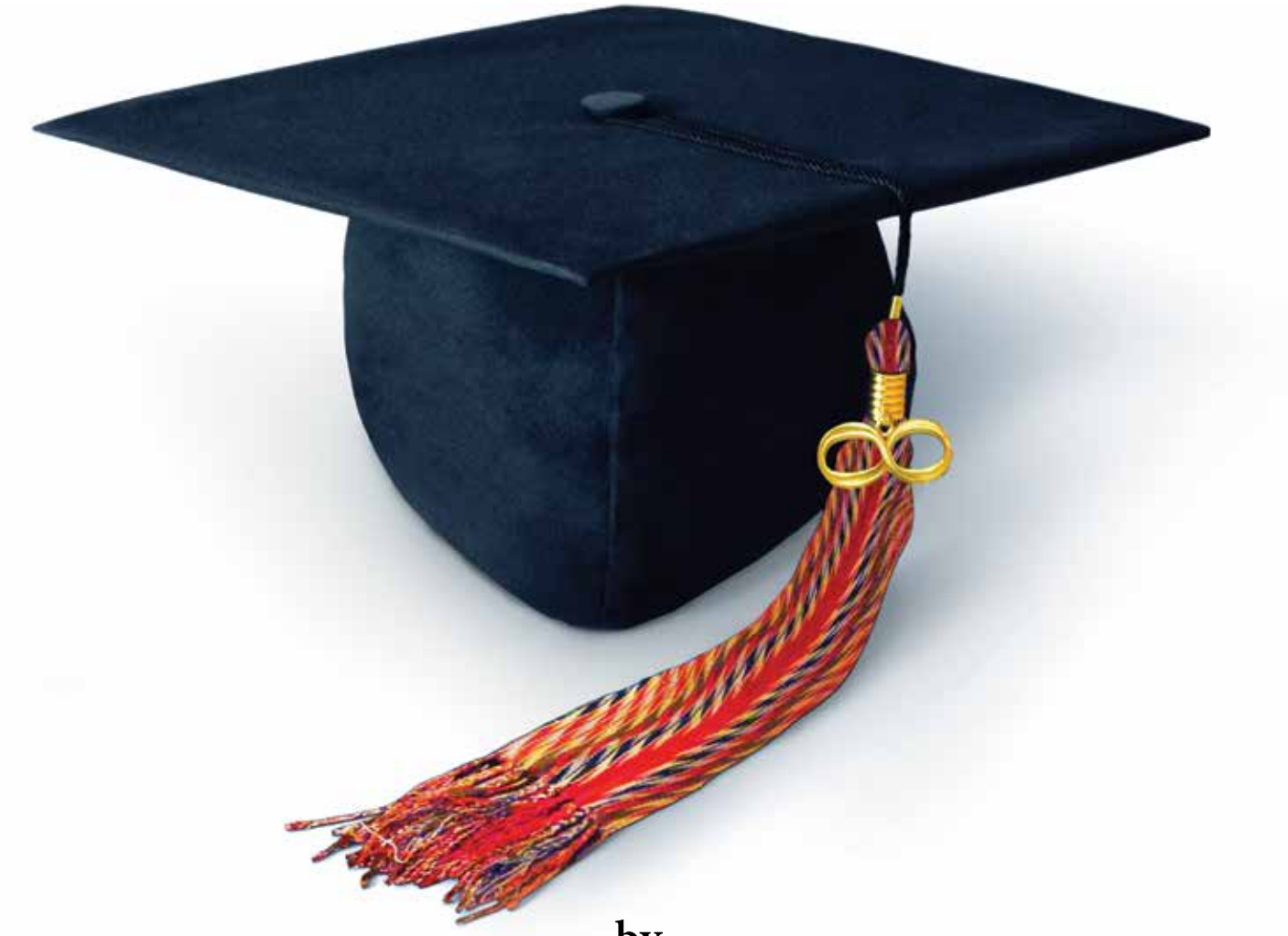
Bridging the Aboriginal Education Gap in Alberta



by

Dr. Eric Howe

University of Saskatchewan

UNIVERSITY OF ALBERTA
FACULTY OF NATIVE STUDIES

Rupertsland Institute
Métis Centre of Excellence

Bridging the Aboriginal Education Gap in Alberta

The Provincial Benefit Exceeds a Quarter of a Trillion Dollars

by

Dr. Eric Howe

University of Saskatchewan

Rupertsland Centre for Metis Research (RCMR)

UNIVERSITY OF ALBERTA
FACULTY OF NATIVE STUDIES

Rupertsland Institute
Métis Centre of Excellence

Library and Archives Canada Cataloguing in Publication

Howe, Eric C.
Bridging the Aboriginal Education Gap in Alberta: The Provincial Benefit Exceeds a Quarter of a Trillion Dollars / Eric Howe.

Includes bibliographical references.
Text in English only.
ISBN 978-1-55195-330-4

1. The Aboriginal Education Gap in Alberta—Large and Growing. 2. Education and Earnings in Alberta. 3. Bridging Alberta's Aboriginal Education Gap—Benefit Albertans by more than a Quarter of a Trillion Dollars. 4. The Aboriginal Education Gap in Alberta—Growing Rapidly. 5. The Impact of the Métis Training to Employment Program—Alberta. 6. The Potential Impact of a Métis Teacher Education Program—Alberta. 7. Fiscal Implications for the Government of Alberta.

UNIVERSITY OF ALBERTA
FACULTY OF NATIVE STUDIES

Rupertsland Centre for Métis Research (RCMR)
Faculty of Native Studies
2-05 Pembina Hall, University of Alberta
Edmonton, Alberta
T6G 2H8
www.nativestudies.ualberta.ca/research/rupertsland-centre-for-metis-research

Rupertsland Institute
a Métis Centre of Excellence

Rupertsland Institute
1450, 10060 Jasper Avenue – Scotia Tower 1
Edmonton, Alberta
T5J 3R8
www.rupertsland.org

Contents

List of Tables & Figures

Message from the MNA President

As President of the Métis Nation of Alberta, I am pleased to receive the "Bridging the Aboriginal Education Gap in Alberta" report. This cutting-edge study and report is a first. It was produced in collaboration between the Rupertsland Institute and its sister organization, the Rupertsland Centre for Métis Research (RCMR). The RCMR is a centre under the Faculty of Native Studies at the University of Alberta and is the only one of its type in Canada.

The report highlights the link between education and earnings, and also provides a positive reflection of the Métis Training to Employment program's contribution to improving the Métis skillset and its overall contribution to the provincial economy. The analysis demonstrates the economic impact of moving people to complete high school or achieve a GED equivalency. The relationship between education and earnings has been extensively documented in the past and comes as no surprise. Yet, the extent to which education determines multigenerational poverty cannot be ignored and this is clearly demonstrated in this research.

The idea for this study had its genesis in work conducted by the Gabriel Dumont Institute (GDI), our sister Métis organization in Saskatchewan.

Many people and institutions participated in making this report possible. Staff from the Rupertsland Institute, the University of Alberta, and the Rupertsland Centre for Métis Research worked assiduously to meet deadlines and support the study. Staff from the Gabriel Dumont Institute shared their research and freely offered their insight and expertise. The Government of Alberta contributed some funding. To all of them, I offer thanks and my commitment to continue working to improve labour market and education outcomes for Métis people in Alberta and across the Métis homeland.

Respectfully
Audrey Poitras, President
Métis Nation of Alberta
August 15, 2013

Message from the Director

By now, you have likely heard the term "education gap" and may have even seen some of the alarming statistics behind our educational disparity. In a country like Canada that boasts a highly educated population, a large Aboriginal education "gap" has prevented Aboriginal people from achieving the quality of life enjoyed by other citizens.

In this eye-opening report, respected economist Dr. Eric Howe not only explores just how large this gap in Alberta is but the extent to which it is growing. His sophisticated analysis shows how varying levels of educational attainment affect groups – from First Nations to Métis to non-Aboriginals – differently. Howe also demonstrates what should be obvious to all of us, that even in a resource-rich economy like Alberta – education is a silver bullet that affects not only Aboriginal citizens but our province as a whole.

As Director of the Rupertsland Centre for Métis Research in the Faculty of Native Studies at the University of Alberta, it is my hope that the information contained in this report will be widely circulated to become part of a public discussion on the importance of education. As Dr. Howe states, a mind is a terrible – and expensive – thing to waste, and if we stand by and do nothing to change our current situation, Alberta stands to lose a substantial amount of money as well as human potential.

Chris Andersen, Director
Rupertsland Centre for Métis Research
Faculty of Native Studies, University of Alberta

Executive Summary

The study is developed in seven sections and three appendices.

Section 1. The Aboriginal Education Gap in Alberta is large and growing rapidly

An alarming Aboriginal Education Gap exists in this country—a gap between the levels of educational attainment of the Aboriginal and the non-Aboriginal populations. In Alberta, and across Canada, the Aboriginal Education Gap is large, and growing rapidly.

This study measures the Aboriginal Education Gap in Alberta by calculating the benefit of bridging it. Part of the benefit is the increased earnings that would accrue to Aboriginal people from greater educational attainment. Those increased earnings are large, but there are other parts to the benefit as well: the nonmonetary individual benefit of education, which accrues to the educated individual, as well as the external social benefit, which flows to society as a whole.

"A Mind is a Terrible Thing to Waste" was an iconic advertising message that emerged from the United States Civil Rights Movement. The message of this study is deliberately different: "A Mind is an Expensive Thing to Waste." The original phrasing, using "terrible," encompassed ethical and moral considerations; the "expensive" phrasing corresponds to cold, hard cash. With the Aboriginal Education Gap, Alberta is leaving over a quarter of a trillion dollars unrealized and unclaimed—money that is essentially lying on the ground, waiting to be picked up.

This study analyzes why a mind is an expensive thing to waste in two fundamentally different, but related, ways. We measure the monetary benefit of education to an individual Albertan. The benefit is large, so we conclude that a mind is an expensive thing for an individual to waste. We also measure the benefit of education from the perspective of Albertan society—and show that that benefit is larger still. We conclude that a mind is an expensive thing for society to waste.

Section 2. Education and earnings in Alberta

Section 2 examines the relationship between education and earnings in Alberta. The section uses tools from forensic economics—which are usually applied in situations of personal injury or wrongful death—to measure how much money typical Albertans will earn in their lifetimes.

Lifetime earnings depend on whether an individual is non-Aboriginal, Métis, or First Nations, as well as on whether the individual is male or female. In addition, earnings depend on an individual's level of education. This study focuses on individuals who:

- Drop out prior to receiving a high school diploma and do not subsequently obtain high school equivalency;
- Earn a high school diploma either by graduation or by completing high school equivalency—with no further formal education;
- Complete a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship–with no further formal education; or
- Receive a Bachelor's degree or higher.

We measure the lifetime earnings of 24 different hypothetical Albertans: males or females who are non-Aboriginal, Métis, or First Nations, and who have one of the above four levels of educational attainment. Each is assumed to have had his or her fifteenth birthday sometime in 2013.

The analysis of the earnings of non-Aboriginal Albertans establishes a pattern that repeats in the analysis. On average, education pays in the Information Age: the more you learn, the more you earn. But the labour market treats the sexes very differently. Non-Aboriginal males make more than non-Aboriginal females at each level of education. However, the analysis also measures how much a non-Aboriginal Albertan would earn with education for every dollar he/she would have earned as a dropout. Here, the tables are turned: at all levels of education, females do better than males. So, although they earn less, females have more to gain in obtaining an education.

That pattern repeats in the separate analyses of Métis and First Nations Albertans: earnings increase with education, males earn more than females at each level of education, and females have more to gain in obtaining education.

The top earner in Alberta (on average) is a non-Aboriginal male with a Bachelor's degree or higher. A typical non-Aboriginal male Albertan who is 15 years of age in 2013 and subsequently obtains his Bachelor's degree or higher will have lifetime earnings of over $3 million. On the other hand, the lowest earner is a First Nations female dropout, with lifetime earnings of less than $200,000—not much to spread over a lifetime.

The top earner in terms of dollars earned as a result of education for every dollar earned as a dropout is a First Nations female with a Bachelor's degree (or higher). She will earn $13.99 for every dollar she would earn as a dropout. The lowest earner per dollar is a non-Aboriginal male who gets his high school diploma and then stops his formal education. He makes $1.81 for every dollar he would have earned as a dropout.[1]

Dollar amounts of lifetime earnings by sex, Aboriginal identity, and education are provided in the text.

Section 2 continues by breaking down employment by occupation and by industry, separately for non-Aboriginal, Métis, and First Nations Albertans. Although there are certainly differences, similarities among the employment distributions are notable.

The most common question asked in the writer's discussions of the relationship between education and earnings in Alberta is about the effect of lucrative jobs for males requiring little education in the field of non-renewable resources. Why do lifetime earnings not seem to reflect the existence of these jobs? Expressed differently, since the earnings numbers are based on data for Alberta, why do these jobs not seem to be reflected in the data? The reasons are discussed at the end of Section 2. Two of these reasons are that, statistically, the jobs are not held by a large proportion of the Alberta labour force, and that the individuals who hold them typically do not hold them for very long. The principal reason, however, has to do with the Alberta labour market. The Alberta labour market presents some opportunities for some males with little education to earn good money—certainly greater opportunities than in other provinces—but that labour market presents even more lucrative opportunities for those with more education.

Section 3. Bridging Alberta's Aboriginal Education Gap would benefit Albertans by more than a quarter of a trillion dollars

Section 3 begins by examining, for Albertans aged 15 to 69, the educational attainment of the non-Aboriginal, Métis, and First Nations populations in terms of the percentages who have reached each of the four levels of educational attainment. The differences are stark. For example, whereas over half of the non-Aboriginal population has some postsecondary credential, over half of the Métis population has high school or less, and almost half of the First Nations does not even have high school.

That is to say that there is an Aboriginal Education Gap, a gap between the levels of educational attainment of the Aboriginal and the non-Aboriginal populations.
The size of the Gap is measured by computing the benefit to Alberta of bridging the Gap.

This report reveals that bridging the Gap would result in $44.2 billion of increased earnings for Aboriginal people who have increased levels of educational attainment. This represents the individual monetary benefit, which consists of the increase in earnings that would result from bridging the Gap.

...the benefit is large, so we conclude that a mind is an expensive thing for an individual to waste.

There are also relationships between increased educational levels and a variety of nonmonetary benefits to the educated individual—benefits as varied as longer life expectancy and more stable marriages. Those represent the individual nonmonetary benefit. The monetary value of the individual nonmonetary benefit is shown to be $132.5 billion.

There are also relationships between increased education and a variety of social benefits, from reduced rates of criminality to increased civic-mindedness. Those represent the external social benefit. The external social benefit is shown to be worth $68.7 billion.

1 *That does not mean that non-Aboriginal males do not have an incentive to get their high school diplomas! Although $1.81 is less than the other dollar-per-dollar numbers, it still represents a great deal of money over an entire lifetime. An average non-Aboriginal male Albertan dropout will only have lifetime earnings of $877,120, whereas he will earn $1,586,283 if he completes high school. He will earn even more if he gets more education.*

The sum of all of the above yields a benefit of bridging the Aboriginal Education Gap in Alberta of $245.3 billion.[2] That sum, however, is based on the results of the 2006 Census, which is widely known to have undercounted Aboriginal people. Correcting for undercounting increases the benefit of bridging the Aboriginal Education Gap to $270.5 billion—over half a trillion dollars.

In this era when Canada's federal government has a deficit of several billion dollars and the US has an astounding trillion-dollar deficit, it is easy to lose track of how much money a quarter of a trillion dollars is for a province the size of Alberta. To make the amount more concrete: the benefit is large enough on a per capita basis to buy a well-equipped new car for each individual Albertan, or the lion's share of a new house for a family of four ($68,815 and $275,260 respectively).

Section 4. The Aboriginal Education Gap in Alberta is growing rapidly

The size of the Aboriginal Education Gap in Alberta is growing rapidly. This section explores two possible causes for the increase.

One cause is growth in the Aboriginal population. To shed light on this, the growth in this population in Alberta is analyzed from the 2006 Census though 2013, and projected through 2031. The Aboriginal population is growing rapidly and, other things being equal, this causes an increase in the quantitative size of the Aboriginal Education Gap, because it increases the benefit to be derived from bridging it.

Another potential cause for the Gap is that the level of Aboriginal educational attainment, although it is growing, is being outpaced by that of the non-Aboriginal population. To shed light on this, the 2006 Census is compared to that of 1996 for Albertans age 20 to 69. There is a mixed set of results. For some categories, the level of Aboriginal educational attainment improves relative to that of non-Aboriginal people. For others, although Aboriginal educational attainment improves, Aboriginal people fall farther behind.

Consider this: between 1996 and 2006, the percentage of First Nations' people without a high school diploma decreased from 56.6% to 45.4%, a decrease of 11.2%. This is good—but the non-Aboriginal percentage in this category decreased from 28.6% to 15.5%, a decrease of 13.1%. First Nations fell 1.9% farther behind the non-Aboriginal population in terms of high school completions.

There are also examples of improvement. Between 1996 and 2006, the percentage of Métis females without a high school diploma decreased by an impressive 21.0%. The percentage in this category for non-Aboriginal females, on the other hand, decreased by 14.1%. So Métis females moved 6.9% closer to closing the Aboriginal Education Gap in terms of high school completions.

In order to examine whether the comparative rates of educational attainment are increasing or decreasing, a special computation was made of the Aboriginal Education Gap for 1996. That computation varied only population size and the levels of Aboriginal and non-Aboriginal educational attainment from 1996, while continuing to use the earnings data from the 2006 computation. The result demonstrates that, in Alberta, the Aboriginal Education Gap is increasing by less than would have been predicted from Aboriginal population growth rates. Thus, the aggregate level of educational attainment of Aboriginal people in Alberta is catching up with that of non-Aboriginal people. That makes Alberta unusual among Canadian provinces.

Section 5. The impact of the Métis Training to Employment program

The Métis Training to Employment Program (MTE) is the best-known service delivery arm of the Rupertsland Institute. Its objectives are to identify and promote actions that improve education, skill levels, and employment opportunities for Métis people, and to manage and deliver programs that enable Métis individuals to pursue education, enhance their skill level, and find productive and well-paying occupations and employment.

An examination of the 1,496 people who have improved their levels of educational attainment under the MTE program since 2006 reveals that they increased their lifetime earnings by $1.2 billion. The total social benefit, including individual nonmonetary and external social benefits, is $6.9 billion. Thus, the social benefit per person for these 1,496 people exceeds $4 million per person.

The provincial tax revenue from the 1,496 people is shown to increase by a discounted present value of $267.9 million, which is an increase of $179,075 per person over a lifetime.

2 *Sums have been rounded.*

Section 6. The potential impact of a Métis teacher education program in Alberta

As shown by the Saskatchewan Urban Native Teacher Education Program (SUNTEP) in neighbouring Saskatchewan, the social benefit of a Métis teacher education program is stunningly large. Section 5, on the impact of the Métis Training to Employment program, showed that the MTE program has a social benefit of over $4 million per graduate. That is a lot of money per graduate. However, the benefit per graduate of a Métis teacher education program would be an order of magnitude greater.

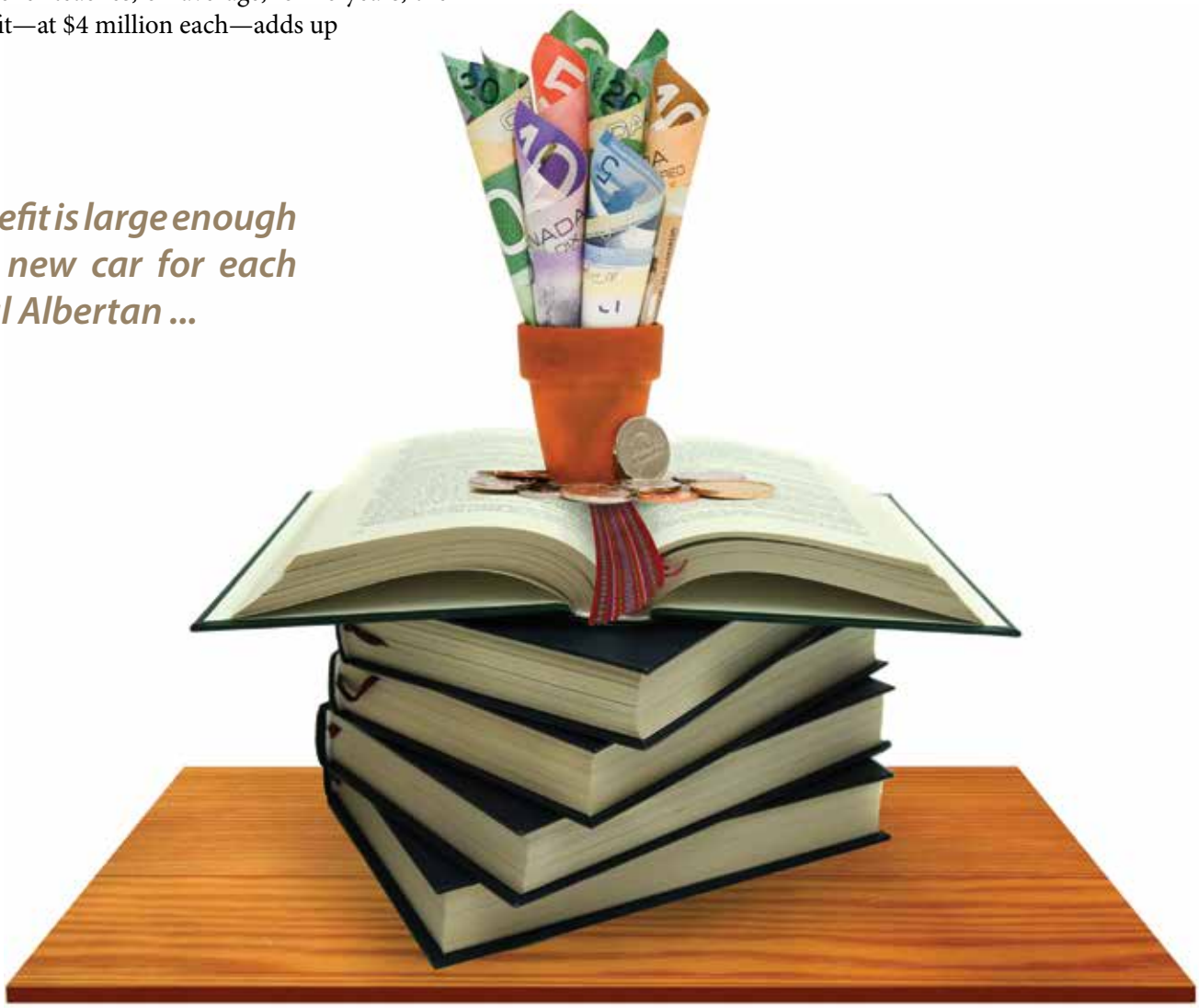
Each teacher-graduate represents an enhanced social benefit because of the role model effect—that is, when Aboriginal students see themselves in their teachers and then find a way to make education work. Each time this happens over the teacher's career, the resulting benefit is worth about another $4 million. (The precise amount would depend on the student's particular educational choices.) If a teacher teaches, on average, for 40 years, the additional benefit—at $4 million each—adds up

... the benefit is large enough to buy a new car for each individual Albertan ...

Section 7. Fiscal implications for the government of Alberta

Bridging the Aboriginal Education Gap would have important fiscal implications for Alberta's provincial government. On the revenue side, bridging the Gap would provide additional tax revenue from the resulting increase in earnings. This would provide the government with a stream of additional revenue over a lifetime that has a discounted present value of $8.5 billion.

On the revenue side, we present an analysis that suggests conservatively that the savings would now be more than half a billion dollars per year; this savings would grow over time.



1. The Aboriginal Education Gap in Alberta is Large and Growing Rapidly

There is an Aboriginal Education Gap—a gap between the educational levels of the Aboriginal and the non-Aboriginal populations. In Alberta, and across Canada, the Aboriginal Education Gap is large, and growing rapidly.

"A Mind is a Terrible Thing to Waste" was an iconic advertising message that emerged from the United States Civil Rights Movement. The message of this study is deliberately different: "A Mind is an Expensive Thing to Waste." The original phrasing, using "terrible," encompassed ethical and moral considerations; the "expensive" phrasing corresponds to cold, hard cash. With the Aboriginal Education Gap, Alberta is leaving over a quarter of a trillion dollars unrealized and unclaimed—money that is essentially lying on the ground, waiting to be picked up.

...for a Métis female, dropping out of high school is like owning a fleet of 87 top-of-the-line 4WD trucks and pushing each of them off a cliff.

In this study, the size of the Aboriginal Education Gap in Alberta is measured in terms of the benefit to the province of bridging it. The total benefit is measured using three different types of benefits derived from higher levels of educational attainment:

- an individual monetary benefit that consists of increased earnings;
- an individual nonmonetary benefit that encompasses a varied array of benefits, ranging from improved health to longer paid vacations; and
- an external social benefit that encompasses another varied array of benefits, ranging from reduced rates of criminality to a faster increase in productivity.

The study begins with an analysis of the effect of education on lifetime earnings in Alberta. The size of the Aboriginal Education Gap is then measured in terms of the dollar benefit of bridging the Gap. Other matters will subsequently be considered—the fiscal implications for the province of Alberta, the benefit of the Métis Training to Employment program, and the benefit that would result from establishing a Métis teacher education program. We begin by measuring how much money an individual Albertan will earn in his or her lifetime according to his or her level of education.

2. Education and Earnings in Alberta

In Alberta, a typical Métis male who drops out instead of completing his high school diploma is reducing his lifetime earnings by over three-quarters of a million dollars. For every $1.00 he earns as a dropout, he would earn $2.02 if he had his high school diploma. A typical Métis female who, instead of dropping out, finishes high school and goes on to finish university increases her lifetime earnings by over two million dollars. For every $1.00 she would have earned as a high school dropout, she will earn $7.16 as a university graduate. Similar amounts apply to non-Aboriginal and First Nations Albertans as well.

Adults reading this report know that these are large amounts of money. Many young people, however, do not appreciate this, because young people, as most people think, tend to overestimate their future earnings vastly. That overestimation is not surprising: parents often do not tell their own children about household earnings, because they do not want their children to tell others. The only information young people get may be media stories about the earnings of sports and entertainment figures. A consequence of the overestimation is that many young people regard the above figures as a drop in the bucket. That is unfortunate, because important educational decisions are made by young people as early as grade seven, or even earlier; if young people do not learn until grade twelve the impact of education on their earning potential, it may well be too late.

The above amounts of money thus need to be made concrete. After some dickering, a new, top-of-the-line Ford F150 XLT Supercab 4WD costs about $28,000. Thus, when a Métis male drops out of school, it is as though he owns 27 of these trucks and, one by one, pushes them off a cliff. For a Métis female, dropping out of high school instead of completing it and going on to complete university is like owning a fleet of 87 of these trucks and pushing each of them off a cliff.

The purpose of this section of the report is to measure the lifetime earnings of Albertans depending on their level of education. Earnings vary depending on whether an individual is non-Aboriginal, Métis, or First Nations, so they will be measured separately. Earnings also vary depending on whether an individual is male or female, so they will also be measured separately.

This is the Information Age, when an individual's earnings depend largely on what he or she knows. It is not surprising that earnings increase (on average) with further education. This report focuses on four levels of education. It focuses on individuals who:

- drop out prior to receiving a high school diploma and do not subsequently obtain high school equivalency;
- earn a high school diploma either by graduation or by completing high school equivalency—with no further formal education;
- complete a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship–with no further formal education; or
- receive a Bachelor's degree or higher.

Thus, we measure the earnings of 24 different typical Albertans: males or females, who are non-Aboriginal, Métis, or First Nations, and who have reached one of the above four levels of educational attainment.

(At this point, some readers may prefer to skip ahead to Section 2.1, where we turn to reporting actual dollar amounts; they may then wish to return here.)

An important caveat relates to the third educational category defined above, which includes people who have received a postsecondary certificate or diploma below the Bachelor's degree level. Such certificates are awarded by a variety of educational institutions, including universities and colleges, as well as technical schools. This report, for ease of presentation, usually refers just to technical schools. This educational category also includes people who have completed apprenticeships.

The results of the earnings analysis will be different from what many expect. For example, although it is well-known that males typically earn more money than equally educated females, females in fact realize a higher financial return to education than males. Why is that? Empirically, it is evident that uneducated females make far less than uneducated males. With an education, however, most of the difference in earnings goes away. Consequently, females receive a double financial benefit from education: with education, females obtain the increase in earnings that we all (typically) experience in the Information Age, but they also catch up with the earnings of males.[3]

3 *This observation is broadly true across a wide spectrum of different economies. The exception that proves the rule is the Scandinavian countries, which tend to be more egalitarian. There, uneducated females earn at about the same level as uneducated males, so the returns on education are roughly equal.*

Similarly, Aboriginal people realize a higher financial return to education than non-Aboriginal people. Empirically, uneducated Aboriginal people typically earn far less than uneducated non-Aboriginal people. With an education, however, the difference in earnings largely goes away. Consequently, Aboriginal people receive a double financial benefit from education: with education, Aboriginal people obtain the increase in earnings that we all typically experience in the Information Age, but they also catch up with non-Aboriginal people.

In fact, some studies conclude that Aboriginal females realize the highest financial return to education of any group in North America. See, for example, O. Ashenfelter and C. Rouse (2000). Aboriginal females receive a triple benefit from education: they receive the usual increase in earnings that results from education, but they also catch up with non-Aboriginal people and also catch up with males.

There is a vast literature in economics measuring the financial return to education. Careful reviews of the literature are available by Craig W. Riddell (2006), as well as the paper by Philip Oreopoulos and Kjell G. Salvanes (2011), which is discussed at length in Section 3.2 below. Most studies are presented in terms that—although they may be riveting to a person with a PhD in economics—leave the rest of the world unimpressed. For example, a study may conclude that the elasticity of earnings with respect to years of postsecondary education for an Aboriginal female equals 1.14629. It is safe to say that almost anyone who knows how to interpret the previous sentence is already fairly well on his or her way to possessing a good deal of formal education. Another study may conclude that the financial rate of return to investment in education for an Aboriginal male is 11%. If you were to convince the writer that he could make 11% on an investment, then you would have his attention; however, the same is not true of many young people, with their intrinsic lack of experience and understandable impatience to get on with their lives.

Consequently, the financial return to education reported here is expressed in terms dollars of earnings. Techniques will be employed from the field of forensic economics, which are usually employed to measure lifetime earnings in cases of personal injury or wrongful death. These techniques yield a dollar value of lifetime earnings dependent on whether an individual is male or female; whether they are non-Aboriginal, Métis, or First Nations; and on their level of education. A review of forensic economics techniques can be found in the Eastern Economic Journal in a special issue introduced by David Schap (2010), as well as in the textbook by Frank D. Tinari (2010).

The amounts reported below are median earnings: 50% of people will make more than the amounts shown, and 50% will earn less. The earnings distribution is well-known to be skewed, so that mean earnings are higher than median. The following results should be interpreted with that in mind. The following dollar amounts will be large, but mean earnings would be even larger.

All 24 individuals in this study are assumed to reach age 15 sometime in 2013.

All results are stated in constant 2013 dollars, so the effect of inflation is removed. All of the following results are stated as discounted present values, using a two percent real discount rate. More is said about discounted present values in the third section of Appendix B.

With education Aboriginal people obtain the increase in earnings which we all typically experience in the Information Age but they also catch up with Nonaboriginal people.

2.1 How much will non-Aboriginal Albertans earn?

Table 1 shows the lifetime earnings of non-Aboriginal Albertans depending on their sex and level of education.

Table 1. Lifetime earnings of a non-Aboriginal Albertan

	MALE	FEMALE
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	$877,120	$413,291
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	$1,586,283	$1,077,737
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	$2,362,089	$1,534,249
Receives a Bachelor's degree or higher	$3,126,634	$2,705,966

Note that female dropouts have lifetime earnings of less than half a million dollars—the lowest amount in Table 1, and not much to spread over a whole lifetime. Although male dropouts earn far less than males in any other educational category, they nonetheless earn far more than female dropouts. In fact, female dropouts have less than half the earnings of male dropouts.

In general, males at all levels of education tend to have higher earnings than similarly educated females. Average lifetime earnings for males, calculated from a simple average of the entries for all four levels of education, is $1,988,031. The average for females is $1,432,811, over a half a million dollars less. The difference between male and female earnings is greatest for below-Bachelor's postsecondary graduates, at $827,840, reflecting the fact that females are more likely to go into lower-paying pink-collar jobs and males are more likely to go into higher-paying trades. The smallest difference is for those who receive a Bachelor's degree or higher, at $420,668.

Table 2 shows the additional earnings that accrue with education by showing how much is earned at each level of education per dollar of lifetime earnings for a dropout. For example, the first entry in the table shows that a non-Aboriginal male who finishes high school will earn $1.81 for every dollar he would earn if he had dropped out. A non-Aboriginal female who finishes high school and then technical school will earn $3.71 for every dollar she would have earned if she had dropped out.

The situation of the sexes is reversed comparing Table 2 to Table 1. Males make more money—as shown in Table 1—but the response of earnings to education is dramatically higher for females—as shown in Table 2. Note carefully that a male has a large incentive to complete high school and then go onto university, earning $3.56 for every dollar that he would have earned as a dropout. For a female, however, completing high school and then going on to university results in her earning $6.55 for every dollar she would have earned as a dropout.

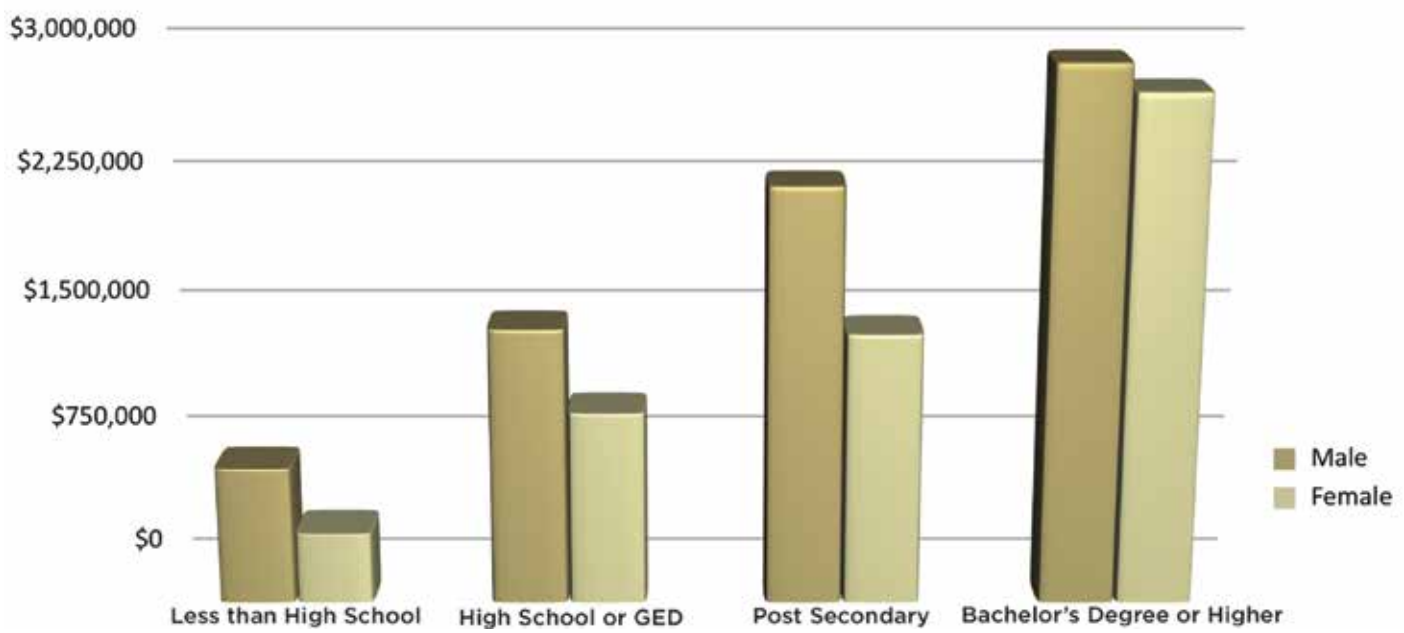
Table 2. For every dollar a Nonaboriginal Albertan dropout earns, how many dollars would be earned with education?

	MALE	FEMALE
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency, with no further formal education	$1.81 per $1	$2.61 per $1
Receives a postsecondary certificate or diploma below the Bachelor's degree level (e.g., completes a technical school program) without further formal education	$2.69 per $1	$3.71 per $1
Receives a Bachelor's degree or higher	$3.56 per $1	$6.55 per $1

2.2 How much will Métis Albertans earn?

Table 3 shows the lifetime earnings of Métis Albertans depending on their sex and level of education.

Table 3. Lifetime earnings of a Métis Albertan



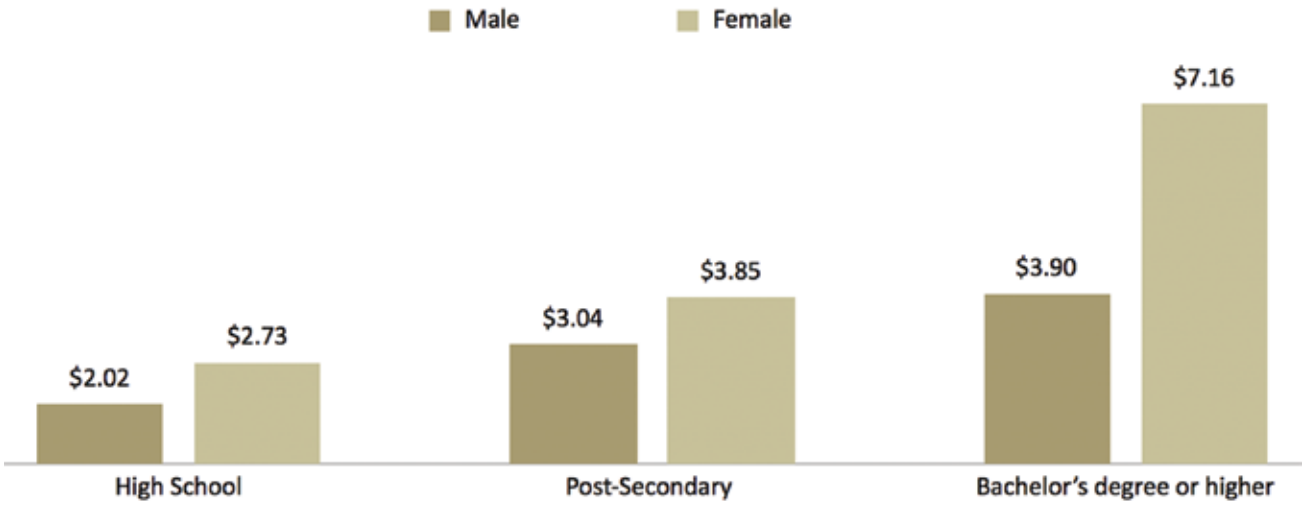
The comparison for males and females is just as stark as for non-Aboriginal Albertans: averaging the entries of Table 3, males earn $1,908,973 and females $1,457,997, which is $450,976 less than males. Similarly, the difference in earnings is largest for below-Bachelor's postsecondary graduates, at $809,545—reflecting both females' greater likelihood of entering pink-collar occupations and males' greater likelihood of entering trades—and the difference is smallest for those in the top educational category.

Female Métis dropouts earn even less than female non-Aboriginal dropouts. Their lifetime earnings, only $395,523, are not much to spread over an entire lifetime.

The effect of education on earnings for Métis Albertans is shown in Table 4.

Table 4 shows the additional earnings that accrue with education by showing how much is earned in each educational category for each dollar earned by a dropout. For example, a male Métis who finishes high school and then university earns $3.90 for each dollar he would have earned as a dropout.

Table 4. For every dollar a Métis Albertan dropout earns, how many dollars would be earned with education?



Comparing Table 3 to Table 4, we see that the tables are turned. Table 3 shows that Métis males earn more than equally educated Métis females. But Table 4 shows that Métis females realize a greater financial benefit from education. For example, Table 3 shows that a Métis male who is a below-Bachelor's postsecondary graduate earns over $800 thousand more over his lifetime than an equally educated Métis female. However, for every dollar he would have earned as a dropout, he earns $3.04; for every dollar she would have earned as a dropout, she earns $3.85. Similar observations can be made for high school graduates and for those with a Bachelor's degree or higher.

2.3 How much will First Nations Albertans earn?

Table 5 shows the lifetime earnings of First Nations Albertans depending on their sex and level of education.

Table 5. Lifetime earnings of a First Nations Albertan

	MALE	FEMALE
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	$439,728	$182,215
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	$1,046,431	$682,554
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	$1,815,663	$1,129,866
Receives a Bachelor's degree or higher	$2,880,805	$2,548,820

We can observe from Table 5 that First Nations female dropouts earn even less than both non-Aboriginal and Métis female dropouts. Whereas Tables 1 and 3 showed the economic marginalization of female dropouts in general, the situation for First Nations females is significantly more severe. With lifetime earnings of only $182,215, it is not surprising that life choices become extremely restricted and often result in people engaging in risky or abusive situations.

Something different for First Nations compared to non-Aboriginal and Métis Albertans is that First Nations male dropouts earn less than a half a million dollars—receiving lifetime earnings that are only a little more than that of non-Aboriginal and Métis female dropouts.

For First Nations, as for the other groups, males make more than females. The difference is greatest for below-Bachelor's postsecondary graduates, at $685,797—again, a reflection of both females' greater likelihood of entering pink-collar occupations and males' greater likelihood of entering trades. For both non-Aboriginal people and Métis, the smallest difference between the earnings of males and females occurs with university graduates, but for First Nations, the smallest difference occurs with dropouts.

Table 6 shows how First Nations earnings respond to education.

Table 6. For every dollar a First Nations Albertan dropout earns, how many dollars would be earned with education?

	MALE	FEMALE
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency, with no further formal education	**$2.38 per $1**	**$3.75 per $1**
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	**$4.13 per $1**	**$6.20 per $1**
Receives a Bachelor's degree or higher	**$6.55 per $1**	**$13.99 per $1**

Just as for non-Aboriginal and Métis Albertans, the effect of education on earnings is greater for females than for males. In fact, the highest-value single entry for Tables 2, 4, and 6 is for First Nations females who complete university. A First Nations female who finishes university typically earns $13.99 for every dollar she would have earned as a dropout.

Comparisons can be made of the different earnings levels shown in Tables 1, 3, and 5. Comparison of the male earnings is particularly straightforward. For a given level of education, non-Aboriginal males earn the most and First Nations males earn the least, with Métis males in between. The highest earning male is a non-Aboriginal with a Bachelor's degree or higher. The story is somewhat more complicated for females. For any given level of education, First Nations females earn less than non-Aboriginal or Métis females. However, the category of highest female earners goes back and forth between non-Aboriginal and Métis females, depending on education levels. Overall, the highest-earning female is a Métis with a Bachelor's degree or higher.

Tables 2, 4, and 6 tell the opposite story. Those tables show the effect of education on how many dollars would be earned for each dollar earned by a dropout. For both males and females, First Nations are at the top, followed by Métis and then non-Aboriginal. The highest increase is for a First Nations female who has her Bachelor's degree or higher: she earns $13.99 for each dollar she would have earned as a dropout. The lowest increase is for a non-Aboriginal male who gets his high school diploma: he earns $1.81 for every dollar he would have earned as a dropout.[4]

A First Nations female who finishes university typically earns $13.99 for every dollar she would have earned as a dropout.

4 *It is important to see this in context. Although $1.81 is lower than the other amounts, it still represents a lot of money over a lifetime. A non-Aboriginal male Albertan dropout will have lifetime earnings of only $877,120, whereas he will earn $1,586,283 if he completes high school, as shown in Table 1.*

2.4 What do working Albertans do?

Table 7 shows the distribution of employees by occupation in Alberta.[5] The data is compiled from the Microdata files from the 2006 Census of Canada. Much more is said about this data source in Appendix B of this report.

Table 7. Employment in Alberta by occupation

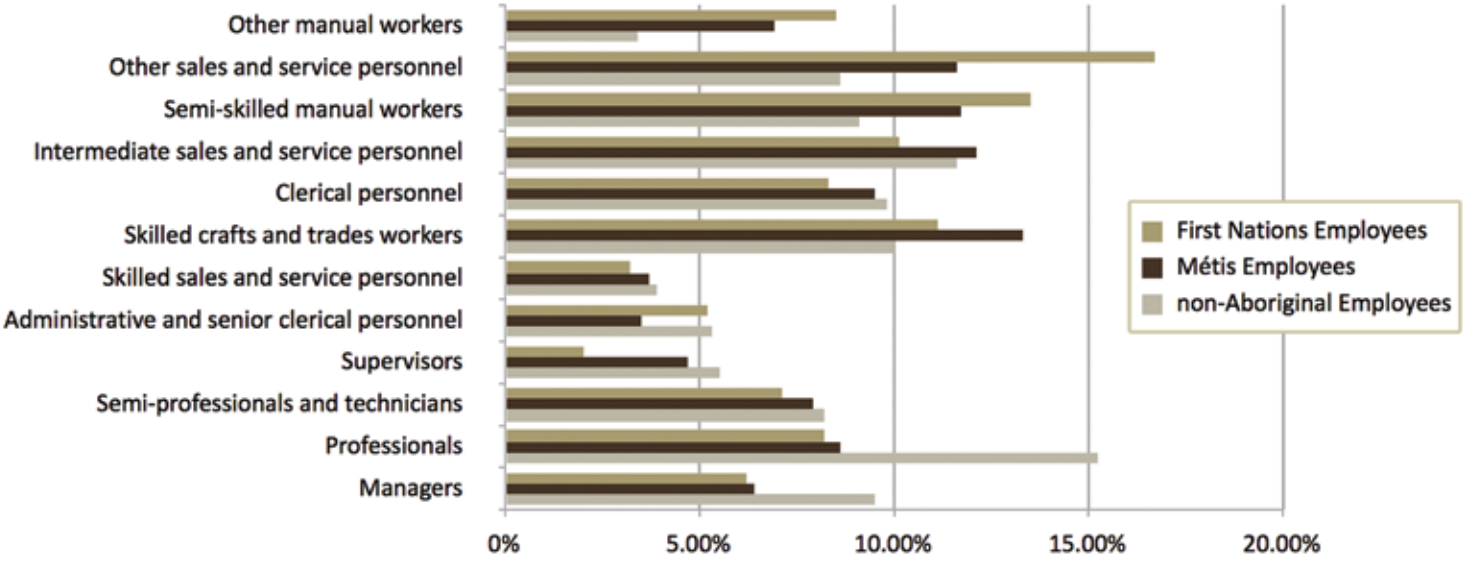


Table 7 shows that the distribution of employment in Alberta depends on whether an individual is non-Aboriginal, Métis, or First Nations. The top four occupations for non-Aboriginal people are, in order: Professionals; Intermediate sales and service personnel; Skilled crafts and trades workers; and Clerical personnel. The top four for Métis are: Skilled crafts and trades workers; Intermediate sales and service personnel; Semi-skilled manual workers; and Other sales and service personnel. The top four for First Nations are: Other sales and service personnel; Semi-skilled manual workers; Skilled crafts and trades workers; and Intermediate sales and service personnel.

Although there are certainly differences, one notes from Table 7 how similar the employment distributions are. It is impossible to explain the significance of this similarity without being politically incorrect. Many non-Aboriginal people still think of Aboriginal people in stereotypical terms, including being drunken, lazy, and living in the bad part of town. They do not even notice that the professional couple living just down the street are Aboriginal. However, the presence of the professional couple—who probably would not have been there a few years ago—shows that Aboriginal education programs work. Moreover, they provide valuable role models who are useful for other Aboriginal people who seek to use education as a path to escape poverty.

Table 8 shows the distribution of employees in Alberta by industry.

Table 8 shows that employment in Alberta engages a much smaller fraction of employees in the area of non-renewable resources than many would expect. Mining and oil and gas extraction is the seventh-largest employer of non-Aboriginal people, the fourteenth-largest employers of Métis, and tied for the seventh-largest employer of First Nations.[6] Many would expect that non-renewable resources would employ a larger fraction of employees in Alberta. The significance of Table 8 is discussed in Section 2.5.

5 *The occupational classification in Table 7 is based on the National Occupational Classification maintained by Human Resources and Skills Development Canada*

6 *A First Nations friend of the writer who is a professional tells about being told to her face by an acquaintance that the acquaintance "didn't know any Aboriginal people."*

Moreover, they provide valuable role models who are useful for other Aboriginal people who seek to use education as a path to escape poverty.

Table 8. Employment in Alberta by industry

	Nonaboriginal Employees	*Métis Employees*	*First Nations Employees*
Agriculture, forestry, fishing and hunting	4.2%	11.6%	2.6%
Mining and oil and gas extraction	6.6%	3.2%	6.3%
Utilities	0.9%	0.8%	0.3%
Construction	8.5%	6.1%	10.9%
Manufacturing	7.1%	6.0%	5.8%
Wholesale trade	4.4%	3.6%	1.8%
Retail trade	11.1%	11.1%	9.6%
Transportation and warehousing	5.0%	4.3%	4.9%
Information and cultural industries	1.8%	2.2%	0.9%
Finance and insurance	3.2%	3.8%	0.8%
Real estate and rental and leasing	1.9%	1.1%	1.5%
Professional, scientific and technical services	7.5%	3.6%	3.6%
Management of companies and enterprises	0.1%	0.1%	0.0%
Administrative and support, waste management and remediation services	3.6%	2.8%	6.3%
Educational services	6.3%	7.4%	6.5%
Health care and social assistance	9.1%	11.4%	9.9%
Arts, entertainment and recreation	2.0%	2.0%	1.8%
Accommodation and food services	7.0%	7.0%	8.7%
Other services (except public administration)	5.2%	5.1%	5.1%
Public administration	4.5%	6.9%	12.6%
TOTAL	100.0%	100.0%	100.0%

2.5 What about lucrative/low-education jobs in non-renewable resources?

One of the most frequent questions regarding the above earnings results is related to the employment of males in lucrative jobs in the non-renewable resources sector that require little formal education. Many Albertans personally know young men who were hired in this sector—some before even completing high school—and were paid handsomely to work for a non-renewable resource firm. Yet at first glance, these men do not seem to be reflected in the earnings results in Tables 1 through 6.

The earnings results are derived from data regarding employment and earnings in Alberta, so the question should be why those jobs do not appear to be reflected in the data. (In fact, they are reflected in the data, but that will be discussed later.) One explanation for the apparent absence of the jobs from the data has to do with relative significance of employment in the non-renewable resources sector. Although non-renewable resources obviously make up a vital part of the economy of Alberta, Table 8 shows that less than 10 percent of Albertans actually work directly in the non-renewable resource industry.

A more significant reason that the jobs do not seem to be reflected in the data has to do with job tenure: such jobs are typically held for only a short time. Statistics Canada's labour force survey (the survey used to measure vital labour-market statistics like unemployment rates) keeps track of average job tenure—how long a job has been held. For each of the last fifteen years, Alberta has had the lowest job tenure of any province in Canada. In 2012, the last full year for which we have data, job tenure in Alberta was over a year (13.8 months) shorter than the Canadian average, and almost two years shorter than in neighbouring Saskatchewan.[7] Within Alberta, the non-renewable resources sector has, in turn, lower job tenure than the already low Albertan average: for example in 2012, job tenure in non-renewable resources was 14.4 months shorter than the average for Alberta.[8] Finally, young people tend to hold individual jobs for much shorter lengths of time than they will when they get older.

The data is thus somewhat insulated from the presence of lucrative/low-education jobs in non-renewable resources because these jobs are not typically held for very long.

Of course, the non-renewable resource companies that pay these lucrative wages are not doing so out of the goodness in their hearts. High pay is a hard-nosed business strategy to reduce job turnover. Job turnover is costly for businesses, which is why some firms will even employ people who have not completed high school. An employee who does not at least have a high school diploma will have few employment options, and hence will likely hold onto a job somewhat longer.[9]

What should a young man do if he is contemplating taking one of the lucrative/low-education jobs available in non-renewable resources? If that is a direction in which he wants to go, he should do it with his eyes open. He will probably not be holding the job for very many years, and he will have to prepare for when he wants to move on to something else. If he is contemplating dropping out of school, he should consider whether he will enjoy re-entering the labour market at, say, age 22 (perhaps when he has a partner and children) with no high school diploma. It is important to understand that this is the very dilemma that the employer is trying to create, in order to entice employees to hold onto their jobs a little longer. But suppose this young man does just that and holds out a bit longer; will it be any better for him re-enter the labour market without a high school diploma at age 23? What about age 24?

People who take lucrative/low-education jobs in non-renewable resources should take into account that they may not hold these jobs for long. They may reasonably expect to enjoy things for a while – enjoy making payments on a big pickup with a lot of chrome – but they should also plan for the end of the job, which may arrive sooner than they think. Tables 1 through 6 show that Albertans are financially better off over their lifetime if they finish high school, and better off yet if they go on to education beyond high school.

7 This low level of job tenure is one of the results of the high demand for labour in Alberta: employees change jobs more frequently when new jobs are readily available

8 Formally, the series giving Albertan job tenure in CANSIM, V2332992, also includes lumber and fishing with non-renewable resources.

9 It is a common business strategy to hire people who have only partly completed an educational program, and not yet received a credential. That strategy is employed at all levels of education. For example, the writer got his PhD at the University of Maryland. In his first year the economics PhD program had an entering class of 55 students, only three of whom actually completed their PhDs. Does that mean that 52 students failed? No; employers actively recruited and hired many of the students prior to the formal completion of all the requirements for a PhD. In that way, the employer obtained an employee who did not have as much job mobility, which made up for the employee's lack of some knowledge from having an incomplete degree.

As noted above, the lucrative/low-education jobs do, in fact, show up in the data, but they seem hidden because Alberta has many lucrative jobs. And while an uneducated male[10] in Alberta can earn more there than elsewhere in Canada, an educated Albertan can earn even more still.[11] Some employers will want to hire before a credential is received—to lower job mobility—but Tables 2, 4, and 6 show how much more an Albertan will make if he/she gets an educational credential.

...show that Albertans are financially better off over their lifetime if they finish high school, and better off yet if they go on to education beyond high school.

10 *This does not apply to uneducated females—or to uneducated First Nations males—in Alberta, who Tables 1 through 6 show are economically marginalized.*

11 *A warning here: There are postsecondary subjects that actually lower earnings. And low grades are best avoided because of what they communicate to some potential employers.*

3. Bridging Alberta's Aboriginal Education Gap would benefit Albertans by more than a quarter of a trillion dollars

There is a gap between the educational attainment levels of the Aboriginal and non-Aboriginal populations of Alberta. Table 9, compiled from the Microdata files of the 2006 Census of Canada, shows the percentage of Alberta residents with each of four levels of educational attainment. Consistent with the parameters of this study, the coverage of the table begins at age 15—Statistics Canada's Labour Force Age—and ends at age 69.

Table 9. Educational attainment by sex and Aboriginal identity, Alberta, age 15-69, 2006

Educational attainment	*Male*	*Female*	*Both*
non-Aboriginal			
No high school diploma	**21.4%**	**19.1%**	**20.3%**
High school diploma, terminal	**25.7%**	**28.8%**	**27.2%**
Technical school diploma, terminal	**34.9%**	**32.6%**	**33.7%**
Bachelor's degree or higher	**18.0%**	**19.5%**	**18.8%**
Métis			
No high school diploma	**39.5%**	**32.0%**	**35.5%**
High school diploma, terminal	**21.9%**	**27.8%**	**25.0%**
Technical school diploma, terminal	**33.9%**	**32.8%**	**33.3%**
Bachelor's degree or higher	**4.7%**	**7.4%**	**6.1%**
First Nations			
No high school diploma	**56.2%**	**47.3%**	**51.5%**
High school diploma, terminal	**15.4%**	**18.1%**	**16.8%**
Technical school diploma, terminal	**25.2%**	**29.2%**	**27.3%**
Bachelor's degree or higher	**3.2%**	**5.3%**	**4.3%**

The table shows that, in Alberta, 20.3% of the non-Aboriginal population aged 15 to 69 has not completed high school, compared to 35.5% for the Métis and 51.5% for First Nations. Nearly one-fifth—18.8%—of non-Aboriginal people have a Bachelor's degree or higher, compared to 6.1% for Métis and 4.5% for First Nations. We can add the percentage of those with technical school education to the percentage with a Bachelor's degree or higher to get the percentage of people with postsecondary education. Over half of non-Aboriginal people, 52.5%, have completed postsecondary education, but only 39.4% of Métis and only 31.6% of First Nations have done so.

The only category in Table 9 for which educational attainment by Aboriginal people exceeds that of non-Aboriginal people is for Métis females who have completed technical school: the Métis female percentage is slightly higher than the non-Aboriginal female percentage, but not by enough to offset the deficit for Métis males. Non-Aboriginal people are somewhat more likely than Aboriginal people to have completed technical school when one combines both sexes, although the difference is less than one-half of one percent.

Although there is much that is depressing about the results in Table 9, there is one aspect of the data that is encouraging—very encouraging. Section 2 of this report noted that there are large differences between the financial incentives faced by males and females in obtaining educational credentials. Tables 1, 3, and 5 showed that female dropouts—whether non-Aboriginal, Métis, or First Nations—are economically marginalized. Tables 2, 4, and 6 showed that females have a greater financial incentive than males to achieve higher levels of educational attainment. As well, compared to males, females have a much higher incentive to obtain a Bachelor's degree (or higher) rather than completing a program at a technical school. For centuries (literally) economists have been highlighting the importance of economic incentives in explaining and predicting behaviour: the differences in financial incentives between males and females would be expected to affect behaviour. The results displayed in Table 9 indicate that, as would be predicted, females are evidently motivated to achieve a higher level of educational attainment than males at all levels of educational attainment with the exception of technical school.

However, compared to males, females have a much higher incentive to obtain a Bachelor's degree (or higher) rather than completing a program at a technical school.

Overall, females are better educated than males. When did this happen? The writer recalls that when he worked toward his Bachelor's degree—a very long time ago—his fellow students were virtually all males. But the feminist movement changed the economic landscape, giving females the greater financial incentives shown in Table 2, 4, and 6. That change in incentives resulted in the higher female levels of educational attainment shown in Table 9. It took several decades, but it happened.

Tables 2, 4, and 6 also showed that Aboriginal people have a greater financial incentive to seek education than non-Aboriginal people. Is it, then, safe to predict that a similar shift will happen in Alberta with Aboriginal people becoming better-educated than non-Aboriginal people? Significantly, Aboriginal people face a financial impediment that was not faced by non-Aboriginal females: young non-Aboriginal females were typically in the same households as young non-Aboriginal males, so they had somewhat similar access to funds to finance education. The same equality of access is not true for Aboriginal people. We find later in this report that a consequence is that the Aboriginal Education Gap in Alberta is widening. If, however, appropriate programs are established or expanded that will help to level the playing field of access to education, then the Gap will narrow and ultimately disappear, just as it did between non-Aboriginal females and males. At that time, it will be fascinating to see if the Gap reverses, just as it has for males and females.

There is, unsurprisingly, a great deal of heterogeneity in the aggregate population represented by the data in Table 9. Educational attainment of the youngest people in the table tends to be lower—they have not finished their education—and the educational attainment of the oldest people tends also to be lower—they were educated at a time when the average level of formal education was lower overall. In between the age extremes, educational attainment tends to be higher. For example, consider the educational attainment of the cohort of young adults, age 25-34, that is shown in Table 10.

Table 10. Educational attainment by sex and Aboriginal identity, Alberta, age 25-34, 2006

Educational attainment	Male	Female	Both
Nonaboriginal			
No high school diploma	14.5%	10.6%	12.6%
High school diploma, terminal	25.5%	22.3%	23.9%
Technical school diploma, terminal	36.7%	35.9%	36.3%
Bachelor's degree or higher	23.3%	31.2%	27.2%
Métis			
No high school diploma	32.1%	24.4%	28.2%
High school diploma, terminal	25.5%	23.3%	24.3%
Technical school diploma, terminal	39.4%	41.5%	40.5%
Bachelor's degree or higher	3.0%	10.8%	7.0%
First Nations			
No high school diploma	48.2%	45.9%	46.9%
High school diploma, terminal	20.1%	22.5%	21.4%
Technical school diploma, terminal	29.3%	24.4%	26.5%
Bachelor's degree or higher	2.4%	7.2%	5.1%

As expected, the population age 25 to 34 is much better educated than the population age 15 to 69. For each category in the table—non-Aboriginal, Métis, and First Nations, and for both males and females—the probability of not having a high school diploma is lower for the group age 25 to 34. The probability of having postsecondary education is higher for almost all categories in this age cohort. The probability of a female in this cohort having a postsecondary education increases to over two-thirds for non-Aboriginal females and over a half for Métis females.

In Table 10, covering the 25-to-34 population, the gap between the educational attainment of Aboriginal people and non-Aboriginal people is less evident than it was in Table 9, which covers the overall 15-to-69 population. For example, Métis males and females as well as First Nations females actually have as high or higher a probability of having a terminal high school diploma compared to non-Aboriginal people.[12]

The most notable observation from Table 9 is that the Aboriginal Education Gap is reversed for both Métis males and females when it comes to completing technical school—both have a higher probability of having completed a technical school program than their non-Aboriginal counterparts. Although the next section reveals that there is still an Aboriginal Education Gap in terms of technical school graduates once First Nations people are included, Métis technical school graduates reduce the size of the Gap.

12 *It should be noted that the higher probability of a terminal high school diploma is actually a good news/bad news situation given the importance of postsecondary education in the Information Age.*

3.1 The benefit includes an individual monetary benefit of $44.2 billion

In order to compute the increase in earnings that would result from bridging the Aboriginal Education Gap in Alberta, it is necessary to convert the proportional differences—shown in Tables 9 and 10—into the differences in numbers of people. How many more Métis and how many more First Nations individuals would be required in each educational category in order to reach the same proportionate level of educational achievement as seen in the non-Aboriginal population? Because the financial value of education varies by age and sex, the computation must produce measures for both of these variables. The results of the computation are shown in Table 11.

The data in Table 11 show the Aboriginal Education Gap in terms of numbers of individuals compiled from the Microdata files of the 2006 Census.

There are several negative numbers in Table 11, arising from situations in which a larger percentage of the Métis or First Nations population holds a credential than is the case for the non-Aboriginal population of the same sex and age. The majority of these occurrences are for Métis, and most are for technical school completions. In terms of the eleven different five-year age cohorts, the Aboriginal Education Gap is reversed for seven cohorts of females and for six cohorts of males in terms of Métis completion of technical school programs. Summed across all age cohorts, the Aboriginal Education Gap is reversed for Métis males and for Métis females in terms of technical school completions, although the Gap for First Nations is numerically large enough to counterbalance this; thus, the Aboriginal Education Gap does exist for technical school completions.

One of the notable features of the results in Table 11 is their variability with age. Examine, for example, the 25-to-29 age cohort for high school completions. That particular cohort has a much better record in terms of Aboriginal high school completions, whether male, female, Métis, or First Nations. One of the critical limitations of Aboriginal education programs is that they are often not funded from the base budget of educational institutions, but rather from special funds—e.g., as trial projects. When the trial is over, the funding is gone and the program ends. Some of the variability of the results shown in Table 11 would be attributable to such programs that were tried in the past but not sustained. It is fair to speculate that the special results for the 25-to-29 age cohort may reflect the outcome of a past program to encourage Aboriginal high school completion.

Table 11. Number of additional graduates required to bridge the Aboriginal Education Gap

	Métis		First Nations	
Age	**Male**	**Female**	**Male**	**Female**
High School Diploma				
15-19	408	25	1038	863
20-24	154	134	981	504
25-29	-81	-124	-4	77
30-34	75	74	342	-88
35-39	-38	1	387	288
40-44	22	-215	322	478
45-49	225	-196	25	315
50-54	112	371	113	383
55-59	220	260	127	223
60-64	181	158	132	281
65-69	35	95	120	132
Technical School Diploma				
15-19	20	60	78	-118
20-24	181	-32	212	413
25-29	131	147	316	559
30-34	-293	-512	135	332
35-39	-77	-85	294	-295
40-44	202	-63	310	-114
45-49	-254	187	343	-248
50-54	-208	-269	-86	-143
55-59	-210	-23	166	88
60-64	-12	27	-27	-36
65-69	105	-53	-23	178
Bachelor's Degree or Higher				
15-19	6	0	7	0
20-24	138	239	351	440
25-29	527	663	611	1099
30-34	721	647	643	751
35-39	523	610	479	764
40-44	377	631	472	586
45-49	348	193	334	420
50-54	260	418	409	131
55-59	407	147	229	258
60-64	85	87	67	96
65-69	97	62	139	75

Table 12. Increase in lifetime earnings from education by age, sex, and Aboriginal Identity

	Métis		First Nations	
Age	**Male**	**Female**	**Male**	**Female**
High School Diploma				
15-19	$782,452	$686,015	$606,703	$500,339
20-24	$853,539	$746,481	$666,307	$548,110
25-29	$901,760	$784,641	$714,026	$581,068
30-34	$917,740	$794,446	$731,933	$590,795
35-39	$900,946	$782,646	$719,577	$589,895
40-44	$856,019	$747,898	$679,890	$566,937
45-49	$777,089	$675,128	$608,811	$504,768
50-54	$652,794	$551,232	$497,832	$395,144
55-59	$475,776	$382,647	$336,453	$254,177
60-64	$278,751	$207,053	$170,836	$119,992
65-69	$103,126	$64,682	$48,308	$28,046
Technical School Diploma				
15-19	$1,564,449	$1,126,313	$1,375,935	$947,651
20-24	$1,705,403	$1,226,199	$1,508,820	$1,037,251
25-29	$1,802,236	$1,293,095	$1,613,226	$1,102,599
30-34	$1,838,565	$1,315,834	$1,654,133	$1,127,697
35-39	$1,811,973	$1,303,558	$1,631,777	$1,131,186
40-44	$1,730,340	$1,254,285	$1,552,358	$1,096,499
45-49	$1,580,675	$1,143,617	$1,405,223	$995,513
50-54	$1,340,458	$948,603	$1,171,642	$810,588
55-59	$994,508	$677,456	$828,212	$563,583
60-64	$601,486	$384,376	$459,318	$306,000
65-69	$235,683	$131,326	$154,506	$95,701
Bachelor's Degree or Higher				
15-19	$2,221,262	$2,437,570	$2,441,076	$2,366,605
20-24	$2,426,482	$2,655,283	$2,670,072	$2,568,732
25-29	$2,563,850	$2,810,311	$2,849,320	$2,671,973
30-34	$2,612,863	$2,876,610	$2,927,516	$2,643,138
35-39	$2,568,044	$2,861,844	$2,906,886	$2,544,078
40-44	$2,440,736	$2,766,267	$2,797,226	$2,364,454
45-49	$2,212,352	$2,537,236	$2,577,757	$2,060,540
50-54	$1,842,985	$2,117,179	$2,218,381	$1,610,032
55-59	$1,321,686	$1,514,376	$1,671,457	$1,069,071
60-64	$740,081	$862,159	$1,046,423	$560,888
65-69	$246,355	$299,636	$441,765	$177,781

Another potential cause of the variability with age is that the path of Aboriginal people through the educational system can be very different from the path typically taken by non-Aboriginal people. There are exceptions, of course, but whereas non-Aboriginal people typically front-load education in their youth, Aboriginal people often pursue education at different times throughout their lives. The increase in Aboriginal high school completions seen in Table 11 starting with the 25-to-29 age cohort may be caused by dropouts subsequently obtaining high school equivalency.

In addition to the results in Table 11, in which the size of the Aboriginal Education Gap is measured by number of people, it is necessary to measure the financial return to education by age cohort. Bridging the Gap involves increasing the number of individuals in various age cohorts who have different educational credentials—but the increase in lifetime earnings from obtaining a credential varies by age, sex, and Aboriginal identity. The increases in lifetime earnings by credential are shown in Table 12.

The entries in Table 12 measure the increase in the individual's future lifetime earnings. For example, the table shows that a Métis female who graduates from high school between the ages of 15 to 19 increases her future lifetime earnings by an amount with a present value of $686,015.[13] If she waits and gets high school equivalency when she is between 60 and 64, it still increases her lifetime earnings, but by less.

13 *This is the same increase as shown by the entries in Table 3. Without a high school diploma, her lifetime earnings, starting from age 15 to 19, would be $395,523. With a high school diploma, her lifetime earnings will be $1,081,538. The difference, $686,015, is the entry in Table 12 for a Métis female age 15 to 19.*

Before continuing, it is useful to note that the results shown in Table 12 provide considerable justification for adult education programs. Many readers would expect to see a gradual decrease in the value of future earnings with age, because aging obviously shortens an individual's remaining time in the labour force. Note instead that the increase in the lifetime earnings of an individual is greater for a person age 30 to 34 than for a person age 15 to 19. How can that be? Recall that lifetime earnings are discounted present values, so the future is discounted (at an annually compounded rate of two percent per year in this study). Lifetime earnings initially increase with age because the individual gets closer to his or her prime earning years. Prime earning years are farther in the future—and hence more heavily discounted—for an individual age 15 to 19 than will be the case when the individual is age 30 to 34.

For example, a Métis male age 20 to 24 who gets his Bachelor's degree increases his future lifetime earnings (on average) by a present value of $2.4 million dollars; if he gets his Bachelor's degree twenty-five years later, when he is between 45 and 49, his future lifetime earnings increase by $2.2 million—only about 10 percent less.[14] As a society, to our credit, we invest large amounts of money in providing education to youth, ensuring their futures as well as our own. This focus on education for the young correlates with the typical non-Aboriginal approach of frontloading formal education. As noted previously, however, Aboriginal people may spread formal education over their lives. Adult education programs then become an imperative. Table 12 provides a further financial justification for providing those programs: educating adults can provide a financial benefit that is similar in size to that realized by educating youth.

Continuing with the principal purpose at hand, Table 11 shows that bridging the Aboriginal Education Gap requires another 74 Métis females age 30 to 34 to earn high school diplomas, and Table 12 shows that the diploma will increase their lifetime earnings by $794,446 each. So the increase in earnings would be $58,789,004 (=74*$794,446) overall. There is also a requirement for another 316 First Nations males age 25 to 29 to complete technical school, which will increase their lifetime earnings by $1,613,226 each; their increase in lifetime earnings as a group would be $509,779,416 (=316*$1,613,226). There is also a requirement for another 721 Métis males age 30 to 34 to attain a Bachelor's degree, which will increase their lifetime earnings by $2,612,863 each; their increase in lifetime earnings as the group would be $1,883,874,223 (=721*$2,612,863).

As noted previously, however, Aboriginal people may spread formal education over their lives.

Continue with this process: multiply each of the numbers of individuals in the entries in Table 11 by the corresponding dollar entries of Table 12, and add up the product. The result is an increase in earnings in Alberta of $44.2 billion dollars.

That large sum can be subdivided in several relevant ways. Table 13 shows the increase in earnings by educational credential from bridging the Aboriginal Education Gap.

Table 13. Increase in lifetime earnings from bridging the Aboriginal Education Gap in Alberta, by credential

High school diploma, terminal	$4.7 billion
Technical school diploma, terminal	$1.8 billion
Bachelor's degree or higher	$37.6 billion
Total	**$44.2 billion**

14 *In the retirement literature, compound interest is frequently referred to by the phrase "the miracle of compound interest." The other side of that coin is that discounting has some fairly "miraculous" effects too.*

Table 13 shows that by far the greatest increase in earnings from bridging the Aboriginal Education Gap results from increasing Aboriginal educational attainment at the level of a Bachelor's degree or higher. That reflects the average earnings of those in Alberta who have obtained that level of education, whom Tables 1, 3, and 5 show to have significantly higher earnings than others. The smallest increase is for completion of technical school. That reflects the fact that, as shown in Table 11, many of the age cohorts for Métis had a surplus of technical school graduates (compared to the non-Aboriginal population), which partly offset the deficit of First Nations and lowered the total of the earnings increase for technical school. High school is in between.

There is an important qualifier regarding high school. Recall that the high school category used for Table 13 refers to those with a terminal high school diploma—those who finish high school and then do not go on to further formal education. However, the people who complete university or technical school would typically receive their high school diplomas first. Thus, high school is far more important than may be suggested by the relative amounts in Table 13.

As well, although the relative amounts shown in Table 13 for high school and technical school are both much smaller than that for Bachelor's degrees, the absolute amounts are still large. The smallest number is $1.8 billion, which is smaller than the rest, but is still large in itself.

The total increase in earnings of $44.2 billion can also be divided by Aboriginal identity, as shown in Table 14.

Table 14. Increase in lifetime earnings from bridging the Aboriginal Education Gap in Alberta, by Aboriginal Identity

Métis	$16.9 billion
First Nations	$27.3 billion
Total	**$44.2 billion**

Table 14 reveals that Métis make up about 38.3% of the Gap and First Nations, 61.7%. These percentages can be compared to the population percentages among those covered by the Education Gap computations—Albertans age 15 to 69. For that population, Métis made up 49.4% and First Nations, 50.6%.

The total increase in earnings can be divided by sex, as shown in Table 15.

Table 15. Increase in lifetime earnings from bridging the Aboriginal Education Gap in Alberta, by sex

Male	$22.3 billion
Female	$21.9 billion
Total	**$44.2 billion**

Table 15 indicates that the Aboriginal Education Gap is 50.5% male and 49.5% female. This differs somewhat from Alberta's overall Aboriginal population age 15 to 69, which is 47.3% male and 52.7% female.

3.2 The benefit includes an individual nonmonetary benefit of $132.5 billion

The reader should take a moment and think about the value of a longer, healthier life. What would it be worth in terms of money? What about having a job with more satisfying personal interactions, greater prestige, and improved job benefits such as longer paid vacations? Less stress? There are relationships between all of these things and education.

The previous section measured the monetary benefit of education to the individual, but there are nonmonetary benefits as well. Some nonmonetary benefits of education are not surprising, and follow obvious channels: education tends to improve health, because education trains people to think in terms of long-term consequences, so they are less likely to do unhealthy things like smoke. Improved health causes greater longevity. On the other hand, some of the benefits follow channels that are not obvious, and are more difficult to explain: for example, increased education tends to result in more stable marriages.

Another nonmonetary benefit of education is fewer unwanted pregnancies. People who are educated are more likely to use contraceptives effectively, so unwanted pregnancies are reduced. If, however, an individual decides to have a child, then parental education is strongly related to the child's socioeconomic success in life. That is a nonmonetary benefit to the educated parent to the extent that he/she derives satisfaction from having a successful child.

There is also the consumption value of obtaining an education. The process of becoming educated can be enjoyable: it may involve time spent studying interesting things and time interacting with others. It may be a hiatus from the future responsibilities of starting an adult life.

Another benefit has to do with unemployment. With more education, individuals tend to have both lower incidences and shorter durations of unemployment. The monetary consequences of the lower unemployment rates were figured into the lifetime earnings results presented in Section 2, using methods discussed in Appendix B. But unemployment has been shown to have other nonmonetary consequences as well: it has negative consequences for happiness, self-esteem, and mental health, all of which are beyond those that can be explained by the reduction in earnings. The nonmonetary consequences are turned into nonmonetary benefits of education, because educated people tend to have lower rates of unemployment.

As noted above, better-educated people tend to have better fringe benefits: longer paid vacations, private pensions, stock options, insurance (dental, medical, disability, and life), and so forth.

It may seem that better-educated individuals, because they tend to have jobs with greater responsibility, would also tend to experience greater levels of stress. In fact, the opposite is the case: more education lowers stress, presumably because less-educated people tend to have greater difficulty making a living.

The above results are part of an emerging economics literature examining the mechanisms that give education its benefits. Previously, economists had a tendency to regard education as a black box, and to confine their analyses to comparisons of people who have acquired formal education to those who have not. Now the black box is being disassembled and its mechanisms exposed. Part of the mechanism is fascinating and makes intuitive sense. An individual who pursues an education tends to be making short-term sacrifices for long-term gains. That focus on the long term tends to change a person's perspective in a number of ways, making him or her less myopic. Myopia, in this context, is to attach too much significance to the short term; a person can be impatient without being myopic. Educated individuals tend to be less myopic and more far-sighted, in that figurative sense. That seems to be a critical component of the personal transformation that comes with education.

For the purposes of this report, it is necessary to assign monetary value to the nonmonetary benefit of education. The monetary value should intuitively be expected to be large—as is clear by considering, for example, the value of having a longer and healthier life. But the sources of the nonmonetary benefits are inherently extremely heterogeneous, so they are difficult to value.

In a path-breaking analysis, Philip Oreopoulos and Kjell G. Salvanes (2011) measured the monetary value of the nonmonetary benefit of education. Given the heterogeneous nature of those nonmonetary benefits, measurement was a remarkable achievement. They used a data source that included measures of the earnings, education, and happiness of individuals. With the data, they measured the increase in happiness that comes with increased earnings; the increase in earnings that comes with

education; and also the increase in happiness that comes with education. The nonmonetary benefit of education was then calculated as the increase in happiness that resulted from education after the increased happiness that resulted from higher earnings was removed. The monetary value of the nonmonetary benefit was the increase in earnings that was required to obtain that increase in happiness. They concluded that the nonmonetary benefit was worth about three times the monetary benefit. The multiple of three is large but not counterintuitive, considering that it relates to the issues mentioned at the beginning of this section—the value of living a longer and healthier life, for example.

The monetary benefit of bridging the Aboriginal Education Gap was shown in the previous section to be $44.2 billion, so the nonmonetary benefit would be three times that, or $132.5 billion. Both the monetary and the nonmonetary benefits accrue to the educated individual, so economists call them internal benefits. Thus the internal benefit of bridging the Aboriginal Education Gap in Alberta is worth $176.6 billion.

The amount $176.6 billion is large, but it still leaves out the external social benefit, which is addressed in the next subsection.

They concluded that the nonmonetary benefit was worth about three times the monetary benefit.

3.3 The benefit includes an external social benefit of $68.7 billion

As noted above, the benefits measured in the previous two sections are internal—benefits that accrue to the individual. They do not include the benefit of education that many would regard as most fundamental, the external social benefit. The external social benefit of education accrues to society as a whole as a consequence of increased levels of educational attainment.

As an illustration of the distinction between the internal benefit and the external social benefit, consider the relationship between education and the quality of child rearing. As noted in the previous section, there is a strong relationship between the care—and future socioeconomic success—of a child and the educational attainment of that child's parents. The child benefits from the parents' education. That results in an internal nonmonetary benefit—included in the estimates in the previous section—in that the success of a child increases the happiness of the parent; but it represents an external social benefit as well, in that it also benefits the child.

Although the internal benefit of education provides economic incentives to individuals, the external social benefit would not, because it accrues to others. Policymakers, on the other hand, need to take account of the total benefit, including both the internal the external social, in making their choices about the funding of education.

There is a vast economic literature about the nature of the external social benefit of education.

There is a vast economic literature about the nature of the external social benefit of education. For example, higher levels of education result in lower levels of criminality, apparently because education increases earnings and hence increases the opportunity cost of crime to the educated person.

Some readers will recognize that the analysis of criminality in the previous paragraph implicitly uses the "substitution effect" half of the Slutsky equation regarding individual behaviour. The other half, the "income effect," can in some circumstances more than offset the substitution effect. But in the case at hand, the income effect is supportive of the substitution effect. Criminality is what an economist would classify as an "inferior" activity, meaning that, other things being equal, an increase in income causes the activity to decrease. Thus, the higher incomes from education would cause lower rates of criminality because the income and the substitution effects would be acting in the same direction. More on the income and substitution effects and the Slutsky equation can be found in any intermediate microeconomic theory textbook. The text by Hal R. Varian (2006) is excellent.

Higher levels of education also reduce welfare dependence because they increase earnings. Higher education increases civic-mindedness, and hence increases the probability that an individual will vote or seek public office.

There are no estimates of the value of the external social benefit that are as comprehensive in nature as the measure of the internal nonmonetary benefit discussed in the previous section. Consequently, the measure discussed in this section should be regarded as a lower bound to the external social benefit of bridging the Aboriginal Education Gap. One example of a benefit that is excluded from measurement is the positive relationship between education and health, which can result in lower usage of the public healthcare system. One example of a benefit that is included in the measurement is the relationship between education and higher rates of productivity increase which results in an external social benefit because higher productivity increases material standards of living.

The article by Walter W. McMahon (2004) is a large meta-analysis of the literature on quantifying the external social benefit of education. Of course, the benefit varies depending on a country's overall level of economic development. His estimate of the external social benefit of education in the countries that are members of the OECD (which consists basically of the world's rich countries and includes Canada) is that the external social benefit equals of the internal monetary benefit.

Thus the external social benefit of bridging the Aboriginal Education Gap in Alberta equals times $44.2 billion, which equals $68.7 billion.

3.4 The total benefit is $245.3 billion

The benefit of bridging the Aboriginal Education Gap in Alberta includes an internal monetary benefit of $44.2 billion, an internal nonmonetary benefit of $132.5 billion, and an external social benefit of $68.7 billion. In total, the benefit to Albertans would be $245.3 billion, or nearly a quarter of a trillion dollars.[15]

This staggering amount, however, does not take account of the fact that the Census of Canada undercounts Aboriginal people. We turn to that issue in the next section.

It is well-known that the census of Canada undercounts the Aboriginal population.

3.5 The total benefit is $270.5 billion after correcting for census undercounting

It is well-known that the Census of Canada undercounts the Aboriginal population. The reasons for this undercounting are discussed in a variety of publications such as (Eric Guimond et al., 2003). The principal problems are incompletely enumerated reserves and churn. A reserve is incompletely enumerated when the Census is disrupted prior to its completion. Churn refers to the fact that people who are economically marginalized tend to move frequently or may have no fixed address, making them hard to count.

It has long been suspected that the undercounting of Aboriginal people is a large problem; this has been deduced in part from comparisons of the numbers of Registered Indians in the Census to the numbers in the Indian Register. That comparison showed that the Census numbers were notably smaller than those in the Register. Some difference would be expected due to fundamental differences in the underlying definitions of the data—but the difference was too large to be thus accounted for entirely.

Statistics Canada released a study (Statistics Canada, 2011) that corrected for the undercounting of the Aboriginal population in the 2006 Census—providing the result by province and separately for Métis and First Nations. The results are shown in Table 16.

Table 16. The correction of the 2006 Census for undercounting Aboriginal people, Alberta

	2006 Census	2006 Census Corrected for Underestimation	Percent Correction
Métis	85,500	89,000	4.1%
First Nations	97,275	111,000	14.1%
Total	**182,775**	**200,000**	**9.4%**

15 *The sharp eyed reader may have noted that $44.2 + $132.5 + $68.7 equals $245.4, not $245.3. The difference is due to rounding.*

Table 16 shows that the Aboriginal population of Alberta was underestimated by 9.4%, with First Nations underestimated by 14.1% and Métis by 4.1%.

That population difference affects the size of the Aboriginal Education Gap. For Métis, the Gap, based on the undercounted data shown above, is worth $16.9 billion measured in terms of earnings. Including the individual nonmonetary benefit and the external social benefit increased the Métis portion of the Gap to $93.9 billion. Correcting for undercounting, then, increases the Métis total by 4.1% to $97.8 billion. For First Nations, the earnings total, based on the undercounted data, is worth $27.3 billion, and thus an external social benefit of $151.4 billion. Correcting for undercounting increases the First Nations total by 14.1% to $172.8 billion.

Corrected for undercounting, the social benefit of bridging the Aboriginal Education Gap is $270.5 billion, or over a quarter of a trillion dollars.

In an era of a multiple-billion-dollar deficit in Canada and a trillion-dollar deficit in the United States, it is easy to lose track of how much money this is. The late United States Senator Everett Dirksen famously said: "A billion here, a billion there, and pretty soon you're talking about real money." In the spirit of Dirksen, we point out that $270.5 billion is "real money." At the beginning of 2013, Alberta's population was 3,931,341, so the benefit equals $68,815 per Albertan, the price of a nicely equipped new car. For an average family of four, the benefit—$275,264—is over a quarter of a million dollars. Recently, the Alberta Real Estate Association pegged the average price of a house in Alberta at $385,595, so the benefit to a family of four is a significant fraction of the average price of a house.[16]

In some policy contexts, it is appropriate to focus on the external social benefit alone, because—unlike the individual monetary and the nonmonetary benefits—it flows to society as a whole. Bridging the Aboriginal Education Gap in Alberta has an external social benefit of $75.8 billion. That amounts to $19,268 per Albertan, or $77,074 for a family of four.

As much as $270.5 billion is, it is based on the 2006 population. But the Aboriginal population is growing rapidly. The following section accounts for population growth through 2013, and then projected growth through 2031.

16 *The web page www.pagetutor.com/trillion/index.html contains an amusing visual aid to help visualize how much money a trillion dollars is.*

4. The Aboriginal Education Gap in Alberta is growing rapidly

The Aboriginal Education Gap in Alberta is growing rapidly. There are two potential reasons: one has to do with population growth and the other has to do with educational levels. We will consider population growth first.

It is well-known that the Aboriginal population is disproportionately younger than the general population, with a high fertility rate, and consequently is growing rapidly. Other things being equal, the growth of the Aboriginal population will cause an equiproportionate increase in the Aboriginal Education Gap, meaning that the Aboriginal Education Gap is also growing rapidly.

The study used in Section 3 (Statistics Canada, 2011), which corrected the Census for undercounting, also projected Aboriginal population. through to 2031. The study projected the Aboriginal population under four scenarios. This section uses a simple arithmetic average of those four scenarios. The Aboriginal population numbers for Alberta for 2006 and (projected for) 2031 are shown in Table 17.

Table 17. Alberta's Aboriginal population in 2006 and 2031

	2006 Census Corrected for Underestimation	2031 Population Projection	Percent Increase
Métis	89,000	149,250	67.7%
First Nations	111,000	177,750	60.1%
Total	**200,000**	**327,000**	**63.5%**

Over the twenty-five years covered by the projection, the population of Métis Albertans is forecast to increase by over two-thirds, and that of First Nations by over three-fifths, with the total Aboriginal population increasing by 63.5%.

As noted above, other things being equal, this population increase would cause an equiproportionate increase in the Aboriginal Education Gap. The monetary value of the Métis portion of the Gap identified in the previous section was $97.8 billion. The Gap in 2031, measured in 2013 dollars would be 67.7% higher, or $163.9 billion. The monetary value of the First Nations portion of the Gap identified in the previous section was $172.8 billion. The Gap in 2031 would be 60.1% higher, or $276.7 billion.

Therefore, the effect of population increase alone would increase the Aboriginal Education Gap to $440.6 billion (the sum of the benefits for Métis and for First Nations) by 2031, measured in 2013 dollars.[17]

Some of this increase has happened already, because the population numbers used in the previous sections of this report are from the year 2006. The Aboriginal population has increased in the seven years since then. Table 18 shows the 2013 Aboriginal population, where the projection through 2031 has been used to interpolate the population in 2013.[18]

Table 18. Alberta's Aboriginal population in 2006 and 2013

	2006 Census Corrected for Underestimation	2013 Population Projection	Percent Increase
Métis	89,000	102,862	15.6%
First Nations	111,000	126,642	14.1%
Total	**200,000**	**229,504**	**14.8%**

17 *This is a very conservative measure because it does not use projected 2031 earnings rates. With economic growth, those wage rates will be higher, which would in itself cause the Aboriginal Education Gap to grow.*

18 *Of course, it would be useful to be able to work from the 2011 Census, but Aboriginal population data (along with broad swaths of other data) were gathered from the long form of the Census, and the long form was eliminated for the 2011 Census. The Family Survey, undertaken in 2011, was a voluntary survey which consequently yields population counts which are not comparable to the results of previous Censuses—and hence are irrelevant to this study.*

The Métis portion of the Gap identified in the previous section was $97.8 billion. The Gap in 2013 is 15.6% higher, or $113.0 billion. The First Nations portion of the Gap identified in the previous section was $172.8 billion. The Gap in 2013 is 14.1% higher, or $197.1 billion.

Therefore, in 2013, the social benefit of bridging the Aboriginal Education Gap is worth $310.1 billion, using Aboriginal population numbers from 2013 but the educational attainment and earnings data from 2006.

In addition to population growth, another potential cause of the increasing Aboriginal Education Gap is that the Aboriginal population of Alberta is falling farther behind the non-Aboriginal in terms of educational attainment, which causes the Gap to increase even more rapidly.

As is well-known, the level of educational attainment of the Aboriginal population in Alberta—and across Canada—is rising. By comparing the Censuses of 2006 and 1996, we can see that the increase is actually masking what is potentially some very bad news.

Table 19 shows the level of educational attainment for the Aboriginal population of Alberta in 1996 and 2006, compiled from the Microdata files from the long form of the Censuses of those two years. Whereas earlier in this study the focus was on the population age 15 to 69, we now focus on the population age 20 to 69. Starting at age 20 makes the analysis somewhat clearer by allowing more time for high-school completion.

The improvement in the level of educational attainment over the ten year period between 1996 and 2006 is remarkable, especially since many of those alive in 1996 would have still been alive in 2006. Over this ten-year period, the percentage of Métis who had not completed high school decreased from 47.4% to 29.4%. The percentage of First Nations who had not completed high school decreased from 56.6% to 45.4%. The percentage of those with university degrees increased from 2.4% to 7.2% for Métis and from 3.6% to 5.1% for First Nations. Similar increases applied to those with terminal high school diplomas and those having completed technical school. In fact, all categories of educational attainment for Métis and First Nations in Alberta, for both males and females, show improvement over this ten-year period.

Table 19. Métis and First Nations educational attainment, age 20 to 69, Alberta

Educational attainment	*Male*	*Female*	*Both*
Métis, 1969			
No high school diploma	**47.1%**	**47.7%**	**47.4%**
High school diploma, terminal	**17.8%**	**19.0%**	**18.5%**
Technical school diploma, terminal	**33.6%**	**29.9%**	**31.7%**
Bachelor's degree or higher	**1.5%**	**3.3%**	**2.4%**
First Nations, 1969			
No high school diploma	**59.0%**	**54.4%**	**56.6%**
High school diploma, terminal	**13.7%**	**15.0%**	**14.4%**
Technical school diploma, terminal	**25.7%**	**25.2%**	**25.5%**
Bachelor's degree or higher	**1.6%**	**5.3%**	**3.6%**
Métis, 2006			
No high school diploma	**32.5%**	**26.7%**	**29.4%**
High school diploma, terminal	**22.0%**	**27.0%**	**24.7%**
Technical school diploma, terminal	**39.9%**	**37.7%**	**38.7%**
Bachelor's degree or higher	**5.5%**	**8.6%**	**7.2%**
First Nations, 2006			
No high school diploma	**49.1%**	**42.1%**	**45.4%**
High school diploma, terminal	**16.5%**	**18.7%**	**17.7%**
Technical school diploma, terminal	**30.4%**	**33.0%**	**31.8%**
Bachelor's degree or higher	**3.9%**	**6.2%**	**5.1%**

Two vitally important caveats need to be noted before going on.

The improvements in levels of education attainment shown in Table 19 need to be thought of in terms of the many individual stories behind those numbers. Individuals, both Métis and First Nations, through individual perseverance—and with the support of their families and communities—found a way to make education work. They deserve our sincere admiration and gratitude. Nothing that follows should be regarded as taking anything away from them and their achievement.

The improvements must also be thought of in terms of the many dedicated teachers, teachers' aids, instructors, and professors who provided encouragement, and also in terms of the educational institutions that provided innovative Aboriginal education programs. They, too, deserve our sincere admiration and gratitude.

There is, however, a problem. Table 20 shows the educational attainment of the non-Aboriginal population in 1996 and 2006.

Table 20. Non-Aboriginal educational attainment, age 20 to 69, Alberta

Educational attainment	*Male*	*Female*	*Both*
non-Aboriginal, 1996			
No high school diploma	**28.6%**	**28.6%**	**28.6%**
High school diploma, terminal	**19.6%**	**24.3%**	**22.0%**
Technical school diploma, terminal	**35.1%**	**31.9%**	**33.5%**
Bachelor's degree or higher	**16.7%**	**15.1%**	**15.9%**
non-Aboriginal, 2006			
No high school diploma	**16.5%**	**14.5%**	**15.5%**
High school diploma, terminal	**25.2%**	**28.3%**	**26.7%**
Technical school diploma, terminal	**38.4%**	**35.6%**	**37.0%**
Bachelor's degree or higher	**20.0%**	**21.6%**	**20.8%**

Note that the story now becomes much more complicated. For some categories, the educational attainment of the Aboriginal population—although it increased overall—decreased in comparison to that of the non-Aboriginal.

Consider, for example, First Nations persons who do not have a high school diploma. Between 1996 and 2006, the percentage without a high school diploma decreased from 56.6% to 45.4%, a decrease of 11.2%.

That's good, but the non-Aboriginal percentage in that category decreased from 28.6% to 15.5%, a decrease of 13.1%. So First Nations fell 1.9% farther behind in terms of high school completions.

As another example, consider the percentage of First Nations persons with a Bachelor's degree or higher. Over the ten-year period from 1996 to 2006, that percentage increased by 1.5%. However, the non-Aboriginal percentage in that category increased by 4.9%, so First Nations fell 3.4% farther behind in terms of university degree attainment.

As a final example, consider the percentage of Métis with a Bachelor's degree or higher. Over the ten-year period from 1996 to 2006, that percentage increased by 4.8%. However, the non-Aboriginal percentage in that category increased by 4.9%, so Métis fell 0.1% farther behind in terms of university.

There are also many categories in the previous two tables in which the First Nations or Métis males or females caught up somewhat with respect to their non-Aboriginal counterparts. How does it all net out? In educational terms, did Aboriginal people catch up slightly or fall slightly behind in Alberta during the period 1996 to 2006? What was the aggregate outcome?

In order to answer this question, the size of the Aboriginal Education Gap was computed for 1996 by changing the 2006 computation to introduce the 1996 population and levels of educational attainment for the non-Aboriginal, Métis, and First Nations populations. The Gap was measured for 1996 using all of the same earnings data as had been used for 2006, but using 1996 population and educational attainment.[19]

The results were that the increase in earnings from bridging the Aboriginal Education Gap in 1996 equalled $27.3 billion, compared to the value in 2006 of $44.2 billion. The Gap increased during the ten-year period between 1996 and 2006. Aboriginal people as a group in Alberta fell 62.0% farther behind over just ten years.

But that increase is in part attributable to increased population. In 1996, the population of Aboriginal Albertans age 15 to 69 was 71,352; in 2006 it was 122,563, for an increase of 71.8%.[20] The increase in the Aboriginal Education Gap in Alberta was thus caused by population growth and not by a lag in educational attainment. In terms of educational attainment, Aboriginal people fell behind in some categories, as shown above, but caught up in others, netting out to a slight increase in relative educational attainment. The Aboriginal population, however, grew by enough that the size of the Aboriginal Education Gap grew overall.

This makes Alberta unique in this writer's experience. As noted above, the Aboriginal Education Gap was measured and analyzed earlier for Saskatchewan (Eric Howe, 2011) and for Ontario (Eric Howe, 2012). In both of those provinces, the Aboriginal Education Gap is growing both absolutely (due to population increase) and relatively (due to the education levels of Aboriginal people falling behind those of non-Aboriginals).

In Alberta, the relative educational attainment of the Aboriginal population is gradually moving toward that of the non-Aboriginal population. This is not increasing sufficiently, however, to keep the Aboriginal Education Gap from growing because of population growth, so more needs to be done.

The Gap increased during the ten-year period between 1996 and 2006. Aboriginal people as a group in Alberta fell 62.0% farther behind over just ten years.

19 *Expressed differently, the population entries in Table 11 were changed to equal their 1996 values, but the financial entries in Table 12 were not changed. Then the population entries from the modified Table 11 were multiplied into the corresponding entries in the unmodified Table 12, and the products were added together.*

20 *Both of these Aboriginal population numbers are computed from the Microdata files for their respective years. They would not be the same as the census count, which, for example, reports the 2006 population as a little larger, at 125,425. Computation of the size of the Aboriginal Education Gap is based on the Microdata files, so the relevant population is also taken from the Microdata files.*

5. The impact of the Métis Training to Employment Program

The Métis Training to Employment Program (MTE) is the best-known service delivery arm of the Rupertsland Institute. Its objects are to identify and promote actions that improve education, skills levels, and employment opportunities for Métis people, and to manage and deliver programs that enable Métis people to pursue education, enhance their skill levels, and find productive and well-paying occupations and employment. The purpose of this section is to measure the impact of the MTE program in bridging the Aboriginal Education Gap.

The MTE Program uses funding from the federal government through Human Resources and Skills Development Canada following principles established by the Metis National Council under the former Labour Market Development program. It maintains a commitment to excellence, enhanced accountability, partnerships, and demand-driven skills development under the Aboriginal Skills Employment and Training Strategy (ASETS).

The MTE Program provides standardized employment services through a province-wide network of 10 Métis Training to Employment Services (MTES) offices and two Mobile Métis Employment Services units, with centralizing financial and administrative accountability at the Rupertsland Institute Head Office. In this way, the MTE Program ensures that Métis people from across the province receive standardized employment assistance designed to provide Alberta with a skilled Métis workforce.

The staffs at each MTES office have knowledge of the local community and the employment outlook in their respective regions, offering distinct bundles of services to individuals, to employers, and to youth. The services provided to the individual vary, ranging from employment assessment and action plans, to information about access to funding for education and training, employer referrals, resume preparation, and so forth. Although the focus of this study is on educational services provided to the individual, the reader should be aware that services are also available for youth to prepare them for their working lives, and that a variety of services is also provided to employers.

The services to individuals also provide access to an array of resources such as apprenticeships, wage subsidies, and bursaries. A longer list of programs and services is available at the website:

www.metisemployment.ca/about-us/metis-training-to-employment

The purpose of this section is to assess the economic impact of the educational component of the MTE program. We will confine the analysis to those who have graduated since 2006 (inclusive). The year 2006 corresponds to the completion of the KETO Data System.

For the period since 2006, additions to the educational credentials—within the categories of educational attainment used in this study—of those in the MTE program are given in Table 21.

Table 21. Additions to educational credentials for those in the Métis Training to Education program since 2006

	MALE	*FEMALE*	*TOTAL*
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	**94**	**88**	**182**
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	**358**	**623**	**981**
Receives a Bachelor's degree or higher	**118**	**215**	**333**
Total	**570**	**926**	**1,496**

Table 3 in Section 2.2, above, shows the lifetime earnings of Métis males and females with these different levels of educational attainment. When an individual obtains an educational credential, it increases his or her lifetime earnings by amounts that can be obtained from Table 3 by subtracting.[21] Multiplying the increases in lifetime earnings by the numbers of credentials from Table 21 yields the numbers displayed in the following Table 22.

So the 1,496 Albertans in the MTE program who have received an educational credential since 2006 have increased earnings over their lifetimes of $1.2 billion.

As discussed at length in Section 3 of this report, the increase in lifetime earnings comprises only a part of the social benefit that results from higher levels of educational attainment. There are also the individual nonmonetary benefit and the external social benefit. These are both added to the earnings shown in Table 22 to arrive at the total social benefit of the educational attainment component of the MTE program, shown in Table 23.

Table 22. Increase in lifetime earnings of those in the Métis Training to Education program since 2006

	MALE	FEMALE	TOTAL
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	$73.6 million	$60.3 million	$133.9 million
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	$280.0 million	$274.3 million	$554.3 million
Receives a Bachelor's degree or higher	$169.8 million	$376.6 million	$546.4 million

Table 23. Social Benefit of those in the Métis Training to Education program since 2006

	MALE	FEMALE	TOTAL
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	$408.6 million	$335.4 million	$744.0 million
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	$1,555.3 million	$1,523.9 million	$3,079.2 million
Receives a Bachelor's degree or higher	$943.2 million	$2,092.1 million	$3,035.4 million
Total	$2,907.1 million	$3,951.4 million	$6,858.6 million

21 *The following estimates of benefits should be interpreted as conservative estimates due to the way the differencing was performed. For example, the increase in the earnings for the 118 Métis males who received a Bachelor's degree was taken as their earnings with Bachelor's degrees minus what their earnings would have been with only high school diplomas. However, some of the 118 had done both high school and university while clients of MTE, so for them the calculation should have assumed a larger increase in their earnings—earnings with Bachelor's degrees minus what their earnings would have been as dropouts. Thus the following results, large as they are, are conservative estimates.*

The total social benefit over their working lives from the 1,496 people in the MTE program (from Table 21) since 2006 is shown in Table 23 to be $6.9 billion. So the social benefit per person exceeds $4 million per person: $4,584,611.

Using a multiplier from Appendix A, it is also possible to calculate the increase in the revenue of the provincial government resulting from the educational attainment part of the MTE program. The increase in earnings from the MTE program is shown in Table 22 to be $1.2 billion. Table 25 in Appendix A shows that the provincial government revenue multiplier for an exogenous increase in earnings equals 0.2170, where revenue is measured in 2002 constant dollars. As explained in Appendix A, this is a long-run multiplier: the long-run effect of an exogenous one-dollar increase in earnings in Alberta is to increase provincial revenue by about twenty cents.[22] The lifetime increase in the revenue of the provincial government from the individuals in the educational attainment part of the MTE program since 2006 has a present value of $267.9 million, an amount that is over a quarter of a billion dollars. The provincial tax revenue increase per person for the 1,496 people is $179,075 per person.

...the social benefit per person exceeds $4 million per person.

There are aspects of the MTE program that imply that the economic benefit is notably greater than that reported above. For example, the KETO data system has a limitation associated with high school completions. When an MTE client finishes high school and then goes on to postsecondary education, sometimes the client's high school entry in the KETO system has been overwritten for the postsecondary program. That eliminates the record of the high school diploma. Note that Tables 21, 22, and 23 should each have an additional line of data for MTE clients who received their high school diplomas and subsequently went on to postsecondary education. (At the high school level, all three tables confine themselves to terminal high school diplomas.) That is, only the economic benefit of the highest level of educational attainment is included, and that artificially lowers the measured economic benefit of the MTE.

Probably of greater importance is the fact that the above measures only show the effects of the MTE program in bridging the Aboriginal Education G ap, so it includes only the benefit of educational credentials. As noted above, the MTE program provides a variety of client services to help clients in finding a job: employment assessment and action plans, employer referrals, resume preparation, and so forth,[23] as well as access to further education. Only those who completed their educational programs are included in Tables 21, 22, and 23, but client files usually note the reason that an educational program was not completed—and the most common reason is that the client found a job. Although that is unsuccessful relative to educational attainment—and hence unsuccessful relative to bridging the Aboriginal Education Gap—it would nonetheless have a substantial benefit for Alberta, and hence be a further benefit of the MTE program.

22 *This is a long-run effect, so it takes into account that some of the increase in earnings is put into savings, resulting in future taxes on increased interest and dividends; that some is spent by individuals, resulting in increased employment and, in turn, taxes on higher earnings; that some of the tax revenue is spent by government resulting in increased employment and earnings; and so forth, as discussed in Appendix A.*
23 *The list of individual services is quite long. The interested reader should consult the website mentioned above.*

6. The potential impact of a Métis teacher education program in Alberta

The writer's report on bridging the Aboriginal Education Gap in Saskatchewan (Eric Howe, 2011) included an analysis of the Saskatchewan Urban Native Teacher Education Program (SUNTEP), offered by the Universities of Saskatchewan and Regina.[24]

SUNTEP is a fully accredited, four-year Bachelor of Education program designed for Métis and non-Status Aboriginal students. It was established in 1980 through the Gabriel Dumont Institute in cooperation with the Saskatchewan Ministry of Advanced Education, Employment and Immigration, the University of Saskatchewan and the University of Regina.

SUNTEP provides a solid foundation in the theories and skills of teaching at the elementary/middle or secondary levels, with an emphasis on Native Studies, cross-cultural education, and Métis and First Nations history and culture. Programs are offered in Saskatoon, Regina, and Prince Albert.

Since the SUNTEP program began, it has graduated almost 1,000 students with Bachelor of Education degrees. These graduates are now teachers and role models in schools across western Canada.

SUNTEP's primary goals are ensuring that people of Métis ancestry are well-prepared to fill their share of teaching positions in the province of Saskatchewan and that their graduates are educated to be sensitive to the individual educational needs of all students, and those of Métis and First Nations ancestry in particular.
Qualifying students must meet standards of admission and are screened for their interest, commitment, and desire to work toward becoming an effective teacher working with Métis and First Nations peoples. The SUNTEP program covers students' university tuition fees.

Alberta does not have a similar program, and it pays a steep price as a consequence.

The social benefit of a Métis teacher education program in Alberta would be stunningly large. Section 5, on the impact of the Métis Training to Employment program, showed that the program has a social benefit of over $4 million per graduate. That is a lot of money per graduate. However, the benefit of the graduate of a Métis teacher education program would be an order of magnitude greater.

Alberta does not have a similar program, and it pays a steep price as a consequence.

Each graduate has an enhanced social benefit because of the role model effect, which occurs when Aboriginal students see themselves in their teachers and then find a way to make education work. Each time this happens over a teacher's career, the resulting benefit is about another $4 million. (Of course, the precise amount would depend on the student's precise subsequent educational choices.) If a teacher teaches, on average, for 40 years, the additional benefit—at $4 million for each student influenced—adds up.

24 *SUNTEP is one of the three TEP's in Saskatchewan. The others are the Indian Teacher Education Program (ITEP) and the Northern Teacher Education Program (NORTEP).*

7. Fiscal implications for the Government of Alberta[25]

Bridging the Aboriginal Education Gap—with the attendant increases in earnings and consequent increases in economic activity—has important fiscal implications for the government of Alberta. Government revenue will increase with Aboriginal people's increased earnings and economic activity. In addition, government expenditures will decrease due to the improved socioeconomic circumstances of Aboriginal people in Alberta.

Appendix A to this report shows that the long-run implication of bridging the Aboriginal Education Gap would be a lump sum of an additional $8.5 billion in revenue for the provincial government. That estimate is shown in the appendix to be fairly straightforward.

Estimating the decrease in expenditure that would result from the improved socioeconomic conditions of Aboriginal people, however, is actually quite tricky. The principal problem here is actually data, or rather lack of data. An individual's Aboriginal identity is not typically obtained at the point of service for most government services. There are some counter examples, mostly for Registered Indians. However, when, for example, a Métis receives medical services at a hospital, that person's Aboriginal identity is not noted. The bridging of the Aboriginal Education Gap will improve health and hence decrease the number of hospital visits, but by how much?

The estimates in the literature compare per capita government expenditure on Aboriginal people to that of expenditure on the total population. Per capita expenditure on Aboriginal people exceeds that of the general population for a variety of reasons, some relating to Aboriginal people's socioeconomic situation. The Royal Commission on Aboriginal Peoples (1996) and Bert Waslander (1997) examine this difference in government expenditure levels for Aboriginal and non-Aboriginal Canadians. Aggregating across all levels of government (municipal, provincial, and federal), it is found that governments spend approximately 57% more on Aboriginal persons on a per capita basis each year.

The bridging of the Aboriginal Education Gap will improve health and hence decrease the number of hospital visits, but by how much?

The discrepancy has four contributing factors: a higher cost of service delivery due to the remoteness and small size of many Aboriginal communities; the fact that the Aboriginal population has a different age structure and thus makes different demands for service from the general population; expenditure programs that are specific to Aboriginal people (such as those related to treaty rights); and differing demand for government-funded services due to socioeconomic differences between Aboriginal and non-Aboriginal Canadians. All of these differences are difficult to untangle and assess. For example, consider the differences in the age-structure of the Aboriginal population. Aboriginal people are disproportionately younger and hence make high demands on government expenditures for expensive things like schooling. However, non-Aboriginal people are disproportionately older, and hence make high demands on government expenditures for expensive things like health care. The effect of the differing age structures is thus probably negligible.

It is estimated that more than half of the aforementioned 57% gap in per capita government expenditure is directly linked to financial assistance and remedial services whose use can be traced back to the socioeconomic condition of the Aboriginal population. Bridging the Aboriginal Education Gap would result in the saving of that portion of government expenditure.

To estimate the gap in expenditure on financial assistance and remedial services between Aboriginal persons and the Canadian average for the province of Alberta, it is tempting to take the figure of a 57% higher expenditure on Aboriginal people, and consider that approximately half of it is related to financial assistance and remedial services, as mentioned in the study referred to above. Applying the resulting 28.5% produces the following table for the years 2006 through 2009.

25 *For his help with the analysis in this section of the report, the writer wishes to sincerely thank and acknowledge the contribution of his research assistant, Christopher Tsang.*

Table 24. One estimate of additional expenditure per Aboriginal person in Alberta

Year	Total expenditure by the provincial government *(millions of dollars)*	Population *(number of people)*	Per capita spending *(dollars per person)*	Alberta's additional per capita spending for Aboriginal persons *(dollars per person)*
2006	$28,067	3,421,253	$8,203.72	$2,338.06
2007	$30,517	3,512,897	$8,687.13	$2,475.83
2008	$35,140	3,592,191	$9,782.33	$2,787.96
2009	$39,026	3,672,728	$10,625.89	$3,028.38

The above result, however, is probably an underestimate. The estimates from the Royal Commission and from Waslander aggregate across multiple levels of government. The size of the expenditure gap is certainly dependent on the nature of the expenditure, so ignoring the composition of the provincial government's expenditure can be expected to lead to inaccurate results. For example, expenditure on the Canadian Forces by the federal government would presumably not be greater per capita to protect Aboriginal Canadians than it is to protect the total population. But the provincial government does not have a military, so provincially the effect of military expenditure has to be excluded, which would cause the Aboriginal proportion to increase.

The analyses in the Royal Commission included estimates of the additional expenditure per Aboriginal person for several different categories of government expenditure. For this report, the expenditures of the government of Alberta were subdivided into the Royal Commission's categories, and the Aboriginal proportions from the Royal Commission were applied. Further adjustments were made to remove the expenditure on the military from the Royal Commission's category of protection of persons and property, since that expenditure would not occur at the provincial level. Similarly, non-insured health benefits for Registered Indians were removed for health care spending.

The effect of these adjustments is to increase the additional per capita spending on Aboriginal Albertans related to their socioeconomic conditions from the 28.5% used for Table 24 to percentages in the range of 48.3% to 53.0% (depending on the varying composition of spending in each year).

The decision was made to stick with the lowest of the above estimates, 28.5%, in order to produce conservative estimates of provincial government savings. The results were shown in Table 24 on a per capita basis. The average of the four years shown in that table is $2,657.56. Alberta's Aboriginal population in 2006, corrected for Census undercounting, was 200,000, so the annual saving of provincial government spending in that year would have been about $531.5 million. By the time of this writing, 2013, the Aboriginal population of Alberta has grown to 229,505, so the saving of provincial government spending would be about $609.9 million. Using the projection from Statistics Canada, discussed above, by 2031, the Aboriginal population will grow to 327,000, so the saving would be about $869.0 million. However, this estimate does not allow for the increases in government spending which occur over time, and—as noted above—uses a particularly conservative measure of per capita spending on Aboriginal people. Even though these estimated amounts are large, the actual savings will certainly be larger.

APPENDIX A: A macroeconomic addendum

Bridging the Aboriginal Education Gap in Alberta would yield the varied socioeconomic benefits discussed in the body of this report. Some of the benefits are nonpecuniary—such as lowered rates of criminality—but nonetheless have pecuniary values, which have been calculated in the report. The fundamental change that has been the base all of the calculations, however, has been pecuniary—the increase in earnings that would result from improved education. The purpose of this appendix is to focus solely on the increase in earnings and calculate its macroeconomic impacts in Alberta.

For this purpose, a macroeconometric simulation model of Alberta, the Alberta Impact Model (ALTIM) was used for the analysis. That model is one of a sequence of provincial and territorial macroeconometric simulation models built by the writer: for Saskatchewan (Eric Howe, 2011); Ontario (Eric Howe, 2012); The Northwest Territories (Eric Howe and Jack Stabler, 1990); and Nunavut (Eric Howe, 2007). The model for Alberta was initially developed over a decade ago for a study of the economic future of the Métis settlements of Alberta (Eric Howe and Kelly Lendsay, 1999).

The science and craft of building and using macroeconometric simulation models is the subject of a large literature. The textbook by Clopper Almon (1989) provides a useful overview of many of the issues. Three books (R. C. Fair, 2004, 1984, 1994) have provided important parts of the intellectual muscle in the resurgence in their use, which had declined after some embarrassing forecasting errors made back before many readers of this appendix were born. Another book by R. C. Fair (2002) provides an extremely accessible treatment of many of the econometric issues.

Bridging the Aboriginal Education Gap will increase the supply of educated individuals in Alberta.

The core of any macroeconometric simulation model includes equations that predict the values of the income and product accounts, which include prominent economic variables such as Gross Domestic Product, Personal Disposable Income, and Personal Expenditure. There are, of course, other equations that predict other important variables like employment and population, but the computational core shows the state of the economy by predicting the entries in the income and product accounts. More about the specifics of social income and product accounting can be found in any intermediate macroeconomic theory textbook, such as the text by N. Gregory Mankiw and William Scarth (2011)

The existing model ALTIM was updated and restructured to focus on long-term relationships. Although a focus on the long term would usually be inappropriate for a macroeconometric model, since its principal use is short-to-medium-term analyses, it is appropriate for computing the effect of incomes that span an entire career.

Why is this macroeconomic analysis relegated to an appendix rather than placed front-and-centre in the report? The reason has to do with the nature of the economic change being studied. Bridging the Aboriginal Education Gap will increase the supply of educated individuals in Alberta. One principal effect of this is to shift the supply curve of educated individuals to the right. That is—obviously—a good thing for the economy in the Information Age, but a precise analysis would require the use of applied microeconomics, not applied macroeconomics. The macroeconomic analysis presented in this appendix should be interpreted as indicative of the magnitudes of the economic impact of bridging the Aboriginal Education Gap. The results in the body of this report are designed to be as accurate as possible given the inherent limitations of the analysis, which reaches over half a century into the future; the numbers in this appendix, however, should be taken as only approximative.

Once restructured and re-estimated for long-term analysis, the ALTIM model was used to estimate multipliers for the long-term effect of an exogenous increase in earnings. The base year for the estimation of the multipliers was 2006. The multipliers are shown in Table 25.

Table 25. Long-term Alberta multipliers for an increase in earnings

Variable	*Multiplier*
Expenditure Variables in Constant (2002) Dollars	
Gross Domestic Product	1.1950
Personal Expenditure	1.5353
Gross Fixed Capital Formation, Housing	0.1449
Gross Fixed Capital Formation, Government	0.0503
Value of the Physical Change in Inventories	0.0019
Government Expenditure	0.2270
Imports	0.7530
Income Variables in Current Dollars	
Personal Income	2.5060
Wages, Salaries, and Supplementary Labour Income	1.7470
Other Personal Income	0.4215
Current Transfers to Persons	0.3372
Current Transfers to Government	0.5560
Personal Disposable Income	1.9490
Personal Disposable Income in 2002 Dollars	1.8280
Miscellaneous Variables	
Employment, person years	1.31×10^{-5}
Provincial Government Revenue in 2002 Dollars	0.2170

For example, Table 25 shows that for an exogenous one dollar increase in earnings, constant dollar Gross Domestic Product is higher by $1.1950.

Those who are less familiar with the typical magnitude of multipliers will likely be struck by the fact that the multipliers shown in Table 25 are surprisingly small. Numerical examples of multipliers from introductory macroeconomics textbooks usually go for whole numbers and consequently often show multipliers of five or even higher. In the real world, multipliers are much smaller due to leakages that operate as automatic stabilizers. For the economy of Alberta, the largest single leakage is for imports, which is subtracted from the summation of other types of expenditure to yield Gross Domestic Product.

On the other hand, those who are more familiar with multipliers will likely be struck by the fact that the multipliers shown in Table 25 are surprisingly large. The multipliers are large because they are long-run multipliers. In the long run, forces come into play that have minimal effect in the short run. For example, one multiplier shows that another dollar of earnings results in an increase of $0.44 in the variable for "other personal income." The largest part of that 44-cent increase arises through interest and investment income (formally, the variable is Interest, Dividends, and Miscellaneous Investment Income). A portion of the increase in earnings is saved, which brings about higher wealth, which causes a long-term increase in investment income. Of course, some of the increased investment income is put into savings, causing further increases. Those increases are quite small in the short run, but are large in the long run.

The multipliers for ALTIM were compared to those for provincial models estimated earlier: SIM (for Saskatchewan) and ONTIM (for Ontario). The differences between Alberta's multipliers and those for the other two provinces tended to be small, with two interesting exceptions. The multipliers for the effect-on-income variable are larger for Alberta because of the high rate of Albertan savings, which leads to higher interest and investment income in the long run. The high rate of Albertan savings is revealed by the low provincial average propensity to consume. In the first decade of the 21st Century, the average propensity to consume in Ontario was 93.5% (so out of every dollar of disposable income, Ontarians consumed 93.5 cents). In Saskatchewan it was 97.2%. In Alberta it was dramatically lower, 86.9%. That lower average propensity to consume results in higher savings, which result in the long term

in higher interest and investment income.[26] A further consequence of the higher income multipliers is that Alberta's multiplier for real GDP tends to be a cent or two higher than those for Ontario and Saskatchewan.

The multiplier for the increase in provincial government revenue is lower for Alberta than for Ontario and Saskatchewan, so a given increase in earnings ultimately has a smaller of an effect on the revenue of the provincial government. That is a reflection of the Alberta Advantage of somewhat lower personal tax rates.

Section 4.1 in the body of the report demonstrated that bridging the Aboriginal Education Gap would result in an additional $44.2 billion dollars of earnings, measured in 2013 dollars. Using the Consumer Price Index (overall, for Alberta), that amount corresponds to $34.1 billion (measured in 2006 dollars). Multiplying that by the multipliers of Table 25 results in the impacts shown in Table 26.

Bridging the Aboriginal Education Gap would bring about a cumulative increase in Gross Domestic Product of $40.7 billion measured in constant 2002 dollars. By comparison, real annual Gross Domestic Product averaged $169.9 billion per year in Alberta in the first decade of the 21st Century. The component of expenditure that increases the most is personal expenditure. The revenue of the provincial government increases by $8.5 billion.

Table 26. The macroeconomic impact of bridging the Aboriginal Education Gap in Alberta

Variable	*Impact*
Expenditure Variables in Constant (2002) Dollars	
Gross Domestic Product	$40.7 billion
Personal Expenditure	$52.3 billion
Gross Fixed Capital Formation, Housing	$4.9 billion
Gross Fixed Capital Formation, Government	$1.7 billion
Value of the Physical Change in Inventories	$0.1 billion
Government Expenditure	$7.7 billion
Imports	$25.7 billion
Income Variables in Current Dollars	
Personal Income	$85.4 billion
Wages and Salaries	$59.5 billion
Other Personal Income	$14.4 billion
Current Transfers to Persons	$11.5 billion
Current Transfers to Government	$18.9 billion
Personal Disposable Income	$66.4 billion
Personal Disposable Income in 2002 Dollars	$62.3 billion
Miscellaneous Variables	
Employment in person years	446.3 thousand
Provincial Government Revenue in 2013 dollars	$8.5 billion

26 *Here the distinction between long-run and short-run multipliers becomes critical. A low propensity to consume causes Alberta's income multipliers to be lower in the short run, as discussed in any macroeconomics text. However, in the long run, it makes the multipliers larger for the reasons discussed above.*

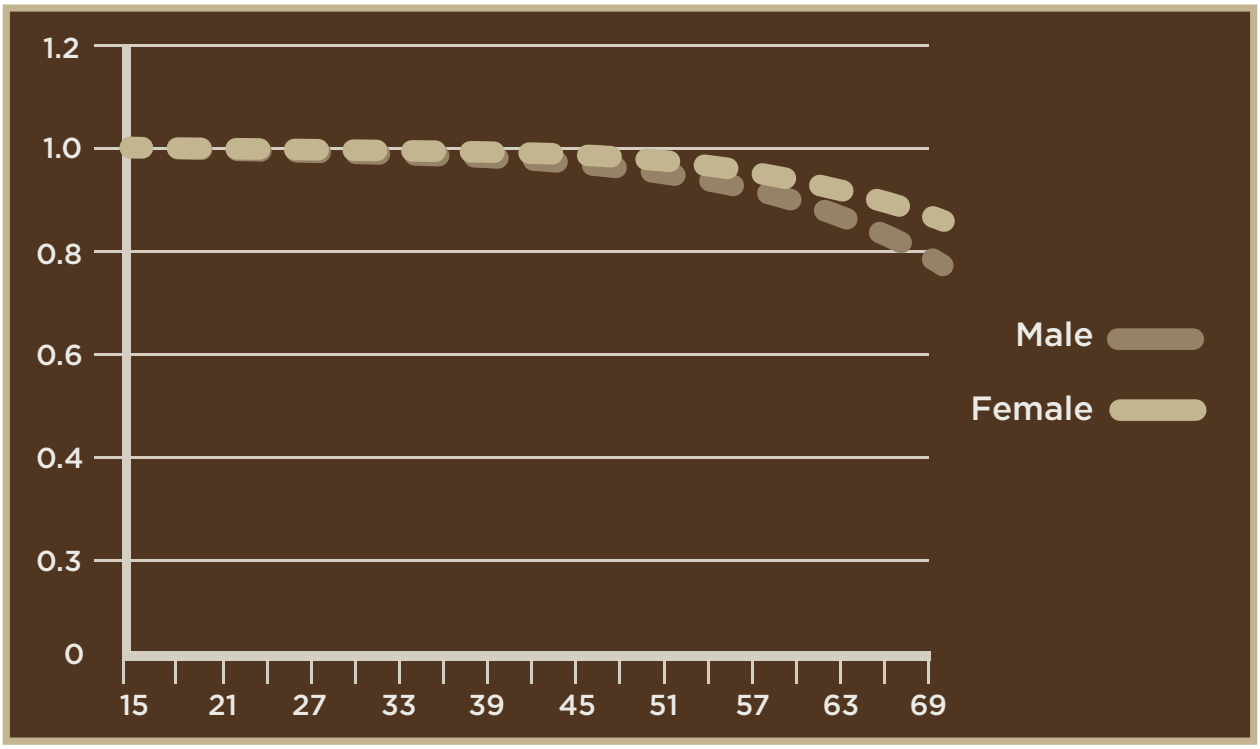
APPENDIX B: How the individual earnings numbers were computed

The computational technique used to measure lifetime earnings handled each of the 24 hypothetical individuals distinctly. (Henceforward in this appendix, the phrase "hypothetical individuals" will be replaced by the single word "individuals," with the understanding that they are hypothetical.) Each of the individuals had their lives divided into five-year periods: ages 15–19, 20-24, and so forth through 65-69. Although they were assumed to follow the usual pattern of retirement, they were numerically forced to retire on their 70th birthday if they had not done so beforehand—for reasons that will be given below. For each individual and in each five-year period, their earnings, if they were employed, were predicted, as were their labour force participation rate, their unemployment rate, and their survival rate. Each individual's expected annual earnings in any given five-year period equalled their earnings if employed; times their labour force participation rate; times one minus their unemployment rate; times their survival rate. These earnings were then discounted back to a present value at age 15.

Two other examples of the application of the methodology can be found (Eric Howe, 2004 and 2011), both of which apply the methodology to Saskatchewan. The former measures lifetime earnings for Aboriginal people and shows a sample earnings spreadsheet used in the computation. The latter applies the methodology separately to non-Aboriginal, Métis, and First Nations people, as is done in this analysis.

How were the earnings, labour force participation rates, unemployment rates, and survival rates computed for each of the 24 individuals for each five-year period in their lives? Begin by considering the survival rates. The latest life tables were obtained from Statistics Canada (2006) and were used to calculate the survival rates for an individual who has reached his or her fifteenth birthday; this was done separately for male and female Albertans. The results are shown in Figure 1.

Figure 1. Future survival rates for Albertans who survive to age 15



The survival rates begin at one by definition, because the individual is assumed to have survived to his or her fifteenth birthday. The decrease in survival rates is thereafter initially gradual, but accelerates with age. Males have lower survival rates than females. Of Albertan males who survive to age 15, 79.0% will survive to their 70th birthday, and hence to the end of the study. On average, females live longer, and 86.6% will survive to the end of the study.

The principal source of data to predict the wage rate, participation rate, and unemployment rate was the Microdata files compiled from the long form of the Census of 2006.[27] For the 2006 Census, the long form went to one in five individuals. The Microdata files are a sample of the individual responses to the long form after any information that would allow the identification of an individual is removed. For Alberta, there are data for 87,947 individuals, which is a huge sample representing about 2.7% of the entire population of Alberta at that time.

The breakdown of the sample by Aboriginal identity is given in Table 27, using the six possible values of the variable ABOID from the Microdata files.

Table 27. Alberta sample by Aboriginal identity

North American Indian single response	2,613
Métis single response	2,330
Inuit single response	51
Multiple Aboriginal identity responses	34
Aboriginal responses not included elsewhere	71
non-Aboriginal	82,848
Total	87,947

This report deals with residents of Alberta who are First Nations, Métis, or non-Aboriginal: categories 1, 2, and 6. It would conceptually be possible to include the small number in category 4—multiple Aboriginal identity responses—but it is not actually possible to include them because no data is provided on the nature of the multiple responses. Category 5, also small, consists of those who do not identify themselves as Aboriginal, but whose Aboriginal identity is suggested by their other responses on the long form (such as, for example, indicating membership in a First Nation). Again, they cannot be included in this analysis because there is no information on the nature of that suggested Aboriginal identity.

We will focus on the individuals in categories 1, 2, and 6, but not on all of them. All people below age 15 will be excluded from the sample because 15 is Statistics Canada's labour-force age. For ages younger than that, the Census does not provide information on earnings or other labour market outcomes. We will also exclude from the sample people who have passed their 70th birthday because this study will numerically force them into retirement if they have not already retired. Although empirically most individuals have retired by age 70, there are a few in the Microdata files who continue working past this age. However, they are too few in number to provide a sufficiently large sample to use. In any case, due to discounting, the earnings number would be largely unaffected by this computational mandatory retirement date. The discounted present values of earnings use a two percent real discount rate: at that rate, a future dollar at age 70 has a discounted present value of only 34 cents at age fifteen. Thus the earnings of the small proportion of people who work past age 70 would be discounted heavily.

Finally, a handful of individuals who completed the long form for the 2006 Census did not indicate their level of education. Since the purpose of the analysis is to examine the effect of education, those individuals are excluded from the sample.

Table 28 shows the size of our sample of Albertans by sex, educational level, and Aboriginal Identity with the above exclusions.

27 *It would obviously be preferable to use the results of the 2011 Census, but the long form was eliminated for that census.*

Table 28. Alberta sample by educational attainment, sex, and Aboriginal identity, age 15-69

Educational attainment	*Male*	*Female*
non-Aboriginal		
No high school diploma	**6,608**	**5,746**
High school diploma, terminal	**7,930**	**8,672**
Technical school diploma, terminal	**10,763**	**9,818**
Bachelor's degree or higher	**5,558**	**5,886**
Total	**30,859**	**30,122**
Métis		
No high school diploma	**305**	**275**
High school diploma, terminal	**169**	**239**
Technical school diploma, terminal	**262**	**282**
Bachelor's degree or higher	**36**	**64**
Total	**772**	**860**
First Nations		
No high school diploma	**444**	**416**
High school diploma, terminal	**122**	**159**
Technical school diploma, terminal	**199**	**257**
Bachelor's degree or higher	**25**	**47**
Total	**790**	**879**

One conclusion can be inferred from examining Table 28: sample sizes are not typically large enough to allow the direct measurement of lifetime earnings for each of the 24 individuals within each of his or her five-year age cohorts. For example, the sample only contains 36 Métis males with a Bachelor's degree or higher; over half of the five-year age cohorts contain three or fewer people.

Even for the large non-Aboriginal sample, the numbers can be small when the individuals are divided by level of education and into five-year age cohorts. For example, although Table 28 shows that there are 5,886 females in the sample who have a Bachelor's Degree or higher, only 121 of them are in the 65-69 age cohort. Of those 121 individuals, 37 are still in the labour force, for a participation rate of 30.6%. Using this data, however, a 95% confidence interval on the participation rate runs from 22.5% to 39.6%, which is far too wide to yield reliable conclusions.

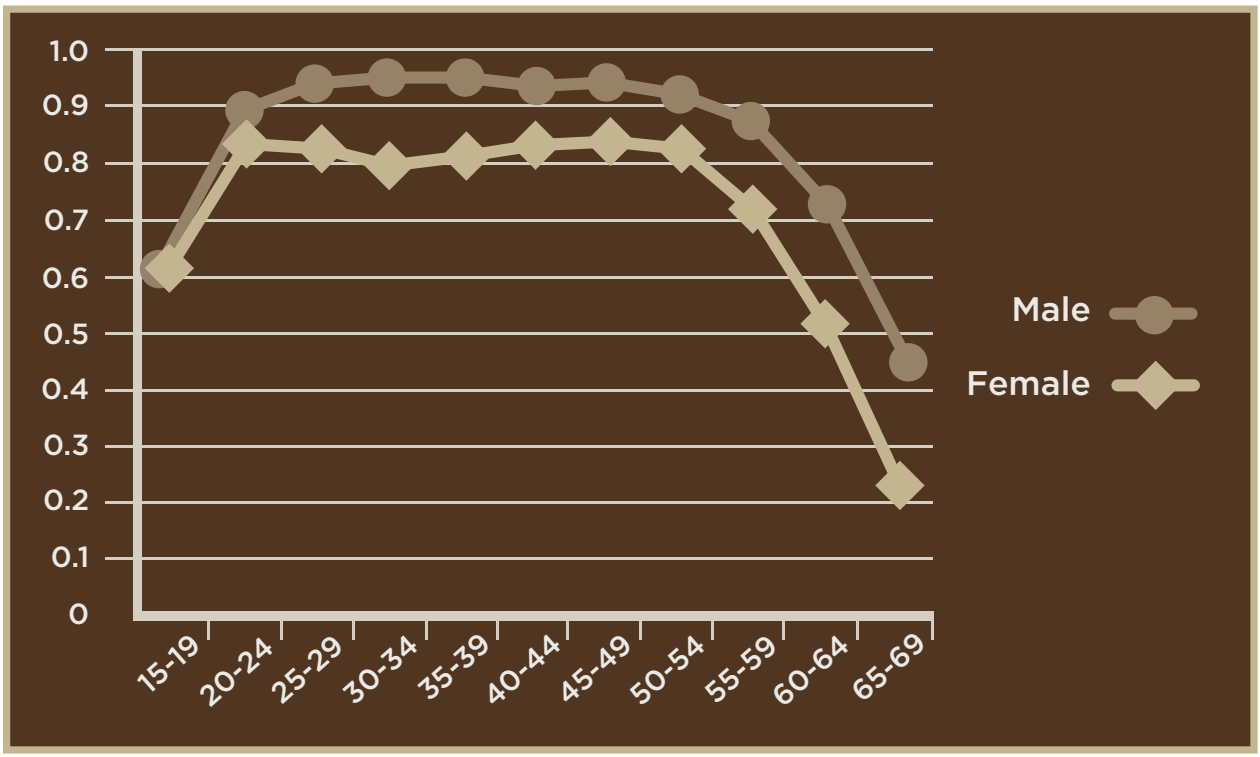
The computational strategy employed for this study involved using the entire non-Aboriginal sample, separately for males and females, to measure the lifecycle patterns of the wage rate if employed, the participation rate, and the unemployment rate. Then geometric adjustments were made to account for the effects of education and of Aboriginal identity.

APPENDIX B-1: non-Aboriginal earnings

Consequently, the next several pages will be devoted to the analysis of non-Aboriginal Albertans—and to the data about their labour market experiences, dependent on their levels of education. That will be followed by a discussion of the geometric adjustments which convert the non-Aboriginal results to those for Métis and First Nations and to account for the effects of education.

Figure 2 shows the labour force participation rates for the entire sample of non-Aboriginal residents of Alberta, males and females separately, divided into five-year age cohorts.

Figure 2. Labour force participation rates for non-Aboriginal Albertans

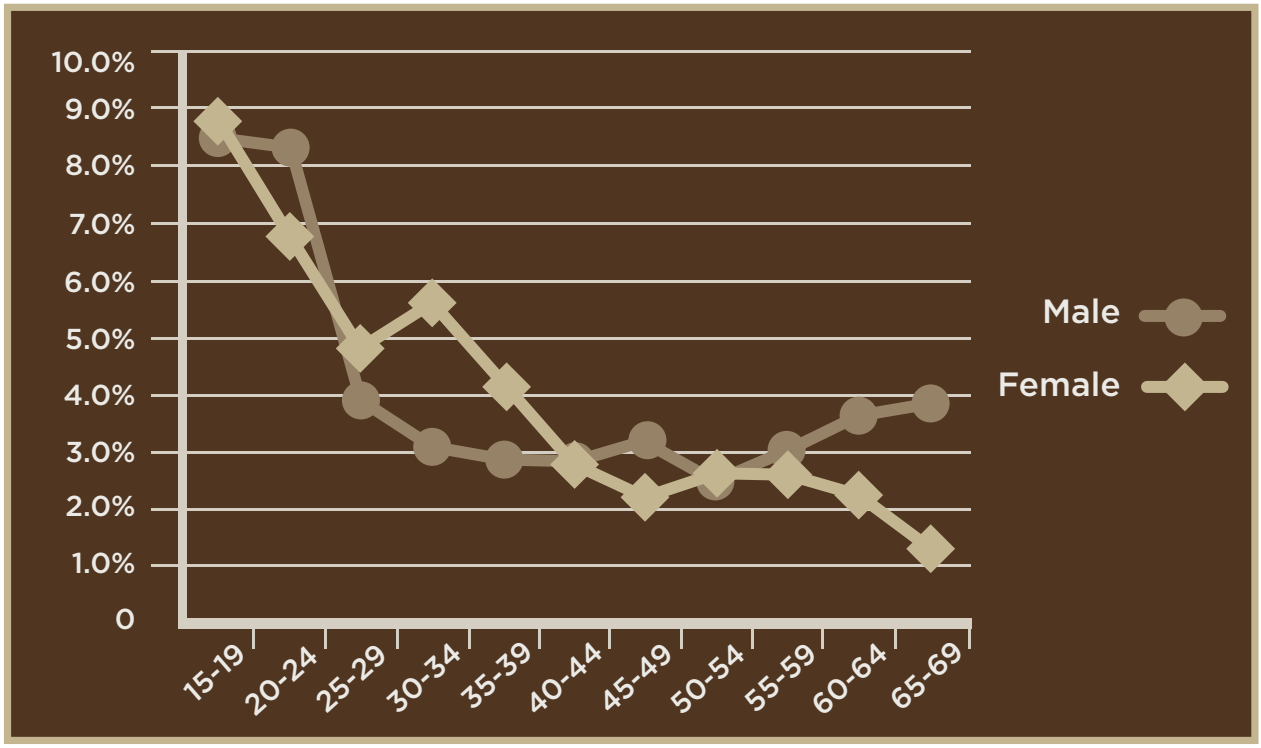


The labour force participation rate for males climbs steeply early in adulthood and then plateaus. It does not begin to decrease appreciably until the 55-59 age cohort, when some begin to take early retirement. The participation rate for females follows a more complicated pattern. Although the participation rates for males and female are roughly equal for the 15-19 age cohort, the female rate then rises more slowly because some females do not enter the labour market while they are rearing children (which is also true for some males, but less common). The peak participation for males is in the 30-34 age cohort, whereas the peak for females is fifteen years later, 45-49. For females, peak participation corresponds to when any children are likely to be more independent. Furthermore, female labour force participation may be necessitated by marriage breakup, which may force some to enter the labour market for financial reasons.

It is notable that the labour force participation rate for males is always higher than that for females in Alberta. (Even for the age 15-19 cohort, where the two rates are close, the male rate is slightly higher than the female.) Even though females have greater longevity—as shown in Figure 1—and hence tend to be in comparably better physical condition when older, males are still more likely to participate in the labour force in their late 60's.

The unemployment rates for non-Aboriginal Albertans are shown in Figure 3.

Figure 3. Unemployment rates for non-Aboriginal Albertans

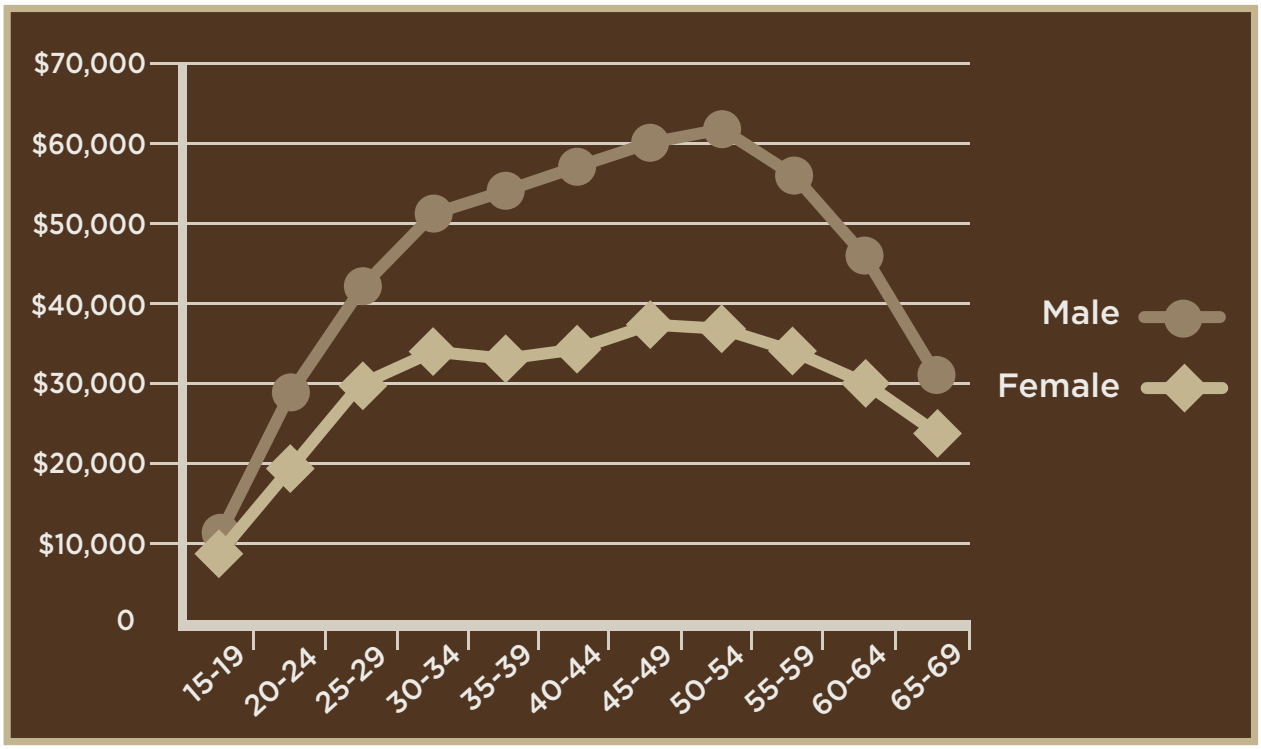


The rates are highest for the youngest people due to their lack of labour-market experience. Moreover, younger people tend to change jobs more frequently as they find their way in life, which pushes their unemployment rate upward. Initially, male and female unemployment rates are approximately the same in the 15-19 age cohort, though the rate for males is somewhat lower. Then, as the participation rate begins to surge for males within the 20-24 age cohort, as shown in Figure 2—increasing the supply—the male unemployment rate increases. However, in due course, the resulting additional labour-market experience causes the male unemployment rate to drop below the female in subsequent age cohorts. Toward the end of the working life, the female unemployment rate is below that of the male. The higher unemployment rate for older males is the result of jobs being difficult for older people to find, making job-loss more problematic at that stage of life. An older female who loses her job, however, is more likely to retire, perhaps because she is unable to find another job.

The survival rates were easy to explain, and the participation and unemployment rates were fairly straightforward. The fourth basic ingredient in the computation—the wage rate if employed—will be more challenging.

Median earnings for employed non-Aboriginal people are shown in Figure 4, separately for males and females. The data, compiled from the Microdata files from the Census of 2006, measure median annual earnings for the year 2005.

Figure 4. Annual earnings for non-Aboriginal Albertans, 2005



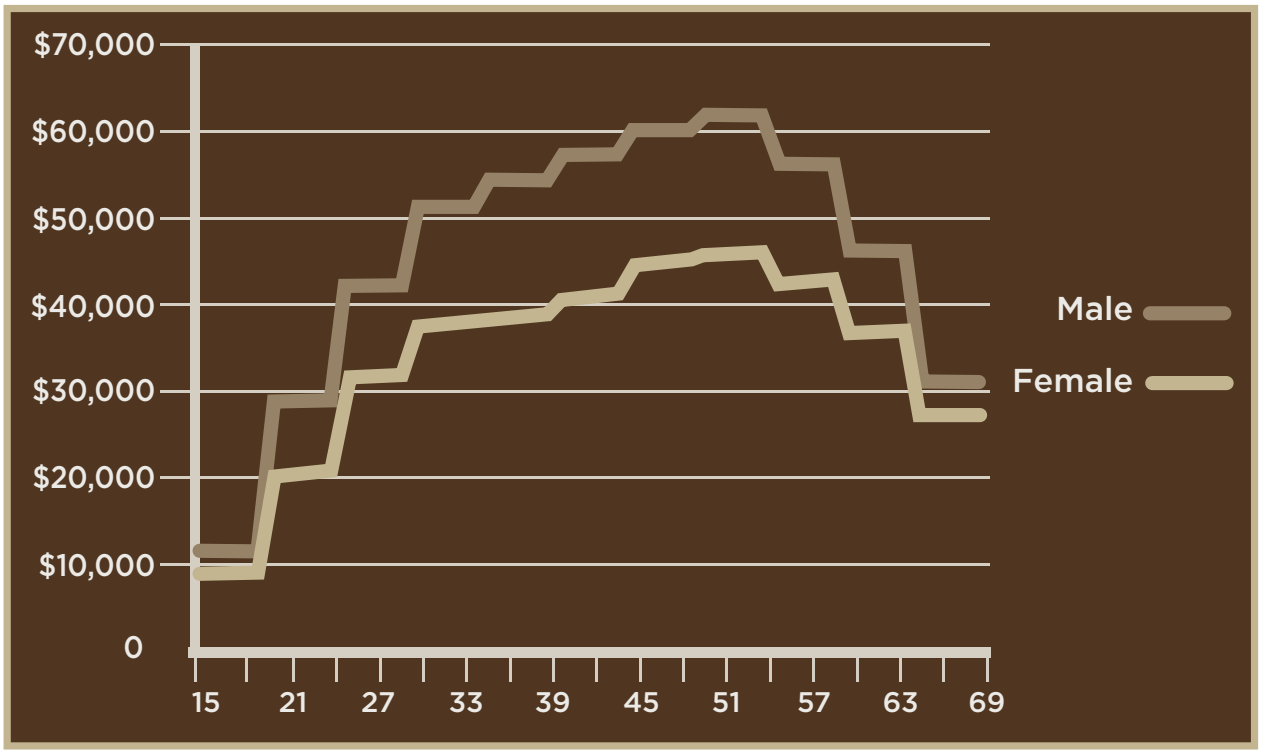
Male earnings increase until the 55-59 age cohort, when they begin to fall as high earners begin to take early retirement, lowering median earnings.

The familiar observation that Canadian females get paid about a third less than Canadian males is reflected in Figure 4. Averaging the entries in Figure 4, annual male earnings are $45,375, whereas female earnings are about a third less, $29,186.

Across Canada, socioeconomic change has resulted in a gradual decrease in the difference between male and female earnings for those who are employed. This phenomenon, and its implications for forensic economic analysis, is discussed at length by Matthew J. Cushing and David I. Rosenbaum (2010). Although some analysts have taken to replacing the earnings data for females with that for males, in effect assuming that the difference in earnings will go away rapidly, Cushing and Rosenbaum apply a different analytical technique. In Alberta, comparing the results of the Census of 1996 to the Census of 2006, one can see that the relative size of the difference is diminishing annually by a factor of 0.99008 times its value the previous year. That .99008 adjustment reduces the gap between male and female earnings (for those who are employed) by about one percent per year.[28] That adjustment was applied into the future, resulting in the annual earnings shown in Figure 5.

28 *A caution is appropriate. Some readers might suppose that a decrease of about one percent per year would result in the elimination of the difference in 100 years. No. The one percent decrease applies to the value in the preceding year, so the future effect is obtained geometrically rather than multiplicatively. The value of .99008100 is .3690, so about 63% of the difference would be eliminated after 100 years at this rate.*

Figure 5. Annual earnings for non-Aboriginal Albertans adjusted for increased relative female earnings, 2005 dollars



In Figure 5, the data are shown annually, rather than in five-year age cohorts, because female earnings are subject to an annual adjustment. The earnings rates for males in Figure 5 are identical to those shown in Figure 4. For females, however, there is gradual progress, with a 1.0% annual decrease of the difference between their earnings and male earnings (if employed).

The lifetime earnings reported in this study are expressed in 2013 dollars. The above earnings were adjusted from 2005 dollars (which are reported in the earnings data in the Census of 2006) to 2013 dollars using the Consumer Price Index, which for Alberta is 19.9% higher in 2013 than it was in 2005.

The value of lifetime earnings for the 24 individuals, all of whom are 15 years old in 2013, will be affected by the magnitude of growth in wage rates in Alberta that will occur over their lifetimes. The series Wages, Salaries, and Supplementary Labour Income for Alberta, from Statistics Canada's Provincial Income and Product Accounts (series V691712 in CANSIM), includes benefits such as employer payments to individual pension plans. It is important to include benefits in the following calculation because benefits are usually negotiated to grow faster than wage rates due to preferential tax treatment. The calculation also uses the overall Consumer Price Index for Alberta (series V41692327 in CANSIM) to remove the effects of inflation, and labour force employment (series V2066591 in CANSIM) to express earnings in dollars per worker. Using these series, constant-dollar wages, salaries, and supplementary labour income per worker have been growing healthily in Alberta. The annual rate of growth has been 2.00% over the past five years, 2.55% over the past ten, 1.75% over the past twenty, and 1.18% over the past thirty. The rate of growth in wages was set at 1.5% going into the future, which is somewhat lower than average growth over the past twenty years, though somewhat higher than over the past thirty.

A further adjustment to the growth in wages is required, necessitated by the fact that wage rates in the previous paragraph are mean wage rates, whereas the lifetime earnings numbers in this report are median earnings. After some trial calculations in which the median wage growth tended to be about a third less than the growth in the mean, the growth in the median was set at 1.0%.

The effect of education on earnings was analyzed initially for non-Aboriginal people. The effect was controlled by two parameters for each level of educational attainment, and separately for males and females. One of the parameters was static and the other dynamic. The static parameter controlled how much would be earned by a non-Aboriginal individual with a given level of educational attainment compared to the overall non-Aboriginal population. Comparing the results of the 1996 and the 2006 Censuses, the future rates of increase in wage rates were estimated, as given in Table 29.

Table 29. Future annual rate of increase in non-Aboriginal real wage rates per worker

	MALE	FEMALE
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	0.00%	-0.20%
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	1.00%	1.00%
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	1.10%	1.20%
Receives a Bachelor's degree or higher	1.25%	1.75%

Table 29 shows that male workers without a high school diploma are just keeping up with the cost of living, so their wage is unchanged in constant dollars. Female dropouts are not keeping up with the cost of living. Males and females with a high-school diploma are beating the cost of living, and have real wage rates that increase by one percent per year per worker. This is the overall rate of increase in real per-worker wage rates, as discussed above. Those completing a below-Bachelor's postsecondary program do somewhat better, though females do better than males. Recall that female wage rates are dramatically below male wage rates for this educational category. The difference in growth rates causes the difference in wage rates to decrease, but not disappear by 2067 (the final year of the study). Those with a Bachelor's degree or higher, in turn, do better yet, though again females do somewhat better than males. The difference in wage rate growth was sufficient to bring about equal real per-worker wage rates for males and females who have a Bachelor's degree or higher in 2049. Starting after that year, the rates of increase in real per-worker wages rates for females was set at the (lower) male rate of increase. Afterward, although the rate of increase in the real per-worker wage rate was equal for males and females with a Bachelor's degree or higher, the expected annual rate of pay was nonetheless lower for females than males because females have lower labour force participation rates.

It was necessary to adjust the labour force participation rate for the level of education, because more highly educated individuals tend to have higher labour force participation rates. The participation rates given in Figure 2 have to be adjusted upward for those with more educational credentials and downward for those with fewer. The adjustment was done geometrically. Let denote the participation rate of a non-Aboriginal individual—either a male or a female—with one of our four levels of educational attainment. Let denote the overall participation rate for non-Aboriginal individuals of the same sex. Then the adjustment performed was

$$P = \Pi^{\alpha}$$

The values of and were estimated from the 2006 Microdata for all non-Aboriginal males or females, separately. Then α was estimated from the 2006 Census Microdata files as

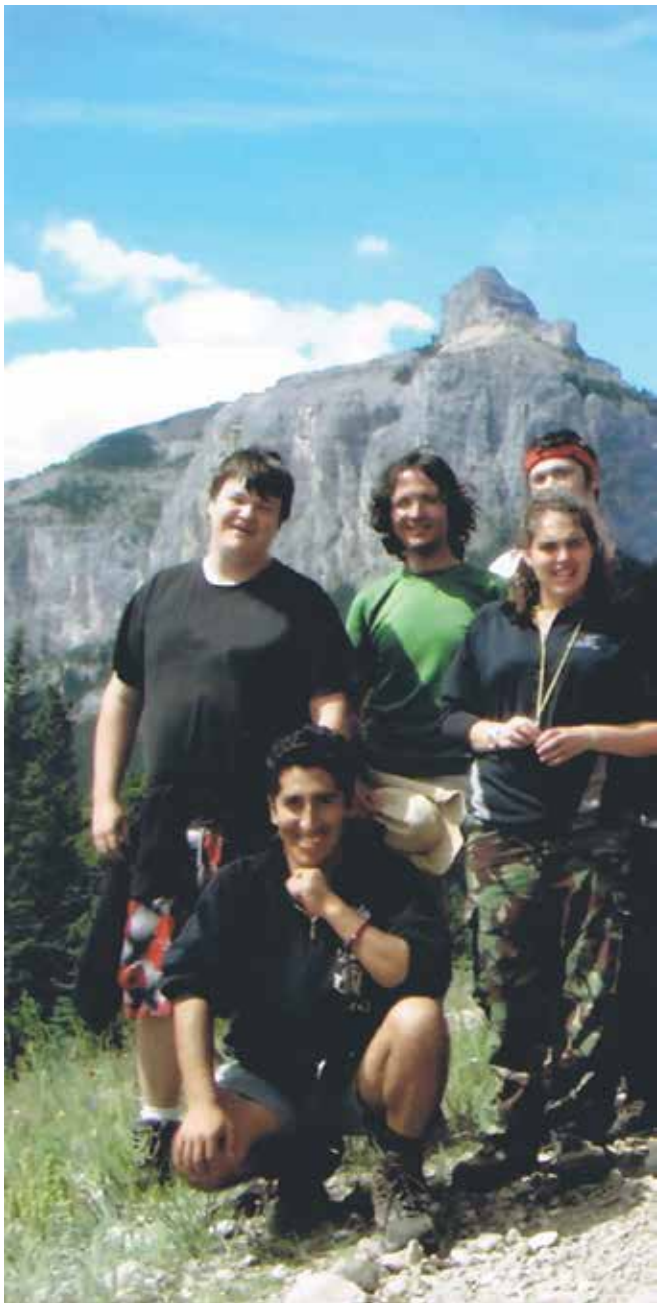
$$\alpha = \frac{\log(P)}{\log(\Pi)}$$

The resulting values of α were applied separately to all age cohorts, both sexes, and each level of education. The values of α are shown in Table 30.

Table 30. Value of alpha by sex and education level for the labour force participation rate of the non-Aboriginal population of Alberta

	MALE	FEMALE
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	2.080037	2.008409
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	0.859656	0.933715
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	0.667662	0.780074
Receives a Bachelor's degree or higher	0.680853	0.652705

Table 30 shows that increased education results in higher labour force participation rates. A higher value of α takes the value of (which is less than one) to a higher power, which makes it a smaller number. High school dropouts tend to have the lowest participation rates, and participation rates increase with education, as shown by the smaller values of α. The only exception is for males who complete a below-Bachelor's program at a postsecondary institution, who tend to have a slightly higher participation rate than males with a Bachelor's degree or higher.



A similar approach was taken to adjust the aggregate non-Aboriginal unemployment rates for different levels of education. The unemployment rates given in Figure 3 have to be adjusted upward for those with more educational credentials and downward for those with fewer. The adjustment was done geometrically. Let denote the unemployment rate of a non-Aboriginal individual—either a male or a female—with one of our four levels of educational attainment. Let denote the overall unemployment rate for non-Aboriginal individuals of the same sex. Then the adjustment performed was

$$U = \Omega^{\beta}$$

The values of and Ω were estimated from the 2006 Microdata for all non-Aboriginal males or females, separately. Then the values of β were obtained as

$$\beta = \frac{\log(U)}{\log(\Omega)}$$

The resulting values of β were applied separately to all age cohorts, both sexes, and each level of education. The values of β are shown in Table 31.

Table 31. Value of beta by sex and education level for the unemployment rate of the non-Aboriginal population of Alberta

	MALE	FEMALE
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	0.874989	0.882025
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	0.940634	0.997045
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	1.085392	1.03289
Receives a Bachelor's degree or higher	1.110746	1.050483

Table 31 shows that increased education results in lower unemployment rates. A higher value of β takes the value of (which is less than one) to a higher power, which makes it a smaller number. High school dropouts tend to have the highest unemployment rates, and unemployment rates decrease with education (as shown by the larger values of β).

APPENDIX B-2: Métis and First Nations earnings

Similar adjustments for the effect of education on unemployment and labour force participation rates were performed for Métis and First Nations people. The values of α and β, estimated from the 2006 Census Microdata files, are given in Table 32 for Métis and Table 33 for First Nations.

Table 32. Values of alpha and beta for Métis Albertans

	MALE	FEMALE
	α (Participation Rate)	
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	2.892391	2.036941
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	0.683860	0.843212
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	0.517622	0.700819
Receives a Bachelor's degree or higher	1.028131	0.550000
	β (Unemployment Rate)	
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	0.668078	0.737247
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	0.747355	0.871038
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	0.870372	0.845172
Receives a Bachelor's degree or higher	1.073190	1.296123

Table 33. Values of alpha and beta for First Nations Albertans

	MALE	FEMALE
	α (Participation Rate)	
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	4.060037	3.291515
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	1.436336	1.391439
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	0.962685	0.916239
Receives a Bachelor's degree or higher	0.280679	0.566546
	β (Unemployment Rate)	
Drops out of school prior to receiving a high school diploma, and does not subsequently obtain high school equivalency	0.497941	0.429287
Obtains a high school diploma either by graduation or by subsequently completing high school equivalency—with no further formal education	0.589747	0.601548
Completes a postsecondary program leading to a certificate or diploma (e.g., a program at a technical school or college) or an apprenticeship—with no further formal education	0.785749	0.695563
Receives a Bachelor's degree or higher	0.993206	1.167767

Just as with non-Aboriginal people, higher levels of education typically correspond to higher labour force participation rates and lower unemployment rates.

Comparison of the 1996 and the 2006 Censuses revealed that the gap between the labour market outcomes of Aboriginal people and non-Aboriginal people—for a given sex and level of education—is decreasing in Alberta.

An adjustment was made that followed the same approach as was taken for wage rates (if employed) for non-Aboriginal females. The gap between the corresponding variables (whether the participation rate, the unemployment rate, or the wage rate if employed) was adjusted at a given annual rate until parity was achieved. The rates of adjustment are given in Table 34.

Table 34. Annual Rate of change in labour market factors

	MALE	FEMALE
	Métis	
Labour force participation rate factor	0.77%	1.35%
Unemployment rate factor	-4.09%	-4.42%
Wage rate factor	4.62%	2.54%
	First Nations	
Labour force participation rate factor	0.48%	1.22%
Unemployment rate factor	0.00%	0.00%
Wage rate factor	3.49%	1.78%

Table 34 shows that for both Métis and First Nations, Aboriginal wage rates, unemployment rates, and labour force participation rates are moving toward parity with non-Aboriginal rates, for a given level of education. The only exception is for the First Nations unemployment rate, which does not have a downward trend.

APPENDIX B-3: Undiscounted earnings

The lifetime earnings figures reported and analyzed in Tables 1 through 6 are discounted present values. The formula for computing present values is the following. Suppose that r is the real interest rate (which equals the nominal interest rate less the rate of inflation). Suppose that the constant dollar value of earnings in year t is E_t for t = 0, …, T, where t = 0 at age 15. Then the discounted present value of earnings is obtained by computing

$$PV = \sum_{t=0}^{T} \frac{E_t}{(1+r)^t}$$

The amount PV could be used to purchase the stream E_t, for t = 0, …, T, at interest rate r. More about discounted present values can be found in any intermediate microeconomic theory text, such as the excellent text by Hal R. Varian (2006).

Discounting is important in evaluating any stream of money that accrues over time: a dollar at some time in the future is worth less than a dollar today because (due to interest) it would take less than a dollar today to obtain a dollar at that future time. But discounting can be misleading when applied to consumers. The real interest rate used in this study is two percent. At that interest rate, a dollar at age 69 is only valued at

$$\frac{\$1}{(1.02)^{54}} = \$0.34$$

at age 15.

Consumers do not necessarily think like this: consumers do not eat discounted dollars. In fact, consumers tend to try to smooth their expenditure streams over their lives, as discussed in the lifecycle theory of consumption, which can be found in almost any intermediate macroeconomic theory text, such as that by N. Gregory Mankiw and William Scarth (2011).

Hence, many will want to know what their undiscounted lifetime earnings will be. Those can be obtained approximately by increasing the discounted amounts shown in Tables 1, 3, and 5 by 75%. For example, a Métis female who gets a Bachelor's degree or higher will have discounted lifetime earnings of $2,833,092 as shown in Table 2. Her undiscounted lifetime earnings will be $5,031,809, which is precisely 77.6% more. Similarly for the other entries in Tables 1, 3, and 5.

Bibliography

Almon, Clopper. 1989. *The Craft of Economic Modelling*. Needham Heights, Massachusetts: Ginn Press.
Ashenfelter, O. and C. Rouse. 2000. "Schooling, Intelligence, and Income in America," K. Arrow, S. Bowles and S. M. Durlauf, *Meritocracy and Economic Inequality*. Princeton, NJ: Princeton University Press, 89-117.
Cushing, Matthew J. and David I. Rosenbaum. 2010. "Cohort Effects in Age-Earnings Profiles for Women: Implications for Forensic Analysis." *Eastern Economic Journal*, 36(3), 353-69.
Fair, R. C. 2004. *Estimating How the Macroeconomy Works*. Cambridge, Massachusetts: Harvard University Press.
_____. 2002. *Predicting Presidential Elections and Other Things.* Stanford, California: Stanford University Press.
_____. 1984. *Specification, Estimation, and Analysis of Macroeconometric Models.* Cambridge, Massachusetts: Harvard University Press.
_____. 1994. *Testing Macroeconometric Models.* Cambridge, Massachusetts: Harvard University Press.
Guimond, Eric; Don Kerr and Roderic Beaujot. 2003. "Charting the Growth of Canada's Aboriginal Populations: Problems, Options and Implications." *Population Studies Centre Discussion Papers* Series, 17(5), 1-23.
Howe, Eric. 2012. "Bridging the Aboriginal Education Gap in Ontario," University of Saskatchewan: 67.
_____. 2004. "Education and Lifetime Income for Aboriginal People in Saskatchewan," J. P. White and D. Beavon, *Aboriginal Policy Research: Setting the Agenda for Change.* Thompson Educational Publishing, 175-91.
_____. 2011. *Mishchet Aen Kishkayhtamikihk Nawut Ki Wiichiihtonaan: Bridging the Aboriginal Education Gap in Saskatchewan.* Saskatoon, Saskatchewan: Gabriel Dumont Institute.
_____. 2007. "Nunavutmod," University of Saskatchewan: 125.
Howe, Eric and Kelly Lendsay. 1999. "The Economic Model of Alberta and the Métis Settlements," University of Saskatchewan: 135.
Howe, Eric and Jack Stabler. 1990. "The Revised Northwest Territories Economic Model," University of Saskatchewan: 115.
Mankiw, N. Gregory and William Scarth. 2011. *Macroeconomics (Canadian Edition)*. Worth Publishers.
McMahon, Walter W. 2004. "The Social and External Benefits of Education," G. Johnes and J. Johnes, *International Handbook on the Economics of Education.* Cheltenham, UK: Edward Elgar, 211-59.
Oreopoulos, Philip and Kjell G. Salvanes. 2011. "Priceless: The Nonpecuniary Benefits of Schooling." *Journal of Economic Perspectives*, 25(1), 159-84.
Riddell, Craig W. 2006. "The Impact of Education on Economic and Social Outcomes: An Overview of Recent Advanced in Economics," *An Integrated Approach to Human Capital Development.* School of Policy Studies, Queens University: Canadian Policy Research Networks,
Royal Commission on Aboriginal Peoples. 1996. "Renewal, a Twenty-Year Commitment," *Royal Commission on Aboriginal Peoples.* Ottawa: 542.
Schap, David. 2010. "Introduction to the Symposium on Forensic Economics." *Eastern Economic Journal*, 36(3), 344-46.
Statistics Canada. 2006. "Life Tables, Canada, Provinces and Territories," 84-537-XIE. Ottawa: Statistics Canada = Statistique Canada, electronic resource.
_____. 2011. "Population Projections by Aboriginal Identity in Canada, 2006-2031," 91-552-X. Ottawa: Statistics Canada = Statistique Canada, electronic resource.
Tinari, Frank D. 2010. "The Practice of Forensic Economics: An Introduction." *Eastern Economic Journal,* 36(3), 398-406.
Varian, Hal R. 2006. *Intermediate Microeconomics : A Modern Approach.* New York: W.W. Norton & Co.
Waslander, Bert. 1997. "Government Expenditures on Aboriginal People: The Costly Status Quo." *Canadian Tax Journal,* 45(5), 959-78.

Eric Howe received his B.A. (1973, cum laude) from Wittenberg University and Ph.D. (1982) from University of Maryland. He was a Graduate Fellow at University of Maryland, where his education included research experience with INFORUM, the Interindustry Forecasting Project. His formal education has been supplemented by extensive practical experience performing economic analyses, including employment by the Economic Research Service of the United States Department of Agriculture, the Applied Mathematics Division of the National Bureau of Standards, and the United States Agency for International Development. He has done research for Environment Canada, Transport Canada, the Government of the Northwest Territories, the Government of Saskatchewan, the Federation of Saskatchewan Indian Nations, the Prince Albert Grand Council, the General Council of the Métis Settlements of Alberta, SaskTel, the Potash Corporation, PanCanadian Petroleum, Rawlco Communications, Kitikmeot Corporation, Nuna Logistics, Cameco, and others. In addition, he has provided expert testimony in several civil legal proceedings.

Eric joined the University of Saskatchewan in 1979, where he is a professor of economics. His specialties are Aboriginal social policy research, economic forecasting, economic modelling, microeconomic theory, forensic economics, and the economies of the Canadian prairies and arctic. His research is documented in an extensive list of publications in professional journals, including articles in *Econometrica, Journal of Regional Science, Canadian Public Policy, Social Choice and Welfare, Journal of Theoretical Probability, Journal of Aboriginal Economic Development, Arctic,* and *American Journal of Agricultural Economics*. He has received numerous teaching awards.

In addition to his professional responsibilities, Eric enjoys attending theatre, cooking, backpacking, snowshoeing, canoeing, and being a grandfather.

Métis Training to Employment Services
Rupertsland Institute

Métis Training to Employment Services is here to help you get ahead of the future. Whatever your needs are, we've got a program to assist you. For more information on our:

- *Post Secondary Funding*
- *Scholarships and Bursaries*
- *Apprenticeship Programs*
- *Training Programs*
- *Disability Services*
- *Job Postings*
- *And More…*

Visit us on the web, or call to be connected to the MTES Office nearest you.

1-888-48-MÉTIS
(1-888-486-3847)

Online at:
www.metisemployment.ca

Since 1670, the Rupert's Land territory has held the pulse of Canadian industry, and the Métis people were among the catalysts that drove its success. In 2010 the Rupertsland Institute was created to reinvigorate that legacy of labour and achievement born over 300 years ago.

Métis people: a history of fostering excellence in achievement – Rupertsland Institute: a mission of fostering excellence in Métis people.

Rupertsland Institute
a Métis Centre of Excellence
www.rupertsland.org

UNIVERSITY OF ALBERTA
FACULTY OF NATIVE STUDIES

Rupertsland Institute
Métis Centre of Excellence

Canada

Rupertsland Institute – 1450-10060 Jasper Avenue, Edmonton, AB, T5J 3R8 – 1-855-616-9977– www.rupertsland.org