

RETURNS OF EDUCATION AMONG NORTHWESTERN ONTARIO'S NATIVE PEOPLE

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Abstract / Resume

National data suggest that much of the wage gap between Aboriginal and non-Aboriginal people is related to educational levels. The authors examined data for Northwestern Ontario. They found that each year of primary or secondary education for Aboriginal people added an average of 7.8% to earnings. University education added even more, some 31.5%. This has obvious policy implications for governments.

Les données nationales suggèrent qu'une bonne partie de l'écart salarial entre les autochtones et les allochènes est liée aux niveaux d'éducation. Les auteurs ont examiné des données du nord-ouest de l'Ontario. Ils ont trouvé que les salaires des autochtones augmentaient de 7,8% en raison de chaque année d'étude primaire ou secondaire que ces autochtones ont terminée. Une éducation universitaire augmentait les salaires à 31,5%. Cela comporte d'évidentes implications politiques pour les gouvernements.

Introduction

It is known that Aboriginal people are economically disadvantaged compared to Canadians in general. They generally have lower levels of education, higher unemployment rates and lower average incomes than Canadians overall (McDonald, 1991). There have been a few studies of the causes of high unemployment rates and low incomes among the Aboriginal population of Canada. Using data from the 1986 Census, George and Kuhn (1993; 1994) examined the employment and wage gap between Aboriginal and non-Aboriginal people in Canada. They found that about 50% of the overall Native/non-Native wage gap in Canada can be explained by differences in education, language, and region. Using data from the 1986 Labour Market Activity Survey, Banerjee, Alam and De Civita (1991) found that, on average, Aboriginal people earned about 26% less than non-Aboriginal individuals. Their regression analysis revealed that about 58% of the wage gap is explained by differences in experience, education and unionization. They also found that an additional year of education results in a 10% increase in the earnings of Aboriginal people as compared to a 7.5% increase in the earnings of non-Aboriginal people. Finally, using regression analysis and employing data from the 1986 Labour Market Activity Survey, Patrinos and Sekellariou (1992) found that about 41% of the wage differential between Aboriginal and non-Aboriginal people can be explained in terms of personal endowments such as educational and occupational attainments and labour force experience.

The above studies deal with the overall labour market characteristics of Native people in Canada. However, given the non-uniformity of labour markets and the diversity of economic bases in different regions of Canada, there would be great value in undertaking such studies at the regional level. Unfortunately, the lack of information on labour market characteristics of Aboriginal people at the regional level presents a major obstacle to carrying out such an analysis. This explains the absence of any study on this subject for Northwestern Ontario. The objective of the present study is to bridge this gap by examining the effect of various labour market characteristics on the earnings of the Aboriginal population in Northwestern Ontario using information obtained from a recent survey which we conducted (Jankowski and Moazzami, 1994). Our main emphasis here is on the effect of different levels of education on the earnings of Native people in Northwestern Ontario. The rest of the paper is organized as follows. Section II discusses the general characteristics of the individuals in our survey. Section III presents the model and the results of our regression analysis. Finally, we present a brief summary and a look at some policy implications in section IV.

Characteristics of Northwestern Ontario's Aboriginal Population

In the summer of 1993, we surveyed 784 people with Aboriginal origins in Northwestern Ontario. The geographic region covered by our survey includes Upsala, Thunder Bay, Armstrong, Marathon, and Geraldton. About 30% of our sample were on-Reserve Status Indians, 57.4% were off- Reserve Status Indians, 4.8% were non-Status Indians, 7.5% were Métis and the rest, or 0.1%, were simply classified as Status Indians without reference to their legal residence as either on- or off-Reserve.

Table 1 presents the age and sex distribution of the surveyed population. We can observe that the surveyed sample not only represents both sexes approximately equally, but also represents different age categories.

**Table 1: Age Category By Sex
Native Population of Northwestern Ontario**

Age Category	Male	%	Female	%	Total	%
15-19 years	85	22.14	67	16.75	152	19.39
20-24 years	80	20.83	77	19.25	157	20.03
25-34 years	81	21.09	102	25.5	183	23.34
35-44 years	83	21.61	89	22.25	172	21.94
45-54 years	38	9.90	51	12.75	89	11.35
55-60 years	17	4.43	14	3.5	31	3.95
TOTAL	384	100.00	400	100.00	784	100.00

Table 2 presents the income distribution of the surveyed population by sex. We have to note that the figures in Table 2 represent income from all sources and not just from employment alone. We can observe that the distribution of income for males and females is approximately symmetric around the \$10,000 to \$14,999 income category. We can also see that about 43% of the Native population have annual incomes of less than \$10,000. Our survey revealed that the average annual income of Native males was equal to \$14,933. Native females had an average annual income of about \$12,431. The overall average income was \$13,663. Note that the average income of the employed population was significantly higher than that of the overall population. Our survey revealed that, on average, full-

**Table 2: Income Distribution by Sex
Overall Population**

Income Category	Male	%	Female	%	Total	%
No income	12	5.05	20	3.13	32	4.10
Under \$1,000	36	11.62	46	9.38	82	10.51
\$ 1,000 - 2,999	17	4.04	16	4.43	33	4.23
\$ 3,000 - 4,999	17	6.06	24	4.43	41	5.26
\$ 5,000 - 6,999	26	5.81	23	6.77	49	6.28
\$ 7,000 - 9,999	46	13.64	54	11.98	100	12.82
\$10,000 - 14,999	75	23.74	94	19.53	169	21.67
\$15,000 - 19,999	43	11.87	47	11.20	90	11.54
\$20,000 - 24,999	47	7.32	29	12.24	76	9.74
\$25,000 - 29,999	21	3.03	12	5.47	33	4.23
\$30,000 - 34,999	19	4.04	16	4.95	35	4.49
\$35,000 and over	25	3.79	15	6.51	40	5.13
Total	384	100.00	396	100.00	780	100.00

NOTE: Four respondents did not complete the income question and thus are not included in this Table.

time male and female workers earned about \$22,491.50 and \$21,058.30 per year, respectively. The overall average annual income of those with full-time employment was \$21,834.

Table 3 presents the employment status of the surveyed population. We can observe that, overall, about 38% of the surveyed population were engaged in paid employment, 4% were self-employed and about 58% were unemployed. Of those who were not unemployed, 30% worked full-time (more than 30 hours per week), 24% had permanent jobs (without a specified term limit) and 25% worked off-Reserve. Table 3 also shows that the percentages of employed, including those with full-time employment, were higher among the male population.

Table 4 presents the educational profiles of both the overall population and those who had full-time employment. We can observe that about 63% of the population surveyed had received up to a Grade 10 education. In contrast, among those who had full-time employment, 39% had up to grade 10 education. The percentage of those who had a university education was 4% among the general population and 7% among those who had full-time employment. The percentage of individuals with a community college education was about 14% among the general population and 21% among those with full-time employment.

Table 3: Employment Status

Employment Status	Male	%	Female	%	Total	%
Employed	148	39.05	145	36.62	293	37.81
Self-Employed	18	4.75	14	3.54	32	4.13
Full-Time	128	33.77	107	27.02	235	30.32
Permanent						
Employment	87	22.96	96	24.24	183	23.61
Off-Reserve						
Employment	102	26.91	95	23.99	197	25.42
Unemployed	213	56.20	237	59.85	450	58.06
Total	379	100.00	396	100.00	775	100.00

Table 4: Educational Profiles

Highest Level of Education	Total Population	%	Full-Time Employment%	
No Education	4	0.51	0	0.00
Grade 1	2	0.26	0	0.00
Grade 2	4	0.51	1	0.47
Grade 3	14	1.79	0	0.00
Grade 4	9	1.15	1	0.47
Grade 5	10	1.28	1	0.47
Grade 6	22	2.81	4	1.88
Grade 7	14	1.79	1	0.47
Grade 8	93	11.88	15	7.04
Grade 9	116	14.81	23	10.80
Grade 10	204	26.05	38	17.84
Grade 11	114	14.56	22	10.33
Grade 12	154	19.67	40	18.78
Grade 13	23	2.94	7	3.29
University	34	4.34	14	6.57
Community College	107	13.67	44	20.66
Trade School	11	1.40	2	0.94
Total	783	100.00	213	100.00

Model Specification and Estimation

Our primary objective is to examine the effect of the level of educational attainment on the earnings of Aboriginal people in Northwestern Ontario. In addition, we would like to examine the effect of other labour market characteristics such as experience, sex, location of residency and permanent or temporary nature of employment on the level of earnings. In general, the relationship between earnings and observed characteristics may be specified in the following form:

$$E_i = X_i \beta + \varepsilon_i \quad (1)$$

where E_i denotes the earnings of individual i measured in thousands of dollars, X_i is a vector of characteristics for the i th individual, β is a vector of coefficients, and ε_i is an error term. The X variables are specified as:

$$X = (\text{Ed, University, College, Trade, Sex, Permanent, On-Reserve, T.Bay, Age})$$

where Ed represents years of schooling and takes the values of one to thirteen. University, College and Trade represent possession of university, college or trade certificates or degrees. These variables take the value of one if the individual in the survey possesses the corresponding degree or certificate and zero otherwise. Sex takes the value of one if the individual is female and zero if the individual is male. Permanent takes the value of unity if the individual in the survey has a permanent job and zero elsewhere. On-Reserve takes the value of unity if the individual works on-Reserve and zero elsewhere. Thunder Bay variable is included to capture the effect of working in Thunder Bay as compared to other areas in Northwestern Ontario on earnings. This variable takes the value of one if the individual works in Thunder Bay and zero elsewhere. Finally, age is used as a proxy for experience.

Education and experience variables can be regarded as productivity-generating characteristics. The other variables capture the presence or absence of differential payments due to sex, location of work or the permanent or temporary nature of employment.

Note that total annual earnings can vary due to differences in the number of hours worked and/or wages per hour. As mentioned above, we are interested in explaining the variation in earnings that are caused by individual characteristics and not by the number of hours of work. Therefore, we restrict our analysis to full-time, full year workers. Note that the two individuals with trade certificates and full-time employment did not work full-

year. Therefore, that variable was omitted from our regression analysis.

Table 5 presents the result of applying the Ordinary Least Squares method to equation 1.

To ensure that the results are reliable for making statistical inference,

Table 5: Estimation Results of Earnings Equation

Explanatory Variables	Coefficients	T-Statistics
Constant	-7.16	1.02
Ed1	1.70	3.19*
University	6.88	1.99*
College	1.73	0.74
Female	-6.67	3.55*
On Reserve	-1.07	0.56
Permanent	2.40	0.96
Thunder Bay	-0.24	0.11
Age	0.51	4.77*
R ²	0.22	

* Significantly different from zero at 5% level.

we subjected the estimated equation to a series of diagnostic tests. The presence of heteroskedasticity was tested using the test procedure suggested by Goldfeld and Quandt (1965). No heteroskedasticity was found. We also examined the possible presence of multicollinearity by examining the variance covariance matrix of the explanatory variables. We did not find any high correlation among the explanatory variables. Having ensured that the results are statistically reliable, we can now turn to the discussion of the results shown in Table 5.

Table 5 shows that education, sex and age coefficients are statistically significant and have the expected signs. Concentrating on the education variables, we observe that the coefficient of the primary and secondary variable is positive and statistically significant at the 5% level. The numerical value of this coefficient is 1.70, suggesting that the return of each additional year of schooling has been about \$1.7 thousand in annual earnings. Given the average annual income of \$21,834, this implies an increase in earnings of about 7.8% due to an additional year of schooling. The university coefficient is also positive and statistically significant. It shows that return to university education has been very high. In other

words, given all other characteristics, those individuals in our sample who possessed a university degree earned an average of \$6.88 thousand more than those who did not have a university education. Expressed in another way, a university education results in an average increase of about 31.5% in annual earnings. The coefficient of college has the expected sign, but is statistically insignificant. This implies that our data do not support the presence of differential earnings due to college education. The sex variable is negative and is highly significant. It suggests that, given all other characteristics, women in our sample earned an average of \$6.67 thousand a year less than their male counterparts. The on-Reserve variable has a negative coefficient but is statistically insignificant, suggesting that there are no differential earnings related to working on or off Reserves. The coefficient of the permanent variable is positive but insignificant, implying that the permanent or temporary nature of the employment does not seem to be related to differential earnings. The Thunder Bay variable has a negative and insignificant sign. This implies that being employed in Thunder Bay as compared to other places in Northwestern Ontario does not result in any significant change in earnings. Finally, the age variable, which is used as a proxy for experience, is positive and highly significant. This suggests that, on average, each year of experience adds about \$0.51 thousands to earnings.

Conclusion and Policy Implications

This study examined whether there exists a statistically significant return to productivity-generating factors such as education and experience among the Aboriginal population of Northwestern Ontario. We found that higher levels of education and experience are associated with higher levels of earnings for the region's Aboriginal population. Specifically, we found that each additional year of primary or secondary education adds an average of about 7.8% to earnings. Moreover, university education causes earnings to increase by about 31.5%. This finding that higher education results in a significant increase in income for the region's Aboriginal population warrants serious attention and has major implications for government funding of training and higher education in Northwestern Ontario. As we noted in a previous paper (Jankowski and Moazzami, 1994), the unemployment rate among the Aboriginal population of Northwestern Ontario is about 40%, which is significantly above the provincial and national levels. We pointed out that about 80% of the Aboriginal population 15 years of age and over has less than or equal to a Grade 11 education. We also showed that some 40 to 50% of the Aboriginal population between

the ages of 15 and 24 receive social assistance, including direct welfare payments. On the basis of this data we can now safely argue that if the returns from education, in terms of income, are very high for the Aboriginal population, then expenditures on training and higher education can, in the long-term, replace many social assistance payments, including direct welfare.

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