

# METROPOLIS BRITISH COLUMBIA

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# Aboriginal Income Disparity in Canada

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# **Metropolis British Columbia**

## ***Centre of Excellence for Research on Immigration and Diversity***

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### **ABORIGINAL INCOME DISPARITY IN CANADA**

**Krishna Pendakur and Ravi Pendakur**

#### ABSTRACT<sup>1</sup>

In this paper, we explore the disparity in income and earnings faced by Aboriginal people in Canada. Using the entire (confidential) database of the 2001 Census of Canada, we consider the economic outcomes of seven groups of Aboriginal people defined along their legal registry under the Indian Act, their self-reported identity, and their ethnic ancestry. We explore the following dimensions of economic disadvantage: (1) conditional mean disparity, the most common indicator in the literature on economic discrimination; (2) disparity in the income return to education; (3) disparity across the conditional distribution, to assess the importance of glass ceilings for these groups; and (4) disparity across cities, to illuminate the role of co-ethnic community size.

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## 1. INTRODUCTION

In Canada, Aboriginal people number approximately 1 million (Census of Canada 2001), or about 3 per cent of the population, and the federal government of Canada spends nearly 10 billion dollars per year on Aboriginal programs and affairs (Government of Canada 2007, p. 90). In spite of this, rates of social integration and economic success for Aboriginal people have generally been abysmal. Aboriginal policy consequently finds itself in the spotlight of public debates not only in Canada (e.g., Richards 2006) but also in the US (e.g., Jenkins 2007) and Australia (e.g., Tonkinson 2007).

While policy literature has been active, especially on education issues (e.g., Jenkins, 2007; Mendelson 2006; Walters et al 2004; Hull 2000), academic literature has also focused on issues such as fertility (e.g., Trovato 1987), and assimilation (e.g., Kuhn and Sweetman 2002). However, there has been little work assessing the labour market prospects and performance of Aboriginal people. This may at least be in part due to the small size of Aboriginal populations, which causes the Aboriginal counts on most publicly available micro-data sets to be challenging. (e.g.: Pendakur and Pendakur, 1998; Kuhn and Sweetman, 2002).

In this paper, we circumvent this problem by using the entire (confidential) main base of the 2001 Census of Canada, which includes records for roughly 20 per cent of all households. We are thus able to examine the labour market outcomes of Aboriginal people in Canada along several important dimensions. First, how do Aboriginal (Indian) legal registration, Aboriginal identity and Aboriginal ancestry play into patterns of earning disparity? Are these different types, or possibly degrees, of "Aboriginality" associated with different patterns

of economic disadvantage? Second, while we know that education levels for Aboriginal people are on average low, does schooling allow Aboriginal workers to overcome earnings disparity? Third, to what degree does earnings disparity change across the distribution? In particular, is disparity driven by a glass ceiling in the sense of poor access to the very top jobs? And finally, how does Aboriginal labour market disparity vary across urban labour markets? Does this variation correlate with the size of Aboriginal communities within cities?

We use regression methods applied to the labour market earnings and total incomes of Canadian-born workers. We run separate regressions for men and women, comparing Aboriginal to majority people in each case. Our linear regressions condition on typical labour market controls, including age, education and place of residence. Our exploration of glass ceilings uses analogous quantile regression methods.

We find that Aboriginal men and women face severe earnings disparity relative to majority persons with similar personal characteristics such as age and education. Further, we observe that within the Aboriginal population, registered Indians fare worst, persons with self-reported Aboriginal identity fare somewhat better, and persons with Aboriginal ancestry (but not identity or registry) fare better still. However, even those in the last category face disparity on par with the most disadvantaged non-Aboriginal ethnic minorities in Canada (see Pendakur and Pendakur 2002, 2007)

Although it is well documented that Aboriginal people have very poor educational outcomes, we find that even those who attain high levels of education still face substantial earnings disparity. Indeed, we see little evidence of economic integration even at the highest levels of schooling.

That labour market disparity is important even for Aboriginal people with high levels of education suggests that glass ceilings may be one driver of economic disparity. However, our investigation of glass ceilings belies this. In fact, we observe something more like a “sticky floor” (see Dolado and Llorens 2004), wherein the most severe disparity is actually at the bottom of the conditional earnings distribution, and disparity is smaller—though still present—at the top of the conditional earnings distribution.

Because our dataset is very large, we are able to consider economic disparity at the level of the local labour market. We observe a great deal of variation in measured Aboriginal earnings disparity across Canadian cities. Past research has suggested larger co-ethnic populations can reduce the level of disparity for group members (Pendakur and Pendakur 2002). In this work, however, we find that this is not the pattern for Aboriginal people—indeed, it seems that the greater the size of an urban Aboriginal community, the worse the economic outcomes for its members.

## 2. PREVIOUS WORK

In this paper, we use 2001 Canadian census data to study seven groupings of Aboriginal people defined by their registry under the Indian Act, their self-reported identity, and their self-reported ancestry. Thus, we jointly consider an external—or legal—definition, an internal—or identity-based—definition, and a definition based purely on ancestry. Previous research based on Census data has focused on a broad Aboriginal category that lumps all these groupings together (George and Kuhn 1994; Drost 1994; Pendakur and Pendakur 1998; Kuhn and Sweetman 1998, 2002). Most of these studies use 1991 Canada Census data, though Drost (1994) uses the 1986 Census PUMF and Mendelson (2004) and Pendakur and Pendakur (2007) use the 2001 Census. These pa-

pers together establish that the incomes of Aboriginal people in Canada are extremely low relative to those of non-Aboriginal population, but they do not address the question of how this disparity varies across the groups that constitute the Aboriginal population.

Other papers have used smaller data sources, which are even more severely hampered by the fact that Aboriginals constitute only a small part of the Canadian population. In particular, Patrinos and Sakellariou (1992) use 1986 Labour Market Activity Survey data to decompose wage differentials between Aboriginals and non-Aboriginals in the Canadian labour market, and Wannell and Caron (1994) use data from the 1992 National Graduates Survey to examine earnings of 1990 post-secondary graduates for Aboriginals, visible minorities and whites. Despite Aboriginals constituting less than 3 per cent of the relatively small samples at their disposal, these authors still found significant wage disparity between Aboriginal and non-Aboriginal workers.

Other authors examining this disparity have pointed to the importance of location and identity. George and Kuhn (1994) establish great labour market disparity between Aboriginal and non-Aboriginal workers. Kuhn and Sweetman (1998) evaluate whether Aboriginal identity matters in the context of disparity and find that those persons with the “deepest” Aboriginal identity fare the worst in the labour market. Drost and Richards (2003) examine Aboriginal income and show that on-reserve Aboriginals fare poorly in comparison to their on-reserve counterparts. Through the current study, we are able to add to these findings and to demonstrate that these patterns have persisted into the new millennium.

Regression-based studies, such as Kuhn and Sweetman (1998) and Pendakur and Pendakur (2007), control for level of schooling. However, few

studies have looked explicitly at the link between schooling and incomes for Aboriginals in Canada. Notable exceptions include Jenkins (2007), Mendelson (2006), and Hull (2000), which used census tables to look at the link between income 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. (p. 39)

Hull (2000) found that registered Indians and those claiming Aboriginal identity faced far higher levels of unemployment than majority people.. He also established that the employment rates of registered Indians show stronger improvement than those of non-registered Aboriginal people as education levels rise. These papers provide a detailed picture of the relationship between schooling and average earnings in any given age-sex Aboriginal cohort. However, because they use exclusively tabular methods, they don't control for many variables. Our work extends this research on income and education for Aboriginal people by using regression methods to assess similar questions.

A few recent studies have focused on differences in minority earnings outcomes across the conditional distribution (see, for example, Pendakur and Pendakur 2007; Dolado and Llorens 2004). These papers have asked whether glass ceilings are at work in determining the wages of minorities. In this paper, we extend that line of research to illuminate the conditional income distribution of our seven groups of Aboriginal people.

Very little research has focused on how Aboriginal labour market attainment varies across urban labour markets. To our knowledge, only Pendakur and Pendakur (2002) studied this, but that work used older data and aggregated our seven groups into one category. In sum, our current work extends previous study in this area in the following important dimensions: we consider

three different types of “Aboriginality” (registry, identity and ancestry); we estimate income-education profiles for these groups; we consider disparity across the conditional distribution; and, we assess how disparity varies across cities.

### 3. 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.<sup>1</sup> From this master data file, 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 whom are Aboriginal.

We explore two aspects of income disparity. First we use OLS regressions to measure the difference in the conditional mean of log-earnings and log-total-income between Aboriginal and non-Aboriginal workers for Canada as a whole. Earnings regressions use the log of total earnings from wages and salaries as the dependent variable, and include only those people who work for someone else and whose primary source of earnings is from wages and salaries. Total income regressions use the log of total income from all sources as the dependent variable, and include everyone with positive incomes from any source, including wages and salaries as well as self-employment, investment and government transfer income. Earnings and income are reported for the previous year, which is 2000 for the 2001 Census year.

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<sup>1</sup> In 2001, a total of thirty Indian reserves and Indian settlements were incompletely enumerated by the census. The populations of these communities are not included in the census counts (Statistics Canada - Cat. No. 97F0011XCB2001001).

Earnings regressions are comparable with previous research in the literature (e.g., Pendakur and Pendakur 1998, 2002, 2007) and allow the researcher to focus on possible labour market discrimination (which cannot easily be seen in transfer payments and self-employment income). Total income regressions are particularly interesting in the examination of the returns to education because education decisions depend on the total return to education, rather than just the returns flowing through wages and salaries.

Our regressions control for a variety of personal characteristics. These are: age (eight categories); marital status (five categories); number of household members; knowledge of English and/or French (three categories); twelve area-of-residence categories (ten Census Metropolitan Areas or CMAs, a small CMA identifier and a non-CMA identifier); thirty-one non-Aboriginal ethnic origin controls; and, finally, seven categories of Aboriginal people defined on registry, identity and ethnic origin (detailed below). Regressions controlling for these personal characteristics can be thought of as comparing the earnings of Aboriginal and non-Aboriginal persons with similar skill and background sets.<sup>2</sup>

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 (Table 4). 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 thirteen categories

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<sup>2</sup> One may worry that leaving out job characteristics gives a slanted picture of income disparity. In the Appendix, we include regressions that control for a variety of work (job) characteristics. Regressions labeled "work" include all personal characteristics plus full time-part time status (two categories), weeks of work (eleven categories), occupation (ten categories) and industry (twenty categories). Coefficients from these regressions compare the earnings of Aboriginal and non-Aboriginal persons sharing both skill sets and job characteristics. In addition, as noted in Pendakur and Woodcock (2008), the difference in the coefficients between regressions controlling for personal characteristics and controlling for both personal and work coefficients may be understood as the coefficient in an (artificial) regression of the dollar-value of work characteristics on personal characteristics and ethnic origin.

of highest-level-of-schooling. We chose these categories to ensure comparability with previous work in the area (see Pendakur and Pendakur 2002, 2007). When education is used as a regressor-of-interest, we use twenty-two 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 investigation of Aboriginal income and earnings disparity focuses on seven categories of Aboriginal people differentiated along legal, identity and ancestry dimensions. The legal dimension is that of registry under the Indian act; the identity dimension is illuminated by self-reported identity; and the ancestry dimension is illuminated by self-reported ethno-cultural ancestry. We use two categories of self-reported Registered Indian status derived 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 that 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:

1. North American Indian (including multiple responses, i.e. ticks);
2. Métis;
3. 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 up to six responses to this question. We use the first two responses to identify people who reported:

1. Single Aboriginal ancestry but not Aboriginal identity;
2. Multiple origin Aboriginal ancestry (for example Aboriginal origin and British origin) but not Aboriginal identity.

Our categorisation of Aboriginal peoples allows us to differentiate those classified as Aboriginal for policy and program purposes (*registry*) from those who self-identify as Aboriginal people (*identity*) from those who neither register nor self-identify (*ancestry*). Registry under the Indian Act is associated with considerable policy and program attention. Persons with Aboriginal identity (but not registry) 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.

#### 4. RESULTS

Table 1 shows schooling and earnings data for Aboriginal and majority persons.<sup>3</sup> Results from the table show two important differences between majority and Aboriginal groups. First, on average, the Aboriginal population

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<sup>3</sup> 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).

TABLE 1 - HIGHEST LEVEL OF SCHOOLING, MAJORITY AND SELECTED ABORIGINAL GROUPS, CANADA 2001.

		REG. (ON- AND OFF- MAJORITY	RESERVE)	NAI	METIS	INUIT	ABORIG. ANCESTRY (SINGLE ORIGIN)	ABORIG. ANCESTRY (MULTIPLE ORIGIN)
Schooling								
Female	Total	108,263	3,435	652	1,498	241	369	3,074
	Less than Grade 5	0.01	0.04	0.02	0.01	0.09	0.01	0.00
	Grades 5 to 8	0.05	0.11	0.07	0.06	0.17	0.08	0.03
	Grades 9 to 13	0.17	0.24	0.25	0.25	0.19	0.30	0.16
	Secondary - high school	0.18	0.08	0.12	0.10	0.05	0.17	0.15
	Trades certificate	0.03	0.03	0.04	0.03	0.05	0.03	0.03
	College: Without trades cert.	0.06	0.10	0.09	0.09	0.14	0.07	0.08
	College: With trades cert.	0.06	0.07	0.07	0.10	0.05	0.08	0.08
	College: With college	0.17	0.13	0.15	0.17	0.15	0.11	0.21
	University: Without cert.	0.02	0.06	0.04	0.03	0.02	0.03	0.04
	University: With univ.	0.07	0.07	0.07	0.06	0.06	0.07	0.09
	University: With bach.	0.11	0.05	0.06	0.07	0.03	0.04	0.10
	University: With certificate	0.02	0.01	0.00	0.01	-	0.01	0.02
	University: With mast.	0.02	0.01	0.02	0.01	-	0.00	0.02
	Index of dissimilarity		0.23	0.16	0.16	0.30	0.19	0.11
Males	Total	107,398	2,975	661	1,562	231	407	2,615
	Less than Grade 5	0.01	0.04	0.02	0.02	0.06	0.01	0.01
	Grades 5 to 8	0.06	0.13	0.09	0.08	0.18	0.12	0.05
	Grades 9 to 13	0.19	0.27	0.29	0.27	0.21	0.29	0.20
	Secondary - high school	0.15	0.08	0.11	0.10	0.04	0.11	0.11
	Trades certificate	0.06	0.07	0.06	0.06	0.07	0.07	0.06
	College: Without trade cert.	0.06	0.10	0.08	0.07	0.16	0.07	0.09
	College: With trades cert.	0.10	0.11	0.12	0.16	0.14	0.10	0.13
	College: With college	0.12	0.08	0.10	0.10	0.10	0.09	0.14
	University: Without cert.	0.03	0.04	0.03	0.04	0.00	0.05	0.04
	University: With univ.	0.06	0.05	0.04	0.05	0.01	0.03	0.06
	University: With bach.	0.11	0.03	0.04	0.04	0.01	0.03	0.08
	University: With cert.	0.02	0.00	0.00	0.01	0.01	0.00	0.01
	University: With mast.	0.03	0.00	0.01	0.01	-	0.00	0.02
	Index of dissimilarity		0.24	0.18	0.18	0.34	0.21	0.11
Income								
females	log of wages and salaries	9.89	9.38	9.72	9.59	9.70	9.68	9.73
	log of total income	9.72	9.24	9.49	9.51	9.61	9.50	9.67
males	log of wages and salaries	10.39	9.66	10.03	10.04	9.73	10.12	10.28
	log of total income	10.28	9.46	9.74	9.91	9.69	9.88	10.18

Source: drawn from 2001 census public use microdata individual file

is not as well educated. We see that 39 per cent of registered females and 44 per cent of registered males do not have a high school certificate (almost double the rate for majority Canadians). While about 15 per cent of the majority population has a university degree, this is true for less than 10 per cent of females, and less than 5 per cent of males, who self-identify as Aboriginal. The index of dissimilarity between the registered Indian and majority population is 24 per cent for women and 23 per cent 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.<sup>4</sup>

The bottom half of Table 1 shows the log of earnings from wages and salaries and the log of total income from all sources for men and women by majority and Aboriginal group status. For small differences (e.g., less than 0.10), the differences between the two figures can be interpreted as proportionate differences in average earnings. For example, the average of log total income for majority women is 9.72. For women with multiple-origin Aboriginal ancestry, it is 9.67, suggesting that they earn about 5 per cent less than majority women (9.67-9.72=-0.05). We see for both women and men, all Aboriginal groups have lower earnings and income than majority people. In our regression analysis, we will see that this is true even when controlling for important characteristics like age and education. This implies that Aboriginal people are

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4 . 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 per cent difference between two groups . It is calculated as follows:

$$D = \frac{1}{2} \sum_{i=1}^N \left| \frac{r_i}{R} - \frac{m_i}{M} \right|,$$

where  $r_i$  =the number of people in group 1 (in this case the Aboriginal population) with a particular characteristic (i.e. a high school certificate),  $R$ =the number of people in group 1,  $m_i$ =the number of people in the comparison group (in this case the majority) with the same characteristic, and  $M$ =the total number of people in the majority category.

poorer than can be explained by their low education levels and relative youth compared to the majority population.

It is typical to interpret coefficients in log-dependent variable regressions as above. However, for larger differences, this approximation does not work as well. For example, the average of log total income is 10.28 and 9.46 for majority and registered Indian men, respectively, yielding a difference in the logs of  $(9.46-10.28) = -0.82$ . This might suggest that registered Indian men have 82 per cent lower income than majority men (i.e., they yield only 18 per cent the income of majority men). However, the *proportionate difference* in total income, which corresponds with this difference in log income, is in fact  $\exp(9.46)/\exp(10.28)-1 = -0.56$ , indicating that registered Indian men in fact have incomes about 56 per cent lower than majority men. Thus, when we report regression results, we also report the proportionate difference in income or earnings associated with the estimates.

#### 4.1 *Total Income and Earnings Disparity*

To begin our investigation of income and earnings disparity, we first present overall earnings and income gaps by regressing the log of income or earnings on personal characteristics and group status. Income regressions use the entire population of either men or women reporting positive income from any source. Earnings regressions use only those men or women who report positive earnings from wages and salaries. The coefficients on group membership may be taken as indicators of overall earnings and income disparity under the restriction that the returns to education (and all other characteristics) are the same for all groups (a restriction we relax in Table 3). We report coefficients, standard errors and estimated proportionate differences (defined as  $\exp(b)-1$ , where  $b$  is the estimated coefficient). We do not report t-statistics or p-values

for significance tests for two reasons: first, virtually everything is statistically significant; and second, they add unnecessary clutter since these objects are easily computed from the information in the tables.

For Table 2, 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.

TABLE 2 - SELECTED RESULTS FROM REGRESSIONS CONTROLLING FOR PERSONAL CHARACTERISTICS.

REGION		FEMALES				MALES			
		COEF.	S.E.	SIG.	% DIF	COEF.	S.E.	SIG.	% DIF
Canada	Adj. R2	0.13				0.17			
	Reg. on reserve	-0.22	0.01	***	-0.19	-0.70	0.01	***	-0.50
	Reg. off reserve	-0.29	0.01	***	-0.25	-0.42	0.01	***	-0.34
	N. Amer. Indian	-0.19	0.02	***	-0.17	-0.31	0.02	***	-0.27
	Metis	-0.17	0.01	***	-0.16	-0.24	0.01	***	-0.22
	Inuit	0.05	0.02	***	0.05	-0.46	0.01	***	-0.37
	Aboriginal Ancestry (single origin)	-0.12	0.02	***	-0.11	-0.16	0.02	***	-0.15
	Aboriginal Ancestry (multiple origin)	-0.11	0.01	***	-0.11	-0.11	0.01	***	-0.10

Source: Custom microdata file for individuals, 2001 Census of Canada, population age 25-64 not in school full time. Individuals whose primary source of income is wages and salaries.

Significance: \*: 0.1 level; \*\*: 0.05 level; \*\*\*: 0.01 level

We see three related patterns in Table 2. First, with one exception,<sup>5</sup> we find that regardless of type of income, sex or Aboriginal group, the differential between majority and Aboriginal Canadians is always negative and statistically significant at conventional levels. The degree of disparity is very large. The estimated proportionate gaps are on the order of 10 to 20 per cent for

<sup>5</sup> That exception is Inuit women. Compared to majority origin women, Inuit women have total incomes of about 27% more than majority women. We find throughout this work that the Inuit face quite different patterns.

women and 20 to 50 per cent for men. To get a sense of context, the comparable earnings disparity faced by non-Aboriginal ethnic minorities in Canada is 0 to 10 per cent for women and 0 to 20 per cent for men (Pendakur and Pendakur 2007). Thus, Aboriginal groups are easily the most disadvantaged ethnic groupings in Canada.

Second, we see a rank-ordering in the income and earnings attainment of our various categories of Aboriginal people. For both men and women, registered Indians face the greatest disparity. For women, considering either income or earnings, registered Indians face disparity of over 20 per cent; while for men, disparity is over 30 per cent. For registered men, disparity is greater on-reserve, where registered men have incomes approximately half those of majority men. For women, however, disparity is greater off-reserve. These findings add nuance to Drost and Richards' (2003) finding that although incomes are very low for urban Aboriginal people, incomes for those on-reserve—most of whom live outside of cities—are even lower. We corroborate this finding for registered Indian men but find the opposite for registered Indian women (who perform slightly better on- than off-reserve).

One might argue that registry, and especially on-reserve registry, is correlated with remoteness of residence, concluding that the extreme disparity observed for registered Indians is really due to the isolation of many reserves. However, when we run regressions by city, so that we are considering exclusively urban Aboriginals (some of whom live on urban reserves), a similar pattern of disparity emerges. Thus, although remoteness exacerbates the income disparity faced by registered Indians, it does not explain it.

Those with self-reported Aboriginal identity (but not legal registry under the Indian Act) form the next most disadvantaged group of Aboriginal people.

Here, we see disparity on the order of 10 to 20 per cent and 20 to 40 per cent for women and men, respectively. For both women and men, persons reporting North American Indian identity have lower earnings and income than persons reporting Métis identity. Inuit are an outlier in this investigation. For women, Inuit have *higher* incomes and earnings than majority people, whereas for men, Inuit have much lower incomes and earnings than majority people. We do not have an explanation for this pattern, but we do note that the Inuit live mainly in the far north of Canada in very small communities, and so face quite different labour market conditions than do other Aboriginal people.

The least disadvantaged group of Aboriginal people is that comprised of people who report Aboriginal ancestry but who neither report registry under the Indian Act nor self-identify as Aboriginal. However, this group still faces disparity of approximately 10 per cent for women and 10 to 20 per cent for men. This degree of disparity is on par with the income disparity faced by the most disadvantaged non-Aboriginal ethnic groups in Canada. Pendakur and Pendakur (2007) report comparable numbers for a variety of Canadian-born ethnic minority groups, finding, for example, that Canadian-born South Asian and Black men both face earnings disparity of 16 per cent while Canadian-born South Asian and Black women face earnings disparity of 6 per cent and 12 per cent, respectively. From a comparison of these findings, it appears that even a little “Aboriginality” is associated with very poor labour market outcomes.

The third pattern we observe in Table 2 is that total income disparity is similar to earnings disparity. Some of the public debate in Canada has focused on the fact that registered Indians have access (in principle) to a large set of public transfer programs. Thus, earnings disparity may overstate the true economic disparity faced by this group. However, we see in Table 2 that proportionate income and earnings disparity are both 50 per cent for registered

on-reserve men, and are 21 and 19 per cent, respectively, for registered on-reserve women. We do not see much difference between disparity measured on earnings versus income, and so conclude that public transfers are not substantially mitigating the disadvantage that we observe.

#### 4.2 *Income, Earnings and Education Levels*

Table 2 shows the average differentials in either total income or earnings faced by different groups of Aboriginal men and women as compared to men and women of British origin, controlling for schooling and other characteristics. However, the return to schooling might be different for Aboriginal versus non-Aboriginal people for at least two reasons. First, it is well known (and shown in Table 1) that Aboriginal people have lower education levels. This could be connected to low returns to education, in comparison with the returns to education for majority people. Second, because transfer programs focus on registered Indian Aboriginals and because such transfers typically have higher incidence for poorer persons, the total income return (including transfer income) could potentially be lower for Aboriginal than for majority people.

Alternatively, one might expect that because Aboriginal people are the target of federal and provincial government preferential hiring programs, the extreme disparity observed on average for Aboriginal people would be less severe for those Aboriginals with high levels of education. In this case, the total income return to education would be higher than for majority people. In this section, we examine the income-schooling profiles (or, equivalently, naïve returns to education) for our seven groups of Aboriginal people.

Figures 1 and 2 show selected estimated coefficients from regressions done on men and women in each of our seven groups of interest, as well as majority men and women. The coefficients are those for values of highest

level of schooling ranging from grade 6 to an earned graduate degree, with high school diploma normalized to equal zero (we don't report estimates for less than grade 6). The slope of each line in this figure gives the return to schooling for a particular group. In all figures, the thick black line gives the return to schooling for majority people.

Although there is a lot of noise in the estimates, these graphs illustrate that the income-education profiles for Aboriginal people are in large measure very similar to those for majority people. There are a few exceptions. Registered on-reserve women seem to have slightly higher returns than majority women do at high levels of post-secondary schooling but lower returns at lower levels of post-secondary schooling. Registered on-reserve men show a similar pattern but for this group, the return to years of high school education seems lower than that of majority men. That returns are low for men and women who are registered under the Indian Act, and thus eligible in principle for large social transfers, suggests that transfers may play a role in reducing the return to education. However, that this reduction in the return to education is only observed for on-reserve (and not off-reserve) registered Indians leaves this explanation wanting.

The main message conveyed by these figures is that, with the exception of registered on-reserve Aboriginals, even Aboriginal people with relatively high levels of education still face great income disparity. In addition, the fact that the slopes of the income education profiles are very similar for Aboriginal and majority people suggests that low returns to schooling may not best explain the low educational attainment of Aboriginal people.

FIGURE 1 - TOTAL INCOME PAYOFFS TO DIFFERENT LEVELS OF SCHOOLING , MAJORITY AND ABORIGINAL IDENTITY GROUPS, MALES

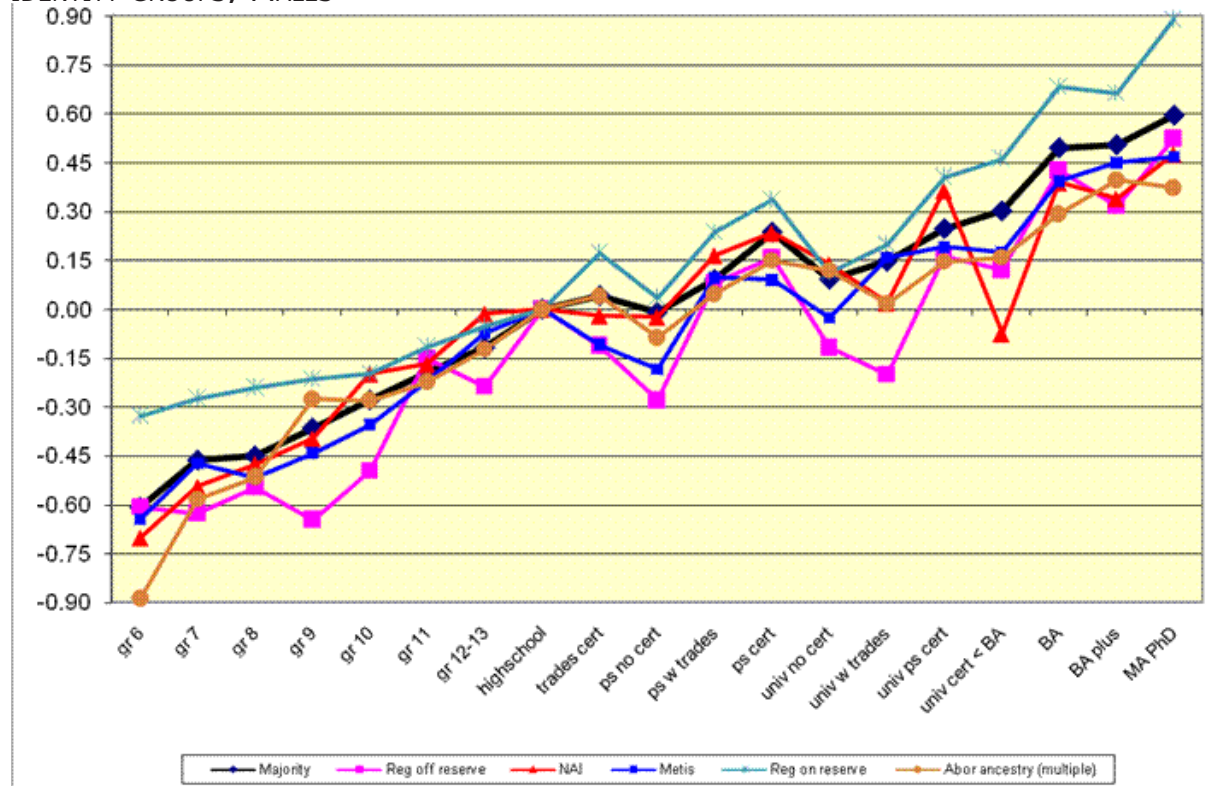
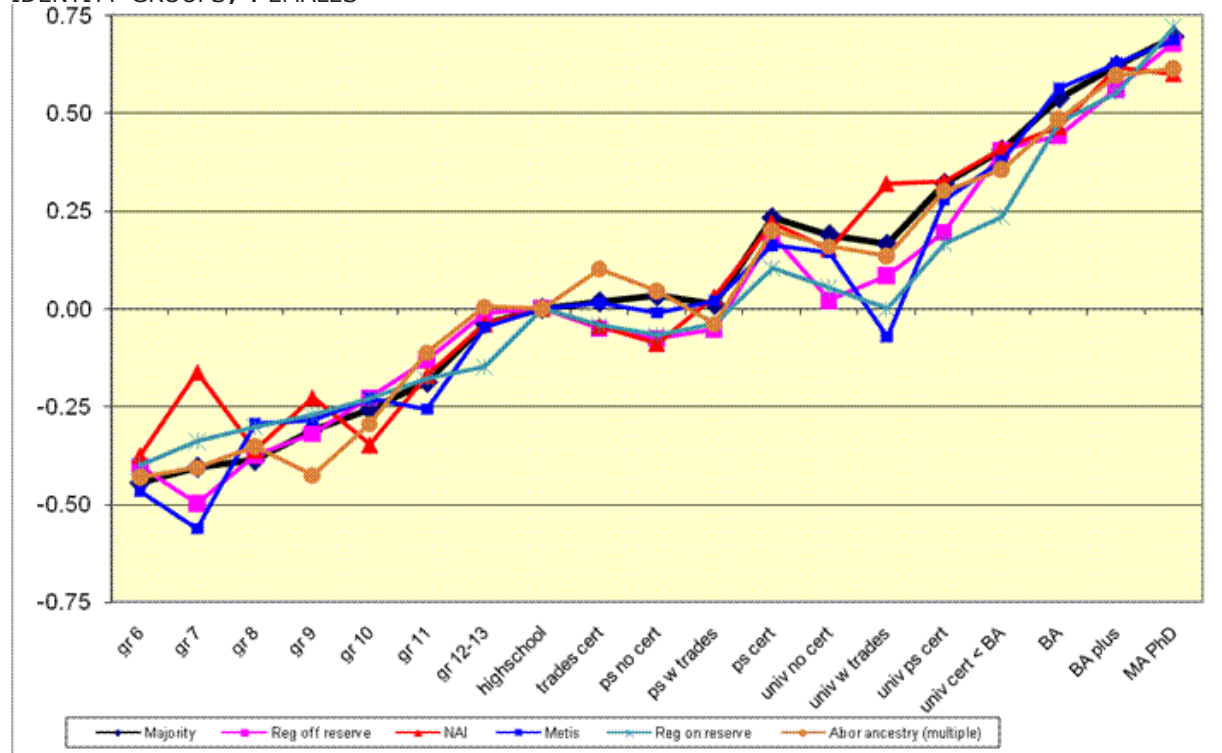


FIGURE 2: TOTAL INCOME PAYOFFS TO DIFFERENT LEVELS OF SCHOOLING , MAJORITY AND ABORIGINAL IDENTITY GROUPS, FEMALES



Closer inspection of the income-earnings profiles suggests that “sheepskin effects” might be comparatively important for some groups of Aboriginal men. Consider registered Indian men living on reserve. High-school dropouts (who never earn their diploma) face log-income gaps relative to high school completion of 0.65 and 0.50 for grade 9 and grade 10, respectively. In contrast, for majority men, these gaps are 0.37 and 0.28. Thus, the naïve returns to high-school completion—that is, getting a sheepskin in the form of a high-school certificate—are much higher for on-reserve registered Indian men than for majority men. Another interesting example is the difference between postsecondary education with no certificate versus postsecondary education with a trades certificate. Here, majority men gain 0.10 log-income points but registered on-reserve men gain 0.20 log-income points. This again points to a large sheepskin effect for this group.

The key message from our examination of income-education profiles is that, given the enormous size of Aboriginal income disparity, the small differences between the income-education profiles of Aboriginal and majority people are not sufficient to undo that overall disparity. Thus, even highly educated Aboriginal people face substantial income disparity.

#### *4.3 Earnings Disparity across the Conditional Distribution*

Our work so far has looked at the degree to which there are differences in the conditional mean of earnings for Aboriginal compared to majority workers. Here, we will focus on the degree to which there are differences in the conditional quantiles of earnings, for example, differences in the top decile of earnings conditional on personal characteristics. Pendakur and Pendakur (2007) and Albrecht et al. (2003) examine the conditional quantiles of labour market outcomes to assess the relevance of glass ceilings to minority workers and

to women, respectively. These papers investigate whether or not disparity is greater at the top of the distribution than at the bottom, taking such a pattern to indicate the presence of a “glass ceiling.” As we detail below, we find that Aboriginal workers exhibit the opposite pattern, termed a “sticky floor” in the literature on conditional wage distributions (e.g., Dolado and Llorens 2004). We use quantile regression to estimate the conditional  $p$ 'th quantile of log earnings attributable to Aboriginal group membership conditional on observable characteristics (see Buchinsky 1998 for a review of these methods in an economics context). For any given set of right-hand side conditioning variables,  $X$ , and left-hand side response variable,  $Y$ , the quantile regression finds parameters to fit the model:

$$P[Y \leq X\beta_p] = p .$$

When  $p=0.50$ , this corresponds to median regression, whose parameters can be found by minimizing the sum of absolute deviations of  $Y$  from the regression line. When  $p$  corresponds to a different quantile, the spirit of the optimization is to minimize asymmetrically weighted functions of absolute deviations. Because quantile regression can be computationally expensive with large samples, we use 20 per cent of majority workers and 100 per cent of minority workers in all reported estimates. However, because the variance of estimated differentials between groups depends most strongly on highest variance component, sampling majority workers does not much increase the variance of our coefficients of interest.

Table 3 shows estimated earnings differentials, asymptotic standard errors and proportional differences, controlling for personal characteristics, at the 20th, 50th, 80th and 90th percentiles. These regressions are estimated for workers whose major source of income is wages and salaries and who have

positive earnings. In most cases, we find that the disparity faced by Aboriginal workers is greatest at the bottom quintile of the conditional distribution and smallest at the top quintile and decile of the conditional distribution. This means that the mean regression may be somewhat misleading: disparity at the mean is much smaller in many cases than disparity at the bottom.

**TABLE 3 - SELECTED COEFFICIENTS FROM QUANTILE REGRESSIONS AT THE 20TH, 50TH, 80TH AND 90TH QUANTILES.**

		20TH QUANTILE			50TH QUANTILE			80TH QUANTILE			90TH QUANTILE		
	GROUP	COEF.	S.E.	% DIF	COEF.	S.E.	% DIF	COEF.	S.E.	% DIF	COEF.	S.E.	% DIF
Females	R2	0.07			0.10			0.12			0.12		
	Reg. on reserve	-0.44	0.02	-0.36	-0.19	0.01	-0.17	-0.17	0.00	-0.15	-0.17	0.00	-0.15
	Reg. off reserve	-0.56	0.02	-0.43	-0.20	0.01	-0.18	-0.09	0.01	-0.09	-0.07	0.01	-0.07
	N. Amer Indian	-0.31	0.04	-0.27	-0.15	0.01	-0.14	-0.09	0.01	-0.08	-0.08	0.01	-0.08
	Metis	-0.31	0.03	-0.27	-0.16	0.01	-0.15	-0.09	0.01	-0.09	-0.06	0.01	-0.06
	Inuit	-0.38	0.04	-0.31	0.04	0.02	0.04	0.21	0.01	0.24	0.27	0.01	0.30
	Abor. Ancestry (single origin)	0.00	0.11	0.00	0.00	0.04	0.00	0.00	0.02	0.00	0.01	0.01	0.01
	Abor. Ancestry (multiple origin)	-0.16	0.03	-0.15	-0.09	0.01	-0.08	-0.05	0.01	-0.05	-0.05	0.01	-0.05
Males	R2	0.12			0.12			0.12			0.13		
	Reg. on reserve	-1.01	0.01	-0.64	-0.63	0.01	-0.47	-0.46	0.00	-0.37	-0.41	0.01	-0.33
	Reg. off reserve	-0.70	0.04	-0.50	-0.28	0.01	-0.25	-0.14	0.01	-0.13	-0.11	0.01	-0.11
	N. Amer Indian	-0.48	0.04	-0.38	-0.22	0.02	-0.20	-0.13	0.01	-0.12	-0.12	0.01	-0.11
	Metis	-0.40	0.02	-0.33	-0.17	0.01	-0.16	-0.10	0.01	-0.09	-0.06	0.01	-0.06
	Inuit	-0.91	0.03	-0.60	-0.36	0.02	-0.30	-0.13	0.01	-0.13	-0.09	0.01	-0.09
	Abor. Ancestry (single origin)	-0.19	0.03	-0.18	-0.08	0.01	-0.08	-0.03	0.01	-0.03	-0.02	0.02	-0.02
	Abor. Ancestry (multiple origin)	-0.13	0.02	-0.12	-0.07	0.01	-0.07	-0.04	0.01	-0.04	-0.05	0.01	-0.05

For women at the bottom quintile of conditional earnings, the estimated disparity ranges from no disparity for those reporting single-origin Aboriginal ancestry to 36 per cent for registered women living off-reserve. In contrast, at the top decile of conditional earnings, the estimated disparity ranges from no disparity for women reporting single-origin ancestry to 15 per cent for registered women living on-reserve. An interesting outlier here is Inuit women,

who face great disparity at the bottom of the distribution but nearly as great advantage at the top.

For men at the bottom quintile, the estimated proportionate differences range from 18 and 12 per cent for men reporting single- and multiple-origin Aboriginal ancestry, respectively, to 64 per cent for registered men living on-reserve. At the top decile, the estimated proportionate differences range from 2 and 5 per cent for people with Aboriginal ancestry to 33 per cent for registered men living on-reserve. Thus, taking men and women in all seven groups together, we see that the disparity at the bottom is two to three times as severe as that at the top of the conditional distribution.

One may read these results in terms of the within-group inequality of members of these Aboriginal groups. When disparity at the bottom is larger than that at the top, the distribution of earnings for the Aboriginal group is stretched and pushed towards low earnings compared with the distribution of earnings in the majority population. This is broadly consistent with findings on Aboriginal inequality in Richards and Vining (2004). They find (without conditioning on characteristics) that incomes are low, but inequality high, for Aboriginal people. The combined view from our OLS and quantile regressions shows the same picture, even as we condition out observable characteristics.

As noted above, the pattern we see, where disparity is greatest at the bottom of the conditional distribution, has been called a "sticky floor" by Dolado and Llorens (2004) among others. They interpret this pattern in terms of differential labour market attachment at the bottom and top of the conditional distribution: That is, workers at the bottom of the conditional distribution have weak labour force attachment and low earnings for that reason.

We see an alternative explanation in our context. In Canada, Aboriginal people are an explicit target group for preferential government employment via the Employment Equity Act (1988, 1998). If government employers seek out Aboriginal workers, they may “cream” the distribution for those with highly productive unobserved characteristics and offer them highly paid government jobs. In this case, disparity would be diminished, but only at the top of the conditional distribution. However, if this were a primary driver of sticky floors, we would also expect government employers to cream the distribution based on observed characteristics, such as education. But, as discussed above, there is little evidence that Aboriginal income disparity is much smaller for highly educated Aboriginal workers.

#### *4.4 Patterns Across Cities*

In this subsection, we examine Aboriginal earnings disparity in twelve urban labour markets. There are two important reasons to consider urban Aboriginal people in a city-specific way. First, from the material above, it is clear that registered Indians living on-reserve face the most severe earnings and income disparity. However, since most reserves are very remote from cities and their associated economic activity, one might argue that this disparity is really about location. In this subsection, we show that this is not the case: on-reserve registered Indians living in large cities face severe economic disparity. Second, Aboriginal people are distributed quite unevenly across Canadian cities. Other research on the economic outcomes of the ethnic minorities in Canada has shown that ethnic minority people perform better in cities with large numbers of co-ethnic residents (Pendakur and Pendakur 2002) . This suggests a favourable enclave effect, wherein large urban ethnic

enclaves improve the outcomes of their members. In this subsection, we show that this is not the case for Aboriginal people; indeed, Aboriginal people living in cities with large numbers of Aboriginals tend to fare particularly poorly.

Table 4 presents selected coefficients from regressions like those for earnings in Table 2, but run separately in each of twelve Canadian cities. We report coefficients for four of our Aboriginal groups: registered Indians living on- and off-reserve and the North American Indian and Métis identity groups. We do not report results for Inuit, since they do not live in great numbers in the southern cities, nor do we report results for people with Aboriginal ancestry (but not registry or identity). The top panel shows earnings disparity for registered Indians living on-reserve in cities. All these estimates are significantly negative or insignificantly different from zero. The estimated earnings differential ranges from insignificantly different from zero to 78 per cent for women in Saskatoon and Halifax, respectively. For men, the estimated earnings differentials range from insignificantly different from zero to 72 per cent in Halifax and Calgary, respectively.

Empty cells in Table 4 indicate cities with no reserves. However, even some cities with reserves have very few reserve residents. Even considering only those western cities where there are enough on-reserve people to get tight standard errors, that is, Calgary to Victoria, disparity ranges from 21 to 62 per cent for women and 52 to 72 per cent for men. Thus, neither statistical imprecision nor remoteness is the sole driver of the extremely severe earnings disparity we observe for registered Indians living on-reserve. Aboriginals are not spread evenly across Canadian cities. If we aggregate all the Aboriginals types, they constitute at least 1 per cent of the population in all of the twelve cities we examine. In Montreal, Toronto, Hamilton and Vancouver, a group

TABLE 4: EARNINGS DISPARITY IN URBAN LABOUR MARKETS

VARIABLE	REGION	WOMEN			MEN		
		COEF.	S.E.	% DIF.	COEF.	S.E.	% DIF.
Reg. on reserve	Halifax	-1.53	0.41	-0.78	-0.36	0.40	-0.30
	Montreal						
	Ottawa-Hull						
	Toronto	-0.60	0.16	-0.45	-0.40	0.15	-0.33
	Hamilton						
	Winnipeg	-0.42	0.13	-0.34	-0.76	0.11	-0.53
	Regina						
	Saskatoon	0.20	0.22	0.23	-0.76	0.20	-0.53
	Calgary	-0.51	0.10	-0.40	-1.26	0.09	-0.72
	Edmonton	-0.23	0.06	-0.21	-0.89	0.05	-0.59
	Vancouver	-0.50	0.06	-0.39	-0.74	0.05	-0.52
Victoria	-0.97	0.09	-0.62	-1.15	0.09	-0.68	
Reg. off reserve	Halifax	-0.20	0.15	-0.19	-0.47	0.15	-0.38
	Montreal	-0.22	0.08	-0.20	-0.26	0.07	-0.23
	Ottawa-Hull	0.03	0.07	0.04	-0.29	0.06	-0.25
	Toronto	-0.26	0.05	-0.23	-0.19	0.05	-0.18
	Hamilton	-0.15	0.09	-0.14	-0.21	0.08	-0.19
	Winnipeg	-0.48	0.05	-0.38	-0.64	0.04	-0.47
	Regina	-0.58	0.08	-0.44	-0.76	0.08	-0.53
	Saskatoon	-0.58	0.09	-0.44	-1.00	0.08	-0.63
	Calgary	-0.40	0.06	-0.33	-0.43	0.06	-0.35
	Edmonton	-0.30	0.05	-0.26	-0.48	0.05	-0.38
	Vancouver	-0.51	0.04	-0.40	-0.52	0.04	-0.40
Victoria	-0.38	0.12	-0.32	-0.43	0.11	-0.35	
N. Amer. Indian	Halifax	-0.09	0.18	-0.09	-0.21	0.14	-0.19
	Montreal	-0.15	0.10	-0.14	-0.24	0.10	-0.21
	Ottawa-Hull	-0.11	0.08	-0.10	-0.17	0.08	-0.16
	Toronto	-0.27	0.06	-0.24	-0.18	0.06	-0.17
	Hamilton	-0.04	0.14	-0.04	-0.20	0.09	-0.18
	Winnipeg	-0.31	0.10	-0.27	-0.55	0.08	-0.42
	Regina	0.00	0.25	0.00	-0.12	0.25	-0.11
	Saskatoon	-0.31	0.24	-0.26	-0.68	0.19	-0.49
	Calgary	-0.44	0.10	-0.36	-0.30	0.08	-0.26
	Edmonton	-0.34	0.11	-0.29	-0.25	0.08	-0.22
	Vancouver	-0.29	0.07	-0.25	-0.46	0.06	-0.37
Victoria	-0.30	0.14	-0.26	-0.19	0.14	-0.17	
Métis	Halifax	-0.68	0.18	-0.49	-0.23	0.16	-0.21
	Montreal	-0.32	0.11	-0.28	-0.34	0.09	-0.29
	Ottawa-Hull	-0.10	0.08	-0.14	-0.25	0.07	-0.32
	Toronto	-0.16	0.08	-0.14	-0.25	0.07	-0.22
	Hamilton	-0.050	0.17	-0.40	-0.01	0.15	-0.01
	Winnipeg	-0.14	0.04	-0.13	-0.30	0.03	-0.26
	Regina	-0.17	0.08	-0.16	-0.33	0.08	-0.24
	Saskatoon	0.01	0.08	0.01	-0.27	0.07	-0.24
	Calgary	-0.26	0.06	-0.23	-0.14	0.05	-0.13
	Edmonton	-0.18	0.05	-0.17	-0.21	0.04	-0.19
	Vancouver	-0.09	0.05	-0.09	-0.32	0.05	-0.27
Victoria	-0.14	0.11	-0.13	-0.20	0.11	-0.18	

Source: Custom microdata file for individuals, 2001 Census of Canada, population age 25-64 not in school full time. Individuals whose primary source of income is wages and salaries

† Reserves close to Montreal did not take part in the 2001 Census.

†† There are no Indian reserves in these Census Metropolitan Areas

that includes Canada's largest three cities, Aboriginals form relatively small fractions of the population, constituting 1.51 per cent, 1.00 per cent, 2.12 per cent and 2.72 per cent, respectively. Aboriginal people make up 3 to 5 per cent of the population in Halifax, Ottawa, Calgary and Victoria and more than 5 per cent in Winnipeg, Saskatoon, Regina and Edmonton. The highest concentration is found in Winnipeg, where more than 11 per cent of the residents are Aboriginal.

Looking first at registered Indians living off-reserve, we see that for both men and women, the estimated disparity is highest in the prairie cities of Winnipeg, Regina and Saskatoon, which have very large Aboriginal populations. Turning to the identity groups, we see that North American Indian and Métis follow a roughly similar pattern.

Whereas other research in Canada has found that ethnic minorities have better economic performance in the presence of large numbers of co-ethnics, we do not see such a pattern for any group of Aboriginal people. In fact, what we see suggests the opposite. In Winnipeg, where Aboriginals constitute more than 11 per cent of the population, Aboriginal disparity is amongst the most severe of any of the twelve cities studied. However, in Toronto, where Aboriginals make up only 1 per cent of the population, Aboriginal disparity is amongst the least severe of the twelve cities studied.

## 5. CONCLUSION

We find that Aboriginal men and women face severe earnings and income disparity relative to majority persons in Canada. Further, within the Aboriginal population, registered Indians fare worst, persons with self-reported Aboriginal identity fare somewhat better, and persons with Aboriginal ancestry

fare better still. However, even those in the last category face disparity on par with the most disadvantaged non-Aboriginal ethnic minorities in Canada (see Pendakur and Pendakur 2002, 2007). We also find that the economic prospects of Aboriginal people living in cities with large Aboriginal populations are worse still. That is, the beneficial enclave effects noted for other ethnic groups in Canada's cities do not seem to apply to Aboriginal people and may even work to their harm.

Our analysis of the returns to education and of disparity across the conditional distribution is similarly depressing. We find little evidence of high returns to education for Aboriginal people in any of our groups. Although Aboriginal incomes do rise with increased education, this finding suggests that even those Aboriginal people with high levels of education face considerable economic disparity. We also find little to support the view that Aboriginal workers face a glass ceiling. Since the main antidiscrimination policy tool in Canada is a preferential hiring policy for government employers, the lack of a glass ceiling suggests that this type of policy might not be very effective in dealing with Aboriginal disparity. Indeed, the sticky floor pattern we observe suggests that policy attention is most needed at the bottom of the conditional distribution, a place where government employers seldom shop for employees.

Aboriginal people have nearly twice the fertility of non-Aboriginal people in Canada and higher fertility than all other non-immigrant ethnic communities (Trovato 2004). This in conjunction with our findings above suggests that Aboriginal groups are both the fastest growing and the poorest ethnic groups in Canada. As such, the disenfranchisement of Aboriginal people from Canadian society faces considerable risk of growing over time.

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