Skill Mismatch of Indigenous Peoples in Canada: Findings from PIAAC*

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Abstract

Using the Programme for the International Assessment of Adult Competencies (Canadian sample) the paper examines overskilling among Indigenous off-reserve peoples and compares the outcomes to the other Canadian born. We construct several measures of skill mismatch in literacy and numeracy finding no statistically significant difference between aboriginal and non-aboriginal Canadian-born populations. We then use the developed measures in the analysis of wages and find that among First Nations, Metis and Inuit only the males of the former aboriginal group earn significantly less than their non-aboriginal Canadian-born counterparts.

Keywords: Indigenous; Aboriginal; Skill Mismatch; Programme for the International Assessment of Adult Competencies (PIAAC)

JEL Codes: J15; J24; J71

1 Introduction

The developing success of Indigenous populations in the Canadian labor market and their closer integration with the society has recently received increased attention from the government. In 2017 the Prime Minister of Canada announced the dissolution

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of Indigenous and Northern Affairs Canada and the creation of two new departments: Indigenous Services Canada and Crown-Indigenous Relations and Northern Affairs Canada, signifying a more specialized approach to the engagement with Indigenous populations.

Extensive literature has documented that indigenous people face challenges in the Canadian labor market, both in employment and earnings. For example, Drost (1994), Walters et al. (2004), Pendakur and Pendakur (2011), Frenette et al. (2011) and Lamb (2013) find negative earnings differentials and lower rates of employment in comparison to the rest of the Canadian population\(^1\). All these papers point out to education as a major impediment in the integration of aboriginals into the Canadian labor market. This situation is not unique to Canada. Similar tendencies have been documented for other countries, e.g. Australia (Jones (1993), Halchuk et al. (2006)) and the United States (Gitter and Reagan (2002)).

Education is undoubtedly an important factor contributing to the observed disparities in the labor market for aboriginals, but as fairly noted by Hu et al. (2019), there are deeper reasons linked to the information-processing skills, which affect labor market outcomes and are not necessarily connected to formal education. The skills of people in literacy and numeracy, for example, up until recently were hard to quantify, and they remained under the shroud of unobserved heterogeneity. Programme for the International Assessment of Adult Competencies (PIAAC) was aimed at measuring skills of individuals and helps to illuminate certain outcomes of indigenous peoples from a

\(^1\)Additional evidence is provided by De Silva (1999), Hossain and Lamb (2012) and Feir (2013).
different angle. Previous surveys that measured skills (PISA, ALLS and IALS) were not as comprehensive. The first survey was focused solely on students and the other two — only on literacy. PIAAC encompasses adults 16-65 years old and measures their skill level across three domains of information-processing skills (discussed below).

It is not surprising that for most people skills are innately linked to earnings. Finnie and Meng (2002) find that lower levels of literacy account for a large income gap across many minority groups in Canada. Bonikowska et al. (2008) and Ferrer et al. (2006) show that the income gap between immigrants and the Canadian born is largely defined by differences in their literacy skill levels, even though the return on it is the same. Using PIAAC data Hanushek et al. (2015) show that for every population group earnings rise with an increase in information-processing skills. Arriagada and Hango (2016) find that Canadian indigenous people have lower skills in comparison to non-aboriginal populations, and that in some instances highly skilled representatives of First Nations are still less likely to be employed than low-skilled non-aboriginal respondents. Finally, using IALS survey Biswal (2008) shows that there is no gap in annual wages between high-skilled aboriginals and high-skilled non-aboriginal Canadian born.

Hu et al. (2019) argue that skill-wise there is no significant difference in earnings between aboriginals and non-aboriginals. We take it one step further and investigate whether aboriginal people are more likely to be skill mismatched at their workplace in comparison to other population groups. We do not find evidence for this. We further add overskilling rates to the analysis of wages and find that among all indigenous peoples of Canada First-Nation males earn significantly less than their non-aboriginal
Canadian-born counterparts.

In our study the measure of skill mismatch, or rather overskilling, serves as indirect evidence of workplace discrimination. Previous research agrees that skill (and education) mismatch has pernicious consequences for the performance, productivity and rewards for workers and their employers (e.g. Leuven and Oosterbeek (2011), Sloane (2003)), but it does not necessarily imply discrimination. Overskilling, on the other hand, may be a signal for its existence. For example, a worker may be overskilled for a job due to manually mounted obstacles preventing him from moving up the career ladder. On the other hand, he may simply enjoy extra time from doing the work more efficiently and faster than a skill-matched worker. Moving to a more challenging position may limit his free time. If the latter has high weight in the preferences, it may not be an optimal decision even when countered by a higher wage.

There may be all sorts of constraints preventing a worker from getting a position matching his skills. Selective choices of employers are one of them. As argued by Rafferty (2019), a variety of forms of workplace discrimination increases the probability of a person being overskilled for his current position. The author notes that some forms of discrimination may be linked to underskilling, so we also calculate the skill-mismatch rates and compare them between aboriginals and the other Canadian born finding no significant differences. In addition, skill mismatch influences the health of people via a variety of psychological factors documented by vast psychological literature (e.g. Johnson and Johnson (1999), Wassermann and Hoppe (2019)). Lastly, it also results in the loss of productivity (Erdogan et al. (2011)).
Due to the specific nature of the information required to analyze skill mismatch, education mismatch is encountered more frequently in the literature. Leuven and Oosterbeek (2011), Rubb (2003) and Groot and Van Den Brink (2000) provide comprehensive review of that topic and Hartog (2000) in detail discusses existing methodologies. Skill mismatch, on the other hand, is different, because nominal education does not always reflect someone’s actual abilities. Education is frequently used as a proxy for unobserved skill level, but there is definitely much more variation in the skill level of individuals working for positions with same educational requirements. It becomes even more complicated with the rising complexity of tasks at jobs demanding higher skill levels. Quintini (2011) provides a good overview of the existing literature on education and skill mismatch and concludes that the former is by no means synonymous to the latter.

Unlike education mismatch, skill mismatch is relatively scarce in the literature, especially for Canada. To the best of our knowledge, skill mismatch of aboriginal peoples has not been investigated for any country. Hence, our paper provides initial insight into the skill mismatch of indigenous populations of Canada. We build on the methodology developed by several papers investigating skill mismatch predominantly across OECD countries. For example, using PIAAC data Allen et al. (2013) study skill mismatch across a large number of countries concluding that higher skill utilization (i.e. less skill mismatch) is always positive for economies. The authors also document weak relationship between education and skill mismatch. Desjardins and Rubenson (2011) provide similar analysis based on ALLS survey and arrive to the same conclusions.
Pellizzari and Fichen (2013) show that on average, across OECD countries, there is a higher percent of overskilled rather than underskilled employees, but the matching rate (using their methodology) is quite high: 80-85%. Within this sample, men are more likely to be overskilled than women, and foreign workers are substantially more likely to be underskilled\(^2\). In addition, there is strong overlap in skill mismatch between literacy and numeracy.

In the main part of our analysis we are mainly concerned with overskilling, because we believe that its consequences are more hazardous for the economy and individuals than underskilling. However, we do provide robustness analysis where we calculate mismatch rates and show that they do not change the results. We find that neither the rates of overskilling among aboriginals nor the rates of skill mismatch are significantly different from non-aboriginal Canadian-born population, which provides rare positive evidence toward certain outcomes of aboriginal peoples. However, when examining the wages, we show that even after controlling for skills and overskilling rates one group of indigenous peoples does earn significantly less than their non-aboriginal Canadian-born counterparts. This group is First Nation males.

The paper is organized in the following way. The next section discusses the data. Section 3 develops relevant methodology. Section 4 compares overskilling rates across population groups. Section 5 provides results for additional measures of overskilling. Section 6 shows the robustness of the results when using skill-mismatch rates instead of overskilling. Section 8 examines wages, and section 9 concludes the paper.

\(^2\text{We observe the same effect for Canadian immigrants.}\)
2 Data Description

We use microdata from the Canadian sample of the 2012 PIAAC survey, which was developed by OECD and conducted in more than 30 countries. This survey was motivated by previous results from the Program for International Student Assessment (PISA), International Adult Literacy Survey (IALS) and Adult Literacy and Lifeskills Survey (ALLS). PIAAC combined the best practices of the previous designs and tested skills of adults from 16 to 65 years old across three information-processing domains: literacy, numeracy and problem-solving in technologically rich environments (PTRE). Respondents performed a variety of tasks in each of the domains. The survey defines literacy as “understanding, evaluating, using and engaging with written texts to participate in society, to achieve one’s goals, and to develop one’s knowledge and potential”; numeracy as “the ability to access, use, interpret and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life”; and PTRE as “the ability to use digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks”. Literacy and numeracy testing was paper- and computer-based. PTRE was administered only on computers. Due to several reasons, the number of missing values in PTRE is relatively high, so we exclude it from the analysis.

Each domain of the information-processing skills is represented by ten plausible values measuring the skills of participating individuals on the scale from 0 to 500\(^3\). It is

\(^3\)More information on the type of questions and scores interpretation is available from the PIAAC
common in the design of competency tests to have an algorithm guiding each respondent through a subset of the test items, which helps to reduce the length of the assessment and increase participation. All the answers are used to estimate a psychometric model based on Item Response Theory (IRT) and replicate weights, resulting in a skill proficiency measure for each participant (De Ayala (2013), Jakubowski (2013)). The purpose of the IRT model is to estimate respondents' unobserved abilities in each domain (literacy, numeracy) using information about their observed performance in tasks that are associated with each domain. The number of potential tasks is infinite, while only their finite subset may be tested on practice. Hence, this methodology is meaningful for the whole population, but not for any single individual. Most of the computations involve replicate weights, so jackknife standard errors are calculated and reported in the results.

We exclude students from the analysis and include only those respondents who currently have a job. We also restrict the age to 25-65 years in order to decrease the variation in the potential interaction between skills and professions. We further separate immigrants from the non-aboriginal Canadian-born population dividing them into two groups: recent (5 years or less from the landing date) and established (more than 5 years since landing) immigrants. The test results of immigrants in literacy and numeracy differ significantly from the Canadian born (Xu et al. (2017)). As discussed later, the same pertains to their overskilling rates.

It is also important to emphasize that the tests were conducted in the official

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Reader’s Companion.
language of the country, i.e. for Canada — in English or French. Hence, poor language abilities would be positively correlated with low scores. The survey does not have an objective measure of a respondent’s language skills. It includes self-reported language ability, which does not necessarily reflect the true level of language finesse. Tables 1 and 2 show that 50-60% of immigrants identify their official language proficiency as “very good”. Despite shortcoming of this measure, we include it in the analysis to control for the variation in the language abilities among immigrants.

Finally, note that in PIAAC aboriginals are represented by Metis, Inuit and First Nations who live off-reserve. The survey did not cover the indigenous populations living on reservation areas.

3 Methodology

There are no ideal measures of skill mismatch. Each method has its own advantages and disadvantages. Our methodology builds on Verdugo and Verdugo (1989) and the other research on skill mismatch discussed in the introduction, i.e. Allen et al. (2013) and Pellizzari and Fichen (2013). In the main part of our analysis we employ the method of realized matches (discussed below), but in section 5 we construct two additional measures of skill mismatch showing the consistency of the results across different methodologies.

Any employed individual possesses certain skills, and his job has certain skill
requirements. The difficulty with measuring skill mismatch is that there are no perfect measures of either, so comparing them is even more challenging. Skill mismatch occurs when a worker’s skills do not match the skills required by his job. PIAAC provides a measure (by no means ideal) of the worker’s skills in three information-processing domains, but the skills required by his job need to be derived from some observable information. PIAAC has two questions where respondents indirectly self-identify whether they are skill mismatched or not. For example, in one of the questions, an individual is asked to evaluate whether his skills are enough to cope with more demanding duties, while another question asks whether his skills allow to cope with his current duties. Then, following Pellizzari and Fichen (2013) an answer of "no" to both questions would indicate that the worker is matched. An answer of "yes" to at least one of the questions would indicate a mismatch. As with many other self-reporting assessments the results are prone to biases and thus excluded from the main analysis\(^5\).

We construct a more objective measure of skill mismatch by calculating an average skill level of workers in literacy and numeracy by each occupational category and then considering all workers with a skill level higher (lower) than one standard deviation from the mean to be overskilled (underskilled). Figure 1 provides an exposition of this method. Occupational groups are identified according to 2-digit National Occupational Classification of Canada\(^6\).

The major shortcoming of this method is that it does not capture heterogeneity of

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\(^5\)Section 5 includes two alternative methods for calculating mismatch, one of which is partly based on these questions.

\(^6\)https://www.canada.ca/en/employment-social-development/services/noc.html
Figure 1: Identifying skill-mismatched workers

...skills within same occupation groups, but it allows for a relatively detailed decomposition of industry skills into various categories serving as a proxy for the required skill levels (which are unobserved). It was not feasible to use three- or four-digit occupation codes due to the restrictions imposed by the sample size.

In the survey, there are 10 plausible values and 80 replicate weights for each observation. Hence there are $10 \times 80 = 800$ additional estimates. The standard errors accounting for the variability in those estimates are calculated as follows (see Wu (2005) for details):

$$SE_{\theta_p} = \sqrt{\sum_{p=1}^{P} \left( \frac{f \sum_{r=1}^{R} (\hat{\theta}_{r,p} - \bar{\theta}_{0,p})^2}{P} \right) + \left[ (1 + \frac{1}{P}) \sum_{p=1}^{P} (\hat{\theta}_{0,p} - \bar{\theta}_{0,p})^2 \right] \frac{1}{P - 1}}$$

where $\bar{\theta}_{0,P} = \frac{\sum_{r=1}^{R} \hat{\theta}_{0,p}}{P}$, $P$ is the number of plausible values, $\hat{\theta}_{r,p}$ is the estimate for replicate weight $r$ and plausible value $p$, $\hat{\theta}_{0,p}$ is the estimate for the final sample weight for plausible value $p$.

We calculate an individual’s skill mismatch for each of his ten plausible values...
for literacy and numeracy. Then, estimate a logistic regression for males and females in literacy and numeracy separately, where the dependent variable is the overskilling rate, and the independent variables include the variable of interest discerning between different population groups and a set of controls. The final estimates are produced by averaging out the results among ten regression equations:

\[ OS_{i,j} = \beta_0 + \beta_1^A A_i + \beta_2^I I_i + \gamma X_i + \epsilon_i \]  

(1)

where \( OS_{i,j} \) is a set of ten dummy variables of being either overskilled or not for each of the plausible values\(^7\). \( \beta_1^A \) is a set of dummy variables for three Indigenous groups (A), i.e. Metis, Inuit and First Nations. \( \beta_2^I \) is a set of dummies for immigrants (I), including recent immigrants who landed in Canada five or less years before the survey and established immigrants, who landed in Canada more than five years before the survey. The reference group is non-aboriginal Canadian-born population. \( \gamma \) is a vector of coefficients for controls including age, education, marital status, number of children, parents’ education, province and self-reported language ability.

We also run separate regressions for each of the population groups adding extra controls exclusive to the respondents of the corresponding group. This information is helpful in comparing the magnitude of effect that different factors may have on

\(^7\)Note that in this case the reference group is the people who are matched, which does not include underskilled individuals.
overskilling for various population groups:

Aboriginals subsample: \[ OS_{i,j} = \beta_0 + \beta_1 I_i + \beta_2 M_i + \alpha X_i + \epsilon_i \]

Immigrants subsample: \[ OS_{i,j} = \beta_0 + \beta_1 R_i + \phi X_i + \epsilon_i \] (2)

Other Canadian-born subsample: \[ OS_{i,j} = \beta_0 + \gamma X_i + \epsilon_i \]

where \( I_i \) defines Inuit, \( M_i \) — Metis and \( R_i \) — Recent Immigrants. First Nations is the reference group for aboriginals, and established immigrants is the reference group for immigrants. Extra controls include Indian status for aboriginals, i.e. whether an individual is an officially registered Indian or not, and country of highest education for immigrants.

4 Overskilling Rates

Tables 1 and 2 present summary statistics for the sample revealing a stark difference in the observed distributions of socio-demographic characteristics between Inuit and other population groups. In particular, we see that their education is significantly skewed toward lower levels (Hu et al. (2019) also point this out), and there are not many people present in provinces other than the territories. They are younger, and more than 60% do not have a single parent who attained upper secondary education. Other indigenous groups are to a larger extent in line with non-aboriginal Canadian born, with the exception of their location across provinces and the presence of a spouse.
Table 3 describes the results of the baseline model. It may be inferred that there is no significant difference in the probability of being overskilled between aboriginals and the other Canadian born. Moreover, as Table 4 suggests, there is no significant difference among groups of indigenous peoples in the likelihood of being overskilled when considered separately. In contrast, immigrants are almost twice less likely to be overskilled in comparison to other Canadian born. Interestingly, spending more time in Canada does not affect this probability — the likelihood of being overskilled for recent immigrants is not significantly different from the one for established immigrants (Table 5). We mentioned above that there is no objective measure of the language ability in this survey — respondents self-identify how well they wield one of the official languages of Canada. As such, it is possible that even after controlling for “subjective” language skills, the results could be attributed to the “objective” and unobserved variation in the true language ability. The same phenomenon was documented by the literature examining immigrants’ skills in other countries (e.g. Batalova and Fix (2014), Lind and Mellander (2016)).

The outcomes for males and females align across most of the considered variables. Immigrant males seem to have a lower probability of being overskilled than females, and the results are stronger for established immigrants. A possible explanation of this phenomenon is that men are generally better matched in the labor market after a couple immigrates to Canada (Phan et al. (2015)). The results are more robust in the presence of children (in our sample around 65% of recent immigrants and 80% of established immigrants have children). Another interesting result in the gender differences is that
parents’ education has significant effect only on males, but not on females, and this result holds exclusively for non-aboriginal Canadian born. In particular, if neither parent has attained upper secondary education then non-aboriginal males are almost twice as unlikely to be overskilled in comparison to their peers whose parents attained a tertiary degree, while for females this effect is not significant. We did not find any literature providing evidence toward different effect of parents’ education on males and females except Sewell and Shah (1968), who showed that parents’ education indeed seem to affect males and females with various magnitude.

Tables 3-6 suggest that education is a strong predictor of being overskilled, but only for non-aboriginal Canadian born. In general, lower levels of education engender lower probability of being overskilled. This result is most likely due to the fact that lower-skilled jobs have less heterogeneity in both required and supplied skills. In addition, aboriginal groups have less variation in the education levels, which may also have affected this result (especially combined with a low sample size for Inuit). Immigrants do not show this tendency, because their education is not necessarily representative of their skills in the official language of the new country. Hence, non-aboriginal Canadian born is the only group who is not affected by aforementioned issues.
5 Additional Measures of Overskilling

Previously, we argued that no measure of skill mismatch / overskilling is perfect. In this section we compute overskilling using two other methods and show that the results from the baseline model hold.

5.1 OECD method

The OECD method is based on Pellizzari and Fichen (2013) and is similar to the one employed in the main part of the analysis, because it aims at identifying the variation in the skill requirements across industries by establishing a range of values around a central tendency measure. It employs a hybrid approach where the matched population is identified from the following two questions of the survey:

1. Do you feel that you have the skills to cope with more demanding duties than those you are required to perform in your current job? Yes/No

2. Do you feel that you need further training in order to cope well with your present duties? Yes/No

An answer of “no” to both questions indicates that the worker is matched. An answer of “yes” to the first question and “no” to the second question suggests that the worker is overskilled. An answer of “no” to the first question and “yes” to the second question suggests that the worker is underskilled. Then, for matched workers within each 1-digit International Standard Classification of Occupations (ISCO) categories\(^8\) we

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\(^8\)Following Pellizzari and Fichen (2013) we exclude armed forces (ISCO code 10) and skilled agricultural and fishery workers (ISCO code 6) due to the shortage of observations. We also combine managers (ISCO code 1) and professionals (ISCO code 2).
calculate 5\textsuperscript{th} and 95\textsuperscript{th} percentiles for literacy and numeracy. Workers with scores outside this range are identified as mismatched (overskilled if higher than 95\textsuperscript{th} percentile and underskilled if lower than the 5\textsuperscript{th} percentile).

We estimate a similar regression to the one in the baseline model for the whole sample:

$$OS_{i,j} = \beta_0 + \beta_1 A_i + \beta_2 I_i + \gamma X_i + \epsilon_i$$  \hspace{1cm} (3)

Now, however, overskilling $OS_{i,j}$ is calculated according to the OECD method discussed above. The results are presented in Table 7, which shows that most of the observed phenomena remained the same. In particular, there is still no significant difference in the probabilities of being overskilled between aboriginal and non-aboriginal Canadian born. Due to the small sample size, estimates for Inuit are not reliable, but were retained in the table. Most of the coefficients for immigrants became insignificant even though their actual numbers are not different from those received in the baseline model. Most likely, it occurred due to a very small number of observations on the tails of skill distribution for all population groups.

Similar to the “realized matches” method employed in the main part of the analysis, OECD method has its shortcomings. It shares the problem of the former method in that it does not account well for the heterogeneity of skills used across each of the occupation groups. Meanwhile, it still provides a measure of the central tendency for skill levels across occupation categories, which serves as a proxy for the average required skills.
Another problem with this method is that questions 1 and 2 do not specify which skills exactly workers need to identify when answering them. Hence, it is implied that workers are matched on literacy and numeracy, when in reality their answers may be much broader. This method assumes that the skill distributions among underskilled, matched and overskilled workers are non-overlapping, when in practice it is hardly the truth. In fact, Allen et al. (2013) shares these concerns indicating that relying on well-matched workers is redundant in practice.

Finally, the choice of 5-95th percentiles is arbitrary. The decrease of this range would inevitably lead to higher overskilling rates.

5.2 Krahn and Lowe Method

In this section we develop a measure of skill mismatch based on Krahn and Lowe methodology (Krahn and Lowe (1998)). We identify skills required by a job based on how frequently individuals carry out different tasks in literacy and numeracy at their workplaces. The latter information is contained in the survey: the respondents were asked about the frequency with which they perform various activities in one of the information-processing domains. For literacy, an example would be reading (and writing) reports, journals, financial statements, diagrams, maps or schematics and other publications; for numeracy — using a calculator, preparing charts, applying simple algebra or advanced math/statistics etc. There are around 15 questions in total.

The frequency of using each of the activities is measured on a scale from 1 (never use) to 5 (use every day). We subdivide activities into three categories: reading, writing
and numeracy and then calculate the average among the answers within each of the groups rounding it to the lowest integer. As a result, we derive 4 skill levels required by the job with 1 being the lowest required skill level and 4 being the highest required skill level. The received values for reading and writing groups are averaged to produce a literacy index. Without any further alterations, the value for the numeracy group is transformed into a numeracy index.

Using calculated literacy and numeracy indices as a proxy for the required skill level we compare them to the respondents’ actual skills measured by the test scores, which are also grouped into 4 classes based on the suggested categories from the survey. The following ranges of test scores for literacy and numeracy were used: 0-225 for skill level 1, 226-275 for skill level 2, 276-325 for skill level 3 and 326-500 for skill level 4\(^9\). The two-level difference between the required and the actual skill level then constitutes a skill mismatch. For example, if a respondent has a skill level 1 in literacy, and the required skill level in literacy for his job is 3 or 4, then this worker will be deemed as underskilled. Likewise, if a worker’s skill in numeracy is 4, and the job requirement in numeracy is skill level 2 or 1, then he will be deemed as overskilled.

We estimate a similar regression to the one in the baseline model for the whole sample using the new overskilling measure:

\[
OS_{i,j} = \beta_0 + \beta_1 A_i + \beta_2 I_i + \gamma X_i + \epsilon_i
\]  
\(^{(4)}\)

The results are presented in Table 8, which shows that this approach did not produce any significant differences between aboriginal and non-aboriginal Canadian born in the probability of being overskilled for their jobs.

The main problem with this method is that it equalizes the frequency with which a worker uses some skill at his job with the skill actually required for this job, but the skill level of the worker will mostly likely select him into the position requiring a different frequency for using this skill. Allen et al. (2013) show that there is indeed positive correlation between the two. In addition, the way calculated literacy and numeracy indices are matched to respondent’s skill levels is somewhat arbitrary, because they are measured on different scales.

6 Skill Mismatch

Skill mismatch has negative consequences for workers and for their employers. However, it may be argued that overskilling is worse than underskilling. When a worker is overskilled, he is performing a job, which most likely does not make him happy. Thus, there are two losses of productivity: the reduced effort from performing an inferior job and decreased productivity from not accomplishing a higher-skilled job. When a worker is underskilled it does not necessarily mean that he is not able to perform his job well, and the productivity suffers. An underskilled worker may have more incentives to perform his job well and to acquire new skills and knowledge. He is constantly challenged by new ordeals, which may eventually improve his skills and productivity. Despite the
innate difference between the two, the literature has identified both overskilling and underskilling as hazardous phenomena for economies. In this section we calculate skill mismatch for diverse population groups and investigate whether it supersedes any results from the main part of our analysis.

We run the same regressions as (1), (3) and (4), but change the dependent variable to skill mismatch (measured by three discussed approaches) instead of overskilling. The results are presented in Table 9, which shows that the probability of being skill mismatched is not significantly different between aboriginal and non-aboriginal Canadian born. Skill mismatch rates for Inuit females are statistically significant, but with high standard errors these estimates are not reliable. Interestingly, immigrants are no longer less likely to be skill mismatched in comparison to non-aboriginal Canadian born. This result may be driven by a larger percentage of underskilled immigrants, which cancels out the effect of overskilling. In addition, education is no longer a predictor of skill mismatch.

7 Overskilling and Wages

Overskilling on its own may be a good proxy for workplace discrimination, but it does not tell us much about its economic consequences. One of the most salient indicators of economic discrimination is wage — specifically, the wage differentials between different population groups. The goal of this section is to estimate the differences in wages across examined population groups controlling for both skills and overskilling in addition to
socio-demographic characteristics. To do that we estimate an adapted version of the regression specified by Hu et al. (2019), where we gradually add ancillary controls:

$$\ln w_i = \beta_0 + \beta_1 A_i + \beta_2 I_i + \psi S_{ij}^{li,n} + \phi OS_{ij}^{li,n} + \gamma X_i + \epsilon_i$$  

where $\ln w_i$ is the natural logarithm of hourly wage$^{10}$. In addition to dummies for aboriginals ($A_i$) and immigrants ($I_i$) as well as controls for socio-demographic variables, this regression also includes a respondent’s skill level in both literacy and numeracy ($S_{ij}^{li,n}$) and whether he is overskilled in literacy or numeracy ($OS_{ij}^{li,n}$). Subscript $i$ indicates the unique observation, $j = 1, \ldots, 10$ stands for plausible values, and $k = \{RM, OECD, K&L\}$ represents measures of overskilling calculated based on the discussed methods: realized matches, OECD, and Krahn and Lowe.

Table 10 presents the results. For exposition purposes it includes overskilling calculated only according to the “realized matches” approach. Other methods lead to the same outcomes. We can see that the wage differentials decrease for each aboriginal group with the addition of more controls, but in most of the specifications only the First-Nation men are the ones who earn significantly less than the other Canadian born. From extensive literature we know that females are commonly more likely to experience higher wage differentials than males, so it is surprising to see that for the First Nations this situation reverses. This phenomenon requires further examination and may potentially inform corresponding policies of the Canadian government toward

$^{10}$We exclude respondents who reported hourly wage lower than $5 or higher than $1000. In addition, using raw hourly wage does not change the results.
indigenous populations.

8 Conclusion

The paper analyzed overskilling among indigenous peoples of Canada. Using the PIAAC survey we have constructed several measures of skill mismatch and tested whether aboriginal populations were more likely to be overskilled than non-aboriginal Canadian born. We did not find any significant difference in the overskilling rates between aboriginals and the other Canadian born across a number of specifications (and for skill mismatch in general). We argue that overskilling may be a signal for workplace discrimination, and our results show that it is not the case for aboriginals. The main consequences of overskilling are deteriorating health, loss of productivity and stagnation of skills, and indigenous people are not more likely to experience them. Hence, we can add one more argument toward the importance of policies aimed at education and promotion of other institutions positively affecting social demography of indigenous peoples. Interestingly, immigrants were found to be underskilled. Bereft of an objective measure of their true language abilities it is hard to conclude whether it is indeed the case or the results are biased due to a missing variable (recall that tests were administered in the official language of the country).

Each measure of skill mismatch that was used in this analysis has its own advantages and disadvantages. Both skills required by a profession and skills possessed by an individual are not observable and hard to measure. Identifying a mismatch
between the two is even of a greater challenge. We have employed several methods to measure overskilling, and none of them showed significant difference between aboriginal and non-aboriginal Canadian born in the probability of being overskilled in literacy and numeracy. We believe that despite the discussed shortcomings of each of the methods individually, together they provide strong evidence supporting the absence of workplace discrimination of aboriginals in Canada, and their labor outcomes are solely determined by poorer socio-demographic institutional structures as was documented by vast previous literature. However, some of the results may be due to small sample sizes (especially for Inuit).

Lastly, we have examined the wage differentials among different population groups controlling for their skill levels and overskilling rates. We found that among all indigenous peoples of Canada First-Nation males earn significantly less than their non-aboriginal Canadian-born counterparts. This result may be important for the formulation of corresponding public policies.
References


Table 1: Summary statistics, males

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Notes: The sample includes working males from 25 to 65 years old and excludes students. Numbers are given in percentages with the average sample size across subgroups.
Table 2: Summary statistics, females

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Notes: The sample includes working females from 25 to 65 years old and excludes students. Numbers are given in percentages with the average sample size across subgroups.
Table 3: Odds of being overskilled, full sample (realized matches)

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<td>Odds</td>
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<td>0.658</td>
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<td>0.567</td>
<td>(0.3705)</td>
<td>0.529</td>
<td>(0.4855)</td>
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<td>(0.3957)</td>
<td>0.952</td>
<td>(0.5345)</td>
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<td>(0.3896)</td>
<td>0.751</td>
<td>(0.4518)</td>
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<td>(13.2340)</td>
<td>0.006</td>
<td>(12.7350)</td>
<td>0.024</td>
<td>(11.7730)</td>
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<td>(17.0190)</td>
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<tr>
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<td>(0.3312)</td>
<td>0.424**</td>
<td>(0.4217)</td>
<td>0.662</td>
<td>(0.3120)</td>
<td>0.423*</td>
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<td>Established immigrants</td>
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<td>(0.2104)</td>
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<td>(0.3263)</td>
<td>0.578**</td>
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<td>0.435**</td>
<td>(0.3971)</td>
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Notes: statistical significance is represented by * for 10%, ** for 5% and *** for 1%. Jackknife standard errors are in parenthesis. Controls include age, education, children, self-assessed language ability, parents’ education, spouse and province of residence.
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<td>0.163 (1.6218)</td>
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<td>0.179 (1.3558)</td>
</tr>
<tr>
<td>High school diploma</td>
<td>0.492 (1.0820)</td>
<td>0.416 (0.8627)</td>
<td>0.215 (0.9949)</td>
</tr>
<tr>
<td>Below bachelor’s degree</td>
<td>0.695 (1.0201)</td>
<td>0.349* (0.5863)</td>
<td>0.714 (0.7249)</td>
</tr>
<tr>
<td>First prof. degree, master’s or PhD</td>
<td>0.744 (1.7816)</td>
<td>0.572 (0.8520)</td>
<td>0.410 (1.3106)</td>
</tr>
<tr>
<td>Registered Indian (ref = official indian status)</td>
<td></td>
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</tr>
<tr>
<td>Not registered</td>
<td>2.371 (0.6721)</td>
<td>1.826 (0.6154)</td>
<td>2.225 (0.6280)</td>
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<tr>
<td>Parents’ education (ref = at least one parent has attained tertiary)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Neither attained upper secondary</td>
<td>0.507 (0.6930)</td>
<td>0.339 (0.8335)</td>
<td>0.542 (0.8583)</td>
</tr>
<tr>
<td>One attained post-sec. non-tertiary</td>
<td>0.579 (0.7498)</td>
<td>0.573 (0.5948)</td>
<td>0.938 (0.6401)</td>
</tr>
<tr>
<td>Province (ref = Ontario)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlantic provinces</td>
<td>1.657 (1.1071)</td>
<td>1.001 (0.8689)</td>
<td>1.263 (1.2074)</td>
</tr>
<tr>
<td>Quebec</td>
<td>2.190 (1.3061)</td>
<td>0.852 (1.5846)</td>
<td>1.887 (1.9995)</td>
</tr>
<tr>
<td>Prairies</td>
<td>2.383 (0.9437)</td>
<td>0.937 (0.8331)</td>
<td>2.322 (0.7235)</td>
</tr>
<tr>
<td>British Columbia</td>
<td>2.652 (1.0807)</td>
<td>0.658 (0.8543)</td>
<td>1.661 (0.7145)</td>
</tr>
<tr>
<td>Territories</td>
<td>0.971 (1.2992)</td>
<td>0.589 (1.3033)</td>
<td>0.666 (1.2537)</td>
</tr>
<tr>
<td>Spouse (ref = no spouse)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Has a spouse</td>
<td>0.908 (0.7979)</td>
<td>1.151 (0.9077)</td>
<td>1.084 (0.9515)</td>
</tr>
</tbody>
</table>

Notes: statistical significance is represented by * for 10%, ** for 5% and *** for 1%. Jackknife standard errors are in parenthesis.
Table 5: Odds of being overskilled, immigrants (realized matches)

<table>
<thead>
<tr>
<th></th>
<th>Literacy</th>
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<td></td>
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<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Odds</td>
<td>SE</td>
<td>Odds</td>
<td>SE</td>
</tr>
<tr>
<td>Intercept **</td>
<td>0.033***</td>
<td>(1.0611)</td>
<td>0.033***</td>
<td>(1.0611)</td>
</tr>
<tr>
<td><strong>Age groups (ref = 35-44 years)</strong></td>
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<td></td>
</tr>
<tr>
<td>25-34 years</td>
<td>0.902</td>
<td>(0.6844)</td>
<td>0.902</td>
<td>(0.6844)</td>
</tr>
<tr>
<td>45-54 years</td>
<td>0.931</td>
<td>(0.6921)</td>
<td>0.931</td>
<td>(0.6921)</td>
</tr>
<tr>
<td>55-65 years</td>
<td>2.339</td>
<td>(1.2254)</td>
<td>2.339</td>
<td>(1.2254)</td>
</tr>
<tr>
<td><strong>Children (ref = youngest child ≤ 12 years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No children</td>
<td>0.908</td>
<td>(0.6118)</td>
<td>0.908</td>
<td>(0.6118)</td>
</tr>
<tr>
<td>Youngest child &gt; 12 years</td>
<td>0.424</td>
<td>(1.0775)</td>
<td>0.424</td>
<td>(1.0775)</td>
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<tr>
<td><strong>Education (ref = bachelor’s degree)</strong></td>
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</tr>
<tr>
<td>Less than high school diploma</td>
<td>0.476</td>
<td>(2.6195)</td>
<td>0.476</td>
<td>(2.6195)</td>
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<tr>
<td>High school diploma</td>
<td>0.983</td>
<td>(1.1266)</td>
<td>0.983</td>
<td>(1.1266)</td>
</tr>
<tr>
<td>Below bachelor’s degree</td>
<td>0.855</td>
<td>(0.7463)</td>
<td>0.855</td>
<td>(0.7463)</td>
</tr>
<tr>
<td>First prof. degree, master’s or PhD</td>
<td>1.707</td>
<td>(0.6162)</td>
<td>1.707</td>
<td>(0.6162)</td>
</tr>
<tr>
<td><strong>Years since landing in Canada (ref = immigrants ≥ 5 years since landing)</strong></td>
<td></td>
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</tr>
<tr>
<td>&lt; 5 years since landing</td>
<td>1.577</td>
<td>(0.5970)</td>
<td>1.577</td>
<td>(0.5970)</td>
</tr>
<tr>
<td><strong>Self-assessed language ability (ref = very good)</strong></td>
<td></td>
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<tr>
<td>Poor or can’t speak</td>
<td>1.781</td>
<td>(2.3871)</td>
<td>1.781</td>
<td>(2.3871)</td>
</tr>
<tr>
<td>Fair</td>
<td>0.631</td>
<td>(1.4697)</td>
<td>0.631</td>
<td>(1.4697)</td>
</tr>
<tr>
<td>Good</td>
<td>0.986</td>
<td>(0.8908)</td>
<td>0.986</td>
<td>(0.8908)</td>
</tr>
<tr>
<td><strong>Parents’ education (ref = at least one parent has attained tertiary)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither attained upper secondary</td>
<td>0.607</td>
<td>(0.8539)</td>
<td>0.607</td>
<td>(0.8539)</td>
</tr>
<tr>
<td>One attained post-sec. non-tertiary</td>
<td>0.942</td>
<td>(0.6517)</td>
<td>0.942</td>
<td>(0.6517)</td>
</tr>
<tr>
<td><strong>Province (ref = Ontario)</strong></td>
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<td></td>
</tr>
<tr>
<td>Atlantic provinces</td>
<td>0.310</td>
<td>(5.9776)</td>
<td>0.310</td>
<td>(5.9776)</td>
</tr>
<tr>
<td>Quebec</td>
<td>0.917</td>
<td>(0.4718)</td>
<td>0.917</td>
<td>(0.4718)</td>
</tr>
<tr>
<td>Prairies</td>
<td>0.501</td>
<td>(0.9300)</td>
<td>0.501</td>
<td>(0.9300)</td>
</tr>
<tr>
<td>British Columbia</td>
<td>0.656</td>
<td>(0.9067)</td>
<td>0.656</td>
<td>(0.9067)</td>
</tr>
<tr>
<td>Territories</td>
<td>0.580</td>
<td>(1.0933)</td>
<td>0.580</td>
<td>(1.0933)</td>
</tr>
<tr>
<td><strong>Country of highest education (ref = other countries)</strong></td>
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<tr>
<td>Canada</td>
<td>2.098</td>
<td>(0.7359)</td>
<td>2.098</td>
<td>(0.7359)</td>
</tr>
<tr>
<td>US, W/N Europe, Australia, NZ</td>
<td>2.004</td>
<td>(0.9936)</td>
<td>2.004</td>
<td>(0.9936)</td>
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<td><strong>Spouse (ref = no spouse)</strong></td>
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<tr>
<td>Has a spouse</td>
<td>1.885</td>
<td>(1.0607)</td>
<td>1.885</td>
<td>(1.0607)</td>
</tr>
</tbody>
</table>

Notes: statistical significance is represented by * for 10%, ** for 5% and *** for 1%. Jackknife standard errors are in parenthesis.
Table 6: Odds of being overskilled, non-aboriginal Canadian born (realized matches)

<table>
<thead>
<tr>
<th>Literacy</th>
<th>Male</th>
<th>Odds</th>
<th>SE</th>
<th>Female</th>
<th>Odds</th>
<th>SE</th>
<th>Male</th>
<th>Odds</th>
<th>SE</th>
<th>Female</th>
<th>Odds</th>
<th>SE</th>
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</tr>
<tr>
<td>Intercept</td>
<td>0.560</td>
<td>(0.3544)</td>
<td>0.380***</td>
<td>(0.3040)</td>
<td>0.525*</td>
<td>(0.3674)</td>
<td>0.303***</td>
<td>(0.3474)</td>
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<tr>
<td>Age groups (ref = 35-44 years)</td>
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</tr>
<tr>
<td>25-34 years</td>
<td>1.266</td>
<td>(0.2268)</td>
<td>1.182</td>
<td>(0.2917)</td>
<td>1.284</td>
<td>(0.2666)</td>
<td>1.260</td>
<td>(0.2445)</td>
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<tr>
<td>45-54 years</td>
<td>1.070</td>
<td>(0.2326)</td>
<td>0.894</td>
<td>(0.3111)</td>
<td>0.989</td>
<td>(0.2747)</td>
<td>1.031</td>
<td>(0.2814)</td>
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<tr>
<td>55-65 years</td>
<td>0.914</td>
<td>(0.3517)</td>
<td>0.691</td>
<td>(0.3428)</td>
<td>0.969</td>
<td>(0.3292)</td>
<td>0.855</td>
<td>(0.3503)</td>
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</tr>
<tr>
<td>Children (ref = youngest child ≤ 12 years)</td>
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</tr>
<tr>
<td>No children</td>
<td>0.961</td>
<td>(0.2253)</td>
<td>0.953</td>
<td>(0.2474)</td>
<td>0.928</td>
<td>(0.2289)</td>
<td>0.842</td>
<td>(0.2749)</td>
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<tr>
<td>Youngest child &gt; 12 years</td>
<td>0.821</td>
<td>(0.2294)</td>
<td>0.851</td>
<td>(0.2816)</td>
<td>0.952</td>
<td>(0.2327)</td>
<td>0.937</td>
<td>(0.3193)</td>
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<tr>
<td>Education (ref = bachelor’s degree)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school diploma</td>
<td>0.205***</td>
<td>(0.5773)</td>
<td>0.077*</td>
<td>(1.4741)</td>
<td>0.165***</td>
<td>(0.5633)</td>
<td>0.109*</td>
<td>(1.1782)</td>
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</tr>
<tr>
<td>High school diploma</td>
<td>0.434***</td>
<td>(0.2722)</td>
<td>0.393***</td>
<td>(0.2433)</td>
<td>0.346***</td>
<td>(0.2780)</td>
<td>0.375***</td>
<td>(0.3161)</td>
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</tr>
<tr>
<td>Below bachelor’s degree</td>
<td>0.545***</td>
<td>(0.1880)</td>
<td>0.546***</td>
<td>(0.1901)</td>
<td>0.568***</td>
<td>(0.1887)</td>
<td>0.505***</td>
<td>(0.2271)</td>
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</tr>
<tr>
<td>First prof. degree, master’s or PhD</td>
<td>1.046</td>
<td>(0.2821)</td>
<td>1.104</td>
<td>(0.3009)</td>
<td>0.921</td>
<td>(0.2855)</td>
<td>1.130</td>
<td>(0.3067)</td>
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<td></td>
</tr>
<tr>
<td>Parents’ education (ref = at least one parent has attained tertiary)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Neither attained upper secondary</td>
<td>0.532***</td>
<td>(0.2359)</td>
<td>0.688</td>
<td>(0.2472)</td>
<td>0.518***</td>
<td>(0.2385)</td>
<td>0.755</td>
<td>(0.2980)</td>
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<tr>
<td>One attained post-sec. non-tertiary</td>
<td>0.892</td>
<td>(0.1983)</td>
<td>0.975</td>
<td>(0.2274)</td>
<td>0.798</td>
<td>(0.1834)</td>
<td>1.000</td>
<td>(0.1876)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Province (ref = Ontario)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlantic provinces</td>
<td>0.902</td>
<td>(0.2028)</td>
<td>0.923</td>
<td>(0.1894)</td>
<td>0.884</td>
<td>(0.1794)</td>
<td>0.868</td>
<td>(0.2111)</td>
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</tr>
<tr>
<td>Quebec</td>
<td>0.813</td>
<td>(0.2009)</td>
<td>0.658</td>
<td>(0.1978)</td>
<td>0.819</td>
<td>(0.1803)</td>
<td>0.796</td>
<td>(0.2517)</td>
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</tr>
<tr>
<td>Prairies</td>
<td>1.017</td>
<td>(0.2828)</td>
<td>1.249</td>
<td>(0.2431)</td>
<td>1.020</td>
<td>(0.2425)</td>
<td>1.275</td>
<td>(0.2751)</td>
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</tr>
<tr>
<td>British Columbia</td>
<td>0.899</td>
<td>(0.3175)</td>
<td>1.313</td>
<td>(0.3326)</td>
<td>0.916</td>
<td>(0.2979)</td>
<td>1.205</td>
<td>(0.3280)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Territories</td>
<td>0.996</td>
<td>(0.5310)</td>
<td>0.823</td>
<td>(0.5423)</td>
<td>1.051</td>
<td>(0.5000)</td>
<td>0.802</td>
<td>(0.4959)</td>
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<td></td>
</tr>
<tr>
<td>Spouse (ref = no spouse)</td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Has a spouse</td>
<td>0.976</td>
<td>(0.3051)</td>
<td>1.054</td>
<td>(0.2371)</td>
<td>1.225</td>
<td>(0.2992)</td>
<td>0.950</td>
<td>(0.2720)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: statistical significance is represented by * for 10%, ** for 5% and *** for 1%. Jackknife standard errors are in parenthesis.
Table 7: Odds of being overskilled, full sample (OECD method)

<table>
<thead>
<tr>
<th>Population groups (ref = Non-indigenous Canadian born)</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Nations</td>
<td>0.607 (0.5772)</td>
<td>0.701 (0.4681)</td>
<td>0.436 (0.5344)</td>
<td>0.383 (0.8270)</td>
</tr>
<tr>
<td>Metis</td>
<td>1.917 (0.5149)</td>
<td>0.877 (0.6907)</td>
<td>1.699 (0.5312)</td>
<td>0.663 (1.0318)</td>
</tr>
<tr>
<td>Inuit</td>
<td>0 (17.386)</td>
<td>0 (18.146)</td>
<td>0.001 (16.702)</td>
<td>0 (18.535)</td>
</tr>
<tr>
<td>Recent immigrants</td>
<td>0.558 (0.4582)</td>
<td>0.564 (0.5155)</td>
<td>0.677 (0.4020)</td>
<td>0.450 (0.6959)</td>
</tr>
<tr>
<td>Established immigrants</td>
<td>0.463 (0.3708)</td>
<td>0.489 (0.5131)</td>
<td>0.566* (0.3104)</td>
<td>0.549 (0.5715)</td>
</tr>
</tbody>
</table>

Notes: statistical significance is represented by * for 10%, ** for 5% and *** for 1%. Jackknife standard errors are in parenthesis. Controls include age, education, children, self-assessed language ability, parents’ education, spouse and province of residence.

Table 8: Odds of being overskilled, full sample (Krahn and Lowe method)

<table>
<thead>
<tr>
<th>Population groups (ref = Non-indigenous Canadian born)</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Nations</td>
<td>1.466 (0.4949)</td>
<td>0.891 (0.4392)</td>
<td>1.213 (0.3993)</td>
<td>0.611 (0.3996)</td>
</tr>
<tr>
<td>Metis</td>
<td>1.200 (0.4508)</td>
<td>1.279 (0.4966)</td>
<td>0.885 (0.3083)</td>
<td>0.827 (0.4222)</td>
</tr>
<tr>
<td>Inuit</td>
<td>0.000 (15.043)</td>
<td>0.000 (17.338)</td>
<td>0.402 (1.1338)</td>
<td>0.009 (11.880)</td>
</tr>
<tr>
<td>Recent immigrants</td>
<td>0.692 (0.5763)</td>
<td>0.541 (0.4363)</td>
<td>0.882 (0.3352)</td>
<td>0.332*** (0.3066)</td>
</tr>
<tr>
<td>Established immigrants</td>
<td>0.585 (0.3749)</td>
<td>0.575* (0.3237)</td>
<td>0.787 (0.2390)</td>
<td>0.590** (0.2181)</td>
</tr>
</tbody>
</table>

Notes: statistical significance is represented by * for 10%, ** for 5% and *** for 1%. Jackknife standard errors are in parenthesis. Controls include age, education, children, self-assessed language ability, parents’ education, spouse and province of residence.
Table 9: Odds of being mismatched, full sample, different methods

<table>
<thead>
<tr>
<th></th>
<th>Literacy</th>
<th>Numeracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Odds</td>
<td>SE</td>
</tr>
<tr>
<td>Realized Matches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Nations</td>
<td>0.904 (0.2604)</td>
<td>0.961 (0.2198)</td>
</tr>
<tr>
<td>Metis</td>
<td>0.768 (0.3259)</td>
<td>1.079 (0.3381)</td>
</tr>
<tr>
<td>Inuit</td>
<td>0.454 (0.7279)</td>
<td>0.402* (0.4811)</td>
</tr>
<tr>
<td>Recent immigrants (≤ 5 years since landing)</td>
<td>1.050 (0.2303)</td>
<td>0.855 (0.2516)</td>
</tr>
<tr>
<td>Established immigrants (&gt; 5 years since landing)</td>
<td>1.024 (0.1517)</td>
<td>0.783 (0.1973)</td>
</tr>
<tr>
<td>OECD Method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Nations</td>
<td>1.311 (0.5716)</td>
<td>1.099 (0.3584)</td>
</tr>
<tr>
<td>Metis</td>
<td>0.596 (0.4532)</td>
<td>1.149 (0.5447)</td>
</tr>
<tr>
<td>Inuit</td>
<td>1.357 (0.6410)</td>
<td>0.404 (0.7096)</td>
</tr>
<tr>
<td>Recent immigrants (≤ 5 years since landing)</td>
<td>1.324 (0.3290)</td>
<td>1.097 (0.3932)</td>
</tr>
<tr>
<td>Established immigrants (&gt; 5 years since landing)</td>
<td>1.244 (0.2806)</td>
<td>0.982 (0.3084)</td>
</tr>
<tr>
<td>Krahn and Lowe Method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Nations</td>
<td>0.628 (0.3314)</td>
<td>0.854 (0.2937)</td>
</tr>
<tr>
<td>Metis</td>
<td>0.923 (0.3541)</td>
<td>0.794 (0.3547)</td>
</tr>
<tr>
<td>Inuit</td>
<td>1.293 (0.6060)</td>
<td>0.441 (0.7880)</td>
</tr>
<tr>
<td>Recent immigrants (≤ 5 years since landing)</td>
<td>1.072 (0.3478)</td>
<td>0.897 (0.1108)</td>
</tr>
<tr>
<td>Established immigrants (&gt; 5 years since landing)</td>
<td>0.967 (0.2276)</td>
<td>0.828 (0.2135)</td>
</tr>
</tbody>
</table>

Notes: statistical significance is represented by * for 10%, ** for 5% and *** for 1%. Reference group is non-aboriginal Canadian born. Jackknife standard errors are in parenthesis. Controls include age, education, children, self-assessed language ability, parents' education, spouse and province of residence.
Table 10: Differences in Log Hourly Wages

<table>
<thead>
<tr>
<th></th>
<th>Basic Controls</th>
<th>+ Education</th>
<th>+ Skills / Noc / WorkExp</th>
<th>+ Overskilling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Est.</td>
<td>SE</td>
<td>Est.</td>
<td>SE</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Nations</td>
<td>-0.229*** (0.035)</td>
<td>-0.141*** (0.034)</td>
<td>-0.122*** (0.041)</td>
<td>-0.160*** (0.05)</td>
</tr>
<tr>
<td>Metis</td>
<td>-0.108*** (0.031)</td>
<td>-0.054* (0.033)</td>
<td>-0.033 (0.038)</td>
<td>-0.048 (0.047)</td>
</tr>
<tr>
<td>Inuit</td>
<td>-0.158 (0.134)</td>
<td>-0.013 (0.146)</td>
<td>0.071 (0.126)</td>
<td>0.161 (0.205)</td>
</tr>
<tr>
<td>Recent Immigrants</td>
<td>-0.263*** (0.043)</td>
<td>-0.400*** (0.047)</td>
<td>-0.257*** (0.042)</td>
<td>-0.266*** (0.053)</td>
</tr>
<tr>
<td>Established Immigrants</td>
<td>-0.033 (0.037)</td>
<td>-0.108*** (0.037)</td>
<td>-0.060 (0.037)</td>
<td>-0.066* (0.04)</td>
</tr>
<tr>
<td>R²</td>
<td>0.253</td>
<td>0.359</td>
<td>0.454</td>
<td>0.473</td>
</tr>
<tr>
<td>Observations</td>
<td>6392</td>
<td>5947</td>
<td>5570</td>
<td>4476</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Basic Controls</th>
<th>+ Education</th>
<th>+ Skills / Noc / WorkExp</th>
<th>+ Overskilling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Est.</td>
<td>SE</td>
<td>Est.</td>
<td>SE</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Nations</td>
<td>-0.178*** (0.035)</td>
<td>-0.106*** (0.033)</td>
<td>-0.068** (0.032)</td>
<td>-0.042 (0.036)</td>
</tr>
<tr>
<td>Metis</td>
<td>0.017 (0.060)</td>
<td>0.090 (0.069)</td>
<td>0.117 (0.076)</td>
<td>0.092 (0.088)</td>
</tr>
<tr>
<td>Inuit</td>
<td>-0.192* (0.092)</td>
<td>-0.020 (0.093)</td>
<td>0.044 (0.075)</td>
<td>0.138* (0.076)</td>
</tr>
<tr>
<td>Recent Immigrants</td>
<td>-0.130*** (0.043)</td>
<td>-0.293*** (0.047)</td>
<td>-0.120*** (0.043)</td>
<td>-0.130*** (0.052)</td>
</tr>
<tr>
<td>Established Immigrants</td>
<td>0.018 (0.032)</td>
<td>-0.066** (0.029)</td>
<td>0.026 (0.028)</td>
<td>0.028 (0.035)</td>
</tr>
<tr>
<td>R²</td>
<td>0.206</td>
<td>0.363</td>
<td>0.432</td>
<td>0.448</td>
</tr>
<tr>
<td>Observations</td>
<td>6935</td>
<td>6460</td>
<td>5648</td>
<td>4289</td>
</tr>
</tbody>
</table>

Notes: statistical significance is represented by * for 10%, ** for 5% and *** for 1%. Reference group is non-aboriginal Canadian born. Jackknife standard errors are in parenthesis. Basic controls include age, education, children, self-assessed language ability, parents’ education, spouse and province of residence. Skills and overskilling include both literacy and numeracy. The results for overskilling are presented only for the realized matches approach.