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CLOSING THE ABORIGINAL EDUCATION GAP IN CANADA: ASSESSING PROGRESS AND ESTIMATING THE ECONOMIC BENEFITS

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Closing the Aboriginal Education Gap in Canada: Assessing Progress and Estimating the Economic Benefits

Abstract

This report has two major goals. The first goal is to assess progress on the gaps in educational attainment and labour market outcomes between 2001 and 2011 and the consequences of any progress (or lack thereof) for the Canadian economy. The second goal is to produce updated estimates of the benefits of eliminating the educational attainment gap. Utilizing projections of the Aboriginal population in 2031 and data from the 2011 National Household survey, we estimate the effects of closing the educational attainment gap on Aboriginal labour market outcomes and national economic performance. We provide breakdowns of the benefits by province, sex, age, Aboriginal identity, registered Indian status, and residence on- and off-reserve. We project that the direct cumulative economic benefits to Canada of closing the educational attainment gap between 2011 and 2031 could be as large as $261 billion.

Closing the Aboriginal Education Gap in Canada: Assessing Progress and Estimating the Economic Benefits

Table of Contents

Closing the Aboriginal Education Gap in Canada: Assessing Progress and Estimating the Economic Benefits

Executive Summary

Introduction

Measures of economic and social performance reveal that Canada's Aboriginal population continues to lag behind the rest of the population. There is wide agreement that improving Aboriginal education levels is a key part of the solution to ending these disparities. More educated individuals have stronger labour market performance, better health, lower crime rates, and many other desirable attributes and outcomes. Through further educational attainment, Aboriginal people can acquire knowledge and skills which can help them to be more successful in the labour force and in their personal lives.

Improving Aboriginal outcomes is not just a matter of assisting the less fortunate. In addition to being an embarrassment for Canada on the world stage, the poor living standards of our Aboriginal people are costly in terms of additional government expenditures on social assistance, health care, and prisons. In addition to these direct costs, these poor living standards are the result of high unemployment rates and low incomes of Aboriginal Canadians which represent lost income not only for these individuals, but for the Canadian economy more generally. The low level of educational attainment of Canada`s Aboriginal population reflects a failure to fully develop and utilize the nation`s human resources. Closing the educational attainment gap would have a significant positive impact on Canadian employment, productivity, and gross domestic product.

In 2007, the Centre for the Study of Living Standards (CSLS) produced a report which found that there were potentially very large economic benefits to eliminating the Aboriginal educational attainment gap in Canada between 2001 and 2017 (Sharpe et al., 2007). The present report serves as a follow-up to that study with the aim of reassessing the benefits of closing the gap in light of new data from the 2011 National Household Survey.

This report has two major goals. The first is to assess progress on the gaps in educational attainment and labour market outcomes between 2001 and 2011 and the consequences of any progress (or lack thereof) for the Canadian economy. The second goal is to produce updated estimates of the benefits of eliminating the educational attainment gap observed in 2011 by the year 2031. The methodology utilized in this report is based upon the previous CSLS study on the topic, but has been modified to account for the age, sex, and geographic distribution of the

Aboriginal population. This report is able to provide a breakdown of the benefits by province, sex, age, Aboriginal identity, and those living on- and off-reserve.

The report is structured as follows. Section 1 provides an introduction. Section 2 briefly reviews the research linking greater education to superior economic outcomes for individuals and for society. Section 3 presents the evidence on the gaps between the Aboriginal and non-Aboriginal populations with regard to educational attainment and labour market outcomes. This section explores how these gaps have changed between 2001 and 2011 and the relationships between these gaps and Aboriginal demographics. Section 4 outlines a methodology for assessing the potential benefits of closing the educational attainment gap and discusses the results when this methodology is applied to data from the National Household Survey. Section 5 concludes with a summary of major findings, a short discussion of policy implications, and notes the limitations of this study for those interested in further research in this area.

The Labour Market Gaps

Aboriginal people are less likely to have jobs and earn lower wages in their jobs than non-Aboriginal Canadians. Consider the following statistics from the 2011 National Household Survey:

- The labour force participation rate is the ratio of people working or looking for work to the total number of individuals of working age. The Aboriginal labour force participation rate of the population aged 25 to 64 in Canada in 2011 was 71.7 per cent compared to 80.6 per cent for the non-Aboriginal population.

- The Aboriginal unemployment rate – the fraction of those in the labour force who do not have a job - was 12.8 per cent for the Aboriginal population aged 25 to 64 in 2011. This was more than double the non-Aboriginal unemployment rate of 6.0 per cent.

- Only 62.5 per cent of Aboriginal people aged 25 to 64 were employed compared to 75.8 per cent of non-Aboriginal people.

- Among full-year full-time workers aged 25 to 64, the average Aboriginal worker in 2010 only earned $50,928[1], while the average non-Aboriginal worker earned $60,296.

The extent of the discrepancies between Aboriginal and non-Aboriginal outcomes varies across different subsets of the population. Aboriginal labour market outcomes tend to be closer to those of non-Aboriginal people among the Métis, women, those living in eastern Canada, and those living off-reserve. The gaps are typically wider for those living on the Prairies or in the Territories, the Inuit, and the First Nations, particularly those living on-reserve.

[1] All figures in the executive summary are adjusted for inflation and are expressed in 2010 Canadian dollars.

Part of the gaps described above can be explained by demographic differences between the Aboriginal and non-Aboriginal populations. The Aboriginal population tends to be younger and younger people have more difficulty acquiring and retaining positions and earn lower wages. Similarly, the Aboriginal population is more concentrated in rural areas, which tend to have fewer economic opportunities. Even controlling for demographic and geographic differences, Aboriginal people still underperform in the labour market. One factor which helps explain this is the educational attainment gap between the Aboriginal and non-Aboriginal populations.

The Education Gap

Those possessing more education have better labour market outcomes than those who do not. The returns to investing in education have been well documented by decades of economic research. There are many channels through which education potentially raises a worker's employment prospects and future earnings. Workers acquire valuable knowledge and skills which make them more valuable to employers. Education may also operate as a signal of pre-existing aptitudes and abilities.

Besides enhancing individual labour market prospects, education is believed to have other positive effects on society. Spillover benefits from having better educated co-workers can raise the productivity of other workers. Those with better education may also make better decisions with regards to health, social interaction, and personal finances.

The Aboriginal population is less educated than the non-Aboriginal population. We focus on the population aged 25 to 64 in order to avoid incorporating a relatively young Aboriginal population which has not had time to complete schooling into our assessment. Comparing the educational attainment of two populations can be difficult as there is no single, readily available statistic to compare.

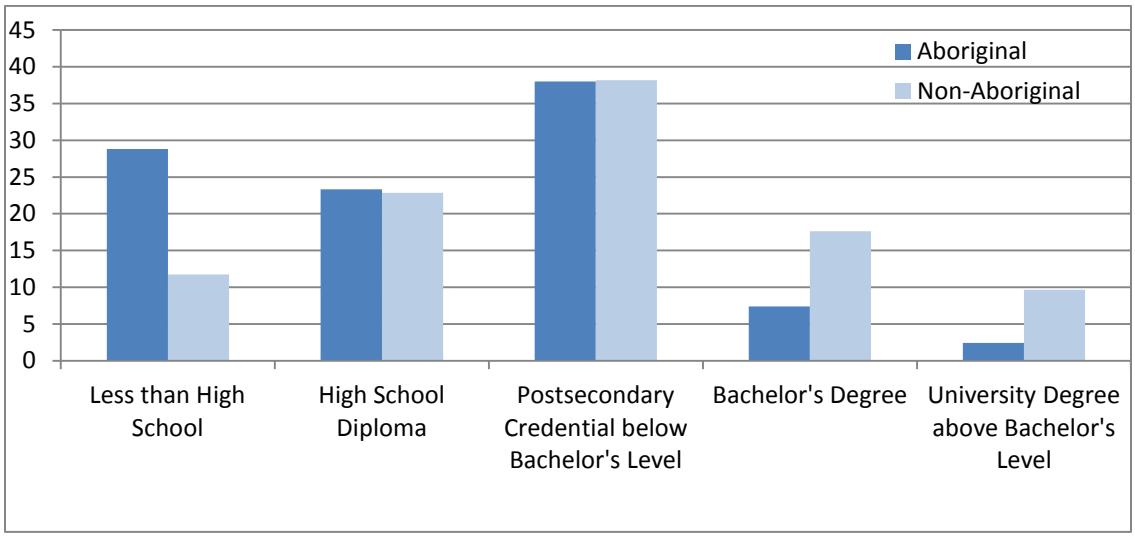
One can estimate the average years of educational attainment of the population by assigning a number of years of education to each highest educational attainment category based on years of education reported by the total population in that category in the 2001 Census. This measure allows one to construct a common metric with which to summarize the distribution of educational attainment based upon the relative years of education associated with individuals in each category.

We estimate that the average Aboriginal person aged 25 to 64 had 12.7 years of education compared to 14.1 for the average non-Aboriginal person in the same age group in 2011. This amounts to a gap of 1.4 average years of educational attainment.

Plotting the educational distributions of the two populations by highest certificate, diploma, or degree attained is another way to illustrate the gap (see chart below). One observes that the shares of the Aboriginal and non-Aboriginal populations whose highest education attainment is a high school diploma or a postsecondary credential below the bachelor's level are

very similar. The difference arises in the population with less than a high school degree and with a university education. Aboriginal people are far less likely to have completed high school or to have acquired a university degree.

Distributions of the Aboriginal and Non-Aboriginal Populations Aged 25-64 by Highest Level of Educational Attainment Successfully Completed, 2011



Source: Author's calculations using public use microdata from the 2011 National Household Survey

These poor educational outcomes are a major factor in explaining the Aboriginal labour market gaps, but they do not explain everything. If we control for educational attainment, the labour market gaps still persist to some extent. The income gap tends to be very small for those with the least education, but it is still sizable for Aboriginal individuals possessing a bachelor's degree. Similarly, the labour market gaps are very large for those with less than a high school degree, but tend to shrink with education.

Are the Gaps Closing?

We are interested in how the gaps have been evolving over time. Policymakers are well aware of the poor educational and labour market performance of the Aboriginal population and have introduced policies to try to address these issues. Comparing relative outcomes for the population aged 25 to 64 between the 2001 Census and the 2011 National Household Survey, one sees that there has been some success:

- There has been little improvement in the labour force participation rate gap between 2001 and 2011. The Aboriginal labour force participation rate was 9.2 percentage points lower than the non-Aboriginal rate in 2001, but only 8.9 percentage points lower in 2011. There was quite a bit of progress between 2001 and 2006, but most of this progress was lost in the second half of the decade.

- In absolute terms, the Aboriginal unemployment rate was 11.3 percentage points above the non-Aboriginal rate in 2001. This gap fell to 6.8 percentage points in 2011. Improvement in the absolute gap occurred primarily between 2001 and 2006.

- As a result of progress on the unemployment rate gap, the employment rate gap declined from 16.6 percentage points in 2001 to 13.3 percentage points in 2011. This progress occurred almost entirely in the 2001 to 2006 period.

- The average Aboriginal person between 25 and 64 working full-year full-time made $11,330 (2010 dollars) less than the average non-Aboriginal person in 2000. This gap fell to $9,368 by 2011. In relative terms, the gap was 22.6 per cent of non-Aboriginal income in 2000 and 15.5 per cent in 2010. The relative income gap shrank by an average of 0.71 percentage points each year over the decade, but most of the closure of this gap occurred since 2005.

Labour Market Outcome Gaps between the Aboriginal and Non-Aboriginal Populations Aged 25-64, Summary Table

Gap (percentage points)	2001	2006	2011	Change 2001-11 (percentage points)
Participation Rate Gap (absolute)	9.2	8.1	8.9	-0.3
Employment Rate Gap (absolute)	16.6	13.3	13.3	-3.3
Unemployment Rate Gap (absolute)	-11.3	-7.9	-6.8	4.5
Employment Income Gap[a] (relative)	22.6	21.4	15.5	7.1

[a] Based on income earned in the preceding year

Source: 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

The improvement in these gaps may be attributable in part to improvements in Aboriginal educational attainment. Demographic changes, economic shocks which affected the areas where the Aboriginal population is or is not relatively concentrated (the resource boom in western Canada, for example), reporting errors in the National Household Survey, and other social factors also may have played a role.

The Aboriginal educational attainment gap widened very slightly between 2001 and 2011. In absolute terms, our approximate measure based on years of schooling suggests that the gap of 1.40 years in 2011 grew by 0.05 years from 1.35 years in 2001. Nonetheless, Aboriginal education levels did improve significantly over the period. Average years of Aboriginal educational attainment rose by 0.76 years and the share of the Aboriginal population aged 25-64 possessing an educational certificate, diploma, or degree drastically increased from 61 per cent in 2001 up to 71 per cent in 2011. The non-Aboriginal population experienced similar

improvements in educational attainment over the same period so that the gap is practically unchanged.

Average Years of Education of Aboriginal and non-Aboriginal Canadians Aged 25-64, Summary Table

	2001	2006	2011	Absolute Change (years) 2001-11
Aboriginal	11.93	12.43	12.69	0.76
Non-Aboriginal	13.28	13.84	14.09	0.81
Gap (years)	1.35	1.41	1.40	0.05
Gap Compared to Non-Aboriginal Education in 2001 (years)	1.35	0.85	0.59	-0.76

Source: Author's calculations using public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey.

Improvements in Aboriginal educational attainment have occurred almost entirely off-reserve. On-reserve, the share of the Aboriginal population with no certificate, diploma, or degree fell from 48.4 per cent to 46.4 per cent from 2001 to 2011. In contrast, the share of the Aboriginal population with no certificate, diploma, or degree off-reserve fell from 35.2 per cent to 24.2 per cent over the same period, while the share of the non-Aboriginal population in this category fell from 22.3 per cent to 12.1 per cent.

Improvement in terms of the summary measure of years of educational attainment is similarly modest on-reserve. Years of educational attainment of the Aboriginal population on-reserve aged 25 to 64 rose by 0.14 years from 11.64 years in 2001 to 11.78 years in 2011. Over the same period, Aboriginal years of educational attainment off-reserve rose from 12.31 years to 12.96 years. The reader should be aware that these measures of years of educational attainment on- and off- reserve are not perfectly comparable (although very similar) to those presented in the table above because data limitations required the calculations on- and off-reserve to be calculated using a smaller number of educational attainment categories. As a point of comparison, non-Aboriginal years of educational attainment rose from 13.29 in 2001 to 13.96 in 2011 using the smaller number of educational attainment categories.

Assessing the Benefits from Closing the Education Gap

We quantify the magnitude of the benefits from closing the Aboriginal educational attainment gap for the working age population (aged 15+) in order to assess the potential returns of future investments in this area. This is the major exercise of this report.

To estimate the benefits from closing the Aboriginal educational attainment gap by 2031, we follow a methodology similar to that of an earlier study on the topic (Sharpe et al., 2007). First, we project the Aboriginal educational attainment gap in 2031 if the 2011 educational attainment levels of the Aboriginal and non-Aboriginal populations continue to follow the trends observed between the 2006 and 2011 censuses. Given that there has been very little change in the

educational attainment gap between 2006 and 2011, we do not expect the gap in 2031 to be very different in size from the one observed in 2011, but the level of educational attainment will be higher within both the Aboriginal and non-Aboriginal populations. This projection of future educational attainment differs from the approach in Sharpe et al. (2007) which assumed that educational attainment remained unchanged in the future.

Next, we combine our baseline projections of educational attainment with data from the 2011 National Household Survey, projections of the Aboriginal population, and projections of aggregate economic conditions in 2031 in order to forecast baseline Aboriginal employment and Aboriginal employment income in 2031.

Once we have a baseline estimate of what we expect Aboriginal and non-Aboriginal education, employment rates, and employment incomes (and the gaps) to be in 2031, we can compare these outcomes to several alternative projection scenarios which make assumptions as to how much the forecast educational attainment gap closes by 2031 (half, entirely, or not at all) and how much the employment rate and income gaps conditional on education change (either closed or not at all). This entails holding the projected non-Aboriginal outcomes in 2031 fixed at the levels estimated in the baseline scenario and changing projected Aboriginal outcomes to reduce the size of the gaps.

For the purposes of these exercises, closing the educational attainment gap means that the share of the Aboriginal population in each educational attainment category in 2031 is the same as the share of the non-Aboriginal population in that educational attainment category in 2031. Naturally, this implies that the non-Aboriginal population would have the same number of years of educational attainment as the non-Aboriginal population.

Closing the employment income gap conditional on education means that, within each educational attainment category, an average Aboriginal worker will earn exactly the same income as we expect a non-Aboriginal worker in that category to earn in 2031. For example, a non-Aboriginal person with a high school degree would be paid the same on average as a Aboriginal person with a high school degree.

Similarly, closing the employment rate gap conditional on education means that, within each educational attainment category, the Aboriginal employment rate will be exactly the same as the employment rate we assume for the non-Aboriginal population (we assume the 2031 non-Aboriginal employment rate is unchanged from 2011). For example, if the employment rate for the non-Aboriginal population with only a high school degree is 40 per cent, eliminating the gap would mean that the Aboriginal employment rate for those with only a high school degree is also 40 per cent.

We assume that acquiring a higher level of education will result in an Aboriginal person having the same labour market outcomes on average as other individuals who we observe with

that level of education. The largest possible gains are discussed here, but scenarios in which the gaps half close are perhaps more realistic.

Nine educational categories are considered. A major methodological improvement over this previous study is the incorporation of controls for the age, sex, and province of the Aboriginal population. Rather than comparing a 25-34 year old Aboriginal woman living in Alberta to the average non-Aboriginal Canadian when we close the gaps, we compare her to a 25-34 year old non-Aboriginal woman living in Alberta. Demographic and geographic differences can matter. Men, the middle aged, and those living in Western Canada tend to have stronger than average labour market performance. To the extent that the Aboriginal population has a different age-sex-province distribution, this will improve our estimates. Furthermore, breaking the population down by age, sex, and province facilitates decomposition of the gains from closing the gap along these dimensions.

A few other exercises are performed in addition to these projections. Estimations of the benefits by Aboriginal identity group are constructed in a similar way as for the Aboriginal population as a whole. Due to data limitations, we apply some additional assumptions and restrict ourselves to aggregated data on just four educational categories to perform a crude estimation of the benefits on- and off- reserve. Finally, we also perform a retrospective exercise in which we compare observed outcomes in 2011 to counterfactual scenarios in which the gaps from 2001 remained unchanged or entirely closed. This allows us to quantify not only the potential gains, but also those which have been realized, without relying upon projections of the future population and economic conditions.

Projected Benefits in 2031

By 2031, the population projections utilized in this report forecast that the Aboriginal population will have reached 1,734,000, based upon estimates of the Aboriginal population in 2006. As the Aboriginal population grows, it becomes increasingly important for national economic performance. Highlights of the estimated benefits of closing the projected educational attainment gap by 2031 are as follows:

- We estimate that eliminating the educational attainment gap by 2031 will boost Aboriginal employment by 90,000 workers, the Aboriginal contribution to GDP by as much as $28.3 billion (2010 dollars) or $672 per Canadian living in 2031, and Aboriginal average employment income by as much as $11,236. These estimates assume no improvement in the income or employment rate gaps conditional upon education. The effects would be even greater if these gaps closed as well.

- These improvements to Aboriginal outcomes from closing the educational attainment gap alone would raise the projected national annual growth rate of employment of 0.7829 per cent by 0.0224 percentage points (an increase of 2.86 per cent), the projected

national annual growth rate of GDP of 2.1740 per cent by 0.0549 (an increase of 2.53 per cent) and the projected national annual growth rate of labour productivity 1.3802 per cent by 0.0320 percentage points (an increase of 2.32 per cent)

- We estimate that cumulative gains to output between 2011 and 2031 could be as great as $94.9 billion for the closing of the employment rate gap conditional on education alone, $58.1 billion for the income gap conditional on education alone, $260.7 billion for the entire educational attainment gap alone, and $334.7 billion if all three gaps simultaneously closed. The gains from closing the three gaps individually do not sum to the gains from closing all three gaps at once due to interactions between the three gaps.

Estimated Benefits of Closing the Educational Attainment Gap by 2031

		Absolute Increase over Baseline		**Per cent Increase over Baseline**	
	Baseline	Only Education Gap Closes	All 3 Gaps Close	Only Education Gap Closes	All 3 Gaps Close
Aboriginal Outcomes, 2031					
Employment (thousands)	727.0	90.0	145.4	12.38	20.00
Contribution to GDP (billions, 2010 dollars)	80.7	28.3	36.4	35.13	45.13
Average Employment Income (2010 dollars)	55,482	11,236	11,623	20.25	20.95
National Growth Rates, 2011-2031					
Employment (%)	0.7829	0.0224	0.0361	2.86	4.61
GDP (%)	2.1740	0.0549	0.0704	2.53	3.24
Labour Productivity (%)	1.3802	0.0320	0.0335	2.32	2.43
Cumulative GDP, 2011-2031					
Cumulative GDP (billions, 2010 dollars)	43,116	260.7	334.7	0.60	0.78

We are able to breakdown the benefits of closing the gaps by sex, province, age group, Aboriginal identity, and those living on- and off-reserve. Closing the educational attainment gap

alone by 2031 is estimated to raise the Aboriginal contribution to GDP of select subgroups in 2031 by the following amounts compared to a baseline in which the gaps remain unchanged:

- 28 per cent for women over a 2031 baseline contribution to GDP of $32.9 billion and 40 per cent for men over a 2031 baseline contribution to GDP of $47.7 billion

- 97 per cent on-reserve over a baseline contribution to GDP of $13.3 billion and 18 per cent off-reserve over a baseline contribution to GDP of $62.7 billion

- 27 per cent for the Métis over a baseline contribution to GDP of $28.9 billion, 49 per cent for the Inuit over a baseline contribution to GDP of $3.9 billion, and 45 per cent for the First Nations over a baseline contribution to GDP of $42.7 billion

- Several provinces would see large increases in their Aboriginal contributions to GDP, notably Alberta (44 per cent over a baseline contribution to GDP of $18.0 billion), the Territories (81 per cent over a baseline contribution to GDP of $4.3 billion), and Manitoba (38 per cent over a baseline contribution to GDP of $10.8 billion)

Conclusion

Elimination of the Aboriginal education gap has the potential to generate massive returns to the Canadian economy by raising employment and labour productivity. This report has focused on the benefits of improving Aboriginal education and found that they remain very large. In light of this, the pursuit of cost-effective strategies to improve Aboriginal education should remain a top priority for policymakers.

List of Charts

List of Tables

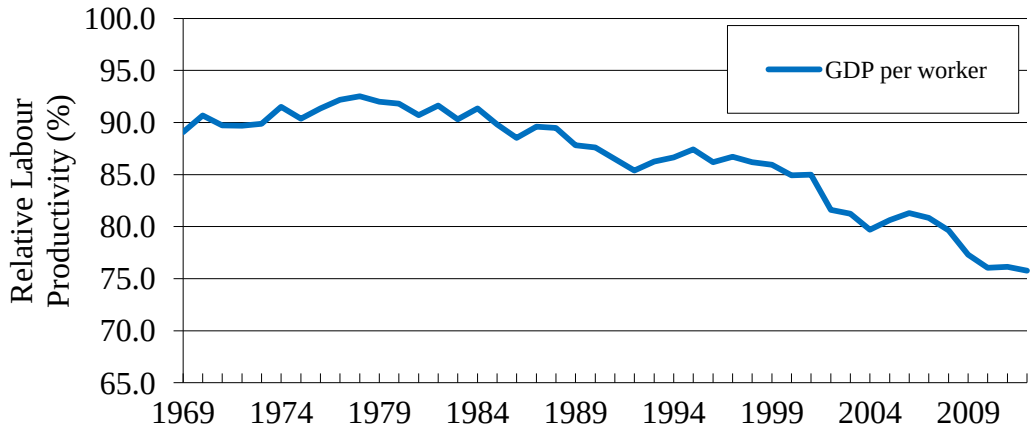
Closing the Aboriginal Education Gap in Canada: Assessing Progress and Estimating the Economic Benefits[2]

I. Introduction

A. Motivation and Background Information

One of the most important goals of public policy is to raise the living standards of the population. This is usually achieved either by raising aggregate income or by redistributing existing income. These two approaches to boosting aggregate living standards tend to work against one another: greater income redistribution creates a disincentive for individuals to generate wealth, lowering aggregate income. However, sometimes the redistribution of resources can improve the living standards of a disadvantaged group and have a net positive impact on aggregate income. Reallocating resources to improve the education of Aboriginal Canadians is likely such a situation.

Chart 1: Relative Labour Productivity Levels in the Total Economy, Canada as a Percentage of the United States, 1969-2012



Source: Chart 3 of Aggregate Income and Productivity Trends: Canada vs. United States, the Centre for the Study of Living Standards

[2] This report was written by Matthew Calver under the supervision of Andrew Sharpe. The Centre for the Study of Living Standards (CSLS) thanks Aboriginal Affairs and Northern Development Canada (AANDC) for financial support for this project. The CSLS also thanks Kathleen Keenan, until September 2014 Director-General at AANDC, for her support of this project, and John Clement and other AANDC officials for comments. Finally, the CSLS thanks Don Drummond of Queen's University, David Johnson of Wilfrid Laurier University, and Bert Waslander for some particularly useful suggestions to improve the report. Email: matthew.calver@csls.ca.

It is generally understood that rising productivity is a major source of growth in per capita income. Canada has struggled in recent times to keep pace with productivity growth in other developed countries.[3] Since 2000, business sector productivity growth in Canada has averaged only 0.8 per cent annually, only slightly more than half the average rate of productivity growth between 1980 and 2000. While Canada has had lower labour productivity compared to the United States for a long time, this slowdown has caused the gap to widen considerably over the last three decades as shown in Chart 1.

Table 1: Selected Characteristics of the Aboriginal and Non-Aboriginal Populations, 2011

Characteristic	Aboriginal	Non-Aboriginal
Median 2010 Income of Population 15+	$20,701	$30,195
Unemployment Rate of Population 15+	15.0	7.5
Life Expectancy of Women at Birth, 2001	76.8	82.2
Median Age	27.7	40.6
Fertility Rate of Women (1996-2001)	2.6	1.5
High School (or equivalent) Completion Rate (%), Population 15+	56.7	77.8

Source: 2011 National Household Survey and Women in Canada: A Gender Based Statistical Report, Statistics Canada, 2006, http://www.statcan.gc.ca/pub/89-503-x/2010001/article/11442-eng.htm#a11

The relatively poor education of Canada's Aboriginal population presents an opportunity to generate substantial gains to national output, employment, and productivity. Higher levels of education are associated with increased labour productivity, wages, and likelihood of employment. While Aboriginal identity Canadians only made up about 4.3 per cent of the Canadian population in 2011, higher birth rates amongst the Aboriginal population make them an increasingly larger segment of the total population.

Aboriginal communities are plagued by substandard housing conditions, high poverty rates, low education, and poor health outcomes, particularly on-reserve. The median 2010 income of Canadian individuals reporting an Aboriginal identity in the 2011 National Household Survey was only slightly greater than two thirds that of the non-Aboriginal population. Besides the aggregate economic benefits, there are strong humanitarian reasons to try to raise the living standards of the Aboriginal population up to those of the rest of the population. Improving the level of education achieved by Aboriginal Canadians is the most frequently proposed means of improving other outcomes.

[3] For further reading on the reasons for Canada's poor productivity performance, the interested reader is invited to look at Rao and Li (2013), Spiro (2013), Drummond et al. (2010), and Sharpe and Thomson (2010)

Investing in Aboriginal education has the potential to generate very high returns. A 2007 report by the Centre for the Study of Living Standards (Sharpe et al. 2007) estimated that the benefits of eliminating the 2001 gaps in terms of education, employment rates conditional on education, and employment income conditional on education between 2001 and 2017 could generate as much as $160 billion (2001 dollars) for the Canadian economy and boost productivity growth by as much as 0.037 percentage points per year. While this increase in productivity growth may seem small, one has to remember that the productivity growth rate in the business sector since 2000 has only been about 0.8 per cent each year and at the time of the study, Aboriginal people were only projected to compose 3.37 per cent of the working age population in 2017.

The current report seeks to continue the work done in Sharpe et al. (2007). That study used data from the 2001 Census. Newer data from the 2006 Census and the 2011 National Household Survey along with new projections of the Aboriginal population allow for an updated estimate of the benefits of closing the Aboriginal educational attainment gap in 2011 levels by 2031. The new estimates incorporate controls for demographic and geographic differences[4] between the Aboriginal and non-Aboriginal populations which produce more realistic estimates of the potential contributions of Aboriginal Canadians. In addition to updating the estimated benefits, this report investigates the extent to which the benefits estimated in the previous report have actually been realized – how much progress has been made towards closing the education and labour market gaps and how has this progress impacted Canadian employment, output, and productivity?

B. Structure of Report

The present section is intended to motivate the research and to provide the reader with a broad overview of the structure of the document.

Section two briefly discusses theoretical and empirical evidence of the importance of education with an emphasis on recent research. The section begins by considering the positive impact of increased educational attainment on individual labour market outcomes and the channels through which this occurs. Next, the relationship between education and aggregate outcomes is considered – spillover effects from education mean that the aggregate gains to society may diverge from the sum of the benefits to individuals. This section finishes by touching upon non-market benefits of education.

The third section considers changes to the gap between Aboriginal and non-Aboriginal labour market outcomes and the underlying sources of the gap between 2001 and 2011 using data from the Canadian censuses of 2001 and 2006 and the 2011 National Household Survey. The section begins by presenting evidence on how disparities in labour force participation rates, employment rates, unemployment rates, and income rates have changed over the decade. Gaps in

[4] Specifically, the included controls are for age, sex, and province/territory of residence.

non-market outcomes are briefly discussed too. The focus then shifts to trying to understand the sources of these gaps. Information is presented regarding changes in the educational attainment gap over the period and changes in labour market outcomes conditional on educational attainment. Differences between the Aboriginal and non-Aboriginal populations along other potentially relevant dimensions such as field of study, area of residence, and demographics are considered as well.

The fourth section provides estimates of the benefits in terms of GDP, employment, and productivity from closing the gap in educational attainment and the gaps in income and employment conditional on educational attainment between 2011 and 2031. The section begins by discussing the data sources used to obtain projections of the Aboriginal population and economic variables to 2031. The methodology employed in producing the estimates of GDP, employment, and productivity is discussed in detail. The approach closely follows the methodology of the previous study by the CSLS on the issue (Sharpe et al., 2007), but provides additional controls for demographic and geographic differences between the Aboriginal and non-Aboriginal populations. Results are presented and discussed which break down the estimated gains by age group, sex, Aboriginal identity, province/territory, and residence on/off-reserve. The section concludes with a retrospective analysis of the realized gains relative to the potential gains from progress made on the gaps between 2001 and 2011.

The final section summarizes the main findings, discusses implications for Aboriginal education policy, highlights limitations of this study, and offers suggestions for future research related to the issue.

II. The Importance of Education

In estimating the economic benefits of closing the educational attainment gap, we will rely upon very strong assumptions regarding the impact of education on labour market outcomes. Specifically, we assume that if an individual achieves a higher level of educational attainment, that individual will be expected to achieve the same average labour market outcomes as other individuals who already possess that higher level of educational attainment. In simple terms, if we observe one group of people with low education and low incomes and another group with high education and high incomes, we assume that raising the education of the first group from low to high will result in that group earning high incomes.

Is this a reasonable assumption? There are many factors besides education which are known to impact labour market outcomes. These include characteristics such as age, gender, place of residence (province, urban/rural, on/off-reserve), health, social networks, family environment, ability, motivation, and labour market demand.

Some of these factors are readily observable in our data and can thus be controlled for. This allows us to make a much more reasonable assumption, specifically that if an individual of a given age and sex living in a given province (or territory) achieves a higher level of educational attainment, that individual will be expected to achieve the same average labour market outcomes as other individuals of the same age and sex living in the same province (or territory) who already possess that higher level of educational attainment.

It is obvious that closing the educational attainment gap between the Aboriginal and non-Aboriginal populations alone will not eliminate gaps in labour market outcomes because we observe in the data that the Aboriginal population tends to have worse labour market outcomes even when we only compare Aboriginal and non-Aboriginal individuals with the same level of education. After controlling for age, sex, and province of residence, we deal with these gaps within educational attainment categories by assuming one of two things will happen in the future: either these gaps will remain unchanged or something will happen which eliminates them. The former first assumption is more conservative. It amounts to assuming if an Aboriginal individual of a given age and sex living in a given province (or territory) achieves a higher level of educational attainment, that individual will be expected to achieve the same average labour market outcomes as other **Aboriginal** individuals of the same age and sex living in the same province (or territory) who already possess that higher level of educational attainment. The second approach assumes that if an Aboriginal individual of a given age and sex living in a given province (or territory) achieves a higher level of educational attainment, that individual will be expected to achieve the same average labour market outcomes as other **non-Aboriginal** individuals of the same age and sex living in the same province (or territory) who already possess that higher level of educational attainment.

Even under the stronger assumption that Aboriginal outcomes would become the same as those of the non-Aboriginal population, we would still expect educational attainment and labour market gaps to remain nationally to the extent that the Aboriginal and non-Aboriginal populations differ in terms of these observable characteristics.

However, there remain many differences between the Aboriginal and non-Aboriginal populations which are difficult to observe (cultural differences, for example) or for which we lack data to control for. One notable example is the difference between urban and rural populations. Rural labour markets can be very different from urban ones, potentially resulting in very different employment rates and incomes. The Aboriginal population tends to be more concentrated in rural areas than the non-Aboriginal population. This is problematic because the stronger assumption of the non-Aboriginal population achieving the same outcomes as the Aboriginal population within a given educational attainment category requires either that these unobservable differences cease to exist (for example, the Aboriginal population migrates to urban areas) or that these differences cease to matter (for example, labour market outcomes conditional upon education become identical in urban and rural areas). Many of these unobservable differences between the Aboriginal and non-Aboriginal populations will be linked to educational attainment and may endogenously diminish if the educational attainment gap is removed (for example, differences in the health of the two populations), but these processes would take time.

In practice, it is unlikely that these gaps conditional upon education will be fully eliminated, so the values of our estimates under the assumption that these non-education differences between the non-Aboriginal and Aboriginal populations should be viewed cautiously. One may view outcomes under this stronger assumption as a best case scenario.[5]

What about the weaker assumption that conditional on education (and other observables), an Aboriginal person who earns a higher level of education will be expected to achieve the same outcomes on average as other Aboriginal individuals who possess that higher level of education? This assumption is also very strong. There are two major concerns with this assumption. The first is that there exist structural limitations which would lower the value of the credential if more individuals possess it. For example, if the market is flooded with enough people with PhDs, one may expect that the excess supply of labour could make it more difficult for an individual to find a job and that wages would fall in equilibrium. Given the relatively small share of Aboriginal Canadians in the national population, we do not think this sort of effect is a major concern. However, this could potentially be a problem in some communities where most of the population is Aboriginal, particularly on-reserve.

[5] It may not even be desirable to eliminate some of these differences conditional upon educational attainment and observable factors. For example, if some Aboriginal people intrinsically value living a more traditional lifestyle in remote areas, they may optimally choose to forego the benefits of participating in an urban labour market.

The second major concern is that Aboriginal individuals who receive a higher level of education differ from those with a lower level of education in some way. This could make our assumption incorrect if these underlying characteristics partly cause the worse outcomes of the less educated (if education was just a signal of these characteristics, for example) or if these underlying characteristics mean that the individuals who receive a higher level of education would benefit more from it than those who do not.

For example, suppose that we observe that a large segment of the Aboriginal population does not possess a high school diploma and that Aboriginal people with a high school diploma earn far more on average than those without. Is it reasonable to assume that the individuals without the diploma could earn just as much income as the Aboriginal population with a high school diploma if they earned one? Well, if the majority of those who lack the diploma happen to live on-reserve, and if the returns to having a high school diploma happen to be very low on-reserve, and if these individuals would opt to stay on-reserve after attaining the diploma, then this could be a very bad assumption.

As a result of these other factors which matter and we are unable to control for, even our assumption that Aboriginal individuals who complete a higher level of educational attainment will achieve the same average outcomes as other Aboriginal people who already possess that level of education may be somewhat strong. Nonetheless, we will see that there are solid reasons to believe that higher educational attainment will significantly improve labour market outcomes and we are able to control for several major factors, namely age, sex, and province/territory of residence. The assumption likely somewhat overstates the gains from increased educational attainment, but we can only control for the factors which we possess data on.

A central premise of this report is that more education improves economic outcomes for individuals and in the aggregate. Before discussing recent changes in educational attainment and labour market outcomes or trying to estimate the benefits of closing the educational attainment gap, it is important to consider why we expect that improved education will help Aboriginal Canadians.

A. Education and Labour Market Outcomes

There is considerable evidence linking improved education to better labour market outcomes, particularly higher earnings and greater probability of employment. An enormous body of literature has investigated the issue. A few recent studies which document the returns to investments in education include Boudarbat et al. (2010), Dickson and Harmon (2011), and Li et al. (2012).

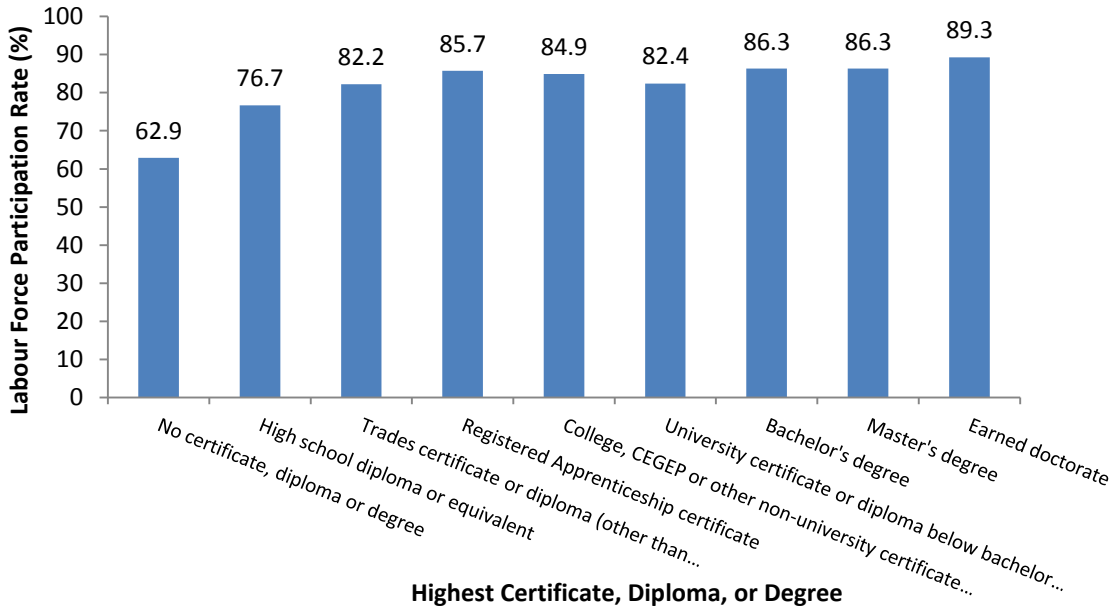
As we will see in the next few pages, the correlations between labour market outcomes and education are clear. What is not so obvious is the extent to which the correlation reflects a causal effect, and what the primary mechanisms are through which education improves

outcomes. The major issue is that causation might run in the other direction (for example, if you do not intend to work, you may choose to obtain less education) or other unobserved factors such as personality traits or innate ability might impact both educational attainment and labour market outcomes. Researchers have used strategies such as looking at twins, considering the impact of policy changes such as compulsory schooling laws, and exploiting factors which influence educational attainment but are (arguably) unrelated to labour market outcomes in any other way to try and identify the causal effect of education on labour market performance.

i. Labour Force Participation Rates

The labour force participation rate is defined as the fraction of the working age population which is either employed or unemployed and looking for work. Individuals who are of working age and unemployed but not actively seeking work are not included. It is well known that those with more education are more likely to participate in the labour force.

Chart 2: Canadian Labour Force Participation Rates by Highest Level of Educational Attainment, Ages 25-64, 2011



Source: 2011 National Household Survey

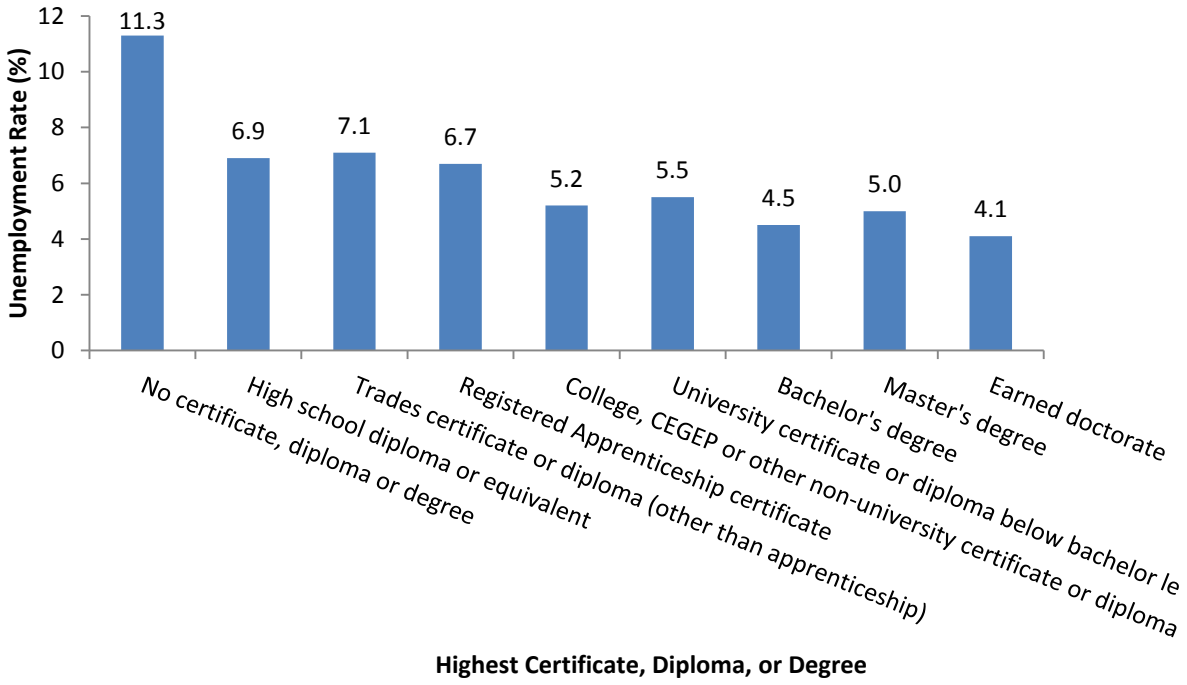
Consider Chart 2, which presents labour force participation rates for the Canadian population aged 25-64 for various levels of educational attainment according to the 2011 National Household Survey. We avoid considering those below 25, as they are much more likely to be out of the labour force because they are attending school. One can see that labour force participation rates tend to rise with educational attainment. In particular, those who have completed high school have a participation rate of 76.7 per cent, considerably higher than the rate of 62.9 per cent for those who have less than a high school education. Completion of postsecondary education is associated with another substantial rise in participation rates to 82.2

per cent or higher. There is some variation amongst the various postsecondary qualifications, but one can see that most have participation rates around 85 per cent.

One reasonable explanation for higher participation rates among those with more education has been suggested since at least Bowen and Finegan (1966). Those with higher levels of education would expect to earn higher incomes on average if they entered the labour force. They are more likely to choose to participate in the labour force because they face a higher opportunity cost of not doing so.

ii. Unemployment Rates

Chart 3: Canadian Unemployment Rates by Highest Level of Educational Attainment, Ages 25-64, 2011



Source: 2011 National Household Survey

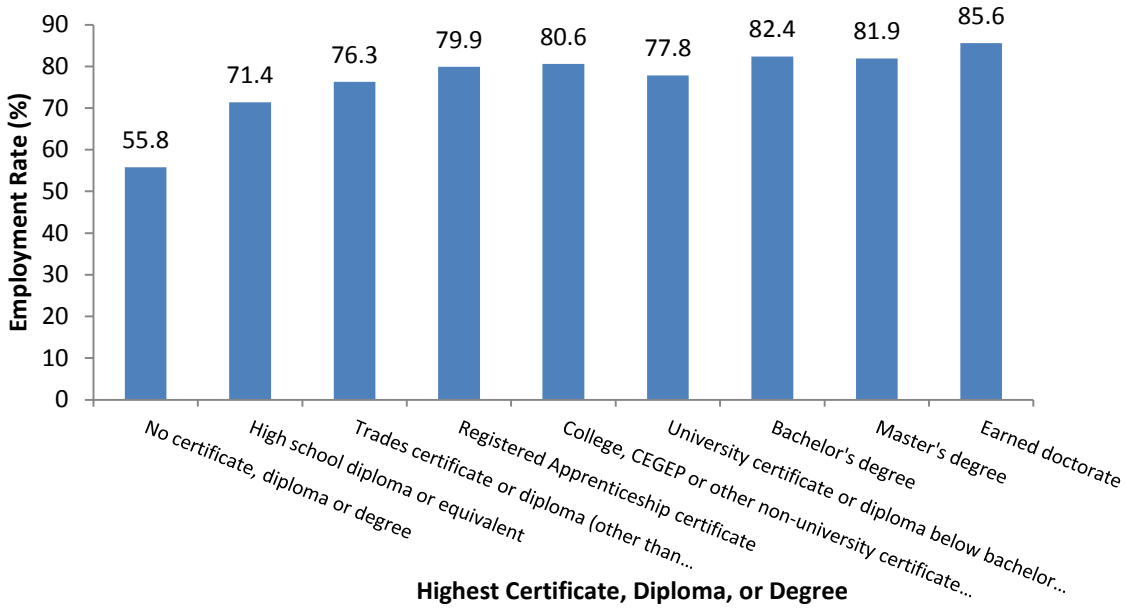
The unemployment rate is defined as the percentage of those in the labour force who are unemployed. The most striking feature of Chart 5, which shows the unemployment rate by educational attainment, is the huge difference completing high school has for one's prospects of finding a job in Canada. The unemployment rate of those with no certificate, diploma, or degree is 11.3 per cent. Unlike the labour force participation rate, not all postsecondary qualifications are associated with big improvements in unemployment rates over a high school diploma. Those with a trades certificate, diploma, or apprenticeship seem to have very similar unemployment rates to those with only a high school diploma. Those who attend college, CEGEP, or university have even lower unemployment rates, ranging from 5.5 per cent for those with a university certificate or diploma below the bachelor's level to 4.1 per cent for an earned doctoral degree.

Although perhaps a bit dated, Mincer (1991) provides some deeper analysis of what drove higher unemployment rates amongst the less educated in the United States. Mincer found evidence that increased incidence of unemployment was a bigger factor than longer duration of unemployment. The less educated tend to separate from their jobs more frequently. He provided suggestive evidence that the sources of higher separation and slightly longer spells of unemployment for the less educated were due to higher costs of searching while unemployed (as opposed to searching while on the job) for more educated workers, educated workers being more efficient at processing information in their search, and greater effort exerted by both workers and firms to fill positions which require more education.

iii. Employment Rates

The employment rate is the fraction of the working age population which is employed. This is affected by the labour force participation rate and the degree of success those seeking employment have in finding and keeping jobs (ie, the unemployment rate). By definition, the employment rate will always be less than the labour force participation rate.

Chart 4: Canadian Employment Rates by Highest Level of Educational Attainment, Ages 25-64, 2011



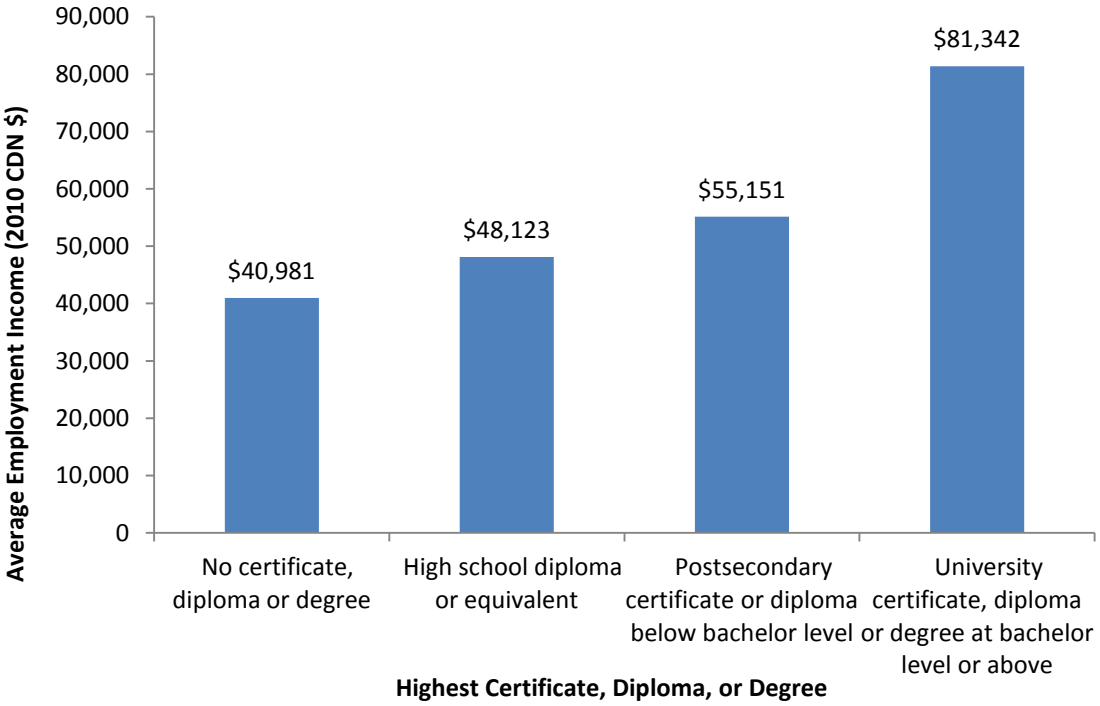
Source: 2011 National Household Survey

Similar to the labour force participation rate, Chart 4 shows those with less than a high school diploma were much less likely to be employed in 2011. Completion of high school raises the employment rate by 15.6 percentage points. Those with postsecondary education have higher employment rates, especially if they possess a university degree. Once again, there is some variation, but generally more years of education correspond to higher employment rates.

iv. Income

Besides being more likely to work, workers with more education earn more on average. Chart 5 presents average employment incomes of full-year full-time workers aged 25-64 in 2010 by educational attainment. There are significant earnings premia associated with both a high school diploma and a postsecondary education. Unlike the employment measures, the biggest gains do not seem to come from high school or postsecondary completion, but from earning a university degree. The average full-year full-time worker aged 25-64 with a high school diploma would be expected to earn $7,142 more than one who did not complete high school. Someone with a postsecondary credential other than a university degree would be expected to bring in an additional $7,028. The premium from having a university degree over other postsecondary credentials is a very large $26,191. Those with a university degree earned almost double the employment income of those with less education than a high school diploma.

Chart 5: Average Employment Income by Highest Level of Educational Attainment in Canada, Ages 25-64, Full-Year Full-Time Workers, 2010



Source: 2011 National Household Survey

Brunello and Comi (2004) use data on cohorts from eleven European countries to consider whether differences in earnings by education are driven more by higher initial wages or

a faster wage growth as individuals gain experience. They find that both occur: those with more education earn a higher starting salary but also experience faster wage growth over time.

Another study by Brunello et al. (2009) provides evidence that compulsory school laws can raise educational attainment and lower earnings inequality. They do this by looking at temporal variation across twelve European countries in the minimum age at which children may choose to stop attending school. This quasi-experimental result provides further evidence that educational attainment matters for labour market outcomes

v. Channels

There is good reason to believe that education improves labour market outcomes, but exactly why this occurs is not so clear.

The most obvious explanation is probably that those who attend school longer become more valuable to employers because they gain more knowledge and develop specialized skills. There is research indicating the importance of developing skills and the importance of educational interventions at a young age (Heckman, 2006).

In primary and secondary school, students develop basic mathematical and literacy skills which are crucial not just in the labour market, but in everyday life. Ishikawa and Ryan (2002) utilize data from the American National Adult Literacy Survey to show that schooling plays an important role in the development of core skills and find that there are significant returns to the skills developed in a year of schooling, at least for Caucasian students.

The results from Ishikawa and Ryan (2002) did not hold for black children, who they estimated had a much lower return from skills developed in school. One possible explanation which they offer is that black children may be attending schools of lower quality.[6]

Not surprisingly, there is evidence that quality of education matters in addition to quantity. For example, Card and Krueger (1992) find evidence that the returns to education were larger in American states with higher quality schools.[7] Similarly, Hanushek and Woessman (2009) find that lower quality schools, as measured by scores on cognitive tests, impede economic development in Latin American, despite relatively high levels of educational attainment.

In addition to developing cognitive skills, education also plays a role in socializing children and developing non-cognitive skills. Development of basic social skills in addition to

[6] First Nations children attending band operated schools which struggle with finances and the recruitment and retention of staff may face a similar situation. Poor education on-reserve can result in graduates who lack the knowledge and skills to be successful in the workforce and who are inadequately prepared if they proceed to attend secondary or post-secondary institutions off-reserve.

[7] School quality in this study was measured by the pupil-to-teacher ratio, average term length, and relative teacher pay.

knowledge of language is essential for developing sound communication and teamwork skills. Brunello and Schlotter (2011), discuss a series of studies in Europe and the United States which have found evidence that non-cognitive skills, such as agreeableness, conscientiousness, emotional stability, extraversion, and autonomy improve labour market outcomes. The role of schooling in the development of non-cognitive skills is less clear, particularly later in life, although it seems likely that education plays at least some role in developing non-cognitive skills.

Our estimations of the benefits of closing the educational attainment gap rely strongly on the idea that education is inherently valuable because it augments workers in some valuable way, whether it is increasing knowledge, developing social skills, or improving cognitive abilities. However, there are some other views on education which we should acknowledge which imply that more education might benefit individuals, but would not generate the same returns if provided to everyone.

The most popular alternative explanation to human capital for explaining the value of education is that education plays largely a signaling or a screening role. The general idea is that higher educational attainment does not improve one's skills or abilities so much as it signals that one possesses sufficient skills or abilities such that the individual is willing and able to incur the costs associated with earning the qualification. These costs are theoretically higher for those with less skill or ability – they have to work harder. The theoretical foundations of this idea are laid out in a few classic papers (Layard and Psacharopoulos, 1974; Spence, 1973).[8]

Signaling and screening models of the returns are not without empirical support. Bedard (2001) argues that in settings where some high ability students are limited in their access to university, a high school diploma will be a stronger signal because some high ability individuals who are prevented from attending university will only have a high school degree, raising employer's expectations of the ability of those with only a high school degree. Thus, more students will choose to earn a high school diploma instead of dropping out as access to university decreases under a signalling model of education. Theories based purely on schooling raising human capital predict that university access should not impact high school dropout rates. Bedard (2001) finds that there are more high school dropouts in labour markets with greater access to universities, which supports the signaling hypothesis.

[8] The reader may wonder why one should care if education develops skills or acts as a signal when assessing Aboriginal education. If education is purely a signal, then it plays a valuable role in helping firms assess which workers have the aptitudes, skills, work habits, etc. that they require. If Aboriginal people are choosing not to acquire the signal (higher education) because they lack the signalled attributes for some reason, then simply helping them obtain the signal would be of little use for anyone – we would only be reducing the information carried by the signal and making it harder for firms to match with the workers they need. However, if structural impediments are preventing Aboriginal people with the desired attributes from acquiring the signal, helping these people obtain it would have a positive impact on their incomes and on total output.

More recently, Hussey (2012) found empirical evidence that most of the value of an MBA derives from signalling rather than accumulation of knowledge and skills. This result is largely based upon differences in pre-MBA work experience conditional upon total work experience. The dataset used in this study also explicitly asked about skills and abilities gained through schooling, which allowed the author to estimate the value of the skills acquired in the labour market.

A related concern is that it is possible to be overeducated for a position.[9] Some jobs, particularly those which involve menial labour are needed by society, but probably do not need the sort of skills which are developed with a postsecondary education. There are, of course, studies which investigate the extent of overeducation in the labour market and costs associated with it (For example, Dolton and Vignoles, 2000, or McGuinness, 2006). We are not claiming that every Aboriginal person should have a university degree, but rather that Aboriginal people should achieve the same level of education on average as non-Aboriginal people do. We assume that doing so would not result in a total population which is overeducated compared to what is socially optimal.[10]

While there is undoubtedly some merit to the signaling role of education, there are also strong reasons to suspect that more education can make an individual more productive. We believe that the current state of Aboriginal education reflects a sub-optimal outcome not just for Aboriginal people, but for Canada as a whole.

B. Education and Aggregate Economic Outcomes

In addition to improving the labour market outcomes of individuals, raising the education level of the general population raises the level and growth rate of aggregate output. This would not be the case if greater education only reallocated opportunities across individuals rather than raising labour productivity. In fact, it is often argued that the aggregate returns to education appear to exceed the private returns, suggesting that more education for an individual somehow has spillover benefits on other people as well.

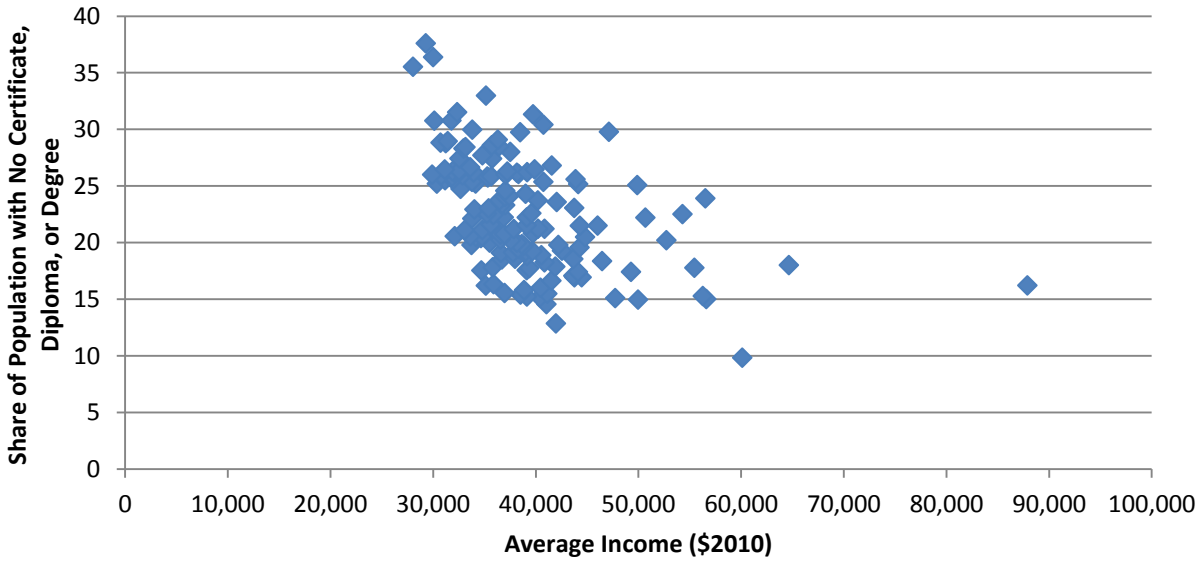
Chart 6 depicts the relationship between educational outcomes and economic performance in Canadian census metropolitan areas (CMAs) and census agglomerations (CAs) as measured by high-school non-completion rates and average income. As one might expect, average incomes rise as a greater fraction of the population completes high school. While this picture suggests that there is a relationship, it does not necessarily indicate that higher education

[9] Overeducation is just one of several types of mismatch which can occur between individuals and jobs. It is also not uncommon for individuals to possess skills or specialization within a given level of education which are not directly relevant for the position. For example, a trained music teacher who manages a factory.

[10] Some commentators have suggested that too many workers are investing in university education in this country – or that they are studying the wrong fields. For example, see the following article from the Globe and Mail: http://www.theglobeandmail.com/report-on-business/economy/economy-lab/the-end-of-the-golden-age-for-university-graduates/article12572751/ (Jackson, 2013)

causes incomes to rise. It may be that wealthier communities can afford more education or that other factors drive the relationship. We turn to the literature for theoretical and empirical support of the idea that education improves aggregate outcomes.

Chart 6: Average Total Income and Share of Population 15 Years and Over with Income with No Certificate, Diploma, or Degree, Canadian Census Metropolitan Areas and Census Agglomerations, 2011



Source: Income in 2010 (34), Age Groups (10B), Sex (3) and Highest Certificate, Diploma or Degree (11) for the Population Aged 15 Years and Over in Private Households of Canada, Provinces, Territories, Census Metropolitan Areas and Census Agglomerations, 2011 National Household Survey

There have been many studies of the link between education and growth, often looking at cross-country comparisons with an emphasis on economic development. For example, Barro (2001) considered a panel of 100 countries between 1960 and 1995 and found evidence of a link between secondary and post-secondary education of men and economic growth.[11] More recent studies such as Cohen and Soto (2007) have used higher quality data to provide further evidence that education is a source of growth at the national level. Shapiro (2006) and Aghion et al. (2009) find causal evidence that more college educated students generate growth in US cities and states.

Externalities from investments in education potentially arise through several different channels. Education can lead to better outcomes when groups of individuals interact. Less educated workers can learn from well educated peers, boosting the productivity of firms and the wages of less educated workers within these firms (Martins and Jin, 2010).

Besides providing students with knowledge and technical skills, schools play a crucial function in socialization. The ability to cooperate, communicate, and foster friendships can

[11] Barro suggests that the weak relationship between female education and growth may stem from failure to properly utilize female labour in many countries

generate positive returns in jobs which require social interaction. Gradestein and Justman (2002) argue that education has a positive impact on economic growth through increased social cohesion.

Many additional studies have found evidence of geographically based positive spillover effects of human capital raising wages and productivity locally (Moretti, 2004a; Moretti, 2004b; Kirby & Riley, 2008; Rosenthal & Strange, 2008).

A couple of specific types of education have attracted considerable attention in recent times. Human capital is important not just as an input in the production of goods and services, but also as a generator of technological progress as emphasized by endogenous growth models. Technological progress is recognized as a major source of long run economic growth. In particular, specialized skills in science, technology, engineering, and mathematics (STEM) are thought to play a special role in the process of technological innovation. Nelson and Phelps (1966) argued that firms require these sorts of skills to adopt new technologies. Jones (2002) performs a growth accounting exercise which suggests that educational attainment and a rising share of the population of G5 countries working as scientists and engineers can account for up to 80 per cent of economic growth in the United States in recent years.

Since the financial crisis, the importance of financial literacy to a well functioning economy has become more apparent. Basic education about budgeting and financial instruments can improve individual decision making and potentially lower the risk of systemic financial crises. Recent research explores the relationship between financial education and financial outcomes both theoretically and empirically (Hastings et al., 2012; Lusardi and Mitchell, 2013).

In addition to the general level of education in a society, some authors have suggested that the distribution of this education matters. It is not immediately obvious whether it is better for all people to be equally well educated or for some people to receive more education than others.[12] If individuals vary in aptitude and interest or if different jobs require different levels of educational attainment, some degree of educational inequality would probably be desirable. At the same time, unequal educational attainment generated by unequal access may lead to suboptimal aggregate skill levels, unequal education may help to entrench political elites who underinvest in public goods, or education may inherently exhibit decreasing returns. Using data over a 60 year period from 143 countries, Zagler and Sauer (2014) find that educational inequality lowers the macroeconomic returns to education, although in countries with very low education, some inequality can have a positive effect.

C. Education and Non-Market Outcomes

There are several additional benefits from education besides improved labour market performance and higher economic growth. The present study will only be accounting for the

[12] Assuming the average level of education under inequality remains the same as it had been under equality. .

direct labour market benefits accruing to individuals when calculating the returns to improved educational attainment for Canada's Aboriginal population. One should keep in mind that other social benefits and the externalities discussed in the previous sub-section will generate additional economic value which is more difficult to quantify.

Only three non-market outcomes (health, crime, and political engagement) will be discussed very briefly in this sub-section as these are not the focus of this study.[13] For further, more detailed discussions of the various benefits of education the interested reader is invited to look at Oreopolous and Salvanes (2011) and Lochner (2011).

i. Health

Table 2: Age-standardized mortality rates per 100,000 person-years at risk by educational attainment, male cohort members aged 25 or older at baseline, Canada, 1991 to 2006

Cause of death	Less than High School	High School Diploma	Post-Secondary Certificate or Diploma	University Degree
All causes	1,561.9	1,315.2	1,145.7	1,008.9
Communicable diseases	62.1	53.0	49.7	50.9
Non-communicable diseases	1,342.8	1,139.2	993.7	863.8
Injuries	91.3	69.3	54.2	47.0
Smoking-related diseases	266.1	198.3	143.9	102.6
Alcohol-related diseases	21.6	15.1	9.6	7.4
Drug-related diseases	7.7	5.5	3.4	3.4
Amenable to medical intervention (younger than 75)	61.0	48.4	42.1	35.9

Note: The causes of death are not mutually exclusive, so the categories do not sum to the total

Source: Tjepkema et al. (2012), Cause-specific mortality by education in Canada: A 16-year follow-up study, Statistics Canada, Table 2, http://www.statcan.gc.ca/pub/82-003-x/2012003/article/11700-eng.htm

There is evidence that better educated individuals have better health outcomes. It is reasonable to think that this occurs in part because better educated people possess more information about the consequences of their actions for their health and use this information to

[13] Some other potential benefits of education include improved parenting skills, better outcomes in the marriage market, development of trust, and the intrinsic value of learning.

make better decisions. Table 2 presents age-standardized mortality rates of men 25 years or older between 1991 and 2006 in Canada by educational attainment from a study by Statistics Canada (Tjepkema et al., 2012). Generally speaking, mortality rates decline with education. Several studies provide evidence of causal relationships between education and health outcomes (see Heckman and Urzua, 2010; Cutler and Lleras-Muney, 2010; Amin and Spector, 2013) although there are other studies (such as Braakman, 2011) which find no evidence of causality.

Health, education, and economic outcomes are all interrelated. Some of the health benefits from more education likely occur indirectly through better employment prospects which raise income and allow for more expenditure on health. Similarly, unhealthy individuals may be less productive or unable to work, and providing healthcare for these unhealthy individuals can be expensive.

ii. Crime

More educated people generally are less likely to be convicted of crimes. This may be partly a result of improved labour market outcomes, as better employment prospects raise the opportunity cost of being in jail. The relationship may operate through other channels as well. Young males are particularly prone to certain criminal activities. Attendance at school takes young people off the street and reduces the amount of time available to commit crimes. It may change the type of person children associate with, generating positive peer effects. Education may also socialize individuals in a way which alters their preferences or interactions with other individuals in ways which result in fewer crimes. Another possibility is that being better educated may not reduce the odds of committing crimes, but just the odds of being caught.

Table 3 presents data from Perrault (2009) demonstrating that those between the ages of 25 and 34 were more likely to be incarcerated in Nova Scotia and New Brunswick, Saskatchewan, and Alberta in 2006 if they did not have a high school diploma and did not have a job. This was true of both the Aboriginal and non-Aboriginal populations.

Machin et al. (2011) exploit changes in compulsory schooling laws to present evidence of a causal relationship between more education and less property crime amongst students in England and Wales. Fella and Gallipoli (2014) use data on property crime and a sophisticated model of crime and education over the life cycle to estimate that policies which aim to raise high school graduation rates can generate substantial gains to welfare which cannot be achieved through tougher sentencing. Quality of education also seems to matter. Deming (2011) uses data from a random lottery assigning students to their first choice of public school to demonstrate that attending a better school makes a student less likely to commit crimes.

Table 3: Incarceration Rates of those Aged 20 to 34 by Aboriginal Identity, Employment Status, and Possession of a High School Diploma, Select Provinces, 2006

Employment and education status	Aboriginal			Non-Aboriginal		
	Number Aboriginal people in custody	Number	Incarceration rate on Census Day (per cent)	Number Non-Aboriginal people in custody	Number Non-Aboriginal in the general population	Incarceration rate on Census Day (per cent)
Nova Scotia and New Brunswick						
Without a diploma	12	1,980	0.606	109	32,365	0.337
With a diploma	29	6,570	0.441	384	251,280	0.153
Total	41	8,550	0.480	493	283,645	0.174
Saskatchewan						
Without a diploma, without employment	420	8,610	4.878	46	4,660	0.987
With a diploma, without employment	75	7,590	0.988	29	21,475	0.135
Without a diploma, with employment	147	3,550	4.141	36	13,170	0.273
With a diploma, with employment	50	11,575	0.432	36	108,205	0.033
Total	692	31,325	2.209	147	147,510	0.100
Alberta						
Without a diploma, without employment	388	8,425	4.605	333	23,640	1.409
With a diploma, without employment	55	6,655	0.826	154	94,720	0.163
Without a diploma, with employment	204	8,165	2.498	348	67,450	0.516
With a diploma, with employment	53	22,045	0.240	285	491,620	0.058
Total	700	45,290	1.546	1,120	677,430	0.165

Source: Perreault (2009), "The incarceration of Aboriginal people in adult correctional services," Statistics Canada, Table 7, http://www.statcan.gc.ca/pub/85-002-x/2009003/article/10903-eng.htm

iii. Political Engagement

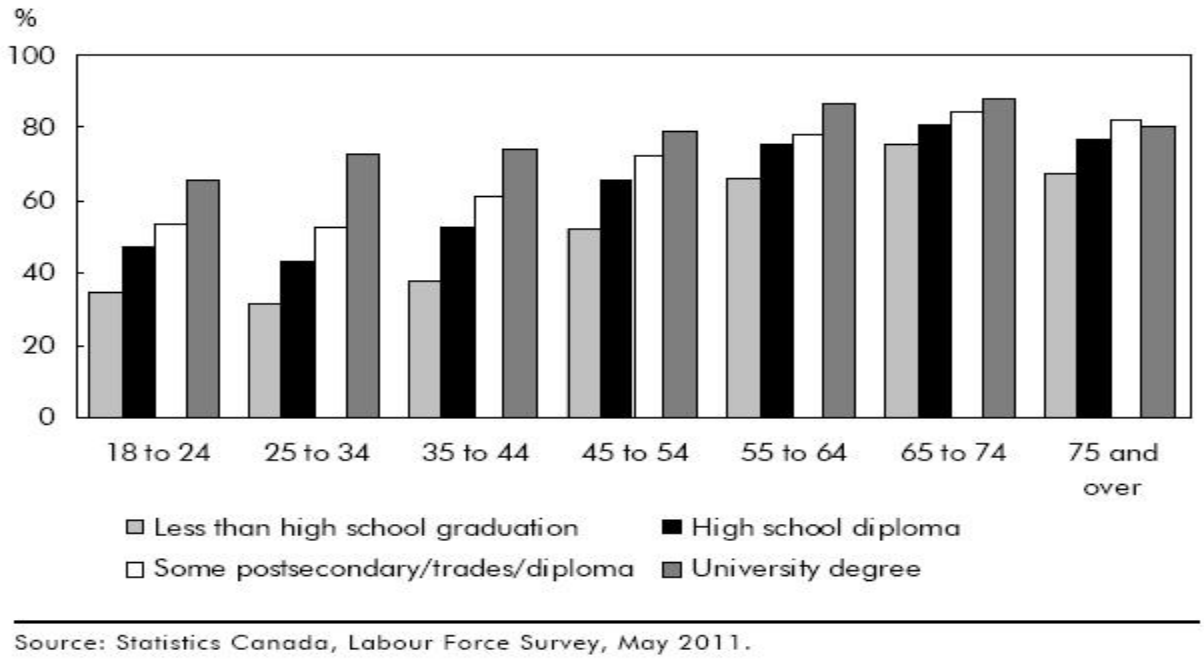
In well-functioning democratic societies, people have considerable freedom to become involved politically by discussing issues, organizing political events, running for office, voting, and expressing their views to elected representatives. These political activities represent ways in which groups can bring attention to the issues relevant to them and attempt to influence policy decisions related to these issues. Additionally, a well-informed electorate is important for holding elected officials to account and encouraging sound policies.

Less educated people are less likely to be politically active. Chart 7, which comes from Uppal and LaRochelle-Côté (2012), shows that reported voter participation in the 2011 federal election increases with education in Canada irrespective of age. Dee (2004) finds evidence that educational attainment raises voter participation, free speech, and newspaper readership.[14] Milligan et al. (2004) use compulsory schooling laws to find that education is related to several measures of political interest and involvement in both the US and UK. This study finds that

[14] Newspaper readership is arguably a measure of the quality of a voter's civic knowledge

education raises voter turnout in the US but not in the UK. Controlling for voter registration eliminates this difference, indicating that voter registration rules can create a barrier to voting for the less educated.

Chart 7: Voter Participation Rates by Age and Education in the Federal Election of May 2, 2011



Source: Chart B of Uppal and LaRochelle-Côté (2012), Factors Associated with Voting, Statistics Canada

III. Assessing the Gap Between Aboriginal and Non-Aboriginal Canadians

It is well known that, on average, Aboriginal people lag behind other Canadians in measures of economic and social well-being. This section aims to document the extent of these gaps and progress towards narrowing them over the last decade. Emphasis is placed on labour market outcomes, although other outcomes will briefly be considered. After presenting information on the gaps in terms of economic outcomes, we discuss possible sources of the gaps and how they have changed in recent times. While some of the divergence in economic outcomes can be attributed to demographics, poor educational attainment is a major factor. We examine whether or not the education achievement gap has been closing in recent time and the consequences for the labour market outcome gaps.

Unless otherwise noted, the data used in this report come from the long forms of the 2001 and 2006 Canadian Censuses and the 2011 National Household Survey (NHS) which provide the most comprehensive information available on the Canadian population.[15] Information on income from these surveys always refers to income earned in the previous year. For example, the 2011 NHS asks about income earned in 2010.

Readers should be made aware of several limitations of the data, particularly with regards to intertemporal comparisons. Aboriginal people on a number of reserves are "incompletely enumerated" because enumeration was prevented by local authorities or natural disasters. The specific reserves which were not fully included differ from one census to another. Twenty-two Indian reserves and Indian settlements were incompletely enumerated in the 2006 Census while 36 were incompletely enumerated in the 2011 National Household survey. Additionally, the NHS does not include those institutionalized in collective dwellings such as prisons and hospitals[16] - this may be of some concern for assessing the gap if the people in these dwellings have worse economic outcomes and if Aboriginal people are overrepresented in these institutions.

[15] Of course, there are many other data sources which provide information on the Aboriginal labour market in Canada. For a good overview, see McKellip (forthcoming).

[16] Only basic data on these individuals (age, sex, marital status, and mother tongue) were collected as of 2001 so this should not be much of a problem for intertemporal comparison of our labour market and education variables across time (https://www12.statcan.gc.ca/census-recensement/2006/ref/dict/pop053a-eng.cfm). We have seen that Aboriginal people are overrepresented in prisons and that lower levels of educational attainment are associated with criminal activity. These correlations would suggest that the exclusion of prisons may have a small positive effect on the observed Aboriginal educational attainment in our data. For more information on who is included, please see Statistics Canada's documentation at http://www12.statcan.gc.ca/nhs-enm/2011/ref/nhs-enm_guide/guide_1-eng.cfm.

Minor differences in the wording and format of four questions pertaining to the Aboriginal population in the NHS may impact comparisons to the 2001 and 2006 censuses.[17]

Of greater concern is the impact of the shift from the mandatory long form census to a voluntary National Household Survey. If voluntary non-response to the National Household Survey is non-random, the results can be biased (Green and Milligan, 2010). It may surprise some readers to know that the global non-response rate was actually better among those residing on-reserve than among those residing off-reserve – the response rates on-reserve were in the realm of 80 per cent, much higher than the 70 per cent response rates which prevailed in the cities. The high response rates on-reserve occurred because every household on-reserve was surveyed (only 30 per cent were surveyed elsewhere) and the surveys were conducted as face-to-face interviews on-reserve (Elliot 2010).[18]

While Statistics Canada makes adjustments to try to account for bias introduced by non-response, there is likely still some bias which makes comparison to the long form censuses less accurate. It is possible that perceived improvements in the Aboriginal education, income, and employment rate gaps may be driven in part by a greater tendency for Aboriginal Canadians with worse outcomes to choose not to respond to the NHS.

Another major concern is ethnic mobility[19] in terms of reported Aboriginal identity from one census to the next. If one looks at the number of people reporting an Aboriginal identity across the surveys, one will realize that the increase is much greater than can be accounted for by Aboriginal births. The same individuals are changing their reported Aboriginal identity over time. This may be the result of changes in social environment, attitudes towards Aboriginal identity, or real or perceived legal changes. For the 2011 NHS, changes in reported Aboriginal identity were greatest among Métis, Inuit living outside Nunangat, and non-Status First Nations people. The concern with these reporting differences is that it is difficult to distinguish whether changes between 2001 and 2011 were the result of actual improvements among the Aboriginal population in 2001, or if they just represent a composition effect of non-Aboriginal people in 2001 with average labour market outcomes (above the average Aboriginal outcomes) deciding to report an Aboriginal identity in 2011.

[17] The four questions are about Aboriginal ancestry (Question 17 on ethnic origin); Aboriginal group (Question 18); Registered or Treaty Indian status (Question 20); and membership in a First Nations/Indian band (Question 21).

[18] These higher standards of data collection on-reserve had been used in the long-form census previously, so this does not represent a methodological improvement in data collection over the 2001 and2006 censuses (AANDC, 2013)

[19] The term ethnic mobility refers to changes in how ethnic affiliation is reported by individuals and families. There are two types. Intergenerational ethnic mobility occurs when children report a different ethnicity than that of their parents. Intragenerational ethnic mobility occurs when individuals change their reported ethnicity over the course of their lives.

Enactment of certain amendments to the Indian Act can also have an effect on ethnic mobility in specific instances such as the creation of the Qalipu Mi'kmaq First Nation in Newfoundland and the McIvor v. Canada case.[20]

These difficulties with the data mean that we must be cautious in our interpretation of comparisons between 2001, 2006, and 2011, particularly for the Métis who were particularly prone to ethnic mobility over the period. Nonetheless, the comparison is important to attempt to assess progress made with regard to the education and labour market gaps, so we perform the exercise with the best data which are available.

A. Labour Market Performance

The data presented in this sub-section are for Canadians aged 25-64. Those below 25 are excluded because many of them may still have limited participation in the labour market because they are in school. Four measures of labour market performance are considered for both the Aboriginal and non-Aboriginal populations: labour force participation rates, employment rates, unemployment rates, and average employment income of full-year full-time workers. For each indicator, the discussion focuses on information from a pair of tables for that indicator.

The first table will present the absolute level of the indicator for the Aboriginal and non-Aboriginal populations in 2001, 2006, and 2011 along with the absolute magnitude by which the non-Aboriginal indicator exceeds the Aboriginal indicator. This information is presented for Canada as a whole, each province and territory, those with Registered Indian status, those on- and off-reserve, specific Aboriginal identities (First Nations, Métis, or Inuit), and each sex.

The second table will present the relative gap for each year, which simply the absolute gap expressed as a percentage of the non-Aboriginal indicator.

Average annual growth rates of the relative gap are presented for 2001-2011 and for the two sub periods (2001-2006 and 2006-2011). These relative gaps and growth rates are presented for Canada as a whole, each province and territory, those with Registered Indian status, those on- and off-reserve, specific Aboriginal identities (First Nations, Métis, or Inuit), and each sex.

[20] The Mi'kmaq people living in Newfoundland had been denied any claim to the Aboriginal title (and rights) since the island joined the Confederation in 1949. The Qalipu Mi'kmaq First Nation received official Indian Act status in 2011, and has since received more than 100,000 applications for membership. The McIvor case (Bill C-3 – the Gender Equity in Indian Registration Act) reinstated grandchildren of Registered Indian women who had lost their status through marriage to a non-Status husband prior to 1985. This decision could result in the reinstatement of Aboriginal status for as many as 50,000 individuals. Bill C-3 came into effect as of January 31, 2011.

i. Labour Force Participation Rates

Aboriginal Canadians are less likely to participate in the labour force than non-Aboriginal Canadians. In 2011, the national labour force participation rate for the Aboriginal population was 71.7 per cent (see Table 4). This was 8.9 percentage points below the non-Aboriginal rate of 80.6 per cent. These participation rates have been fairly stable over the last decade.

Table 4: Participation Rates and Absolute Gaps, Ages 25-64, Canada, 2001, 2006, 2011

	2001			2006			2011			2001-2011
	Aboriginal	Non-Aboriginal	Gap	Aboriginal	Non-Aboriginal	Gap	Aboriginal	Non-Aboriginal	Gap	Change in Gap (percentage points)
Canada	70.7	79.9	9.2	72.4	80.5	8.1	71.7	80.6	8.9	-0.3
Newfoundland and Labrador	72.1	71.0	-1.1	71.7	72.5	0.8	72.5	73.8	1.3	2.4
Prince Edward Island	71.2	83.4	12.2	78.8	82.9	4.0	77.4	83.9	6.5	-5.7
Nova Scotia	69.9	75.1	5.3	72.1	77.0	4.8	73.5	78.1	4.6	-0.7
New Brunswick	70.3	76.6	6.3	72.6	77.5	4.9	70.5	78.4	7.9	1.6
Quebec	68.1	77.6	9.5	71.4	78.8	7.4	72.7	79.5	6.8	-2.7
Ontario	72.2	80.6	8.4	72.7	80.8	8.1	71.2	80.4	9.2	0.8
Manitoba	68.7	83.2	14.5	69.5	83.1	13.6	69.3	83.3	14.0	-0.5
Saskatchewan	65.6	85.1	19.6	67.7	85.4	17.7	68.3	85.5	17.2	-2.4
Alberta	72.7	84.5	11.8	76.3	85.0	8.6	74.4	84.8	10.4	-1.4
British Columbia	71.6	79.5	7.9	73.4	79.7	6.3	72.4	79.7	7.3	-0.6
Yukon Territory	82.7	90.0	7.4	80.7	88.7	8.0	81.1	87.5	6.4	-1.0
Northwest Territories	77.9	92.2	14.3	78.9	90.8	11.9	76.7	91.9	15.2	0.9
Nunavut	73.4	96.2	22.8	72.4	94.0	21.6	68.3	95.3	27.0	4.2
Registered Indian	66.8	79.9	13.1	68.5	80.5	12.0	66.5	80.6	14.1	1.0
On-Reserve	65.1	79.9	14.8	64.9	80.5	15.6	60.1	80.6	20.5	5.7
Off-Reserve	72.8	79.9	7.1	74.2	80.5	6.3	74.8	80.6	5.8	-1.3
First Nations single response	67.5	79.9	12.4	69.3	80.5	11.2	67.7	80.6	12.9	0.5
Métis single response	76.6	79.9	3.2	77.4	80.5	3.1	78.0	80.6	2.6	-0.6
Inuit single response	73.6	79.9	6.3	73.4	80.5	7.1	70.9	80.6	9.7	3.4
Male	77.3	86.5	9.2	77.7	86.3	8.6	76.3	85.6	9.3	0.1
Female	64.8	73.4	8.7	67.7	74.9	7.3	67.6	75.8	8.2	-0.5

Source: Author's Calculations using data from the 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

There is considerable variation across provinces. The highest participation rates for the Aboriginal population can be found in the Yukon Territory (81.1 per cent), Prince Edward Island (78.2 per cent), and the Northwest Territories (76.7 per cent). Aboriginal participation rates are lowest in Manitoba, Saskatchewan, and Nunavut, where they fall below 70 per cent. The gaps

are relatively small in the Atlantic Provinces, British Columbia, and the Yukon, but the gaps are larger in the Prairie Provinces and the other two territories. The large gaps in these areas are partly driven by higher than average participation rates of the non-Aboriginal population. For example, Northwest Territories and Nunavut both had participation rates above 90 per cent.

Table 5: Relative Participation Rate Gaps and their Growth Rates, Ages 25-64, 2001, 2006, and 2011

Characteristic	2001	2006	2011	Average Annual Growth Rate 2001-2006	Average Annual Growth Rate 2006-2011	Average Annual Growth Rate, 2001-2011
Canada	11.48	10.03	11.04	-2.53	2.02	-0.38
Newfoundland and Labrador	-1.61	1.12	1.76	-33.91	11.46	-20.94
Prince Edward Island	14.62	4.84	7.75	-13.38	12.01	-4.70
Nova Scotia	7.00	6.26	5.89	-2.11	-1.18	-1.59
New Brunswick	8.23	6.29	10.08	-4.71	12.04	2.24
Quebec	12.18	9.33	8.55	-4.68	-1.66	-2.98
Ontario	10.44	9.99	11.44	-0.86	2.91	0.96
Manitoba	17.38	16.38	16.81	-1.15	0.52	-0.33
Saskatchewan	22.98	20.71	20.12	-1.98	-0.57	-1.25
Alberta	13.94	10.17	12.26	-5.41	4.12	-1.20
British Columbia	9.92	7.93	9.16	-4.01	3.10	-0.77
Yukon Territory	8.21	8.97	7.31	1.85	-3.69	-1.09
Northwest Territories	15.47	13.13	16.54	-3.03	5.19	0.69
Nunavut	23.73	22.96	28.33	-0.65	4.68	1.94
Registered Indian	16.41	14.91	17.49	-1.83	3.47	0.66
On-Reserve	18.53	19.34	25.43	0.88	6.30	3.73
Off-Reserve	8.90	7.83	7.20	-2.42	-1.61	-1.92
First Nations single response	15.49	13.94	16.04	-2.00	3.01	0.36
Métis single response	4.05	3.81	3.28	-1.16	-2.82	-1.91
Inuit single response	7.88	8.83	12.06	2.42	7.32	5.31
Male	10.58	9.93	10.90	-1.23	1.94	0.29
Female	11.82	9.67	10.80	-3.63	2.32	-0.87

Source: Author's Calculations using data from the 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

Registered Indians are less likely to participate than other Aboriginal people. The difference between those on-reserve (60.1 per cent) and those off-reserve (74.8 per cent) is even more substantial.

Looking at the gaps by specific Aboriginal identity, one sees that the gap is not very large for the Métis – about 2.6 percentage points. The First Nations and Inuit are the groups which seem to be much less likely to participate.

Men are more likely than women to participate in the labour force. The difference between Aboriginal and non-Aboriginal participation rates is only very slightly higher for men (9.3 versus 8.2 percentage points). The gender gap in participation appears to be similar for both the Aboriginal and non-Aboriginal populations at around 10 percentage points in 2011.

Table 5 presents the gaps in relative terms and average growth rates of the relative gaps. Nationally, there seems to have been very little progress in 2011 compared to 2001 as the gap went from 11.5 per cent to 11.1 per cent. Most provinces have not experienced much change. Notable exceptions are Prince Edward Island and Quebec which have seen their gaps shrink at average rates of about 5 per cent and 3 per cent annually. The growth rate looks impressive for Newfoundland and Labrador, but there is almost no gap in this province – the Aboriginal population had a higher participation rate than the non-Aboriginal population in 2001. Nunavut and New Brunswick are notable as the relative participation rate gap expanded by about 2 per cent annually in these areas.

Much more progress has been made on the participation gap off-reserve than on-reserve. The relative gap expanded 3.7 per cent annually on-reserve while it shrank 1.9 per cent annually off-reserve. First Nations people have seen very little change, while the gap for the Métis has closed at a pace of about 2 per cent per year. The rising participation gap for the Inuit at an average pace of roughly five percent each year is perhaps a cause for concern.

The most striking trend in the participation rate gaps is that considerable progress had been made almost across the board[21] from 2001-2006, but much of those gains was lost between 2006 and 2011. Generally, the adverse labour market effects of the Great Recession of 2008 were worse for the Aboriginal population (Usalcas, 2011; Centre for the Study of Living Standards, 2012).[22]

ii. *Unemployment Rates*

Aboriginal people in the labour force were over twice as likely to be unemployed as non-Aboriginal people in 2011 (see Table 6). Nonetheless, the Aboriginal unemployment rate has fallen considerably from 17.3 per cent nationally in 2001 to 12.8 per cent in 2011. The non-Aboriginal unemployment rate was about six per cent in both of these years.

[21] The Yukon Territory, Newfoundland and Labrador the Inuit, and those living on-reserve are the only sub-groups for which the Aboriginal participation rates worsened relative to those of non-Aboriginals over the period

[22] Both studies found that the national Aboriginal population fared worse in terms of employment, the employment rate, the unemployment rate, and the participation rate from the onset of the recession to 2011. They also both note that Aboriginal employment continued to decline in 2010 while non-Aboriginal labour market indicators were improving. There were some subpopulations in which Aboriginal labour market performance was stronger – specifically women and youth (CSLS, 2012: 56).

Regionally, the absolute unemployment gap is largest in the Territories, New Brunswick, and Saskatchewan. The gap tends to be smaller in provinces such as Prince Edward Island, Nova Scotia, Quebec, and Ontario. Unemployment rates are twice as high on-reserve, although progress has been made both on and off-reserve.

The Métis have the smallest gap of all the subcategories considered – the Métis unemployment rate in 2011 was only 2.6 percentage points higher than that of the non-Aboriginal population. The gaps were much larger for the Inuit (11.3 percentage points) and First Nations (9.6 percentage points) populations.

Table 6: Unemployment Rates and Absolute Gaps, Ages 25-64, Canada, 2001, 2006, and 2011

	2001			2006			2011			2001-2011
	Aboriginal	Non-Aboriginal	Gap	Aboriginal	Non-Aboriginal	Gap	Aboriginal	Non-Aboriginal	Gap	Change in Gap (percentage points)
Canada	17.3	5.9	-11.3	13.0	5.1	-7.9	12.8	6.0	-6.8	4.5
Newfoundland and Labrador	31.8	19.5	-12.3	28.6	16.8	-11.9	19.9	12.8	-7.1	5.2
Prince Edward Island	27.4	11.7	-15.7	13.8	9.9	-3.9	14.3	10.1	-4.2	11.5
Nova Scotia	19.1	9.0	-10.1	13.5	7.4	-6.0	11.9	7.9	-4.1	6.0
New Brunswick	27.1	11.0	-16.1	20.2	8.6	-11.7	19.1	9.1	-10.0	6.1
Quebec	17.0	7.2	-9.7	14.0	6.0	-8.0	11.8	6.1	-5.7	4.0
Ontario	12.1	4.7	-7.4	10.1	4.8	-5.3	10.8	6.2	-4.6	2.8
Manitoba	17.0	3.7	-13.3	13.0	3.2	-9.8	11.4	3.9	-7.5	5.8
Saskatchewan	21.3	3.7	-17.7	16.1	3.2	-13.0	14.5	3.5	-11.0	6.7
Alberta	13.2	3.7	-9.5	9.5	3.1	-6.5	10.9	4.3	-6.6	2.9
British Columbia	21.1	6.8	-14.4	13.7	4.7	-9.0	14.7	6.1	-8.6	5.8
Yukon Territory	24.7	6.6	-18.1	21.3	5.2	-16.1	22.0	5.4	-16.6	1.5
Northwest Territories	16.0	3.0	-13.0	17.9	3.3	-14.6	20.3	3.4	-16.9	-3.9
Nunavut	20.4	2.5	-17.9	17.9	3.3	-14.5	20.3	2.9	-17.4	0.5
Registered Indian	21.0	5.9	-15.0	16.9	5.1	-11.8	17.2	6.0	-11.2	3.8
On-Reserve	25.0	5.9	-19.1	22.1	5.1	-17.0	21.9	6.0	-15.9	3.2
Off-Reserve	14.7	5.9	-8.8	11.1	5.1	-6.0	10.9	6.0	-4.9	3.9
First Nations single	20.0	5.9	-14.1	16.0	5.1	-10.8	15.6	6.0	-9.6	4.5
Métis single response	12.5	5.9	-6.6	8.4	5.1	-3.3	8.6	6.0	-2.6	4.0
Inuit single response	20.4	5.9	-14.4	18.5	5.1	-13.4	17.4	6.0	-11.3	3.1
Male	19.7	6.1	-13.7	14.2	5.0	-9.2	14.4	6.2	-8.3	5.4
Female	14.6	5.9	-8.8	11.7	5.3	-6.5	11.2	5.8	-5.3	3.5

Source: Author's Calculations using data from the 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

Aboriginal women fare better than Aboriginal men in terms of unemployment. This difference between genders exists for the non-Aboriginal population too, but it is very small.

Looking at the growth rates of the relative unemployment gaps (Table 7), there is some reason to be optimistic. The national gap has been closing at a rate of about four per cent a year. This rate of progress has been fairly consistent over the decade – if anything, progress seems to have been greater in the second five years. The Territories have experienced the least improvement of all the provinces. The relative unemployment gap has actually widened in the Yukon and Northwest Territories. Most other provinces with large Aboriginal populations have seen improvement at rates between 3 per cent and 5 per cent per year on average.

Table 7: Relative Unemployment Rate Gaps and their Growth Rates, Ages 25-64, 2001, 2006, and 2011

Characteristic	2001	2006	2011	Average Annual Growth Rate 2001-	Average Annual Growth Rate 2006-	Average Annual Growth Rate, 2001-
Canada	-190.40	-154.30	-113.10	-3.80	-5.33	-4.06
Newfoundland and Labrador	-63.00	-70.90	-55.40	2.50	-4.36	-1.20
Prince Edward Island	-134.10	-39.60	-41.30	-14.10	0.89	-6.92
Nova Scotia	-112.20	-81.00	-52.10	-5.56	-7.15	-5.36
New Brunswick	-146.80	-136.00	-102.80	-1.48	-4.88	-3.00
Quebec	-134.40	-134.10	-93.80	-0.04	-6.01	-3.02
Ontario	-158.20	-110.70	-74.40	-6.00	-6.56	-5.30
Manitoba	-361.10	-305.00	-192.31	-2.96	-7.44	-4.65
Saskatchewan	-480.30	-406.70	-314.29	-3.05	-4.41	-3.39
Alberta	-258.00	-209.00	-153.49	-3.92	-5.13	-4.02
British Columbia	-212.80	-191.20	-140.98	-1.79	-5.28	-3.30
Yukon Territory	-273.40	-309.40	-307.41	2.58	-0.14	1.21
Northwest Territories	-428.00	-446.60	-497.06	0.42	2.47	1.47
Nunavut	-707.60	-435.50	-600.00	-7.64	7.12	-1.62
Registered Indian	-253.30	-230.84	-186.30	-1.77	-3.86	-2.65
On-Reserve	-321.00	-330.00	-264.40	0.56	-3.98	-1.76
Off-Reserve	-148.30	-117.00	-81.70	-4.22	-6.04	-4.49
First Nations single response	-236.70	-211.20	-160.40	-2.15	-4.81	-3.22
Métis single response	-110.50	-63.70	-43.20	-8.47	-6.43	-6.09
Inuit single response	-243.20	-261.20	-188.80	1.48	-5.55	-2.24
Male	-226.00	-183.30	-133.80	-3.78	-5.40	-4.08
Female	-149.60	-122.00	-91.40	-3.69	-5.02	-3.89

Source: Author's Calculations using data from the 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

This progress has occurred at similar rates both on and off-reserve. While the Métis have narrowed the relative gap at a tremendous pace of six per cent a year, the First Nations and Inuit are also doing significantly better. Unfortunately, the progress on unemployment rates between 2006 and 2011 has been partly offset by a widening gap in participation rates, resulting in little progress on the overall employment rate gap over the period.

iii. Employment Rates

Table 8: Employment Rates and Absolute Gaps, Ages 25-64, Canada, 2001, 2006, and 2011

	2001			2006			2011			2001-2011
	Aboriginal	Non-Aboriginal	Gap	Aboriginal	Non-Aboriginal	Gap	Aboriginal	Non-Aboriginal	Gap	Change in Gap (percentage points)
Canada	58.5	75.1	16.6	63.0	76.4	13.3	62.5	75.8	13.3	-3.3
Newfoundland and Labrador	49.1	57.1	8.0	51.1	60.4	9.3	58.0	64.3	6.3	-1.7
Prince Edward Island	52.5	73.7	21.1	66.7	74.7	8.0	67.5	75.5	8.0	-13.1
Nova Scotia	56.5	68.4	11.9	62.4	71.2	8.8	64.7	72.0	7.2	-4.7
New Brunswick	51.1	68.2	17.1	58.0	70.9	12.9	57.0	71.2	14.2	-2.9
Quebec	56.6	72.0	15.4	61.4	74.1	12.7	64.1	74.6	10.5	-4.9
Ontario	63.5	76.8	13.3	65.4	76.9	11.5	63.5	75.4	11.9	-1.4
Manitoba	57.1	80.1	23.0	60.4	80.4	20.0	61.3	80.0	18.7	-4.3
Saskatchewan	51.6	82.1	30.5	56.8	82.7	25.9	58.4	82.5	24.1	-6.4
Alberta	63.1	81.3	18.2	69.1	82.3	13.2	66.3	81.2	14.9	-3.3
British Columbia	56.5	74.2	17.7	63.4	76.0	12.6	61.7	74.8	13.1	-4.6
Yukon Territory	62.7	84.0	21.4	63.5	84.1	20.6	63.3	82.8	19.5	-1.9
Northwest Territories	65.6	89.3	23.7	64.7	87.9	23.2	61.2	88.7	27.5	3.8
Nunavut	58.5	94.0	35.5	59.6	91.2	31.6	54.5	92.5	38.0	2.5
Registered Indian	52.8	75.1	22.4	56.9	76.4	19.5	55.1	75.8	20.7	-1.7
On-Reserve	48.8	75.1	26.3	50.6	76.4	25.8	46.9	75.8	28.9	2.6
Off-Reserve	62.0	75.1	13.1	66.0	76.4	10.4	66.6	75.8	9.2	-3.9
First Nations single response	54.0	75.1	21.1	58.2	76.4	18.1	57.1	75.8	18.7	-2.4
Métis single response	67.1	75.1	8.1	71.0	76.4	5.4	71.2	75.8	4.6	-3.5
Inuit single response	58.6	75.1	16.6	59.8	76.4	16.6	58.7	75.8	17.1	0.5
Male	62.1	81.2	19.2	66.6	81.9	15.3	65.3	80.3	15.1	-4.1
Female	55.3	69.2	13.9	59.8	71.0	11.2	60.1	71.4	11.4	-2.5

Source: Author's Calculations using data from the 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

The employment rate gap is partly a function of the participation rate, but it also depends on the success at finding work of those who choose to participate. The Aboriginal participation

rate in Canada was 62.5 per cent in 2011, 13.3 percentage points below the non-Aboriginal employment rate (see Table 8). The good news is that this gap has closed by over three percentage points since 2001. The bad news is that, like the participation rate, most of the improvement occurred between 2001 and 2006.

The employment rate of the Aboriginal population varies from a low of 54.5 per cent in Nunavut to a high of 67.5 per cent in PEI. Similar to the participation rate, the absolute gap tends to be lowest in Atlantic Canada and highest in the Prairies and Territories. The employment rate is especially low on-reserve where it has fallen below 50 per cent.

Table 9: Relative Employment Rate Gaps and their Growth Rates, Ages 25-64, 2001, 2006, and 2011

Characteristic	2001	2006	2011	Average Annual Growth Rate 2001-2006	Average Annual Growth Rate 2006-2011	Average Annual Growth Rate, 2001-2011
Canada	22.12	17.46	17.51	-4.21	0.05	-2.08
Newfoundland and Labrador	14.04	15.32	9.82	1.82	-7.17	-3.00
Prince Edward Island	28.67	10.71	10.57	-12.53	-0.27	-6.31
Nova Scotia	17.37	12.40	10.07	-5.72	-3.77	-4.20
New Brunswick	25.06	18.25	20.94	-5.44	2.94	-1.65
Quebec	21.42	17.09	14.06	-4.05	-3.55	-3.44
Ontario	17.34	14.95	15.77	-2.75	1.09	-0.90
Manitoba	28.76	24.84	23.38	-2.73	-1.21	-1.86
Saskatchewan	37.17	31.29	29.21	-3.16	-1.34	-2.14
Alberta	22.40	16.07	18.35	-5.65	2.88	-1.80
British Columbia	23.81	16.63	17.51	-6.03	1.13	-2.66
Yukon Territory	25.41	24.44	23.55	-0.76	-0.77	-0.71
Northwest Territories	26.54	26.40	31.00	-0.11	3.49	1.68
Nunavut	37.78	34.69	41.08	-1.64	3.71	0.88
Registered Indian	29.79	25.47	27.29	-2.90	1.43	-0.84
On-Reserve	35.03	33.75	38.11	-0.73	2.58	0.88
Off-Reserve	17.41	13.61	12.14	-4.37	-2.16	-3.03
First Nations single response	28.14	23.73	24.64	-3.13	0.77	-1.24
Métis single response	10.73	7.06	6.00	-6.84	-3.00	-4.41
Inuit single response	22.03	21.69	22.60	-0.31	0.84	0.26
Male	23.60	18.67	18.75	-4.17	0.08	-2.06
Female	20.13	15.78	15.91	-4.31	0.16	-2.09

Source: Author's Calculations using data from the 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

The Inuit and First Nations face employment rate gaps of 17.1 and 18.7 percentage points respectively. While the Métis fare much better, they still have an employment rate which is 4.6 percentage points below that of the non-Aboriginal population.

The gap is also somewhat larger for men than for women, both in a relative and an absolute sense. The gender gap in employment appears to be somewhat smaller for the Aboriginal population.

On average, the data in The employment rate gap is partly a function of the participation rate, but it also depends on the success at finding work of those who choose to participate. The Aboriginal participation rate in Canada was 62.5 per cent in 2011, 13.3 percentage points below the non-Aboriginal employment rate (see Table 8). The good news is that this gap has closed by over three percentage points since 2001. The bad news is that, like the participation rate, most of the improvement occurred between 2001 and 2006.

The employment rate of the Aboriginal population varies from a low of 54.5 per cent in Nunavut to a high of 67.5 per cent in PEI. Similar to the participation rate, the absolute gap tends to be lowest in Atlantic Canada and highest in the Prairies and Territories. The employment rate is especially low on-reserve where it has fallen below 50 per cent.

Table 9 indicate that the Aboriginal population has gradually been closing the relative employment rate gap at a pace of about 2 per cent per year, but very little progress has been made since 2006. The gap is closing for everyone except for the Inuit, on-reserve, and in the Northwest Territories and Nunavut. Significant progress has been made off-reserve while the gap has widened slightly on-reserve. Newfoundland and Labrador, Prince Edward Island, Nova Scotia, Quebec, British Columbia, and the Métis have all made considerable progress in closing their employment rate gaps.

iv. Employment Income

In addition to the willingness and ability to find and maintain employment, we are interested in how much Aboriginal people earn if they are employed. We compare the earnings of only those working full-year full-time jobs in order to avoid some of the differences which arise from the number of hours worked in part-time or seasonal jobs. The reader will not be surprised to see that Aboriginal Canadians working full-year full-time aged 25-64 earned $9,368 less than non-Aboriginal Canadians on average in 2010 (Table 10).

Many of the patterns of the income gaps are similar to those observed for the participation, employment, and unemployment gaps. The gaps tend to be largest in the Territories and the Prairies and smaller in most of the eastern provinces. In 2010, Nunavut had an especially large gap of $29,216.

There is a substantial gender gap in terms of earnings. While the average Aboriginal man employed full-time and full-year earned $57,149 in 2010, the average Aboriginal woman only earned $44,364. There is also a large gender gap in terms of incomes of the non-Aboriginal population. The non-Aboriginal gender gap is wide enough that Aboriginal women face a smaller income gap relative to non-Aboriginal women than that faced by Aboriginal men, both in absolute and relative terms.

Table 10: Average Employment Incomes and Absolute Gaps (2010 dollars), Full-Year Full-Time Workers, Ages 25-64, Canada, 2000, 2005, 2010

	2000			2005			2010			2000-2010
	Aboriginal	Non-Aboriginal	Gap	Aboriginal	Non-Aboriginal	Gap	Aboriginal	Non-Aboriginal	Gap	Change in Gap (dollars)
Canada	38,836	50,166	11,330	45,604	58,047	12,444	50,928	60,296	9,368	-1,962
Newfoundland and Labrador	34,996	43,543	8,547	43,835	50,778	6,943	55,245	56,299	1,054	-7,493
Prince Edward Island	33,759	39,002	5,242	51,089	43,871	-7,218	43,416	48,081	4,665	-577
Nova Scotia	35,101	43,657	8,556	42,085	48,904	6,819	45,335	51,314	5,978	-2,578
New Brunswick	33,307	41,697	8,390	36,748	46,866	10,118	41,095	50,600	9,504	1,114
Quebec	37,561	45,212	7,651	43,225	50,728	7,503	45,978	51,814	5,836	-1,815
Ontario	41,891	54,501	12,610	47,441	62,708	15,267	51,123	63,504	12,381	-229
Manitoba	33,694	43,530	9,836	40,457	50,091	9,633	44,839	54,147	9,308	-528
Saskatchewan	35,164	41,948	6,783	41,060	48,825	7,765	47,516	58,379	10,863	4,080
Alberta	39,566	51,939	12,373	49,935	67,140	17,205	59,512	73,027	13,515	1,142
British Columbia	40,334	51,301	10,967	44,880	57,816	12,936	49,189	60,141	10,953	-14
Yukon Territory	41,789	52,889	11,100	51,667	61,189	9,522	56,912	66,278	9,365	-1,735
Northwest Territories	49,116	64,076	14,960	61,212	81,003	19,791	70,217	84,444	14,227	-733
Nunavut	45,100	70,419	25,319	56,115	84,435	28,320	69,090	98,306	29,216	3,897
Registered Indian	36,522	50,166	13,644	42,058	58,047	15,990	46,949	60,296	13,348	-296
First Nations single	37,239	50,166	12,927	42,380	58,047	15,668	47,238	60,296	13,059	132
Métis single response	40,639	50,166	9,527	48,688	58,047	9,360	54,429	60,296	5,867	-3,660
Inuit single response	42,169	50,166	7,997	52,781	58,047	5,266	59,928	60,296	368	-7,629
Male	43,623	57,127	13,505	51,073	66,497	15,423	57,149	67,997	10,847	-2,658
Female	33,408	40,315	6,908	39,530	46,707	7,177	44,364	50,551	6,187	-733

Source: 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

The gaps presented by Aboriginal identity can be somewhat misleading because they are all calculated relative to the average non-Aboriginal income in Canada. One notices that the Inuit earn much higher incomes than the Métis, only $368 less than the average Canadian in 2010. However, the majority of the Inuit population live in the Territories, where average incomes (and the cost of living) tend to be much higher for everybody. The very large income gaps in Nunavut and the Northwest Territories indicate that the Inuit earn far less employment income compared to non-Aboriginal people in the same labour market. The Métis earn nearly $6,000 less on

average than non-Aboriginal people, but they are the best performing Aboriginal identity group in terms of the employment income gap.

Fortunately, the employment income gap between Aboriginal and non-Aboriginal Canadians seems to be closing over time, especially since 2005. The relative gap has closed at an average rate of 3 per cent annually between 2000 and 2010 (see Table 11). The progress started slowly at about 1 per cent per year between 2000 and 2005, but there has been massive improvement since. The rate of closure has averaged 6 per cent per year since 2005.

Table 11: Relative Employment Income Gaps and their Growth Rates, Full-Year Full-Time Workers, Ages 25-64, 2000, 2005, 2010

Characteristic	2000	2005	2010	Average Annual Growth Rate 2000-2005	Average Annual Growth Rate 2005-2010	Average Annual Growth Rate, 2000-2010
Canada	22.58	21.44	15.54	-1.02	-5.50	-3.12
Newfoundland and Labrador	19.63	13.67	1.87	-6.07	-17.26	-9.05
Prince Edward Island	13.44	-16.45	9.70	-44.48	-31.8	-2.78
Nova Scotia	19.60	13.94	11.65	-5.77	-3.29	-4.06
New Brunswick	20.12	21.59	18.78	1.46	-2.60	-0.66
Quebec	16.92	14.79	11.26	-2.52	-4.77	-3.34
Ontario	23.14	24.35	19.50	1.05	-3.98	-1.57
Manitoba	22.60	19.23	17.19	-2.98	-2.12	-2.39
Saskatchewan	16.17	15.90	18.61	-0.33	3.40	1.51
Alberta	23.82	25.63	18.51	1.51	-5.56	-2.23
British Columbia	21.38	22.38	18.21	0.93	-3.72	-1.48
Yukon Territory	20.99	15.56	14.13	-5.17	-1.84	-3.27
Northwest Territories	23.35	24.43	16.85	0.93	-6.21	-2.78
Nunavut	35.95	33.54	29.72	-1.34	-2.28	-1.73
Registered Indian	27.20	27.55	22.14	0.26	-3.93	-1.86
First Nations single response	25.77	26.99	21.66	0.95	-3.95	-1.60
Métis single response	18.99	16.12	9.73	-3.02	-7.93	-4.88
Inuit single response	15.94	9.07	0.61	-8.62	-18.65	-9.62
Male	23.64	23.19	15.95	-0.38	-6.24	-3.25
Female	17.13	15.37	12.24	-2.06	-4.07	-2.86

Source: 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

Most groups and provinces have shared in this progress with average rates of improvement usually between 1 and 3 per cent each year on average for most categories. The Métis have done especially well, with a reduction of the gap by an average of almost 5 percent annually. The huge improvement amongst the Inuit in Table 11 is misleading as the comparison is made relative to the national average, but many Inuit live in Nunavut where incomes are far above average. The notable exception to this trend towards smaller employment income gaps is

Saskatchewan, where the relative income gap has actually grown by about 1.5 per cent a year since 2000. Saskatchewan started out with one of the lowest relative employment income gaps in 2000, but now it has one of the larger gaps.

Table 12: Full-/Part-Time Status and Weeks Worked of the Working Population Aged 25-64 by Aboriginal Identity, 2010

	Share of the Aboriginal Population (per cent)	Share of the Non-Aboriginal Population (per cent)
Full-Time / Part-Time Status in 2010		
Full-Time	84.23	85.11
Part-Time	15.77	14.89
Weeks Worked in 2010		
none	3.75	2.42
1 to 9	4.26	2.54
10 to 19	5.83	3.82
20 to 29	8.54	5.48
30 to 39	6.33	5.11
40 to 48	13.91	15.71
49 to 52	57.39	64.91
Full-Year Full-Time Status		
Not Full-Year Full-Time	46.10	39.58
Full-Year Full-Time	53.90	60.42

Note: Full-time status in this table is defined as working more than 30 hours in most weeks. Full-year full-time adds an additional requirement that an individual work 49-52 weeks in the year.
Source: Author's calculations using data from the 2011 National Household Survey Public Use Microdata File

As noted above, these comparisons avoid differences in earnings which arise due to differences in the number of hours worked. If Aboriginal workers work fewer hours than non-Aboriginal workers, this will increase the size of the earnings gap. Comparing differences in median employment incomes between full-year full-time workers and all workers aged 25 to 54,[23] one is not surprised to see that those who work more earn more. The median Aboriginal worker earned $32,037 in 2010. The median Aboriginal who worked full-year full-time earned $43,842 which is 36.8 per cent more. The number of hours worked will be a major factor in this difference. The difference is somewhat smaller for the non-Aboriginal population. The median full-year full-time non-Aboriginal worker earned $50,013, 24.3 per cent more than the $40,244

[23] We use 25-54 because data on the median employment income from the online NHS tables is not available for those aged 25-65.

earned by the median non-Aboriginal workers in the age group. The bigger difference for the Aboriginal population suggests that a gap in hours worked widens the employment income gap.

Table 12 presents information from the 2011 National Household Survey Public Use Microdata File on the hours worked by Aboriginal and non-Aboriginal workers aged 25-64 in 2010. One sees that there was actually very little difference in terms of the share of the population employed full-time (30+ hours in most weeks). 84.2 per cent of the Aboriginal population worked full-time compared to 85.1 per cent of the non-Aboriginal population.

It appears that the non-Aboriginal population worked more weeks, but the difference is not huge. For example, 57.4 per cent of Aboriginal workers worked between 49 and 52 weeks in the year compared to 64.9 per cent of non-Aboriginal workers. Finally, we consider the share of the two populations who worked all year (49-52 weeks) and full-time. We find that 53.9 per cent of Aboriginal workers fall into this category, somewhat less than 60.4 per cent of non-Aboriginal workers.

The National Household Survey Public Use Microdata File does not provide us with data on the precise number of hours worked[24], so we draw upon a study by Usalcas (2011) which analyzes data on hours worked from the Labour Force Survey. She finds that, in 2010, Aboriginal workers aged 25-54 worked an average of 38.7 hours per week in all jobs compared to an average of 38.4 hours for non-Aboriginal workers. These numbers actually suggest that Aboriginal people work more hours when they are working. However, data from the Labour Force Survey excludes the on-reserve population, so these numbers should be viewed somewhat cautiously. Usalcas also finds that Aboriginal workers are much more likely to hold temporary positions. Fourteen per cent of Aboriginal workers aged 25-54 were temporary workers in 2010 compared to 9.8 per cent of non-Aboriginal workers. These findings seem consistent with those from the 2011 PUMF. There does not appear to be a major difference in hours worked in the weeks employed, but Aboriginal people appear to work fewer weeks in the year. These differences will increase the employment income gap compared to that of full-year full-time workers discussed above.

v. Summary

Overall, data from the 2001 and 2006 Censuses and the 2011 National Household Survey indicates that Aboriginal Canadians continue to underperform in the labour market relative to non-Aboriginal Canadians. Aboriginal Canadians are less likely to be working due to higher unemployment and lower labour force participation rates and those who are working receive less employment income. The gaps are generally greater in the Prairie Provinces and the Territories, on-reserve, and for the First Nations and Inuit peoples.

[24] The NHS PUMF only indicates if individuals worked mostly full-time hours (more than 30 per week) or mostly part time hours (less than 30 per week).

While the gaps remain wide, there has been considerable progress in terms of reducing the employment income gap and the employment rate gap between 2001 and 2011. Strangely, the timing of the closure of these two gaps differed somewhat. Improvements in the absolute unemployment rate gap were concentrated in 2001-2006[25] while most of the progress on the income gap occurred over the 2006-2011 period. Progress on the unemployment rate gap has generated some improvement in the employment rate gap as well, despite very little progress on the participation rate gap.

Table 13: Labour Market Outcome Gaps, Summary Table

	Levels			Absolute Changes		
Year	2001	2006	2011	2001-06	2006-11	2001-11
Participation Rate Gap (absolute)	9.2	8.1	8.9	-1.1	0.8	-0.3
Employment Rate Gap (absolute)	16.6	13.3	13.3	-3.3	0.0	-3.3
Unemployment Rate Gap (absolute)	-11.3	-7.9	-6.8	3.4	1.1	4.5
Employment Income Gap (relative)	22.6	21.4	15.5	-1.2	-5.9	-7.1

Source: 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

B. Other Outcomes

Although not the focus of this study, it is important to appreciate that outcome gaps between Aboriginal and non-Aboriginal Canadians extend beyond the labour market.

Crime rates are much higher amongst the Aboriginal population. Table 14 presents Aboriginal adults as a percentage of adults in the general population and as a percentage of those incarcerated for most of the provinces and territories of Canada in 2010/11 (Dauvergne, 2012). It is clear from the numbers that the Aboriginal people are grossly overrepresented amongst those imprisoned[26]. For example, Aboriginal people comprised 4.9 per cent of the population in Alberta, but represent 40.6 per cent of those in custody.

The Aboriginal population is generally less healthy than the non-Aboriginal population, at least according to many standard measures. Table 15 provides a series of health indicators of the population aged 12 and older by Aboriginal identity between 2007 and 2010 (averages over the period). The Aboriginal population is more prone to poor health outcomes such as asthma, respiratory problems, obesity, and lower perceived health. These poor outcomes may result in

[25] However, the relative unemployment rate gap closed at a strong pace throughout the entire decade.
[26] This fact has been documented by researchers Mary Hyde and Carol LaPrairie. For example, see Hyde and LaPrairie (1987).

part because of higher smoking rates, lower consumption of fruits and vegetables, and lower likelihood of having a regular doctor.

Note that not all of the Aboriginal health indicators are worse than those of the non-Aboriginal population. Aboriginal people report lower rates of high blood pressure, heart disease, or suffering from a stroke. Inuit people have much lower rates of arthritis, diabetes, and chronic health problems. Some lifestyle indicators also appear to be better for the Aboriginal population. Métis and First Nations people are more likely to report being physically active during their leisure time. Inuit people are far more likely to report feeling a strong sense of belonging to their local community.

Table 14: Aboriginal Shares of Incarcerated and Total Populations, Ages 18+, 2010/2011

Province and territory	Percent of adults in custody	Percent of adults in the population	Ratio of Per cent Adults in Custody to Per cent Adults in Population
Northwest Territories	90.9	46.5	1.95
Yukon	73.9	22.5	3.28
Alberta	40.6	4.9	8.29
Saskatchewan	77.6	11.9	6.52
Manitoba	69.1	12.9	5.36
Ontario	11.4	1.8	6.33
Quebec	4.4	1.3	3.38
New Brunswick	9.2	2.2	4.18
Nova Scotia	9.7	2.4	4.04
Prince Edward Island	3.0	1.0	3.00
Newfoundland and Labrador	18.3	4.3	4.26

Source: Dauvergne (2012), Adult correctional statistics in Canada, 2010/2011, Statistics Canada, Chart 7, http://www.statcan.gc.ca/pub/85-002-x/2012001/article/11715/c-g/desc/desc07-eng.htm

Another well known problem facing Aboriginal Canadians is sub-standard housing. This problem is greatest for the First Nations and Inuit populations. In 2011, 29.9 per cent of Inuit and 25.7 per cent of First Nations lived in housing which required major repairs (see Table 16). This compares to 6.8 per cent of the non-Aboriginal population and 13.2 per cent of Métis. The poor First Nations housing outcomes are largely the result of the abysmal housing situation on-reserve. Almost 43 per cent of those residing on-reserve live in housing which requires major

repairs. The maintenance situation of First Nations people living off-reserve is only very slightly worse than that of the Métis.

First Nations and Inuit people are also more likely to live in overcrowded conditions. The data indicates that 5.9 per cent of First Nations and 12.9 per cent of Inuit live in a home where there are more than 1.5 people per room compared to only 1.6 per cent of the non-Aboriginal population. The Métis actually perform better than the non-Aboriginal population by this measure, as only 1.1 per cent of the Métis population live in a home with more than 1.5 people per room.

Table 15: Health Indicators by Aboriginal Identity, Rates (%), Population 12+, 2007-2010, Average

	First Nations	Métis	Inuit	Non-Aboriginal
Arthritis	14.4	13.8	9.6	12.1
Asthma	13.7	12.8	14.2	8.6
Body mass index, self-reported, ages 18+, overweight or obese	56.9	54.0	58.2	48.3
Has a regular medical doctor	77.7	79.7	44.5	83.3
Current smoker, daily or occasional	39.8	36.0	48.4	20.6
Diabetes	6.1	3.9	1.9	4.5
Exposure to second-hand smoke at home	15.4	15.9	16.8	7.3
5 or more drinks on one occasion, at least once a month in the past year	26.5	26.6	26.2	18.5
Food Insecurity, moderate or severe	21.7	15.3	27.2	7.3
Fruit and vegetable consumption, 5 times or more per day	36.2	38.6	27.3	44.6
High blood pressure, heart disease or suffering from effects of stroke	11.1	10.5	8.9	14.3
Life satisfaction, satisfied or very satisfied	89.1	89.8	92.2	92.6
Mood disorder	11.9	9.9	5.3	6.0
One or more chronic conditions	55.5	54.8	43.4	48.0
Perceived health, very good or excellent	49.9	53.7	54.5	62.7
Perceived mental health, very good or excellent	65.6	66.8	65.4	75.3
Physical activity during leisure-time, moderately active or active	56.5	60.6	51.2	53.6
Respiratory problems	15.3	14.5	14.7	9.9
Sense of belonging to local community, somewhat strong or very strong	63.1	62.5	81.5	65.0

Source: Statistics Canada, CANSIM Table 105-0513 - Health indicator profile, by Aboriginal identity and sex, age-standardized rate, four year estimates, Canada, provinces and territories, occasional (rate).
Note: The data in this table come from the Canadian Community Health Survey which relies upon self-reported responses to a questionnaire. Given that there is some subjectivity in many of these health indicators, it is possible that some of the differences between the reported outcomes of Aboriginal identity groups may be the result of differences in reporting rather than differences in health outcomes.

All of these unsatisfactory outcomes for the Aboriginal population are inter-related. Worse labour market performance makes crime more appealing and may make it difficult to afford adequate housing. Poor health may prevent one from entering the labour force, while a criminal record makes it more difficult to find a job.

The next section discusses another area in which Aboriginal outcomes are far worse than those of non-Aboriginal Canadians: education. Section II of this report discussed the importance of receiving a quality education for achieving good outcomes later in life. The under-education of the Aboriginal population is likely an important contributor to the poor labour market and social performance discussed so far.

Table 16: Proportion of Population with Select Housing Characteristics by Aboriginal Identity, percentage, 2011

	Aboriginal	First Nations (On-reserve)	First Nations (Off-reserve)	Métis	Inuit	Non-Aboriginal
Regular maintenance only	47.3	27.4	52.8	54.7	40.1	67.5
Minor repairs needed	31.3	29.9	31.8	32.1	30.1	25.7
Major repairs needed	21.5	42.7	15.4	13.2	29.9	6.8
More than 1.5 people per room	4.5	11.4	2.5	1.1	12.9	1.6

Source: National Household Survey, 2011

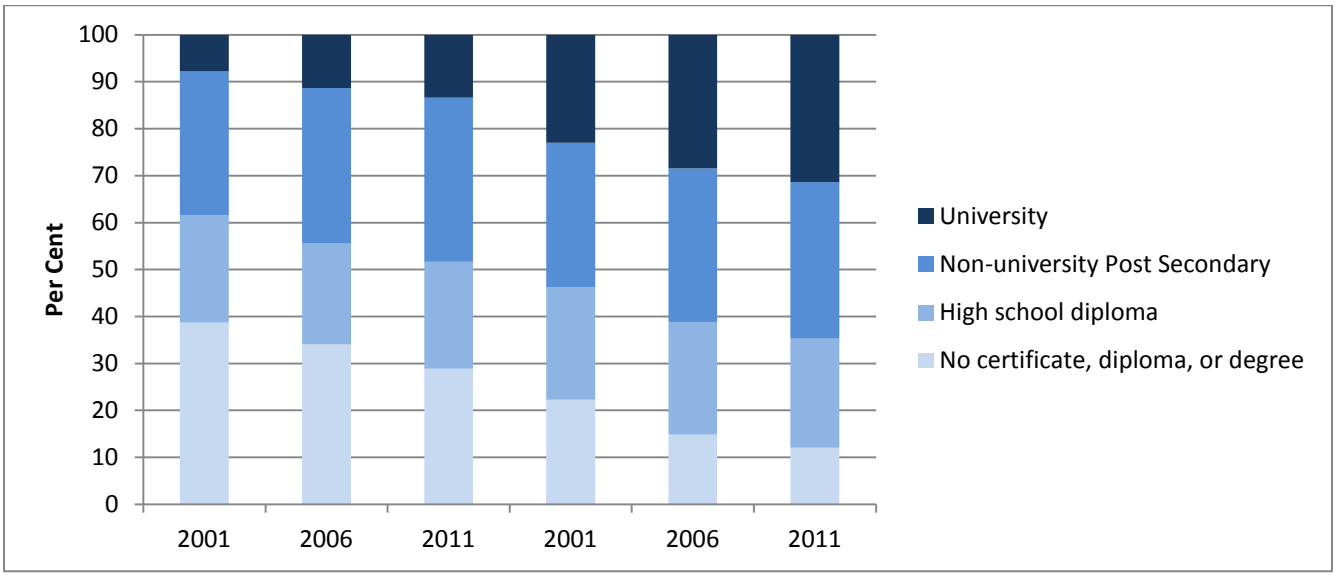
C. Education and the Outcome Gaps

i. The Aboriginal Education Gap

The Aboriginal population in Canada is undereducated compared to the rest of the population. Similar shares of the two populations hold a high school diploma or a non-university post-secondary certificate, diploma, or degree as their highest level of educational attainment. As previously noted by Hull (2009), the educational attainment gap arises because a much larger share of the Aboriginal population holds no certificate, diploma or degree while a much smaller share of the Aboriginal population holds a university degree. In 2011, 28.9 per cent of Aboriginal people between the ages of 25 and 64 did not possess at least a high school diploma or equivalent. At the same time, only 13.3 per cent of Aboriginal adults possessed a certificate, diploma, or degree from a university. As a point of comparison, 12.1 per cent of non-Aboriginal people in the same age group did not possess at least a high school diploma or equivalent, while 31.4 per cent possessed university credentials.

As dismal as the Aboriginal education rates might seem, they are actually much improved compared to a decade earlier. Chart 8 shows how the education distributions of the Aboriginal and non-Aboriginal populations of Canada changed between 2001 and 2011.

Chart 8: Highest Level of Educational Attainment, Ages 25-64, Aboriginal and Non-Aboriginal Populations, 2001, 2006, 2011



Source: 2011 National Household Survey, 2006 Canadian Census, and 2001 Canadian Census

Before proceeding further, the reader should be aware that the census questions relating to education underwent a substantial change between 2001 and 2006 which has affected the comparability of results in 2001 with those in 2006 and 2011. The major change which is relevant for our analysis is that the 2006 census changed from asking a single question about the highest certificate, degree, or diploma attained to asking a series of questions for each level of educational attainment. Statistics Canada has deemed the overall quality of the data acceptable, but there are a number of specific issues for comparison:

- High school completion had been underreported in the Censuses prior to 2006. This means that some of the improvement in educational attainment, particularly the share of the population holding a high school diploma, observed between 2001 and 2006 (and thus also between 2001 and 2011) will be the result of elimination of this underreporting.

- The 2006 questionnaire added a type of educational institution found only in Quebec, "centres de formation professionnelle", which had not previously been included. This may have affected data on trades certifications in Quebec.

- The "university certificate or diploma below the bachelor's level" category experienced unexpected growth which was not observed in other surveys. Statistics Canada warns against comparing this category from 2001 to 2006.

- Data in the college categories and university categories at the bachelor's level and above are all readily comparable across time.

Assuming that these comparability issues affected the Aboriginal and non-Aboriginal populations similarly, comparison of the relative gaps between the Aboriginals and non-Aboriginal populations over time should not be affected.[27]

Table 17: Highest Level of Educational Attainment, Ages 25-64, Aboriginal and Non-Aboriginal Populations, 2001, 2006, 2011

Highest Level of Educational Attainment	Share of Aboriginal Population (per cent)			Share of Non-Aboriginal Population (per cent)		
	2001	2006	2011	2001	2006	2011
No certificate, diploma or degree	38.7	34.1	28.9	22.3	14.8	12.1
High school diploma or equivalent	22.8	21.4	22.8	24.0	24.0	23.2
Non-University Postsecondary Certificate, Diploma, or Degree	30.7	33.1	35.0	30.8	32.7	33.3
University Degree	7.8	11.4	13.4	23.0	28.5	31.4
University certificate or diploma below bachelor level	1.8	3.6	3.5	2.9	5.0	4.9
Bachelor's degree	4.5	5.5	7.0	13.6	14.9	16.9
University certificate or diploma above bachelor level	0.6	0.9	1.0	2.1	2.4	2.8
Degree in medicine, dentistry, veterinary medicine or optometry	0.0	0.1	0.1	0.0	0.7	0.7
Master's degree	0.7	1.0	1.5	3.7	4.6	5.2
Earned doctorate	0.1	0.2	0.2	0.7	0.8	0.9

Source: 2011 National Household Survey, 2006 Canadian Census, and 2001 Canadian Census

Observe in Table 17 and Chart 8 that both populations have seen sizable increases in high school and university credentials. The share of the Aboriginal population without a high school diploma fell by nearly 10 percentage points over the decade.[28] Over the same period, the share of the Aboriginal population with a post-secondary education also rose by nearly 10 percentage

[27] For further information on how the education questions changed between 2001 and 2006, we encourage the reader to consult Statistics Canada's documentation of the issue via the following link: http://www12.statcan.gc.ca/census-recensement/2006/ref/info/education-eng.cfm.

[28] However, a sizable amount of this improvement will be due to underreporting of high school completion in the 2001 census. We can obtain a rough sense of how much of the improvement was real by considering how high school completion rates changed in the Labour Force Survey, which remained consistent from 2000 to 2006 and is not known to suffer from an underreporting problem. According to the Education Reference Guide from the 2006 Census, "the proportion of Canadians aged 15 and over with less than high school showed a sizable decrease from 33.2% in 2001 to 23.8% in 2006. This decrease was more pronounced than in the *Labour Force Survey* where the rate went from 28.8% to 24.9% over the same period." A similar comparison can be made for those with a high school degree as their highest level of education: "based on Census results, the proportion of Canadians 15 years and over with high school as their highest level of education increased from 23.0% in 2001 to 25.5% in 2006. By comparison, the similar rate in the *Labour Force Survey* went from 26.9% to 26.8% over the same period."

points. This is a significant improvement, but it actually was slightly less than the improvement of the non-Aboriginal population in absolute terms, even though the non-Aboriginal population was much more educated to begin with. The share of the non-Aboriginal population with less than high school fell by 10.2 percentage points and the share with a postsecondary credential rose by 10.9 percentage points. This means that there was little progress on the educational attainment gap over the period, despite considerable progress on Aboriginal education levels.

Table 18: Average Years of Educational Attainment, Summary

	Years Educational Attainment			Changes		
	2001	2006	2011	2001-06	2006-11	2001-11
Aboriginal	11.93	12.40	12.69	0.47	0.29	0.76
Non-Aboriginal	13.28	13.84	14.09	0.56	0.25	0.81
Gap	1.34	1.44	1.40	0.10	-0.04	0.06
Gap (Relative to 2001 Non-Aboriginal Population)	1.35	0.88	0.59	-0.47	-0.29	-0.76

Source: Author's calculations using public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey.

When comparing educational attainment across groups, it is convenient to have a summary measure rather than a distribution across many educational levels. One natural summary statistic for educational attainment is the average number of years of education. While this variable is not included in the 2011 National Household Survey, the 2001 census did ask individuals to report the number of years they had spent in school. Assuming that the average educational attainment of the population in each educational category is constant over time, we use this data from the 2001 census to estimate the average number of years of formal education of the Aboriginal and non-Aboriginal populations by several characteristics in 2001, 2006, and 2011 using publically available microdata files.[29] This allows us to quantify the size of the gap and how it has changed over time.[30] Table 18 summarizes the results.

[29] Be aware that this is an imprecise approximation. The 2001 data on years of schooling often identifies a range for each individual rather than the precise number of years. In the cases where only the range was available, we assigned the median number of years in the range to the individual. The top range, 18 years or more, is problematic because there is no upper bound. All individuals in this category were assigned a value of 18 years of schooling, which almost guarantees that we are underestimating the education of those at the upper end of the education distribution. Also note that we have calculated years of education based upon the actual number of years of schooling at all levels rather than assigning values to each category based upon how many years we expect one should take to earn the credential. This means that our measurement includes years completed towards uncompleted degrees, grades of elementary and secondary school attended but not completed, and potentially repeated years. The advantage of this approach is that it produces non-arbitrary estimates of years of education for some categories which are difficult to assign values to, particularly those with no certificate, diploma, or degree or those who fall in categories which include a range of times to completion. Appendix Table 2 presents the educational categories and corresponding years of schooling used in these calculations.

[30] The reader should note that this measure may include additional years of schooling as a result of years towards incomplete credentials and may also include some repeated years. This will add noise to the data to the extent that

Table 19: Average Years of Education of the Population Aged 25-64 by Select Characteristics, Canada, 2001, 2006, 2011

	2001				2006				2011				
	Aboriginal	Non-Aboriginal	Absolute Gap	Relative Gap (%)	Aboriginal	Non-Aboriginal	Absolute Gap	Relative Gap (%)	Aboriginal	Non-Aboriginal	Absolute Gap	Relative Gap (%)	Annual Growth Rate of Gap (%) 2001-2011
Canada	11.93	13.28	1.34	10.11	12.40	13.84	1.44	10.40	12.69	14.09	1.40	9.92	-0.19
Newfoundland and Labrador	11.85	12.47	0.63	5.02	12.43	13.12	0.69	5.26	13.19	13.49	0.30	2.26	-7.67
Prince Edward Island	11.64	12.80	1.16	9.04	13.06	13.43	0.37	2.76	13.57	13.71	0.14	1.04	-19.45
Nova Scotia	12.25	13.04	0.79	6.04	12.95	13.57	0.62	4.57	13.32	13.88	0.56	4.05	-3.90
New Brunswick	12.23	12.73	0.50	3.93	12.40	13.28	0.88	6.63	12.87	13.56	0.70	5.16	2.76
Quebec	11.91	13.19	1.28	9.72	12.37	13.74	1.37	9.97	12.78	13.95	1.17	8.42	-1.43
Ontario	12.30	13.45	1.15	8.53	12.77	14.04	1.27	9.05	13.18	14.29	1.11	7.77	-0.93
Manitoba	11.54	12.97	1.42	10.98	12.07	13.52	1.45	10.72	12.19	13.80	1.61	11.69	0.63
Saskatchewan	11.73	12.88	1.15	8.91	12.09	13.46	1.37	10.18	12.34	13.71	1.37	10.01	1.17
Alberta	11.89	13.23	1.34	10.09	12.32	13.74	1.42	10.33	12.45	14.02	1.57	11.17	1.02
British Columbia	12.01	13.41	1.40	10.41	12.52	13.94	1.42	10.19	12.80	14.17	1.37	9.67	-0.74
Territories	11.65	13.99	2.34	16.70	11.85	14.26	2.41	16.90	11.52	14.49	2.97	20.50	2.07
Female	12.10	13.32	1.22	9.18	12.58	13.93	1.35	9.68	12.94	14.22	1.28	9.01	-0.19
Male	11.75	13.23	1.47	11.13	12.19	13.75	1.56	11.38	12.42	13.96	1.54	11.03	-0.09
Ages 25-34	12.04	13.80	1.76	12.75	12.42	14.23	1.81	12.74	12.66	14.41	1.75	12.12	-0.51
Ages 35-44	12.04	13.39	1.35	10.11	12.46	14.02	1.56	11.14	12.94	14.37	1.43	9.94	-0.17
Ages 45-54	11.97	13.21	1.24	9.40	12.46	13.64	1.18	8.63	12.71	13.97	1.26	9.02	-0.42
Ages 55-64	11.26	12.44	1.18	9.49	12.21	13.37	1.16	8.68	12.41	13.61	1.20	8.79	-0.77
First Nations	11.82	13.28	1.45	10.94	12.25	13.84	1.59	11.49	12.46	14.09	1.63	11.57	0.56
Métis	12.21	13.28	1.07	8.04	12.70	13.84	1.14	8.23	13.11	14.09	0.98	6.94	-1.45
Inuit	11.44	13.28	1.84	13.85	11.58	13.84	2.27	16.37	11.56	14.09	2.53	17.98	2.65
Registered Indian Status	11.81	13.28	1.47	11.06	12.20	13.84	1.64	11.86	12.31	14.09	1.78	12.61	1.32

Note: The 2011 NHS PUMF does not identify whether an individual lives on- or off- reserve, so we do not present values for these groups.

Source: Author's calculations using public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

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these additional years are of less value and are more prominent in some categories than in others. We apply the same national average years of schooling in each category to both the Aboriginal and non-Aboriginal population, but the two populations have different average years of schooling in each category (see Appendix Table 2). For example, the average Aboriginal aged 25-64 who did not complete high school had about half a year less education than the average non-Aboriginal aged 25-64 in 2001, suggesting that Aboriginal students drop out of school earlier. As we do not know how the gap within categories changed over time, we opt to ignore it in the construction of our summary measure of educational attainment, but the reader should be aware that gaps likely exist within educational categories as well as between them.

The average Aboriginal person in Canada between 25 and 64 years of age had 12.7 years of educational attainment in 2011. The population below 25 is excluded because individuals still in school will of course have fewer years of education. The average non-Aboriginal Canadian has about 1.4 additional years of education.

Average Aboriginal educational attainment increased by about 0.76 years between 2001 and 2011. However, non-Aboriginal people experienced an equal improvement over the same period. As a result, the absolute educational attainment gap was almost unchanged, increasing from 1.34 years in 2001 to 1.40 years in 2011. The relative gap in years of educational attainment just barely narrowed. The pace of improvement in absolute terms appears to have slowed from 2001 to 2006, but the reader needs to recall that a good part of the perceived improvement from 2001 to 2006 was due to underreporting of high school diplomas in the 2001 Census.

A few trends observable in Table 19 are worth pointing out:[31]

- Years of education appear to decrease with age[32] because people received less education in the past then they receive now. Oddly, the effect of age appears to be stronger among the non-Aboriginal population. Lower education in older cohorts means that some of the improvement in education between 2001 and 2011 is the result of older people who are less educated leaving the sample and being replaced by better educated people from a younger generation. While younger Aboriginal people are better educated, they also have larger educational gaps relative to their non-Aboriginal peers.

- Among Aboriginal people, women tend to be somewhat better educated than men. In 2011, the average Aboriginal female aged 25 to 64 had 0.5 years more

[31] Appendix Table 8 presents similar results using assigned values for each educational attainment category based on the number of years we would expect that one would require to reach a given level of educational attainment (for example, high school would be 12 years) for readers who are concerned about our use of years of schooling in calculating our summary measure of years of educational attainment. The level of years of educational attainment is lower under this alternative measure, but the estimates of the gaps and how they have changed over time remain qualitatively similar. Nationally, the absolute gap under this alternate measure increased very slightly from 1.28 years in 2001 to 1.30 years in 2011. The relative gap also closed at a very slow pace of at a rate of -0.37 per cent per year from 10.12 per cent in 2001 to 9.76 per cent in 2011.

[32] The reader should also note that there are differences in the process of education over the life cycle between the Aboriginal and non-Aboriginal populations. Aboriginal education is more likely to occur later at an older age and a significant number of Aboriginal people acquire a post-secondary education without completion of a high school diploma. Notice that our metric for years of education only considers the highest certificate, diploma, or degree attained. As such, it considers all holders of a post-secondary credential to have the same level of education, the average years of schooling of all holders of the credential, regardless of whether an individual completed high school or not. We think that this is justifiable on the basis that earning a more advanced credential implies that one has acquired knowledge or skills equivalent to what would normally be associated with a high school diploma. If one considers that earning a post-secondary credential without a high school degree represents an inferior level of education to holding the same credential with a high school degree, than our summary measure will be biased upwards for the Aboriginal population to the extent that this occurs.

education than the average Aboriginal man. This makes the education gap slightly smaller for women because the difference between the genders is smaller for the non-Aboriginal population (women only have about 0.2 years more).

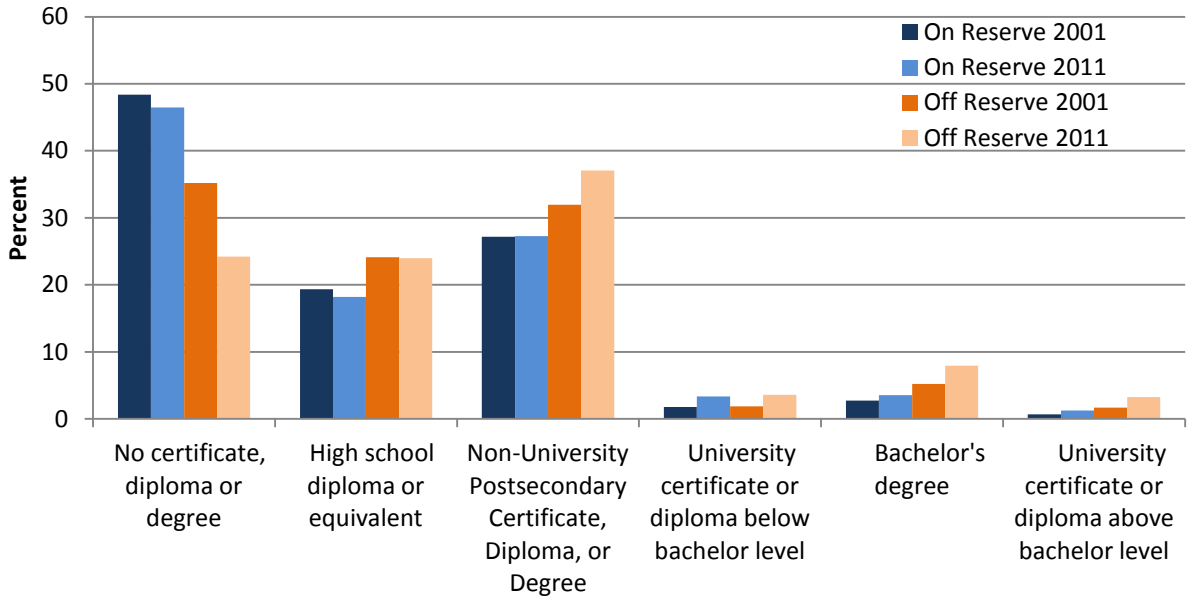
- Provinces differ in terms of education levels, but the more interesting patterns for our purposes are how the gaps vary. Generally, the educational attainment gaps are smallest in the Atlantic Provinces where the average Aboriginal person only had between 1 and 5 per cent less schooling relative to the average non-Aboriginal person in 2011. The gaps are somewhat larger further west where they reach as large as 12 percentage points in Manitoba. By far the biggest education gap is found in the Territories. This is because Aboriginal people in the Territories have unusually little education (11.52 years in 2011) while non-Aboriginal people in the Territories have unusually high levels of education (14.49 years).

- Consistent with this and with earlier observations on the labour market outcome gaps, the Métis are the most educated Aboriginal identity group with 13.1 years education on average while the First Nations and Inuit lag behind with 12.5 years and 11.6 years respectively.

- Those groups with the smallest gaps in 2011 were also in many cases the ones which made the most progress since 2001. For example, the relative years of schooling gap shrank for the Métis at an average compound annual rate of 1.45 per cent each year over the period. The Inuit and First Nations both faced growing gaps over the period. The gap shrank about twice as quickly for women as for men. The Prairie Provinces and the Territories, which are the regions with some of the largest gaps, all experienced an expansion of their gaps in the range of 0.63 per cent per year (Manitoba) to 2.07 per cent per year (Territories) each year. In contrast, Quebec and Ontario reduced their gaps by 1.43 per cent and 0.93 per cent each year respectively. Nova Scotia, Newfoundland and Labrador, and Prince Edward Island made the most progress with very impressive rates of closure.

The improvements in the absolute levels of Aboriginal education have occurred primarily off-reserve. On-reserve, where education levels were dismally low in 2001, there has been very little improvement. Chart 9 shows the distribution of highest levels of educational attainment of the Aboriginal populations on and off-reserve in 2001 and 2011. Education rates at the university level have improved somewhat on-reserve, but the number of people in the bottom educational attainment category remains shockingly high at 46.4 per cent.

Chart 9: Comparison of Highest Educational Attainment, Total Aboriginal Population On- and Off-Reserve, Ages 25-64, 2001 and 2011



Source: Census, 2001, and National Household Survey, 2011

As we do not have the distribution of the Aboriginal populations on- and off-reserve in the same set of categories as reported in the PUMF, we cannot calculate years of educational attainment which are perfectly comparable to the numbers above for these groups. However, we can calculate it using 4 categories to get a good approximation to how things have changed on- and off- reserve. From 2001 to 2011, years of educational attainment on-reserve rose from 11.64 to 11.78 years. Off-reserve, the improvement among the Aboriginal population was much greater, rising from 12.31 to 12.96 years.[33] Using four categories, the comparable improvement of the non-Aboriginal population was from 13.29 years to 13.96 years.

In summary, a sizable educational attainment gap persists between the Aboriginal and non-Aboriginal populations in Canada, although Aboriginal education levels have risen considerably off-reserve since 2001. Improvements have been particularly strong in Eastern Canada, off-reserve, and for the Métis people.

[33] Since most of the Aboriginal people living on-reserve identify as First Nations, one may be more interested in comparing the First Nations population living on-reserve to the First Nations population living off-reserve. We have constructed the equivalent to Chart 9 for only the First Nations population and the results are very similar in absolute terms. There are some differences in relative terms at the upper end of the distribution. For example, In 2001, 1.67 per cent of Aboriginal people living off-reserve possessed a university certificate or diploma above the bachelor level compared to only 0.67 per cent of the First Nations population living off-reserve.

ii. Labour Market Gaps Conditional on Education[34]

Part of the overall education gap may be driven by demographics (i.e., a relatively young and rural population), but we have seen that the education gap exists across all provinces, genders, Aboriginal identities and age groups. Research on the link between education and economic outcomes suggests that the education gap contributes to the poor labour market performance of Aboriginal Canadians, but we would like to have some idea of how much of a role education plays. One way to assess this is to look at differences in labour market outcomes if we control for level of educational attainment. If educational attainment is the only factor determining labour market outcomes, we would expect to see very little difference between the outcomes of Aboriginal and non-Aboriginal people with the same educational backgrounds. Gaps which persist once education is controlled for indicate that non-educational factors are also contributing to poor Aboriginal outcomes.

First, consider employment income of full-year full-time workers aged 25 to 64.[35] The restriction to these types of workers avoids any effect from differences in the likelihood of being a part-time or temporary worker between Aboriginal and non-Aboriginal workers.[36] Conditional on education, Table 20 shows that Aboriginal workers earn less than their non-Aboriginal counterparts, but the differences in 2010 are not huge for the most part. Aboriginal workers with education below a bachelor's degree earned over ninety percent of the income of non-Aboriginal workers with a bachelor's degree. Aboriginal workers with less than high school earn 99.5 per cent as much as non-Aboriginal workers with less than high school while Aboriginal workers with university degrees above the bachelor level actually appear to have earned more than non-Aboriginal workers with university degrees above the bachelor level.[37] The gap is largest for Aboriginal people with a bachelor's degree, as they earn only 86 per cent as much as non-

[34] For clarity, labour market gaps "conditional on education" refers to the labour market outcome gaps which exist between the Aboriginal and non-Aboriginal populations with the same level of education (i.e. the gap between Aboriginal and non-Aboriginal individuals with a high school degree, the gap between Aboriginal and non-Aboriginal individuals with a trades certificate, etc.). Because these gaps are between individuals with the same level of educational attainment, they cannot be explained by differences in educational attainment.

[35] Using the 2011 NHS PUMF, we have calculated that, in 2010, 51.3 per cent of non-Aboriginal people aged 25-64 worked full-year full-time compared to 39.21 per cent of Aboriginal people aged 25-64. We required at least 49 weeks of work (including sick leave, vacation time, and paid training) to be considered full-year.

[36] Recall that we found some evidence earlier that Aboriginal workers work fewer hours in a year, primarily because they work fewer weeks. These differences will increase the employment income gap beyond that considered here. There may be differences between educational attainments in terms of the gap in hours worked, but we do not explore this issue in this report.

[37] While there may have been some improvement over earlier years, we doubt that the income gap is actually negative for those in this educational attainment category. The public use microdata file used in this calculation only includes a small sample size of 193 observations for Aboriginal people aged 25-64 working full-year full-time with a degree above the bachelor's level. As such, the reader should be very cautious in interpreting this result.

Aboriginal people with a bachelor's degree.[38] The larger gap for those with a bachelor's degree compared to those with less than high school is similar to the findings of a quantile regression exercise performed by Pendakur and Pendakur (2011).

Table 20: Average Employment Incomes of Full-Year Full-Time Workers Aged 25-64, 2000, 2005, 2010 (2010 dollars)

Highest Level of Education Attained	2000			2005			2010		
	Aboriginal	Non-Aboriginal	Relative Gap (%)	Aboriginal	Non-Aboriginal	Relative Gap (%)	Aboriginal	Non-Aboriginal	Relative Gap (%)
None	34,981	39,648	11.8	36,591	38,631	5.3	38,735	38,919	0.5
High School or Equivalent	41,294	45,139	8.5	41,521	46,289	10.3	43,563	47,030	7.4
Postsecondary Below Bachelor's	42,417	50,348	15.8	45,170	52,785	14.4	51,650	53,343	3.2
Bachelor's Degree	55,751	66,178	15.8	65,360	75,610	13.6	64,389	74,983	14.1
University Degree Above Bachelor's	63,793	79,388	19.6	78,324	95,129	17.7	96,032	91,215	-5.3
All Categories	41,412	51,816	20.1	45,048	57,439	21.6	50,230	58,934	14.8

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

Aboriginal people who are more educated earn more money, but the rate of the increase in income up to the bachelor's level is not as great for Aboriginal workers as for non-Aboriginal workers. This may suggest that part of the Aboriginal education gap might be the result of a rational choice to invest in less education by Aboriginal workers, as their expected returns to education are not as high. This could be especially true for those living on-reserve.

For most categories, the gaps conditional on education have shrunk somewhat since 2000. The improvements were greatest for those with less than high school and those with a postsecondary education other than a bachelor's degree. These groups all had earned less than 90 per cent as much as the corresponding non-Aboriginal groups in 2000 but earn more than 95 per cent as much in 2010 – the gap has effectively closed for these people. In contrast, the gap for those with a bachelor's degree remains substantial and has barely improved.

The differences in incomes across education levels are substantial while the differences between Aboriginal and non-Aboriginal people within an education level are now quite small. Differences in education likely can explain much of the income gap. To quantify the effect of differences in education on labour market outcomes we perform a simple shift-share analysis exercise (see results in Table 24). The exercise involves recalculating the employment income gap for the total population if all the gaps conditional upon education were eliminated – only

[38] One factor which may play a role in this is a relative lack of opportunity to put a university education to good use on remote reserves. If many Aboriginal people acquire a university degree and then choose to live on-reserve due to personal preferences, this may reduce Aboriginal incomes relative to non-Aboriginal incomes.

differences in educational attainment between the Aboriginal and non-Aboriginal populations would be producing the gap if this were the case. [39] By comparing this counterfactual gap to the actual gap in 2011, we can estimate how much of the gap in outcomes can be explained by differences in educational attainment and how much is the result of other factors.

A simple example may help the reader better understand this exercise. Suppose there are only education levels, educated and uneducated. Aboriginal workers earn $0 if uneducated and $10,000 if educated. Non-Aboriginal workers earn $5,000 if uneducated and $20,000 if educated. Suppose three quarters of the Aboriginal population are uneducated while half the non-Aboriginal population is uneducated. Average Aboriginal income would be $2,500 ($0 x 0.75 + $10,000 x 0.25) while average non-Aboriginal income would be $12,500 ($5,000 x 0.5 + $20,000 x 0.5). Thus, the gap is $10,000.

Under the counterfactual, we eliminate the gaps conditional upon education by assuming that Aboriginal people have the same labour market outcomes as non-Aboriginal people with the same education. That is, we consider a situation in which uneducated Aboriginal workers earn $5,000 and educated Aboriginal workers earn $20,000. Under such a situation, there may still be a gap, but it can be explained entirely by differences in education because differences in outcomes given education do not exist. How big would the remaining gap be in this scenario? We can calculate the counterfactual Aboriginal outcome as $5,000 x 0.75 + $20,000 x 0.25 = $8,750. Nothing has changed for the non-Aboriginal population, they still earn $12,500 on average. Thus the new gap, which is entirely attributable to differences between the two populations in educational attainment, is $3,750.

We compare this counterfactual gap to the original gap of $10,000 which was the result of both education and differences conditional upon education and conclude that 37.5 per cent of the income gap can be attributed to differences in educational attainment ($3,750 / $10,000). We attributed the remainder of the gap, 62.5 per cent, to other factors. Now we perform a similar exercise using real data.

We find that average Aboriginal income for full-year full-time workers aged 25-64 would rise from $50,230 to $52,781 in 2011 if their income conditional upon educational attainment was the same on average as that of similarly educated non-Aboriginal workers. Under this scenario, the gap would fall from $8,704 to $6,153. This indicates that educational attainment can explain about 70.7 per cent of the gap in incomes conditional upon education because 70.7 per cent of the gap would persist if there were no differences in incomes within educational categories – the only differences remaining are in terms of the educational distribution of the two populations.

[39] The reader should note that this recalculation is the same as applying the Aboriginal educational attainment distribution to the non-Aboriginal population.

Table 21: Participation Rate of Population Aged 25-64, 2001, 2006, and 2011

Highest Level of Education Attained	2001			2006			2011		
	Aboriginal	Non-Aboriginal	Relative Gap (%)	Aboriginal	Non-Aboriginal	Relative Gap (%)	Aboriginal	Non-Aboriginal	Relative Gap (%)
None	56.7	66.4	14.6	57.4	66.2	13.3	54.0	64.2	15.8
High School or Equivalent	75.4	79.9	5.6	76.5	80.2	4.6	74.1	78.2	5.2
Postsecondary Below Bachelor's	83.0	85.3	2.7	82.8	85.7	3.4	81.3	85.3	4.7
Bachelor's Degree	86.6	86.8	0.2	88.9	87.2	-1.9	87.0	86.9	-0.1
University Degree Above Bachelor's	82.0	87.1	5.8	88.8	87.0	-2.1	89.0	86.6	-2.7
All Categories	70.3	79.8	11.9	72.8	82.0	11.2	72.4	81.7	11.3

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

What about the odds of finding a job? Recall that Aboriginal people are less likely to participate in the labour market than non-Aboriginal people. If we control for education, it turns out that this is still true, but only for those with less than a bachelor's degree (see Table 21). Like income, there are significant differences in participation rates depending upon education, but there are also sizable gaps within educational categories. The increase in labour force participation if one has a high school diploma seems to be especially large for Aboriginal individuals.

Table 22: Employment Rate of Population Aged 25-64, 2001, 2006, and 2011

Highest Level of Education Attained	2001			2006			2011		
	Aboriginal	Non-Aboriginal	Relative Gap (%)	Aboriginal	Non-Aboriginal	Relative Gap (%)	Aboriginal	Non-Aboriginal	Relative Gap (%)
None	43.4	60.4	28.1	45.2	60.6	25.4	42.9	57.3	25.1
High School or Equivalent	63.9	75.3	15.1	67.4	75.9	11.2	64.8	72.8	11.0
Postsecondary Below Bachelor's	70.7	80.7	12.4	73.6	81.6	9.8	73.1	80.5	9.2
Bachelor's Degree	80.0	83.2	3.8	82.1	83.6	1.8	81.7	83.1	1.7
University Degree Above Bachelor's	76.2	83.6	8.9	84.3	83.2	-1.3	85.6	82.5	-3.8
All Categories	58.1	75.1	22.6	63.3	77.8	18.6	63.4	76.7	17.3

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

Conditional on education, participation rates have not changed much since 2001 except for Aboriginal people with a degree above the bachelor level. As this is more or less true for both

the Aboriginal and non-Aboriginal populations, the participation rate gaps have remained fairly stable.

Our shift-share analysis exercise (Table 24) suggests that the Aboriginal participation rate could rise from 72.4 per cent to 77.7 per cent if the gaps conditional upon education were eliminated. The non-Aboriginal participation rate is 81.7 per cent, so this suggests that differences in educational attainment can explain 42.5 per cent of this gap.

Similarly, most Aboriginal employment rates conditional on education have not changed a whole lot since 2011 (see Table 22). They have risen slightly, particularly for those with higher levels of education. At the same time, non-Aboriginal employment rates have been falling somewhat. The result is that the employment rate gaps conditional on education have been closing. In 2011, there is essentially no employment rate gap for Aboriginal people holding a university degree. However, significant gaps continue to exist, particularly for the less educated. Only 57 per cent of non-Aboriginal persons with less than a high school education are employed, far less than 73 per cent of those who have completed high school. Aboriginal people who did not complete high school fare much worse with an employment rate of just 43 per cent – their employment rate is about 25 per cent below that of non-Aboriginal people with equally little education.

We estimate that educational attainment can explain about one third of the employment rate gap (Table 24).

Table 23: Unemployment Rate of Population Aged 25-64, 2001, 2006, and 2011

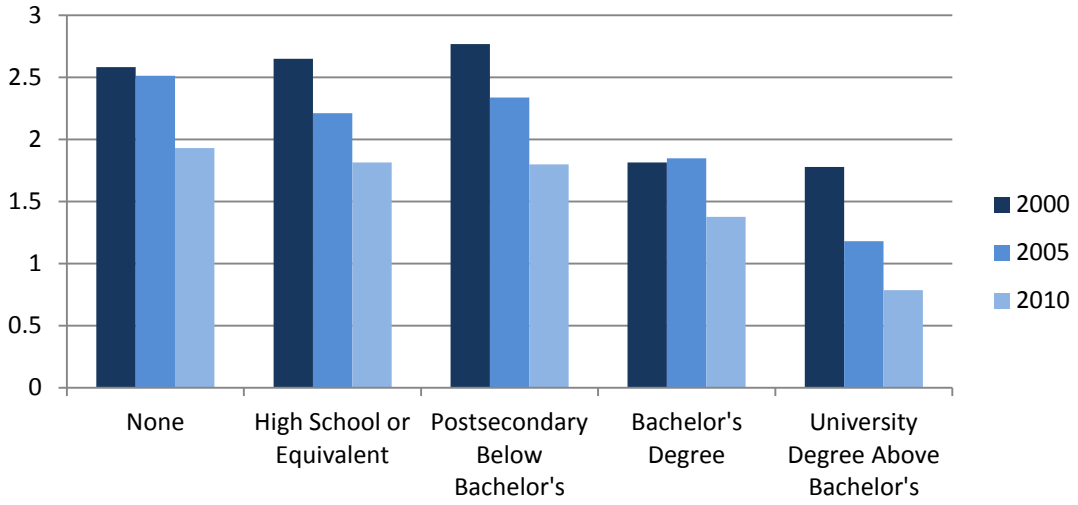
Highest Level of Education Attained	2001			2006			2011		
	Aboriginal	Non-Aboriginal	Relative Gap (%)	Aboriginal	Non-Aboriginal	Relative Gap (%)	Aboriginal	Non-Aboriginal	Relative Gap (%)
None	23.6	9.1	-159.3	21.3	8.5	-150.6	20.6	10.7	-92.5
High School or Equivalent	15.3	5.8	-163.8	11.9	5.4	-120.4	12.5	6.9	-81.2
Postsecondary Below Bachelor's	14.8	5.3	-179.2	11.1	4.8	-131.3	10.2	5.7	-78.9
Bachelor's Degree	7.6	4.2	-81.0	7.6	4.1	-85.4	6.0	4.4	-36.4
University Degree Above Bachelor's	7.1	4.0	-77.5	5.1	4.3	-18.6	3.7	4.8	22.9
All Categories	17.4	5.9	-194.9	13.7	5.2	-163.5	12.4	6.1	-103.3

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

Part of the employment rate gaps for the less educated arise due to the participation rate gaps, but one can see that the employment rate gaps are somewhat larger and have improved more over time. This is because there is also a huge unemployment rate gap conditional on

education, even for those with a bachelor's degree, but these unemployment rate gaps have been closing (see Table 23).

Chart 10: Ratio of Aboriginal to non-Aboriginal Unemployment Rates of those Aged 25-64 by Educational Attainment, 2001, 2006, and 2011



Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

In 2001, Aboriginal people with less than a bachelor's degree were more than 2.5 times as likely to be unemployed than non-Aboriginal people with equal education.[40] Even for those with university degrees, unemployment rates were still much higher. Conditional on education, Aboriginal employment rates have fallen while non-Aboriginal unemployment rates have risen slightly. The numbers in Table 23 may not look so impressive, but Chart 10 shows that the ratio between Aboriginal and non-Aboriginal unemployment rates has improved significantly in every category. That being said, the unemployment rate gap remains large even when education is controlled for. Aboriginal people with less than a bachelor's degree still have unemployment rates over 1.5 times greater than those of equally educated non-Aboriginal people. Even those with a bachelor's degree are still at a major disadvantage when it comes to finding work.[41]

Large differences across education levels indicate that education likely explains some of the difficulty Aboriginal people experience in finding work, but it is clear that factors besides education are important sources of the unemployment rate gap. Our shift-share analysis (Table 24) finds that the unemployment rate gap could improve from -6.4 percentage points to just -0.8

[40] For example, the calculation for the category of highest educational attainment "Postsecondary below bachelor's" is 14.8/5.3≈2.8.

[41] Aboriginal people with a degree above the bachelor's level have an unemployment rate of 3.7 per cent, lower than the non-Aboriginal rate of 4.8 per cent in the same category. Like the other strong results for this educational category, the reader should view this cautiously given the relatively small sample size of this group in the PUMF.

percentage points if Aboriginal people could achieve the same unemployment rates as non-Aboriginal people conditional upon education, Thus, we conclude that educational attainment can only explain 13.2 per cent of the gap in the unemployment rate.[42]

Table 24: Shift-Share Analysis of the Contribution of Educational Attainment to the Aboriginal Labour Market Outcome Gaps in 2011

Outcome	Non-Aboriginal Outcome	Observed Aboriginal Outcome (Aboriginal Educational Attainment)	Aboriginal Outcome if Aboriginal People had Non-Aboriginal Outcomes Conditional Upon Education	Observed Gap	Gap If Aboriginal People had Non-Aboriginal Outcomes Conditional Upon Education	Share of Gap Explainable by Education (%)	Share of Gap Explainable by Other Factors (%)
Participation Rate	81.7	72.4	77.7	9.3	3.9	42.5	57.5
Unemployment Rate	6.1	12.4	6.9	-6.4	-0.8	13.2	86.8
Employment Rate	76.7	63.4	72.3	13.3	4.4	33.4	66.6
Employment Income (2010 $, FYFT)	58,934	50,230	52,781	8,704	6,153	70.7	29.3

Source: Author`s calculations using data from the 2011 National Household Survey Public Use Microdata File (PUMF)

The reader should note the relationship between this shift share analysis and the major assumption which we will be using later in this report in assessing the economic benefits of closing the gap: we assume that if an individual achieves a higher level of educational attainment, that individual will be expected to achieve the same labour market outcomes as individuals already possessing that level of education. The same assumption is implicitly utilized in this shift share analysis. When we say that 70.7 per cent of the gap in employment income for full-year full-time workers aged 25 to 64 can be explained by education, this assumes that

[42] Note that what could perform a very similar exercise by considering a hypothetical scenario in which the Aboriginal population achieved the educational attainment of the non-Aboriginal population in 2011 while Aboriginal outcomes conditional on education remain unchanged. This would generate somewhat different results, particularly for the unemployment rate. Under this alternative methodology, differences in educational attainment can explain 34.9 per cent of the unemployment rate gap. As the choice of one of these two approaches over the other is purely arbitrary, the reader may want to compare the results of the shift-share analysis in Table 24 to those of the alternative analysis in Appendix Table 9. The shares of the participation, employment rate, and employment income gaps attributable to differences in education under this alternative exercise are 63.7 per cent, 52.8 per cent, and 65.1 per cent respectively.

shifting individuals from one educational attainment category into another would alter their employment incomes (on average) in a very specific way. If the gains from achieving a higher level of educational attainment were actually lower than assumed in this exercise, the share of the labour market outcome gaps which could be explained by differences in educational attainment would be reduced, and consequently, so would the benefits of eliminating the educational attainment gap.

iii. Fields of Study

While differences in educational attainment clearly explain some of the gap in labour market outcomes, we see that sizable gaps exist between Aboriginal and non-Aboriginal people with the same amount of education, even at the postsecondary level. What else might be generating these differences? One possible answer for those is that Aboriginal people are choosing different fields of specialization which the market does not value as much.

It is well known that the returns to a college education vary considerably across majors or fields of study. The differences between majors are large enough that choice of a college major is an important factor in explaining the gender gap in wages (Altonji et al., 2012). Some of the difference between the returns to a field of study can be explained by the skills and knowledge acquired through earning the credential, but differences in pre-existing attributes of those who pick certain majors are also thought to play an important role. Assuming that the content of the education is a major factor affecting outcomes, differences between the fields of study of the Aboriginal and non-Aboriginal populations merits consideration as a possible source of the gaps.

Table 25 presents a breakdown of postsecondary fields of study for the Aboriginal and non-Aboriginal populations aged 15 and above in 2011.[43] The table also includes the average labour market outcomes and average total incomes of the total population which are associated with each field of study. The highest average incomes of over $52,500 accrue to those who majored in "Architecture, engineering, and related technologies," "physical and life sciences and technologies," and "mathematics, computer and information sciences." Those who majored in business, social sciences / law, education, or health also earn fairly high wages, around $50,000. People who studied the humanities, "visual and performing arts, and communications technologies," or "personal, protective, and transportation services" make substantially less.

Unemployment rates also vary considerably across majors. "Visual and performing arts, and communications technologies," and "personal, protective, and transportation services" both have unemployment rates above 7 per cent while education has an unemployment rate of 3.7 per cent and health related fields have an unemployment rate of 4.7 per cent. The reader should be somewhat cautious when looking at the participation rates and employment rates, as differences in these are likely driven in part by variation in the gender composition of majors.

[43] A similar assessment of the fields of study of the Aboriginal population is presented in Gordon and White (2013)

Table 25: Postsecondary field of study, Aboriginal Identity, and Labour Market Outcomes for the Population 15+, 2011

Major field of Study	Share of Aboriginal identity, per cent	Share of Non-Aboriginal identity, per cent	Difference (Aboriginal minus Non-Aboriginal shares)	Participation rate (All)	Employment rate (All)	Unemployment rate (All)	Average Total Income (2010 $) (All)
Education	7.05	7.51	-0.46	66.1	63.7	3.7	49,220
Visual and performing arts, and communications	2.84	3.73	-0.89	78.6	72.8	7.4	34,655
Humanities	3.58	5.6	-2.02	72.9	67.8	6.9	42,404
Social and behavioural sciences and law	9.7	10.13	-0.43	79.3	74.6	5.9	51,451
Business, management and public administration	20.18	21.57	-1.39	77.1	72.9	5.5	52,392
Physical and life sciences and technologies	1.51	3.81	-2.30	75.6	70.7	6.5	52,943
Mathematics, computer and information sciences	2.78	4.1	-1.32	83.3	78.4	5.9	52,571
Architecture, engineering, and related technologies	23.01	21.53	1.48	77.2	72.2	6.5	54,569
Agriculture, natural resources and conservation	2.74	2.19	0.55	80.4	75.4	6.2	45,415
Health and related fields	15.16	13.89	1.27	73.9	70.5	4.7	48,515
Personal, protective and transportation services	11.42	5.94	5.48	76.9	71.3	7.3	36,340
Other	0.04	0.02	0.02	76.9	70.2	8.7	37,755
All fields of Study	100.00	100.00	0.00	66.0	60.9	7.8	49,673

Source: National Household Survey, 2011

Are Aboriginal individuals more likely to study subjects with higher unemployment rates and lower incomes? The shares of the Aboriginal and non-Aboriginal population by field of study are not all that different in many fields. Aboriginal people seem to be more likely to enrol in programs specializing in "agriculture, natural resources and conservation" (15 per cent more likely), "architecture, engineering, and related technologies" (7 per cent more likely), "health and related fields" (9 per cent more likely) and "personal, protective, and transportation services" (92 per cent more likely). These programs have above average unemployment and below average incomes. Aboriginal people are much less likely to have studied "visual and performing arts, and communication technologies" (24 per cent less likely), "humanities" (36 per cent less likely) and the natural sciences (38 per cent less likely for math and 60 per cent less likely for the physical and life sciences). Mathematics and science are some of the best fields in terms of the labour market, but the humanities and "visual and performing arts, and communications technologies" are some of the worst. Major choice is not obviously leading to worse labour market outcomes for the Aboriginal population.

A simple exercise may provide a clearer idea of the consequences of educational specialization on the labour market outcomes of Aboriginal people with postsecondary education. Suppose that choice of major perfectly determines labour market outcomes and that

these outcomes are equal to the averages of the total population in that major. If this was the case, we could calculate the expected outcome by Aboriginal identity based upon the distribution of the Aboriginal identity group across the different majors.

An example should clarify the nature of the exercise. Suppose that there are only two majors: call them Arts and Science. Suppose that the average income of all workers in Arts is $50,000 per year, while in science it is $100,000 per year. Further, assume that the distribution of Aboriginal people across majors is 50 per cent in Arts and 50 per cent in Science while the distribution of non-Aboriginal people in Arts is 75 per cent and only 25 per cent in Science. To determine if the distribution across majors may be having a major effect on Aboriginal and non-Aboriginal incomes, we apply these two distributions to the average outcomes and see how big the predicted difference between Aboriginal and non-Aboriginal workers is. On average, Aboriginal workers would earn $0.5 * \$50{,}000 + 0.5 * \$100{,}000 = \$75{,}000$. Meanwhile, we expect the average outcome for a non-Aboriginal worker to be $0.75 * \$50{,}000 + 0.25 * \$100{,}000 = \$62{,}500$. In this case, major choice would explain a difference of $12,500. We apply the same methodology to real data with a larger set of fields of study.

This exercise is performed to calculate the expected outcomes for all Aboriginal people, Métis, Inuit, and non-Aboriginals. The results are presented in Table 26.

Table 26: Postsecondary Field of Study, Aboriginal Identity, and Labour Market Outcomes for the Population 15+, 2011

Outcome	Aboriginal	First Nations	Métis	Inuit	Non-Aboriginal
Participation Rate	76.2	76.2	76.2	76.3	76.2
Employment Rate	71.7	71.7	71.7	71.7	71.7
Unemployment Rate	5.88	5.88	5.87	6.01	5.84
Total Income (2010 $)	49,113	48,994	49,272	48,888	49,688

Source: Author's calculations using data from the 2011 National Household Survey

One can see that differences in choice of major from one group to another appear to make very little difference in terms of average participation rates and employment rates. The Inuit are choosing majors which seem to have slightly higher participation rates, but the difference is less than one fifth of a percentage point. There are some differences in terms of expected unemployment rates, but they are not huge. Given their fields of study, we would expect Inuit with postsecondary education to have an unemployment rate 0.17 percentage points higher than non-Aboriginals with the same level of education.

Major choice suggests that Aboriginal people would earn approximately $500 less than non-Aboriginal people. The Inuit would make slightly less, about $800 less than non-Aboriginal people. The biggest contributor to these differences in income due to major choice is the over-representation of the Aboriginal population in "personal, protective, and transportation services" (11.42 per cent of non-Aboriginal people compared to only 5.94 per cent of non-Aboriginal people). The average income for those who majored in this field is over $13,000 less than the average in all fields.

This crude exercise[44] suggests that choice of major does not explain much of the gap in terms of employment, unemployment, or participation rates, although it can explain part of the income gap. Of course, given that our analysis of field of study was restricted to only the portion of the population possessing a postsecondary education, this could only explain a limited portion of the gaps for the total population. Even if we had found that occupational choices had a large impact on labour market outcomes, this would not necessarily indicate that Aboriginal people are making bad choices. It may be that Aboriginal people choose to enter the fields which are more relevant to the local labour markets in which they are choosing to live.

A recent study by TD Economics (Fong and Gulati, 2013) uses a more detailed custom tabulation from the National Household Survey to analyze the fields of study and eventual fields of occupation of the Aboriginal and non-Aboriginal populations. This study found that much of the recent employment growth of the Aboriginal population with less than a university education was concentrated in the construction and resource extraction industries. While many of these jobs offer higher wages, the authors note that these industries have a history of boom-bust cycles which may make them less secure in the long term.

Among those with a university degree, Fong and Gulati find that Aboriginal people are overrepresented in the fields of health, education, and public administration. For example, 21.5 per cent of Aboriginal people living off-reserve with a university degree above the bachelor's level studied education compared to only 13.0 per cent of non-Aboriginal degree holders. Aboriginal degree holders are underrepresented in business and STEM (science, technology, engineering, and mathematics) fields.[45]

These degrees reflect the fields which Aboriginal university graduates later work in. Nearly two thirds of Aboriginal university graduates work for the public sector (healthcare, education, or public administration) compared to 42 per cent of non-Aboriginal graduates. This trend is even stronger on-reserve, where 85 per cent of Aboriginal university graduates are employed in these areas (Fong and Gulati, 2013). A concentration of the Aboriginal university graduates in education and healthcare may be a desirable given the challenges the Aboriginal

[44] A more rigorous attempt to understand the contribution of field choice to the gaps would use employment income rather than total income and would control for demographic differences (especially gender)

[45] If the reader is confused as to how this relates to the discussion earlier in this section, these are statements about university degree holders while the previous analysis of field of study was for all postsecondary credentials.

population faces in these areas. Concentration of work in these sectors may impact the incomes earned by the Aboriginal population relative to those of the non-Aboriginal population.

D. Others Sources of the Outcome Gaps

While education is a major factor underlying the poor economic and social outcomes of Aboriginal people relative to non-Aboriginal people, other factors will also account for some of the disparity. Some other potential sources of the gaps include differences in the age and gender composition of the population, geography, employer attitudes towards race, cultural factors, occupational preferences, and "vicious cycles" stemming from historical mistreatment. All of these other factors might negatively affect labour market outcomes directly, but also indirectly through their impact on education.

This subsection will be limited to the discussion of demographic factors, as these are attributes of the Aboriginal population which we have solid quantitative data on (from the National Household Survey) and are thus best able to control for. However, one should keep in mind that issues such as racism, fundamental differences between Aboriginal and non-Aboriginal peoples, and the presence of other social problems which may reduce the absolute magnitude of returns to schooling may potentially hinder Aboriginal people in the labour market.

The subsection will proceed as follows. First, the relationship between several demographic factors – namely place of residence, gender, age, and Aboriginal identity – and labour market outcomes[46] will be considered. After the links between these factors and the outcomes of interest are established, we will analyze how the Aboriginal and non-Aboriginal populations differ in terms of these characteristics and how Aboriginal demographics have changed over the past decade. The subsection will conclude with a discussion of the issue of ethnic mobility in order to try to clarify how this phenomenon affects comparisons of data on the Aboriginal population over time.

i. Province/Territory of Residence

Regional labour markets can vary dramatically. People can freely move across the country to find employment, but many have a preference to remain close to their friends and family. Current conditions in the local labour market can have a substantial effect on an individual's economic performance. The Atlantic Provinces are traditionally characterized by above average unemployment rates and below average incomes. The Western provinces are known to have lower unemployment rates and above average incomes. The Yukon and Northwest Territories have relatively high unemployment rates, high employment rates, and high wages. Some of these differences are the result of different industrial compositions. Provinces such as Quebec and Ontario are better known for manufacturing, the Atlantic Provinces are

[46] Demographic factors matter in a direct way for educational outcomes as well, although this relationship is not emphasized in the discussion.

better suited for fishing, and the Prairies have traditionally had large agricultural sectors. Differences in the education and skills of the local workforce or regional policies which encourage economic may also matter.

Table 27: Labour Market Outcomes of the Total Population (Aboriginal and Non-Aboriginal) Aged 15+ by Province / Territory, 2011

Province / Territory	Participation rate	Employment rate	Unemployment rate	Average employment income (2010)
Newfoundland and	59.4	50.7	14.6	36,127
Prince Edward Island	68.4	60.1	12.1	30,887
Nova Scotia	63.1	56.8	10.0	35,310
New Brunswick	63.5	56.5	11.0	34,549
Quebec	64.6	59.9	7.2	36,990
Ontario	65.5	60.1	8.3	43,833
Manitoba	67.3	63.1	6.2	37,579
Saskatchewan	69.2	65.1	5.9	40,730
Alberta	73.2	69.0	5.8	52,159
British Columbia	64.6	59.5	7.8	40,005
Yukon	77.3	69.7	9.8	45,182
Northwest Territories	75.4	66.8	11.4	56,184
Nunavut	63.4	52.1	17.9	46,071
Canada	66.0	60.9	7.8	40,650

Source: National Household Survey, 2011

Differences in the regional distribution of the Aboriginal and non-Aboriginal populations would be expected to lead to differences in aggregate economic outcomes (see Table 27). If a population was relatively concentrated in the Territories, we would expect that population to earn higher incomes on average, assuming that it was identical to the national population in every respect except for location.

ii. Urban/Rural

The size of the community in which one lives also matters. Urban areas tend to provide more economic opportunities than rural ones. Higher population density allows for greater economies of scale and economies of scope which raise productivity. Many businesses or infrastructure investments are not economically viable if the population is too low and dispersed. A larger number of people to share the burden allows for investment in expensive public goods such as schools and infrastructure.

Rural communities face significant challenges in terms of education. Rural children may choose to acquire less education because the returns to education are lower in rural areas. Many

rural communities have difficulty attracting and retaining high quality teaching staff. While smaller class sizes in some rural schools may benefit students, course selection and access to high quality communication and information technology are often limited in rural schools (Canadian Council of Learning, 2006).

Those living in rural areas may have a tendency to become less educated. Education may also impact an individual's choice of where to live. If there are fewer opportunities to use an advanced education in rural areas, individuals living in these areas who do receive such an education may face a strong incentive to migrate to larger centres where the rate of return on the education is potentially higher.

Table 28: Population Shares and Labour Market Statistics, Urban and Rural, 2011[47]

	Urban	Rural
Per cent Share of Total Population	85.9	14.1
Per cent Share of Aboriginal Population	58.3	41.7
Per cent Share of First Nations Population	53.4	46.6
Per cent Share of Métis Population	71.2	28.8
Per cent Share of Inuit Population	18.2	81.8
Per cent Share of Non-Aboriginal Population	87.2	12.8
Participation rate	66.9	60.5
Employment rate	61.9	54.7
Unemployment rate	7.52	9.53
Average Income in 2010	42,192	31,223

Note: For the purposes of this table, we are defining "urban" to be the population living in Census Metropolitan Areas (CMAs) or Census Agglomerations (CAs) which contain 10,000 or more people. Everyone who does not live in these large urban centres is categorized as "rural".

Source: Author`s calculations based on data from the 2011 National Household Survey. For the purposes of this table, "urban" consists of the population living in CMAs or census agglomerations of 10,000 or more people; "rural" is the remainder of the population.

Table 28 presents some information on labour market outcomes and population shares by Aboriginal identity in large urban centres and everywhere else (which we call "rural"). The average income in CMAs or census agglomerations of 10,000 or more people in 2010 was $42,192. This is considerably higher than the average income of $31,223 earned by people living

[47] Note that these labour market indicators are for the entire population, both Aboriginal and non-Aboriginal. One might be concerned about the causality – labour market outcomes might be worse in rural communities because such a large share of the Aboriginal population lives there, rather than Aboriginal outcomes being worse because so much of the population is rural. This turns out not to be a major concern. Only 4.26 per cent of the Canadian population identified as Aboriginal in 2011. As 14.1 per cent of 95.74 per cent (that is, 100 per cent minus 4.26) is still much greater than 41.7 per cent of 4.26 per cent, the Aboriginal population only has a small impact on the rural labour market outcomes reported here.

in smaller communities. Of course, prices are often higher in large urban centres too. People are also more likely to be in the labour force and to have a job in these larger communities.

iii. Gender

One should not expect that differences in gender should explain much of the gap between Aboriginal and non-Aboriginal people because the two groups have very similar gender ratios. Nonetheless, the gender gap in the labour market is well known and may explain a very small part of the difference. It may be more relevant in terms of understanding local differences rather than those at the national or provincial levels, although in most cases we expect gender ratios to have very little impact.

Table 29: Labour Market Outcomes of the Population Aged 15+ by Gender, Canada, 2011

Outcome	Educational Attainment	Men	Women
Median employment income (2010)	No certificate, diploma or degree	38,095	27,416
	High school diploma or equivalent	43,969	35,377
	Postsecondary certificate, diploma or degree	60,200	47,131
Participation rate	No certificate, diploma or degree	47.4	31.1
	High school diploma or equivalent	72.5	59.1
	Postsecondary certificate, diploma or degree	78.5	73.9
Employment rate	No certificate, diploma or degree	40.8	26.8
	High school diploma or equivalent	65.5	53.6
	Postsecondary certificate, diploma or degree	73.8	69.6
Unemployment rate	No certificate, diploma or degree	13.9	13.8
	High school diploma or equivalent	9.7	9.3
	Postsecondary certificate, diploma or degree	6.0	5.7

Source: National Household Survey, 2011

Men earned considerably more than women with the same level of education in 2011 (see Table 29). They were also far more likely to participate in the labour force and, consequently, far more likely to be employed. The differences in terms of labour force participation and employment rates are much greater for those who do not have postsecondary education. For

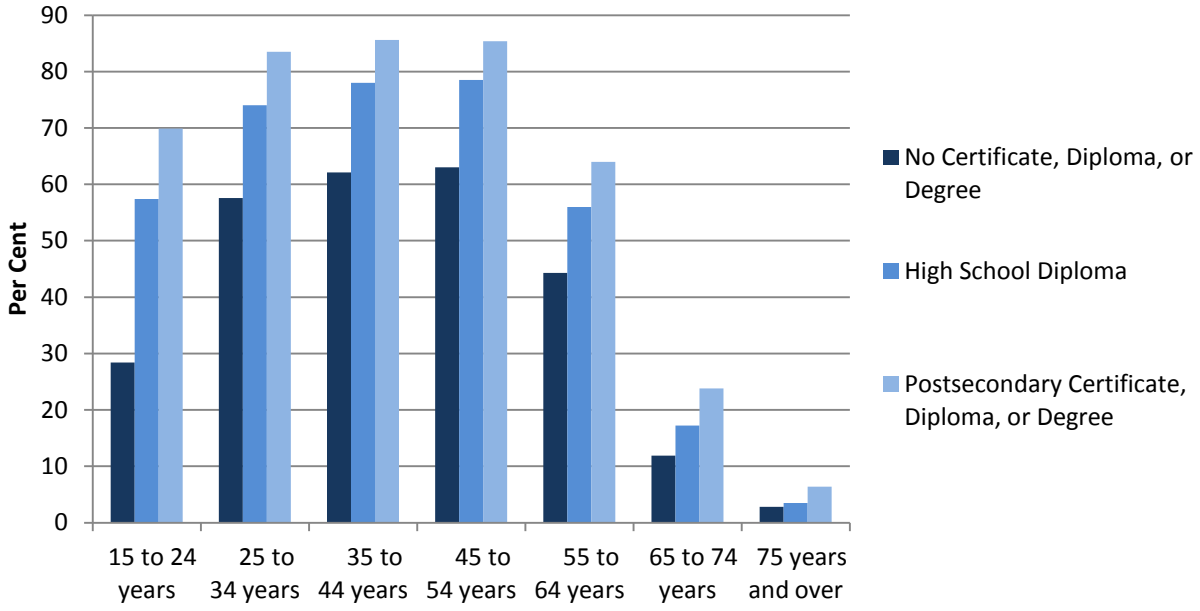
those with a postsecondary education, the male participation rate is 78.5 per cent compared to a female rate of 73.9 per cent. The difference is far greater for women with only a high school degree. They have a participation rate of just 59.1 per cent compared to a rate of 72.5 per cent for men with the same education.

Interestingly, unemployment rates are very similar for both sexes. In fact, conditional on education, women had slightly lower unemployment rates than men in 2011. However, one should bear in mind that far more women are choosing not to participate in the labour market compared to men – these women may also be the ones with worse employment prospects.

iv. Age

A younger Aboriginal population could potentially explain part of the labour market outcome gaps. As workers age, they accumulate experience and skills which make them more valuable to employers. As they near retirement age, many people choose to leave the workforce because they have accumulated sufficient wealth, become eligible for pensions, or develop physical or mental problems which make working difficult.

Chart 11: Employment Rate in Canada by Age and Education, 2011



Source: National Household Survey, 2011

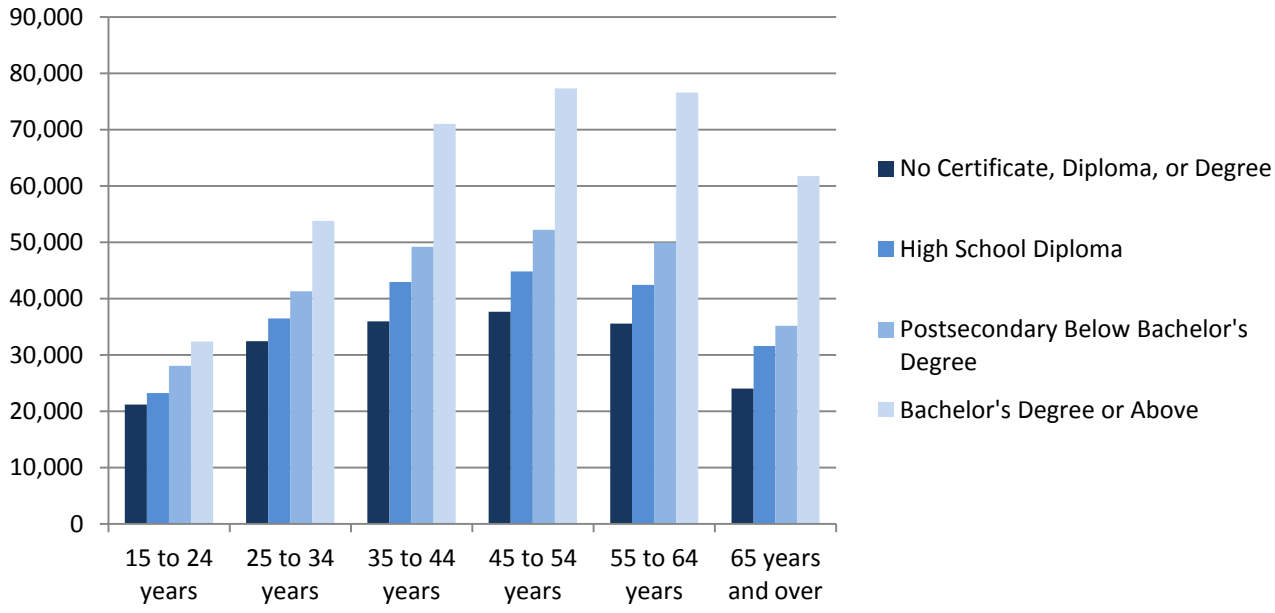
The general trends are similar for workers for all levels of education. Chart 11 shows that employment rates are considerably lower for those aged 15 to 24 – many of these individuals will still be in school. Employment rates are fairly steady, rising slightly with age, between the ages of 25 and 54. Once workers are above 55, employment begins to taper off. Those with more

education are always more likely to be working, but employment rates of the population over 64 fall below 25 per cent even for those with a postsecondary degree.

Employment incomes of full-year full-time workers follow similar trends. Incomes for all levels of education rise with age. The differences between 10 year age groups from 15 to 44 are substantial. Incomes continue to rise at a slower pace for those 45-54, but fall slightly for those 55-64. Those who continue to work after 64 earn considerably less. This might reflect deterioration of skills with advanced age. Another explanation is that those with high incomes earlier in life are more likely to have accumulated enough wealth to retire, while those who earn less choose to continue working to support themselves in old age.

One striking feature of Chart 12 is how much more those with a university degree at the bachelor's level or above make compared to those with less education within most age categories. The differences across age categories are substantial, but the differences arising from education are often larger. For example, the difference in the average earnings of someone aged 35-44 with a bachelor's degree and another person aged 35-44 with a high school diploma is greater than the difference between someone aged 35-44 with a high school diploma and a youth aged 15 to 24 with the same level of education.

Chart 12: Average Annual Employment Income of Full-Year Full-Time Workers in Canada by Age and Education, 2010



Source: National Household Survey, 2011

v. Aboriginal Identity

Changes in the composition of the Aboriginal population over time may explain some changes in the education and labour market gaps. Subsections A, B, and C showed evidence that the gaps tend to be much smaller for the Métis population compared to the First Nations and the Inuit.

vi. Demographics of Aboriginal Canadians

Now that the relationship between various demographic factors and labour market outcomes have been established, it is time to consider the demographics of the Aboriginal population and how they may contribute to the outcome gaps. Table 30 contains information on the geographic, sex, age, identity, and on/off-reserve distributions of the Aboriginal and non-Aboriginal populations (where applicable) in 2001, 2006, and 2011. This table is useful for understanding how demographic differences may be relevant for the gaps. Table 31 presents the same information in levels, along with the population growth rates and growth shares between 2001 and 2011. This table is useful for understanding how demographic changes may have impacted the gap over time.

Ontario has more Aboriginal people than any other province or territory in Canada. Most Aboriginal people live in Ontario (22 per cent), British Columbia (17 per cent), Alberta (15 per cent), Manitoba (15 per cent), Saskatchewan (11 per cent), or Quebec (10 per cent). Compared to the general population, Aboriginal people are overrepresented in the Territories and the western provinces and underrepresented in Ontario and Quebec – only about one-third the Aboriginal identity population lived in Ontario and Quebec in 2011, while nearly two-thirds of the non-Aboriginal population lived in these provinces. Given the relatively strong economic performance of the western provinces in recent times, one might expect the Aboriginal population would have an economic advantage nationally, but the Prairies and the Territories are also the regions which tend to have some of the largest gaps.

The number of people reporting an Aboriginal identity has increased by 43.5 per cent between 2001 and 2011. Since the number of non-Aboriginal people only increased by 9.7 per cent over the same period, Aboriginal people are becoming a larger segment of the Canadian population. Over four (4.26) per cent of Canadians had an Aboriginal identity in 2011 compared to just 3.3 per cent in 2001.

This population growth has varied across the provinces. The number of people reporting an Aboriginal identity grew fastest in Newfoundland and Labrador (90.6 per cent), Nova Scotia (98.9 per cent), Quebec (78.7 per cent), Prince Edward Island (65.8 per cent), and Ontario (60.1 per cent). The Aboriginal population grew slowest in the Territories and Saskatchewan, all of which only witnessed increases of 22 per cent or less. Five provinces (Quebec, Ontario, Manitoba, Alberta, and British Columbia) accounted for 82 per cent of the increase in the Aboriginal identity population.

Table 30: Characteristics of Aboriginal and Non-Aboriginal Total Populations, 2001, 2006, 2011

Characteristic		Share of Aboriginal Population (%)			Share of Non-Aboriginal Population (%)		
		2001	2006	2011	2001	2006	2011
	Newfoundland and Labrador	1.92	2.00	2.56	1.71	1.59	1.50
	Prince Edward Island	0.14	0.15	0.16	0.46	0.44	0.43
	Nova Scotia	1.74	2.06	2.42	3.07	2.92	2.77
	New Brunswick	1.74	1.51	1.61	2.45	2.33	2.27
Province/Territory of Residence	Quebec	8.13	9.25	10.13	24.58	24.37	24.13
	Ontario	19.29	20.68	21.52	38.72	39.20	39.27
	Manitoba	15.37	14.96	13.99	3.33	3.19	3.11
	Saskatchewan	13.33	12.10	11.26	2.91	2.70	2.71
	Alberta	16.00	16.06	15.76	9.72	10.20	10.64
	British Columbia	17.42	16.72	16.58	12.90	12.90	13.01
	Yukon Territory	0.67	0.65	0.55	0.08	0.08	0.08
	Northwest Territories	1.92	1.76	1.51	0.06	0.07	0.06
	Nunavut	2.33	2.12	1.95	0.01	0.01	0.01
Sex	Male	48.83	48.78	48.70	49.15	49.07	49.22
	Female	51.17	51.22	51.30	50.85	50.93	50.78
	Under 15	33.18	29.75	27.99	18.89	17.39	16.54
	15 to 24	17.32	18.08	18.17	13.32	13.29	12.94
	25 to 34	15.22	13.78	13.38	13.34	12.72	13.06
Age	35 to 44	14.94	14.45	12.84	17.19	15.38	13.61
	45 to 54	9.87	12.22	13.23	14.99	15.99	16.23
	55 to 64	5.41	6.91	8.49	9.75	11.87	13.42
	65+	4.06	4.81	5.90	12.51	13.36	14.21
	15 to 64	62.75	65.44	66.10	68.60	69.25	69.26
	First Nations	62.36	59.52	60.80	-	-	-
Identity	Métis	29.94	33.24	32.26	-	-	-
	Inuit	4.62	4.30	4.24	-	-	-
Area of Residence	On-Reserve	29.30	26.30	23.19	-	-	-
	Off-Reserve	70.70	73.70	76.81	-	-	-
Registered Indian Status	Registered Status	57.17	53.19	49.80	-	-	-
	Non-Registered Status	42.83	46.81	50.20	-	-	-

Source: 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

Table 31: Population Growth by Selected Characteristics, 2001-2011

	Aboriginal					Non-Aboriginal				
Characteristic	2001	2006	2011	Growth Rate 2001-2011 (%)	Share of Population Growth (%)	2001	2006	2011	Growth Rate 2001-2011 (%)	Share of Population Growth (%)
Canada	976,305	1,172,790	1,400,685	43.47	100.00	28,662,725	30,068,240	31,451,635	9.73	100.00
Newfoundland and	18,780	23,450	35,800	90.63	4.01	489,300	477,155	471,470	-3.64	-0.64
Prince Edward Island	1,345	1,730	2,230	65.80	0.21	132,040	132,475	135,145	2.35	0.11
Nova Scotia	17,015	24,175	33,845	98.91	3.97	880,555	878,915	872,325	-0.93	-0.3.0
New Brunswick	16,990	17,655	22,620	33.14	1.33	702,725	701,995	713,215	1.49	0.38
Quebec	79,400	108,430	141,915	78.73	14.73	7,046,180	7,327,475	7,590,610	7.73	19.52
Ontario	188,315	242,495	301,430	60.07	26.65	11,097,235	11,786,405	12,350,365	11.29	44.93
Manitoba	150,040	175,395	195,895	30.56	10.81	953,655	958,120	978,450	2.60	0.89
Saskatchewan	130,190	141,890	157,740	21.16	6.49	832,960	811,960	851,020	2.17	0.65
Alberta	156,220	188,365	220,695	41.27	15.19	2,784,930	3,067,990	3,347,280	20.19	20.16
British Columbia	170,025	196,075	232,290	36.62	14.67	3,698,850	3,878,310	4,092,170	10.63	14.1
Yukon Territory	6,540	7,580	7,710	17.89	0.28	21,975	22,610	25,615	16.56	0.13
Northwest Territories	18,725	20,635	21,160	13.00	0.57	18,375	20,420	19,640	6.88	0.05
Nunavut	22,720	24,920	27,360	20.42	1.09	3,945	4,410	4,335	9.89	0.01
Male	476,700	572,095	682,190	43.11	48.42	14,087,575	14,754,175	15,480,925	9.89	49.96
Female	499,605	600,695	718,500	43.81	51.58	14,575,150	15,314,065	15,970,710	9.57	50.04
Under 15	323,955	348,890	392,105	21.04	16.06	5,413,715	5,227,905	5,200,700	-3.93	-7.64
15 to 24	169,065	212,005	254,520	50.55	20.14	3,819,135	3,995,805	4,069,555	6.56	8.98
25 to 34	148,550	161,575	187,350	26.12	9.14	3,824,535	3,825,500	4,106,600	7.38	10.11
35 to 44	145,855	169,465	179,795	23.27	8.00	4,928,235	4,624,630	4,281,640	-13.12	-23.18
45 to 54	96,370	143,285	185,275	92.25	20.95	4,296,810	4,808,125	5,104,285	18.79	28.95
55 to 64	52,830	81,095	118,960	125.18	15.58	2,795,125	3,568,435	4,220,020	50.98	51.09
65+	39,680	56,460	82,685	108.38	10.13	3,585,170	4,017,830	4,468,850	24.65	31.69
15 to 64	612,670	767,425	925,900	51.13	73.81	19,663,840	20,822,495	21,782,100	10.77	75.95
First Nations	608,850	698,025	851,560	39.86	57.19	-	-	-	-	-
Métis	292,305	389,780	451,795	54.56	37.58	-	-	-	-	-
Inuit	45,075	50,480	59,440	31.87	3.38	-	-	-	-	-
On-Reserve	286,080	308,490	324,780	13.53	9.12	-	-	-	-	-
Off-Reserve	690,225	864,300	1,075,910	55.88	90.88	-	-	-	-	-
Registered Indian Status	558,175	623,780	697,505	24.96	32.83	-	-	-	-	-
Non-Registered Indian Status	418,135	549,005	703,180	68.17	67.17	-	-	-	-	-

Source: 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

The urban-rural difference is likely quite important for explaining the gaps between the Aboriginal and non-Aboriginal populations. Eighty-seven per cent of non-Aboriginal people lived in urban areas in 2011 compared to only 58 per cent of Aboriginal people.[48] As discussed above, those living in rural communities tend to have worse labour market outcomes than those in larger urban centres.

Related to the urban-rural divide is the fact that many First Nations people continue to live on-reserves, some of which are well-known for their poor living conditions and lack of economic opportunity. In 2011, 23 per cent of the Aboriginal population who were accounted for by the National Household Survey lived on-reserve. The vast majority of these on-reserve Aboriginal people are Registered Indians (97.3 per cent).

Relatively slow population growth on-reserve may account for some of the progress on the gaps.[49] The Aboriginal population increased by 13.5 per cent on-reserve and 55.9 per cent off-reserve from 2001 to 2011. As a result, the share of Aboriginal people living on-reserve fell from 29.3 per cent in 2001 to 23.2 per cent in 2011. Most of the Aboriginal population living on-reserve identify as First Nations. Of the 851,560 First Nations people living in Canada in 2011, 320,030 lived on-reserve (about 37.6 per cent). Only 3,185 Métis and 215 Inuit people lived on-reserve at the same time.

As one might expect, the ratio of men to women is very close to 1 for both the Aboriginal and non-Aboriginal populations. Aboriginal people are slightly more likely to be women than non-Aboriginal people – 51.3 per cent of the Aboriginal population are female compared to 50.8 per cent of the non-Aboriginal population. The population growth rate was also marginally higher for women between 2001 and 2011. Gender composition is likely an insignificant source of Aboriginal labour market gaps in Canada.

Of greater importance is the age distribution. The Aboriginal population is very young. About 28.0 per cent of Aboriginal people were under the age of 15 in 2001 compared to 16.5 per cent of non-Aboriginal people. For both groups the share of the population in this age category has been falling since 201l. About one third of the Aboriginal population was below the age of 15 in 2011.

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[48] Based on the figures we presented in Table 28 which were generated defining "urban" as the population living in CMAs or Census Agglomerations with a population of 10,000 or more.

[49] A large part of the relatively slow growth on-reserve can be attributed to either intragenerational mobility or net migration out of reserves. The population of those aged 15 to 64 off-reserve in 2011 was 1.35 times greater than the population aged 5 to 54 off-reserve in 2001. The comparable growth factor on-reserve was only 0.89. This suggests that a large portion of the difference is due to migration or changes to Aboriginal status rather than natural increases. This is consistent with recent projections produced by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada which indicate that population growth will be stronger on than off-reserve unless intragenerational ethnic mobility persists

The fraction of the population of working age below the retirement age, those 15 to 64, is not so different across the two groups (66.1 per cent vs. 69.3 per cent), but the Aboriginal working age population is younger which we have seen is associated with lower employment incomes and employment rates. Of course, there are also far more non-Aboriginal people above the age of 65 who are less likely to be working and earn lower wages if they do which makes it difficult to discern the overall impact of the age distribution on the labour market gaps.

What is clear is that, in the coming decades, Aboriginal people will make up an increasingly large share of the working age population which means that closing the gap will become increasingly important for Canada's aggregate economic performance. The Aboriginal population age 15-64 increased by 51.1 per cent since 2001, while the non-Aboriginal population aged 15-64 only increased by 10.8 per cent.

The overall effects on the gaps are less clear when one looks at how population growth was spread across the age distribution. Those aged 15 to 24 accounted for 20.1 per cent of the growth of the Aboriginal population compared to 9.0 per cent for the non-Aboriginal population. As many people at this age are still in school, this likely increased the participation, employment rate, and educational attainment gaps. As younger people earn less if they are working, this likely also lowered earnings. However, much more of the population growth occurred for Aboriginal people aged between 25 and 54, which should have improved the gap. Moreover, 82.8 per cent of the non-Aboriginal population growth was amongst the population aged 55 and above compared to just 25.7 per cent of Aboriginal population growth. These are the people who start to have much lower employment rates and diminishing incomes.

Overall, changes in the population age likely acted to raise the educational attainment gap slightly while decreasing the size of the employment and participation rate gaps. The overall effect of changes in the population age distributions on the unemployment rate and income gaps is less clear.

Just over 60 per cent of Aboriginal people in Canada identify as being First Nations. The Métis make up 32.3 per cent, while the Inuit comprise just 4.2 per cent[50]. The Métis are becoming an increasingly large portion of the Aboriginal population over time (32.3 per cent in 2011 compared to 30.0 per cent in 2001). This contributes to closing education and outcome gaps for the Aboriginal population because the gaps are smaller for the Métis than for the First Nations or Inuit.

[50] These numbers do not add up to 100 per cent because they only include those who reported a single Aboriginal identity – those who reported other or multiple Aboriginal identities make up the remainder.

vii. Ethnic Mobility

Earlier, we noted that some individuals have changed their reported Aboriginal identity over time. These changes could potentially account for some of the observed improvement in Aboriginal labour market performance and education relative to that of non-Aboriginal people. Aboriginal birth rates are higher than average, but population growth of 43 per cent over a decade seems very high. A substantial amount of this growth is the result of intragenerational and intergenerational ethnic mobility. [51]

To obtain a sense of the number of individuals changing their Aboriginal identity, we can look at changes to the population by age category. Barring immigration, changes to reported identity, or increased census coverage, the Canadian population with an Aboriginal identity aged 15 to 24 in 2001 should be higher than the Canadian population aged 25 to 34 in 2011 because some of the people in the former group would have died and people who were born over the decade will be no older than 10. We assume that the number of Aboriginal people who leave Canada is small enough that immigration will have a negligible effect.[52] We also assume that the share of the Aboriginal population included in the Census has not been increasing significantly over time.[53] If this is the case, then any positive population growth within an age cohort indicates that people are changing their identities. Table 32 presents population growth factors by age group in 2001. Those older than 64 in 2011 are excluded because death rates become much higher and can offset intragenerational mobility once the population becomes old enough.

Growth factors above 1 are indicative of changing identities. One can see that at least 11 per cent to 27 per cent of growth in several age groups was the result of ethnic mobility. Those aged 0 to 4[54] and 25 to 54 in 2001 seem to have been especially likely to have changed their identities. Unfortunately, we cannot match these individuals across censuses, so we do not know exactly how they affect the Aboriginal labour market and education gaps, but looking at growth in age cohorts by observable characteristics can provide some insight into whom these people are. For example, the fact that those between 25 and 54 in 2001 are most likely to have adopted an Aboriginal identity in 2011 suggests that intragenerational ethnic mobility raised Aboriginal employment incomes because these are the three age groups associated with the highest earnings.

The breakdown by Aboriginal identity can be informative, assuming that changes from one Aboriginal identity to another Aboriginal identity is uncommon. The Inuit growth factors are very close to 1, except for the youngest category, suggesting that few people adopted an Inuit

[51] For example, see Caron-Malenfant et al. (2014)
[52] This assumption would probably not be valid for the non-Aboriginal population. Consequently, we do not construct cohort specific growth factors for the non-Aboriginal population as a benchmark because comparison would be difficult.
[53] For example, this may be an issue if several large reservations which were incompletely enumerated in 2001 were completely enumerated in 2011.
[54] Of course, for those aged 0 to 4, the parents will be the ones who changed the reported identity of the children.

identity between 2001 and 2011.[55] The First Nations and Métis growth factors are much higher. The First Nations growth factors range from 1.08 to 1.22 while those of the Métis range from 1.20 up to 1.45. The values suggest that ethnic mobility is slightly more than twice as common amongst the Métis population. Ethnic mobility likely accounts for some of the improvement in Aboriginal outcomes over time because it increases the share of the Métis in the total Aboriginal population and the Métis tend to face smaller gaps.[56]

Table 32: Who is Changing Aboriginal Identity? Population Growth Factors by Cohort and Select Characteristics, 2001-2011

	Age of Cohort in 2001	0 to 4	5 to 14	15 to 24	25 to 34	35 to 44	45 to 54
Growth Factor of Cohort, 2001-2011	Aboriginal Population	1.27	1.15	1.11	1.21	1.27	1.23
	First Nations	1.22	1.09	1.08	1.17	1.20	1.15
	Métis	1.45	1.35	1.20	1.34	1.45	1.40
	Inuit	1.11	1.01	1.00	1.02	1.04	1.03
	Aboriginal Men	1.29	1.15	1.05	1.19	1.27	1.23
	Aboriginal Women	1.25	1.15	1.17	1.23	1.27	1.24

Note: Age cohorts are defined based upon age in the year 2001. For example, values for the age 15-24 cohort provide the ratio of those aged 15-24 in 2001 to those aged 25-34 in 2011. As a result of deaths and emigration, we would expect the values to be below unity in the absence of ethnic mobility.
Source: Author's calculations using data from the 2001 Canadian Census and the 2011 National Household Survey

Breaking the population down by gender, one sees that men and women have similar levels of ethnic mobility for most age groups. The most notable exception is that women between the ages of 15 and 24 in 2001 were much more likely than men to adopt an Aboriginal identity. This may partly explain why the population growth rate of Aboriginal males was slightly lower than that of females between 2001 and 2011.

[55] Using the public use microdata files, we can break the population into 5 year age groups and consider how ethnic mobility was spread over the decade. Consider the total Aboriginal population aged 15-54 in 2001. It grew by a factor of about 1.18 between 2001 and 2006 (based on the population aged 20-59 in 2006). Intragenerational mobility seems to have slowed in the second sub-period, as this same population only grew by a factor of about 1.04 between 2006 and 2011.

[56] We perform some crude back of the envelope calculations to obtain a ballpark estimate for the potential size of this effect. Using the 2011 labour force outcomes by Aboriginal identity reported earlier in this report, we compared the average outcomes of single response First Nations, Métis, and Inuit people aged 25-64 based upon their population shares in the 2011 NHS PUMF to the average outcomes of these groups aged 15-54 in the 2001 census PUMF. We find that the Métis population in this cohort increased from 31 per cent to 37 per cent from 2001 to 2011. We estimate that this change in composition due to intragenerational mobility (assuming constant immigration and death rates across identities) raised the national Aboriginal participation rate by 0.60 percentage points, employment rate by 0.86 percentage points, the unemployment rate by -0.46 percentage points, and employment income by $274. These observed improvements can account for roughly 200 per cent, 26 per cent, 10 per cent, and 14 per cent of the progress on closing the respective absolute gaps nationally between 2001 and 2011.

IV. Estimating the Gains from Closing the Gap

Now that we have a sense of the scale of the education and labour market gaps, how they have been changing over time, and the demographic characteristics of the Aboriginal population, we attempt to estimate the economic benefits which may be generated if the educational attainment gap between Aboriginal and non-Aboriginal Canadians is closed. The core assumption of this section is that the observed relationship between education and labour market outcomes conditional on demographic factors is causal so that a higher level of educational attainment will result in an individual achieving the same labour market outcomes on average as those observed in similar individuals already possessing that higher level of education.[57] Under this assumption, we can estimate the gains from eliminating the gap by comparing a situation with the anticipated education gap to another hypothetical situation in which there is a reduced gap.

To perform the estimation, we need to decide upon an appropriate baseline for comparison. The natural choice might be to compare observed outcomes today (a baseline) to a counterfactual scenario which is identical to today except that Aboriginal education levels are as high as the observed non-Aboriginal education levels (a counterfactual). This is not the primary approach we take. While it is convenient to be able to compare current outcomes to a counterfactual, this is not as relevant for policy because the observed outcomes have already occurred – there is no policy which can make the counterfactual a reality. Although we do present a retrospective estimate of the costs of failing to close the education gap between 2001 and 2011, we focus most of our efforts on a forward looking exercise. We estimate the economic benefits of closing the Aboriginal education gap by 2031 in hopes that quantifying the potential gains will encourage policymakers to take action. Our assessment focuses not on the gains from closing the existing gap in 2011, but rather from closing the gap which we expect to exist in 2031 given trends of increasing Aboriginal and non-Aboriginal educational attainment.

The difficulty with this approach is that we need to project education and labour market outcomes and their influence on macroeconomic performance. To do this, we rely upon projections of the future Aboriginal population and economic conditions produced by other researchers.

[57] One specific concern is supply side effects in the labour market. If there are more people available with university degrees, we would expect the wages received by these individuals to fall in equilibrium. Given that the Aboriginal population is only a small part of the total population, we expect that such effects would be limited.

The Meaning of the Educational Attainment Gap

It is important to be clear on what is meant when this report discusses closing the educational attainment gap

The educational attainment gap is not just a difference between the Aboriginal and non-Aboriginal populations in terms of our summary measure of the average years of schooling attended. Rather, it is the difference between the distributions of the Aboriginal and non-Aboriginal populations over various academic credentials marking the highest level of education achieved. This means that it is not one gap, but a series of gaps – one gap for the share of the population in each educational attainment category.

Closing the educational attainment gap means that the share of an Aboriginal population in each educational attainment category will be the same as that of a similar non-Aboriginal population within that category. For example, if 10 per cent of non-Aboriginal people in Nova Scotia have no certificate, diploma, or degree, then closing the educational attainment gap would mean that 10 per cent of Aboriginal people in Nova Scotia would also have no certificate, diploma, or degree.

In practice, we do not seek an identical educational attainment distribution for the Aboriginal and non-Aboriginal populations nationally. This is because the Aboriginal and non-Aboriginal populations differ in terms of their demographic and geographic composition. Instead, we seek to eliminate the gaps conditional upon demographics and geography so that the two populations would have an identical educational attainment distribution if they had an identical demographic and geographic composition.

A. Projections of Population and Economic Performance

i. Population Projections

In order to estimate the aggregate economic consequences of changing the education of a population, we need to have an estimate of how large that population will be. The primary source of projections of the Aboriginal population used in this project is "Population Projections by Aboriginal Identity in Canada, 2006 to 2031" (Malenfant and Morency, 2011) which provides projections of the Aboriginal population produced by Statistics Canada's Demosim Team based upon the population in 2006. These projections are produced using a micro-simulation model which simultaneously produces estimates of the Aboriginal and non-Aboriginal populations of Canada and takes into account a large number of variables over the course of the simulation such as marital status and education.[58]

[58] Education is relevant for population projections because, among other things, it is known to be related to fertility and mortality rates. A downside of relying on population projections externally generated by this sort of model is that the future population is determined in part by assumptions on the education of the Aboriginal population over 25 years used in the study. We will be using the same Aboriginal population projection in all our scenarios

Five different sets of projections are available as part of the study which rely on slightly different assumptions. The two major assumptions which vary are what happens to the fertility rate of the Aboriginal population and how much intragenerational ethnic mobility occurs. Accurately predicting what will happen to these variables is inherently very difficult. Four of the scenarios make the same assumptions on internal migration patterns and can be summarized as follows:

Table 33: Aboriginal Population Projection Scenarios

Scenario	Fertility	Intragenerational Ethnic Mobility
1	Constant	None
2	50 per cent convergence	None
3	Constant	Constant
4	50 per cent convergence	Constant

All four of these projection scenarios assumed that Aboriginal migration patterns within Canada would follow the trends observed in the 1996, 2001, and 2006 Censuses. Like scenario 1, the fifth scenario assumes constant fertility[59] and no intragenerational mobility, but its assumptions on internal migration differ in that it assumes there will be no net migration on-reserves. To avoid cluttering this document with too many different scenarios, we choose to focus on just one scenario from these projections, Scenario 1. While intragenerational ethnic mobility has been a major factor in Aboriginal population growth, it is not clear that this phenomenon can and will continue for the next twenty years. Even if it did, this would be somewhat problematic as those who changed to an Aboriginal identity may not have the same characteristics as the Aboriginal people we possess information on today. The focus of this study is on the benefits of closing the gap for those who considered themselves Aboriginal in 2011 and their children. Fertility rates are a tougher decision, but, because our focus is on the working age population, we really only care about fertility rates up to 2016. As this is in the relatively near future, constant fertility rates seem to be an appropriate choice. The appendix presents tables of projection populations by province/territory under Scenarios 1 through 4. Scenario 1 is the second most conservative with regards to the total Aboriginal population, predicting 1,734,000 Aboriginal people in Canada by 2031.

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regardless of what we assume will happen to the Aboriginal education gap. We do not account for how these educational changes may impact the population projections. In practice, we do not expect this to be a major issue for projections of the population 15+ which only extend 25 years into the future.

[59] The assumption is that fertility rates remain at the same level as observed in the 2006 Census for various subgroups of the Aboriginal population. In particular, the 2005/2006 fertility rate was about 2.7 children per Inuit woman, 2.4 children per First Nations woman, and 1.8 children per Métis woman. For more information on the assumptions underlying these projections, see http://www.statcan.gc.ca/pub/91-552-x/2011001/sce-eng.htm.

The following two tables present the populations in 2006 upon which the projections were based, populations from the 2011 National Household Survey, and the projected populations in 2031. Table 34 breaks the projections down by age while Table 35 shows expected growth by province and territory.

The projected Aboriginal population is much younger than the non-Aboriginal population. 22.5 per cent of Aboriginal people are projected to be under the age of 15 in 2031 compared to only 16.5 per cent of non-Aboriginal people. This projected population share of the young is expected to be much reduced from 28.9 per cent in 2006. At the same time, the share of the Aboriginal population above retirement age is expected to become much larger by 2031. The Aboriginal population aged 15-64 is predicted to see strong growth, increasing at an average compound annual rate of 1.01 per cent since 2006. The highest population growth rates compared to 2006 are projected for Nunavut, Alberta, and Saskatchewan. Newfoundland and Labrador is the only province in which the Aboriginal population is expected to decline. High population growth rates and a relatively young population mean that Aboriginal people will be more important for national and regional economies in 2031. Specific provinces will see big increases in their Aboriginal population shares. The share of the population which has an Aboriginal identity is expected to rise by 7.1 percentage points in Saskatchewan compared to 2006 and 2.9 percentage points in Manitoba.

Table 34: Aboriginal Population by Age, 2006, 2011, and 2031 (Projected Assuming Constant Fertility and No Ethnic Mobility)

Age Group	Population (thousands)			Projected Growth (%), 2006-2031	Share of Aboriginal Population		
	2006*	2011 (NHS)	2031 (Projected)		2006*	2011 (NHS)	2031 (Projected)
0 to 14 years	369.2	392.1	390.3	5.7	28.87	27.99	22.51
15 to 24 years	238.0	254.5	245.2	3.0	18.61	18.17	14.14
25 to 34 years	189.5	187.4	231.1	21.9	14.82	13.38	13.33
35 to 44 years	187.5	179.8	249.8	33.3	14.66	12.84	14.41
45 to 54 years	150.4	185.3	197.8	31.5	11.76	13.23	11.41
55 to 64 years	84.0	119.0	167.5	99.3	6.57	8.49	9.66
65 or more years	60.4	82.7	252.3	317.9	4.72	5.90	14.55
All Ages	1279.0	1400.7	1734.0	35.6	100.00	100.00	100.00

* 2006 values are as reported by Malenfant and Morency (2011). The 2006 values have been adjusted for undercoverage of the 2006 Census.

Source: 2011 National Household Survey and Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division

Comparing the 2011 numbers to the 2031 projections, one can see that some of the projections based upon 2006 data already appear likely to be inaccurate.[60] For example, the population share of Aboriginal people in Canada was projected to raise from 3.9 per cent in 2006 to 4.1 per cent in 2031, but it was already 4.3 per cent in 2011. Comparing the 2006 numbers upon which the projections were based to the values observed in 2011 can be a bit misleading. This is because the 2006 numbers upon which the projections are based have been adjusted upwards from the counts in the 2006 census to account for known undercoverage of the Aboriginal population on- and off-reserve, while we have made no such adjustments to the numbers from the 2011 PUMF.

Table 35: Aboriginal Identity Population by Province/Territory, 2006, 2011, and 2031 (Assuming Constant Fertility and No Ethnic Mobility)

	Thousands			Projected Growth (%), 2006-2031	Share of Population (%)		
	2006*	2011 (NHS)	2031		2006*	2011 (NHS)	2031
Newfoundland and Labrador	24	36	21	-12.5	4.7	7.1	4.8
Prince Edward Island	2	2	2	0.0	1.3	1.6	1.5
Nova Scotia	25	34	31	24.0	2.7	3.7	3.4
New Brunswick	18	23	19	5.6	2.4	3.1	2.7
Quebec	127	142	178	40.2	1.7	1.8	2.0
Ontario	268	301	348	29.9	2.1	2.4	2.0
Manitoba	188	196	257	36.7	15.9	16.7	18.8
Saskatchewan	153	158	227	48.4	15.4	15.6	22.5
Alberta	207	221	299	44.4	6.1	6.2	6.0
British Columbia	209	232	281	34.4	4.9	5.4	4.7
Yukon	8	8	8	0.0	25.5	23.1	21.9
Northwest Territories	23	21	25	8.7	52.3	51.9	51.9
Nunavut	26	27	39	50.0	84.8	86.3	85.9
Canada	1,279	1,401	1,734	35.6	3.9	4.3	4.1

* 2006 values are as reported by Malenfant and Morency (2011). The 2006 values have been adjusted for undercoverage of the 2006 Census

Source: 2011 National Household Survey and Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division

Nonetheless, one would expect that values which have been adjusted upwards would lead to a larger projected share of the Aboriginal population in the future than what was observed in

[60] Another example is Saskatchewan, where the observed and projected Aboriginal populations and population shares imply a very slow rate of growth in the non-Aboriginal population from about 993,000 in 2006 to 1,009,000 in 2011. This may seem inconsistent with Saskatchewan's recent surging population. However, the projections were made based off of 2006 data and the non-Aboriginal population in Saskatchewan had actually fallen between the 2001 and 2006 census. We do not attempt to adjust the projections based on changes in population growth rates observed since 2006.

2011. The projections do offer 5 year annual estimates – for 2011 the projected Aboriginal population was 1.373 million compared to the 1.4 million observed in the PUMF. Growth will be outpacing the projection in part because of continued intragenerational ethnic mobility between 2006 and 2011. Under scenario 3 (constant fertility and constant intergenerational mobility), for example, the Aboriginal population is projected to be 5.3 per cent in 2011. If the Aboriginal population growth outpaces that in the projections, then these projections will result in an understatement of the potential benefits of closing the gap.

We also use projections of the Aboriginal population on-reserve presented in Table 1 of "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada. This study uses the "cohort component method" to forecast 2031 Aboriginal populations based on data from 2006. We use the "medium growth" scenario from this study. This scenario assumes no intragenerational ethnic mobility, but it differs from our primary projection in that it has moderately declining fertility rates. We use these projections to separately estimate the economic value of eliminating the educational attainment gaps on and off-reserve, as our primary population projections do not break the total Aboriginal population down by reserve residence status. [61] To be consistent with the total size of the population in our other estimates, we only take the projected ratio of the on-reserve to off-reserve Aboriginal populations and apply it to our primary Aboriginal population estimates. This data source is also used in the same way in generating projections for the First Nations population by Registered Indian status.

ii. Projections of Wages, Productivity, and Economic Growth

In addition to the population in 2031, we need to have estimates of what economic activity will be like in the future. These are taken from a long term economic forecast by Peter Dungan and Steve Murphy of the Policy and Economic Analysis Program (PEAP) of University of Toronto's Rotman School of Management. These estimates are produced using a computer simulation of the FOCUS model of the Canadian economy developed by PEAP. The model consists of a large number of accounting identities and equations. The estimates are generated by applying a series of assumptions on variables such as technological progress, government spending, population growth, and economic performance in other countries. Table 36 presents the PEAP forecasts of a few relevant variables.

In order to estimate the benefits of closing the gap in the future, we need to have estimates for future real wages. These wage rates are assumed to reflect the productivity of each individual. We estimate future wage rates by taking observed wages from the 2011 National

[61] Our primary projections from Malenfant and Morency (2011) do, however, provide projections for the First Nations population on-reserve. As most of the Aboriginal population on-reserve has a First Nations identity, we probably could have used these projections as well. As it turns out, this choice does not have much impact on the results.

Household Survey, broken down by selected socio-economic characteristics, and assuming that they all grow at the same average rate between 2010 and 2031. We use annual projected wage growth rates from PEAP to calculate this projected cumulative real wage growth rate as about 41 per cent.[62]

Table 36: Policy and Economic Analysis Program (PEAP) Projections, 2011 and 2031

	2011	2031
GDP (billions, 2007 dollars)	1,633.6	2,511.6
Total Population	34,303	42,286
Growth Factor for Real Wages over 2010*	1.01	1.41
Unemployment Rate (%)	7.5	6.2
Labour Force Participation Rate (%)	66.8	63.1
Employment (thousands)	17,300	20,220
Labour Productivity (2007 dollars per worker)	94,426	124,211

* Employment income in the National Household Survey is reported for the year 2010, so 2010 is the relevant base year for wage growth in the PEAP
Source: Dungan and Murphy (2013), National Projections through 2040, Long Term Outlook for the Canadian Economy

The second reason that we use PEAP is to provide a baseline scenario with which to compare our estimates in order to say something about the impact economic growth rates in Canada. We assume that the PEAP projections represent the level of employment, real GDP, and labour productivity which will occur in Canada in 2031 if Aboriginal and non-Aboriginal educational attainment continue to improve at a similar pace to that observed between 2006 and 2011. We are then able to restrict our attention to projecting different scenarios for the Aboriginal population and adding the additional employment and output of Aboriginal people from closing the gap without worrying about finding projections of the non-Aboriginal population and estimating future non-Aboriginal contributions to GDP too. We believe that this is a reasonable approach, but it does rely on the assumption that the FOCUS model is based upon similar progress in educational attainment.

B. Methodology

The main exercise of this section is to estimate the total value of the potential benefits which could be realized if the Aboriginal population were to become as well educated as the non-Aboriginal population by 2031. To do so, we rely on a series of assumptions which will be outlined in the following pages. We begin with a high level explanation of the exercise to orient

[62] PEAP projects that real annual wage growth will settle down at about 1.6 per cent annually by about 2021. This growth rate is slightly higher than that of 1.5 per cent annually projected for labour productivity. This is a very high productivity growth rate to assume given that labour productivity growth, measured in terms of GDP per hour, between 2000 and 2013 for the total Canadian economy was only about 0.97 per cent annually (Aggregate Income and Productivity Trends: Canada vs. United States, 1961-2011, Table 4, Centre for the Study of Living Standards).

the reader before providing a more detailed explanation of the calculations. The approach closely follows that of Sharpe et al. (2007).

i. Overview of Exercise

We estimate the economic benefits generated if the Aboriginal population were to achieve the same educational outcomes as the non-Aboriginal population by the year 2031. This is done by making various combinations of assumptions about what will happen with regards to three gaps between Aboriginal and non-Aboriginal peoples:

1) Educational attainment
2) Employment rates conditional on education
3) Employment income conditional on education

The first gap is the one of primary interest, but convergence in terms of the other two gaps will affect the total gains from improving education. We refer to a set of assumptions regarding what happens to these three gaps as a "scenario".

Recognizing that the Aboriginal population differs from the non-Aboriginal population in terms of demographics and place of residence, we calculate outcomes for a series of "bins" based on age group, sex, and province or territory of residence. [63] Controlling for demographic and geographic differences between the two populations should produce more realistic estimates. For each scenario, we apply projected educational attainment, employment income, and employment rates based on data from the 2011 National Household Survey to the projected Aboriginal population in that bin in 2031 in order to estimate the contribution of the Aboriginal population in that bin to output and employment in 2031.[64] The total contribution of the Aboriginal population is calculated by summing over the contributions of all the bins. This approach allows for a very simple decomposition of the sources of the gains.

For each scenario, the benefits are estimated by considering the outcome relative to that of a baseline scenario in which the income and employment rate gaps remained the same as they were in 2011, while the educational attainment gap is assumed to have progressed based upon trends in Aboriginal and non-Aboriginal educational attainment observed between 2006 and

[63] The National Household Survey PUMF groups the three territories together in its variable reporting province or territory of residence. Consequently, most of our estimates also group the territories together. For brevity, we will typically only use the word "province" when discussing the province or territory in which a population lives with respect to the bins, but the reader should understand that this also includes the three territories (or their aggregate).
[64] We are taking a very simplistic approach to projecting future Aboriginal and non-Aboriginal labour market outcomes conditional upon education in 2031 – we are basically assuming that they will be the same as the outcomes observed in the 2011 NHS (with all wages increased based upon the PEAP forecast of national real wage growth). There are more sophisticated ways to forecast future labour market outcomes. For an overview of best practices in labour market forecasting which specifically considers the Canadian Aboriginal population, see Thomas (forthcoming).

2011. This means that our point of comparison is not the educational attainment gap observed in 2011 but rather a projected educational attainment gap in 2031 based upon the gap in 2011 and recent trends in rising educational attainment. The goal is thus not to raise Aboriginal education levels in 2011 to those of non-Aboriginal Canadians in 2011, but rather to raise projected Aboriginal education levels in 2031 to projected non-Aboriginal education levels.

It is assumed that the PEAP projections of output and employment in 2031 correspond to a situation in which the Aboriginal and non-Aboriginal education levels improve based upon trends from 2006 to 2011. The difference between Aboriginal contributions to output and employment between a scenario and the baseline is added to the PEAP projections in order to estimate Canadian GDP, employment, and productivity in 2031 under each scenario. This allows for a simple calculation of the implied improvements in average growth rates of GDP, employment, and productivity between 2011 and 2031 as a result of closing the gap. Under a further assumption that progress in closing the gap(s) is constant over the period, one can estimate the cumulative gains for the entire period 2011 to 2031.

Similar exercises are performed to estimate the economic gains from closing the gaps for those on- and off-reserve and by Aboriginal identity. Data limitations which decrease the precision of these estimates are discussed below.

ii. Defining the Scenarios

Choosing the appropriate assumptions regarding the extent to which the educational attainment and related gaps will close between 2011 and 2031 is critical for assessing the gains. Our projected outcomes are based upon an assumption that Aboriginal and non-Aboriginal incomes and employment rates conditional upon education in 2031 will be identical to those observed in 2011, except that incomes in 2011 are adjusted for projected real wage growth. The educational attainment distributions of the Aboriginal and non-Aboriginal populations in 2031 are constructed by applying trends in the distributions observed between the 2006 Census and the 2011 National Household Survey to the distributions observed in 2011. If the gaps were to close, the Aboriginal people in 2031 would have the same outcomes as those predicted for the non-Aboriginal population in 2031.

As the choice of assumptions can impact the results considerably, we opt to consider several different scenarios. For each gap under consideration, we consider two or three different assumptions about how much it closes. To be thorough, we produce results for all possible combinations of these assumptions, but for brevity we will limit the discussion of results to only a few of the scenarios which are most relevant.

The first gap which we must consider is that of educational attainment. The public use microdata files for the National Household Survey allow us to break the population down into 9 mutually exclusive levels of educational attainment. We will consider the gap to be closed if the distribution of Aboriginal people across these educational categories is identical to that of the

non-Aboriginal population.[65] We make three different assumptions about the extent to which the educational attainment gap closes: it does not change, it closes entirely, or it half closes. We define "half-closing" to be an education distribution which consists of the average of the Aboriginal and non-Aboriginal projected 2031 population shares in each education category. While the entire gap closing would generate larger benefits and is theoretically possible, we believe that it is unlikely to occur in practice. Aboriginal people aged 25-44 in 2011 will still be of working age in 2031 and are far behind the comparable non-Aboriginal population in terms of education. Given that most education occurs when the population is younger and there is a longer time horizon to earn a return on the investment, it is extremely unlikely that the gap will close from this group. It may be more realistic to consider a situation in which the gap only half closes.[66]

One natural benchmark scenario is to assume that the educational attainment gap continues to change at the same rate as it has in recent years.[67] In practice, forecasting future levels of educational attainment can be a difficult exercise, particularly for the Aboriginal population. Given the known impact of changes to the educational attainment questions on the long form Census in 2006, it would be unwise to incorporate trends between 2001 and 2006 using Census data. For this reason, we opt to make our educational attainment projections based upon only the 2006 to 2011 trends. However, the switch from the mandatory long form census to an optional National Household Survey raises further concerns about the validity of the trends between 2006 and 2011.[68] We have compared non-Aboriginal educational attainment trends from 2006 to 2011 over the same period from the labour force survey and found that they are similar to the trends in the 2011 National Household Survey Public Use Microdata File.

Predicting the educational attainment of the general population seventeen years in the future is a difficult task, but one which we feel is important for estimating the benefits of closing the educational attainment gap by 2031. While it seems unlikely that educational attainment

[65] The gap is closed within each age-sex-province bin. Compositional differences will still result in differences between the Aboriginal and non-Aboriginal educational attainment distributions nationally.

[66] One may wonder how closing the gap in the distribution relates to our summary measure of years of educational attainment. If there is no difference in the education distribution, then there is also no difference in years of educational attainment. Similarly, if the gaps in each educational attainment category are half closed, then Aboriginal years of educational attainment will be equal to the average of the Aboriginal and non-Aboriginal baseline projected years of educational attainment.

[67] An alternative approach is to assume that both Aboriginal and non-Aboriginal educational attainment levels remain unchanged between 2011 and 2031. This avoids the difficulties of projecting future educational attainment, but at the cost of assuming a future educational attainment distribution which is very likely incorrect. This was the approach adopted in Sharpe et al. (2007). An earlier version of the present report adopted the same approach. The major results under this alternative assumption about future educational attainment are presented in the appendix.

[68] An additional concern is that we are using a projection which assumes no intragenerational ethnic mobility between 2006 and 2031, but substantial intragenerational ethnic mobility between 2006 and 2011 likely played some role in the observed trends over the period. It is not entirely consistent to apply trends which are partly driven by ethnic mobility while also assuming that there is no additional ethnic mobility over the period.

among the non-Aboriginal population will continue to rise forever, there has been persistent progress over the past several decades.[69]

The approach we have taken in projecting the educational attainment distribution is quite simple.[70] For each educational attainment category under consideration, we have taken the growth rate of the share of the relevant national population in that category between 2006 and 2011 and assumed that this growth rate persists through 2031.

One problem with such an approach is that the resulting educational attainment shares will no longer sum to one hundred per cent by 2031, so a normalization must be applied to each share. For example, suppose there were two categories, call them educated and uneducated, and half the population of 200 was initially in each category in 2006 (100 and 100). Suppose that we observe a 10 per cent increase in the educated and a 10 per cent decrease in the uneducated by 2011 (90 and 110). If we applied the same rates of change from 2011 to 2016, we would get a distribution of 81 uneducated and 121 educated – the sum is 202. Thus we would renormalize the share of the population in each group by multiplying by (200/202) to restore the initial sum of 200 (80.20 and 119.80).

Another related issue is that small educational attainment categories may potentially have very large growth rates. Repeatedly applying these high growth rates over a 20 year period can potentially generate very questionable educational attainment distributions. This can be a substantial problem if we generate detailed educational attainment distributions of subsets of the population (some of which would have very small sample sizes) from the 2006 and 2011 PUMFs. For this reason, we only calculate growth rates of Aboriginal and non-Aboriginal educational attainment categories at the national level and apply these growth rates to the educational attainment distributions of the more specific subpopulations. The resulting aggregate educational attainment distributions will be presented along with the results.

The other two gaps which we consider are the employment rate and average employment income gaps conditional upon the educational attainment category. These are the differences between Aboriginal and non-Aboriginal outcomes which are not attributable to education, age, sex, or province of residence. Changes in either of these two gaps will alter the value of closing the educational attainment gap. To the extent that we believe improvements in the employment rate and income gaps between 2001 and 2011 reflect real improvements in outcomes for the Aboriginal population, it may be conceivable that these gaps could close in many educational

[69] White and Gordon (2013) project Aboriginal post-secondary education rates out to 2021. They conclude that both Aboriginal and non-Aboriginal post-secondary education rates will likely continue to rise with very little change in the gap.

[70] A more sophisticated approach would be to apply a multi-state, cohort component projection model such as the one used in Samir et al. (2010). Such an approach would look at the existing educational attainment of each age cohort in the population and estimate the future educational attainment of that cohort based upon past observations of transition rates from one level of educational attainment to another. The approach we adopt has the advantage of requiring less data and being easier to implement, but the projections are likely to be much less accurate.

attainment categories by 2031. The employment rate gap also seems to be shrinking for the less educated and actually tends to be negative for those with a university degree. For both these gaps, we apply two assumptions. Either the gap remains the same as in 2011 or it completely closes. Note that we are not imposing a restriction that the gap closing has to benefit the Aboriginal population, so the employment rate gap closing could actually hurt Aboriginal people with higher levels of education in our estimates.

Summary of Assumptions

a) The Educational Attainment Gap

1. **Projected 2031 gap unchanged:** The share of the Aboriginal population in each educational attainment category in 2031 is identical to the projected share of the Aboriginal population in that educational attainment category in 2031
2. **Half projected 2031 gap eliminated:** The share of the Aboriginal population in each educational attainment category in 2031 is equal to the average of the shares of the projected Aboriginal and non-Aboriginal populations in that educational attainment category in 2031
3. **Entire projected 2031 gap eliminated:** The share of the Aboriginal population in each educational attainment category in 2031 is identical to the projected share of the non-Aboriginal population in that educational attainment category in 2031

b) The Average Income Gap (Conditional on Education)

1. **2010 gap unchanged by 2031**: The average real income of an employed Aboriginal person with a given level of education in 2031 is assumed to equal that of an employed Aboriginal person with the same level of education in 2010, increased at the average rate of real wage growth predicted by the PEAP forecast
2. **Entire 2010 gap eliminated by 2031**: The average real income of an employed Aboriginal person with a given level of education in 2031 is assumed to equal that of an employed non-Aboriginal person with the same level of education in 2010, increased at the average rate of real wage growth predicted by the PEAP forecast

c) The Employment Rate Gap (Conditional on Education)

1. **2011 gap unchanged by 2031**: The employment rate of an Aboriginal person with a given level of education in 2031 is assumed equal to that of an Aboriginal person with the same level of education in 2011
2. **Entire 2011 gap eliminated by 2031**: The employment rate of an Aboriginal person with a given level of education in 2031 is assumed equal to that of a non-Aboriginal person with the same level of education in 2011

One might be concerned with the fact that we are assuming that achieving a higher level of education will cause an individual to achieve the same outcomes as other individuals with that level of education, even if we control for observable characteristics. This is likely not true in

reality. There are, of course, many factors which will affect labour market outcomes (recall section III.D), many of which are unobservable to us. If one takes the signaling role of education or selection into education seriously, there is good reason to suspect that some of those who choose not to receive as much education may not benefit as much from it as those who do. It is also fairly obvious that achieving universally high education will not generate high returns for the entire population. Many crucial jobs involve manual labour, and acquiring a university degree will likely not improve productivity substantially in many of these jobs. To the extent that education plays a signaling role, workers are overeducated for their positions, or supply side effects lower job-finding rates and wages in the market for skilled labour, or factors which are unobservable in our data lower the returns to Aboriginal education, we may overestimate the benefits.

Table 37: Summary of Scenarios

	Assumptions		
Scenario	Educational Attainment Gap	Average Employment Income Gap	Employment Rate Gap
Baseline (1)	Projected 2031 gap unchanged	Increase with average wage growth	Aboriginal employment rate 2011
2	Projected 2031 gap unchanged	Increase with average wage growth	non-Aboriginal employment rate 2011
3	Projected 2031 gap unchanged	Level of non-Aboriginal income in 2031	Aboriginal employment rate 2011
4	Projected 2031 gap unchanged	Level of non-Aboriginal income in 2031	non-Aboriginal employment rate 2011
5	Half projected 2031 gap eliminated	Increase with average wage growth	Aboriginal employment rate 2011
6	Half projected 2031 gap eliminated	Increase with average wage growth	non-Aboriginal employment rate 2011
7	Half projected 2031 gap eliminated	Level of non-Aboriginal income in 2031	Aboriginal employment rate 2011
8	Half projected 2031 gap eliminated	Level of non-Aboriginal income in 2031	non-Aboriginal employment rate 2011
9	Entire projected 2031 gap eliminated	Increase with average wage growth	Aboriginal employment rate 2011
10	Entire projected 2031 gap eliminated	Increase with average wage growth	non-Aboriginal employment rate 2011
11	Entire projected 2031 gap eliminated	Level of non-Aboriginal income in 2031	Aboriginal employment rate 2011
12	Entire projected 2031 gap eliminated	Level of non-Aboriginal income in 2031	non-Aboriginal employment rate 2011

There is a close relationship between this exercise and the shift share analysis earlier in this report which attempted to quantify the relative contributions of the educational attainment gap and the gaps conditional upon educational attainment in explaining the labour market outcome gaps. Scenario 9, under which the educational attainment gap closes while both gaps conditional upon educational attainment remain unchanged estimates the impact of closing the educational attainment gap on labour market outcomes (and implicitly the labour market

outcome gaps) when compared to the baseline scenario.[71] This scenario requires that upon achieving a higher level of educational attainment, an Aboriginal person will achieve the same labour market outcomes on average as the Aboriginal individuals already possessing that level of educational attainment in the baseline scenario.

Scenario 12 goes a step further and assumes that, in addition to eliminating the educational attainment gap, the employment income and employment rate gaps conditional upon education are also eliminated. Thus, this scenario makes the stronger assumption that upon achieving a higher level of educational attainment, an Aboriginal person will achieve the same labour market outcomes on average as the non-Aboriginal individuals already possessing that level of educational attainment in the baseline scenario. In this exercise, even scenario 12 does not completely eliminate the labour market outcome gaps because of demographic and geographic differences between the Aboriginal and non-Aboriginal populations which are controlled for.

iii. Controlling for Demographics and Geography

In order to produce more accurate estimates of the benefits from closing the educational attainment gap, we control for demographic and geographic differences between the Aboriginal and non-Aboriginal populations to the extent possible given the data and projections available. If it is not clear to the reader why this is a useful thing to do, consider the following example.

Rural Canadians tend to be less educated than urban Canadians – this is not necessarily undesirable, it may be more profitable to have higher levels of education in an urban environment. Aboriginal people are also more likely to live in rural communities than non-Aboriginal people. If the rural and urban Aboriginal populations achieved the same levels of educational attainment as the rural and urban non-Aboriginal populations respectively, this would result in a total Aboriginal population which is less educated than the non-Aboriginal population because a larger portion of the Aboriginal population lives in rural areas (a composition effect).

If one did not consider the urban and rural gaps separately, but only the total population, both the urban and rural Aboriginal populations would be required to attain the average educational attainment of the non-Aboriginal population. Not only would this overestimate the educational attainment of the Aboriginal population if the gap were closed, it would also imply that rural and urban Aboriginal people are over- and under-educated respectively relative to their local non-Aboriginal peers. When closing the Aboriginal educational attainment gap, the appropriate target education for a 36 year old Aboriginal woman in rural Nova Scotia is that of a

[71] Of course, we cannot say that this scenario corresponds to eliminating 70.7 per cent of the employment income gap and 33.4 per cent of the employment rate gap because the earlier analysis focused on only subsets of the population (25-64 and full-year full-time employees in the case of employment income), this exercise uses our projected 2031 educational attainment distributions, and the earlier analysis did not employ any of the demographic and geographic controls which we will be using here.

36 year old non-Aboriginal woman in rural Nova Scotia, not the average education of all Canadians over 15 years old.

Unfortunately, we do not possess the data necessary to effectively control for rural and urban area of residence. Factors which we are able to control for include age group, sex, and province / territory of residence.

For a given scenario, each of the three assumptions about the gaps is applied to each age-sex-province bin of the Aboriginal population to produce hypothetical values of 2031 educational attainment, employment rates (conditional upon education), and average employment income (conditional upon education) of the Aboriginal population in each age-sex-province bin. We use data on the ten provinces (and one aggregation over all the territories), two sexes, and six age categories[72] to produce data for 132 age-sex-province bins.

Our population projections provide two separate distributions of the population. One distribution is by age group and sex, the other is by province / territory of residence. To obtain projections of the population in each age-sex-province bin, we assume that the age-sex distribution will be identical to the national distribution within each province. Applying the age-sex-province distribution to the projected total population in 2031, we obtain a projected number of Aboriginal people in each age-sex-province bin.

Using the hypothetical educational attainment distribution (9 categories[73]), the 9 corresponding average employment rates, the 9 corresponding average employment incomes of the bin (of those with employment), and the projected population in the bin, we can calculate the number of people employed and the employment income generated in each bin in 2031. We estimate the total value of output produced in each bin to be equal to **twice** the employment income of the bin, as labour tends to receive about half of the returns to output in Canada in recent years[74]. Summing over all the outcomes for each combination of age, sex, province, and education, we can calculate the total contribution of Aboriginal people to national output and employment under each scenario.

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[72] The age categories are 15-24 years old; 25-34 years old; 35-44 years old; 45-54 years old; 55-64 years old; 65 years and older.

[73] The educational attainment categories are: none; high school graduation certificate or equivalency certificate; other trades certificate or diploma; college, CEGEP, or other non-university certificate or diploma from a program of 3 months to less than 1 year; college, CEGEP, or other non-university certificate or diploma from a program of 1 to 2 years; college, CEGEP, or other non-university certificate or diploma from a program of more than 2 years; university certificate or diploma below bachelor level; bachelor's degree; university degree above bachelor level. These categories are based off of the variable "highest certificate, diploma, or degree" in the 2011 NHS PUMF with two modifications. First, we combine "trades certificate and diploma (other than apprenticeship)" with "registered apprenticeship certificate" as these are not distinguished in the 2001 PUMF. Second, we combine all 4 categories above a bachelor's degree as these categories tend to have fewer Aboriginal observations in the PUMF.

[74] In 2013, compensation of employees constituted 50.7 per cent of Canada's gross domestic product at market prices (CANSIM table 380-0063, gross domestic product, income based). For further evidence that labour's share of output is about one half, see Sharpe et al. (2008).

A simple example may clarify the nature of the calculations, as this is much simpler than the above description may suggest. Suppose we are assessing the outcome under one scenario for one specific age-sex-province bin, say women aged 25-34 living in Alberta. For simplicity, assume there are only two educational attainment categories: educated or uneducated. The three assumptions of the scenario provide us with values in 2031 for educational attainment (say 50 per cent have no education and 50 per cent have an education), the employment rate conditional upon educational attainment (say 50 per cent if uneducated and 100 per cent if educated), and average income of the employed conditional upon education (say $50,000 if uneducated and $100,000 if educated).

Suppose our projected population is 1,000 Aboriginal women aged 25-34 in Alberta. We apply the assumed educational distribution to obtain 500 non-educated individuals. The assumed 50 per cent employment means there will be 250 Aboriginal non-educated women aged 25-34 working in Alberta in 2031. These women are earning $50,000 a year on average, so that their contribution to GDP in 2031 is estimated at 250 x $50,000 x 2 = $25,000,000 We multiply by two as the wages earned by these workers only represent about half the value of the output they produce. Similar calculations for the educated group give 250 educated women aged 25-34 generating $50,000,000. If we add the educated and non-educated values together, we obtain 500 Aboriginal women contributing $75,000,000 to GDP within the age-sex-province bin.

Similar calculations are repeated in the other 131 age-sex-province bins under this scenario. By aggregating the outcomes across bins, we can calculate the total Aboriginal contributions to employment and GDP by age, by sex, by province, or nationally under the scenario.[75] This process is repeated for each of the 12 scenarios.

In some cases, data are not available for some educational segments of the Aboriginal population in some bins. For example, the public use microdata file does not include any Aboriginal women above the age of 65 in Newfoundland and Labrador who possess a degree above the bachelor's level and are in the labour force, but there are some non-Aboriginal women fitting this description. In order to estimate the gains from closing the education gap but not the income and employment rate gaps conditional on education, we need to have an estimate of what such an Aboriginal person's employment and income would be. These holes in the data are filled by taking the averages across all individuals with the same education in other bins which share two of the three criteria (age, sex, and province). First, sex and province are used. If no individuals possess the necessary combination of education, sex, and province, then we try sex

[75] The reader should note that controlling for province of residence in this way may potentially introduce a downwards bias into our estimates. We are assuming that the Aboriginal population in each province will remain unchanged if educational attainment rises. However, differing rates of return to education between provinces may result in individuals migrating to provinces where labour market outcomes are superior given their level of educational attainment. To the extent that such migration occurs, our estimates will understate the gains to improving Aboriginal education.

and age. If this too were to fail, we would try province and age, but this is never necessary. The order in which the relaxed criteria are applied was chosen arbitrarily.

One might be concerned about the effects of missing data on the results. As a robustness exercise, the results have also been generated using less detailed education data (only 4 categories and no demographic controls[76]) available in aggregated form from the National Household Survey website – these data draw upon the entire sample of the National Household Survey, not just what is available in the PUMF. The results of this exercise are presented in the on-line appendix.

iv. Calculating Aggregate Outcomes and Growth Rates

Once the total contribution of the Aboriginal population to national income and output and employment under each scenario is determined, the gains to output and employment from closing the gaps are calculated by taking the difference in the contributions of the Aboriginal population between the scenario of interest and the baseline scenario. In order to estimate the outcomes for the national economy, we assume that the GDP estimate in 2031 of $2.512 trillion (2007 dollars) and the employment estimate of 20,220,470 from the PEAP projections are realized in the baseline scenario. Output and employment in each scenario is then just equal to the gains (over the baseline scenario) from closing the gaps added to the PEAP projections. Labour productivity in each scenario is calculated as the ratio of GDP to employment.

As we are interested in the impact of closing the gaps on the growth rates of GDP, employment, and productivity, we calculate impacts for each scenario relative to GDP, employment, and productivity in 2011 as reported in the PEAP projections. The difference between growth rates in scenario X and the baseline scenario can be attributed to the change in the gap(s). To estimate cumulative gains in output over the period, we assume that the (compound) annual growth rate is constant from 2011 to 2031 and apply it repeatedly to the 2011 value from the PEAP projections. This produces estimates of GDP in each year. As in 2031, the gains from closing the gap(s) in scenario X each year are calculated as the difference between GDP using the growth rate from scenario X and GDP using the baseline growth rate. Summing over the gains from each year, we obtain the cumulative gains for the period. These gains are not discounted.

v. Aboriginal Identity

The exercise by Aboriginal identity calculates the potential contributions for the three major Aboriginal identity groups: First Nations, Inuit, and Métis. These calculations do not include those who reported multiple or other Aboriginal identities, but they do capture differences in terms of demographics and place of residence between the three groups.

[76] The four categories are less than high school, high school, postsecondary below a bachelor's degree, and bachelor's degree or above.

Consequently, the sum of the benefits of the three groups does not equal the total benefits calculated for all Aboriginal people.

It should be noted that the projections of the Aboriginal population used did not provide a breakdown of the estimated 2031 Inuit population by province/territory of residence, so the Inuit population is only broken down into bins by age and sex at the national level in the calculations. This result in an underestimation of Inuit outcomes when the income and employment rate gaps are closed because non-Aboriginal employment rates and incomes tend to be high in the Territories where much of the Inuit population is concentrated, but we are only comparing these Aboriginal people to the national average within each age, sex, and education category.

vi. On- and Off-Reserve and Registered Indian Status

Given the large disparities between Aboriginal peoples on and off-reserve, it is useful for policymakers to have an estimate of the gains from improving education on-reserve compared to improving education of Aboriginal people off-reserve. Data limitations require several additional assumptions to produce such estimates.

There is some difficulty acquiring income data on-reserve. Statistics Canada does not include on-reserve status in the public use microdata files for the National Household Survey and does not provide a table which includes income on- and off- reserve by educational attainment. As is well known, many of the reserves are incompletely enumerated in the National Household Survey, so the quality of the data is reduced.[77] However, the global non-response rates in the National Household Survey were better on-reserve than off-reserve.

Statistics Canada provides Aboriginal Population Profiles for the National Household Survey at the Indian band geographic level which include average employment income of the population 15 years and older working full-year full-time. By taking a population weighted average across Indian bands, we can obtain a good estimate of average employment income of full-year full-time workers 15+ on-reserve in 2011. However, we need average employment income of all on-reserve workers 15+ by educational attainment to perform our estimates.

We possess the necessary data for the total Aboriginal population. We estimate the employment income of all workers (not just full-year full-time) 15+ by educational attainment on-reserve by assuming that it is equal to that of the total Aboriginal population multiplied by a constant which is the same for all educational categories. To estimate this constant, we need to calculate the total income which would be earned by the total Aboriginal population aged 15 years or older working full-year full-time if it had education levels identical to those of the population on- reserve. The ratio of the total incomes on- and off-reserve with this fixed educational attainment distribution is then multiplied by the average employment income by

[77] 36 Indian reserves were incompletely enumerated in the 2011 National Household Survey. For a complete list, see http://www12.statcan.gc.ca/nhs-enm/2011/ref/aboriginal-autochtones-eng.cfm.

educational attainment of all Aboriginal workers 15+ to estimate the average employment income for four educational attainment categories of Aboriginal workers 15+ on-reserve.[78] Some of these calculations are presented in Appendix Table 15.

Given values for the total and on-reserve Aboriginal populations, calculating educational attainment and average employment income of those living off-reserve is straightforward.

We rely upon another data source to obtain projections of the Aboriginal population on- and off-reserve in 2031.[79] These projections are available in Table 1 of "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada. We use the "Medium Growth" projection scenario from this project, which predicts that the total Aboriginal population in 2031 will be 1,826,100 compared to a population of 1,734,000 from the Statistics Canada (2012) projections we use for our other estimations. To maintain consistency across our estimates, we only use this study to calculate a projected fraction of the Aboriginal population which will live on-reserve in 2031 (32.75 per cent[80] compared to 30.1 per cent[81] in 2006, the base year of the projections) which is then applied to the population values from our primary population projections.[82] These additional projections do not provide estimates on- and off- reserve by age group, gender, or province, so we can only use national averages over the entire population, resulting in less precise estimates for this exercise. Nonetheless, we expect it might be informative given the large gaps which are known to exist on-reserve.

There is also a small difference in methodology for projecting educational attainment distributions. For the earlier exercises, we have only calculated the growth rates in each educational attainment category between 2006 and 2011 for the total Aboriginal and non-

[78] The four categories are the same as those for the aggregate exercise mentioned in subsection iv: less than high school, high school, postsecondary below a bachelor's degree, and bachelor's degree or above.

[79] Our primary projections do include projections by province of North American Indians living on-reserve, but they do not include projections for the total Aboriginal identity population living on-reserve. In 2006, about 361,000 people identifying as North American Indians lived on-reserve along with about 50,000 who did not report such an identity (Malenfant and Morency, 2011), Based on the National Household Survey, about 88 per cent of those on-reserve without a North American Indian (First Nations) identity are non-Aboriginal. The data we have used for income includes all Aboriginal people living on-reserve.

[80] As a point of comparison, our primary projections indicate that about 584 thousand First Nations people will live on-reserve in 2031. The total Aboriginal population in 2031 is projected to be 1,734 thousand, so that First Nations people on-reserve would comprise about 33.7 per cent of the population. First Nations individuals represent the vast majority of Aboriginal people living on-reserve, so while our estimated population on-reserve may be slightly low as a result of using the second set of projections, the number seems to be in the right ballpark.

[81] Readers may notice that this 2006 share of the population on-reserve appears inconsistent with a value of about 26.3 per cent reported earlier in this report. However, the value of 30.1 per cent used in generating the projections is likely more accurate, as the baseline values used in the projections were adjusted upwards to account for incomplete enumeration and undercoverage. Our primary projections made a similar adjustment to the 2006 baseline population.

[82] This ratio is for the entire population, but we are only concerned with those of working age. We make the additional assumption that this value of 32.75 per cent on-reserve holds for the working age population too. If a greater share of the population is below 15 years of age on-reserve than off-reserve in 2031, this assumption will overstate the projected number of working age people on-reserve in 2031.

Aboriginal populations nationally and then applied these growth rates to the educational attainment shares in each age-sex-province bin. In this exercise, we separately estimate the educational attainment growth rates for the Aboriginal populations on- and off- reserve. This is particularly important in this case as there has been much more progress in terms of education off-reserve.

We perform a similar exercise to assess the breakdown of gains for the First Nations population by registered Indian and non-registered Indian status. Our primary source of population projections (Malenfant and Morency, 2011) does not include projections by registered-Indian status, so we apply the fractions of the projected status and non-status First Nations population from "Aboriginal Demography: Population, Household and Family Projections, 2006-2031" to our primary First Nations population projection. The projection is that 83.6 per cent of First Nations will have registered Indian Status, quite similar to the ratio of 84.7 per cent in 2006, the base year of the projections.

Like the on-reserve / off-reserve exercise, we estimate outcomes in 2031 for these groups using just 4 educational categories and without demographic controls because the relatively small number of non-Status First Nations aged 15 and above in the PUMF raises concerns about sample size in the educational attainment-sex-age-province bins. The employment rates, average employment incomes, and educational distributions across the four categories are calculated for the two subpopulations using the PUMFs. Trends in educational attainment growth are separately generated for the status and non-status populations.

C. Results

Our results indicate that there continue to be large potential returns to investing in Aboriginal education. The presentation and discussion of the main results will proceed as follows. First, we will consider the primary exercise of projecting Aboriginal and national economic outcomes by 2031 at the aggregate level and by province, age, sex, and Aboriginal identity under our various scenarios regarding the gaps. The three outcomes we will consider in sequence are employment, output, and productivity. After considering the various outcomes for the Aboriginal population, we present estimates of the effects of closing the gaps on national employment, GDP, and productivity growth relative to 2011. Under a few additional assumptions, we calculate estimated cumulative values of the gains to GDP between 2011 and 2031.

This will conclude the main results, but we will also present the results of two additional exercises. The first is an estimate of the impact of closing the gaps for those living on- and off-reserve using data at a higher level of aggregation. The second is to discuss retrospective estimates of the realized and potential gains from narrowing the gaps between 2001 and 2011. The discussion of the retrospective estimates will focus on the national level, but more detailed results are included in tables in the on-line appendix.

In order to focus the discussion, only results from six of our twelve scenarios are presented in the text – scenarios 1, 2, 3, 5, 9, and 12. These scenarios represent the baseline (employment rate gap unchanged, income gap unchanged, and educational attainment gap based on education trends from 2006-2011), only closing the employment rate gap, only closing the income gap, only closing the education gap half-way, only closing the education gap fully, and fully closing all gaps simultaneously. These scenarios allow for comparison regarding the relative potential impacts of addressing the three different gaps and also allow for the consideration of the effects of closing the education gap under a variety of conditions. The outcomes under the remaining 6 scenarios are presented in the appendix.

i. Educational Attainment

Before discussing labour market outcomes, we should consider the projected educational attainments of the Aboriginal and non-Aboriginal populations. Table 33 presents the national educational attainment distributions across the nine categories for the Aboriginal and non-Aboriginal populations aged 15 and older in 2006 and 2011. The compound annual growth rates of each share have been calculated nationally and then applied to the 2011 educational attainment distribution of each age-sex-province bin to project educational attainment for the non-Aboriginal and Aboriginal population in that bin in 2031. The 2031 educational attainment distributions presented in Table 38 are at the national level based upon the demographics of the Aboriginal population – thus the 2031 "non-Aboriginal" distribution presented in the table is not the non-Aboriginal education distribution projected for 2031, but rather the Aboriginal education distribution in 2031 if the 2031 educational attainment gap is eliminated.[83]

A few points are worth noting. First, we are projecting large improvements in Aboriginal education compared to 2011. Our baseline projects that, if recent progress continues the share of the Aboriginal population with less than a high school degree could fall from 38.4 per cent to 22.0 per cent. At the same time, we project that the share of the population with a high school degree as the highest educational attainment could rise from 24.4 per cent to 31.7 per cent. Those possessing a bachelor's degree could rise from 5.5 per cent to 12.2 per cent. These projections would represent substantial gains for the Aboriginal population, the value of which is not included in our estimates. This is because these improvements would not represent improvement in terms of the educational attainment gap other than what appears to have occurred between 2006 and 2011.

The gains from closing the educational attainment gap which we estimate are those associated with moving from the projected Aboriginal outcomes in 2031 to the projected non-Aboriginal outcomes in 2031. In particular, closing the education gap would entail changes of

[83] Similarly, the projected national Aboriginal education distribution in the far right column of Table 38 is not quite the same as the Aboriginal education distribution projected at the national level using only the data in the table. This is because it incorporates the 2031 Aboriginal age-sex-province distribution in 2031 rather than that which prevailed.

about minus twelve percentage points, minus six percentage points, plus nine percentage points, and plus eight percentage points of the shares of the Aboriginal population in the no degree, high school degree, bachelor's degree, and university above bachelor's categories respectively.

Table 38: Projected Educational Aboriginal and Non-Aboriginal Educational Attainment Based on 2006-2011 Trends, Population Aged 15+, 2031

		Non-Aboriginal				Aboriginal			
	Years Education (2001)	2006 Share (%)	2011 Share (%)	Compound Annual Growth Rate of Share (%)	2031 Share (%) (Projected) *	2006 Share (%)	2011 Share (%)	Compound Annual Growth Rate of Share (%)	2031 Share (%) (Projected)
None	9.29	23.10	19.45	-3.38	10.11	43.99	38.36	-2.70	22.00
High school graduation certificate or equivalency certificate	12.79	25.79	25.72	-0.05	25.67	21.72	24.45	2.40	31.73
Other trades certificate or diploma	12.92	10.86	10.77	-0.17	9.11	11.33	11.43	0.18	10.67
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	12.06	2.27	2.27	0.09	2.45	2.80	3.12	2.19	3.97
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	14.68	8.32	8.67	0.84	9.33	7.78	8.44	1.64	9.01
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	15.73	6.85	7.40	1.56	7.12	3.92	4.47	2.67	5.97
University certificate or diploma below bachelor level	15.68	4.45	4.42	-0.10	3.82	2.76	2.44	-2.48	1.25
Bachelor's degree	16.42	11.90	13.70	2.86	21.47	4.18	5.45	5.47	12.22
Above Bachelor`s	17.44	6.47	7.58	3.23	10.91	1.53	1.85	3.86	3.18
Years Educational Attainment		13.20	13.46		14.21	11.81	12.08		12.98

* Note that this is not the projected non-Aboriginal national educational attainment distribution in 2031, but rather the national education distribution which the non-Aboriginal population would have if it had the projected demographics of the Aboriginal population in 2031. This is the distribution we project the Aboriginal population will achieve if the gap closes.

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File, the 2006 Census Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

We have also included our summary measure of years of educational attainment. One will notice that the years of educational attainment reported in the above tables are quite a bit

lower than those discussed earlier in this report. This is because the values discussed earlier were calculated for the population aged 25-64 while the values in the above tables include everyone aged 15 and above. For purposes of comparing trends in the educational attainment gap earlier in the report, we ignored those under the age of 25 as many of these individuals are still in school. However, in assessing the benefits of closing the gaps, we include the entire population of potential workers aged 15 and above.

ii. *Employment*

Table 39 presents our baseline projections for Aboriginal employment in 2031 alongside the estimated absolute increase over the baseline under each scenario. Table 40 presents the same improvements as a percentage of the 2031 baseline employment.

We estimate that 727 thousand Aboriginal people will be working in Canada in 2031 if the education gap follows existing trends and the employment and income gaps remain unchanged. This number rises significantly if the education or employment rate gaps close. Closing the employment rate gap will raise Aboriginal employment by 109 thousand workers. Elimination of the education gap also is estimated to have a substantial impact, but it is not as large. Closing the educational attainment gap is estimated to lead to the employment of 90 thousand additional Aboriginal people. If both gaps closed, employment could reach as high as 872 thousand, a 20.0 per cent increase over the baseline. Note that the total increase from closing both gaps simultaneously is less than the sum of the gains from closing the two gaps independently. This is due to interaction between the gaps. The employment rate gap is largest for the less educated, so closing the education gap reduces the gains from improving employment rates conditional upon education.

The benefits from closing the gaps vary considerably across different groups depending on their initial conditions. The improvement over the baseline from eliminating the education gap is largest in the Territories where completely eliminating the gap would increase employment by an estimated 40 per cent even if the employment rate gap conditional on education did not improve (Scenario 9). Manitoba, Saskatchewan, British Columbia, Prince Edward Island, and New Brunswick also are estimated to have higher than average returns to employment if the education gap is closed under this scenario.

As one might expect given their relatively strong labour market performance, the potential gains are smaller for the Métis than for other Aboriginal populations, but they are estimated to be quite large for the First Nations and Inuit. Just closing half of the education gap (Scenario 5) would result in an estimated increase in 2031 employment of 9.4 per cent for the First Nations population and 12.6 per cent for the Inuit population relative to the baseline. Recall that we do not possess projections for the Inuit by province, so the estimates for the Inuit may be somewhat low given the unusually high non-Aboriginal employment rates in the Territories.

Table 39: Projected Increase in Aboriginal Employment over Baseline Scenario (thousands), 2031

	Baseline (2031 Level)	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Province						
Newfoundland and Labrador	8.10	0.92	0.00	0.48	0.95	1.01
Prince Edward Island	0.77	0.09	0.00	0.15	0.30	0.20
Nova Scotia	13.46	0.83	0.00	0.53	1.06	1.30
New Brunswick	6.95	1.59	0.00	0.45	0.90	1.95
Quebec	74.76	6.82	0.00	2.73	5.47	11.33
Ontario	148.93	10.22	0.00	6.19	12.38	17.58
Manitoba	109.50	16.99	0.00	7.52	15.03	23.55
Saskatchewan	86.95	31.11	0.00	5.82	11.64	34.83
Alberta	135.23	15.13	0.00	7.59	15.19	22.19
British Columbia	115.04	13.24	0.00	8.04	16.07	19.14
Territories	27.29	11.98	0.00	5.49	10.97	12.29
Canada	726.99	108.94	0.00	44.99	89.97	145.36
Identity						
First Nations	412.62	109.37	0.00	38.96	77.91	141.02
Métis	247.19	5.58	0.00	9.79	19.58	12.00
Inuit	29.68	4.16	0.00	3.72	7.45	8.48
Total*	689.49	119.11	0.00	52.47	104.94	161.50
Gender						
Female	351.37	40.62	0.00	20.85	41.70	60.18
Male	375.62	68.32	0.00	24.14	48.27	85.19
Total	726.99	108.94	0.00	44.99	89.97	145.36
Age						
15-24	112.51	21.33	0.00	9.38	18.76	35.50
25-34	156.37	27.47	0.00	8.99	17.98	34.68
35-44	183.69	25.72	0.00	7.95	15.90	30.77
45-54	142.57	21.52	0.00	4.69	9.38	25.98
55-64	93.53	11.46	0.00	4.31	8.63	14.51
65+	38.33	1.44	0.00	9.66	19.32	3.93
Total	726.99	108.94	0.00	44.99	89.97	145.36

* Notice that total employment under the breakdown by Aboriginal identity is considerably lower than under the breakdowns by age group, sex, and province of residence. A large part of the difference is the result of not including those with multiple or other Aboriginal identities in this breakdown. This also reflects the fact that the Métis are projected to be a significantly smaller component of the Aboriginal working age population in 2031 than they were in 2011 – given the relatively strong performance of the Métis, controlling for the Aboriginal identity composition in 2031 lowers baseline employment which also increases the estimated impact of closing the gap.

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

Table 40: Projected Increase in Aboriginal Employment over Baseline Scenario (per cent), 2031

	Employment Rate Gap Closes	Income Gap Closes*	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Province					
Newfoundland and Labrador	11.38	0.00	5.89	11.79	12.43
Prince Edward Island	11.80	0.00	19.78	39.56	25.98
Nova Scotia	6.18	0.00	3.96	7.91	9.64
New Brunswick	22.90	0.00	6.45	12.90	28.13
Quebec	9.13	0.00	3.66	7.31	15.15
Ontario	6.86	0.00	4.16	8.32	11.80
Manitoba	15.52	0.00	6.86	13.73	21.50
Saskatchewan	35.78	0.00	6.69	13.38	40.06
Alberta	11.19	0.00	5.62	11.23	16.41
British Columbia	11.51	0.00	6.99	13.97	16.63
Territories	43.90	0.00	20.10	40.20	45.04
Canada	14.99	0.00	6.19	12.38	20.00
Identity					
First Nations	26.51	0.00	9.44	18.88	34.18
Métis	2.26	0.00	3.96	7.92	4.85
Inuit	14.03	0.00	12.55	25.10	28.56
Total	17.28	0.00	7.61	15.22	23.42
Gender					
Female	11.56	0.00	5.93	11.87	17.13
Male	18.19	0.00	6.43	12.85	22.68
Total	14.99	0.00	6.19	12.38	20.00
Age					
15-24	18.96	0.00	8.34	16.68	31.55
25-34	17.57	0.00	5.75	11.50	22.18
35-44	14.00	0.00	4.33	8.66	16.75
45-54	15.09	0.00	3.29	6.58	18.23
55-64	12.25	0.00	4.61	9.22	15.52
65+	3.76	0.00	25.20	50.41	10.25
Total	14.99	0.00	6.19	12.38	20.00

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

* Note that this column of zeros is not a mistake. Scenario 3 involves only a change in the income gap conditional upon education. Under the assumptions of our exercise, there is no change in employment under this scenario because educational attainment rates and employment rates conditional upon education have not changed from the baseline. However, there will be an effect of closing the income gap on the Aboriginal contribution to GDP.

One can see that the benefits of closing the education gap alone are quite similar for both men and women. When this gap closes in conjunction with the employment rate gap men end up gaining slightly more than women, but men also gain more if only the employment rate gap

closes (Scenario 2) so it is not clear that closing the education gap is having a bigger impact for men than for women. To properly assess this, one needs to compare the gains for the two groups in Scenario 12 relative to Scenario 2 and will find that closing the education gap on top of the employment rate gap is actually slightly more beneficial for women than for men (5.6 per cent compared to 4.5 per cent).

Across the age distribution, the relative benefits from closing the education gap in isolation appear to be greatest for the very young (15-24) and the very old (65+). In practice, closing the gap for the very young is much more realistic than for the very old.

iii. Output

Higher levels of employment combine with higher levels of employment income per worker to generate large increases to the output of Aboriginal people.

Output and income are two different ways of looking at the production process. Output is the value added generated by production. This value added is dispersed to the two primary factors of production, labour and capital, in the form of wages and profits.

Aboriginal income is the income that accrues to Aboriginal individuals who are employed and produce output. If these individuals are self-employed or own the business through co-operatives or community ownership, then they receive all the income generated by the production process, both wages and profits. If these Aboriginal individuals are only workers, then profits may accrue to non-Aboriginal owners of capital.

Wages and profits each account for about half of the value added. Thus, if one knows the value of wages, twice this value estimates the total value added. This is an assumption used in the report, although it is recognized that the Aboriginal population often does not receive the resulting profits when it does not own the capital.

Table 41 presents our baseline projections of the Aboriginal contribution to GDP in 2031 alongside the estimated absolute increase over the baseline under each scenario. Table 42 presents the same improvements as a percentage of the 2031 baseline employment.

Closing the education gap could boost the Aboriginal contribution to GDP (total domestic output) by as much as $28.3 billion 2010 dollars in 2031 (35 per cent!).[84] Note that the gains which we attribute to closing only the educational attainment gap are sizable. We find that

[84] Note that, in making this claim, we have compared the four scenarios in which the educational attainment gap fully closes to the relevant baseline. For example, the gains from closing the educational attainment gap if only the education gap closes is equal to $109.01 billion (Scenario 9, only the education gap closes) minus $80.67 billion (Scenario 1, no gaps close) to get a gain of $28.34 billion. Similarly, we compare Scenario 10 (education and employment rate gaps both close) to Scenario 2 (only the employment rate gap closes), Scenario 11 to Scenario 3, and Scenario 12 to Scenario 4. It turns out that the benefits are greatest if the other two gaps remain unchanged.

closing just half of the education gap (in isolation) would generate a greater increase to GDP than fully closing only the employment rate gap or only the income gap.

Again, the reader should note that the total gains from closing all three gaps are not equal to the gains from closing the three gaps separately. This is because of interaction effects which may be positive between the gaps. These interactions can lead to increased gains if the gaps close simultaneously, but their can also be redundancies in closing the gaps.

Table 41: Projected Increase in Aboriginal Contribution to GDP over Baseline Scenario (billions of 2010 dollars), 2031

	Baseline (2031 Level)	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Province						
Newfoundland and Labrador	1.12	0.12	-0.09	0.15	0.31	0.04
Prince Edward Island	0.06	0.02	0.01	0.02	0.03	0.04
Nova Scotia	1.23	0.10	0.16	0.17	0.35	0.43
New Brunswick	0.59	0.18	0.11	0.08	0.16	0.43
Quebec	7.78	0.48	0.11	0.87	1.75	2.31
Ontario	16.47	1.34	1.26	2.36	4.70	6.81
Manitoba	10.81	1.25	0.80	2.06	4.12	4.83
Saskatchewan	9.23	2.54	1.59	1.09	2.18	6.23
Alberta	17.97	1.58	0.75	3.97	7.96	6.96
British Columbia	11.10	1.34	1.75	1.66	3.32	5.74
Territories	4.32	1.35	-0.15	1.74	3.48	2.59
Canada	80.67	10.31	6.31	14.18	28.34	36.41
Identity						
First Nations	42.73	9.51	6.06	9.51	19.02	29.88
Métis	28.94	0.73	0.94	3.97	7.84	6.48
Inuit	3.90	0.66	-0.70	0.95	1.91	1.09
Total	75.57	10.90	6.30	14.43	28.76	37.45
Gender						
Female	32.97	2.82	1.33	4.64	9.27	11.22
Male	47.70	7.50	4.98	9.53	19.07	25.19
Total	80.67	10.31	6.31	14.18	28.34	36.41
Age						
15-24	4.70	0.83	0.16	1.07	2.14	2.43
25-34	16.07	2.47	1.14	2.24	4.48	6.78
35-44	24.57	2.85	1.73	3.47	6.93	10.64
45-54	20.09	2.72	1.69	4.03	8.07	9.61
55-64	12.20	1.22	1.32	1.88	3.76	5.76
65+	3.04	0.23	0.28	1.48	2.97	1.19
Total	80.67	10.31	6.31	14.18	28.34	36.41

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

Table 42: Projected Increase in Aboriginal Contribution to GDP over Baseline Scenario (per cent), 2031

	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Province					
Newfoundland and Labrador	10.46	-8.04	13.73	27.36	3.17
Prince Edward Island	43.37	15.45	30.10	60.20	72.97
Nova Scotia	8.26	12.77	14.07	28.15	35.03
New Brunswick	30.61	18.83	13.22	26.50	73.23
Quebec	6.21	1.40	11.22	22.45	29.71
Ontario	8.15	7.67	14.30	28.54	41.33
Manitoba	11.53	7.44	19.06	38.15	44.69
Saskatchewan	27.49	17.25	11.78	23.56	67.48
Alberta	8.79	4.18	22.11	44.27	38.73
British Columbia	12.12	15.81	14.99	29.89	51.72
Territories	31.37	-3.52	40.33	80.65	60.00
Canada	12.78	7.82	17.57	35.13	45.13
Identity					
First Nations	22.25	14.18	22.25	44.50	69.93
Métis	2.53	3.25	13.72	27.08	22.38
Inuit	16.89	-17.96	24.40	49.06	27.88
Total	14.42	8.34	19.09	38.06	49.55
Gender					
Female	8.54	4.03	14.08	28.13	34.02
Male	15.71	10.44	19.99	39.98	52.81
Total	12.78	7.82	17.57	35.13	45.13
Age					
15-24	17.61	3.35	22.77	45.56	51.72
25-34	15.36	7.07	13.92	27.88	42.17
35-44	11.60	7.04	14.11	28.19	43.29
45-54	13.55	8.41	20.08	40.19	47.85
55-64	9.97	10.79	15.42	30.79	47.26
65+	7.45	9.19	48.87	97.67	39.09
Total	12.78	7.82	17.57	35.13	45.13

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

For example, suppose there are two levels of education. For simplicity assume the employment rate is universally 100 per cent (no employment rate gap). All non-Aboriginal people hold a high school diploma, but no Aboriginal people do. Suppose that an Aboriginal with no high school diploma earns $10,000 annually. Further suppose that a high school diploma doubles Aboriginal income to $20,000 and that Aboriginal people earn only half as much as non-Aboriginal people given education. Thus, a non-Aboriginal with no high school diploma earns $20,000 and a non-Aboriginal with a high school diploma earns $40,000. Suppose the education gap or the income gap closed individually – they would each raise an Aboriginal person's

income by $10,000 in isolation (from $10,000 to $20,000). However, if both gaps closed at once, all Aboriginal people would earn $30,000 more (from $10,000 to $40,000).

It is easy to see how the sum of closing the two gaps can exceed the value of closing each gap individually as well. Take the same example as above, but suppose that the income gap only exists for those without a high school degree (both Aboriginal and non-Aboriginal people with a high school degree earn $20,000). In this case, closing either the education or income gap individually would lead to an improvement of $10,000 in the income of each Aboriginal person. However, if both gaps closed at once, each Aboriginal person would still only earn $10,000 more in total. If one gap is already closed, there is nothing to be gained from closing the second gap.

Some provinces could potentially gain significantly from eliminating the disparities between their Aboriginal and non-Aboriginal populations. For example, if all three gaps were completely closed, we estimate that Saskatchewan could boost its Aboriginal contribution to GDP by a massive 67.5 per cent, amounting to an increase in provincial GDP of $6.2 billion (2010 dollars) in 2031.

Similar to employment, the improvements to the Aboriginal contribution to GDP from closing the education gap are somewhat larger for the First Nations and the Inuit than for the Métis. This is because the Métis tend to have better outcomes than other Aboriginal identity groups so that there is less value to be generated by eliminating the gaps. However, the benefits to the Métis from closing the educational attainment gap are still potentially quite large, as much as $7.8 billion (27.1 per cent) over the baseline. In absolute terms, the gains are smaller for the Inuit at $1.9 billion because the Inuit population is relatively small, but this is an increase of 49.1 per cent over the baseline for the group. The potential gains are very large for the First Nations population, amounting to $19.0 billion or 44.5 per cent of group's baseline contribution to GDP.

As noted a bit earlier, the limited information on the geography of the Inuit in our population projections causes problems for the estimates of outcomes for this group. Specifically, we cannot control for province/territory of residence for the Inuit population because we do not possess projections by province and territory. One sees that our estimates suggest that closing the income gap for the Inuit will actually lower their output. This is probably not true. As many Inuit people live in Nunavut, which we have seen enjoys unusually high non-Aboriginal average incomes and employment rates, closing the absolute gap in incomes between the Inuit from this territory and the average non-Aboriginal person of the same age and sex nationally might actually result in the Inuit earning less than they did before.[85] This illustrates

[85] Recall that in Table 20 the average Aboriginal person 25-64 working full-year full-time in Nunavut earned more than non-Aboriginal people everywhere else in the country except for Alberta, but the income gaps within these Territories were still enormous.

why it can be important to control for the demographic characteristics of the population when generating these estimates.[86]

It is also worth pointing out that the relative improvements from closing the education gap alone tend to be larger for men, the very young, and the very old as these groups tend to face larger gaps.

iv. Average Employment Income

Table 43 presents our baseline projections of Aboriginal average employment income in 2031 alongside the estimated absolute increase over the baseline under each scenario. Table 44 presents the same improvements as a percentage of the 2031 baseline employment.

At first, Aboriginal average employment income of $55,482 (2010 dollars) per worker in 2031 under the baseline estimate, which assumes 41 per cent wage growth conditional upon education, might sound high. However, this amount is much less impressive when one realizes that we expect the national average employment income to be about $64,891 per worker (based on half of the national labour productivity reported in Table 45). Closing the education gap is estimated to significantly improve Aboriginal wages – employment income rises to about $61,430 per worker even if the gap is only half closed. Notice that when all the gaps close, average Aboriginal employment income is estimated at $67,105 which is actually above the projected average employment income of $65,321. Demographic differences between the two populations result in different outcomes nationally.

The reader may notice that closing the employment rate gap is associated with lowering average Aboriginal employment income. This is because when we close the employment rate gap for all educational attainment categories we are disproportionately increasing the employment share of the less educated who face a much larger employment rate gap. These less educated individuals earn less employment income, so increasing their share of employment drags down the average employment income. These individuals boost total Aboriginal employment income, but they lower average Aboriginal employment income because the less educated tend to be less productive, at least based upon their wages.

The gains to Aboriginal average employment income from closing just the education gap are not all that great in some provinces, such as Saskatchewan, but they are reasonably large (in excess of 20 per cent of the baseline) in Manitoba, Alberta, and the Territories.

The baseline average incomes of the Aboriginal identity groups indicate that the Inuit are expected to earn the highest annual wages of about $65,660 per worker. The First Nations lag far

[86] Interestingly, Nunavut is also a good example of a situation where using demographic controls may be problematic. This is because the educational attainment, employment, and incomes of the population in Nunavut may not represent what is realistically feasible for the local Aboriginal population. Many non-Aboriginal people working in Nunavut are well-educated individuals who move there for high paying bureaucratic jobs.

behind at about $51,783 per worker – however, one needs to recall that the Inuit tend to be concentrated in the north where nominal[87] wages are higher. If we look at the gains from fully closing only the education gap (Scenario 9), we see that the First Nations and Inuit people both are projected to have wage increases of about 20 per cent compared to the baseline.

Table 43: Projected Increase in Aboriginal Average Employment Income over Baseline Scenario (2010 dollars), 2031

	Baseline (2031 Level)	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Province						
Newfoundland and Labrador	68,989	-571	-5,547	5,105	9,609	-5,685
Prince Edward Island	37,278	10,526	5,761	3,210	5,514	13,905
Nova Scotia	45,878	898	5,857	4,466	8,603	10,626
New Brunswick	42,400	2,658	7,984	2,697	5,107	14,925
Quebec	52,013	-1,388	730	3,796	7,337	6,577
Ontario	55,287	665	4,241	5,384	10,326	14,602
Manitoba	49,349	-1,707	3,672	5,634	10,600	9,419
Saskatchewan	53,101	-3,245	9,160	2,533	4,765	10,397
Alberta	66,449	-1,431	2,777	10,380	19,738	12,740
British Columbia	48,228	263	7,624	3,606	6,734	14,509
Territories	79,061	-6,884	-2,784	13,314	22,812	8,152
Canada	55,482	-1,063	4,340	5,948	11,236	11,623
Identity						
First Nations	51,783	-1,742	7,343	6,061	11,158	13,797
Métis	58,543	154	1,902	5,495	10,391	9,786
Inuit	65,660	1,645	-11,794	6,911	12,576	-347
Total	54,804	-1,334	4,569	5,848	10,865	11,602
Gender						
Female	46,913	-1,270	1,891	3,607	6,819	6,767
Male	63,498	-1,330	6,631	8,091	15,263	15,598
Total	55,482	-1,063	4,340	5,948	11,236	11,623
Age						
15-24	20,894	-237	701	2,783	5,172	3,203
25-34	51,402	-964	3,634	3,973	7,552	8,412
35-44	66,883	-1,409	4,711	6,273	12,020	15,202
45-54	70,448	-948	5,927	11,455	22,217	17,650
55-64	65,219	-1,322	7,039	6,739	12,879	17,920
65+	39,599	1,407	3,638	7,485	12,443	10,361
Total	55,482	-1,063	4,340	5,948	11,236	11,623

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

There are no obvious trends to highlight with regards to age, but the reader may notice that relative improvements to income from closing the gaps are estimated to be somewhat greater for men than for women.

[87] Not necessarily real wages given the higher cost of living.

Table 44: Projected Increase in Aboriginal Average Employment Income over Baseline Scenario (per cent), 2031

	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Province					
Newfoundland and Labrador	-0.83	-8.04	7.40	13.93	-8.24
Prince Edward Island	28.24	15.45	8.61	14.79	37.30
Nova Scotia	1.96	12.77	9.73	18.75	23.16
New Brunswick	6.27	18.83	6.36	12.04	35.20
Quebec	-2.67	1.40	7.30	14.11	12.64
Ontario	1.20	7.67	9.74	18.68	26.41
Manitoba	-3.46	7.44	11.42	21.48	19.09
Saskatchewan	-6.11	17.25	4.77	8.97	19.58
Alberta	-2.15	4.18	15.62	29.70	19.17
British Columbia	0.55	15.81	7.48	13.96	30.08
Territories	-8.71	-3.52	16.84	28.85	10.31
Canada	-1.92	7.82	10.72	20.25	20.95
Identity					
First Nations	-3.36	14.18	11.70	21.55	26.64
Métis	0.26	3.25	9.39	17.75	16.72
Inuit	2.51	-17.96	10.53	19.15	-0.53
Total	-2.43	8.34	10.67	19.82	21.17
Gender					
Female	-2.71	4.03	7.69	14.54	14.42
Male	-2.09	10.44	12.74	24.04	24.56
Total	-1.92	7.82	10.72	20.25	20.95
Age					
15-24	-1.13	3.35	13.32	24.75	15.33
25-34	-1.88	7.07	7.73	14.69	16.37
35-44	-2.11	7.04	9.38	17.97	22.73
45-54	-1.35	8.41	16.26	31.54	25.05
55-64	-2.03	10.79	10.33	19.75	27.48
65+	3.55	9.19	18.90	31.42	26.16
Total	-1.92	7.82	10.72	20.25	20.95

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division

v. Aggregate Outcomes

The results broadly suggest that there may be large gains for the Aboriginal population and the overall population from closing the educational attainment gap. Increased employment and income benefit not only Aboriginal people, but the Canadian economy more generally. As noted a few times already, only about one half of the benefits from increased output accrue directly to workers as employment income. The total gains also include income for business owners, investors, and the Canadian taxpayer.

Table 45: Projected Aggregate Employment, GDP, and Labour Productivity Outcomes, Canada, 2031

	2011	Baseline	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	2011 Values	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Aggregate Levels, Increase over Baseline							
Employment (thousands)	17,300	20,220	109	0	45	90	146
GDP (billions of $2010)	1,707	2,624	11	7	14	29	37
Labour Productivity ($2010)	98,661	129,781	-188	312	411	820	861
Implied Compound Annual Growth Rates (CAGR) (per cent), 2011-2031							
Employment	-	0.78	0.81	0.78	0.79	0.81	0.82
GDP	-	2.17	2.19	2.19	2.20	2.23	2.24
Labour Productivity	-	1.38	1.37	1.39	1.40	1.41	1.41
2011-2031 CAGR Relative to Baseline (per cent increase)							
Employment	.-	0.00	3.46	0.00	1.43	2.86	4.61
GDP	-	0.00	0.92	0.56	1.27	2.53	3.24
Labour Productivity	-	0.00	-0.53	0.88	1.16	2.32	2.43
2011-2031 CAGR Relative to Baseline (percentage points increase)							
Employment	-	0.0000	0.0271	0.0000	0.0112	0.0224	0.0361
GDP	-	0.0000	0.0200	0.0123	0.0275	0.0549	0.0704
Labour Productivity	-	0.0000	-0.0074	0.0122	0.0160	0.0320	0.0335

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

The PEAP forecast projects that employment and GDP in Canada will be about 20.22 million workers and $2.624 trillion (2010 dollars) in 2031 (see Table 45). The maximum employment and GDP which we estimate would be achieved if all the gaps were closed is 20.4 million workers and $2.662 trillion. Under this best case scenario, employment would rise by 145,360 workers (0.72 per cent), output by $36.41 billion (1.39 per cent) or $864 per capita, [88] and labour productivity by $861 per worker (0.66 per cent) relative to the baseline. The percentage difference may not seem very large to the reader, but one needs to keep in mind that Aboriginal people make up only about 4 per cent of the Canadian population as of 2011.

[88] Based on a projected national population of 42,143,000 in 2031.

Table 46: Estimated Cumulative Gains to Output (Billions of 2010 dollars), Canada, 2011-2031

	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
Year	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
2012	0.34	0.21	0.47	0.94	1.20
2013	0.70	0.43	0.96	1.92	2.46
2014	1.07	0.66	1.47	2.94	3.77
2015	1.46	0.89	2.01	4.00	5.13
2016	1.86	1.14	2.56	5.11	6.56
2017	2.29	1.40	3.14	6.27	8.04
2018	2.73	1.67	3.74	7.47	9.59
2019	3.18	1.95	4.37	8.73	11.20
2020	3.66	2.24	5.03	10.04	12.88
2021	4.15	2.54	5.71	11.40	14.63
2022	4.67	2.86	6.42	12.81	16.45
2023	5.20	3.19	7.15	14.29	18.34
2024	5.76	3.53	7.92	15.82	20.31
2025	6.34	3.88	8.71	17.41	22.35
2026	6.94	4.25	9.54	19.06	24.48
2027	7.57	4.63	10.40	20.78	26.69
2028	8.21	5.03	11.29	22.57	28.98
2029	8.89	5.44	12.22	24.42	31.37
2030	9.59	5.87	13.18	26.35	33.84
2031	10.31	6.31	14.18	28.34	36.41
Total	**94.93**	**58.11**	**130.48**	**260.67**	**334.70**

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division. No discounting has been applied in these calculations.

Besides looking at the relative impact on the Canadian economy in 2031 compared to the baseline, one can also calculate the implied effects on Canadian growth rates. We calculate the compound annual growth rates between 2011 and 2031 for employment, GDP, and labour productivity based upon the 2011 values of these variables used in the PEAP forecast and our projected outcomes for 2031.

In absolute terms the differences seem small even in the best case scenarios – for example labour productivity is forecast to grow at a pace of 1.38 per cent annually in the baseline but we find that this could rise as high as 1.41 per cent if the education gap were completely closed. This amounts to an increase in the growth rate of 2.43 per cent. If all three gaps closed, the growth rates of employment and GDP could rise as much as 4.61 per cent (0.0361 percentage points) and 3.24 per cent (0.0704 percentage points). These are not huge numbers, but an

increase in the annual GDP growth rate of 3.24 per cent can add up to quite a bit of output over a period of 20 years.

Table 46 presents the annual gains to GDP between 2011 and 2031 which would result from the increased compound annual GDP growth rate being applied over the period. This assumes that the economic growth generated by closing the gaps over the period occurs smoothly over time as opposed to being concentrated in a few years of rapid progress. By summing over all twenty years we can obtain an estimate of the potential cumulative gains from closing the gap over the 20 year period.

We calculate that the additional output generated could be as large as $335 billion (2010 dollars) if all three gaps were completely closed. The reader should note that the values presented here are not expressed as present values – discounting future returns would result in lower estimates of the benefits. Of the three gaps, closing the education gap has by far the greatest positive effect. Fully closing the gap could generate economic benefits of $261 billion, while only half closing it could result in an additional $130 billion of output. In contrast, equalizing incomes conditional on education is estimated to have a cumulative impact of $58 billion and closing the employment rate gap would generate about $95 billion. These are very large numbers, indicating that there are potentially massive returns to be had from improving Aboriginal education and labour market outcomes.

vi. Robustness of Results

We have performed a few exercises to assess the robustness of our results. This short discussion of some of the results of these robustness exercises will focus on two major issues with regards to methodology:

1) What is the impact of controlling for demographic factors?
2) What are the consequences of using the PUMF to increase the number of educational categories?

To discuss these issues, we will refer to Table 47,

Table 48, and Table 49 which present results for Aboriginal employment and the Aboriginal contribution to GDP at the national level for five exercises (labelled A, B, C, D, and E) as levels, absolute improvements over the baseline scenario, and per cent improvements over the baseline scenario. The four exercises can be characterized by three characteristics:

- The specific source of data from the NHS: Either the NHS tables which are available from Statistics Canada's website or the Public Use Microdata File (PUMF). The PUMF only provides a sample of the data but allows the user more freedom in constructing variables.

- The number of educational attainment categories used: We have used either 4 or 9. There is only data available online for average income by educational attainment and race for four exclusive educational attainment categories.
- Demographic controls: We have either controlled for age, sex, and location or we have not.

Table 47: Robustness of National Totals, Aboriginal Employment and Contribution to Output, Levels

	Aboriginal Employment (thousands)					Aboriginal Contribution to Output (billions, 2010 dollars)				
Exercise	A	B	C	D	E	A	B	C	D	E
Educational Categories	4	9	4	4	9	4	9	4	4	9
Data Used	NHS Tables Online	NHS PUMF	NHS PUMF	NHS PUMF	NHS PUMF	NHS Tables Online	NHS PUMF	NHS PUMF	NHS PUMF	NHS PUMF
Demographic Controls	No	Yes	No	Yes	No	No	Yes	No	Yes	No
Scenario										
1	804	727	798	725	803	84.6	80.7	87.8	80.7	88.0
2	817	836	811	834	815	85.1	91.0	88.4	90.9	88.5
3	804	727	798	725	803	93.9	87.0	97.1	87.7	95.9
4	817	836	811	834	815	94.4	98.3	97.8	99.1	96.4
5	845	772	842	764	847	95.2	94.8	99.8	91.5	102.0
6	852	854	849	853	852	94.8	102.6	99.8	100.3	101.7
7	845	772	842	764	847	106.0	99.2	110.8	98.4	110.8
8	852	854	849	853	852	105.6	107.7	110.8	107.6	110.8
9	887	817	886	804	891	105.7	109.0	111.8	102.4	116.0
10	886	872	888	872	890	104.6	114.1	110.8	109.7	114.9
11	887	817	886	804	891	118.0	111.4	124.3	108.7	125.4
12	886	872	888	872	890	116.7	117.1	123.3	117.0	124.3

Source: Calculations using the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division

Our first question is relevant because controlling for age, sex, and province/territory of residence is supposed to be a major methodological improvement of this assessment over a previous study of the benefits of closing the gap performed by the Centre for the Study of Living Standards (Sharpe et al. 2007). As we would expect, this appears to have a major impact on the results.

Table 48: Robustness of National Totals, Aboriginal Employment and Contribution to Output, Absolute Increase over Baseline

	Aboriginal Employment					Aboriginal Contribution to Output				
Exercise	A	B	C	D	E	A	B	C	D	E
Educational Categories	4	9	4	4	9	4	9	4	4	9
Data Used	NHS Tables Online	NHS PUMF	NHS PUMF	NHS PUMF	NHS PUMF	NHS Tables Online	NHS PUMF	NHS PUMF	NHS PUMF	NHS PUMF
Demographic Controls	No	Yes	No	Yes	No	No	Yes	No	Yes	No
Scenario										
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	13.53	108.94	12.70	109.36	11.94	0.51	10.31	0.63	10.24	0.52
3	0.00	0.00	0.00	0.00	0.00	9.35	6.31	9.30	7.00	7.94
4	13.53	108.94	12.70	109.36	11.94	9.87	17.60	10.03	18.39	8.46
5	41.62	44.99	44.01	39.50	44.19	10.58	14.18	12.02	10.87	14.00
6	48.05	127.15	50.97	128.15	49.32	10.26	21.89	12.02	19.64	13.69
7	41.62	44.99	44.01	39.50	44.19	21.40	18.53	22.99	17.76	22.78
8	48.05	127.15	50.97	128.15	49.32	20.98	27.00	22.99	26.96	22.78
9	83.23	89.97	88.01	79.01	88.38	21.17	28.34	24.03	21.73	28.00
10	82.56	145.36	89.25	146.94	86.70	20.01	33.45	22.99	29.05	26.96
11	83.23	89.97	88.01	79.01	88.38	33.45	30.75	36.57	28.00	37.41
12	82.56	145.36	89.25	146.94	86.70	32.09	36.41	35.52	36.36	36.36

Source: Calculations using the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division

The second issue which we will discuss is the trade-off between having more educational attainment categories and relying upon the PUMF data which only provides a sample of the NHS sample. Given that our demographic controls require the calculation of average incomes and employment rates for 132 age-sex-province bins[89] for each category of educational attainment, a large number of educational attainment categories can be quite demanding on the PUMF, which only contains about 37,973 individuals reporting an Aboriginal identity, a significant number of which are not of working age or are missing data. As we have noted, a number of age-sex-province bins have a very small number (often 0) of Aboriginal observations in the PUMF, which may lead to inaccurate estimation. At the same time, the online data is only sufficient for the analysis of four educational attainment categories. Given that the educational attainment gap

[89] 2 x 6 x 11

is the key interest of this study, a more detailed breakdown is highly desirable. For this reason we have opted to use the PUMF with 9 educational attainment categories.[90]

Exercise A used online data, 4 categories, and no demographic controls. This exercise corresponds to the major assumptions used in our estimates of the gains on- and off-reserve and by registered Indian status. Exercise B represents the assumptions used in estimating the main results of this project which were presented above.

One notices that there are large differences between exercises A and B in many of the scenarios. For example, baseline Aboriginal employment is projected to be 77,000 workers higher under exercise A. Similarly, the baseline Aboriginal contribution to GDP is estimated to be about $4 billion under exercise A. The results are much more similar when all the gaps have closed (scenario 12). The consequences of closing the gaps also sometimes vary a lot. For example, closing the employment rate gap alone (scenario 2) under exercise A is expected to raise employment by 13.5 thousand workers, while the estimated effect is 1098.9 thousand workers under exercise B. These large differences may be a cause for concern if they reflect problems with using the data in the PUMF.

Fortunately, we have some reason to suspect that this is not the case. Exercise C demonstrates that we are able to generate employment results using the PUMF which are very similar to those in exercise A if we eliminate the demographic controls and use 4 educational attainment categories instead of 9. Exercises D and E attempt to distinguish which of these two features is the source of the differences between exercises A and B by applying the two changes to the methodology in B separately. One sees that almost all of the difference seems to be the result of applying the demographic controls.[91]

Theoretically, one would expect that closing the educational attainment gap should have a bigger impact with more categories. If only 4 categories are used, we may be missing important improvements which are occurring within these categories. An intuitive example is the category of a bachelor's degree or higher. Our nine categories separate this into those with bachelor's

[90] More are possible, but we limited the number because some finer potential categories, such as those with a PhD, have a very small number of Aboriginal observations in the PUMF.

[91] This provides some strong evidence that the demographic controls make a large difference, at least in terms of the impact of closing the gaps on employment. However, it is still not clear if the effect of the demographic controls is to improve our estimates – for example, maybe using the PUMF is fine at high levels of disaggregation but becomes problematic only when the demographic controls are applied. Alternatively, it could be that using the disaggregated PUMF data is not a major problem and that controlling for local gaps leads to a much more accurate understanding of the benefits. One way to distinguish these two situations would be to attempt another exercise which uses demographic controls on data from the online NHS tables. While we have not performed such an exercise, we did for a previous set of results (under the alternative assumption that there was no trend improvement in educational attainment) and found that the national results were similar to those using the PUMF. The results of this robustness exercise are included in the on-line appendix.

degree and those with a degree above the bachelor's level. As those with a medical or graduate degree tend to earn more and have higher odds of employment, closing the educational attainment gap in these two categories will have positive benefits which would be missed with only 4 categories. Comparing exercise B to D and exercise C to E under scenario 9 (only education gap closes) seems to confirm that some of the gains in terms of the Aboriginal contribution to GDP would be missed if we did not use the more detailed set of categories, although it is not clear that there is an impact on employment.

Table 49: Robustness of National Totals, Aboriginal Employment and Contribution to Output, Per Cent Growth over Baseline

	Aboriginal Employment					Aboriginal Contribution to Output				
Exercise	A	B	C	D	E	A	B	C	D	E
Educational Categories	4	9	4	4	9	4	9	4	4	9
Data Used	NHS Tables Online	NHS PUMF	NHS PUMF	NHS PUMF	NHS PUMF	NHS Tables Online	NHS PUMF	NHS PUMF	NHS PUMF	NHS PUMF
Demographic Controls	No	Yes	No	Yes	No	No	Yes	No	Yes	No
Scenario										
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1.68	14.99	1.59	15.09	1.49	0.60	12.78	0.71	12.69	0.59
3	0.00	0.00	0.00	0.00	0.00	11.06	7.82	10.60	8.68	9.03
4	1.68	14.99	1.59	15.09	1.49	11.67	21.81	11.43	22.80	9.62
5	5.18	6.19	5.51	5.45	5.50	12.51	17.57	13.69	13.47	15.91
6	5.98	17.49	6.38	17.68	6.14	12.13	27.14	13.69	24.35	15.56
7	5.18	6.19	5.51	5.45	5.50	25.31	22.97	26.19	22.02	25.89
8	5.98	17.49	6.38	17.68	6.14	24.81	33.48	26.19	33.42	25.89
9	10.36	12.38	11.02	10.90	11.01	25.03	35.13	27.38	26.94	31.83
10	10.27	20.00	11.18	20.28	10.80	23.66	41.47	26.19	36.01	30.64
11	10.36	12.38	11.02	10.90	11.01	39.56	38.12	41.67	34.72	42.52
12	10.27	20.00	11.18	20.28	10.80	37.95	45.13	40.48	45.08	41.33

Source: Calculations using the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division

There are clearly some differences between the exercises, but generally we conclude that the results are reasonably robust to our choice of data and educational attainment categories, at least when aggregated to the national level. As the level of disaggregation increases, using the PUMF may lead to some discrepancies in specific age, sex, and provincial categories where the number of Aboriginal observations is low.

vii. Estimates On and Off-Reserve

Table 50: Projected Educational Aboriginal and Non-Aboriginal Educational Attainment Based on 2006-2011 Trends, 2031

	Highest Certificate, Diploma, or Degree	No Certificate	High School	Postsecondary below bachelor	Bachelor's Degree or higher	Years of Education
	Years Education	9.29	12.79	14.20	16.77	
Non-Aboriginal	2006 Share (%)	23.10	25.66	32.69	18.55	
	2011 Share (%)	19.44	25.63	33.57	21.37	13.43
	Compound Annual Growth Rate of Share (%)	-3.40	-0.02	0.53	2.87	
	2031 Share (%) (Projected)	8.84	23.15	33.87	34.15	14.31
Aboriginal	2006 Share (%)	43.67	21.80	28.71	5.83	
	2011 Share (%)	37.97	23.92	30.67	7.44	12.19
	Compound Annual Growth Rate of Share (%)	-2.76	1.88	1.33	5.01	
	2031 Share (%) (Projected)	18.68	29.87	34.39	17.05	13.30
On-Reserve	2006 Share (%)	59.50	14.88	22.60	3.01	
	2011 Share (%)	55.72	17.99	22.95	3.34	11.29
	Compound Annual Growth Rate of Share (%)	-1.30	3.86	0.30	2.12	
	2031 Share (%) (Projected)	38.72	34.67	22.01	4.59	11.92
Off-Reserve	2006 Share (%)	38.45	24.07	30.72	6.76	
	2011 Share (%)	33.05	25.56	32.81	8.58	12.43
	Compound Annual Growth Rate of Share (%)	-2.98	1.21	1.33	4.89	
	2031 Share (%) (Projected)	15.62	28.13	36.95	19.29	13.53
Registered Indian Status	2006 Share (%)	50.48	18.65	25.78	5.09	
	2011 Share (%)	47.96	21.83	24.74	5.47	11.67
	Compound Annual Growth Rate of Share (%)	-1.02	3.21	-0.82	1.41	
	2031 Share (%) (Projected)	36.07	37.88	19.37	6.68	12.06
Non-Status	2006 Share (%)	39.03	23.89	30.98	6.11	
	2011 Share (%)	30.64	27.47	33.11	8.78	12.53
	Compound Annual Growth Rate of Share (%)	-4.73	2.84	1.34	7.54	
	2031 Share (%) (Projected)	8.28	34.22	30.73	26.76	14.00

Source: Author's calculations based on aggregate data from the 2011 National Household Survey, the 2006 Census, and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

Table 50 presents the projected 2031 educational attainment distributions of the non-Aboriginal, Aboriginal, Aboriginal on-reserve, Aboriginal off-reserve, registered Indian First Nations, and non-Registered First Nations populations used in assessing the closure of the educational attainment gaps. As there are no demographic controls used in the calculations for these groups, the educational attainment distribution of the Aboriginal populations will be identical to that projected for the non-Aboriginal population in the event that the education gap closes.

The really important feature to notice in

Table 50 is the projected divergence between those living on- and off-reserve by 2031. We project that 38.7 per cent of Aboriginal people who live on-reserve will not have any certificate, diploma, or degree in 2031 compared to 15.6 per cent of Aboriginal people living off-reserve and 8.8 per of the non-Aboriginal population. In terms of years of educational attainment, we project that Aboriginal people living off-reserve will actually fair slightly better than the non-Aboriginal population in 2011. As a result of the greater progress and better starting point of those living off-reserve, we will see that the gains from closing the educational attainment gap are estimated to be far greater on-reserve. A very similar situation exists when comparing the gains for the First Nations population by registered Indian status.

Table 51: Projected Outcomes for the Aboriginal Population Relative to Baseline Scenario (Levels), On- and Off-Reserve, 2031

Aboriginal Outcomes		Baseline	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
Employment (thousands)	Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
	On-Reserve	172.8	58.3	0.0	38.9	77.8	117.5
	Off-Reserve	575.1	-13.0	0.0	19.0	38.1	20.9
	Total	747.9	45.3	0.0	57.9	115.9	138.3
Contribution to GDP (billions 2010 dollars)	On-Reserve	13.3	3.8	4.0	6.4	12.8	24.9
	Off-Reserve	62.7	-1.6	5.7	5.6	11.2	15.8
	Total	76.0	2.3	9.7	12.0	24.0	40.7
Average Annual Employment Income (2010 dollars per worker)	On-Reserve	38,486	-1,423	11,671	8,085	13,659	27,334
	Off-Reserve	54,487	-125	4,951	2,951	5,719	11,332
	Total	50,791	-1,468	6,503	3,793	7,077	15,029

Source: Author's calculations based on aggregate data from the 2011 National Household Survey and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

Aboriginal people living on-reserve tend to have especially poor economic and social outcomes compared to Aboriginal people living off-reserve. Moreover, while Aboriginal people off-reserve seem to have made considerable progress towards closing the gaps, there has been very little improvement on-reserve.[92] Projections from "Aboriginal Demography: Population, Household and Family Projections, 2006-2031" are that 32.75 per cent of Aboriginal people will be living on-reserve in 2031. Given the unique features of reserves and the large number of Aboriginal people living on them, it may be interesting to disentangle the potential benefits of closing the gaps for Aboriginal people living in these very different environments.

Table 52: Projected Outcomes for the Aboriginal Population Relative to Baseline Scenario (per cent), On- and Off-Reserve, 2031

Aboriginal Outcomes Relative to Baseline (per cent)		Baseline	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Employment	On-Reserve	0.00	33.72	0.00	22.52	45.04	67.98
	Off-Reserve	0.00	-2.26	0.00	3.31	6.62	3.63
	Total	0.00	6.05	0.00	7.75	15.49	18.49
Contribution to GDP	On-Reserve	0.00	28.78	30.33	48.26	96.52	187.29
	Off-Reserve	0.00	-2.49	9.09	8.90	17.81	25.18
	Total	0.00	2.99	12.80	15.79	31.59	53.56
Average Annual Employment Income	On-Reserve	0.00	-3.70	30.33	21.01	35.49	71.02
	Off-Reserve	0.00	-0.23	9.09	5.42	10.50	20.80
	Total	0.00	-2.89	12.80	7.47	13.93	29.59

Source: Author's calculations based on aggregate data from the 2011 National Household Survey and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

As discussed in the methodology section, data limitations require us to produce cruder estimates for populations on- and off-reserve which do not control for age, sex, and province, only consider a narrower set of four educational categories, and rely upon further assumptions to estimate the average income on-reserve by education. Consequently, the aggregate results for the Aboriginal population will differ from those considered previously.

Additionally, the point of comparison on-reserve is also problematic because there are few non-Aboriginal people. We assume that both those on and off-reserve should be able to

[92] For example, the employment rate of the total Aboriginal population 15+ on-reserve fell from 37.7 per cent in 2001 to 35.6 per cent in 2011 while the employment rate of the total Aboriginal population 15+ off-reserve rose from 54.2 per cent to 56.6 per cent over the same period.

achieve the same outcomes as the average non-Aboriginal Canadian. However, the abundance of social problems, lack of opportunity, diseconomies of scale, and economic isolation which prevail in many reserves would likely result in poorer outcomes for non-Aboriginal Canadians if they lived on-reserve too. At best, the non-Aboriginal outcomes on-reserve likely would be much closer to those of rural non-Aboriginal people. For this reason, the gains which we estimate for those living on-reserve are likely overestimates and should be viewed cautiously.[93]

First, consider the levels of outcomes on- and off-reserve. Our projections indicate that there will be about twice as many people living off-reserve as there will be living on-reserve, but one observes that the projected employment under the baseline scenario on-reserve is less than one third of that off-reserve. The projected baseline employment rate is 39.3 per cent on-reserve compared to 63.6 per cent off-reserve.

Table 53: Projected Absolute Improvements to National Growth Rates and Cumulative Output from Closing the Gaps On- and Off-Reserve, 2011-2031

Impact on 2011-2031 Aggregate Growth Rates Relative to Baseline (percentage point increase)		Baseline	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Employment (thousands)	On-Reserve	0.78	0.01	0.00	0.01	0.02	0.03
	Off-Reserve	0.78	0.00	0.00	0.00	0.01	0.01
	Total	0.78	0.01	0.00	0.01	0.03	0.03
Output (billions of 2010 dollars)	On-Reserve	2.17	0.01	0.01	0.01	0.02	0.05
	Off-Reserve	2.17	0.00	0.01	0.01	0.02	0.03
	Total	2.17	0.00	0.02	0.02	0.05	0.08
Productivity	On-Reserve	1.38	-0.01	0.01	0.00	0.01	0.02
	Off-Reserve	1.38	0.00	0.01	0.01	0.01	0.03
	Total	1.38	-0.01	0.02	0.01	0.02	0.04
Cumulative Gains to GDP (2010 dollars)	On-Reserve	0.0	35.2	37.1	59.1	118.2	229.1
	Off-Reserve	0.0	-14.3	52.4	51.4	102.8	145.2
	Total	0.0	20.9	89.6	110.5	220.8	373.9

Source: Author's calculations based on aggregate data from the 2011 National Household Survey and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

[93] Alternatively, one could interpret these results as the potential improvement in Aboriginal labour market outcomes if the Aboriginal population migrated off-reserve **and** the gaps disappeared off-reserve.

The gains to employment from eliminating the education gap are relatively modest off-reserve – only about 6.6 per cent under Scenario 9 (Table 52). Under the same scenario, the gains on-reserve over the baseline are estimated at 45.0 per cent. Not surprisingly, the gains from closing the employment rate gap are also far larger on-reserve – although it may be somewhat surprising that off-reserve the estimated benefit of doing this is actually negative: Aboriginal employment is estimated to fall from 575,100 in the baseline to 562,100 under Scenario 2. The explanation for this is that, in 2011, the labour force participation rates conditional on education of the off-reserve Aboriginal population aged 15+ were higher than those of the corresponding non-Aboriginal population.

The gains in terms of the Aboriginal contribution to GDP if the gaps are closed are quite high off-reserve. Eliminating the education gap alone could boost the Aboriginal contribution to GDP off-reserve by 17.8 per cent, while eliminating the income gap would raise it by about 9.1 per cent. However, the relative gains are far larger on-reserve where closing these two gaps could raise output by 96.5 per cent and 30.3 per cent respectively. Closing the employment rate gap also helps on-reserve, boosting output by 28.8 per cent over the baseline. If all three gaps were closed at once on-reserve, we estimate that the gains over the baseline in terms of output could be as great as 187.9 per cent.

Table 54: Projected Per Cent Improvements to National Growth Rates and Cumulative Output from Closing the Gaps On- and Off-Reserve, 2011-2031

Impact on 2011-2031 Aggregate Growth Rates Relative to Baseline (per cent increase)		Baseline	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Employment	On-Reserve	0.00	1.85	0.00	1.24	2.47	3.73
	Off-Reserve	0.00	-0.41	0.00	0.61	1.21	0.66
	Total	0.00	1.44	0.00	1.84	3.68	4.39
Output	On-Reserve	0.00	0.34	0.36	0.57	1.15	2.22
	Off-Reserve	0.00	-0.14	0.51	0.50	1.00	1.41
	Total	0.00	0.20	0.87	1.07	2.14	3.62
Productivity	On-Reserve	0.00	-0.52	0.56	0.19	0.38	1.34
	Off-Reserve	0.00	0.02	0.80	0.43	0.87	1.82
	Total	0.00	-0.50	1.36	0.62	1.24	3.15

Source: Author's calculations based on aggregate data from the 2011 National Household Survey and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections,

2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

Lastly, we consider employment income. On-reserve, baseline Aboriginal average employment income is projected to be a dismal $38,486 compared to a reasonable $54,487off-reserve. Closing the education gap could yield big improvements both on- (35.4 per cent) and off-reserve (10.5 per cent). The gains would be even greater if the income gap disappeared as well, but in this case both those on- and off- reserve would just have identical average employment income to the average non-Aboriginal Canadian at about $65,819.

What about the effect on national outcomes? As before, we use improvements over the baseline outcomes combined with the PEAP projections for 2031 to estimate aggregate employment, GDP, and productivity under each scenario. We then estimate the annual growth rates relative to the values of these variables in 2011 and compare these growth rates to the baseline (Table 53 and Table 54).

Even though fewer people live on-reserve, this is often where the biggest potential gains for aggregate outcomes lie because there is so much room for improvement. Closing the education gap alone (Scenario 9) is estimated to result in an increase in the national employment growth rate of 4.39 per cent. This total gain comes from an improvement of 3.73 per cent on-reserve and 0.66 per cent off-reserve. Closing all three gaps on-reserve could raise GDP growth by 2.22 per cent and productivity growth by 1.34 per cent compared to 1.41 per cent and 1.82 per cent respectively off-reserve.

The cumulative gains from half closing the education gap from 2011 to 2031 are estimated at $59.1 billion on-reserve and $51.4 billion off-reserve. Notice that the total is not the same as that from the exercise using the microdata (about 130 billion), which reflects the impact of controlling for more factors and the assumptions we made to obtain Aboriginal employment income estimates by education on-reserve. Some of the totals seem to be in the same range while others are quite different. At best, if all three gaps close, the cumulative income generated is estimated at $373.9 billion, $229.1 billion of which would come from those living on-reserve.

viii. Estimates for the First Nations Population by Registered Indian Status

Table 55, Table 56, Table 57, and Table 58 present results for an exercise considering the gains for the First Nations population by Registered Indian Status. Recall that, like the preceding on-reserve / off-reserve exercise, these estimates were made without demographic controls, so they are not perfectly comparable to the results for the breakdown of the gains by the Métis, First Nations, and Inuit populations presented earlier.

Table 55: Projected Outcomes for the First Nations Population Relative to Baseline Scenario (Levels) by Registered Indian Status, 2031

First Nations Outcomes		Baseline	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Employment (thousands)	Status	315.5	59.7	0.0	55.1	110.2	148.6
	Non-Status	90.6	-1.2	0.0	0.9	1.8	0.8
	Total	406.2	58.6	0.0	56.0	112.0	149.4
Contribution to GDP (billions 2010 dollars)	Status	28.75	4.58	3.16	11.27	22.55	32.19
	Non-Status	10.22	-0.12	1.06	0.45	0.91	1.92
	Total	38.97	4.46	4.22	11.73	23.46	34.11
Average Annual Employment Income (2010 dollars per worker)	Status	45,558	-1,159	5,073	8,525	14,824	20,261
	Non-Status	56,405	59	5,496	1,801	3,568	9,414
	Total	47,978	-1,259	5,173	6,831	12,190	17,704

Source: Author's calculations based on data from the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

Table 56: Projected Outcomes for the First Nations Population Relative to Baseline Scenario (per cent) by Registered Indian Status, 2031

First Nations Outcomes Relative to Baseline (per cent)		Baseline	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Employment	Status	0.00	19.16	0.00	17.67	35.34	47.65
	Non-Status	0.00	-1.23	0.00	0.96	1.92	0.84
	Total	0.00	14.35	0.00	13.73	27.47	36.62
Contribution to GDP	Status	0.00	16.13	11.14	39.69	79.38	113.32
	Non-Status	0.00	-1.13	9.74	4.18	8.37	17.67
	Total	0.00	11.36	10.75	29.88	59.76	86.89
Average Annual Employment Income	Status	0.00	-2.54	11.14	18.71	32.54	44.47
	Non-Status	0.00	0.11	9.74	3.19	6.33	16.69
	Total	0.00	-2.62	10.75	14.20	25.33	36.80

Source: Author's calculations based on data from the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

Table 57: Projected Absolute Improvements to National Growth Rates and Cumulative Output from Closing the Gaps for the First Nations Population by Registered Indian Status, 2011-2031

Impact on 2011-2031 Aggregate Growth Rates Relative to Baseline (percentage point increase)		Baseline (Level)	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Employment	Status	0.78	0.01	0.00	0.01	0.03	0.04
	Non-Status	0.78	0.00	0.00	0.00	0.00	0.00
	Total	0.78	0.01	0.00	0.01	0.03	0.04
Output	Status	2.17	0.01	0.01	0.02	0.04	0.06
	Non-Status	2.17	0.00	0.00	0.00	0.00	0.00
	Total	2.17	0.01	0.01	0.02	0.05	0.07
Productivity	Status	1.38	-0.01	0.01	0.01	0.02	0.02
	Non-Status	1.38	0.00	0.00	0.00	0.00	0.00
	Total	1.38	-0.01	0.01	0.01	0.02	0.03
Cumulative Gains to GDP (2010 dollars)	Status	0.0	42.2	29.1	103.8	207.5	296.0
	Non-Status	0.0	-1.1	9.7	4.2	8.4	17.7
	Total	0.0	41.1	38.9	108.0	215.8	313.6

Source: Author's calculations based on data from the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

Our projections indicate that about 82.6 per cent of the First Nations population will have Registered Indian status in 2031.[94] Consequently, the reader should not be surprised that this group has much larger absolute gains in terms of employment and their contribution to GDP from closing the gaps by 2031. However, our estimates also suggest that the Registered Indian population will experience much larger gains relative to their baseline compared to the non-Registered population.

If only the educational attainment gap were to close (Scenario 9), we estimate that the employment of First Nations with Registered Indian status would rise by 35.3 per cent, their contribution to GDP would rise by 79.4 per cent, and their average hourly earnings would rise by 32.5 per cent compared to the baseline (Scenario 1) (see Table 56). The gains for the non-status First Nations population would be far more modest: about 1.9 per cent for employment, 8.4 per cent for their contribution to GDP, and 6.3 per cent for average wages. These differences in the potential gains reflect the fact that non-Status First Nations face narrower gaps to begin with.

[94] This compares to an estimated population share of 84.2 per cent in 2006 underlying the projections. This is somewhat different from the population share of 74.9 per cent in the 2011 NHS, but much of this difference may be because the 2006 number used in generating the projections was adjusted for under coverage.

Table 58: Projected Per Cent Improvements to National Growth Rates and Cumulative Output from Closing the Gaps for the First Nations Population by Registered Indian Status, 2011-2031

Impact on 2011-2031 Aggregate Growth Rates Relative to Baseline (per cent increase)		Baseline	Employment Rate Gap Closes	Income Gap Closes	Education Gap Half Closes	Education Gap Closes	All Three Gaps Close
	Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 5	Scenario 9	Scenario 12
Employment	Status	0.00	1.90	0.00	1.75	3.50	4.71
	Non-Status	0.00	-0.04	0.00	0.03	0.06	0.03
	Total	0.00	1.86	0.00	1.78	3.56	4.74
Output	Status	0.00	0.41	0.28	1.01	2.01	2.87
	Non-Status	0.00	-0.01	0.09	0.04	0.08	0.17
	Total	0.00	0.40	0.38	1.05	2.09	3.04
Productivity	Status	0.00	-0.44	0.44	0.58	1.15	1.79
	Non-Status	0.00	0.00	0.15	0.05	0.09	0.25
	Total	0.00	-0.44	0.59	0.62	1.24	2.04

Source: Author's calculations based on data from the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, and "Aboriginal Demography: Population, Household and Family Projections, 2006-2031," a research project by the Planning, Research, and Statistics Branch of Aboriginal Affairs and Northern Development Canada.

Improving outcomes for the Registered Indian population could have notable impacts on Canada's economy. We find that eliminating the educational attainment gap alone for this group could raise the growth rate of employment by 3.5 per cent, the growth rate of GDP by 2.0 per cent, and the growth rate of productivity by 1.2 per cent between 2011 and 2031 (see Table 58). This could have a cumulative value of $208 billion over the period. Closing the same gap for non-Status First Nations could generate an additional $8 billion of GDP cumulatively.

ix. Retrospective Analysis of the Realized Gains from 2001 – 2011

The exercises above provide estimates of the future benefits of successfully increasing the formal education of Aboriginal people. Forward looking estimates are especially important for policy makers, as present changes in policy can only affect future outcomes. [95] That being said, estimates of future benefits from closing the education gap are limited by our ability to accurately forecast the relevant variables. The exercises above rely upon forecasts of the population, educational attainment, and economic outcomes twenty years into the future and it is difficult to know how accurate these forecasts will be. The estimates above should not be viewed as precise values, but rather as ballpark estimates.

[95] Unless such policy changes were anticipated in advance, in which case they may indirectly have altered behaviour in the past.

One way to avoid much of the uncertainty and assumptions that are part of estimating future benefits is to look to the past where our data are more reliable.[96] The gains from closing the educational attainment gap in the near future are likely not all that different from the unrealized gains from closing the gap in the recent past. By comparing the realized economic benefits from progress in Aboriginal education between 2001 and 2011 to counterfactual scenarios in which there was no improvement or the gap was completely closed, we can both assess the return on investment in past pro-education policies and bring attention to the substantial costs which are being incurred from failing to close the gap.

The retrospective exercise proceeds much like those above, but the scenarios considered are slightly different. The baseline scenario is now the realized outcomes in 2011 based off of numbers from Statistics Canada's macroeconomic accounts and the National Household Survey. As there is no uncertainty with regards to Aboriginal labour market outcomes conditional upon education in 2011, we no longer need to make assumptions about how these gaps close – we just assign the observed employment rates and incomes from the 2011 National Household Survey PUMF.[97] The exercise only involves a comparison of counterfactual Aboriginal educational attainment in 2011 to the observed educational attainment in the National Household Survey. Specifically, we have two counterfactuals in mind:

1) The Aboriginal education gap in 2011 is completely eliminated. Comparing the outcome under this counterfactual to the real outcomes observed in 2011 estimates the losses incurred in 2011 from failing to fully close the gap since 2001.

2) The Aboriginal educational attainment gap remains the same as it had been in 2001 (in relative terms). Comparing the outcomes under this counterfactual to the real outcomes observed in 2011 estimates the realized gains in 2011 from progress on the gap since 2001.

Implementation of the first counterfactual is simple. We just apply the 2011 non-Aboriginal educational attainment to the Aboriginal employment rates and incomes (conditional upon employment) in each age-sex-province bin using data from the National Household Survey and then aggregate the results over all the bins.

The second counterfactual is more difficult as it is not entirely obvious how to apply the gap between the educational attainment distributions from 2001 to outcomes in 2011. The way we do it is to take the ratio of the Aboriginal and non-Aboriginal population shares in each educational attainment category in 2001 and then apply these ratios to the 2011 non-Aboriginal population shares in the corresponding educational attainment categories. The resulting

[96] Of course, the usual concerns about comparing the 2001 long form Census data on the Aboriginal population to data from the 2011 National Household Survey still apply.

[97] As a point of comparison, one may also be interested in the consequences of progress made on these gaps between 2001 and 2011. The results for eliminating these non-education gaps are included in the appendix.

counterfactual Aboriginal education distribution is then renormalized so that the shares sum to 100 per cent. Like in the first counterfactual, the resulting counterfactual Aboriginal education distribution for each age-sex-province bin is then applied to the Aboriginal employment rates and incomes (conditional upon employment) in the bin using data from the National Household Survey and the results are aggregated over the bins.

The results from the second counterfactual indicate that changes in the educational attainment of Aboriginal Canadians relative to that of non-Aboriginal Canadians between 2001 and 2011 had a negative impact on Aboriginal labour market outcomes. However, there have been considerable improvements in the level of Aboriginal education which have resulted in substantial gains. However, the non-Aboriginal population has made very similar progress so that when we only consider the benefits from closing the gap, we do not observe any of this progress. For this reason, we present results from a third counterfactual exercise which estimates the realized gains from absolute progress in terms of Aboriginal educational attainment. This counterfactual simply applies the 2001 Aboriginal educational attainment distribution to the 2011 Aboriginal population, employment rates, and incomes (again, by age, sex, and province). Comparing the results of this exercise to the outcomes observed in 2011 provides an estimate of the value of realized improvements in Aboriginal education levels.

Before considering the results, the confused reader may wish to consider the following short example illustrating the nature of the exercise.

Suppose that there are only two educational attainment levels. Call them uneducated and educated. Suppose the employment rate in 2011 for educated Aboriginal workers is 100 per cent, while the employment rate for uneducated Aboriginal workers is 50 per cent. There are no demographic characteristics or income levels in this example.

Further, suppose that we observe the following educational attainment distributions for the Aboriginal and non-Aboriginal populations in 2001 and 2011:

Table 59: Values for Example of Retrospective Exercise

	Year	Uneducated (per cent share)	Educated (per cent share)
Aboriginal	2001	75	25
	2011	60	40
Non-Aboriginal	2001	50	50
	2011	25	75

The relevant baseline is the observed Aboriginal outcome in 2011 – 60 per cent of the population is uneducated. This corresponds to an average employment rate of 70 per cent (calculated as 0.6*0.5+0.4*1). Say there are 1,000,000 working age Aboriginal people. Then Aboriginal employment under the baseline is 700,000.

Counterfactual 1: Eliminating the educational attainment gap means that we apply the 2011 non-Aboriginal education distribution to the Aboriginal population (25 per cent uneducated). Under this education distribution, the Aboriginal employment rate would be estimated at 87.5 per cent (calculated as 0.25*0.5+0.75*1). There would be 875,000 Aboriginal workers employed, a gain of 175,000 over the baseline. We interpret this as meaning that eliminating the educational attainment gap in 2011 would raise employment by 175,000 workers.

Counterfactual 2: In this case, we use the gaps in each category in 2001 to construct a similar gap in 2011. First we take the ratio of the Aboriginal to non-Aboriginal population shares in 2001. For the uneducated, the ratio is 75/50 = 3/2. For the educated the ratio is 25/50=1/2. If the gaps between the two identity groups remained in 2011, we can calculate Aboriginal educational attainment shares based off of those of the non-Aboriginal population. Thus, we obtain an Aboriginal uneducated share of 25*(3/2) = 37.5 per cent and an educated share of 75*(1/2) = 37.5 per cent. The reader should immediately note that we have a problem – the two shares only sum to 75 per cent. To correct for this, we rescale each share by a factor of (100/75) to obtain 50 per cent in each category.

Now that we have an estimated educational attainment distribution if the relative gaps education gap remained as it was in 2001, it is easy to calculate the Aboriginal employment rate as 75 per cent. This suggests that the employment rate would have been 750,000 had the gap remained unchanged since 2001. Thus we conclude that progress on the gap resulted in a loss of 50,000 Aboriginal jobs in 2011. This is not because Aboriginal education did not improve, but because it did not improved as much as non-Aboriginal education.

Counterfactual 3: The third counterfactual is simpler and attempts to quantify the gains from the absolute progress in Aboriginal education. This counterfactual applies the 2001 level of 75 per cent of Aboriginal people uneducated to the 2011 employment rates conditional on education. This produces an employment rate of 62.5 per cent (calculated as 0.75*0.5+0.25*1). Under this counterfactual, Aboriginal employment would be 625,000. Comparing to the baseline, we conclude that rising Aboriginal education levels have raised employment by 75,000 workers even though the gap relative to the non-Aboriginal population has not improved.

The main results are presented in Table 60. Some additional results which are broken down by age, sex, and province are included in the on-line appendix. Under the baseline scenario, national outcomes are taken from the PEAP projections. Employment was 17,300 thousand, GDP was $1.707 trillion, and labour productivity was $98,661 per worker. Since 2001, annual growth rates were 1.48 per cent, 1.99 per cent, and 0.50 per cent for employment, GDP, and labour productivity based upon the 2001 values reported in the PEAP projections.

Table 60: Summary Table of Results from Retrospective Exercise, 2001-2011

	Baseline (Actual Outcomes)	Counterfactual 1	Counterfactual 2	Counterfactual 3
Aboriginal Education Assumption	**Aboriginal 2011**	**non-Aboriginal 2011**	**2001 Gap**	**2001 Aboriginal Level**
Employment (thousands) in 2011	**17,300**	**17,382**	**17,309**	**17,256**
GDP (billions of $2010) in 2011	**1,707**	**1,720**	**1,709**	**1,702**
Labour Productivity ($2010) in 2011	**98,661**	**98,982**	**98,705**	**98,629**
Absolute Improvements Over Baseline				
Employment (thousands)	**0.00**	**81.38**	**9.18**	**-44.40**
GDP (billions of $2010)	**0.00**	**13.61**	**1.68**	**-4.92**
Labour Productivity ($2010)	**0.0**	**321.0**	**44.6**	**-31.4**
Relative Improvements Over Baseline (per cent)				
Employment	**0.000**	**0.470**	**0.053**	**-0.257**
GDP	**0.000**	**0.797**	**0.098**	**-0.288**
Labour Productivity	**0.000**	**0.325**	**0.045**	**-0.032**
Implied Compound Annual Growth Rates (per cent), 2001-2011				
Employment	**1.482**	**1.529**	**1.487**	**1.456**
GDP	**1.988**	**2.069**	**1.998**	**1.959**
Labour Productivity	**0.499**	**0.532**	**0.503**	**0.496**
2001-2011 CARG Change Relative to Baseline (per cent)				
Employment	**0.000**	**3.215**	**0.363**	**-1.760**
GDP	**0.000**	**4.075**	**0.504**	**-1.481**
Labour Productivity	**0.000**	**6.544**	**0.910**	**-0.641**
Cumulative Gains to GDP Over Baseline (2010 Dollars), 2001-2011	**0.00**	**70.55**	**8.70**	**-25.56**

Source: Author's calculations based upon public use microdata files from the 2011 National Household Survey and the 2001 Census

How did changes to the education gap between 2001 and 2011 affect Canada? If the relative gap had remained unchanged since 2001 (counterfactual 2), we estimate that GDP would have been $1.68 billion higher in 2011 while cumulative gains over the period could have amounted to $8.70 billion (Table 60). The impacts on the growth rates of employment, GDP, and productivity under this scenario are small – in the realm of one percent. These numbers indicate that changes to the relative educational attainment gap have actually made Aboriginal people and Canada as a whole worse off. [98] However, this is somewhat misleading, as there was enormous

[98] The reader may be confused by this point since earlier in this report we concluded that the relative educational attainment gap had actually closed very slightly based on years of educational attainment. To understand how it can be consistent to now say that changes in the relative gap have lead to worse outcomes, the reader needs to understand two points. First, the population considered earlier in the report only included those aged 25-64 while this exercise includes the full population 15+. Second, the details in the distribution underlying our summary measure of years educational attainment can matter. An additional "year of educational attainment" from raising the population share which has completed high school may have a different impact in terms of income and employment than an additional year from raising the population share in university.

improvement in Aboriginal education levels over the period and this improvement has had a positive impact on the Canadian economy. This analysis is just indicating the extent of the additional value which could have been generated if improvements in Aboriginal educational attainment had matched the improvements in non-Aboriginal educational attainment. Counterfactual 3 presents estimated outcomes in 2011 if Aboriginal education had remained at the same level as in 2001. This counterfactual allows us to estimate the realized value of the observed improvements in Aboriginal education. We estimate that employment was increased by 44,400 workers and GDP by $4.92 billion in 2011 as a result of the improvements in Aboriginal education since 2001. We estimate that the cumulative value of additional GDP generated between 2001 and 2011 as a result of these improvements was $25.6 billion.[99]

This indicates that investments in Aboriginal education have likely had a large positive impact, but the unrealized gains which could have been captured from fully closing the education gap are much larger (Counterfactual 1). Closing the education gap could have raised the GDP growth rate by 4 per cent and the labour productivity growth rate by 7 per cent. The additional value to GDP over what was achieved between 2001 and 2011 could have amounted to $70.6 billion.

These improvements are substantial if we are considering absolute rather than relative performance on education. However, the lost benefits of having no Aboriginal-non-Aboriginal differences in education were even larger.

[99] Underreporting of high school completion rates in the 2001 census means that these values which are based upon improvements in the absolute levels of Aboriginal education from 2001 to 2011 may be somewhat overstating these effects. However, assuming that the underreporting issue was the same for both the Aboriginal and non-Aboriginal populations, this underreporting will not have affected the relative gaps or any calculations based upon them.

V. Conclusion

A. Summary of Major Findings

This report can be summarized in terms of five main findings.

1. Education is Very Important for Economic and Social Outcomes

The academic literature strongly supports the idea that education is a major determinant of individual labour market outcomes. Individuals with more education are more likely to participate in the labour force, more likely to find a job if they do, and earn higher wages. This occurs for several reasons – education teaches valuable skills and knowledge which boost productivity, education signals inherent abilities, and education socializes individuals. Better educated individuals can also have positive economic and social externalities[100] on other members of society.

2. Aboriginal People Continue to Have Worse Educational and Labour Market Outcomes than Non-Aboriginal People

Aboriginal people continue to be less educated, less likely to be employed, and earn lower incomes on average than non-Aboriginal Canadians despite policy efforts to improve Aboriginal outcomes.[101] There are many potential sources of these disparities which are difficult to disentangle. Lower education levels explain part of the relatively poor economic performance. Poor economic outcomes can reinforce substandard education for Aboriginal youth. Demographic factors such as a relatively young Aboriginal population which is less concentrated in urban areas can explain part of the economic and education gaps, but there seem to be other social and institutional factors which are relevant too.

Some Aboriginal groups fare better than others. Those living on-reserve tend to be the worst off. The gaps tend to be smaller for women, Aboriginal people living in Atlantic Canada, the Métis, and the better educated than for other groups.[102]

[100] There are many examples of positive spillover effects from increased education. Educated individuals play an important role in the innovation process – improvements in productivity as a result of innovation can raise incomes and generate jobs benefiting many individuals besides the innovators. As we have seen earlier, crime rates are lower for the educated – lower crime rates benefit not just the perpetrators but also the victims. Better educated individuals tend to be healthier which can lead to a lower total cost of public expenditure on healthcare.

[101] This is not to say that existing policies have not had a positive effect (see point 3). It takes time for the effects of education policy to be fully realized.

[102] There are some exceptions to these trends. For example, there is almost no earnings gap between the Aboriginal and non-Aboriginal populations for employed persons with less than a high school diploma while there is still a sizable gap for those who have earned a bachelor's degree.

3. The Gaps are Closing (At Least in Terms of Labour Market Outcomes)

The good news is that most of the gaps appear to have been narrower in 2011 than they were in 2001, at least to the extent that intertemporal comparisons between the 2001 Census and the 2011 National Household Survey are informative. The employment income and unemployment gaps are the most improved. The employment rate gap has also improved somewhat, although the participation rate gap has not improved much.

The educational attainment gap is more difficult to assess because it is not obvious how it should be measured. If one measures it in terms of an approximate average years of schooling based on the highest level of education achieved, then one finds that the gap has just barely improved over the decade. What is clearer is that the education level of the Aboriginal population has increased. The share of Aboriginal people aged 25-64 without a high school education has fallen from 71.1 per cent in 2001 to 61.3 per cent in 2011 while the share with a postsecondary education has increased from 38.4 per cent to 48.4 per cent. Similar trends have occurred for the non-Aboriginal population at the same time, which is why the gap persists.

The improvement in education has occurred almost entirely off-reserve. Education levels on-reserve have barely made any progress. For example, in 2001, 48.4 per cent of those aged 25 to 64 on-reserve did not possess a certificate, diploma, or degree. This number fell slightly to 46.4 per cent. Off-reserve, improvement was much greater for the Aboriginal population (35.2 per cent in 2001 to 24.2 per cent in 2011) and even for the non-Aboriginal population (22.3 per cent in 2001 to 12.1 per cent in 2011).

4. Improved Aboriginal Education Generated Economic Benefits between 2001 and 2011, but only a Fraction of what was Possible

Controlling for age, gender, and province of residence, we find that changes in the relative education gap between 2001 and 2011 actually had a negative impact on economic performance.[103] However, looking at improvements in the levels instead of just the gap, we find that improvements in Aboriginal education could account for $4.92 billion (2010 dollars) of Canadian GDP generated in 2011, or about 0.29 per cent of GDP that year. We estimate that the cumulative impact of improved education between 2001 and 2011 may be as high as $25.6 billion. We estimate that additional output worth nearly $70.6 billion could have been generated if the education gap had been eradicated over the course of the decade.

[103] This is possible despite the fact that the gap did not widen in our summary measure of years of education at the national level. First, our analysis of the change in the gap focused on the population aged 25-64 while assessment of the gains from closing the gap considered the broader population of all individuals aged 15 and above. Second, the distribution of progress across educational attainment categories matters. The relative educational attainment gap widened in certain educational categories. The returns to education differ across educational attainment categories in a way which is not necessarily proportional to the total years of schooling of those in the category, and these differences in returns can differ based on demographic characteristics.

5. The Potential Returns to Improving Aboriginal Education Remain High

Using projections of the Aboriginal population and aggregate economic conditions in 2031 along with data from the 2011 National Household Survey, we estimate that eliminating the educational attainment gap could raise the average employment income of the Aboriginal workforce in 2031 by $11,236 (2010 dollars). If the employment rate and income gaps closed too, we estimate that the cumulative impact on economic output could be as great as $334.7 billion with an additional $864 of GDP per capita in 2031. The potential benefits remain very large. Improving Aboriginal education could have non-negligible effects on the national employment, productivity, and GDP growth rates over the next 17 years, raising them by 0.04, 0.03, and 0.07 percentage points respectively.

B. Policy Implications

The major implication of our report for policy is straightforward and not surprising: resources should be allocated towards improving Aboriginal education because there appear to be very large returns to doing so. This study has only focused on the benefits of improved education, but not the feasibility or costs of actually achieving this. From 2011-2012, the government of Canada spent $1.55 billion on supporting First Nations education at the elementary and secondary levels plus an additional $200 million on construction and maintenance of education facilities on-reserve according to Aboriginal Affairs and Northern Development Canada.[104] Aboriginal Affairs and Northern Development Canada also assists First Nations and Inuit post-secondary students with the costs associated with acquiring a postsecondary education through the Post-Secondary Student Support Program. In light of the potential scale of the benefits, this level of spending seems well justified.

There are many different ways in which better education outcomes for Aboriginal Canadians could be promoted. While we do not seek to make recommendations or analyze specific policies here, we will briefly mention a few possible approaches. One part of the problem is ensuring that the necessary infrastructure, materials, and educators are in place to offer an engaging and intellectually stimulating education to all Canadians who seek one. This can involve both increasing the amount of educational inputs and making improvements to the quality of resources used. There is much controversy with regards to the First Nations education funding gap compared to the funding received by provincial schools.[105] Presumably, First Nations students require similar levels of funding to non-Aboriginal students living in comparable communities (if not more given the special needs of Aboriginal communities), but improving Aboriginal education outcomes goes beyond just the amount of money spent. Effective administration of the funding which ensures that it is being put to the best possible use is equally important.

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[104] More specific information is available at https://www.aadnc-aandc.gc.ca/eng/1349140116208/1349140158945

[105] See Drummond and Rosenbluth (2013) for an excellent discussion of this issue

Lack of access to adequate schooling is likely not the only reason that Aboriginal youth struggle to complete high school. Social problems which are especially prevalent amongst the Aboriginal population can impede success at school. Poorly educated relatives who do not value education or lack the skills to help their children to succeed are one potential barrier. Concerns about health, housing, and safety may make it difficult for students to focus on schooling. Curricula which fail to embrace Aboriginal culture and involve the Aboriginal community may disenchant Aboriginal students, resulting in disengagement and substandard performance. Racism in schools that do not have students from diverse backgrounds might be a barrier for some Aboriginal students. Steps need to be taken to offer the social support necessary for Aboriginal children and youth to attend and succeed at school.

As we have seen, poor education is not just a problem for future generations. It is prevalent across all age groups. Policymakers should also keep in mind that many individuals in their twenties and thirties could potentially be in the workforce for decades. Investing in the completion of basic education for these individuals could potentially be fruitful.

Providing high quality information to parents, children, and young adults is another important component. The returns to investing in education, and the expected consequences of failing to do so should be made apparent to the relevant decision makers.

This study also may provide some guidance as to potential subsets of the Aboriginal population for which the returns to improving education might be especially high. The returns to closing the educational attainment gap were notably higher for men, the First Nations and Inuit, those living in Alberta, Manitoba, and the Territories, and especially those living on-reserve. The potential for higher returns from improving the education of these groups might suggest that they should be priorities. Of course, this has to be weighed against the relative cost of improving outcomes for these groups. The returns to closing the gap for the Métis may be much smaller, but it could be that it is also much cheaper to do. This study does not address the cost side, but it can direct the reader to those segments of the population where the benefits appear to be largest.

C. Limitations

Assessing the size of the gaps between Aboriginal and non-Aboriginal Canadians, evaluating progress towards closing the gaps over time, and estimating the future value of successfully eliminating the gap are important tasks for the formulation of effective Aboriginal education policy. We conclude this report with some comments on the limitations of this study and suggestions as to how future research on this topic may improve.

In order to effectively evaluate how much the education and labour market gaps have closed, a researcher requires high quality, consistent data. There are several problems with comparing the Aboriginal data from the National Household Survey to that of the previous Censuses. One problem is the limited coverage of reserves, some of which are not fully enumerated in all years. A second problem is the voluntary nature of the National Household

Survey. If individuals with poor labour market outcomes were less likely to answer the voluntary National Household Survey than the mandatory long form Canadian census, then changes in the population sampled could be mistaken for improvement in Aboriginal outcomes.

A related issue is ethnic mobility or transfer. If individuals who were considered non-Aboriginal in the 2001 census had the same average outcomes as other non-Aboriginal people in 2001, then they would improve the average outcomes of the Aboriginal population if they reported an Aboriginal identity in 2011. As a result, we may see improvement in Aboriginal outcomes between 2001 and 2011 through a composition effect even if those who reported an Aboriginal identity in 2001 were not any better off in 2011. These problems make it difficult to interpret the observed changes in the gaps. Ideally, a researcher would like to possess longitudinal data which provides information on the same set of Aboriginal and non-Aboriginal individuals over time. This would allow the researcher to better understand the consequences of ethnic mobility on the evaluation of the gaps and maintain consistency across the observed population.

The ability to assess the value of improved education in the future relies crucially on forecasts. We are pleased with the quality of the data sources we have used for Aboriginal population and economic projections, but one does need to keep in mind that these are only estimates of what will happen in the future which are based upon many assumptions. It is very difficult to know how a variable such as the rate of intragenerational ethnic mobility will change in the future.

We are somewhat limited by the availability of detailed projections of the age, sex, and provincial breakdown of the population. The projections we use provide national population shares by age and sex which we assume to be constant across provinces. This is likely unrealistic. We also do not have details of how the Inuit population will likely be distributed across the provinces. We opted to use national aggregates for the Inuit population, but another reasonable alternative would be to use the geographic distribution of the Inuit population from the National Household Survey. The population projections we have used are also slightly out of date, as they were generated a few years ago based on the Aboriginal population in 2006. Hopefully Statistics Canada will produce a more detailed and updated set of projections based on the most recent data in the near future.

One of the biggest data limitations which we faced involved not having detailed information on the urban and rural status of the population, both in the National Household Survey microdata and in projections of the future. We briefly showed that Aboriginal people are much less likely to live in CMAs or census agglomerations of 10,000 people or more, which act as a crude proxy for urban areas. Persons residing in smaller communities tend to be less educated and to have worse labour market outcomes. Consequently, if the Aboriginal people continue to be more concentrated in these smaller centers, comparing these rural individuals to

the average non-Aboriginal will result in obvious overestimates of the benefits from closing the gaps. Controlling for the urban-rural status of the population could greatly refine our estimates.

There is room for improvement with regards to the assumptions we have made about how the gaps will close over time. One issue is whether or not the levels of Aboriginal and non-Aboriginal educational attainment, employment rates, and wages are appropriate. We assume that employment rates and employment income conditional upon education will essentially be the same as in 2011[106] and only focus on how the gaps relative to the non-Aboriginal population change. One might be able to draw upon other sources to craft more reasonable assumptions as to how these variables are likely to evolve. We do attempt to project future baseline levels of Aboriginal and non-Aboriginal attainment, but the approach we adopt is very simplistic and assumes that recent trends of growth within every educational attainment category will persist.

Given the method of estimating the future levels labour market outcomes conditional upon education for the non-Aboriginal population, one also needs to make assumptions about how much the gaps close. We arbitrarily focus on the extremes of no closure or full closure compared to the baseline. One natural approach would be to consider what happens if the current rate of closure persists, much like we have done with educational attainment.

Another point to keep in mind is that when we are assuming the gap half closes (or fully closes), we are assuming that this occurs uniformly across the population. This is not a particularly realistic assumption. One expects that it is relatively unlikely that many 35 year olds in 2011 will opt to go back to school and close the educational attainment gap with their peers. It is even less likely for older age groups. Closure is more likely to occur amongst the very young, as they have a lot more time to reap the benefits of an investment in additional education. It may be more appropriate to look at the education acquisition rate of Aboriginal people in each bin relative to that of non-Aboriginal people and assume that this gap closes, rather than making a general assumption about convergence in education levels. Properly implementing such an assumption would likely require longitudinal data.

The other major problem with our estimates is that we are assuming an improvement in education will cause an individual to earn as much on average as others with that new level of education, conditional on age, sex, and province. This may be untrue, particularly if individuals are choosing their education level in part because of underlying differences in preferences, ability, or other unobservable characteristics. In the absence of such differences, one may expect that increasing the supply of skilled workers would lower the wages of these workers in equilibrium. Developing more realistic estimates of the impact of increased educational attainment conditional on observable characteristics would make the estimated benefits more precise.

[106] All wages are assumed to rise at the same rate, the national rate forecast in the PEAP projections. We do also account for demographic changes, at least with regards to age, sex, and province, but we do not address how these variables may change differently within an age-sex-province bin.

D. Suggestions for Future Work

Closely related to the limitations in the previous subsection, we will offer a few suggestions for future research evaluating the Aboriginal educational attainment gap.

Future work should strive to use the best possible data. While the census and NHS PUMF files provide a lot of flexibility in terms of constructing detailed breakdowns of the population by age, sex, education, and province/territory of residence, it has a limited sample size. While this does not appear to be an issue for assessing the benefits nationally, the limited sample sizes may be problematic in some of the smaller subpopulations considered such as Aboriginal people with a university degree above the bachelor's level. Future researchers wishing to assess the gains in more detail than we have done here would ideally do so using more detailed microdata through Statistics Canada's Research Data Centres or the Computer-assisted Products Specification System (CAPSS).

Further research should be devoted to better understanding the sources of the educational attainment and labour market gaps between the Aboriginal and non-Aboriginal population and how changes in these factors have impacted the gaps over time. We have made some effort in this report to quantify the importance of differences in educational attainment compared in generating the gaps, but more work could be done in terms of quantifying how much of the gaps are attributable to specific compositional differences between the Aboriginal and non-Aboriginal populations. For example, researchers could look at the changes within more detailed age cohorts over time.

In particular, a better understanding of the returns to education for the Aboriginal and non-Aboriginal populations living on- and off- reserve and in rural vs. urban areas would help in assessing the validity of some of the core assumptions of this report. Closely related to this, analysis of the impact of how educational attainment effects Aboriginal migration patterns may be useful in assessing potential bias from our provincial controls and the extent to which improved educational attainment on-reserve may actually translate into improved labour market outcomes.

There are additional factors which we have not explored here which also may explain part of the Aboriginal educational attainment gap – for example, an immigration system which selects highly educated individuals into the non-Aboriginal population may be expected to lead to some difference between Aboriginal and non-Aboriginal education levels. Quantification of the relative importance of the various factors in explaining the gaps would be useful in realistically assessing what a realistic target education of the Aboriginal population should be and the value of reaching such a target.

Further understanding of the continued role of ethnic mobility would also be useful in attempting to understand how the gaps have changed over time. Ideally, future research would

make use of longitudinal data in order to assess progress on the gaps in a consistent Aboriginal population over time.

In terms of the methodology used in assessing the benefits, there are a number of ways in which it could be improved. Controlling for additional differences between the Aboriginal and non-Aboriginal population, particularly the urban/rural division of the population, may substantially improve the estimates.

The approach to projecting the future educational attainment of the relevant populations could be much better developed. One might use a cohort components approach in combination with a model of the transition from one level of educational attainment to another over time based on historical trends to better estimate the future educational attainment of the population. Such an approach would likely produce far more reasonable estimates of future educational attainment and would facilitate calculations specific to each age-sex-location bin. Statistics Canada has projected postsecondary enrolment rates to 2031 which could be useful, particularly for estimating the educational attainment of the youngest cohorts (Hango and de Broucker, 2007). Forecasted improvements in educational attainment should differ for specific segments of the population (especially by age group) rather than applying the national trends to everyone as we have done here. Even if transition rates are not readily available, just using the existing levels of education for the older populations (aged 25+ in 2011) would likely provide a reasonable idea of the likely educational attainment of the population aged 45+ in 2031.

The scenarios we have considered in which the gaps improve are very crude. It is extremely unlikely that the educational attainment gap could be completely eliminated in 20 years. Researchers could develop much more realistic scenarios than the gap half closing. It is far more likely that progress could be made on the young population than on the old. One could assume that the gap closes for the population aged 15-40 in 2031 and remains for those above age 40, for example. Instead of making extreme assumptions about Aboriginal incomes or employment rates conditional upon education based on the gaps remaining unchanged or closing, one could use the trends in these gaps to project what they will be in 2031.

Future researchers may also choose to attempt to project the Aboriginal and non-Aboriginal labour market outcomes conditional upon education rather than assuming that they remain similar to those observed in 2011. For example, skill biased technological change may suggest that the gap in terms of labour market outcomes across levels of educational attainment could continue to grow over time. Similarly, long term regional trends in different parts of the country may suggest differing rates of improvement.

Closely related to this, future work may aim to provide information on the impact of closing the educational attainment gap on provincial employment, GDP, and productivity growth rates. Such analysis would require the use of more detailed long term projections which provide forecasts at the provincial level.

Researchers should continue to investigate the sources and consequences of the problems plaguing Canada's Aboriginal peoples. It is equally, if not more, important that efforts are dedicated to evaluating the effectiveness of various policies attempting to address these challenges, especially on-reserve where there seems to be very little improvement compared to what may be possible.

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Appendix

List of Appendix Tables[107]

[107] Additional appendix tables for this report are available on-line at: http://www.csls.ca/reports/2015-AboriginalEducation-OnlineAppendixTables.pdf

Appendix Table 1: Aboriginal Peoples as a Share of the Population, by Characteristic, 2001, 2006, 2011

Characteristic		Aboriginal Share of Total Population (%)			Change (percentage points)
		2001	2006	2011	2001-11
Province/Territory of Residence	Canada	3.29	3.75	4.26	0.97
	Newfoundland and Labrador	3.70	4.68	7.06	3.36
	Prince Edward Island	1.01	1.29	1.62	0.61
	Nova Scotia	1.90	2.68	3.73	1.83
	New Brunswick	2.36	2.45	3.07	0.71
	Quebec	1.11	1.46	1.84	0.73
	Ontario	1.67	2.02	2.38	0.71
	Manitoba	13.59	15.47	16.68	3.09
	Saskatchewan	13.52	14.88	15.64	2.12
	Alberta	5.31	5.78	6.19	0.88
	British Columbia	4.39	4.81	5.37	0.98
	Yukon Territory	22.94	25.11	23.14	0.20
	Northwest Territories	50.47	50.26	51.86	1.39
	Nunavut	85.21	84.96	86.32	1.11
Sex	Male	3.27	3.73	4.22	0.95
	Female	3.31	3.77	4.31	1.00
Age	Under 15	5.65	6.26	7.01	1.36
	15 to 24	4.24	5.04	5.89	1.65
	25 to 34	3.74	4.05	4.36	0.62
	35 to 44	2.87	3.53	4.03	1.16
	45 to 54	2.19	2.89	3.50	1.31
	55 to 64	1.86	2.22	2.74	0.88
	65+	1.09	1.39	1.82	0.73
	Aged 15-64	3.02	3.55	4.08	1.06

Source: 2001 Canadian Census, 2006 Canadian Census, and 2011 National Household Survey

Appendix Table 2: Average Years of Schooling by Educational Attainment for the Population Aged 25-64, 2001

Educational Attainment Category	Years of Schooling		
	Total Population	Aboriginal	Non-Aboriginal
None	9.52	9.01	9.55
High school graduation certificate or equivalency certificate	12.65	12.77	12.65
Other trades certificate or diploma	13.06	12.16	13.09
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	12.08	11.10	12.12
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	14.71	14.13	14.72
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	15.75	15.49	15.76
University certificate or diploma below bachelor level	15.75	15.43	15.76
Bachelor's degree	16.46	16.41	16.46
University certificate or diploma above bachelor level	16.93	16.88	16.93
Degree in medicine, dentistry, veterinarian medicine, or optometry	17.73	17.16	17.73
Master's degree	17.64	17.76	17.64
Earned doctorate	17.85	17.77	17.85

Source: Calculated using the 2001 Census PUMF based upon the "total years of schooling" variable, assuming that each individual completed the median value of the range of years in each category. Total years of schooling refers to "the total sum of the years (or grades) of schooling at the elementary, high school, university and college levels." Consequently, It will include years towards certifications which were not completed and may include repeated years. Those in the "18 or more years" category were assigned a value of just 18 years, so that the years of schooling of advanced university degree holders are understated.

Appendix Table 3: Detailed Education Distribution by Aboriginal Identity of Population Aged 25-64, 2001, 2006, and 2011

	2001		2006		2011	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
None	43.69	24.17	34.32	14.25	28.83	11.74
High school graduation certificate or equivalency certificate	17.72	22.26	21.21	23.74	23.32	22.83
Other trades certificate or diploma	15.99	12.72	14.34	12.21	13.71	11.74
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	2.61	1.65	3.79	2.66	4.02	2.57
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	7.62	8.91	10.33	10.18	11.12	10.44
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	4.58	7.63	5.04	8.14	6.06	8.48
University certificate or diploma below bachelor level	1.74	2.90	3.51	4.93	3.08	4.93
Bachelor's degree	4.40	12.72	5.39	15.60	7.41	17.61
University certificate or diploma above bachelor level	0.62	2.06	0.82	2.40	0.93	2.76
Degree in medicine, dentistry, veterinarian medicine, or optometry	0.10	0.64	0.07	0.57	0.13	0.65
Master's degree	0.83	3.64	1.08	4.60	1.24	5.42
Earned doctorate	0.10	0.69	0.12	0.72	0.15	0.83
All Categories	100.00	99.99	100.02	100.00	100.00	100.00

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey.

Appendix Table 4: Average Employment Income of Workers Aged 25+ by Educational Attainment, Aboriginal vs. non-Aboriginal, 2000, 2005, 2010 (2010 Dollars)

	2000		2005		2010	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
None	22,224	27,453	21,568	24,474	24,365	26,146
High school graduation certificate or equivalency certificate	26,190	31,878	27,120	32,593	28,921	33,072
Other trades certificate or diploma	32,715	39,859	34,410	39,326	39,525	40,751
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	26,016	35,539	27,479	36,424	34,635	38,362
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	32,361	38,183	32,883	40,355	38,610	41,439
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	34,582	43,000	39,614	46,405	47,074	46,852
University certificate or diploma below bachelor level	35,577	43,056	37,638	45,830	43,370	46,853
Bachelor's degree	42,117	53,271	49,913	59,769	52,704	60,657
University certificate or diploma above bachelor level	50,637	56,911	54,963	64,414	58,148	62,000
Degree in medicine, dentistry, veterinarian medicine, or optometry	77,566	103,055	105,996	160,667	168,593	136,765
Master's degree	55,452	65,006	61,401	75,217	72,839	75,408
Earned doctorate	59,892	75,849	107,516	91,706	106,710	95,349
All Categories	32,153	43,528	34,833	47,407	40,374	48,879

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

Appendix Table 5: Employment Rate of Workers Aged 25+ by Educational Attainment, Aboriginal vs. non-Aboriginal, 2001, 2006, 2011 (2010 Dollars)

	2001		2006		2011	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
None	45.6	45.8	44.0	42.6	40.2	39.1
High school graduation certificate or equivalency certificate	73.5	71.8	73.2	68.7	68.7	65.5
Other trades certificate or diploma	80.0	75.9	76.8	72.2	72.4	71.7
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	78.0	77.9	77.1	73.8	72.0	71.9
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	83.5	79.7	82.8	78.8	80.0	77.6
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	82.2	81.6	81.9	78.4	80.0	76.9
University certificate or diploma below bachelor level	79.2	71.9	76.5	70.7	74.1	70.1
Bachelor's degree	84.8	82.3	86.8	80.8	83.3	79.7
University certificate or diploma above bachelor level	77.3	79.3	84.5	77.1	79.9	76.4
Degree in medicine, dentistry, veterinarian medicine, or optometry	83.3	82.1	71.4	79.8	80.5	80.4
Master's degree	81.9	81.8	85.9	79.9	82.6	78.8
Earned doctorate	58.4	81.0	81.8	77.0	87.7	75.2
All Categories	54.1	62.8	58.1	63.4	57.3	62.3

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

Appendix Table 6: Unemployment Rate of Workers Aged 25+ by Educational Attainment, Aboriginal vs. non-Aboriginal, 2001, 2006, 2011 (2010 Dollars)

	2001		2006		2011	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
None	25.72	10.53	22.16	10.35	23.16	13.18
High school graduation certificate or equivalency certificate	16.25	7.65	12.84	7.11	14.72	9.35
Other trades certificate or diploma	17.92	6.57	14.01	6.01	13.62	7.12
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	18.26	6.95	11.23	5.71	11.38	7.06
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	11.73	5.68	10.23	5.07	9.73	6.23
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	11.43	4.89	8.10	3.99	9.62	4.69
University certificate or diploma below bachelor level	14.34	5.43	10.38	5.02	8.74	6.14
Bachelor's degree	8.14	4.90	8.41	4.70	6.73	5.14
University certificate or diploma above bachelor level	8.21	4.06	10.09	4.71	6.67	5.19
Degree in medicine, dentistry, veterinarian medicine, or optometry	0.00	2.21	0.00	2.48	4.85	2.51
Master's degree	7.47	4.56	4.61	4.50	4.78	5.18
Earned doctorate	0.00	3.74	0.00	3.39	3.49	3.92
All Categories	17.37	5.92	13.59	5.17	12.46	6.10

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

Appendix Table 7: Participation Rate of Workers Aged 25+ by Educational Attainment, Aboriginal vs. non-Aboriginal, 2001, 2006, 2011 (2010 Dollars)

	2001		2006		2011	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
None	45.6	45.8	44.0	42.6	40.2	39.1
High school graduation certificate or equivalency certificate	73.5	71.8	73.2	68.7	68.7	65.5
Other trades certificate or diploma	80.0	75.9	76.8	72.2	72.4	71.7
College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year	78.0	77.9	77.1	73.8	72.0	71.9
College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years	83.5	79.7	82.8	78.8	80.0	77.6
College, CEGEP or other non-university certificate or diploma from a program of more than 2 years	82.2	81.6	81.9	78.4	80.0	76.9
University certificate or diploma below bachelor level	79.2	71.9	76.5	70.7	74.1	70.1
Bachelor's degree	84.8	82.3	86.8	80.8	83.3	79.7
University certificate or diploma above bachelor level	77.3	79.3	84.5	77.1	79.9	76.4
Degree in medicine, dentistry, veterinarian medicine, or optometry	83.3	82.1	71.4	79.8	80.5	80.4
Master's degree	81.9	81.8	85.9	79.9	82.6	78.8
Earned doctorate	58.4	81.0	81.8	77.0	87.7	75.2
All Categories	65.4	66.8	67.3	66.8	65.5	66.4

Source: Author's calculations based on public use microdata files from the 2001 Census, 2006 Census, and 2011 National Household Survey

Appendix Table 8: Average Years of Education of the Population Aged 25-64 by Select Characteristics, Canada, 2001, 2006, and 2011, Alternative Measure of Years

	2001				2006				2011				
	Aboriginal	Non-Aboriginal	Absolute Gap	Relative Gap (%)	Aboriginal	Non-Aboriginal	Absolute Gap	Relative Gap (%)	Aboriginal	Non-Aboriginal	Absolute Gap	Relative Gap (%)	Annual Growth Rate of Gap
Canada	11.38	12.66	1.28	10.12	11.78	13.18	1.39	10.58	12.06	13.37	1.30	9.76	-0.37
Newfoundland and Labrador	11.32	11.94	0.61	5.13	11.78	12.47	0.69	5.51	12.54	12.77	0.23	1.82	-9.85
Prince Edward Island	11.08	12.21	1.13	9.28	12.43	12.75	0.32	2.53	12.96	12.98	0.03	0.19	-32.10
Nova Scotia	11.70	12.45	0.75	6.06	12.34	12.90	0.57	4.40	12.62	13.16	0.54	4.10	-3.84
New Brunswick	11.72	12.14	0.42	3.49	11.83	12.62	0.80	6.30	12.29	12.85	0.56	4.35	2.23
Quebec	11.32	12.54	1.22	9.69	11.77	13.08	1.31	10.03	12.19	13.23	1.04	7.88	-2.05
Ontario	11.70	12.83	1.12	8.75	12.11	13.35	1.24	9.29	12.48	13.54	1.06	7.82	-1.12
Manitoba	11.00	12.38	1.38	11.14	11.47	12.88	1.42	10.99	11.57	13.12	1.56	11.86	0.62
Saskatchewan	11.19	12.29	1.10	8.94	11.46	12.82	1.35	10.56	11.71	13.04	1.32	10.16	1.28
Alberta	11.35	12.64	1.29	10.20	11.73	13.09	1.36	10.42	11.83	13.34	1.51	11.29	1.02
British Columbia	11.45	12.80	1.35	10.57	11.92	13.28	1.36	10.24	12.18	13.47	1.29	9.58	-0.98
Territories	11.15	13.36	2.20	16.50	11.29	13.57	2.29	16.84	10.97	13.79	2.82	20.43	2.16
Female	11.51	12.66	1.15	9.11	11.93	13.23	1.30	9.83	12.25	13.44	1.19	8.88	-0.26
Male	11.24	12.66	1.42	11.21	11.62	13.12	1.50	11.47	11.85	13.29	1.44	10.81	-0.37
Ages 25-34	11.48	13.17	1.68	12.79	11.81	13.55	1.74	12.84	12.06	13.73	1.67	12.16	-0.50
Ages 35-44	11.47	12.77	1.30	10.15	11.84	13.35	1.51	11.29	12.29	13.70	1.41	10.27	0.12
Ages 45-54	11.41	12.60	1.18	9.39	11.83	12.98	1.15	8.87	12.00	13.17	1.17	8.91	-0.53
Ages 55-64	10.74	11.86	1.12	9.44	11.61	12.73	1.12	8.78	11.83	12.91	1.08	8.38	-1.18
First Nations	11.26	12.66	1.39	11.02	11.63	13.18	1.55	11.76	11.84	13.37	1.53	11.43	0.37
Métis	11.66	12.66	1.00	7.92	12.10	13.18	1.07	8.14	12.45	13.37	0.92	6.85	-1.45
Inuit	10.91	12.66	1.74	13.77	11.02	13.18	2.16	16.36	11.03	13.37	2.34	17.48	2.41
Registered Indian Status	11.25	12.66	1.41	11.15	11.57	13.18	1.60	12.18	11.69	13.37	1.67	12.50	1.15

Note: These estimates of years of educational attainment and the gaps were calculated based upon assigned values for the number of years of schooling we would expect that it should take to earn a credential (as opposed to the actual number of years of schooling of those holding the credential which was used for the calculations in the main text). The number of years assigned to each level of educational attainment was as follows: None (9 years), High school graduation certificate or equivalency certificate (12 years), Other trades certificate or diploma (13 years), College, CEGEP or other non-university certificate or diploma from a program of 3 months to less than 1 year (12.75 years), College, CEGEP or other non-university certificate or diploma from a program of 1 year to 2 years (13.5 years), College, CEGEP or other non-university certificate or diploma from a program of more than 2 years (14.5 years), University certificate or diploma below bachelor level (13 years), Bachelor's degree (16 years), University certificate or diploma above bachelor level (17 years), Degree in medicine, dentistry, veterinarian medicine, or optometry (17 years), Master's degree (17 years), Earned doctorate (20 years).

Source: Author's calculation using data from the 2011 National Household Survey Public Use Microdata File

Appendix Table 9: Alternative Shift-Share Analysis of the Contribution of Educational Attainment to the Aboriginal Labour Market Outcome Gaps

Outcome	Non-Aboriginal Outcome	Observed Aboriginal Outcome (Aboriginal Educational Attainment)	Aboriginal Outcome if Aboriginal People had Non-Aboriginal Education	Observed Gap	Gap If Aboriginal People had Non-Aboriginal Education	Share of Gap Explainable by Education (%)	Share of Gap Explainable by Other Factors (%)
Participation Rate	81.7	72.4	78.3	9.3	3.4	63.3	36.7
Unemployment Rate	6.1	12.4	10.2	-6.4	-4.1	34.9	65.1
Employment Rate	76.7	63.4	70.4	13.3	6.3	52.8	47.2
Employment Income (2010 $)	58,934	50,230	55,894	8,704	3,039	65.1	34.9

Source: Author`s calculations using data from the 2011 National Household Survey Public Use Microdata File (PUMF)

Appendix Table 10: Projecting the Age and Sex Distribution of the Aboriginal Population in 2031, Scenario 1 (Constant Fertility and no Ethnic Mobility)

Age	Male		Female	
	Per Thousand			
	2006	2031	2006	2031
0 to 4 years	4.74	3.82	4.45	3.64
5 to 9 years	4.85	3.87	4.57	3.70
10 to 14 years	5.23	3.82	5.03	3.66
15 to 19 years	5.17	3.68	4.88	3.59
20 to 24 years	4.26	3.50	4.30	3.37
25 to 29 years	3.77	3.37	3.87	3.24
30 to 34 years	3.56	3.43	3.62	3.29
35 to 39 years	3.49	3.67	3.62	3.63
40 to 44 years	3.70	3.60	3.85	3.51
45 to 49 years	3.17	2.98	3.37	3.08
50 to 54 years	2.52	2.61	2.70	2.74
55 to 59 years	1.91	2.41	2.00	2.51
60 to 64 years	1.31	2.30	1.35	2.44
65 to 69 years	0.88	2.32	0.97	2.47
70 to 74 years	0.61	1.87	0.71	2.06
75 to 79 years	0.34	1.34	0.45	1.50
80 to 84 years	0.18	0.81	0.28	0.94
85 to 89 years	0.08	0.39	0.13	0.47
90 to 94 years	0.02	0.13	0.05	0.18
95 to 99 years	0.01	0.03	0.01	0.04
100 and over	0.00	0.00	0.00	0.00
Total	49.80	49.95	50.21	50.06

Source: Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, Figure 4

Appendix Table 11: Projecting the Aboriginal Population in the Provinces and Territories, 2031, 4 Scenarios

	2006 (observed)		2031 (Scenario 1)		2031 (Scenario 2)		2031 (Scenario 3)		2031 (Scenario 4)	
Fertility	Observed		Constant		50% Convergence		Constant		50% Convergence	
Ethnic Mobility	Observed		None		None		Constant		Constant	
	Thousands	Percentage	Thousands	Percentage	Thousands	Percentage	Thousands	Percentage	Thousands	Percentage
Newfoundland and Labrador	24	4.7	21	4.8	21	4.8	28	6.5	28	6.5
Prince Edward Island	2	1.3	2	1.5	2	1.5	5	3.6	5	3.7
Nova Scotia	25	2.7	31	3.4	30	3.3	46	5.0	45	4.9
New Brunswick	18	2.4	19	2.7	19	2.7	31	4.4	31	4.4
Quebec	127	1.7	178	2.0	174	2.0	234	2.6	230	2.6
Ontario	268	2.1	348	2.0	341	1.9	518	2.9	511	2.9
Manitoba	188	15.9	257	18.8	247	18.2	294	21.5	285	21.0
Saskatchewan	153	15.4	227	22.5	214	21.5	240	23.7	228	22.8
Alberta	207	6.1	299	6.0	291	5.9	378	7.6	370	7.5
British Columbia	209	4.9	281	4.7	274	4.6	374	6.3	367	6.2
Yukon	8	25.5	8	21.9	8	22.1	8	22.8	8	22.9
Northwest Territories	23	52.3	25	51.9	24	51.0	25	52.4	24	51.5
Nunavut	26	84.8	39	85.9	37	85.3	39	86.1	37	85.5
Canada	1279	3.9	1734	4.1	1682	4.0	2220	5.3	2168	5.2

Source: Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division, Table 7

Appendix Table 12: Projected Aboriginal Employment (thousands) in 2031, Select Characteristics and Scenarios

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	Scenario 12
Province												
Newfoundland and Labrador	8.1	9.0	8.1	9.0	8.6	9.1	8.6	9.1	9.0	9.1	9.0	9.1
Prince Edward Island	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	1.1	1.0	1.1	1.0
Nova Scotia	13.5	14.3	13.5	14.3	14.0	14.5	14.0	14.5	14.5	14.8	14.5	14.8
New Brunswick	6.9	8.5	6.9	8.5	7.4	8.7	7.4	8.7	7.8	8.9	7.8	8.9
Quebec	74.8	81.6	74.8	81.6	77.5	83.8	77.5	83.8	80.2	86.1	80.2	86.1
Ontario	148.9	159.2	148.9	159.2	155.1	162.8	155.1	162.8	161.3	166.5	161.3	166.5
Manitoba	109.5	126.5	109.5	126.5	117.0	129.8	117.0	129.8	124.5	133.1	124.5	133.1
Saskatchewan	87.0	118.1	87.0	118.1	92.8	119.9	92.8	119.9	98.6	121.8	98.6	121.8
Alberta	135.2	150.4	135.2	150.4	142.8	153.9	142.8	153.9	150.4	157.4	150.4	157.4
British Columbia	115.0	128.3	115.0	128.3	123.1	131.2	123.1	131.2	131.1	134.2	131.1	134.2
Territories	27.3	39.3	27.3	39.3	32.8	39.4	32.8	39.4	38.3	39.6	38.3	39.6
Canada	727.0	835.9	727.0	835.9	772.0	854.1	772.0	854.1	817.0	872.4	817.0	872.4
Identity												
First Nations	412.6	522.0	412.6	522.0	451.6	537.8	451.6	537.8	490.5	553.6	490.5	553.6
Métis	247.2	252.8	247.2	252.8	257.0	256.0	257.0	256.0	266.8	259.2	266.8	259.2
Inuit	29.7	33.8	29.7	33.8	33.4	36.0	33.4	36.0	37.1	38.2	37.1	38.2
Total	689.5	808.6	689.5	808.6	742.0	829.8	742.0	829.8	794.4	851.0	794.4	851.0
Gender												
Female	351.4	392.0	351.4	392.0	372.2	401.8	372.2	401.8	393.1	411.5	393.1	411.5
Male	375.6	443.9	375.6	443.9	399.8	452.4	399.8	452.4	423.9	460.8	423.9	460.8
Total	727.0	835.9	727.0	835.9	772.0	854.1	772.0	854.1	817.0	872.4	817.0	872.4
Age												
15-24	112.5	133.8	112.5	133.8	121.9	140.9	121.9	140.9	131.3	148.0	131.3	148.0
25-34	156.4	183.8	156.4	183.8	165.4	187.4	165.4	187.4	174.3	191.0	174.3	191.0
35-44	183.7	209.4	183.7	209.4	191.6	211.9	191.6	211.9	199.6	214.5	199.6	214.5
45-54	142.6	164.1	142.6	164.1	147.3	166.3	147.3	166.3	151.9	168.5	151.9	168.5
55-64	93.5	105.0	93.5	105.0	97.8	106.5	97.8	106.5	102.2	108.0	102.2	108.0
65+	38.3	39.8	38.3	39.8	48.0	41.0	48.0	41.0	57.7	42.3	57.7	42.3
Total	727.0	835.9	727.0	835.9	772.0	854.1	772.0	854.1	817.0	872.4	817.0	872.4

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

Appendix Table 13: Projected Aboriginal Contribution to GDP (billions of 2010 dollars) in 2031, Select Characteristics and Scenarios

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	Scenario 12
Province												
Newfoundland and Labrador	1.12	1.23	1.03	1.10	1.27	1.28	1.12	1.13	1.42	1.33	1.21	1.15
Prince Edward Island	0.06	0.08	0.07	0.09	0.07	0.09	0.08	0.09	0.09	0.09	0.10	0.10
Nova Scotia	1.23	1.34	1.39	1.51	1.41	1.45	1.51	1.59	1.58	1.57	1.62	1.67
New Brunswick	0.59	0.77	0.70	0.88	0.67	0.82	0.79	0.95	0.75	0.88	0.87	1.02
Quebec	7.78	8.26	7.89	8.44	8.65	9.07	8.75	9.27	9.52	9.88	9.62	10.09
Ontario	16.47	17.81	17.73	19.07	18.82	20.17	20.02	21.17	21.17	22.53	22.29	23.27
Manitoba	10.81	12.05	11.61	13.00	12.87	13.77	13.37	14.32	14.93	15.49	15.12	15.64
Saskatchewan	9.23	11.77	10.83	13.59	10.32	12.61	12.07	14.53	11.41	13.46	13.30	15.47
Alberta	17.97	19.55	18.72	20.54	21.95	22.92	21.40	22.73	25.93	26.27	24.09	24.93
British Columbia	11.10	12.44	12.85	14.29	12.76	13.62	14.69	15.56	14.41	14.80	16.54	16.84
Territories	4.32	5.67	4.16	5.76	6.06	6.75	5.41	6.33	7.80	7.83	6.66	6.91
Canada	80.67	90.98	86.98	98.27	94.85	102.56	99.20	107.68	109.01	114.12	111.42	117.08
Identity												
First Nations	42.73	52.24	48.79	59.45	52.24	59.97	57.68	66.03	61.75	67.71	66.56	72.62
Métis	28.94	29.67	29.88	30.61	32.91	32.81	33.02	33.02	36.78	35.84	36.15	35.42
Inuit	3.90	4.56	3.20	3.72	4.85	5.25	4.04	4.36	5.81	5.93	4.88	4.98
Total	75.57	86.47	81.87	93.79	90.00	98.03	94.74	103.41	104.34	109.48	107.59	113.02
Gender												
Female	32.97	35.78	34.30	37.38	37.61	39.44	38.68	40.79	42.24	43.09	43.05	44.18
Male	47.70	55.20	52.68	60.89	57.24	63.12	60.52	66.89	66.77	71.04	68.37	72.90
Total	80.67	90.98	86.98	98.27	94.85	102.56	99.20	107.68	109.01	114.12	111.42	117.08
Age												
15-24	4.70	5.53	4.86	5.71	5.77	6.56	5.64	6.42	6.84	7.60	6.42	7.13
25-34	16.07	18.54	17.21	19.98	18.31	20.39	19.13	21.42	20.56	22.24	21.05	22.85
35-44	24.57	27.42	26.30	29.48	28.04	30.26	29.84	32.33	31.50	33.10	33.40	35.21
45-54	20.09	22.81	21.78	24.85	24.12	26.59	24.42	27.28	28.16	30.35	27.06	29.70
55-64	12.20	13.42	13.52	14.79	14.08	15.08	15.49	16.39	15.96	16.75	17.45	17.96
65+	3.04	3.26	3.31	3.46	4.52	3.67	4.68	3.84	6.00	4.08	6.04	4.22
Total	80.67	90.98	86.98	98.27	94.85	102.56	99.20	107.68	109.01	114.12	111.42	117.08

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

Appendix Table 14: Projected Aboriginal Average Employment Income (2010 dollars per worker) in 2031, Select Characteristics and Scenarios

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	Scenario 12
Province												
Newfoundland and Labrador	68,989	68,418	63,442	61,111	74,094	70,837	65,166	62,215	78,598	73,200	66,704	63,304
Prince Edward Island	37,278	47,804	43,040	52,727	40,489	47,715	43,869	51,906	42,793	47,636	44,483	51,183
Nova Scotia	45,878	46,775	51,734	52,674	50,343	49,973	53,886	54,629	54,481	53,051	55,890	56,504
New Brunswick	42,400	45,058	50,384	51,326	45,097	47,157	53,236	54,384	47,507	49,165	55,759	57,325
Quebec	52,013	50,624	52,742	51,705	55,808	54,094	56,478	55,275	59,350	57,374	59,959	58,589
Ontario	55,287	55,952	59,528	59,907	60,671	61,939	64,519	65,006	65,613	67,650	69,086	69,889
Manitoba	49,349	47,642	53,021	51,400	54,983	53,062	57,114	55,186	59,949	58,221	60,698	58,767
Saskatchewan	53,101	49,856	62,261	57,562	55,634	52,589	65,025	60,587	57,866	55,257	67,473	63,497
Alberta	66,449	65,017	69,225	68,314	76,829	74,464	74,923	73,862	86,187	83,447	80,088	79,189
British Columbia	48,228	48,491	55,852	55,693	51,834	51,904	59,691	59,287	54,962	55,148	63,060	62,737
Territories	79,061	72,177	76,277	73,281	92,375	85,565	82,499	80,262	101,873	98,842	86,962	87,213
Canada	55,482	54,419	59,822	58,776	61,431	60,038	64,251	63,031	66,719	65,411	68,191	67,106
Identity												
First Nations	51,783	50,041	59,127	56,947	57,844	55,757	63,860	61,391	62,942	61,146	67,841	65,581
Métis	58,543	58,698	60,446	60,558	64,039	64,084	64,242	64,493	68,935	69,136	67,760	68,330
Inuit	65,660	67,305	53,866	54,956	72,571	72,853	60,528	60,517	78,236	77,774	65,713	65,313
Total	54,804	53,470	59,373	57,993	60,652	59,068	63,842	62,310	65,669	64,325	67,714	66,406
Gender												
Female	46,913	45,643	48,804	47,680	50,520	49,081	51,954	50,758	53,732	52,347	54,760	53,680
Male	63,498	62,169	70,129	68,574	71,590	69,769	75,700	73,931	78,761	77,078	80,646	79,096
Total	55,482	54,419	59,822	58,776	61,431	60,038	64,251	63,031	66,719	65,411	68,191	67,106
Age												
15-24	20,894	20,657	21,594	21,321	23,677	23,289	23,138	22,782	26,066	25,664	24,459	24,097
25-34	51,402	50,438	55,035	54,338	55,375	54,398	57,844	57,147	58,954	58,212	60,362	59,814
35-44	66,883	65,474	71,594	70,389	73,156	71,396	77,861	76,269	78,903	77,172	83,661	82,085
45-54	70,448	69,500	76,375	75,730	81,903	79,929	82,914	82,007	92,665	90,043	89,048	88,098
55-64	65,219	63,897	72,258	70,444	71,958	70,806	79,152	76,919	78,097	77,505	85,410	83,138
65+	39,599	41,006	43,237	43,440	47,084	44,757	48,745	46,796	52,042	48,311	52,405	49,959
Total	55,482	54,419	59,822	58,776	61,431	60,038	64,251	63,031	66,719	65,411	68,191	67,106

Source: Author's calculations based on the 2011 National Household Survey Public Use Microdata File and Aboriginal population projections from Population Projections by Aboriginal Identity in Canada, 2006 to 2031, Statistics Canada, Demography Division.

Appendix Table 15: Calculation of Estimated Average Employment Income on-Reserve by Education Level, 2010

Average income of aboriginal people on-reserve 15+ who worked full-year full-time: 35,958

	A	B	A x B
Highest Education	Population Share on-Reserve	Average Employment Income of all full-year full-time Aboriginal workers	
No Certificate, Diploma, or degree	0.56	37,348	20,812
High School	0.18	41,902	7,537
Post Secondary sub bachelor	0.23	50,533	11,596
Bachelor or above	0.03	70,059	+ 2,342
Implied average income of all full-year full-time aboriginal workers 15+ if education is equal to that on-reserve:			42,286
Ratio of on-reserve to average aboriginal income:			0.85

Applying this ratio to the off-reserve employment income of all workers 15+ earning positive employment income:

Highest Education	Average Employment Income of aboriginal workers				Estimated average employment income on-reserve
No Certificate, Diploma, or degree	21,494	x	0.85	=	18,277
High School	27,580	x	0.85	=	23,453
Post Secondary sub bachelor	38,308	x	0.85	=	32,575
Bachelor or above	55,484	x	0.85	=	47,181

Source: Author's calculations based upon data from the 2011 National Household Survey