831)	(0.00470)	(0.00727)	(0.01013)	(0.00645)	(0.00947)
Tr × Reserve					-0.02656**						
					[0.0661]						
					(0.01078)						
Tr × Male								-0.02369***			
								[0.0010]			
								(0.00620)			
Tr × First Nation											-0.03736**
											[0.0350]
											(0.01254)
N Obs	901080	901080	446900	454180	901080	54260	846820	901080	834490	893610	901080
Adj. R^2	0.04199	0.04849	0.04618	0.04578	0.04851	0.10993	0.03193	0.04850	0.02784	0.04596	0.04849

Notes: Standard errors clustered by province in parentheses. Wild cluster bootstrap P-values in brackets. The dependent variable in each specification is a dummy variable for whether or not the individual is a high school graduate. Treatment is the interaction of graduating after the policy change and eligibility for the program. Column (1) includes an indicator for eligibility and for being in a cohort that should have graduated after the policy change, CMA-province fixed effects, and a linear year of graduation time trend. All other columns control for gender, whether an individual lives on a reserve or northern community, whether the individual is a Status Indian, distance to the closest CMA, latitude and longitude of CSD, tuition of college and university in province p at time t, and I include fixed effects for tribe, CMA-province, aboriginal group, year of graduation, and birth quarter.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Effects of Funding Cutbacks on Labour Supply

	(1) Pr(Not in LF)	(2) Weeks	(3) Hours
Treatment	0.027***	-1.392***	-0.975***
	[0.0010]	[0.0000]	[0.0170]
	(0.0038)	(0.220)	(0.252)
N Obs	901080	901080	901080
Adj. R^2	0.0230	0.057	0.094

Notes: Standard errors clustered by province in parentheses. The dependent variable in column (1) is an indicator for whether or not the individual is in the labour force. In column (2) the dependent variable is the number of weeks worked in the previous year and in column (3) the dependent variable is the number of hours worked in the previous week . Treatment is the interaction of graduating after the policy change and eligibility for the program. All columns control for gender, whether an individual lives on a reserve or northern community, whether the individual is a Status Indian, distance to the closest CMA, latitude and longitude of CSD, tuition of college and university in province p at time t, and I include fixed effects for tribe, CMA-province, aboriginal group, year of graduation, and birth quarter. * $p < 0.1$, ** $p < 0.05$,*** $p < 0.01$