Returns to education amongst Aboriginal groups in Canada, 2001

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Abstract[1]

In this paper we use the 2001 Census to compare returns to education amongst 6 categories of Aboriginal groups to those of majority origin Canadians. We do this by first estimating the overall earnings differential between Aboriginal and majority Canadians and then running separate regressions by group in order to compare the payoffs to different types of schooling. This latter approach is equivalent to running the first model fully interacted by the different aboriginal status. We find that the payoffs to schooling for Aboriginal men and women are about the same as is the case for majority Canadians. Thus, while earnings do increase with schooling for all groups, there appears to be a penalty for just being Aboriginal.

In this paper we use the 2001 Census to compare returns to education amongst 7 categories of Aboriginal groups to those of majority origin Canadians. We find that the payoffs to schooling for Aboriginal men and women are often about the same as is the case for majority Canadians. While there is some 'catch-up' in the earnings as compared to the majority population, high levels of schooling do not appear to overcome a penalty for just being Aboriginal.

Previous work has suggested that Aboriginal Canadians face severe penalties in the labour force (Kuhn and Sweetman 1990, Pendakur and Pendakur 2007). Pendakur and Pendakur (2007) using 2001 census data, find that at the national level, after controlling for basic personal characteristics, Aboriginal men can expect to receive about half the earnings of majority men with similar characteristics.[2] Aboriginal women face smaller, albeit still daunting

[1] . We wish to thank John Clement at Indian and Northern Affairs Canada (INAC) for his comments and help. We also wish to acknowledge the financial and logistic support of INAC.

[2] . Personal characteristics included age, education, marital status, official language knowledge and CMA of residence.

earnings penalties of about 19% as compared to majority women with similar characteristics. While the penalties faced appear to differ across the country, Pendakur and Pendakur, 2007 found that these earnings penalties were consistently above 20% for men and above 4% for women in the 12 CMAs analysed.

Both Kuhn and Sweetman (1990) and Pendakur and Pendakur (2007) use regressions methods to control for level of schooling, however, few studies have looked explicitly at the link between schooling and earnings for aboriginals in Canada. Notable exceptions include Jenkins (2007); Mendelson (2006); Hull (2000). These three studies have used census tables to look at link between earnings and education for Aboriginals. Mendelson (2006) found that:

> … on average the Aboriginal population suffers from higher unemployment, lower levels of education, below average incomes and many other indicators of limited socioeconomic circumstances.
>
> Page: 39.

Jeremy Hull (2000), looking at post secondary education and labour market outcomes, found that registered Indians and those claiming Aboriginal identity faced far higher levels of unemployment (26% and 19% versus 9% for the non-Aboriginal population) (p: 6). At the same time he found a fairly tight relationship between level of schooling and employment income and that this relationship is more pronounced amongst registered Indians than it is among other Aboriginal identity groups (page 8). All three papers provide a detailed picture of the relationship between schooling and average earnings in any given age-sex Aboriginal cohort. They are limited however in the number of variables that can be included in the data tables and therefore the number of variables for which they can control.

In this paper we take an indepth look at the links between level of schooling and earnings for Aboriginal men and women in Canada using 2001 Census data. We use standard regression modeling techniques which allow us include a broader range of variables than have been included in past research papers in the same area.

2. Data and Methodology

Our data come from a customized micro data file drawn from the master file of the 2001 Census of Canada. This file contains information from all the long form records collected. So, we have records for about 20 per cent of households in general, and 100 per cent of households living on those Aboriginal reserves participating in the Census.[3] From this master datafile we select all people age 25 to 65, who are Canadian citizens by birth. Our working database consists of nearly 2 million cases, roughly 3 per cent of who are aboriginal.

We explore two aspects of earnings disparity. We use OLS regressions to measure the difference in the conditional mean of log-earnings[4] and log-total-income between Aboriginal and non-Aboriginal workers.[5] Regressions run using earnings include only those people who work for someone else and whose primary source of earnings is from wages and salaries. Regressions

[3] . In 2001, a total of 30 Indian reserves and Indian settlements were incompletely enumerated by the census. The populations of these 30 communities are not included in the census counts (Statistics Canada - Cat. No. 97F0011XCB2001001).

[4] . When researchers are considering both participation and earnings, it is desirable and customary to treat the two phenomena together. Typical approaches would estimate a model of earnings, correcting for the endogeneity (simultaneity) of the participation decision. However, due to the limitations of Canadian Census data, we are unable to formally correct for the endogeneity of participation because we lack an instrument correlated with participation but uncorrelated with earnings. Aboriginal men and women have much lower participation rates than white men and women, which suggests that results for Aboriginals may be hard to interpret. In the appendix we provide a complete set of logistic regression results for the probability of employment. In those tables, it is apparent that the patterns of earnings disparity are replicated in the patterns of employment disparity. This suggests that formal correction for endogeneity would not undo the earnings disparity we report.

[5] The loglinear specification allows us to interpret the coefficient differences as percent differences (see Mincer, 1974).

run using total income as the dependent variable include everyone with positive incomes, from all sources and thus include wages and salaries as well as self-employment income, investments and government transfers. We run regressions for Canada as a whole and 6 Census Metropolitan Areas with large Aboriginal populations: Montreal, Toronto, Winnipeg, Calgary, Edmonton and Vancouver. The Canada-wide regressions include controls for twelve areas of residence – ten CMAs, one small CMA indicator and non-CMAs.

There are two lists of control variables used in regressions. Regressions labeled 'personal' control for age (8 categories), marital status (5 categories), number of household members, official language knowledge (3 categories), 12 area-of-residence categories (10 CMAs, a small CMA identifier and a non-CMA identifier), 31 non-Aboriginal ethnic origin controls and, finally, 7 categories of Aboriginal people defined on registry, identity and ethnic origin. Regressions labeled 'work' include all the preceding variables plus full time-part time status (2 categories), weeks of work (11 categories), occupation (10 categories) and industry (20 categories). Regressions controlling for personal characteristics can be thought of as comparing the earnings of Aboriginal and non-Aboriginal persons with similar skill and background sets. Adding work characteristics is analogous to comparing the earnings of Aboriginal and non-Aboriginal persons sharing both skill sets and job characteristics.

In addition to these control variables, we include information on the education of the respondent, either as a control (Tables 2 and 3) or as a regressor-of-interest (Tables 4 and 5). We use three types of information on education. When education is used as a control variable to assess the average earnings differential between Aboriginal and majority groups we include 13 categories of highest-level-of-schooling. These categories are chosen to ensure comparability

with previous work in the area (see, Pendakur and Pendakur 2002, 2007, 2008). When education is used as a regressor-of-interest, we use two types of information. Our 'detailed legend' includes 22 categories of highest-level-of-schooling, expanded to capture the highest grade-level for high school non-completers (a large proportion of Aboriginal people). Our 'short legend' focuses on years of schooling (rather than highest level attained), and is comprised of 4 continuous variables:

- years of high school for those who did not complete high school;
- years of school for those who did complete high school, including via General Equivalence Diploma, but did not attend any post-secondary;
- years of post-secondary schooling for those who have some non-university schooling (but no university post-secondary schooling); and
- years of post-secondary schooling for those who have some university schooling.

Individuals can have nonzero amounts of only one of the 4 types of years of education.

The detailed legend allows us to look at payoffs to specific levels of schooling, but is too detailed to allow us to drill below the national level. The shorter legend provides less detail but allows us to examine earnings and schooling patterns in 6 CMAs.

Our seven categories of Aboriginal people are as follows:

Two categories of self-reported Registered Indian status from question 21 of the 2001 Census long form, "Is this person a Treaty Indian or a Registered Indian as defined by the Indian Act of Canada?"

1. Registered Aboriginals living on-reserve;
2. Registered Aboriginals living off-reserve.

The 2001 census includes an *identity* question which asks: "Is this person an Aboriginal person?" There are three tick-boxes for "North American Indian", "Métis" and "Inuit" as responses. Persons reporting registry under the Indian Act without ticking one of the boxes have an imputed (positive) response to the identity question. Thus, in these data, every registered Indian has Aboriginal identity, but not vice versa. All registered persons are captured by the two categories listed above. We create three categories of unregistered persons with self-reported Aboriginal identity as follows:

3. North American Indian (including multiple responses (ticks));
4. Métis;
5. Inuit (Eskimo).

The five categories above capture all people with reported or imputed Aboriginal identity. Our last two categories capture people who have Aboriginal ancestry but not Aboriginal identity, and are derived from responses to the question "To which ethnic or cultural group(s) did this person's ancestors belong?" Respondents may write in up to six responses to this question. We use the first two responses to identify people who reported:

6. Single Aboriginal ancestry, but not Aboriginal identity;
7. Multiple origin Aboriginal ancestry (for example Aboriginal origin and British origin), but not Aboriginal identity.

Because the 'Inuit / Eskimo' category is very small in Canadian cities, we only report their results at the Canada-wide level.

Our categorisation of Aboriginal peoples allows us to differentiate those classified as Aboriginal for policy and program purposes (registered) from those who self-identify as Aboriginal people. The former classification is associated with considerable policy and program attention. Persons in the latter classification (but not the former) receive little or no targeted government financial support, but nonetheless self-identify as Aboriginal. Thus, these people see themselves as Aboriginal even though the state does not formally recognize their Aboriginal status through financial transfers. Finally, the Aboriginal ancestry category captures those people who acknowledge at least some Aboriginal heritage, but do not self-identify as Aboriginal.

For tables 2 and 3, the comparison group is people reporting only British origin. However, we note that there is no significant difference in earnings between people who respond British, French, Canadian, or combinations of these three groups. Thus, we take our results to indicate disparity between Aboriginal origin and majority origin respondents. For tables 4 and 5 which show separate regressions for each group we compare results for Aboriginal persons to people who report British, French or Canadian origins (but not other origins).

3. Results

Table 1: Descriptive Statistics

Table 1 shows schooling and earnings data for Aboriginal and majority persons.[6] Results from the table show two important differences between majority and Aboriginal groups. First,

[6]. Confidentiality guidelines do not allow us to draw tables from the census database that we are using. These data are drawn from the 2001 census public use microdata individual file. As such we are only able to provide data for the rollup of registered Indians (both on and off reserve).

on average, the Aboriginal population is not as well educated. Thirty-nine percent of registered females and 44% of registered males do not have a high school certificate (almost double the rate for majority Canadians). While about 15% of the majority population has a university degree, this is true for less than 10% of Aboriginal females and less than 5% of self-identifying Aboriginal males. The index of dissimilarity between the registered Indian and majority population is 24% for women and 23% for men suggesting that about one quarter of the Aboriginal population would have to increase their schooling to match the schooling profile of the majority population. [7]

The bottom half of table 1 shows the log of earnings from wages and salaries and the log of total earnings for men and women by majority and Aboriginal group status. The differences between the two figures can be interpreted as percent differences (at least for values of .25 or less) in average earnings. For example, the log value for majority women's wages is 9.89. For North American Indian women it is 9.72, suggesting that they earn about 17% less than majority women (9.89-9.72=0.17). The earnings data suggest that regardless of group or whether we look at total or wages earnings, Aboriginal Canadians have substantially lower earnings.

[7] . The index of dissimilarity defines the proportion of people from one group who would have to shift attributes to match the attributes of another group. It is calculated by taking half the sum of the absolute percent difference between two groups . lIt is calculated as follows:

$$ID = \frac{1}{2}\sum_{i=1}^{N} \left| \frac{r_1}{R} - \frac{m_i}{M} \right|$$

Where :

- r_1 =the number of people in group 1 (in this case the Aboriginal population) with a particular characteristic (i.e. a highschool certificate).
- R=the total number of people in group 1.
- m_1=the number of people in the comparison group (in this case the majority) with the same characteristic.
- M=the total number of people in the majority category.

The goal of this paper is to explore the degree to which schooling is responsible for the earnings gap faced by Aboriginal peoples, and concomitantly the degree to which schooling can help close the earnings differential faced by group members.

3.1 Income and Earnings Disparity

To begin our investigation of earnings and income disparity, we first present overall earnings and income gaps, by regressing log-earnings and log-income on personal characteristics and group status. The coefficients on group membership may be taken as indicators of overall earnings and income disparity under the restriction that the returns to education are the same for all groups (a restriction we relax in tables 4 and 5).

Table 2: total income regressions

Table 2 shows results from regressions on the average difference in total income for the year 2000 between British origin men and seven groups of Aboriginal men and women after controlling for age, education, marital status, place of residence and official language knowledge. Table 2 reveals that with one exception, regardless of group or sex, the average differential between majority and Aboriginal Canadians is always negative.[8] However the table also suggests that the differentials amongst women are lower than those amongst men. Looking first at Aboriginal women we see the greatest differentials among Registered and North American Indian women. Registered women living on reserve earn about 23% less than white women with

[8] . That exception is Inuit women. As compared to majority origin women, Inuit women have total incomes of about 27% more than majority women. A quick comparison of the results from table 2 suggests that this difference may be all due to a difference in transfer payments. However, as can be seen, the positive differential is not wiped out when looking at only earnings (table 2). Thus it may be that Inuit women have relatively high earnings, in comparison to Majority origin women with similarly low levels of schooling.

similar characteristics while registered Indian women living off reserve earn about 26% less. North American Indian women can expect about 21% less, while Métis and women with Aboriginal Heritage can expect about 11% less.

The income differentials faced by Aboriginal men are uniformly negative and greater in magnitude than those faced by Aboriginal women. The point estimate for Registered Aboriginal men is -0.70 suggesting that they earn about 45% of what majority males with similar characteristics earn. For Registered Indian men living off reserve the point estimate is -0.48. Unregistered Aboriginals face lower, albeit still substantial earnings differentials. For North American Indians, the point estimate is -0.40 and for Inuit, it is -0.33. Métis can expect about 26% less than Majority origin males with similar personal characteristics. For men with Aboriginal ancestry (but not identity) the differentials are somewhat smaller (-9% to -20%).

Table 3: wages regressions

Table 3 shows the differences in earnings from wages and salaries between Aboriginal men and women and majority origin men and women for Canada and eight Census Metropolitan Areas. The population in Table 3 includes only people who work for someone else and who have positive earnings. As compared to Table 2, the figures in Table 3 show only the difference in earnings, as compared to total income which includes transfers and non-salaried income.

Table 3 shows results from two types of regression models. The first set includes the same variables as found in Table 2 and is labeled personal characteristics. The second includes all the personal characteristics from as well as characteristics of the job (occupation, industry,

full time/part time status and weeks worked). Table 3 thus shows results from 32 regressions (males and females, 8 regions and two models).

At the Canada-wide level, with one exception, earnings differentials faced by Aboriginal men and women are uniformly negative and deeper than is the case when looking at total income regressions. Looking at results for men, models which include only personal characteristics, show differentials ranging from -0.7 for registered men living on reserve to -.11 for people claiming aboriginal heritage, but not identity. In general, regardless of gender, those claiming registered status face larger penalties than those who claim only identity (North American Indian, Métis and Inuit). And those claiming only Aboriginal heritage (but not identity) face smaller differentials than those claiming Aboriginal identity. Adding work characteristics to the model reduces the earnings differential by about half. Thus, for example, the differential faced by registered Indians living off reserve is reduced from -.42 (when looking at only personal characteristics) to -0.19 when work characteristics are added. This suggests that a substantial portion of the penalty faced by Aboriginal Canadians is a product of not being in the same types of jobs as majority origin Canadians.

Overall the national results shown in table 3, suggest that the differentials faced by women are smaller than those faced by men, ranging from -.29 to +0.5. The positive coefficient is for Inuit women. However, as was evident from the descriptive information in table 1, the levels of schooling for Inuit women is very low, suggesting that their earnings are high only given their low level of schooling.

Looking at the cities, it appears that in general, negative differentials are higher in the western CMAs as compared to Montreal, Ottawa-Hull and Toronto. In the western CMAs of

Winnipeg, Calgary, Edmonton and Vancouver, earnings differentials faced by Aboriginal men living on reserve are all above-0.74. For registered Indians not living on reserve, the differentials are greater than -0.48. Earnings penalties faced by non-registered Indians show a similar pattern to that seen for the Canada-wide regressions. Penalties are smaller, but still substantial. Those claiming Aboriginal ancestry but not Aboriginal identity tend to face smaller earnings differentials. Once again, adding work characteristics to the model reduces differentials by about half in most cases. Differentials faced by Aboriginal women (compared to majority women) are generally smaller. However the pattern is similar to that found for men, with more substantial penalties being found in the Western CMAs of Winnipeg, Calgary, Edmonton and Vancouver.

3.2 Income, Earnings and Education Levels

Table 4a: education by group: detailed education legend Total income.

Tables 2 and 3 showed the average differentials in either total income or earnings faced by different groups of Aboriginal men and women as compared to British origin men and women controlling for schooling and other characteristics. The results in these two tables were drawn from regressions that ran one model per region, thus in these tables every person in the regression model receives the same payoff for each level of schooling (and other control variables). If Aboriginal persons receive less or more money for each level of schooling, this difference will be averaged out within the education variables and the earnings differential will not be accurately measured.

Tables 4a and 4b show results from regressions measuring the returns to schooling for 6 groups in terms of total and wages income for Canada as a whole. These tables differ from the

previous two tables because each column of the table represents a separate regression for each of the 7 Aboriginal groups as well as one for the majority population. By doing this, we allow each group to have its own payoff for each level of schooling. As was the case for Table 3, the dependent variable is the log of either total income or earnings from wages and salaries.

Column 1 shows the returns to schooling for the population reporting majority (British, French or Canadian origins), while column 2 shows the returns to schooling for people reporting registered Indian status who are living on reserve. The comparison category is people with only a high school certificate. Where previous regressions allowed only a single payoff to each level of schooling regardless of origin, these regressions allow each group to have its own payoff to schooling. It is thus equivalent to interacting all the regressors in Table 3 with the six origins. Comparing across columns allows us to directly assess the difference in returns to schooling for different groups, while comparing the value of the constant allows us to understand the average difference in income between groups.

Table 4a shows returns to schooling using the log of total income as the dependent variable. Selected results are graphed in Figure 1. Figure 1 shows definite peaks in the slope for points representing earned certificates (high school, post-secondary certificate, and a bachelor's degree). Obtaining some schooling without obtaining a certificate is characterized by substantially lower income (for example some post-secondary but no certificate, university with no university certificate). However, it appears that Aboriginal groups are penalized more heavily than is the case for the majority. While the coefficients are poorly estimated (the standard errors are large) they are indicative of the importance of having a credential. This pattern holds true for total and earnings regressions for both men and women.

Looking at the results for women it does not appear that any consistently large gaps exist across all education levels. Nor are there large overall differentials as reflected by the constant. However the gaps tend to be larger at the bottom end of the schooling spectrum than either the middle or the top. For example, looking at table 4a (total income) the coefficient for majority women with less than grade 5 is -.36 as compared to majority women with high school. The coefficient for Métis women is -.48 which suggests that the income differential as compared to Métis women with high school is substantially greater. At the same time, the coefficients for these lower levels of schooling are poorly estimated for Aboriginal groups and the standard errors around the estimates are large, probably reflecting the fact that there are few people in these groups. There are a few schooling levels where Aboriginal women face differentials as compared to majority origin women. Métis women with a trade certificate and some university face a total income penalty of about 7 percent

The situation for men is somewhat different. First of all, as compared to majority origin men, the constant term for registered Indians, North American Indians and Métis are unambiguously lower suggesting that there is a basic cost to being a member of one of these Aboriginal groups which goes beyond schooling. Looking next at the coefficients for educational attainment, it does not appear that schooling makes up that difference. Rather, the slopes by schooling for all groups are roughly similar. There is however a pattern to the slopes. Registered Indians living off reserve and Métis have consistently lower payoffs to schooling as compared to majority origin males. Aboriginal men also tend to be much lower payoffs to not having a certificate than is the case for majority origin men. Thus where majority origin males with some post-secondary training but no certificate see a small benefit as compared to those

who only have high school, males reporting Aboriginal identity face differentials ranging from -7 percent for Métis men to -23 percent for Inuit men. In the same way, Aboriginal men with some university, but without a certificate gain no advantage over majority men with high school.

Table 4b shows the returns to education from wages and salaries. Looking first at females it appears that, as was seen for total income, there is a basic penalty for reporting Aboriginal identity as represented by the constant. Registered Indian and North American Indian women can expect about 15 to 20 percent less in earnings compared to majority women. North American Indian and Métis can expect about 7 percent less (for example the constant for majority women is 9.2, and the constant for registered women living off reserve is 9.01, suggesting an earnings differential of about 19%) . Returns to education follow a similar pattern for all groups, but there is a tendency for Aboriginal women to get lower returns for not having a certificate. Thus we see more pronounced troughs for Aboriginal women who have some post-secondary but no certificate compared to majority women. Having a post-secondary certificate, however results in a very similar return as compared to majority women.

The pattern for Aboriginal men is similar, but the basic penalty is much greater. For registered Indian males living on reserve, the point estimate for the constant is .69 lower than is the case for Majority males (9.02 versus 9.71 respectively). For registered Indian males living off reserve and Métis males, it is about 20 percent lower. For North American Indian males it is .5 lower. All of these figures are significantly different from each other. Males claiming Aboriginal heritage, but not identity, do not face the same basic penalty, and have constants that are similar to the Majority.

Several things are clear. First, as was seen for women, the pronounced troughs for not having certification are evident. Second, as compared to women, there is a clearer hierarchy of earnings for men. Registered Indians, particularly those living off reserve, have much lower returns to schooling across the spectrum. Métis men also display lower returns to schooling as compared to Majority origin men, but on average, do better than registered Indians. The pattern for North American Indians is more diffuse, but generally the payoffs are similar to those for Majority origin males.

3.3 **The return to a year of schooling**

The results from tables 4a and 4b use a very detailed level of schooling. Table 4 thus provides insight into the benefit of a particular level of schooling. However, because levels of schooling for Aboriginal men and women tend to be low, it is not possible to get significant results below the national level. For this reason we use a much shorter schooling legend for table 5. The broader categories allow us to provide information at a finer geographic area, albeit for coarser schooling groups.

Table 5 provides selected coefficients from regressions of log-earnings and log-income on years of education for members of our Majority group, and for members of each of our 7 categories of Aboriginal people. These regressions are run by group, and have either log-earnings for workers or log-income for all persons as the dependent variable. These regressions have our 'short legend' for schooling on the right-hand side. This is comprised of 4 continuous variables: years of high school for those who did not complete high school; years of school for those who did complete high school (including via General Equivalence Diploma), but did not attend any post-secondary; years of post-secondary schooling for those who have some non-

university schooling (but no university post-secondary schooling); and years of post-secondary schooling for those who have some university schooling. Individuals can have nonzero amounts of only one of the 4 types of years of education. In addition, we have dummies indicating which of these 4 types of years of education applies to the individual, and a dummy indicating that the individual has exactly 12 years of schooling with a high-school diploma. The right-hand side control variables are: age (8 categories), marital status (5 categories), number of household members, official language knowledge (3 categories), and 12 area-of-residence categories (10 CMAs, a small CMA identifier and a non-CMA identifier).

Table 5 reports the coefficients on the continuous years-of-schooling variables. These coefficients may be interpreted as 'naïve' returns to schooling as follows. Since the coefficient gives the slope of log-earnings or log-income with respect to a year of schooling, they indicate the percentage increase in earnings or income associated with an additional year of schooling. We say that they are 'naive' returns because the increase in earnings or income associated with an additional year of schooling is comprised of two effects: first, schooling increases a person's potential productivity and therefore compensation in the labour market; and, second, those people who choose to seek further schooling may have better productivity-related characteristics (for example, determination, social skills, or intelligence) than those that do not seek further schooling. An interpretation focusing on the productivity effects of schooling leans on the first effect. In contrast, an interpretation focusing on the sorting of individuals across different levels of schooling leans on the second effect. In reality, both effects are important, but they are not distinguishable in the data we have at hand.

Consider first the coefficients for high school years of schooling for those who did not ultimately graduate from high school. This is reported in the leftmost column of Table 4. This does not include high school dropouts who later received a high school graduation certificate. We note again that nearly half of Aboriginal people never finish high school, so the return to high school years of education is a very important number for this population.

Looking first at the rows corresponding to the majority group, we see that for both men and women, the earnings return is smaller than the total income return. This implies that the combination of transfers, investment and other sources of income serve to increase the (naïve) return to schooling, and, consequently, the incentive to pursue high school education. The total income return to number of years of high school with completion is 8.3% and 6.8% per year for women and men, respectively.

Turning to on-reserve women and men, we see the same pattern of higher income returns than earnings returns for women, but not for men. For men, the income returns are about the same as the earnings returns. This suggests that the transfer system (and investment income) do not increase the incentive to educate for Aboriginal men.

Considering the income returns, we see that these returns are much lower for on-reserve registered Indians than for the majority: the income return to years of high school education is only 6.0% per year for on-reserve women, compared to 8.3% per year for majority women, and it is only 3.3% per year for on-reserve men, compared to 6.8% per year for majority men. That the return to high schooling for on-reserve men is less than half that of majority men is quite striking, and suggests that the poor educational outcomes of on-reserve men may be driven partly by the absence of any serious gain to the individual of seeking out more education.

We see a much different pattern for off-reserve registered Indians. For women, the income return to schooling is not statistically distinguishable from that of majority women, and for men, it may be somewhat higher than that of majority men. The income return to a year of high school is 8.3% for off-reserve Indian men, which weakly statistically significantly larger than the 6.8% return for majority men.

Several important factors may drive this sharp difference in the returns to high school between on- and off-reserve Indians. First, off-reserve Indians are much more likely to live in cities than on-reserve Indians. Since our regressions do not control for the size of the area of residence, but rather for residence in the 12 largest cities in Canada, this may not adequately control for the remoteness of typical reserves. However, we will show in our results for particular cities that the pattern still holds. Second, off-reserve Indians may be different from on-reserve Indians, since the choice to live off-reserve is a choice that some people make and others don't. Those not living on reserves are different from those who stay, and if that difference is correlated with other factors related to labour market productivity a difference in the return to schooling may result. This problem is analogous to that of measuring the returns to schooling for immigrants. We note, though, that many off-reserve registered Indians never lived on a reserve, so that this effect may be diminished. Although one must take these results are hard to interpret because of these issues, they are nonetheless quite striking: for men, the off-reserve return to a year of high school is nearly triple the on-reserve return.

Turning to the identity groups (who are not registered under the Indian Act), we see that, at the Canada-wide level, the income returns to a year of high school education are quite high relative to the majority. For North American Indian and Métis women, the income returns are

not statistically distinguishable from that faced by majority women. For North American Indian and Métis men, the income returns to high school are (weakly) statistically significantly higher than those faced by majority men. For example, North American Indian identity men face a naive income return to a year of high school of 9.9% compared to only 6.8% for majority men.

In contrast, Inuit men and women have a statistically significantly lower income return to a year of high school than majority men. However, this may well be an artifact of the location (the North) of these individuals.

Turning to the ancestry groups (who report neither identity nor registered status), we see relatively high returns to schooling except for single-origin men. For single-origin Aboriginal men, the income return to high school is much lower than for majority men. However, for other single- and multiple-origin Aboriginal people, the income returns to high school are at least as high as for the majority.

Summing up our findings for the returns to high school, we have three main findings. First, whereas for most groups, the income returns to a year of high school is larger than the earnings return so that transfer system increases the incentive to educate, the income return is smaller than the earnings return for on-reserve registered Indian men. For this group, the transfer system may diminish the incentive to attend high school. Second, the income return to high school is much lower for on-reserve registered Indians than for majority men and women. Third, for other Aboriginal groups, the income returns to schooling are about as high as or even higher than for majority.

Consider now the returns to post-secondary years of schooling for those who have some university education, given in the rightmost columns of Table 4. Considering first the comparison of earnings and income returns for the majority, we see again that the income returns are larger than the earnings returns. This suggests that, for the majority, the joint effect of transfer, investment and other income is to increase the incentive to invest in post-secondary education. For both women and men, the income return to a year of post-secondary schooling is 0.7 percentage points larger than the earnings return. In contrast, for on-reserve registered Indian women and men, the income return is 0.1 percentage points lower and 0.3 percentage points higher, respectively, than the earnings return. In neither case is the income return statistically significantly higher than the earnings return. This suggests that the upward push on the incentive to educate delivered by the transfer system may be weaker for registered on-reserve Indians than for majority men and women.

Although the income return for post-secondary schooling is not much larger than (or even the same as) the earnings return for on-reserve Indians, their income returns are quite high in comparison with the majority. The income return to a year of post-secondary schooling is 5.5% for on-reserve registered Indian women in comparison to 3.5% for Majority women. The return is 4.9% for on-reserve men in comparison to 2.9% for Majority men. Thus, for on-reserve registered Indians, the return to post-secondary education is nearly double that for the majority. This finding contrasts sharply with what we saw for high school education, and is consistent with what Pendakur and Pendakur (2007) observed in their analysis of the conditional distribution of earnings of Aboriginal people: disparity is much more severe at the bottom of the distribution than at the top.

Turning to the results for off-reserve registered Indians, we see that for both men and women, the income returns are lower than for on-reserve registered Indians. For men, the income return for off-reserve Indians is 3.5% in comparison with 4.9% for on-reserve Indians, and this difference is statistically significant. However, we note that these lower returns are still higher than what we observe for majority men and women.

Considering the identity groups, we see a much different pattern. Rather than seeing comparatively high income returns to post-secondary schooling as we observe for registered Indians, people with Aboriginal identity tend to have income returns lower than, or similar to, the majority. The only exception to this pattern is Métis women, who have a statistically significantly higher return to post-secondary schooling than Majority women. North American Indian men, in contrast, have very low returns to post-secondary schooling: their income return is 0.7%, which is statistically significantly lower than the 2.9% observed for Majority men, and which is statistically indistinguishable from zero.

Finally, we consider the income returns to post-secondary schooling (with some university) for people with Aboriginal ancestry, but without Aboriginal identity or registry. Here, an interest pattern emerges. Single-origin Aboriginals have relatively high returns to post-secondary schooling, but multiple-origin Aboriginals do not. For example, single-origin Aboriginal women have an income return of 5.7%; more than double that of multiple-origin Aboriginal women.

The preceding discussion has examined the returns to years of schooling at the Canada-wide level. However, as noted above, many Aboriginal people live in remote areas of Canada where economic opportunities are quite limited relative to Canada's large cities. Although we

included dummies for city of residence in all Canada-wide regressions (one for residence in each of Canada's 11 largest CMAs and one for residence in smaller CMAs), one might argue that there is still considerable unobserved variation in economic prospects across place of residence. To better our understanding of Aboriginal returns to education, we examine these returns within cities for 7 large CMA: Montreal, Ottawa, Toronto, Winnipeg, Edmonton, Calgary and Vancouver. We present results for total income regressions for these cities in Table 6.

We note some distinguishing characteristics of these cities. First, Montreal did not have any participating reserves in the 2001 Census, so there are no results for on-reserve Indians in Montreal. Second, Ottawa has a large amount of federal employment where employment equity legislation may have a greater impact on outcomes for minorities (including Aboriginal workers). Third, Toronto is Canada's largest city. Fourth, Winnipeg, Edmonton and Calgary have Canada's large proportions of urban Aboriginal people. Fifth, Vancouver has a large number of urban reserves.

Consider first the results on total income for Montreal. Because there are relatively few Aboriginal people living in the Montreal CMA, the standard errors on these estimates are relatively large. However, we can still see that, for both men and women, the return to high school years is much larger for registered off-reserve Indians than for the majority population.

Turning to Ottawa-Hull, we see that among women, several Aboriginal groups have relatively high returns to years of high school and to years of post-secondary schooling. Most strikingly, registered off-reserve Indians have more than double the return to years of high-school education than majority women, and more than double the return to years of post-secondary education (with no university) than majority women. In addition, women with single-

origin Aboriginal ancestry have relatively high returns to university years of education. For men in Ottawa-Hull, we also see quite high returns to high-school and post-secondary schooling for many types of Aboriginals. These results are consistent with Employment Equity policy that actually improves the labour market outcomes of those who employable in government (that is, the educated).

Turning to Toronto, we see that although Toronto is a very large city, its Aboriginal population is too small to get much precision on the estimated returns to education. In Winnipeg, Aboriginal populations are a much larger fraction of the population, and we are able to distinguish some patterns. An interesting pattern here is that registered off-reserve Indian women have very low returns to high-school, but registered on-reserve Indian men do not seem to have low returns to either high-school or post-secondary education. In contrast, registered on-reserve Indian women do not have low returns to high school or post-secondary education, but registered on-reserve Indian men do have very low returns to high school.

The prairie cities of Calgary and Edmonton do not have large enough Aboriginal populations to learn much about the return to education in these cities. However, Vancouver's large number of urban reserves does allow us to examine the returns to on-reserve registered Indians with some precision. Here, we see that on-reserve registered Indian women do not seem to have low returns to any level of education. However, on-reserve registered Indian men have very low (essentially zero) returns to high school education (without completion).

Summarizing our results for specific cities, we reach several conclusions. First, examination of results for Ottawa-Hull suggests that the Employment Equity Act may have some positive effect on the return to schooling for Aboriginal people in this city. Second, the relative

size of the Aboriginal population in Winnipeg does not seem to uniformly improve outcomes for Aboriginal people in this city. Third, the results for Vancouver suggest that low returns to schooling for registered on-reserve Indians is not solely driven by the remoteness of reserves.

Conclusions:

Summing up our findings, we see three major patterns. First, the income returns for registered Indians are slightly higher than the earnings returns for the majority. This suggests that whereas for high school education, the transfer system may act to buffer the earnings impact of low schooling. For registered Indians with post-secondary education, it appears that returns to schooling are on generally on par with the majority and therefore the transfer system has less of an impact.

Second, the overall income returns for registered Indians are high relative to majority men and women – the value of a high school certificate for Aboriginal workers, is about the same as the value for majority workers, with some caveats: our results suggest that obtaining the certificate may be far more important for Aboriginal Canadians than it is for majority origin Canadians. It appears that in comparison to majority Canadians, Aboriginal Canadians who get partial credentials (for example some post-secondary or some university) get very little credit in the labour market. However, if a certificate is obtained, the proportional increase in earnings is about the same as is the case for the majority.

Third, it seems that Aboriginal people in all groups (with a few exceptions) do not face low returns to post-secondary schooling. However as pointed out before, the overall

earnings are substantially lower. This suggests that Aboriginals appear to face a penalty for being Aboriginal, which is often exacerbated by having low levels of schooling.

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