

Patterns of Employment, Unemployment and Poverty

(Part Two):

A Comparative Analysis of Several Aspects of the Employment Experience of Aboriginal and
Non-Aboriginal Canadians Using 1991 Census Public Use Microdata

Final Report

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Executive Summary

Canada's native population is economically disadvantaged by all of the standard measures. In this study we document the continued existence of considerable differences in the labour force participation rates and wages of Aboriginal and non-Aboriginal Canadians using Statistics Canada's recently-released 1991 Census Public Use Microdata File (PUMF). Overall, we find that native Canadians are less likely to be employed, more likely to be unemployed, less likely to work full-time full-year (FTFY) and more likely to earn lower wages than non-Aboriginal Canadians. We also attempt, at least in part, to explain the origins of these differentials. Our analyses are conducted separately by sex, and according to three Aboriginal origin categories: individuals with exclusively Aboriginal origins ("single Aboriginal origins"); largely combined Aboriginal and other origins ("multiple origins"); and non-Aboriginal Canadians. The Northern Territories and Indian reserves are studied separately as well.

Gaps in the labour market outcomes for Aboriginals relative to non-Aboriginals are particularly large for those who report single Aboriginal origins; for those who live on reserves; for those who live in the Territories; and for men. Single and multiple origin Aboriginal males not living on reserves or in the Territories are, respectively, 26% and 5% less likely to be employed, 11% and 3% more likely to be unemployed, and 28% and 10% less likely to work FTFY than the non-Aboriginal group. Further, conditional on working FTFY, their earnings are 22% and 8% less than non-Aboriginal males. For females the same gaps are somewhat smaller. They are 25% and 2% less likely to be employed, 5% and 2% more likely to be unemployed and

16% and 5% less likely to work FTFY than non-Aboriginal females. Their comparable wage gaps are 13% and 3%.

While in all cases some of these differences can be attributed to the lower education levels, younger ages, and different geographic distribution of Canada's Aboriginal population, in no case can the entire gap be thus explained. A maximum of about 50% of the male, and 60% of the female participation gaps, and 50% of the male and 90% of the female earnings gaps, can be explained by the characteristics measured in the Census. This leaves statistical room for labour market discrimination, cultural differences and factors that were not measured to play a role. As well, while in all cases but one (for the wage rates of single-origin Aboriginal males living on reserves) there appear to be substantial returns to education for natives, differences in education explain a maximum of 25% of the earnings gap for men, and 50% for women. If the goal of policy is to eliminate these gaps within a fairly limited time horizon, then increasing the educational attainment of natives, especially program completion rates, will be important. Other policy instruments will, however, likely also be needed. Examples might include improving the quality of education received by Aboriginals, promoting changes in the subjects studied, employment promotion on reserves, easier mobility off reserves, job market counselling and search assistance, and specific vocational training. In urban areas, policies designed to reduce long run welfare dependency, for example earnings supplement programs like the Self Sufficiency Project (SSP) currently under trial in New Brunswick and British Columbia, might also prove valuable. While we do not study the effectiveness of such policies here, our analysis does suggest that such alternative policies need to be explored and evaluated.

A dramatic increase in the number of individuals living off reserves who report Aboriginal origins occurred during the five-year interval between the 1986 and 1991 censuses. Any comparisons of Aboriginal labour force behaviour between these two years must therefore

be interpreted very cautiously. Bearing this in mind, we note that the prevalence of FTFY work increased among Canadians identifying themselves as Aboriginals between 1986 and 1991. Noting however that similar increases in FTFY work also occurred for non-Aboriginals over this period, and that some of the increase in measured labour force attachment for Aboriginals may be the result of former non-Aboriginals relabelling themselves as Aboriginals in 1991, it would be premature to conclude from these statistics that the relative economic position of Canadian Aboriginals increased between 1985 and 1990. The wage gaps in the two years are almost identical.

Aboriginals living on reserves exhibit considerably less labour force activity than those living off reserves. Only about **13%** of Aboriginal men and women living on reserves worked FTFY in 1990, compared with 28% and 20% for off-reserve single origin Aboriginal men and women respectively. Also, in addition to carrying a penalty in terms of access to jobs, living on a reserve appears to carry a wage penalty with it as well: those few on-reserve Aboriginals who did work FTFY earned 20 to 25% less (before taxes) than single-origin, off-reserve Aboriginals. Neither the reserve-employment, nor the reserve-wage gap can be entirely accounted for by differences in the observed characteristics of individuals living on and off reserves.

Finally, living in the Yukon and Northwest Territories has opposite effects on the labour market attachment of Aboriginal and non-Aboriginal Canadians: living in the North raises the employment rates and reduces the unemployment and non-participation rates of non-Aboriginal men and women, while apparently reducing the employment rates and raising the unemployment and non-participation rates of Aboriginal Canadians. As a consequence, the gaps in all these outcomes between Aboriginals and non-Aboriginals are considerably greater in the North than in the rest of Canada. Further, because the wage premium for working in the North is smaller for Aboriginals than for non-Aboriginals, the Aboriginal wage gap is also higher in the Territories

than the rest of Canada. In contrast to the rest of Canada, however, wage and labour force participation gaps for Aboriginal women in the North are not smaller than men's. This is primarily a consequence of the fact that nonaboriginal women appear to earn exceptionally large premia for working in Canada's Territories, presenting a more difficult "target" for aboriginal women to match.

A COMPARATIVE ANALYSIS OF SEVERAL ASPECTS OF THE EMPLOYMENT EXPERIENCE OF ABORIGINAL AND NON-ABORIGINAL CANADIANS USING 1991 CENSUS PUBLIC USE MICRODATA

I. INTRODUCTION.

Are Canadians who report their ethnic origins as "Aboriginal" less likely to be employed, more likely to be unemployed, and less well paid when they work than non-Aboriginal Canadians? If so, by how much? And if so, how much of these differentials can be explained by readily observable differences between Aboriginal and other Canadians, such as their levels of education, age, and the regions they tend to reside in? How much is due to more elusive, hard-to-measure factors, including, perhaps, labour market discrimination?

The purpose of this study is to examine several important aspects of the employment experience of Aboriginal and non-Aboriginal Canadians. In particular, we analyze: (a) the differentials in labour market outcomes such as incomes, employment rates, and levels of unemployment between Aboriginal and non-Aboriginal persons, and the determinants of such outcomes; (b) the proportion of the differential in labour market outcomes that can be explained by differences in the observed characteristics of the two groups, and the unexplained residual; and (c) the economic returns to education. This report summarizes our findings concerning these issues from our analysis of Statistics Canada's recently-released 1991 Census Public Use Microdata File (PUMF).

Because of some important differences in wage structure on reserves and in the Territories, as well as some ongoing concerns about the representativeness of Census data for Indian reserves, the main but not exclusive focus of our analysis here is the largest group of Aboriginals in Canada:

those living off reserves and outside the Yukon and Northwest Territories. Our main findings for this group are as follows. First, there were indeed substantial gaps in the labour force activity of Aboriginal and non-Aboriginal Canadians in 1990 and 1991: Aboriginal Canadians were less likely to be employed, more likely to be unemployed, more likely to be out of the labour force, and had more intermittent work patterns than non-Aboriginal Canadians.

Second, the size of the above labour force activity gaps is strongly influenced by the degree of Aboriginal ethnic identification; indeed when the Aboriginal population is disaggregated into those who report **only** Aboriginal origins (the "single origins" group) and those who report other origins in addition to Aboriginal ones (e.g. Aboriginal and English; Aboriginal and Irish; the "multiple origins" group), it becomes clear that the larger gap is that of the single-origins group.

Third, the Aboriginal labour force activity gap also varies with the gender of the individuals concerned. Indeed, with the exception of the probability of being out of the labour force, this gap is somewhat smaller for women than men; this is particularly apparent for unemployment rates, which are lower for Aboriginal women than Aboriginal men.

Fourth, since the number of individuals living off reserves who report Aboriginal origins increased dramatically in the five-year interval between the 1986 and 1991 censuses, any comparisons of Aboriginal labour force behaviour between these two years must be interpreted very cautiously. Bearing this in mind, the one aspect of labour force activity for which there is comparable information in our paper using the 1986 Census (George and Kuhn, 1994) is the prevalence of full-time, full-year work. On this measure, the labour force attachment of Canadians identifying themselves as Aboriginals apparently increased from 1986 to 1991. Noting however that similar increases in full-time, full-year work also occurred for non-Aboriginals over this period, and that some of the increase in measured labour force attachment for Aboriginals may be the result of former non-Aboriginals relabelling themselves as Aboriginals in 1991, it would be premature to

conclude from these statistics that the relative economic position of Canadian Aboriginals increased between 1985 and 1990.

Fifth, only a fraction of the Aboriginal labour force attachment gap can be statistically attributed to differences in the readily observable characteristics of Canadian natives and non-natives, such as their age, education, languages spoken, and geographical distribution. Especially for men, this leaves a sizable unexplained residual, which may be due either to unmeasured, productivity-related characteristics of individuals (such as school performance, knowledge of the world of work, and previous work experience), or to discrimination in access to jobs.

Sixth, Aboriginal Canadians who do work full-time and full-year earn less for their efforts than non-Aboriginal Canadians who do the same. Overall, Aboriginal wages were 10.4 percent below those of non-Aboriginals in 1990, a gap which closely mirrors the 11.0 percent gap we found in 1985 (George and Kuhn, 1994). As in 1985, and as for the measures of labour force attachment considered above, this gap was considerably greater for those with exclusively Aboriginal origins than for those with mixed origins, and considerably smaller for women than men.

Seventh, at least for men, only a fraction of the Aboriginal wage gap in Canada can be explained by individual characteristics which are observed in the 1991 Census, leaving a potential explanatory role for labour market discrimination.

Turning now to Aboriginals living on reserves, our analysis in this report is confined to single-origin Aboriginals, since only a very small number of multiple-origin Aboriginals or non-Aboriginals live on reserves in Canada. For this group, we find that those living on reserves exhibit considerably less labour force activity than those living off reserves. Only about **12 percent** of Aboriginal men and women living on reserves worked full-year, full-time in 1990, compared with 28 and 20 percent for off-reserve men and women respectively. Also, in addition to carrying a penalty in terms of access to jobs, living on a reserve appears to carry a wage penalty

with it as well: those few on-reserve Aboriginals who did work full-time, full-year earned 20 to 25% less than single-origin, off-reserve Aboriginals. Neither the reserve-employment, nor the reserve-wage gap can be entirely accounted for by differences in the observed characteristics of individuals living on and off reserves.

Finally, with respect to the very distinct labour market of Canada's Territories (where almost 10% of Canada's off-reserve single-origin Aboriginals reside), our first result is that living in the Territories has opposite effects on the labour market attachment of Aboriginal and non-Aboriginal Canadians: living in the North raises the employment rates and reduces the unemployment and non-participation rates of non-Aboriginal men and women, while apparently reducing the employment rates and raising the unemployment and non-participation rates of Aboriginal Canadians. As a consequence, the gaps in all these outcomes between Aboriginals and non-Aboriginals is considerably greater in the North than in the rest of Canada. Second, both Aboriginal and non-Aboriginal employed Canadians appear to receive higher wages in the Territories than their counterparts elsewhere, but this northern "premium" is smaller for Aboriginals than for non-Aboriginals. As a consequence, the Aboriginal wage gap is higher in the Territories than the rest of Canada as well. Third, both in terms of their labour force activity and wages, non-Aboriginal women do exceptionally well in Canada's Territories, relative to men and to women in the South. As a consequence, our earlier finding that, relative to non-Aboriginals, Aboriginal women typically fare better than Aboriginal men does not carry over to Canada's Territories: here, the exceptionally good prospects for non-Aboriginal women present a higher target, which northern Aboriginal women find just as difficult to match as northern Aboriginal men.

Section II of this report presents a brief review of some recent contributions to the literature on differences in the employment experiences of Aboriginals and non-Aboriginals in Canada. Section III discusses the PUMF data, and describes the characteristics of the subsample used for analysis here. Section IV analyses patterns of Aboriginal employment and unemployment, relative

to non-Aboriginal Canadians, focusing on the largest group of Aboriginals in Canada: those living off reserves and outside the Yukon and Northwest Territories. Section V analyses the wage rates of this same group of Canadians. Section VI considers the effect of living on a reserve for the employment, unemployment and wages of Aboriginal Canadians; Section VII considers the distinctive patterns of these outcomes in Canada's two northern Territories. Section VIII, a summary, completes the report.

II. RECENT EMPIRICAL INVESTIGATIONS OF ABORIGINAL EXPERIENCE IN THE CANADIAN LABOUR MARKET.

The experiences of Aboriginals in the Canadian labour market have received increasing attention in recent years from policy makers, policy implementors, and professional economists. Much of this attention has been directed at the very high unemployment levels, lower labour force participation rates, and greater dependency on social assistance payments of Aboriginal Canadians. More recently, a number of economic studies have been completed which have been directed increasingly at understanding the economic and other processes underlying the labour market position of Aboriginals. In this section we offer brief summaries of the main findings of those studies, to help set the stage for the presentation of our results in succeeding sections.

i) Banerjee, Alam, and De Civita (1991)

In an unpublished paper, based on data from the 1986 Labour Market Activity Survey, the authors measure Aboriginal-non-Aboriginal earnings differentials and assess the influence of various socio-economic factors to explain the differentials.

Their regression results indicate that, on average, Aboriginals earned about 26% less than non-Aboriginals. Both the experience (defined as age - years of education - 6, which may not provide comparable measures for the two groups) and education variables are significant and positive, implying that higher wages, associated with marketable skills and knowledge and hence greater labour productivity, are related to greater experience and education. Overall, about 58% of the Aboriginal-non-Aboriginal wage gap is "explained" by differences in observed characteristics (e.g., experience, education, unionization), and the remaining 42% is "unexplained" and is accounted for by such factors as "barriers to entry, culture, remoteness, and racial discrimination."

They proceed to examine the impact of education more closely. An additional year of education leads to a 10% increase in earnings of Aboriginals, and to a 7.5% increase in the earnings of non-Aboriginals. If Aboriginals are assumed to have the same educational level as non-Aboriginals, the wage differential falls from 26% to 17%. A similar analysis lowers the differential from 26% to 22% when Aboriginals are assumed to have the same levels of experience as non-Aboriginals. When both education and experience are held equal, the wage gap falls to 12.5%.

While these appear to be interesting preliminary results, there are problems of interpretation in this study. The dependent variable is variously called "wages", "earnings", and "income", but is never defined. LMAS reports Total Annual Earnings from all jobs, and this is probably what the authors are examining. But it cannot be interpreted as wages, since it has two components -- hours worked and wages per hour. Is any measured "gap" in earnings a gap in "wages" or in "hours worked", or both? The solution is to use hourly wage data, or to restrict the analysis to full-time, full-year workers (as do George and Kuhn (1994); see below). Also, the LMAS is somewhat limiting as a data base, in that it does not distinguish between registered and non-registered Indians and it does not cover Indian reserves.

ii) Drost and Eryou (1991)

The authors examine the impacts of education and training on the employment experience of natives and non-natives, using data on the labour force status of trade/vocational school leavers two years after graduation (National Graduates Survey 1984) and of a random sample of the total Canadian population, 15-54 years of age (1986 Census). For the NGS sample, the unemployment rate for both natives and non-natives is higher than the national average rate for natives and non-natives aged 15-54 years, likely reflecting the relatively low educational attainment of the NGS sample. In May/June 1984, the unemployment rate for natives was higher by 6.7% than for non-natives (30.0% compared with 23.3%), but the differential falls as educational attainment level increases, to a low of 3.7% for vocational school graduates with some university education or a university degree (22.2% compared with 18.5%). This result may suggest a higher return to educational attainment for natives than for non-natives (see George and Kuhn (1994), below). The authors also report unemployment rates by field of vocational training, and speculate on the possible reasons for differential impacts on native and non-native persons in highly cyclical and seasonal industries characterized by low employment stability, and in local labour markets with limited absorptive capacity.

The regression results suggest that unemployment is more affected by the major field of study than the level of education, and that previous work experience has a positive impact on post-training employability, especially for native respondents. Also important is the finding that native graduates who have themselves financed their training programs have a lower chance of being unemployed, whereas the funding of training by the federal or provincial governments seems to have a strong disincentive effect on subsequent employment.

We turn now to Drost and Eryou's analysis of the 1986 Census sample. Not surprisingly, the labour force participation rate rises and the unemployment rate falls as educational attainment

level increases for both natives and non-natives. The lowest rates of unemployment for both natives and non-natives are for those with university degrees (9.1% and 6.3% respectively). Male natives had higher unemployment rate differentials relative to non-native males than did native females vis-à-vis non-native females, at all but one level of schooling. Again, the differential between natives and non-natives was smallest for those with university degrees. The regression results give powerful testimony to the positive impact of any post-secondary education or training on employment for native women, and of a university degree for native men, when compared with completing a secondary school graduation diploma.

Drost and Eryou alert us to the importance of studying men and women separately: they demonstrate that the impacts of educational attainment on unemployment are quite different for native men and women, especially for education beyond the secondary school level. Their similar findings for non-native men and women suggest that gender differences may not be entirely due to labour market conditions specific to native persons. Finally, Drost and Eryou recommend a review of the policy implications of sources of training funding and income for Aboriginal participation and success in the labour market, and consideration of the impacts of alternative institutional delivery mechanisms.

iii) Patrinos and Sekellariou (1992)

This recently published paper examines wage gaps between Indians and non-Indians using the 1986 Labour Market Activity Survey, as did Banerjee, Alam, and De Civita (1991). Again, the basic approach is to decompose the differences in wages into "explained" and "unexplained" components, the "explained" elements being identified with human capital endowments which enhance productivity and hence earning capacity, and the "unexplained" elements reflecting unobserved factors, including discrimination.

Patrinos and Sekellariou employ a standard methodology for decomposing the difference in wages into the "explained" and "unexplained" components. The sample characteristics of Indians and non-Indians are as expected. Indians, on average, earn less than non-Indians, and have a lesser endowment of the personal characteristics normally expected to influence employment earnings, including fewer years of schooling and experience. A higher proportion of Indians are in manual labour and are non-unionized, and a lower proportion in managerial and professional employment, than is true for non-Indians.

The earnings function results are very interesting. As the authors report, the average returns to years of schooling are higher for non-Indians than for Indians, as are the returns to labour market experience. As a result, non-Indians are found to have a distinct earnings advantage. (This result is actually mis-reported in Patrinos and Sekellariou, p.262.) Differential endowments of productive personal characteristics of individuals explain about 41% of the wage differential between Indians and non-Indians. The remaining 59% is "unexplained", and may be due to unobserved characteristics (e.g., ability, health, culture) and/or by discrimination.

The authors' conclusions are important for our present purposes. In terms of personal endowments, much of the earnings gap of Indians compared with non-Indians can be explained by Indians' disadvantageous educational attainment, younger average age, and occupational attainment. But the differences in education and age do not completely explain the earnings inequality; the "unexplained" component is very high in Canada among full-time male workers. The authors cite results for a similar United States study which finds only 10% of the earnings gap to be "unexplained". In other words, much of the earnings differential in the US would disappear if Indians' education and experience were brought up to the level of non-Indians. This suggests that "discrimination " accounts for very little of the differential in the US. In Canada, according to Patrinos and Sekellariou, almost 60% is "unexplained", and hence possibly accounted for by discrimination. They adduce lower quality of schooling at Indian schools on-reserve and cultural

differences leading to lesser attachment to the labour force, both of which cannot be modelled adequately, as likely causes of the size of the "unexplained" differential. Even after allowing for the endowment of Indians with the same productive characteristics as non-Indians, Indians are paid less in Canada.

The principal policy recommendation by the authors is that investment in education and training to increase human capital are important for Indians, because such productivity-enhancing characteristics are positively related to earned income. They also recommend affirmative action efforts to recruit Indians into high-wage, high-skill occupations, which will improve the returns to Indians for their acquisition of productivity-enhancing characteristics.

One of the limitations of this study is that it investigates only gross wages for males employed full-time. Moreover, the LMAS is limited to off-reserve status and non-status Indians, and excludes those on-reserve as well as Inuit and Métis. The Survey also excludes the Yukon and Northwest Territories. These deficiencies are satisfied in the George and Kuhn (1994) study.

iv) Drost (1994; forthcoming a; forthcoming b)

Helmar Drost has written a number of recent papers focused on the differential employment and unemployment experience of Aboriginals and non-Aboriginals. As with the George and Kuhn study (1994) of earnings differentials reported below, this work is also based on the 1986 Census Public Use Sample Tape.

Drost (1994) relies on a sample of 5,266 Aboriginals, who were reported as having ages 15-54 and participating in the labour force; males numbered 2,953 and females 2,313; 4,380 lived off-reserve and 886 on-reserve. He is particularly interested in the impact of various levels and types of education and training on the probability of unemployment for Aboriginals. He examines the experiences of males and females, and on-reserve and off-reserve populations separately, and

employs a number of personal attributes, regional location, transfer dependency and eight levels of educational attainment as explanatory variables, using the binomial logit model.

The 1986 Census indicates that Aboriginal Canadians had an unemployment rate almost 2.5 times the national average. For the sample population, unemployment rates are inversely related to educational attainment levels: the unemployment rate was 36% among Aboriginals with a less-than Grade 9 education, compared with approximately 18% for those with a secondary school diploma, trade certificate or college diploma, and some 9% for those holding a university degree.

There were some noticeable differences between males and females, and very large differences between on-reserve and off-reserve populations at various levels of educational attainment. In brief, older Aboriginals were less likely to be unemployed than youthful ones, women were slightly less likely to be unemployed (unless dependents were present), and married men were less likely to be unemployed than unmarried males. Regional differences mattered, especially for men, with Ontario being associated with a lower probability of unemployment. Completion of secondary school decreases the likelihood of unemployment, but further education, especially for men, does not seem to have much of an effect unless it leads to some participation in university-level work, preferably completion of a university degree. Finally, the variable reflecting social assistance dependency during the previous year is large and significant -- Drost reports that having received social assistance increases the probability of unemployment by 35% -- but its interpretation is not clear, as Drost himself seems to admit. In drawing policy recommendations from his analysis, Drost concludes that the "largest gains in lowering the unemployment probability of Aboriginals can be achieved by raising elementary and secondary school completion rates." (p. 59) It is unfortunate that Drost studied only five sub-samples (all, female, male, on-reserve, off-reserve), and did not explore male-female differences for the on-reserve and off-reserve groups, as did George and Kuhn (1994).

As for the other two papers, Drost (forthcoming a) again employs 1986 Census PUST data, here in order to address urban-dwelling non-Aboriginal and Aboriginal comparisons, with more detailed geographic, industry and occupation controls. All ethnic groups are shown to have become more urbanized, including Aboriginals, and within the urban context, all groups have become increasingly concentrated in large urban areas. Yet, of all groups, Aboriginals consistently have been the most rural, and given urbanization, have lived in smaller communities on average.

In Census Metropolitan Areas (CMAs), Aboriginals invariably have higher unemployment rates, averaging 17.2% (27.5% for single-origin and 13.1% for multiple-origin Aboriginals) compared with 8.3% for non-Aboriginals. Similar comparisons obtain for labour force participation and employment-population ratios. The Aboriginal and non-Aboriginal composition of the labour force is then examined for six occupational categories and six industry groups for each of the CMAs and overall. Finally, the logit results depict the estimated probabilities of unemployment for age, personal attributes, educational attainment, industry group and CMA. The most telling results are that Aboriginals have a much higher probability of unemployment in the West, particularly on the prairies, relative to non-Aboriginals. About 60-63% of the wage gap is "explained" in the logit, while 37-40% is not. Of the "explained" part, being younger, less educated, and living in a high unemployment region accounts for the bulk of the difference between Aboriginals and non-Aboriginals. The "unexplained" fraction is slightly smaller than that found for wages in George and Kuhn (1994).

Drost (forthcoming b) is again focused on the unemployment experience of Aboriginals, and emphasizes the differential experience of those reporting single- and multiple-ethnic origins. As with other studies, Drost finds that Aboriginals reporting single-ethnic origin are at a much greater disadvantage in the labour market relative to Aboriginals of multiple-ethnic origin, the latter apparently being more integrated into mainstream off-reserve labour markets, a finding which is robust for all age and educational groups. The logit estimates explain the probability of

unemployment for all, single-origin, and multiple-origin Aboriginals, and for non-Aboriginals. Single- and multiple-origins are found to be statistically significant, especially with respect to education and urban status. The multiple-origins group has a higher probability of employment with postsecondary education and with urban location than does the single-origins group.

In sum, Drost's three papers all employ data from the 1986 Census PUST to estimate a series of logit equations that explore the determinants of unemployment. The sample and techniques are essentially similar to those employed by George and Kuhn (1994) in their study of wage differentials.

v) George and Kuhn (1994)

As with the Patrinos and Sekellariou (1992) paper, we employ standard techniques in the earnings function literature to decompose wage differentials between Aboriginals and non-Aboriginals into their "explained" and "unexplained" components. The primary focus of our study is also natives living off-reserve and outside the Yukon and Northwest Territories, because there are some important differences in wage structure on reserves and in the Territories and because there are legitimate concerns about the representativeness of the on-reserve data owing to incomplete participation in the 1986 Census.

There the similarity ends, for we make use of Statistics Canada's Public Use Sample Tape from the 1986 Census, which allows for a much larger sample of natives than either the LMAS or NGS. (Using LMAS, Patrinos and Sekellariou (1992) have 359 natives in their data set; we have 5,832 natives of whom 1,535 are full-time, full-year workers off-reserve and in Canada outside of the Territories.) We also use two definitions of Aboriginality in our paper: the first, more inclusive definition, includes all respondents reporting any Aboriginal origins, possibly in combination with non-Aboriginal origins, where Aboriginal origins includes North American Indian, Métis and Inuit;

the second, more exclusive, definition includes those respondents reporting only Aboriginal origins.

Our results for off-reserve full-time, full-year workers living outside the Yukon and Northwest Territories can be summarized briefly. We find a relatively small raw wage differential between Aboriginal and white Canadians at 11%, which grows to 17.6% when the sample is restricted to persons with exclusively Aboriginal origins; by comparison, we find a raw wage gap of almost 35% between white men and women in our data set. Interestingly, the gap varies with gender and degree of Aboriginal self-identification: for women reporting any Aboriginal origins, the gap is only 6.5%, whereas the male gap is 11.6%; when restricted to persons reporting exclusively Aboriginal origins, the women's gap rises to 10.8% and the men's to 18.1%.

Differences in observable personal characteristics, such as education, language and region, are readily apparent. Natives are, on average, younger, more likely to live in the West, and less likely to live in Census Metropolitan Areas. Natives are less well educated than non-natives, but native women are considerably better educated than native men. Among non-natives, 24% of men and 23% of women have at least some university education; among Aboriginals, these numbers are 7% for men and a surprisingly high 17% for women. Natives also report less non-university training than non-natives.

Our wage regressions report some of the standard results common in the literature. For both non-Aboriginals and Aboriginals, wages rise with education and training. There are considerably greater returns to education for non-Aboriginal women than for men: while well-educated women still earn less than comparable men, they do much better relative to men than do less educated women. The returns to education for Aboriginal men are very similar to those for non-Aboriginal men, and there are very large returns to education for Aboriginal women, exceeding even those of non-Aboriginal women in the sample. Finally, there doesn't appear to be any clear regional pattern in the native-non-native wage gap.

In calculating the share of the overall native-non-native earnings gap that can be attributed to observable personal characteristics, we are able to explain about 50% of the overall Aboriginal-non-Aboriginal wage gap for those declaring exclusively Aboriginal origins, and about 20% to 40% of the gap between our broader definition of Aboriginals and non-Aboriginals. For this group, raising the education and training levels of natives to those of non-natives could eliminate about 30% of the wage gap for men and 40% for women, according to our estimates. The higher number for native women is due to a higher marginal return to education for native women than for native men in our sample. The remaining differences could also be due to differences in productivity-enhancing characteristics that are observed by employers but not measured in the Census, but given the number of documented cases of labour market discrimination seen in forums like the Canadian Human Rights Commission, it seems likely that discrimination plays some role here as well.¹ If so, our analysis suggests that labour market discrimination is stronger against native men than women.

We also study natives who live on-reserve and in the Yukon and Northwest Territories. Natives who live on-reserve earn considerably less than natives who live off-reserve. Men with exclusively Aboriginal origins earn 14% less on-reserve than off-reserve, while such women earn 9% less on-reserve than off-reserve. Lower wages on-reserve could be caused by a number of factors, including differences in the observed and/or unobserved qualifications of on-reserve natives, differences in the structure of earnings on-reserve and off-reserve, and differences in wages resulting from compensating differentials for the tax benefits of living and/or working on-reserve, or from a lower local demand for labour. Based on our estimates, unlike the case for off-reserve natives, there is a lack of any detectable return to education for people living on-reserve, whether male or female. This finding is consistent with differences in the structure of earnings and employment opportunities on-reserve and off-reserve, with relatively few full-time, full-year wage employment opportunities in the rather thin labour markets characteristic of most reserves and their

vicinities, especially in remote areas. In addition, there is the possibility of income-augmenting traditional activities for those living on-reserve, the results of which affect real income but do not usually enter into measured earnings differences.

Aboriginal-non-Aboriginal wage gaps are much larger in the Yukon and Northwest Territories than in other parts of Canada. For men with any Aboriginal origins, the gap rises from 11.6% in the rest of Canada to 16.1% in the Territories; for women, the gap increases from 6.5% in the rest of Canada to 29.2% in the Territories. This does not reflect lower wages for natives in the North than in the South; rather it results from a smaller wage premium for working in the North among natives than among non-natives. The raw data suggest that the northern premium is about 5% for natives of both sexes, about 11% for non-native males, and an astounding 39% for non-native females, which persists when all observable personal characteristics are controlled for. This might reflect differences in real costs of living for natives and non-natives in the North, and the distinct possibility that natives are deriving real income supplements to wage earnings from their unmeasured economic activities on the land (eg., hunting, trapping, fishing, fowling, and gathering).

We are somewhat more optimistic about the economic position of Aboriginals in the Canadian labour market than are Patrinos and Sekellariou (1992). Certainly there is evidence of serious unemployment problems among natives, and these can be attributed in part to barriers to entry into the labour market, including the lack of employment opportunities in or near native communities and to discrimination in the education system and job market. On the other hand, when those barriers have been overcome and native persons are working full-time, full-year in the labour market, natives incur wage gaps that are small and returns to education that are high when compared with other, much-studied disadvantaged groups in the same situations (e.g., women and US blacks). This suggests that full and effective integration into mainstream Canadian labour markets of native Canadians, and especially native women, may not be an unrealistic goal in the

future. Whether this kind of integration is desired by most native Canadians is a very different question.

We have restricted our analysis to full-time, full-year workers because of the nature of the earnings question in the Census survey instrument. Reliable estimates of wages are only available then for full-time, full-year workers, and we restricted our sample to persons working 48 weeks or more (including paid vacation time) and who report doing so full-time. This excludes from our estimations of wage gaps those workers who choose to be part-time part-year or seasonal workers, and as a consequence excludes many Aboriginals. In many remote areas, for example, Aboriginals may prefer part-time or seasonal work, because of their participation in traditional activities. Among some natives, there may well be a preference for jobs that represent combinations of lower wages plus greater flexibility and non-measured bush income, and our study doesn't allow for this possibility. Hence, our neglect of part-time wage earnings may be unfortunate. Again, we have not looked at earnings gaps by occupational group. Many natives appearing in the Census sample who report full-time, full-year employment may well be employed in the bureaucracy and in education; if true, our aggregative approach might distort the earnings comparisons with non-Aboriginals by concealing the disproportionate representation of Aboriginals in these sectors and disguising some greater earnings differentials in other occupational groups.

From this study, and from our earlier work for the Royal Commission (George and Kuhn, 1993), we concluded that it would be important that a follow-up study of educational, employment and earnings differences between Aboriginals and non-Aboriginals be undertaken with 1991 Census of Canada data. Hence, the genesis of this project and the report on our findings which follows.

III. DATA.

Statistics Canada's 1991 Census Public Use Microdata File (PUMF) on individuals is a 3% sample of the population with responses from the one-fifth of Canadians and landed immigrants who filled in the long form during the 1991 census. The file contains 809,654 observations in contrast to the 500,434 observations of the 1986 PUMF, which was a 2% sample. The increased size permits an improved analysis of subgroups such as natives living on reserves, and in the Yukon and Northwest Territories.

Since our objective is to measure labour market activity, an appropriate sample is selected from the PUMF. Our sample excludes individuals who are younger than 15 and older than 64 years of age, those with crucial missing information (eg., age, Aboriginal ethnic origin or education), those living on collectives and outside of Canada, non-permanent residents², and those with top-coded family income. To avoid contamination of the results by possible discrimination against other visible minorities, all non-Aboriginals classified as visible minorities by Statistics Canada's Interdepartmental Working Group on Employment Equity Data are also excluded. For similar reasons the small number of individuals who had no Aboriginal ethnic origins, but were band members and/or Registered Indians were also removed from the sample. This complete sample of 484,840 observations off reserves, and 2,240 on, is used to study individuals' labour force status both in the survey week (employed, unemployed or out of the labour force), and in the previous year (full-time, full-year (FTFY), or not).

Since individuals are not directly asked their rate of pay in the Census questionnaire, reliable and comparable estimates of wages are only available for full-time, full-year (FTFY) workers. Additionally, when we are interested in comparing earnings, the self employed and unpaid family help are not included since their basis of remuneration is known to differ

systematically from paid workers. Earnings are, therefore, studied only for the subsample of observations that meet these further restrictions.

Further splits in the sample are made in the analysis between those living: 1) off reserves in one of the ten provinces, 2) on reserves, in one of the ten provinces, and 3) off reserves in the Yukon and Northwest Territories. The final complete samples for the labour force status analysis are: 483,242; 2,240; and 1,598 respectively. The 10 individuals living on reserves in the Territories form too small a sample in the PUMF to be meaningfully characterized.

Our analysis is also divided by gender and Aboriginal ethnic origin. Three Aboriginal ethnic groups are defined following the categories used in the Census. Those with a single ethnic origin are called single origin Aboriginals if that origin is Aboriginal, those with multiple ethnic origins are denoted multiple origin Aboriginals if they have at least one Aboriginal ethnic origin, and those with no Aboriginal ancestry are classified as non-Aboriginal. The census definition of Aboriginal includes the subgroups North American Indian, Métis and Inuit. One quirk of the Census is that individuals who have two or more different Aboriginal origins are classified, along with those who have Aboriginal and non-Aboriginal ethnic origins, as multiple origins Aboriginals.

This would serve to make the multiple origins group look more like those with single origins than it ought to, but the effect is likely very small since Statistics Canada (1993 - Table 1) indicates that only 2% of the multiple origins group are combinations of the Aboriginal subgroups exclusively. This classification allows comparisons to be made with George and Kuhn's previous study. It may be possible in future work to identify and obtain a sufficiently large sample size of North American Indians to study them apart from other Aboriginals. Throughout this report, the terms "native" and "Aboriginal" are used synonymously.

As with all work concerning Aboriginals using census data, there is a problem with the data that results from incomplete enumeration. In the 1991 PUMF all of the individuals living in the 78 reserves or settlements that were incompletely enumerated are excluded from the dataset. Twenty

percent of the excluded reserves are urban, and the largest group, 33, are in Ontario. A discussion of the details, and a list of the incompletely enumerated reserves, can be found in Statistics Canada (1994) (pages 107 ff and appendices 1 and 2). The incompletely enumerated reserves are largely the same reserves that were not enumerated in 1986. Since our study uses only high level geographic areas, provinces, and the two northern territories combined, the impact of the missing data is likely small.

Preliminary investigations were conducted by interacting all variables with an Aboriginal-type indicator and performing F-tests on the joint significance of the interacted terms. These tests revealed that the single and multiple origin Aboriginal groups could not be combined in the analysis of labour force status (the probits) because the structure of their labour market activity differed significantly. Similar tests for the wage regressions were not as clear. While F-tests of the constant term and variable coefficients, performed separately, could not reject that they were the same for the two groups, their equality was strongly rejected, at least for the men, when tested jointly. In fact, the difference in the intercept, constraining the variable coefficients to be the same for both groups, is quite sizeable for the men, although it is small and insignificant for the women (see the bottom of Table 19).

It should be recalled that the discrete dependent variable equations examining labour force status (the probits) are conducted on the entire sample. In contrast, the wage equations involve only the much smaller and select group that work FTFY. The latter group may be much more alike than is the entire population. One likely interpretation is that, while there are structural differences between the single and multiple Aboriginal origin groups, at least for the men, the differences are not attributable to any one, or any small number, of the observed characteristics. In light of this we keep the two groups separate for the probit equations. Where the wage regression sample is large enough, we likewise study the two groups separately. For the analysis of on versus off reserves

differences, however, where the sample is small, the two groups are pooled and an indicator variable for multiple origins is added to the regression.

An important issue in our analysis is the identification of those living on and off "Indian reserves and settlements", which is synonymously labelled "band housing" by the census.³ While this separation could be made cleanly in the 1986 census, it cannot be made as nicely in the 1991 one. The gross rent (GROS RTP) and owner's major payments (OMPP) questions allow for individuals living in band housing and in farm dwellings to be separated from the remainder of the population. The dwelling tenure (TENURP) question allows us to further identify those who own the farm dwelling in which they live, but we cannot separate those who rent and live in (part of) a farm dwelling from those who live in band housing (ie. on an Indian reserve or settlement). Our final sample can thus be divided into: 1) those who do not live on a reserve and 2) those who live either on a reserve or rent (a room in) a farm dwelling. This latter group we label as living on a reserve in the remainder of the paper.

To address the size of this misclassification problem, we look at the percentage of the non-Aboriginal sample that fall into the latter group and are classified as living on a reserve, although they may rent (a room in) a farm dwelling. It is 0.39% for men and 0.33% for women. These are very small proportions even if we assume that all of these individuals live in farm dwellings and are therefore misclassified (which is not necessarily true). If the same fractions hold for the Aboriginal population, then less than 10 people would be misclassified in the largest group studied. It is possible, however, that a larger fraction of Aboriginals are misclassified, since their's is a more rural population. Even three times more misclassification is, however, only one percent of the sample. Further, the misclassification is not likely to be as serious as it would be if the confounding group were urban.⁴

IV. EMPLOYMENT AND UNEMPLOYMENT.

The basic patterns of employment and unemployment experienced by Canada's off-reserve Aboriginal population, outside the Yukon and Northwest Territories are summarized in Table 1. As mentioned, the Aboriginal population is broken down for this analysis into two groups: those reporting exclusively Aboriginal ethnic origins (column 1) and those reporting Aboriginal origins in addition to some other ethnic origin (column 2). Column 3 combines these two groups and Column 4 gives comparable figures for non-Aboriginal Canadians who do not belong to any visible minority. The first three rows for each gender group (men, women, and all) give the percentage of individuals in each of three possible labour force states (employment, unemployment, and not in the labour force) in the June 1991 Census survey week; these three figures sum to 100 percent. As is apparent from the Table, Aboriginal Canadians exhibit less overall labour force activity than non-Aboriginals: 58.7 percent of individuals aged 15 to 64 reporting any Aboriginal origins were employed, compared with 70.4 percent of non-Aboriginal Canadians; a gap of 11.7 percentage points. As well, 12.1 percent of Aboriginals were unemployed (i.e. without work and looking for work), compared to 7.5 percent of non-Aboriginal Canadians; a gap of 4.6 percentage points. Of Aboriginals, 29.3 percent were out of the labour force (neither worked nor looked for work), compared to 22.0 percent for non-Aboriginals.

The fourth row for each group, labelled FTFY, refers not to labour force activity in the survey week, but in the previous calendar year (1990). It gives the percent of the relevant group who worked full-year (defined as 48 weeks or more, counting paid vacations), and reported doing so mostly full-time. Aside from showing the same gap in Aboriginal labour force activity, these numbers also suggest that Aboriginals' work patterns are more intermittent than those of non-Aboriginals: In the calendar year 1990, 32.7 percent of Aboriginals worked full-time,

full-year, compared to 45.6 percent of non-Aboriginals; a gap (of 12.9 percentage points) which exceeds the gap in survey week employment rates.

Another result that is apparent from Table 1 is that the size of Aboriginal labour force activity gaps is strongly influenced by the degree of Aboriginal ethnic identification. Indeed, when the Aboriginal population is disaggregated into those who report **only** Aboriginal origins (the "single origins" group) and those who report other origins in addition to Aboriginal ones (the "multiple origins" group), it becomes clear that most of the Aboriginal-non-Aboriginal gap is associated with the single-origins group. For example, the 11.7 percentage point overall Aboriginal employment gap actually consists of only a 4.0 point gap for those with multiple origins and a 25.2 point gap for those with single origins. Similarly, the 4.6 percentage point overall unemployment gap actually combines a 2.8 point gap for those with mixed ancestry with a 7.6 point gap for those with exclusively Aboriginal origins, and the 12.9 point overall gap in full-time, full-year work combines a 7.7 point gap for multiple origins with a 21.9 point gap for single origins.

Table 1 also shows that the Aboriginal labour force activity gap varies considerably with gender. For example, for the single origins group, the Aboriginal/non-Aboriginal unemployment gap is 10.8 percentage points for men, and only 5.0 percentage points for women; indeed Aboriginal women's unemployment rate is considerably below men's. Similarly, the gap in full-time, full-year work is 27.7 points for men, compared to 15.5 for women. This mirrors similar results found for wages in George and Kuhn (1994), as well as in Section V of this report.

Do the Aboriginal labour force patterns in Table 1 indicate any progress or deterioration in the economic position of Canadian Aboriginals from earlier years? Unfortunately, since the number of individuals living off reserves who report Aboriginal origins almost doubled in the five-year interval between the 1986 and 1991 censuses, any comparisons of Aboriginal labour force behaviour between these two years must be interpreted very cautiously.⁵ Bearing this in mind, the

one aspect of labour force activity for which we present comparable information in our paper using the 1986 Census (George and Kuhn, 1994) is the prevalence of full-time, full-year work. On this measure, the labour force attachment of Canadians identifying themselves as Aboriginals certainly increased from 1986 to 1991, with full-time, full-year work rising 4.1 percentage points (from 35.5% to 39.6% of the population) for male Aboriginals, and 7.1 percentage points (from 19.7 to 26.8%) for female Aboriginals. It should be borne in mind, however, that similar increases in full-time, full-year work also occurred for non-Aboriginals over this period (increases of 4.8 and 7.7 points for men and women respectively),⁶ and that some of the increase in measured labour force attachment for Aboriginals may be the result of former non-Aboriginals relabelling themselves as Aboriginals in 1990. Overall, it would be premature to conclude that the labour force activity of Canadian Aboriginals increased between 1985 and 1990 from these statistics.

What explains the sizable gaps in Aboriginal labour force activity, relative to non-Aboriginals, documented in Table 1? In the remainder of this section, we shall use probit analysis to partition these gaps into two components: those which can be explained by readily observable differences between Aboriginal and non-Aboriginal Canadians (such as age, education and region), and those which cannot. As a prelude to this exercise, we first document, in Table 2, the existence of sizable differences in measurable characteristics which are likely to affect labour force participation and employment, between Canadian Aboriginals and non-Aboriginals. As is apparent, the list of such characteristics available in the Census includes province of residence; residence in a Census metropolitan area (cma) or not;⁷ the presence of children under (kidslt6) and over 6 (kidsge6) years of age in the household (available for women only); marital status (single, married, or widowed/separated/divorced); highest level of education completed (grd0_4 through univ5_p);⁸ official languages currently spoken (English only, French only, bilingual, or neither); age; and total household income net of the respondent's own labour market earnings (ex_inc).

Table 2 presents means of all the above variables for the Aboriginal and non-Aboriginal population (categorical variables, such as province of residence, cma, etc. are represented by dummy variables; means of these variables are just the fraction of the population in that particular category). Overall, Table 2 indicates that there are important observable differences between Aboriginal and other Canadians in characteristics which are likely to affect labour force participation. Specifically, Aboriginals are much more likely to live in the Prairie provinces and in British Columbia than non-Aboriginal Canadians, and less likely to live in the Atlantic Provinces, Quebec, and Ontario. They are also less likely to live in a Census Metropolitan Area. Aboriginal women have more children, on average, than non-Aboriginal women, yet are less likely to be married. Aboriginal men are also less likely to be married, and more likely to be single, widowed, divorced or separated than non-Aboriginals. Aboriginals are less well educated than non-Aboriginals, although a sizable fraction (about 10 percent) of the single-origins population now has some university education.⁹ Aboriginal Canadians are less likely to speak only French of the two official languages, and less likely to be bilingual than non-Aboriginals. They are considerably younger (about five years on average) than non-Aboriginal Canadians, and live in households with lower incomes.

Having established that Aboriginal Canadians have different observable characteristics than non-Aboriginals, we now ask whether this matters for their labour force activity rates: What effects do these characteristics have on the likelihood of being employed or unemployed in the survey week, and on the likelihood of working full-time, full-year, in 1990? And do these characteristics have different effects for Aboriginals than for non-Aboriginals? We address these questions using separate probit analyses of employment, unemployment, and full-time, full-year work, in Tables 3 through 5 respectively.¹⁰

Table 3, which considers employment in the survey week, strongly confirms that the characteristics listed in Table 2 do affect employment rates of both natives and non-natives in

Canada: virtually all of the coefficients are statistically significant for non-Aboriginals (due in part to the large sample size); many are significant for Aboriginals. As a result, F-tests in all equations can strongly reject the hypothesis that these variables, as a group, do not influence the probability of employment. Most of the results are standard, and as expected: the presence of children strongly reduces employment for both Aboriginal and non-Aboriginal women; employment increases strongly with educational attainment; exhibits an inverted-U shaped pattern with age (from the positive coefficient on age and negative on its square); is higher in metropolitan areas, and lower in the Atlantic provinces than elsewhere. Given that we are controlling (albeit imperfectly) for urban-rural differences using the *cma* indicators, one somewhat less expected result concerns the effect of living in the Prairies on employment probabilities: this is significantly positive for non-Aboriginals, but negative for Aboriginals. Overall, this suggests a greater gap in the integration of Aboriginals into mainstream labour markets in the Prairies than elsewhere in Canada. Other interesting features of the Table include the particularly strong positive effect of education on the employment of Aboriginal women; the smaller inhibiting effect of children on the employment decisions of Aboriginal women; the surprisingly strong, negative effect of speaking French only on the employment probabilities of non-Aboriginals; and the positive effect of being married on the employment probabilities of women, especially Aboriginal women, in the sample. The latter may, of course, reflect the process of selection into marriage as much as a causal effect of marriage, but is interesting nonetheless.

Tables 4 and 5 give the determinants of unemployment and full-time, full-year work from probits strictly analogous to those in Table 3. Overall, these display similar, and consistent results. (For example, unemployment rates are higher in the Atlantic provinces; full-time, full-year work is strongly inhibited by the presence of children and promoted by higher education levels). Probably because it is less affected by random, short-term shocks, the predictive power of the full-time, full-year work regressions appears to be even stronger than for survey week employment.

Unemployment however appears to be much harder to predict, perhaps because it is a much less well defined concept, defined as much by desires, or intentions to work as by actual labour market behaviour.

To what extent are the labour force activity gaps observed in Table 1 between Aboriginal and non-Aboriginal Canadians attributable simply to differences in their education levels, provinces of residence, and other observed characteristics? Tables 6 through 8 provide answers to these questions by decomposing these gaps into the portion explainable by differences in observed characteristics, and the portion not thereby explainable. Since the most robust and precisely-estimated probit results are obtained for full-time, full-year work, we shall focus our discussion here on the decompositions for that variable, presented in Table 8. The reader can verify that similar, but less stable and well-determined, results obtain for survey date employment and unemployment in Tables 6 and 7.

The first column in Table 8 gives the total native-non-native gap that needs somehow to be explained. More precisely, this column gives the difference between the predicted probability of being employed full-time, full-year for an average Canadian Aboriginal and an average Canadian non-Aboriginal, from the probits estimated in Table 5. These are essentially just an alternative measure of the overall gaps presented in Table 1, and mirror those gaps closely (.32, .13, .20, .17, .06, .10 in Table 8 versus .28, .10, .16, .16, .05, .09 respectively in Table 1); the only reason they differ is the nonlinearity of the normal cumulative distribution function used in the probit estimation. As noted earlier, the biggest gap to be explained is the approximately 30 percentage point gap in full-time, full-year work between single-origin Aboriginal men and non-Aboriginal men; the smallest (of 5-6 percentage points) is that between multiple-origin Aboriginal women and non-Aboriginal women.

The "adjusted gaps" using "own" regressions presented in Table 8 give an answer to the following question: According to the probit equations of Table 5, what would the full-time,

full-year gap be if, instead of having their own, actual characteristics, the Aboriginals in our sample had the same education levels, average age, regional distribution, etc. as Canadian non-Aboriginals? Separate estimates are given for the consequences of eliminating only the native-non-native education/training gap (column 2) and for eliminating all observed differences between natives and non-natives (column 4). As can be seen, these are typically smaller than the overall gaps in column 1, since Canadian non-Aboriginals tend to be better educated, older, more urban, and reside in higher-employment areas than Aboriginals. The fraction of the column-1 gap eliminated by these two hypothetical experiments is given in columns 3 and 5; in other words this is the fraction of the observed gap that can be explained by observable differences between natives and non-natives in Canada.

The "adjusted gaps" using "non-Aboriginal" regressions in Table 8 perform the same hypothetical thought experiment as above in reverse: they compute what the gap would be if, instead of natives being as well-endowed as non-natives, non-natives had the observable characteristics of natives. To the extent that the probit coefficients on all variables but the constant in the Aboriginal and non-Aboriginal equations are the same, this will yield the same results as the "own regressions" technique. They need not, however, since the two techniques involve quite distinct thought-experiments, and sometimes some interesting differences emerge. For example, in the last column of the Table, the fraction explained using own regressions is consistently higher than that using the non-Aboriginal regressions. In part, this is a result of the diverging effects of province of residence in the native and non-native regressions: Hypothetically giving natives the mean characteristics of non-natives implies "moving" a fair number of them out of the Prairies and into Ontario. Since natives are more likely to be employed in Ontario than on the Prairies, this tends to reduce the native-non-native gap, thereby increasing the fraction explained. Hypothetically moving non-natives to the Prairies (where natives disproportionately reside), however, raises the employment rates of non-natives, since --in contrast to natives-- their

employment rates are higher in the Prairies than Ontario. This tends to **raise** the native-non-native gap, thereby **reducing** the fraction explained.

Overall, the decompositions of Table 8 indicate the following. First, according to our point estimates of the fraction explained, **no more than 30 percent of the native-non-native gap in full-time, full-year work can be attributed to differences in the education and training levels of native and non-native persons** (the largest number in column 3 is .26, and 10 of the twelve estimates are below .2).¹¹ While increased education seems capable of reducing the employment gap, it clearly seems unlikely to be capable of eliminating it entirely. For example, for single-origin Aboriginal men, our best estimate of the consequences of raising their education levels to those of non-natives is a decrease in the gap in full-time, full-year work from 32 percentage points to 27 percentage points. Similarly, according to the point estimates, **no more than 65 percent of the native-non-native gap in full-time, full-year work can be attributed to differences in all the relevant observable characteristics of native and non-native persons in the 1991 Census PUMF** (the largest number in column 5 is .63, and 10 of the twelve estimates are below .5). While it is unclear what portion of the remaining, unexplained gap is due to labour market discrimination (as opposed to tastes, cultural factors, and pre-labour market discrimination --e.g. in the school system), some scope for these factors to operate is clearly indicated by the statistical analysis here.

V. WAGES.

Conditional on working full-time, full-year, do Aboriginal Canadians earn less money than non-Aboriginal Canadians? This question is answered in the affirmative in Table 9, which presents average annual earnings of full-time, full-year workers from the 1991 Census PUMF. Overall, Table 9 indicates that Aboriginal wages were 10.4 percent below those of non-Aboriginals in 1990, a gap which closely mirrors the 11.0 percent gap we found in 1985 (George and Kuhn, 1994). As in 1985, the gap (at 19.9%) was considerably greater for those with exclusively Aboriginal origins than for those with mixed origins (7.0%). As well, as in 1985, the Aboriginal wage gap was considerably smaller for women (5.9%) than men (11.3%). Interestingly, the wage gap appears to have risen since 1985 for single-origin Aboriginals even while falling slightly overall. Most of the Aboriginal wage gaps in Table 9 however, still appear small relative to the male-female wage gap of 30.4% among non-natives in 1990, down from 34.6% in the 1986 Census. Once again, however, it is worth recalling that comparisons between Aboriginals in 1985 and 1990 such as those made above should be interpreted cautiously, due to the much greater number of individuals reporting Aboriginal origins in 1990.

Why do Aboriginal Canadians earn lower wages for full-time, full-year work than non-Aboriginals? As in Section IV, we answer this question here in three stages: first, by documenting that there are, in fact, substantial differences in the observed characteristics of Aboriginals and non-Aboriginals **who work full-time, full-year** in Canada (Table 10); second, by establishing that these characteristics do indeed affect the earnings of full-time, full-year workers (Table 11); and third, by computing what fraction of the earnings gap is attributable to differences in these observed characteristics (Table 12).

Table 10 indicates that those Aboriginals who work full-time, full-year differ significantly in their observable characteristics from non-Aboriginals who do the same. The differences, as well, are all in the same direction as for Aboriginals as a whole: greater concentration in the Prairies and B.C.; less representation in urban areas; more children; less likely to be married; less-well educated; less likely to speak French; younger; and less other household income. The magnitudes of these differences tend however to be much smaller: natives who work full-year, full-time, are more similar to non-natives than are natives as a whole. For example, the mean age difference between single-origin Aboriginal women and non-Aboriginal women is now only about one year; the difference in the proportion with some university is essentially zero for multiple-origin women.

The regression coefficients from log earnings equations presented in Table 11 document the substantial effects of age, education, region and other variables on the earnings of both Aboriginal and non-Aboriginal Canadians. For the most part, these effects are as expected: earnings of full-time, full-year workers are higher in Ontario (the omitted category) than in all other provinces, for natives and non-natives alike. Earnings are higher in metropolitan areas, have an inverted-U shaped pattern with age; are positively affected by marriage for men but not for women; increase with education; are lower for speakers of French only than English only; there is a small wage premium (relative to English only) for bilingual workers, and a large penalty for speaking neither official language. In contrast to the employment probits, no obvious structural differences are apparent between the Aboriginal and non-Aboriginal earnings regressions, except perhaps a lower return to education for single origin males than the other groups. Perhaps unfortunately, the higher return to education for Aboriginal females (relative to non-Aboriginal females) noted in the 1986 PUMF (George and Kuhn, 1994) does not show up in the larger, 1991 sample.

Parallel to Table 8, Table 12 decomposes the wage gaps observed in the raw data (Table 9) into a portion that is "explainable" by differences in observed characteristics and one which is not.

The first column in Table 12 gives the total native-non-native gap that needs somehow to be explained. More precisely, this column gives the difference between the average log earnings of Canadian Aboriginals employed full-time and full-year, and that of Canadian non-Aboriginals working full-time, full-year. These are simply an alternative way to express the percentage gaps of Table 9, in a way which corresponds with our log wage regressions,¹² and mirror those gaps closely (.25, .08, .12, .12, .03, .06 in Table 12 versus .22, .08, .11, .13, .03, .06 respectively in Table 9). As in the employment probits, the biggest gap to be explained is the (22 log point, or 25 percent) gap in wages of single-origin Aboriginal men and non-Aboriginal men; the smallest (of only about 3 percent) is that between multiple-origin Aboriginal women and non-Aboriginal women.

The "adjusted gaps" using "own" regressions presented in Table 12 give an answer to the following question: According to the earnings regressions of Table 10, what would the native-non-native wage gap be if, instead of having their own, actual characteristics, the Aboriginals in our sample had the same education levels, average age, regional distribution, etc. as Canadian non-Aboriginals? As before, separate estimates are given for the consequences of eliminating only the native-non-native education/training gap (column 2) and for eliminating all observed differences between natives and non-natives (column 4). As can be seen, these are typically smaller than the overall gaps in column 1, since Canadian non-Aboriginals tend to be better educated, older, more urban, and reside in higher-wage areas than non-Aboriginals. The fraction of the column-1 gap eliminated by these two hypothetical experiments is given in columns 3 and 5; once again this can be seen as the fraction of the observed wage gap that can be explained by observable differences between natives and non-natives in Canada.

The "adjusted gaps" using "non-Aboriginal" regressions in Table 12 perform the same hypothetical thought experiment as above in reverse: they compute what the wage gap would be if, instead of natives being as well-endowed as non-natives, non-natives had the observable characteristics of natives. To the extent that the earnings regression coefficients on all variables

but the constant in the Aboriginal and non-Aboriginal equations are the same, this will yield the same results as the "own regressions" technique. Indeed, since (unlike the case of the probits for full-time, full-year work) this is roughly the case here, our results are now not as sensitive to the decomposition measure as they were in Table 8.

Overall, the decompositions of Table 12 indicate the following. First, according to the point estimates of the fraction explained, **for men, no more than 30 percent of the native-non-native wage gap can be attributed to differences in the education and training levels of employed natives and non-natives** (the largest number in column 3 for males is .24, and the remaining five estimates are all below .2). Interestingly, however, **for single-origin Aboriginal women**, (who face a much smaller wage gap than single-origin men) **as much as 50% of their (smaller) wage gap could apparently be eliminated by eliminating the native-white education gap**. (The very small fractions explained for the multiple-origin women have very high standard errors and are mostly reflective of the very small initial differential to be explained). This larger proportional effect of education for native women was also noted in George and Kuhn (1994). Clearly, however, while increased education seems capable of substantially reducing the wage gap, it still seems unlikely to be capable of eliminating it entirely.

Second, **for men, between about 30 and 55 percent of the native-non-native wage gap can be attributed to differences in all the relevant observable characteristics of native and non-native persons in the 1991 Census PUMF** (the smallest and largest numbers for men in column 5 are .35 and .53) Again, while it is unclear what portion of the remaining, unexplained gap is due to labour market discrimination (as opposed to tastes, cultural factors, and pre-labour market discrimination --e.g. in the school system), some scope for these factors to operate is clearly indicated by the statistical analysis here. Interestingly, **for single-origin Aboriginal women, as much as 90 percent of the native-non-native wage gap may be attributable to differences in observed characteristics**. (Again, the much smaller and more poorly-determined numbers for

multiple-origin women primarily reflect the very small initial differential to be explained). This leaves less room for labour market discrimination **on the basis of Aboriginal ethnicity**¹³ against Aboriginal women than men, a finding that corroborates those in the 1986 PUMF as well (George and Kuhn, 1994).

One remaining potential cause of the earnings gap between native and non-native full-time, full-year workers is that, even conditioning on full-time, full-year work, natives work fewer hours than non-natives. While the Census does not provide direct information on hours worked in the calendar year (1990) for which earnings are measured, some insight into the potential role of this factor can be gained from the information on hours worked in the Census survey week (in June 1991), presented in Table 13. Interestingly, the top half of Table 13 suggests that even natives working full-time, full-year in 1990 worked considerably fewer hours in June 1991. However, as the bottom half of the Table indicates, much of this is due to the greater likelihood that a native employed full-time, full-year in one year will not be employed at all in the following year: counting only the hours of those actually employed in June 1991, the native-non-native hours gap shrinks considerably, and even becomes negative for multiple origin women. In percentage terms, the largest hours gap is 3.2%, for single-origin men, suggesting that, at most, 3 percent out of the 20 to 25 percent earnings gap experienced by this group is due to differences in hours worked by full-year, full-time workers. Clearly, a substantial gap in the **wage rate paid per hour of work** exists between Aboriginal and non-Aboriginal Canadians.

A common concern in interpreting wage gaps such as those presented in Tables 9, 11 and 12 is that individuals who work FTFY may differ systematically, along observed and/or unobserved dimensions, from the entire population. This sample selection problem could manifest itself in different ways. For example, if the labour force is disproportionately composed of Aboriginals who would be more "able", then this positive selection would cause the estimated wage gaps to underestimate the population ones. Alternatively, if individuals who would be more "able"

workers choose to remain out of the FTFY labour force, perhaps to pursue a more traditional native lifestyle, then the estimated wage gaps overestimate those for the population. Of course, adjusting for sample selection requires an identifying assumption: either functional form, an exclusion restriction or a combination of the two. In practice different exclusion restrictions can give different results.

Previous work by George and Kuhn (1994) found that adjusting for sample selection had very little effect on the wage equation coefficients using the 1986 census. Point estimates of the wage gaps for the various subgroups stayed about the same or reduced slightly. None of the changes were, however, even close to statistically significant at conventional levels. On the other hand, George and Kuhn showed that if the unobserved ability is "sector-neutral", then the ordinary least squares estimates are unbiased.

Adjustments for sample selection are therefore not pursued in this study. It is suggested that the results would not be significantly affected were selection correction techniques employed on this dataset. Alternatively, the reader may interpret the wage equation estimates as conditional on FTFY employment.

VI. RESERVES.

According to the 1991 Census PUMF, about 17 percent of Canada's single-origin Aboriginals live on reserves.¹⁴ What are the effects of living on a reserve for the employment prospects and wages of Aboriginal Canadians? That question is explored in this section using techniques that should now be familiar from previous sections. Because of the possible unrepresentativeness of the on-reserve population in the Census PUMF, and because our constructed on-reserve indicator here, while good, is imperfect, the results should however be viewed with more caution than those for the off-reserve population in previous sections.¹⁵

Basic statistics on the labour force activity and earnings of on- versus off-reserve Aboriginal Canadians are presented in Table 14. A first result which is very clear from this table is that very few multiple-origin Aboriginals live on reserves in Canada; for that reason our analysis will focus on single-origin Aboriginals only (shown in the first two columns of Table 14) in the remainder of this Section. The main indications of Table 14 for this group are as follows. First, Aboriginals living on reserves exhibit considerably less labour force activity than those living off reserves. Male survey-date employment rates, at 32.8 percent, are almost twenty percentage points lower than off-reserve; female employment rates are about 15 points lower on reserves than off. Only about **12 percent** of Aboriginal men and women living on reserves worked full-year, full-time in 1990, compared with 28 and 20 percent for single-origin off-reserve men and women respectively. Finally, in addition to carrying a penalty in terms of access to jobs, living on a reserve appears to carry a wage penalty with it as well: those few on-reserve Aboriginals who did work full-time, full-year earned 20 to 25% less than single-origin, off-reserve Aboriginals (recall that the census measures pre-tax earnings). This earnings difference is somewhat greater than what we found in the 1986 Census; such comparisons may however be potentially unreliable due not only to the

reporting problems mentioned earlier, but also to the very small number of observations in these categories here.

Are the on-off reserve differences in Table 14 due to differences in the characteristics of natives who choose (or are constrained) to live on reserves, or are they a feature of reserve life itself? These questions are explored in Tables 15-17 (for labour force activity) and 18-20 (for earnings). Table 15 confirms that there are, indeed, some potentially important differences between the Aboriginal on- and off-reserve population. Among the more interesting of these is that the on-reserve population is much more heavily concentrated in Manitoba and Saskatchewan than the off-reserve population: almost a quarter of the on-reserve natives in our sample live in Manitoba, and about 43 percent live in Manitoba and Saskatchewan! Of course, this does not accurately reflect the distribution of the population since reserves refusing enumeration were slightly more concentrated in Ontario. Women living on reserves have more children, and are actually slightly **more** likely to be married than those off reserves. Interestingly, although the proportion of on-reserve natives with grades 11-13 and with some postsecondary training is substantially below that off reserves, the proportion with university is equal to or greater than the level off reserves. Perhaps this reflects natives in administrative or professional positions on reserves. Finally, natives on reserves are substantially more likely to speak English only (of the two official languages) and are on average one to one and a half years younger than their off-reserve counterparts.

Table 16 reports probit coefficients for survey-week employment, survey -week unemployment, and full-time, full-year work in 1990, for single-origin Aboriginals living on reserves. Overall, it confirms that the characteristics listed in Table 15, as a group, do have a sizable and significant impact on these labour market outcomes. Interestingly, as for the off-reserve native population, employment rates (both in the survey week, and full-time, full-year) of **on-reserve** natives are higher in Ontario (the omitted category) than in any other province.

Indeed, all the other variables generally work in the same direction as for off-reserve natives as well: age has an inverted U-shaped effect on employment; the presence of children strongly reduces women's employment; education strongly increases employment, especially for women as well; and unemployment is much harder to predict than employment.

Table 17 presents adjusted gaps in employment rates (both in the survey week and in 1990) between on- and off-reserve, single origin Aboriginals. Although, due to the considerably smaller sample sizes than for off-reserve natives, the standard errors on the fractions explained are now quite high, and the estimates of the fraction explained vary considerably, all the point estimates in column 5 are substantially below one.¹⁶ This suggests quite strongly that **not all of the on-off reserve difference in employment rates can be attributed to the characteristics and qualifications of individuals living on reserves.** At least some role for poor labour demand, and perhaps for a "reserve culture" which does not support paid employment, appears to exist.

Tables 18-20 perform the same exercise for the on-off reserve wage gap as Tables 17-19 did for employment gaps. Overall, they support the same conclusion: while some of the reserve wage gap is clearly attributable to the different observable characteristics of individuals who live on reserve, not all of it can be so accounted for. Some role for labour demand factors, or perhaps even for compensating differentials for the favourable tax status of reserves, appears to exist.

VII. THE TERRITORIES.

Since only a tiny fraction of Canada's non-native population lives in the Territories, and since the labour market of the Territories is quite distinctive, it has become common practice, in many statistical analyses of labour markets, to exclude Canada's Territories from consideration. What is true of non-natives is not necessarily true of natives, however: in fact, a sizable fraction (about 10%) of Canada's single-origin Aboriginals live in the Yukon or Northwest Territories. For this reason, and because the Territories are indeed distinctive, we conduct a separate analysis of Aboriginal wages and employment in the Territories here.

Basic statistics on labour force activity and wages of Canadian natives and non-natives in the Territories, compared to the rest of Canada, are given in Table 21. A first clear implication of this table is that, while a substantial fraction of Canada's single-origin Aboriginals live in the Territories, the same is not true of multiple-origin Aboriginals: the vast majority of natives in the North claim exclusively Aboriginal ethnic origins.¹⁷ For that reason, even though our Tables present statistics on multiple-origin natives in the Territories, the following discussion will focus only on the single-origins group.

A second interesting implication of Table 21 is that, at least according to the raw data, living in the Territories appears to have **opposite** effects on the labour market attachment of Aboriginal and non-Aboriginal Canadians: living in the North raises employment rates and reduces the unemployment and non-participation rates of non-Aboriginal men and women, while reducing the employment rates and raising the unemployment and non-participation rates of Aboriginal Canadians. As a consequence, the gaps in all these outcomes between Aboriginals and non-Aboriginals is greater in the North than in the rest of Canada: For example, the employment rate gap for single origin men of (77.5 - 51.5) 26 percentage points in the rest of Canada rises to a

massive (88.2 - 44.7) 43.5 percentage points in the Territories. Third, both Aboriginal and non-Aboriginal employed Canadians appear to receive a wage premium for working in the Territories, but this premium (at around 14%) is smaller for Aboriginals than for non-Aboriginals (at around 27-37%). As a consequence, the Aboriginal wage gap, at around 28 to 30 percent for single origin Aboriginals, is higher in the Territories than the rest of Canada as well.

Fourth, both in terms of their labour force activity and wages, non-Aboriginal women do exceptionally well in Canada's Territories, relative to men and to women in the South. At 81.1 percent, the survey-date employment rates of non-Aboriginal, northern women are above those of men in the rest of Canada. Women who are employed full-time, full-year appear to earn 37 percent more in the Territories than the south; men earn only 27 percent more. As a consequence, our Section IV finding that, relative to non-Aboriginals, Aboriginal women typically fare better than Aboriginal men, does not carry over to Canada's Territories: here, the exceptionally good prospects for non-Aboriginal women present a higher target, which northern Aboriginal women find just as difficult to match as northern Aboriginal men.

To what extent are the gaps identified in Table 22 between natives and non-natives in the Territories, as well as the gaps between the Territories and the rest of Canada, due to differences in the readily observable characteristics of workers? Some answers to these questions are provided in Tables 22 and 23. Table 22 gives mean characteristics of natives versus non-natives in Canada's Territories. These show the same, significant, pattern of native-non-native differences as were identified in the rest of Canada, in Table 2: Aboriginals have more children, are less likely to be married, are less well educated, less likely to speak French, younger, and live in lower-income households than non-natives. If anything, these differences are more pronounced than they are in the rest of Canada. Comparing Table 22 with Table 2 also reveals that both natives and non-natives tend to have more children in the Territories, and to be slightly younger than in the rest of Canada. Non-natives are better educated in the Territories than in the rest of Canada; natives

less well educated there. The only major difference in marital status is a much higher likelihood of being single for native men in the North than elsewhere.

Because of the small sample sizes in the Territories, it is not practical to estimate separate probit and wage equations for natives and non-natives within the Territories, and then to apply a decomposition analysis to measure the pure effect of living in the Territories on wages of natives and non-natives. To that end, we simply impose the same regression structure for the effects of education and other variables in the Territories as elsewhere, and estimate employment status probits and wage regressions for all of Canada including a dummy variable for residence in the Territories. The resulting coefficients on the Territory variable are reported in Table 23, for different population groups and dependent variables. These numbers give an estimate of the effect of living in the Territories on the dependent variable in question, **holding constant** the level of all the variables in Table 22.

The employment status probit coefficients in Table 23 confirm the basic trends found in the raw data of Table 21: even controlling for differences in education, age, and other demographic characteristics, living in the Territories has opposite effects on the labour market activity of natives and non-natives: it raises the employment rates and reduces the unemployment rates of non-natives, while reducing the employment rates and raising the unemployment rates of natives, though the latter effect is generally not statistically significant. For women, the same is true of the wage regression coefficients: even controlling for observed worker characteristics, both native and non-native women earn a wage premium in the North, but the premium for non-natives (at 30 log points, or 35 percent¹⁸) is considerably larger than that for non-natives (at 19.6 log points, or 22 percent). For native men, however, the estimated northern premium in Table 23 is actually slightly larger than the non-native premium, suggesting that the larger native premium in the raw data of Table 21 is due mostly to the different characteristics of northern and non-northern natives noted earlier.

VIII. SUMMARY and POLICY IMPLICATIONS.

Canada's native population is economically disadvantaged, by all of the standard measures. Native Canadians have a high proportion of dependent population, and their widespread spatial distribution, especially the rural orientation of status Indians and the remote locations of many reserves, poses serious challenges for accessibility to employment, capital and consumer markets, and to the full range of social services provided through government programs.

In this study, we have documented the existence of considerable differences in the labour market activity rates and wages of Aboriginal and non-Aboriginal Canadians, and have attempted, at least in part, to explain the origins of these differentials. Overall, we find that native Canadians are less likely to be employed, more likely to be unemployed, less likely to work full-time, full-year, and more likely to earn lower wages than non-Aboriginal Canadians. The gaps in these labour market outcomes for natives are particularly large for those who report exclusively Aboriginal origins (as opposed to mixed origins); for those who live on reserves; for those who live in the Territories; and for men relative to women. While in all cases some of these differences can be attributed to the lower education levels, younger ages, and different geographic distribution of Canada's Aboriginal population, in no cases can the entire gap be thus explained. This leaves statistical room for factors such as labour market discrimination, cultural differences and factors not measured in the Census to play a role in explaining our findings. As well, while in all cases but one (for the wage rates of single-origin Aboriginal males living on reserves) there appear to be substantial returns to education for natives, in no case can the above gaps be completely eliminated by eliminating the native-non-native educational attainment gap. If the goal of policy is to eliminate these gaps within a fairly limited time horizon, other policy instruments in addition to increased access to education will likely be needed.

As a result of our analyses of the 1986 and the 1991 Census data, reported in this study, we believe that the Commissioners should acknowledge the income- and employment-augmenting effects of education, and assign high priority to increasing Aboriginal participation in education and training programs. To enhance the impact of investment in education and training on employability, particular attention should be paid to such proven benchmarks of educational attainment as secondary school diploma and university degree completion. The completion of additional educational and training credentials will help Aboriginal Canadians who seek fuller participation in the labour market to capitalize on expanding employment opportunities in the growing sectors of the Canadian economy, especially among knowledge-based industries and services, and to better adjust to displacement in the shrinking sectors of the economy. We acknowledge, however, that there are special cultural and structural factors which may make remediation of the labour market experience of Aboriginals who live on reserves, especially in remote areas, especially challenging.

Nevertheless, even when we restrict our analysis to the "most assimilated" Aboriginals -- those who are off-reserve, full-time, full-year wage-earners -- there is still an unexplained residual after differences in human capital endowments have been taken into account. Employment equity may well begin with education, but even after full policy attention has been directed to the ameliorative effects of greater Aboriginal completion of educational and training credentials, the Commissioners will still need to give careful consideration to other measures, including the role of equity and affirmative action policies, to eradicate persistent earnings and employment differentials that may be associated with cultural and structural factors and with possible discrimination in Canadian labour markets. Other policies might include: improving educational quality; changes in the subjects studied, employment promotion on reserves, easier mobility off reserves, job market counselling and search assistance and specific vocational training. In urban areas, policies designed to reduce long run welfare dependency could be investigated. One example might be

earnings supplement programs, such as the Self Sufficiency Project (SSP), now being tested in New Brunswick and British Columbia. There will also be an ongoing need to evaluate the success of the selected policies by both statistical and experimental methods. Proper evaluation can reduce the misallocation of resources to policy interventions which do not yield appropriate results.

NOTES

1. Studies such as those by Powless (1985) and Sharzer (1985) attribute the serious unemployment and earnings problems among natives at least partly to barriers to entry into the labour market associated with discrimination.
2. The 1991 census is the first to enumerate non-permanent residents. They are excluded from the current analysis to allow comparability with previous findings.
3. We are indebted to Oliver Lo of Statistics Canada for clarifying these definitions.
4. The rural-urban difference is emphasised by Jean Kimmel (1994) in her U.S. study of "Whites, Blacks, and American Indians".
5. Table 1 indicates that the number of men, living off reserves and outside the Territories and meeting our other sample criteria (see Section II for details) claiming any aboriginal ethnic origins was 7,001. The comparable number in the 1986 Census PUMF, reported in Table 5 of Kuhn and George (1994), is 2,626. Given the different sampling rates in the two files (3% versus 2% respectively), this indicates an increase in the size of that population of $.67(7001)/2626 - 1 = 78$ percent! Similar increases occurred for women and for single- and multiple-origin aboriginals. While refusals by reserves to participate in the 1991 Census were apparently not as common as in 1986, this should not affect these off-reserve counts, unless off-reserve natives were somehow induced or inspired to under-report by their counterparts on reserves.
6. Although the long-run trend in male labour force employment rates has been downward over the last forty years, this trend is sometimes temporarily reversed by cyclical factors. The finding of higher levels of male full-time, full-year work in 1990 is thus not surprising given

the considerably tighter labour market of that year. According to Statistics Canada, the national unemployment rate was 10.5 in 1985, and 8.1 in 1990.

7. The cma / non-cma distinction almost certainly captures different effects for the Aboriginals and non-Aboriginals samples since the former, conditional on not living in a cma, are expected to reside in a more remote community. There is room for future research on labour markets in extremely remote communities, but these cannot be identified in the PUMF.

8. In contrast to some other treatments, the "training" variable in our analysis indicates a highest level of education of "high school plus some vocational training", considered by Statistics Canada to be intermediate between the "high school only" (grd11_13) and "some university" (univ1_4) categories.

9. This contrasts favourably with the 5 to 7 percent found in our paper on the 1986 Census, but as mentioned, comparisons are difficult due to the dramatic increase in the population reporting aboriginal origins.

10. Since the probability of nonparticipation in the labour force is equal to one minus the probabilities of employment and unemployment, a separate probit for nonparticipation would add no new information. The results are therefore not reported here. In these analyses the dependent variable is set to one if the condition is true, and zero otherwise. (eg. For the employment equation the dependent variable is 1 if the individual is employed and zero if unemployed or out of the labour force.)
11. Unlike most other authors (including George and Kuhn, 1994) we compute standard errors for the fraction of the gap explained in this report. Thus, it is also possible to construct (say) 95% confidence bounds for each fraction reported in the Table, equal to plus or minus approximately two standard errors. For example, the 14 percent explained for single origin men using the non-Aboriginal regressions (which generally produce smaller standard errors due to the larger sample size), with a standard error of .059, has a 95% confidence band from about 2 percent to 26 percent. While, for brevity, we shall confine our discussion to the point estimates in most of what follows, these point estimates should always be interpreted with the standard errors in mind.
12. We follow the standard practice of estimating our wage equations in logarithmic form, to correct for the usual problem of heteroskedasticity of the error term with respect to the level of earnings.
13. Recall that this calculation compares native women to non-native women, both of whom might face gender-related labour market discrimination.
14. Indeed, this figure is an underestimate due to the 78 reserves refusing to participate in the Census. These missing individuals will only affect our estimates if they differ systematically from those in our sample.
15. One feature of how the on-reserve indicator was constructed is that we know for certain which individuals do **not** live on reserves. Since on-off-reserve status is a matter of choice, there

is the potential for selection bias in this comparison. A fruitful avenue for future research using a richer dataset might include the migration / on-off-reserve decision.

16. It may be worth noting that nothing in the estimation procedure constrains these estimates to be below one, nor even positive. Neither is this a problem conceptually: controlling for a set of variables could just as easily raise the estimated wage differential between two groups as lower it, for example if the lower-wage group was in fact better-educated and older than the higher-wage group.

17. Although the sample sizes are likely to be very small, we expect in future work to further disaggregate natives in the Territories into Inuit versus others. This was not possible in the 1986 PUMF, but appears to be possible in 1991.

18. The percentage difference, y , can always be calculated from the log point difference, x , via the formula: $y = \exp(x) - 1$. The difference between the two measures vanishes as x approaches zero.

REFERENCES

- Banerjee, A.K. Paul, Jahangir Alam, and Paul De Civita, 1991. "Wage Gap Between Aboriginals and Non-Aboriginals in Canada: An Empirical Analysis", paper presented to the Annual Meeting of the Canadian Economics Association, Kingston, June 2-4.
- Drost, Helmar, 1994. "Schooling, Vocational Training and Unemployment: The Case of Canadian Aboriginals", Canadian Public Policy XX: 52-65.
- Drost, Helmar, forthcoming a. "The Aboriginal-White Unemployment Gap in Canada's Urban Labour Markets", forthcoming in John Richards, ed., Aboriginals in Canadian Society, Social Policy Series , Vol. 1 (Toronto: C.D. Howe Institute).
- Drost, Helmar, forthcoming b. "Joblessness among Canada's Aboriginal Peoples", forthcoming in Brian K. MacLean and Lars Osberg, eds., The Unemployment Crisis: All for Nought? (Montreal: McGill-Queen's University Press).
- Drost, Helmar, and Tim Eryou, 1991. "Education/Training and Labour Force Status: A Cross-Section Study of Canadian Natives", paper presented to the Annual Meeting of the Canadian Economics Association, Kingston, June 2-4.
- George, P. and Kuhn, P., 1993. "Expanding Employment in the Canadian Economy", in Sharing the Harvest: The Road to Self-Reliance, Report of the National Round Table on Aboriginal Economic Development and Resources, Royal Commission on Aboriginal Peoples (Ottawa: Supply and Services Canada), 149-64.
- George, P. and Kuhn, P., 1994. "The Size and Structure of Native-White Wage Differentials in Canada", Canadian Journal of Economics 27: 20-42.
- Kimmel, Jean, 1994. "Rural Wages and Returns to Education: Differences between Whites

Blacks, and American Indians", W. E. Upjohn Institute for Employment Research, working paper no. 94-27.

Patrinou, Harry A., and Chris N. Sekellariou, 1992. "North American Indians in the Canadian Labour Market: A Decomposition of Wage Differentials", Economics of Education Review 11: 257-66.

Powless, Richard C., 1985. "Native People and Employment: A National Tragedy", in Judge R.S. Abella, Research Studies of the Commission on Equality in Employment (Ottawa: Supply and Services Canada), 589-610.

Statistics Canada, 1993. Age and Sex, Ottawa: Industry, Science and Technology Canada. 1991 Census of Canada. Catalogue number 94-327.

Statistics Canada, 1994. Canada's Aboriginal Population by Census Subdivision and CMA: Aboriginal Data, Ottawa: Industry, Science and Technology Canada. 1991 Census of Canada. Catalogue number 94-326.

Sharzer, Stephen, 1985. "Native People: Some Issues", in Judge R.S. Abella, Research Studies of the Commission on Equality in Employment (Ottawa: Supply and Services Canada), 549-88.