Wage Assimilation of Immigrants in Canada: A Study Using Census Data from 1981 to 2006

By

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Abstract

This paper continues the literature on immigrant wage differentials and wage assimilation by first extending the work of Bloom, Grenier, and Gunderson (1995) using more recent Census data from 1981 to 2006. After comparing the main findings, additional adjustments to the model specification will be made to observe their impact. The wage outcomes of immigrants from different countries/regions of origin will also be examined, as well as how immigrants perform in their respective province/region and area of residence. The results found were consistent with the literature, that immigrants do earn less upon entry into Canada compared with native-born counterparts, and that their wage growth is stronger than for Canadian-born individuals. The more recent cohorts typically have worse outcomes with regards to having larger negative entry effects, as well as longer years required for equality, if ever. Immigrants from historically preferred countries, such as those in Europe and the United States, performed better than those from the Middle East, Asia, Africa, and Latin America.

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1. Introduction

Literature on immigrants in Canada has stated time and again that immigration is the key component in maintaining the population growth in the country, and, in turn, to meet its need for workers. In exchange for having more diverse workers to fill in for the aging labour force, the incoming immigrants are provided with rights, freedoms, and opportunities to achieve success that some native-born Canadians may take for granted.

In order to claim that Canada is a society where individuals are considered equal, regardless of ethnicity or country of origin, the earnings of immigrants need to reflect this by being similar to those of comparable Canadian-born individuals. Many factors may affect how this may not occur immediately upon entry in Canada. These can include the need for additional training or recognition of credentials, obtaining job search skills, or simply learning one of the official languages. However, these issues are typically resolved over time, thus the gaps in wages should narrow as well. If the immigrants' wages do not catch-up to those of native-born Canadians, then the country may become unattractive to potential migrants. Thus, the wage gap could be perceived as a sign of discrimination, or at the very least a reduction in the chances of success.

This poses a risk to the nation, as skilled migrants may choose to immigrate elsewhere, such as the United States where Canada already suffers from the so-called "brain drain" (Campolieti et al. 2013). As such, the topic of how these immigrants are performing in the labour market over time is certainly of great interest, if not one of great importance.

Building on the work by Bloom, Grenier, and Gunderson (1995) and many others, this paper will continue the study on immigrant wage differential and wage assimilation by using

more recent Canadian Census data. In particular, the following questions are of great interest to the author and attempts will be made to address them:

1. Is there a difference in wages between immigrants and comparable Canadian-born individuals at time of entry?
2. If there is a wage gap between immigrants and native-born Canadians, and does the gap narrow over time? If so, how long will it take to vanish?
3. Are the answers to (1) and (2) the same for:
    a. each cohort of immigrants with respect to time period of immigration?
    b. immigrants from various countries/regions of origin?
    c. immigrants in all provinces/regions of residence?
    d. immigrants living in large cities and those living in towns and rural areas?

The first main contribution of this paper is the use of more recent census data to extend the analysis conducted by Bloom et al. (1995). With the Public Use Microdata Files (PUMF) Census data from 1981 to 2006, the analysis in this paper will involve 4 more sets of Census data, capturing information representing 20 additional years. Thus, the entry effect, assimilation effect, as well as the "years to equality" can be calculated for the newer immigrant cohorts, in addition to having more observations for the older cohorts. Comparisons will be made with Bloom et al. to validate and extend their findings. Additional comparisons will be made with more recent works in the subject, such as Campolieti et al. (2013).

In addition to replicating the results of Bloom et al. (1995) and producing newer estimates using their specifications, a secondary set of analysis will be conducted by making various modifications in order to attempt to answer questions (3b) to (3d). This will include changes such as including additional variables to the model, or estimating with different subsamples. These additional analyses will be the second main contribution of this paper.

Regarding the structure of this paper, the next section will briefly describe the history of Canadian immigration policy to provide some context. The third section will review the early literature on the subject of immigrant wages, as well as recent research and analysis that were conducted. The data source will be introduced with explanations on the restrictions. The empirical models will be presented and described in section five, followed by an overview of summary statistics. The results will then be presented, and afterwards the potential issues, limitations, and alternatives will be covered. The paper comes to a close with the conclusion and a brief discussion.

2. Brief History of Canadian Immigration Policy

Canada has been accepting immigrants throughout most of its history, with various reasons/motives for acceptance and with various types of immigrants. Prior to World War II, immigrants were mainly brought in to meet specific needs. Examples include the settlement in the western regions, as well as works on the three transcontinental railways (Ferrer et al. 2012). These goals required quantity as opposed to quality of workers, as the desired groups were mostly farmers and laborers. Although Canada typically favored workers from preferred countries such the Unites States or U.K, some exceptions were made such as the Chinese railway workers.

Post-WWII, immigration policy was more broadly focused with several objectives. These included ensuring healthy population growth, raising the standard of living, and accepting migrants primarily from Europe, U.K. and U.S., the preferred countries, to ensure that the main characteristics of the Canadian population were maintained. (Green and Green, 1999)

The most important change in Canadian immigration policy occurred in the 1960s. The nation stopped using the preferential system based on the country/region of origin. Instead, the potential economic migrant's traits, such as occupation and skillsets, were more strongly weighted. This eventually developed into a points system in 1967, the type of system which we may be more familiar with today (Ferrer et al. 2012). The change in policy has later resulted in an increase in the proportion of immigrants arriving from developing countries (Bloom et al. 1995).

In the late 1970s, specifically with the Immigrant Act of 1978, there was a stronger mentality of admitting immigrants for humanitarian reasons, namely refugees and family members of Canadians for reunification. As a result, the proportion of immigrants admitted under these two categories has increased dramatically. In 1968, only 26 percent of the incoming immigrants were either refugees or under family reunification, compared with 74 percent which were economic migrants, or independent and assisted relatives categories. "By the 1980s these proportions had almost reversed themselves, with only 35 per cent admitted under the independent and assisted relatives categories and 65 per cent under family and refugee status." (Bloom et al. 1995, p.990). As the refugees and the family reunification immigrants were not subjected to the scrutiny of the points system, these immigrants did not necessary display qualities typically attributable to the economic migrants. In addition, the country of origin of immigrants has also continued to shift during this period. The proportion of immigrants coming from Europe and the United States continued to decrease, while those from Africa, Asia, and Latin America began to rise further.

From the early 1990s, the point system began to emphasize and focus more on human capital characteristics, such as education, in selecting migrants. The system moved away from

meeting immediate labour demands of specific occupations, and instead shifted to prioritize these characteristics. There were several reasons for this shift, as outlined by Ferrer et al. (2012). To summarize, there were difficulties in both identifying labour shortages as well as in addressing them, as there was no way to ensure that the immigrants would work in those occupations and in the specific areas where they were needed.

As a result of the change in the point system, there was a notable increase in the education attainment of immigrants (Ferrer et al. 2012). At the same time, the proportion of economic migrants relative to other categories has risen once again.

To summarize, Canadian immigration policy was initially focused primarily on particular occupations to fulfill specific goals at specific times. There was also a strong preference at first for immigrants from United States and Western Europe. Both of these characteristics gradually changed, as there were difficulties with the policies to quickly and efficiently address short-term needs, and at the same time immigration for humanitarian reasons became a major component as well. The more recent immigration policy is aimed at diversifying the Canadian labour force, allowing it to be flexible enough to mitigate the short-term issues that may arise.

3. Literature Review

As the literature on immigrant earnings and assimilation developed notably following two American studies by Chiswick (1978) and Borjas (1985), it would be most appropriate to begin the review with these two works. Chiswick (1978) essentially laid the foundation of the study of the immigrant wage differential and wage assimilation by being one of the earliest notable works on the subject. His cross-sectional analysis has shown that foreign-born Americans were paid less than comparable native-born upon arrival. The study also emphasized

the importance of the years stayed in the host nation, and determined the number of years required to achieve equality.

While Chiswick's work was focused on cross-sectional data, Borjas (1985) points out one key source of improvement with Chiswick's model. Specifically, the cross-sectional analysis, such as that performed by Chiswick, cannot distinguish between the assimilation effect and the quality differences of each cohort of immigrants. In his study, Borjas found that cross-sectional studies would overestimate the rate of earnings growth, and that the difference in quality of immigrants between cohorts is a key factor that needs to be taken into account when studying wage assimilation.

Following the two foundational works, similar studies using Canadian data began to surface, such as Meng (1987), Abbott and Beach (1993), Wright and Maxim (1993) and Baker and Benjamin (1994). One notable work, which was the main source of inspiration for this paper, was by Bloom, Grenier, and Gunderson (1995). Using Census data from 1971, 1981, and 1986, Bloom et al. studied the entry, assimilation, and cohort effects on wage of Canadian immigrants. The paper also briefly presented the results by two broad regions of origin (U.S. and Europe vs. Asia, Africa, and Latin America). The main conclusion of the paper was that the outcomes of immigrants past 1980 were worse, as corroborated by Baker and Benjamin as well as Wright and Maxim. Suggested reasoning includes reduced quality of immigrants due to shift in focus to humanitarian-minded immigration, as well as increased discrimination and lower quality of education due to more immigrants coming from developing countries outside Europe and the United States.

Among the more recent works, Campolieti et al. (2013) studied the cohort-specific assimilation effects. This was achieved by adding an extra set of variables that was constructed by multiplying each cohort dummy variable with the years since migration. By doing so, it was found that, although the immigrants from more recent cohorts had suffered more severe negative entry effects on earnings, the assimilation effects for those immigrants were also somewhat higher. This provides a positive sign that perhaps the recent cohort of 2002-2006 are assimilating more quickly. The increase in the assimilation effect for the particular cohort was in fact able to offset the increasing entry effect and reduce their number of years required for wage equality, when compared with the relatively older cohorts.

Some researchers chose to focus on particular subgroups of immigrants. Bonikowska et al. (2011), for example, focused their study on university educated immigrants. The study made comparisons between those in Canada as well as in the United States. Results indicated that the outcomes for university educated immigrants in the United States were better, as the wage of Canadian immigrants declined in relation to the native-born counterparts, while those in the United States increased.

Abbott and Beach (2009, 2011) studied the earnings of Canadian immigrants between the different admission categories, such as the economic immigrants, family class immigrants, and refugees. The use of Longitudinal Immigration Database (lMDB) data allowed detailed study of how the cohorts (1982 initially in the first paper, followed by 1982, 1988, and 1994 in the second paper) performed over the first ten years since landing. The main conclusion found was that the economic immigrants consistently had higher earnings among the admission categories. Refugees, on the other hand, had lower earnings but also had the highest earnings growth over the ten year period for all three cohorts and for both men and women.

In the literature reviewed so far, the general expectations and findings were that the immigrants suffer from the negative entry effect initially and then recover some if not all of the loss through the assimilation effect. Chiswick and Miller (2011) found evidence that went against this general pattern. Their hypothesis states that some immigrants, specifically those with highly transferable skills from other similar countries, may arrive due to an unusually high wage offer. As such, the wage is higher than the typical amount; it may approach back to the average over time. As the wage declines, the capable immigrants may migrate elsewhere for better opportunity once again, while those who are less capable would stay. This essentially produces what seems to be a negative assimilation effect. Using the data from 1980, 1990, and 2000 U.S. Censuses, Chiswick and Miller found strong support of this hypothesis, and also suggest that the negative assimilation effect has grown over time.

However, work by Grenier and Zhang (2015) suggests that the hypothesis does not hold in Canada. Their analysis involved examining immigrants from U.K. and the United States, and found that the assimilation effect for the former is ambiguous, while the latter displayed significant positive assimilation. They suggest that many immigrants arrive to Canada prior to receiving a high wage offer, and that the generous social policies and programs may entice most immigrates to stay and settle in the nation.

The literature in the topic of immigrant wages and assimilation has grown quite rich over the last few decades. The works mentioned so far are only a fraction of the extensive research that has been conducted on the subject. However, there are a few findings that are fairly consistent among the literature:

1. Immigrants typically suffer from lower wages at entry than comparable Canadian-born individuals. That is, there is a negative entry effect.

2. Immigrants typically have larger earnings growth, indicating a positive assimilation effect.
3. The more recent cohorts suffer more from entry effects than previous cohorts, and at the same time display stronger assimilation effects.

4. Data

The main and only source of data used in this study is the Canadian Census data. To be specific, the Individual files from the Public Use Microdata Files (PUMF) are used. Each PUMF data set is a sample of the entire Census data (ranging from 2% to 2.7%), and contains numerous variables and characteristics of the sampled individuals. The key variables that were needed in this study include details on the immigrants, such as their year of immigration and country/region of origin. Other key variables include gender, the year of birth, education, wages and salaries, hours worked, weeks worked, part-time/full-time work status, and marital status. Because the Census has data on both immigrants and native-born Canadians, comparisons can be made between the two groups. Due to the abundance of observations and variables, no other sources of data were needed.

Six PUMF data sets were used in our analysis: 1981, 1986, 1991, 1996, 2001, and 2006. The 2011 NHS was not used due to the voluntary nature of the survey, in contrast to the previous mandatory long form Census. The data are restricted to individuals aged 20 to 64 and those that reported positive weeks worked, hours worked, and wages.

Only male observations were used, as the variable reflecting years of experience was produced using Mincer's Identity (Mincer, 1974):

$$(years\ of\ work\ experience) = age - (years\ of\ education) - 6$$

This may cause errors, especially for women, as there is no guarantee that time outside of education and first six years were spent working in the paid labour market. Women are relatively more likely to have disruptions in their work history, for reasons such as marriage and childbearing (Mincer and Polachek, 1974). Thus it was decided to remove them from the sample, and have men be the focus of this study. For the full list of variables as well as their description, please see Appendix A.

5. Empirical Methodology

In the following section, the models used for the respective analyses are presented.

5.1. Replication of model from Bloom et al. (1995)

The analysis of the data will begin with estimating the immigrant earnings equation used by Bloom et al. (1995), based on Chiswick (1978) and accounting for the criticism by Borjas (1985):

$$ln(wage) = X\beta + \alpha I + \delta YSM + \Sigma_j \theta_j COH_j + u \quad (1)$$

where:

$wage$	=	annual wages and salaries
X	=	vector of variables typically in human capital earnings model, such as education, work experience, marital status, as well as dummy variables for hours and weeks worked.
β	=	coefficients corresponding to *X*
α	=	entry effect
I	=	dummy variable (=1 for immigrants, =0 for those born in Canada)
δ	=	assimilation effect
YSM	=	years since migration (=0 for those born in Canada)
θ_j	=	immigrant cohort effect (as a vector corresponding to each cohort)
COH_j	=	vector of dummy variables (=1 if migrated to Canada during the specific period) (=0 by default for native-born Canadians)
u	=	residual term

The main parameters of interest in model (1) are the entry effect, assimilation effect, and cohort effects.

The entry effect, which is the coefficient corresponding to the immigrant dummy variable, reflects the wage gap between immigrants and native-born Canadians at the time of entry. A negative estimate of the entry effect, which is the predicted result, would suggest that immigrants are indeed being paid less than those of comparable Canadian-born counterparts. The estimate of the entry effect will help provide an answer to question 1 listed in the introduction.

The assimilation effect, which is the coefficient corresponding to the years-since-migration variable, reflects the rate at which the immigrants' wages grow over time. The expectation is that the coefficient is positive, as in the immigrants' wages increase over time as they live in Canada for longer and the issues they may have initially faced during entry are mitigated. The value of assimilation effect will provide an answer to question 2.

The cohort effect, or more specifically the cohort entry effect, reflects the initial wage gap specifically for different immigrant cohorts. Adding the dummy variables allows the model to separate the entry effect among cohorts of immigrants arriving at different periods of time. Much literature stated that "[since] the 1980s, the economic outcomes of immigrants – relative to the native-born – have been deteriorating progressively" (Ferrer et al. 2012, p. 7). Estimating and examining the cohort effect in the model will provide an indication as to whether the trend holds true in our study, and also will help answer question 3a.

In addition, using these three parameters, the number of years needed for immigrants to catch-up to their comparable Canadian-born counterparts, or the years-to-equality (YTE), can be derived using the following calculation. Essentially, the positive assimilation effect is required to have a certain number of years to offset the negative entry effect, thus we have:

$$\begin{aligned} \alpha + \ \delta * (Years\ to\ equality) &= 0 \\ \delta * (Years\ to\ equality) &= -\alpha \\ (Years\ to\ equality) &= -\frac{\alpha}{\delta} \end{aligned}$$

To calculate the years-to-equality for each cohort j, we have the following:

$$\begin{aligned} \alpha + \theta_j + \delta * (Years\ to\ equality)_j &= 0 \\ \delta * (Years\ to\ equality)_j &= -(\alpha + \ \theta_j) \\ (Years\ to\ equality)_j &= -\frac{(\alpha + \ \theta_j)}{\delta} \end{aligned}$$

5.2. Estimation using cross-sectional data

The model (1) is applied to a pooled data set of all six Censuses, creating a pseudo-panel data set. To allow further direct comparisons with Bloom et al. (1995), the two cross-sectional estimates, for 1981 and 1986, will be needed. For the estimations using cross-sectional data, the immigrant cohort dummy variables are removed, as there is an issue of perfect multicollinearity with the years since migration variable and the time-specific cohort dummy variable. The assimilation effects may be biased as a result, as mentioned by Bloom et al.

As such, the model for cross-sectional data would simply be:

$$ln(wage) = X\beta + \alpha I + \delta YSM + u \qquad (2)$$

Note that cross-sectional results are mainly presented for comparison purposes with Bloom et al. As pointed out by Borjas (1985), cross-sectional studies can be problematic as there is no distinction between different immigrant cohorts.

5.3. Addition of quadratic term of years-since-migration

In the model (1), the assimilation effect is assumed to be linear in nature. That is, an additional year since migration will increase the wage of an immigrant by a certain percentage, holding all else constant. Typical issues that contribute to the immigrant wage gap at entry, such as language issues, should be resolved relatively earlier on in their new lives in Canada. Thus, adding the quadratic term (i.e., YSM squared) to the base model (1) is certainly a viable option. Work by Chiswick (1978) and others included such a term.

Bloom et al. (1995) was in fact one of the few works to estimate a linear assimilation effect as opposed to quadratic. The reasons provided were that the effect on entry and cohort effects were not significantly affected by the use of linear form. They also found that, for some of the newer cohorts in their study, the catch-up would not occur at all using the quadratic form.

Switching to the linear form allowed Bloom et al. to derive a year-to-equality value that can quantify the severity of the results. The linear form of assimilation effect has subsequently been used in other works such as Chiswick and Miller (2011), Campolieti et al. (2013) and Grenier and Zhang (2015).

Thus, from adding the extra quadratic term, the model becomes:

$$ln(wage) = X\beta + \alpha I + \delta_1 YSM + \delta_2 YSM^2 + \Sigma_j \theta_j COH_j + u \quad (3)$$

The corresponding calculation of the years-to-equality for the reference cohort would be:

$$\alpha + \delta_1 * (Years\ to\ equality) + \delta_2 * (Years\ to\ equality)^2 = 0$$

This is essentially solving a quadratic equation, using the much beloved quadratic formula:

$$(Years\ to\ equality) = \frac{-\delta_1 \pm \sqrt{{\delta_1}^2 - 4\delta_2\alpha}}{2\delta_2}$$

For cohort *j* the calculation would also include the cohort specific entry effect:

$$\alpha + \theta_j + \delta * (Years\ to\ equality)_j + \delta_2 * (Years\ to\ equality)_j{}^2 = 0$$

$$(Years\ to\ equality)_j = \frac{-\delta_1 \pm \sqrt{{\delta_1}^2 - 4\delta_2(\alpha + \theta_j)}}{2\delta_2}$$

The lowest positive real value solved from the equation above would be the estimate of years-to-migration. Cases where there is no solution to the equation may reflect scenarios where immigrants wages would never catch-up to their Canadian-born counterparts.

The model (3) will be estimated to observe and confirm whether the entry and cohort effects will be largely unchanged, as Bloom et al. (1995) have claimed with their results. The estimates of years-to-equality will then be derived to determine any differences from the results from using

model (1), with particular attention to cases where there is no possibility for immigrants' wages to catch-up.

5.4. Robustness checks and adjustments to the base model

In order to ensure that the results from the pooled OLS regression are robust, several variations of the regression were produced and the results were compared. Specifically, the following adjustments were made and tested:

a. Replacement of the dependent variable with natural log of annual wages in constant 2005 dollars.
b. The dummy variables for the number of weeks worked were replaced by one variable: the natural log of the weeks worked. At the same time, the hours worked dummy variables were replaced with a single part-time work dummy variable.
c. Same adjustments as (b), with constant 2005 dollars
d. Replacement of the dependent variable with the natural log of average weekly earnings (annual wages divided by weeks worked) and the replacement of hours dummy variables with part-time.
e. Same adjustments as (d), with constant 2005 dollars.

The use of log of weeks worked has been present in works such as Chiswick (1978), Chiswick and Miller (2011), and Grenier and Zhang (2015), while work by Bloom et al. (1995) and Campolieti et al. (2013) used the dummy variables. The part-time work dummy variable is meant to mitigate errors that may be caused by the hours of work variable. In the PUMF data, hours worked refers to the week before the information was collected from the respondent. In contrast, the wage, weeks worked, and part-time/full-time information refers to the year before the Census was conducted. Bloom et al. (1995) chose to assume that the hours are the same for both reference periods. However, with the part-time dummy variable, the issue can be circumvented.

As the subsequent sections require additional variables, the base model shall be subsequently defined by the (b) specification instead, in part to maintain parsimony as well as consistency with past literature:

$$ln(wage) = Z\beta + \alpha I + \delta YSM + \Sigma_j \theta_j COH_j + u \quad (4)$$

where Z includes the following variables:

$EDUC$	=	years of education
$EXPER$	=	years of work experience
$EXPSQ$	=	years of work experience squared
$MARRI$	=	dummy variable (=1 for married, =0 otherwise)
$LNWKS$	=	natural log of the number of weeks worked
$PRTWK$	=	dummy variable (=1 for part-time work status, =0 otherwise)

Note that the main parameters of interest were untouched with this adjustment, and as shown in the result section, the estimates of the parameters are largely unaffected.

5.5. Interacting years-since-migration with country/region of origin

Question 3(b) regarding differences in place of origin is certainly an interesting question, as the composition of immigrants has noticeably changed over the Canadian history, as mentioned in the earlier sections. Even in the 25-year span of our sample, there is a notable change in the composition of those who were born outside of Canada. Bloom et al. (1995) have performed some analysis on the wage differential and assimilation between immigrants from the historically preferred regions (U.S. and Europe) and others (Asia, Africa, and Latin America). The following is an attempt to expand on their findings using modified specifications as well as with deeper breakdowns of country/regions of origin.

The first adjustment to the base model (4) shall be the replacement of the immigrant dummy variable:

$$ln(wage) = Z\beta + \Sigma_k \alpha_k POB_k + \delta YSM + \Sigma_j \theta_j COH_j + u \quad (5)$$

With this model, the immigrants are controlled based on their country/region of origin (*POB*)[1], thus the coefficients now represent the entry effect for each group of immigrants. The country/region of origin is broken down as follows: the United States, Western/Northern Europe and Oceania, Eastern/Southern Europe, Middle East, South/Southeast Asia, East Asia, Latin America, and others. Logically, those who are from a similar culture as Canada will likely suffer less from the entry effect than those who have significantly different culture and language. However, the model in (5) only distinguishes the entry effect by country/region of origin. (See Appendix E for detailed list of countries/regions included in each category.)

We now make another adjustment:

$$ln(wage) = Z\beta + \Sigma_k \alpha_k POB_k + \delta YSM + \Sigma_k \gamma_k (POB_k * YSM) + \Sigma_j \theta_j COH_j + u \qquad (6)$$

Namely, the model now includes terms that interact the country/region of origin with the years-since-migration variable. As non-immigrants have years-since-migration set to zero, the terms only apply to immigrants. The coefficient can be interpreted as the portion of assimilation effect that is dependent on the immigrant's country/region of birth. This is somewhat similar to what was done in Campolieti et al. (2013), where the immigrant cohort dummy variable was interacted with years-since-migration in order to estimate the assimilation effects that vary depending on the immigrant cohort.

With model (6), theoretically both the entry and assimilation effects are separated by the immigrant's country/region of origin. The parameters now should provide better representations of the wage outcomes of immigrants from different backgrounds.

[1] Although the place of birth may not always be the same as the country of origin, it is assumed so in this analysis.

5.6. Applications of the base model using subsamples

Going back once again to the new base model (4), the model will be estimated using different subsamples to observe differences in estimates by the province/region of residence, and area of residence.

To analyze how immigrants perform in each province with respect to their counterparts within the same province, the full pooled sample will be split into six categories, and the base model (4) is estimated for each subsample. The six categories include the Atlantic Provinces, Quebec, Ontario, the Prairies (i.e. Manitoba and Saskatchewan), Alberta, and British Columbia. The result will allow us to determine in which provinces/regions are the immigrants more successful in assimilating their wage to their Canadian-born counterparts, and in which they are not.

A similar analysis will be performed with the area of residence. Specifically, as immigrants, especially more recent cohorts, tend to gather in large cities, this experiment may provide an insight as to whether such tendencies are beneficial. Larger cities are likely thought to have more opportunities than small rural areas, and are more likely to have people from the same background as those immigrants. However, the competition for those opportunities may be more intense, and being with other fellow immigrants may hinder the path to assimilation (to the Canadian culture or native language).

Considering this, it would be interesting to observe the outcomes of immigrants living in large cities compared with those who are not. For this study, areas are separated into three subsamples based on their population size: large cities, small/medium cities, and towns/rural areas. Specifically, the large cities are restricted to purely the three largest: Vancouver, Toronto, and Montreal. The small/medium sized cities are the Census Metropolitan Areas (or CMAs)

which are essentially a cities with a population of 100,000 or more, excluding the three largest cities. The towns/rural areas refer to areas that do not or did not fall under the CMA category.

6. Descriptive Statistics

Table B.1 in the appendix shows the summary statistics for all six Census data sets as well as for the merged data set. Tables C.1 to C.6 show the breakdowns by total, non-immigrants, and immigrants.

Starting with Table B.1, throughout the six censuses, the distribution of observations by province/region is as expected. Ontario and Quebec constitute the majority of the population, followed by British Columbia, Alberta, the Atlantic and the Prairies. The proportion of respondents belonging to the three largest cities (Montreal, Ottawa, and Toronto) is increasing over time, while those from non-CMA regions are declining.

There is a steady yet noticeable growth in the average years of education, suggesting that individuals in Canada are in school for longer and completing higher education than in the past. Both the average age and the average years of work experience are increasing over time. The rise in average age indicates the shift in the demographic composition from 1981 to 2006, consistent with aging of the baby boom generation. In turn, the average years of work experience has also increased.

Based on the mean values of place/region of birth dummy variables, we see that the composition of immigrants by country/region of birth is changing over time. Consistent with what was discussed earlier in the history briefing, a larger proportion of immigrants in Canada are consisting of individuals migrating from Asia, and to a lesser extent, from Latin America, Africa, and the Middle East. On the other hand, the proportion of immigrants coming from

Europe and United States is declining, with their proportional representation reduced by around one-half from 1981 to 2006.

Comparable statistics from Bloom et al. (1995) were also examined, and the means for all comparable variables in the 1981 and 1985 data were very close, capturing even the smaller movements in means between the two Censuses. This indicates that the data replication was fairly successful.

Looking at the summary statistics separated by non-immigrants and immigrants (Tables C.1 to C.6), we find that generally the two subgroups are fairly similar across the Censuses as well as in the pooled data. Years of education were fairly similar, though immigrants tended to have slightly more. The average hours worked per week as well as weeks worked per year were also close between the two groups.

There were some notable differences that are worth mentioning. The immigrant sample had a larger proportion of people who were married than the Canadian-born individuals. Immigrants also had a larger portion living in one the three largest cities, with the proportion growing over time. In the 2006 data, over 70% of the observations were from immigrants living in Montreal, Toronto, or Vancouver. This is compared with 54 percent in 1981. These two findings were also found by Campolieti et al. (2013), who also used PUMF data, although from 1971 to 2006 rather than 1981 to 2006 used in this study.

Also worth noting is that immigrants tend to be 2-3 years older on average, and in turn, have more work experience. At the same time, the average annual wages and salaries are quite similar between the two groups for all six Censuses and the merged file. These summary statistics may suggest that perhaps immigrants have to be more qualified in order to achieve similar wages, an interesting note before we present the formal empirical results.

7. Primary Results

7.1 Cross-section and pooled data results – Comparison with Bloom et al. (1995)

Table 1 below displays the derived entry effect and assimilation effect for each cross-section of Census data. The pooled data also contains the values reflecting the cohort effects. The table was formatted similarly to the table in Bloom et al. (1995) for convenience. All coefficient estimates were multiplied by factor of 100. (See Table D.1 in Appendix D for full regression result.)

Table 1. Estimates of entry effects, assimilation effects, and cohort effects. (Coefficient estimates x 100)

Model Used	**(2)**	**(2)**	**(2)**	**(2)**	**(2)**	**(2)**	**(1)**	
Effects	1981	1986	1991	1996	2001	2006	Pooled	**Years to equality**
Entry effect	-16.6	-23.9	-25.4	-32.5	-30.6	-40.4	-23.2	
Assimilation effect	0.65	0.82	0.94	1.04	0.96	1.17	0.68	
Cohort effect								
Reference (Before 1956)							---	34.2
COH5660							2.66	30.3
COH6165							5.44	26.2
COH6670							6.17	25.1
COH7175							4.09	28.2
COH7680							2.38	30.7
COH8185							-1.01	35.7
COH8691							-4.34	40.6
COH9195							-10.70	50.0
COH9600							-10.10	49.1
COH0106							-22.70	67.7
Years to equality	25.4	29.0	26.9	31.3	31.9	34.5	34.7	

Compared with Table 2, which is an excerpt from Bloom et al. (1995), the entry effect and assimilation effects are very similar for the comparable results of the 1981 and 1986 cross-sections. The entry effects for both 1981 and 1986 were negative as expected; the estimates are suggesting that the immigrants in the respective data were on average paid less than 16.6 percent and 23.9 percent than comparable Canadian born counterparts, upon entry.

Comparing the derived years-to-equality, the results are also fairly similar between the two results. Our analysis has found that for 1981, the years required for immigrants to achieve wage equality was 25.4 years, compared with 23.9 in Bloom et al. For 1986, it was 29.0 vs. 26.5 years, respectively.

The coefficients derived for variables in vector *X* were also compared, and they were found to be quite similar as well. Based on these observations, it seems reasonable to conclude that the replication was fairly successful, considering the slight differences that may have occurred from the data cleaning process.

Table 2. Estimates from Bloom et al. (1995)

Entry, assimilation, and cohort effects, Canadian immigrants, men, 1971, 1981, and 1986, with a comparison with the United States

Effect (estimated coefficient)	1971	1981	1986	Pooled data, controlling for cohort effects	Implied years to equality	Implied years to equality (U.S. immigrants)[a]
Entry effect, $\alpha \times 100$	−5.35 (3.46)	−13.84 (8.16)	−22.21 (10.96)	−3.54 (1.38)	n.a.	n.a.
Assimilation effect, $\delta \times 100$	0.35 (4.75)	0.58 (7.53)	0.84 (9.73)	0.25 (3.11)	n.a.	n.a.
Cohort effect, $\Theta_j \times 100$						
Cohort pre-1956 (reference)				–	14.3	5.2
Cohort 1956–60				−0.64 (0.38)	16.9	5.2
Cohort 1961–5				0.48 (0.23)	12.3	8.0
Cohort 1966–70				−2.34 (1.13)	23.7	24.8
Cohort 1971–5				−8.39 (3.53)	48.1	31.7
Cohort 1976–80				−14.91 (5.20)	74.5	48.8
Cohort 1981–6				−30.30 (7.78)	136.6	39.5
Years to equality, $-\alpha/\delta$	15.2	23.9	26.5	27.5[b]	n.a.	n.a.

Source: Bloom, Grenier, and Gunderson (1995, p. 994)

Now looking beyond 1986 in Table 1, there seems to be a downward trend in terms of the entry effect value, suggesting that the negative entry effect is become more severe in subsequent

Census data. On the other hand, the assimilation effect seems to be increasing as time goes on. However, the increase is not enough to compensate for the increasing severe wage gap upon entry for immigrants. As a result, the years-to-equality is also going up, from 25.4 years in the 1981 Census to 34.5 in the 2006 Census – an increase of about 9 years.

The results from the pooled regression are quite interesting and more relevant than those from the cross-sectional analysis. We see that the more recent cohorts, beginning from 1980, suffer from negative cohort entry effects. That is, the cohorts of immigrants arriving after 1980 are experiencing wage gaps larger than the reference group of those who arrived before 1956, even after controlling for other factors such as education and work experience. This may be explained by the shift in the demographics of immigrants, as more were coming from developing countries. Furthermore, immigrants who arrived from 1991 onward require, on average, 50 years or more to catch-up. This large value for years-to-equality suggests that many immigrants who arrived after 1990 may never catch-up in wages in practical terms, assuming the workers were to retire after 40 or so years of work.

The estimates presented so far present a grim picture for the labour market outcomes of immigrants. Possible explanations can include the larger amount of adjustments required with the newer immigrants, more of whom are from countries and areas besides Europe and the United States. Their skills and experiences from their country of origin may not be recognized in Canada. It could very well also be an indicator of discrimination. Another explanation, which was also posed by Bloom et al. (1995) and mentioned in an earlier section in the present paper, is the possibility that the immigrants are not assimilating fast enough or at all because they are persistently interacting with others who are from similar ethnic backgrounds. Alternatively, the

immigrants may be unable to attain better qualifications or switch jobs due to financial obligations to take care of their family.

7.2 The effect of using the quadratic assimilation effect

Table 3 below shows the difference between model (1) and model (3), which is the addition of a squared year-since-migration variable in order to capture the assimilation effect as a quadratic as opposed to linear specification. In general terms, the years-to-equality between the two sets of results are somewhat similar, although there was certainly an impact on the cohort effects. The entry effect for model (3), which contains the squared YSM term, is five points higher than that of model (1). Thus, estimating a quadratic assimilation effect as opposed to linear one has certainly impacted other effects, contrary to what was found by Bloom et al. (1995).

Table 3 Comparison of entry, assimilation, cohort effects and years-to-equality (Coefficient x 100)

Effects	**(1) Linear YSM**	Years to equality	**(3) Quadratic YSM**	Years to equality
Entry effect	-23.2		-28.2	
Assimilation effect	0.68		1.52	
(Quadratic term)			-0.0179	
Cohort effect				
Reference (Before 1956)	---	**34.2**	---	**27.4**
COH5660	2.66	**30.3**	0.199	**27.0**
COH6165	5.44	**26.2**	1.94	**24.1**
COH6670	6.17	**25.1**	2.35	**23.5**
COH7175	4.09	**28.2**	0.515	**26.5**
COH7680	2.38	**30.7**	-0.595	**28.5**
COH8185	-1.01	**35.7**	-3.45	**36.6**
COH8691	-4.34	**40.6**	-5.49	n/a
COH9195	-10.7	**50**	-11.1	n/a
COH9600	-10.1	**49.1**	-8.93	n/a
COH0106	-22.7	**67.7**	-20.1	n/a

Despite the differences in magnitude, the cohort entry effects did follow the same general pattern between the two results, albeit with model (3) having typically lower years required for wage equality. Once again, the sudden increase from the 1981 cohort onward is observed. The years-to-equality from the 1986-1991 cohort and beyond are too large to be captured by the quadratic form of the assimilation effect, essentially providing evidence that these cohorts do not catch-up to their native-born counterparts. Overall, the results show partial support for the reasoning behind the decision by Bloom et al. (1995) to use the linear form.

7.3 Robustness check

As mentioned in the Empirical Methodology section, the regression results (Table D.2 in Appendix D) show that the parameters of interests were little changed from the original model. The difference mainly occurs with the index/Census dummy variables, which is understandable as the dummies were meant to control for differences across Census data, such as inflation. The use of natural log of weeks worked and the part-time dummy variable had also little impact on the main coefficients. Note that the squared YSM variable was also added to the robustness check specifications in the previous subsection. The results once again were essentially the same between each specification.

7.4 Looking at the impact of different country/region of origin

The following Table 4 describes the results of using model (6) described in the empirical methodology section. For the years-to-equality results for model (5), where only the immigrant dummy is replaced with the country/region of birth dummy variables, see Table D.4b. For full regression results of both models in comparison to model (4), see Table D.4a.

Looking at the entry effects, the majority of the countries/regions have negative entry effects, as expected. However, the non-European/U.S. regions have noticeably larger negative

estimates, indicating that the immigrants from these historically "non-preferred" countries are faring worse initially upon landing in Canada. Notably, the West Europe region had a positive entry effect, suggesting that these immigrants initially earn more than native-born Canadians, given similar education, experience, and others.

For the assimilation effect specific to each country/region of origin, the expected positive assimilation effect is observed for many areas, especially the non-European/U.S. regions. The U.S.-specific assimilation effect was close to zero, and was found to be not statistically significant at the 1% level. This suggests either there is not enough sample to determine its rate of assimilation, or perhaps there is no assimilation to undergo due to the similarities between the two nations.

Table 4 Entry, assimilation, and years-to-equality based on country/region of origin.

Effects		U.S.	West Europe	East Europe	Middle East	South/ Southeast Asia	East Asia	Africa	Latin America
Entry effect		-4.1	5.0	-11.6	-27.5	-24.5	-25.8	-23.6	-23.2
Assimilation effect	0.177								
(by origin)		0.02*	-0.16	0.28	0.65	0.64	0.50	0.79	0.43
Cohort effect									
Reference		***Years to equality (by country/region of origin, and cohort)***							
(Before 1956)		*21.1*	**n/a**	*25.4*	*33.1*	*30.1*	*38.1*	*24.3*	*38.2*
COH5660	-1.70	*29.8*	**n/a**	*29.2*	*35.2*	*32.2*	*40.6*	*26.1*	*41.0*
COH6165	0.03*	*20.9*	**n/a**	*25.4*	*33.1*	*30.1*	*38.1*	*24.3*	*38.2*
COH6670	0.73*	*17.3*	**n/a**	*23.8*	*32.3*	*29.2*	*37.0*	*23.6*	*37.0*
COH7175	0.27*	*19.7*	**n/a**	*24.9*	*32.8*	*29.8*	*37.7*	*24.0*	*37.8*
COH7680	-1.04*	*26.4*	**n/a**	*27.7*	*34.4*	*31.4*	*39.6*	*25.4*	*39.9*
COH8185	-4.98	*46.7*	**n/a**	*36.4*	*39.1*	*36.3*	*45.5*	*29.4*	*46.4*
COH8691	-7.36	*58.9*	**n/a**	*41.6*	*42.0*	*39.2*	*49.0*	*31.9*	*50.3*
COH9195	-12.50	*85.3*	**n/a**	*52.9*	*48.2*	*45.5*	*56.6*	*37.2*	*58.8*
COH9600	-11.80	*81.7*	**n/a**	*51.3*	*47.3*	*44.6*	*55.5*	*36.5*	*57.7*
COH0106	-24.80	*148.6*	**n/a**	*79.8*	*63.0*	*60.6*	*74.7*	*49.8*	*79.1*

*not statistically significant at 1% level of significance

Note: the effects/coefficients are multiplied by 100.

West Europe displays an interesting result again with a negative region-specific assimilation rate. This may suggest that Chiswick and Miller's (2011) "negative assimilation hypothesis" may have occurred in Canada for this group of immigrants. These Western/Northern European immigrants (or perhaps Oceanic, as they are also included in this group) may have arrived because of abnormally generous job offers. Subsequently, the convergence of wages to the "normal" value may have driven some of these mobile immigrants to move elsewhere, while the less mobile stay and accept this convergence of wage.

Africa is also a noteworthy region based on the results. Immigrants from this continent displayed one of the lowest entry effects among the developing regions, yet also had the largest assimilation effect. Possible explanation is the selection bias, as those who are able to emigrate from Africa to Canada may have considerable ability relative to their peers within the region. And so, their rate of assimilation is stronger than immigrants from other regions.

Similar to the general pooled regression results shown earlier, the cohort effects become negative and larger in magnitude from the 1980s onwards. The newest immigrants from almost all regions suffered relatively larger cohort effects.

7.5 Wage gap and assimilation by province of residence

Table 5 below shows the summary of results while Table D.6 shows the full result for modelling equation (4) for each province/region separately. Note that the Atlantic Provinces were removed from Table 5, as all of the parameters of interest (entry, assimilation, cohort effects) were not statistically significant.

Because the model was estimated separately for each province, the interpretation of the parameters involves comparisons with their native-born counterparts living in the same province.

For all five provinces/regions, the entry effect is negative while assimilation effect is positive. The years-to-equality is generally lower in the Prairies relative to other provinces, partly due to the relatively larger assimilation effect.

Looking at the cohort effects, the newer cohorts are consistently experiencing larger negative effects. Quebec is generally experiencing negative cohort effects – relative to pre-1956 levels – earlier on than in the other provinces, with the increasingly negative trend beginning from the late 1960s/early 1970s.

Overall, the general characteristics of the entry and assimilation effects were fairly consistent across the five regions, although some differences were found in specific cases. Unfortunately, no conclusion can be drawn for the Atlantic Provinces.

Table 5. Entry, assimilation, cohort effects and years-to-equality (YTE), by province/ region of residence.

Effects	Quebec		Ontario		Prairies		Alberta		British Columbia	
	Effect	**YTE**	Effect	**YTE**	Effect	**YTE**	Effect	**YTE**	Effect	**YTE**
Entry effect	-20.0	---	-22.5	---	-30.6	---	-21.6	---	-27.4	---
Assimilation effect	0.55	---	0.61	---	0.89	---	0.50	---	0.62	---
Cohort effect										
Reference (Before 1956)	---	**36.3**	---	**36.9**	---	**34.5**	---	**43.2**	---	**44.2**
COH5660	-0.8	**37.8**	3.0	**32.0**	1.8	**32.5**	-1.1	**45.4**	2.2	**40.7**
COH6165	0.4	**35.6**	4.8	**29.0**	8.4	**25.0**	6.2	**30.8**	6.5	**33.7**
COH6670	-1.3	**38.7**	5.1	**28.6**	9.6	**23.6**	2.6	**38.0**	6.5	**33.7**
COH7175	-3.8	**43.2**	3.3	**31.5**	7.1	**26.5**	-1.0	**45.3**	4.8	**36.5**
COH7680	-6.9	**48.9**	2.1	**33.4**	2.4	**31.7**	-0.8	**44.7**	3.1	**39.1**
COH8185	-11.0	**56.3**	0.4	**36.3**	-1.9	**36.6**	-6.3	**55.8**	-4.6	**51.6**
COH8691	-14.1	**61.9**	-5.5	**46.0**	-5.0	**40.1**	-14.2	**71.6**	-8.5	**57.9**
COH9195	-15.7	**64.8**	-11.9	**56.4**	-9.5	**45.1**	-17.7	**78.6**	-14.4	**67.4**
COH9600	-15.1	**63.7**	-12.1	**56.7**	-2.5	**37.3**	-14.2	**71.6**	-15.9	**69.8**
COH0106	-22.8	**77.7**	-27.8	**82.5**	-16.2	**52.7**	-22.1	**87.4**	-26.0	**86.1**

7.6 Wage gap and assimilation by area of residence

Similar to the estimation by province, Table 6 shows the results of estimating model (4) for each type of area based on population. The large cities refer to Montreal, Toronto, and Vancouver, while towns/rural refer to non-CMAs. The medium/small cities refer to CMA aside from the three largest cities. (Full results are shown in Table D.7.)

From examining the results, the smaller entry effect of immigrants living in towns/rural areas is striking, as it is less than half of those living in either a large or medium/small city. Granted, the wages in rural areas are typically lower and vary less in comparison with the three largest cities. As the initial gap is narrower, it is unsurprising that the assimilation effect is also smaller. The phenomenon may also be partly explained by fewer interactions with other residents in their area, slowing their assimilation process.

Table 6. Entry, assimilation, cohort effects and years-to-equality (YTE), by area of residence

Effects	Large cities		Medium/small cities		Towns/rural	
	Effect	**YTE**	Effect	**YTE**	Effect	**YTE**
Entry effect	-26.1	---	-29.6	---	-11.5	---
Assimilation effect	0.71	---	0.76	---	0.39	---
Cohort effect						
Reference (Before 1956)	---	**36.9**	---	**38.9**	---	**29.6**
COH5660	1.2	**35.3**	2.2	**36.0**	2.2	**24.1**
COH6165	1.8	**34.3**	7.7	**28.7**	6.7	**12.3**
COH6670	3.0	**32.7**	7.5	**29.1**	5.1	**16.4**
COH7175	0.3	**36.5**	6.1	**30.9**	5.4	**15.8**
COH7680	-2.0	**39.7**	6.6	**30.3**	3.5	**20.7**
COH8185	-5.1	**44.1**	3.4	**34.4**	0.2	**29.0**
COH8691	-8.1	**48.3**	-1.1	**40.3**	-2.2	**35.3**
COH9195	-14.9	**58.0**	-1.7	**41.1**	-4.2	**40.3**
COH9600	-15.7	**59.1**	4.3	**33.3**	-7.5	**49.1**
COH0106	-28.2	**76.8**	-9.8	**51.7**	1.1	**26.9**

Recent cohorts of immigrants living in the three largest cities suffered the most with the increasing negative cohort effects, beginning from the late 1970s. On the other hand, those who chose to reside in towns and rural areas from 2001 to 2006 actually had a positive cohort entry effect. Possible explanations include the typically lower wages of rural residents, even if born in Canada. Alternatively, strong competition may exist in the large cities, leaving the immigrants with fewer opportunities. This is supported by the evidence that more recent immigrants tend to settle in the three largest cities, as shown in the descriptive statistics.

Overall, immigrants settling in towns and rural areas seem to fare better in terms of the initial wage gap when compared with those residing in cities. It also seems that the tendency of recent immigrants to settle in large cities may not be beneficial for their wage outcomes.

8. Issues, Limitations, and Suggested Alternatives

The results found in the previous section are produced using a pseudo-longitudinal data set by merging the quinquennial Canadian Census data. In an ideal scenario, a true longitudinal data, such as IMDB used by Abbott and Beach (1993), is likely to provide clearer results than the method used here.

One large source of concern is the disturbingly similar trend in cohort entry effects between Bloom et al. (1995) and what was found in this paper. Going back to Table 1 and Table 2, the cohort entry effects increase at similar rates for the last 3 to 4 cohorts, despite the fact that the time periods are different. This is especially true for the respective newest cohorts, where the cohort effect essentially doubles. A similar pattern is also found with the results from Campolieti et al. (2013) who used a similar methodology and same data source. This may indicate that the methodology may overestimate the cohort entry effects of newer cohorts, as there are not many

observations yet. As such, the results shown should be taken with caution, and further research that uses this methodology should focus on examining its validity. Certainly, if an alternative, longitudinal data source is available, the use of such data is more preferable for the analysis on wage differential and earnings assimilation.

There was also difficulty in producing the years-since-migration variable as well as categorizing immigrants by cohorts. Both of these variables are derived using the year of immigration variable from the PUMF data. For some observations, a single year is provided, while others were reported as intervals. The intervals were converted to the year that represented the midpoint. For intervals where one side was open (for example, before a certain year), the midpoint between the observation's year of birth and the end of the interval was assumed. These transformation may cause some errors as some cohorts may actually belong to another, or the years-since-migration was over or underestimated.

Another issue to take note of is that the data did not exclude those that migrated at a young age. Certainly these immigrants would perform differently than older immigrants, as they are likely to be educated in Canada and assimilate somewhat more before entering the labour force. They may display outcomes that are more similar to the Canadian-born rather than the older immigrants. Continuing on the subject of education in Canada, the paper also does not directly address the differences in the quality of education and work experience that may arise between those in Canada and those obtained outside.

Nevertheless, the main, broad findings in the paper are consistent with the literature, and the analysis shown here provides yet another confirmation to the findings that have been provided by earlier works on the subject.

With regards to possible extensions, the cohort-specific assimilation effects seen in Campolieti et al. (2013) could be estimated. Further use of the quadratic assimilation effect is another possible addition. A better estimate of the years of work experience could certainly improve the estimates as well, or perhaps separating it into foreign and Canadian experience.

9. Conclusion

The literature as well as the results presented in this paper support the notion that immigrants typically earn less in wages upon entry to Canada than comparable Canadian-born individuals. That is, there is a negative entry effect on wage of immigrants. At the same time, these immigrants' wages grow more quickly than their counterparts, displaying a positive assimilation effect. The more recent cohorts are certainly in worse shape than the older ones. In some cases, the results suggest that they will never attain wage equality, while for many others, it takes at least a couple of decades.

Broken down by country/region of origin, immigrants from the historically preferred countries, such as those in Europe and the United States, experienced weaker entry effects than those from the Middle East, Asia, Africa, and Latin America. However, immigrants from these developing regions experience positive and relatively large assimilation effects. These results were similar to Bloom et al. (1995). Notably, Western Europe seemed to display characteristics of negative assimilation as described in Chiswick and Miller (2011). The results indicate that once again, the newer cohorts are performing worse, likely to never achieve wage equality in their lifetime.

Immigrants' wage outcomes varied somewhat depending on their province and area of residence. The Atlantic Provinces displayed ambiguous results due to lack of statistical

significance in all parameters of interest, while the estimates were, to an extent, similar between the other provinces/regions. Recent immigrants living in any of the three largest cities suffered the most from the cohort entry effect, while those living in towns/rural areas were less affected and also had smaller wage gap upon entry.

Further research on wage differential and wage assimilation may benefit from having a true longitudinal data set that can undergo data linkage in order to track individuals over time. The pseudo-panel data used in this study may be problematic, especially in estimating cohort effects for the newest cohorts. Detailed examination on the validity of the general methodology is advisable if it were to be used in future research.

Although the labour market outcome of immigrants is one of the core issues discussed in this paper, it should be noted that what is considered a success by an immigrant may not necessarily be about his/her own wage. Rather, some immigrants may be focused on the future and the opportunities that arise for their children. The findings in this paper do not provide an indication as to the assimilation of the immigrants' children who are born in Canada. Rather, they are placed under the umbrella of "native-born Canadians".

More focus on studies on the outcomes of immigrant's children and grandchildren[2] may be of interest to Canada, as the nation has also recently accepted a fair number of Syrian refugees. When a foreigner immigrates to Canada, we are not only accepting them, but also their descendants as one of our own. As such, it would be prudent to ensure that the descendants of immigrants are successfully integrated into the Canadian culture, and to ensure that their parents' or ancestors' decision to move to Canada was, in fact, the correct one.

[2] Studies include those by Aydemir and Sweetman (2006), which analyzed the labour market outcomes of second, third, and "one and a half" generations.

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Appendix A: List of Variables

Table A.1. List of relevant variables with descriptions.

Variable	Description
PROV	Province of Residence Code
ATL	Province of Residence Dummy – Atlantic Provinces
QUE	Province of Residence Dummy – Quebec
ONT	Province of Residence Dummy – Ontario (reference)
PRA	Province of Residence Dummy – Manitoba & Saskatchewan
ALB	Province of Residence Dummy – Alberta
BC	Province of Residence Dummy – British Columbia
CITY	Area of Residence Dummy – Montreal, Toronto, Vancouver
RURAL	Area of Residence Dummy – non-CMA
AGE	Age of individual at time of Census
EDUC[1]	Years of education (converted from categories of last degree/education completed)
EXPER[1]	Years of work experience (derived from Mincer's Identity)
EXPSQ[1]	Squared years of work experience
HRSWK	Number of hours worked
WKSWK	Number of weeks worked
LNWKS	Natural log of weeks worked
PRTWK	Dummy – Part-time work
IMMIG	Dummy – Immigrant
YRIMG	Year of Immigration (intervals were converted to midpoint)
YSM	Years since migration (derived using year of Census and YRIMG
MARRI[1]	Dummy – Married
WAGE	Annual Salary and Wage
LNWAGE	Natural log of WAGE
COH####	Dummy – Immigrant cohort (=1 if year of immigration falls within interval)
POB_CAN	Place of Birth Dummy – Canada (reference)
POB_USA	Place of Birth Dummy – United States of America
POB_EUW	Place of Birth Dummy – Western/Northern Europe, Oceania
POB_EUE	Place of Birth Dummy – Eastern/Southern Europe
POB_MID	Place of Birth Dummy – Middle East
POB_SEA	Place of Birth Dummy – South Asia/Southeast Asia
POB_ASI	Place of Birth Dummy – East Asia
POB_AFR	Place of Birth Dummy – Africa
POB_LAT	Place of Birth Dummy – Latin America
POB_OTH	Place of Birth Dummy – Others
WKS####[1]	Dummy – Weeks worked (=1 if worked the number of weeks within the specified interval)
HRS####[1]	Dummy – Hours worked (=1 if worked the number of hours within the specified interval)
INDEX##[2]	Dummy – Census year from which the observation was taken

[1]Included in *X* vector in model (1); see section under Empirical Methodology.

[2]Included in all pooled regressions.

Appendix B: Summary Statistics

Table B.1. Summary Statistics – Mean for each variable for each census and pooled data

Summary	Pooled	1981	1986	1991	1996	2001	2006
	mean	mean	mean	mean	mean	mean	mean
PROV	35.80643	35.82823	35.22607	35.55088	35.90957	36.02221	36.10221
ATL	.0719029	.0747943	.0781438	.0764238	.0717411	.0673741	.0663517
QUE	.2462967	.2551503	.2489227	.2475186	.2449306	.2410317	.2444569
ONT	.3839235	.373534	.3918426	.3846206	.3824526	.3891064	.3808884
PRA	.0671542	.0708154	.072955	.0686555	.0674258	.0644677	.0621898
ALB	.1055644	.102448	.096192	.0993725	.1013552	.1110946	.1178955
BC	.1215784	.1165932	.1090124	.1202193	.1286252	.1238707	.1251192
CITY	.3380408	.3196789	.3330662	.331256	.3382679	.3481192	.3490112
RURAL	.3760313	.4591809	.4716378	.3695448	.3635068	.3476925	.311102
AGE	38.96968	37.27131	37.46534	38.19926	39.07883	39.88806	40.71229
EDUC	12.53519	11.69653	11.89968	12.34661	12.6691	12.80614	13.24474
EXPER	20.43539	19.57599	19.56668	19.8537	20.41054	21.08269	21.46824
EXPSQ	557.1462	544.2408	532.9114	530.3636	543.0376	576.4169	600.7676
HRSWK	42.81138	42.41138	42.68926	42.2248	42.70402	43.19881	43.43243
WKSWK	46.57953	46.18748	45.85037	46.43601	46.30453	47.06137	47.19533
PRTWK	.0676976	.0481453	.0692614	.0558905	.0805248	.073051	.0734104
IMMIG	.1946464	.2022998	.1942992	.1911795	.1955249	.2015225	.1860073
YRIMG	384.3387	396.9049	381.8487	376.7292	386.2547	399.1576	369.3391
YSM	3.94707	3.851038	4.029569	3.909109	4.013039	4.088863	3.791552
MARRI	.7067862	.7380059	.7176583	.7222376	.7082543	.6891144	.6815582
SEPAR	.0627016	.0534373	.057809	.0575806	.0665934	.0689696	.0667795
SINGL	.2305122	.2085567	.2245327	.2201818	.2251523	.241916	.2516623
WAGE	37424.79	19289.04	26480.53	34335.66	37116.42	42690.76	53562.36
LNWAGE	10.22169	9.673566	9.941749	10.21668	10.25643	10.39191	10.53843
COH5660	.0168094	.0337415	.0287091	.0204842	.014544	.0091028	.0050053
COH6165	.0129108	.0205513	.0195335	.0164033	.0127327	.0091893	.004443
COH6670	.0266717	.0377503	.0376794	.0324133	.0272434	.0206111	.0127362
COH7175	.0284622	.0335724	.0312888	.0338023	.0310725	.0257932	.0184871
COH7680	.0217934	.020233	.0218005	.0225369	.0226884	.0208337	.0221356
COH8185	.0141818	0	.0154294	.0171654	.0178404	.0182241	.011795
COH8691	.0201574	0	0	.0258618	.0274365	.028675	.0243785
COH9195	.0166489	0	0	0	.0283155	.03207	.0278986
COH9600	.0106839	0	0	0	0	.0284647	.0267864
COH0106	.0054811	0	0	0	0	0	.0281737
POB_CAN	.8048649	.7977002	.8059744	.8089803	.8045616	.7953979	.8141149
POB_USA	.0084332	.0109222	.0097521	.0089422	.0088236	.0072414	.0063925
POB_EUW	.0568651	.0753414	.0673657	.0729084	.0586954	.0476411	.0304288
POB_EUE	.0540793	.0718997	.0636524	.0662524	.052429	.0477339	.0328245
POB_MID	.0066534	0	.0035666	.0052055	.0072187	.010018	.0102672
POB_SEA	.0314525	.0288076	.0185954	.0216334	.0293943	.0386868	.0456218
POB_ASI	.0224081	.0288076	.0113644	.0180074	.0230946	.0269064	.024684
POB_AFR	.0097732	.0060878	.0067033	.008678	.0098958	.0121824	.0125529
POB_LAT	.0206009	.0140258	.0164359	.0191505	.0227017	.0242905	.0231134
POB_OTH	.0016384	.0024471	.0030976	.0025014	.0024773	.0002226	0
WKS0113	.0256896	.0270569	.0334874	.0259786	.0285086	.0223117	.0204366
WKS1426	.0632128	.0650161	.0747237	.0698785	.0672527	.054462	.0532183
WKS2739	.0603071	.0668961	.0665546	.0610284	.0643825	.0543507	.0537805
WKS4048	.1305561	.1456993	.1199566	.1191991	.1239303	.1361643	.1397133

HRS0119	.0310007	.0219041	.0268915	.0306064	.0418406	.0315752	.0290354
HRS2029	.031827	.0222821	.0294908	.0288548	.0382513	.0338818	.0341812
HRS3034	.0332799	.0322991	.0337219	.0337285	.0355875	.0321751	.0321339
HRS3539	.1241334	.1563927	.1421871	.1415147	.1132687	.1038532	.1057521
HRS4549	.0906776	.0890887	.0931042	.0849912	.0959944	.0895126	.0920625
Obs	841079	100529	102337	162711	150165	161709	163628

Appendix C: Summary Statistics by Native-born Canadians and Immigrants

Table C.1. Summary Statistics – Pooled data (1981 to 2006)

Pooled Data	(1)		(2) IMMIG=0		(3) IMMIG=1	
	mean	sd	mean	sd	mean	sd
PROV	35.80643	13.01618	35.08391	13.33417	38.79586	11.12006
ATL	.0719029	.2583272	.0859329	.2802651	.0138535	.1168832
QUE	.2462967	.4308536	.2747141	.4463704	.1287192	.3348899
ONT	.3839235	.4863399	.3399063	.4736775	.5660455	.4956203
PRA	.0671542	.250289	.0746509	.2628274	.0361364	.1866301
ALB	.1055644	.3072795	.1088009	.3113894	.0921735	.2892716
BC	.1215784	.3267984	.1118598	.3151941	.1617892	.3682585
CITY	.3380408	.4730428	.2716833	.4448278	.6125964	.4871586
RURAL	.3760313	.4843883	.4325121	.4954248	.1423406	.3494002
AGE	38.96968	11.35738	38.17225	11.27275	42.26906	11.10849
EDUC	12.53519	2.988794	12.44505	2.933118	12.90814	3.181892
EXPER	20.43539	11.81275	19.72811	11.74265	23.3618	11.65081
EXPSQ	557.1462	546.3543	527.0877	534.3103	681.514	577.1926
HRSWK	42.81138	12.16006	42.87528	12.28715	42.54697	11.61577
WKSWK	46.57953	10.67799	46.53792	10.72611	46.75168	10.47482
PRTWK	.0676976	.2512264	.0692137	.2538174	.0614246	.2401082
IMMIG	.1946464	.3959285	0	0	1	0
YRIMG	384.3387	781.8067	0	0	1974.548	14.67854
YSM	3.94707	9.698006	0	0	20.27816	12.32991
MARRI	.7067862	.4552359	.6882985	.4631889	.7832793	.412012
WAGE	37424.79	37479.31	37397.24	37434.31	37538.78	37664.81
LNWAGE	10.22169	.8509572	10.22084	.8509748	10.22522	.8508776
COH5660	.0168094	.1285567	0	0	.0863584	.2808935
COH6165	.0129108	.1128899	0	0	.0663295	.2488579
COH6670	.0266717	.1611221	0	0	.1370264	.3438762
COH7175	.0284622	.1662895	0	0	.1462254	.3533331
COH7680	.0217934	.1460086	0	0	.1119642	.3153234
COH8185	.0141818	.1182399	0	0	.0728592	.2599061
COH8691	.0201574	.1405388	0	0	.1035593	.3046889
COH9195	.0166489	.1279519	0	0	.0855338	.2796753
COH9600	.0106839	.1028093	0	0	.0548887	.2277637
COH0106	.0054811	.073831	0	0	.028159	.1654275
INDEX86	.1216735	.3269085	.1217259	.3269692	.1214565	.326658
INDEX91	.1934551	.3950068	.1942879	.3956518	.1900093	.3923095
INDEX96	.1785385	.3829657	.1783438	.3828021	.1793443	.3836416
INDEX01	.1922637	.3940794	.1906222	.3927921	.1990557	.3992912
INDEX06	.1945453	.3958505	.1966322	.3974522	.1859107	.3890358
POB_CAN	.8048649	.3963049	.9992176	.0279613	.0007269	.026951
POB_USA	.0084332	.0914446	0	0	.0433258	.2035901
POB_EUW	.0568651	.2315847	0	0	.2921454	.4547502
POB_EUE	.0540793	.2261743	0	0	.2778338	.4479324
POB_MID	.0066534	.0812964	0	0	.0341818	.1816964
POB_SEA	.0314525	.1745372	0	0	.1615877	.3680732
POB_ASI	.0224081	.1480068	0	0	.1151222	.3191703
POB_AFR	.0097732	.0983751	0	0	.0502098	.2183783
POB_LAT	.0206009	.1420442	0	0	.1058377	.3076307
POB_OTH	.0016384	.0404437	0	0	.0084172	.0913585
WKS0113	.0256896	.1582078	.0252758	.1569618	.0274016	.1632511

WKS1426	.0632128	.2433455	.0650328	.2465839	.0556828	.2293089
WKS2739	.0603071	.238055	.0616048	.2404366	.0549376	.2278591
WKS4048	.1305561	.3369144	.126645	.3325751	.1467385	.3538461
HRS0119	.0310007	.1733195	.0310571	.1734721	.0307673	.172687
HRS2029	.031827	.1755393	.0322662	.1767063	.0300098	.1706148
HRS3034	.0332799	.1793665	.0340776	.1814287	.0299793	.1705307
HRS3539	.1241334	.3297339	.1251997	.3309454	.1197217	.3246368
HRS4549	.0906776	.2871502	.0907309	.2872262	.0904571	.2868364
Observations	841079		677366		163713	

Table C.2. Summary Statistics – 1981 Census

1981	(1)		(2) IMMIG=0		(3) IMMIG=1	
	mean	sd	mean	sd	mean	sd
PROV	35.82823	13.83871	35.09929	14.2661	38.70256	11.56703
ATL	.0747943	.2630605	.0893107	.2851934	.0175542	.1313275
QUE	.2551503	.4359478	.2845795	.4512167	.1391061	.3460657
ONT	.373534	.4837444	.329983	.4702095	.5452623	.4979593
PRA	.0708154	.2565175	.0776387	.2676038	.0439101	.2049002
ALB	.102448	.3032381	.1042249	.3055539	.0954418	.2938314
BC	.1165932	.3209365	.1064944	.3084713	.1564144	.3632567
CITY	.3196789	.4663544	.2635799	.4405768	.5408861	.4983378
RURAL	.4591809	.4983335	.5162984	.4997374	.2339578	.4233561
AGE	37.27131	11.94926	36.33259	11.93424	40.97286	11.27071
EDUC	11.69653	3.167429	11.59368	3.117835	12.10208	3.325066
EXPER	19.57599	12.68948	18.74025	12.69142	22.87147	12.13351
EXPSQ	544.2408	597.0377	512.267	590.5815	670.3188	605.6229
HRSWK	42.41138	10.95892	42.41414	11.09825	42.4005	10.39162
WKSWK	46.18748	10.8059	46.03494	10.98642	46.78896	10.04026
PRTWK	.0481453	.2140743	.0519378	.221903	.0331907	.1791387
IMMIG	.2022998	.4017166	0	0	1	0
YRIMG	396.9049	788.1686	0	0	1961.964	10.89628
YSM	3.851038	9.082812	0	0	19.03629	10.89628
MARRI	.7380059	.4397216	.7197227	.4491375	.8100998	.3922317
WAGE	19289.04	11274.08	19012.98	11172.45	20377.61	11602.64
LNWAGE	9.673566	.7046286	9.655959	.7102453	9.742996	.6776024
SLFINC	211.5989	2771.627	218.1527	2804.825	185.7564	2636.557
COH5660	.0337415	.180564	0	0	.1667896	.3727971
COH6165	.0205513	.1418772	0	0	.1015882	.3021135
COH6670	.0377503	.1905927	0	0	.1866057	.3896043
COH7175	.0335724	.1801267	0	0	.1659537	.3720482
COH7680	.020233	.140797	0	0	.1000148	.300027
COH8185	0	0	0	0	0	0
COH8691	0	0	0	0	0	0
COH9195	0	0	0	0	0	0
COH9600	0	0	0	0	0	0
COH0106	0	0	0	0	0	0
POB_CAN	.7977002	.4017166	1	0	0	0
POB_USA	.0109222	.1039376	0	0	.0539903	.226004
POB_EUW	.0753414	.2639428	0	0	.3724246	.4834625
POB_EUE	.0718997	.258323	0	0	.3554113	.4786495
POB_MID	0	0	0	0	0	0
POB_SEA	.0288076	.1672663	0	0	.1424006	.3494691
POB_ASI	.0288076	.1672663	0	0	.1424006	.3494691
POB_AFR	.0060878	.0777869	0	0	.0300929	.1708473
POB_LAT	.0140258	.1175977	0	0	.0693318	.2540237
POB_OTH	.0024471	.0494074	0	0	.0120962	.1093181
WKS0113	.0270569	.16225	.027933	.1647818	.0236023	.1518103
WKS1426	.0650161	.2465554	.0686852	.2529196	.0505483	.2190787
WKS2739	.0668961	.2498433	.0680741	.2518746	.0622511	.2416169
WKS4048	.1456993	.3528062	.1419967	.3490489	.160299	.3668921
HRS0119	.0219041	.1463713	.0224087	.1480096	.0199144	.1397098
HRS2029	.0222821	.1476003	.023132	.1503236	.018931	.1362848
HRS3034	.0322991	.1767943	.0340807	.1814377	.0252741	.1569604
HRS3539	.1563927	.363229	.1547162	.3616362	.1630034	.3693778
HRS4549	.0890887	.2848732	.0876895	.2828446	.0946059	.292677
Observations	100529		80192		20337	

Table C.3. Summary Statistics – 1986 Census

1986	(1)		(2) IMMIG=0		(3) IMMIG=1	
	mean	sd	mean	sd	mean	sd
PROV	35.22607	12.75103	34.49283	13.05104	38.2666	10.90976
ATL	.0781438	.268399	.0924648	.2896827	.0187588	.1356755
QUE	.2489227	.432391	.2771276	.4475827	.1319654	.3384617
ONT	.3918426	.4881642	.3493991	.4767831	.5678435	.4953883
PRA	.072955	.260064	.0794877	.2705001	.045866	.2091997
ALB	.096192	.2948558	.0969886	.295944	.0928888	.2902838
BC	.1090124	.3116563	.1012577	.3016715	.1411688	.3482043
CITY	.3330662	.4713123	.2789711	.448496	.5573828	.4967088
RURAL	.4716378	.4991974	.5312117	.4990279	.2246027	.4173309
AGE	37.46534	11.55038	36.44961	11.37948	41.67723	11.29818
EDUC	11.89968	3.154466	11.82341	3.10699	12.21595	3.325618
EXPER	19.56668	12.24982	18.62728	12.11449	23.46208	12.03761
EXPSQ	532.9114	575.9265	493.7345	560.1604	695.366	610.9235
HRSWK	42.68926	11.83874	42.69866	11.98818	42.65027	11.198
WKSWK	45.85037	11.57096	45.62922	11.78169	46.7674	10.60388
PRTWK	.0692614	.2538993	.0729264	.2600172	.0540636	.2261488
IMMIG	.1942992	.3956622	0	0	1	0
YRIMG	381.8487	777.5939	0	0	1965.261	10.74487
YSM	4.029569	9.474375	0	0	20.73899	10.74487
MARRI	.7176583	.4501409	.6979976	.4591291	.7991853	.4006198
WAGE	26480.53	16841.18	26075.3	16608.96	28160.93	17673.33
LNWAGE	9.941749	.7999557	9.923611	.8048036	10.01696	.7750341
COH5660	.0287091	.1669884	0	0	.147757	.3548679
COH6165	.0195335	.1383912	0	0	.1005331	.300717
COH6670	.0376794	.1904207	0	0	.1939248	.3953806
COH7175	.0312888	.1740979	0	0	.161034	.3675715
COH7680	.0218005	.1460324	0	0	.1122008	.3156212
COH8185	.0154294	.1232538	0	0	.0794106	.2703853
COH8691	0	0	0	0	0	0
COH9195	0	0	0	0	0	0
COH9600	0	0	0	0	0	0
COH0106	0	0	0	0	0	0
POB_CAN	.8059744	.3954506	1	0	.0014082	.0375001
POB_USA	.0097521	.0982705	0	0	.0501911	.2183446
POB_EUW	.0673657	.2506554	0	0	.3467109	.4759347
POB_EUE	.0636524	.244134	0	0	.3276001	.4693499
POB_MID	.0035666	.0596151	0	0	.0183565	.1342401
POB_SEA	.0185954	.1350919	0	0	.0957051	.2941938
POB_ASI	.0113644	.105997	0	0	.0584892	.2346721
POB_AFR	.0067033	.0815995	0	0	.0345001	.1825144
POB_LAT	.0164359	.1271452	0	0	.0845906	.2782785
POB_OTH	.0030976	.0555702	0	0	.0159425	.1252561
WKS0113	.0334874	.1799064	.0349654	.1836932	.0273587	.1631304
WKS1426	.0747237	.2629463	.0787479	.2693465	.0580366	.2338185
WKS2739	.0665546	.2492503	.0689484	.2533679	.0566284	.2311371
WKS4048	.1199566	.3249124	.1174487	.3219562	.1303561	.3367032
HRS0119	.0268915	.1617673	.0271549	.1625355	.0257996	.1585411
HRS2029	.0294908	.1691785	.0303446	.1715346	.0259505	.1589917
HRS3034	.0337219	.1805133	.035123	.1840919	.0279119	.1647246
HRS3539	.1421871	.3492436	.1430512	.3501272	.1386039	.3455414
HRS4549	.0931042	.2905798	.0927559	.2900918	.0945484	.2925975
Observations	102337		82453		19884	

Table C.4. Summary Statistics – 1991 Census

1991	(1)		(2) IMMIG=0		(3) IMMIG=1	
	mean	sd	mean	sd	mean	sd
PROV	35.55088	12.95124	34.79499	13.23649	38.74883	11.11267
ATL	.0764238	.2656759	.090286	.2865922	.0177773	.1321434
QUE	.2475186	.4315719	.2768457	.4474413	.1234449	.3289525
ONT	.3846206	.486507	.3421401	.474428	.5643424	.4958507
PRA	.0686555	.2528681	.0752637	.2638173	.0406982	.1975934
ALB	.0993725	.2991624	.100658	.3008765	.0939338	.2917413
BC	.1202193	.3252188	.1113492	.3145653	.1577458	.3645084
CITY	.331256	.4706664	.2730312	.4455184	.577587	.4939515
RURAL	.3695448	.482683	.4219477	.4938721	.1478445	.3549515
AGE	38.19926	11.08482	37.31966	10.90267	41.92056	11.077
EDUC	12.34661	3.023469	12.27712	2.974367	12.64063	3.206364
EXPER	19.8537	11.67027	19.04365	11.52012	23.28074	11.67947
EXPSQ	530.3636	544.2909	495.3729	528.3974	678.3986	584.2061
HRSWK	42.2248	11.60335	42.3006	11.73834	41.90411	11.0084
WKSWK	46.43601	10.93885	46.33769	11.03813	46.85193	10.49847
PRTWK	.0558905	.2297109	.0574223	.2326486	.0494101	.2167262
IMMIG	.1911795	.3932313	0	0	1	0
YRIMG	376.7292	774.8992	0	0	1970.553	11.50302
YSM	3.909109	9.483997	0	0	20.44733	11.50302
MARRI	.7222376	.447897	.7063767	.4554231	.78934	.4077839
WAGE	34335.66	22114.48	33949.66	21741.3	35968.74	23558.66
LNWAGE	10.21668	.7612858	10.20711	.7576598	10.25715	.7751462
COH5660	.0204842	.1416499	0	0	.1071463	.3093041
COH6165	.0164033	.127021	0	0	.0858006	.2800739
COH6670	.0324133	.1770956	0	0	.1695438	.3752376
COH7175	.0338023	.1807204	0	0	.1768091	.3815132
COH7680	.0225369	.1484221	0	0	.1178834	.3224752
COH8185	.0171654	.1298879	0	0	.0897869	.2858808
COH8691	.0258618	.1587234	0	0	.135275	.3420226
COH9195	0	0	0	0	0	0
COH9600	0	0	0	0	0	0
COH0106	0	0	0	0	0	0
POB_CAN	.8089803	.3931057	.9999088	.0095486	.0012216	.0349305
POB_USA	.0089422	.0941399	0	0	.046774	.2111579
POB_EUW	.0729084	.2599869	0	0	.3813611	.4857287
POB_EUE	.0662524	.2487236	0	0	.3465458	.4758772
POB_MID	.0052055	.0719617	0	0	.0272286	.1627515
POB_SEA	.0216334	.1454839	0	0	.1131578	.3167907
POB_ASI	.0180074	.1329783	0	0	.094191	.292099
POB_AFR	.008678	.0927508	0	0	.0453917	.2081651
POB_LAT	.0191505	.1370543	0	0	.1001704	.3002319
POB_OTH	.0025014	.0499512	0	0	.0130839	.1136358
WKS0113	.0259786	.1590718	.0260706	.159346	.0255891	.1579085
WKS1426	.0698785	.2549429	.0722698	.2589352	.0597615	.2370482
WKS2739	.0610284	.2393832	.0624373	.241949	.055068	.2281166
WKS4048	.1191991	.3240236	.1169493	.3213611	.128717	.3348918
HRS0119	.0306064	.1722494	.0307134	.1725406	.030154	.1710136
HRS2029	.0288548	.167399	.0290569	.1679666	.0280001	.1649757
HRS3034	.0337285	.1805301	.0347482	.183142	.0294146	.1689683
HRS3539	.1415147	.3485528	.1416598	.3487022	.1409008	.3479247
HRS4549	.0849912	.2788694	.0853545	.2794096	.0834539	.2765715
Observations	162711		131604		31107	

Table C.5. Summary Statistics – 1996 Census

1996	(1)		(2) IMMIG=0		(3) IMMIG=1	
	mean	sd	mean	sd	mean	sd
PROV	35.90957	13.01942	35.15669	13.29826	39.00722	11.28669
ATL	.0717411	.2580596	.085469	.2795795	.0152583	.1225807
QUE	.2449306	.4300475	.2737492	.4458836	.1263581	.3322582
ONT	.3824526	.4859878	.3396245	.4735837	.5586663	.4965548
PRA	.0674258	.2507589	.0748402	.2631345	.0369197	.1885679
ALB	.1013552	.3017995	.1044336	.3058235	.0886891	.2842993
BC	.1286252	.3347857	.1180259	.3226401	.1722353	.3775912
CITY	.3382679	.4731218	.2738817	.4459508	.6031811	.4892462
RURAL	.3635068	.4810106	.4189182	.493384	.1355199	.3422839
AGE	39.07883	10.78103	38.31121	10.62557	42.23715	10.841
EDUC	12.6691	2.955071	12.59314	2.902143	12.98164	3.144343
EXPER	20.41054	11.24493	19.7189	11.12524	23.25622	11.28728
EXPSQ	543.0376	517.5718	512.605	503.0846	668.2504	556.0935
HRSWK	42.70402	12.80428	42.73188	12.84445	42.58939	12.63723
WKSWK	46.30453	11.03214	46.26562	11.06878	46.4646	10.87884
PRTWK	.0805248	.2721048	.0820668	.2744676	.07418	.2620681
IMMIG	.1955249	.3966056	0	0	1	0
YRIMG	386.2547	783.504	0	0	1975.476	12.46842
YSM	4.013039	9.831433	0	0	20.52444	12.46842
MARRI	.7082543	.4545674	.6931724	.4611791	.7703076	.4206422
WAGE	37116.42	25371.17	37119.07	25125.42	37105.53	26358.64
LNWAGE	10.25643	.8328379	10.25976	.828695	10.24273	.849548
COH5660	.014544	.1197187	0	0	.0743844	.2623999
COH6165	.0127327	.1121188	0	0	.0651204	.2467424
COH6670	.0272434	.1627923	0	0	.1393345	.3463011
COH7175	.0310725	.1735142	0	0	.1589183	.3656061
COH7680	.0226884	.1489086	0	0	.1160383	.3202763
COH8185	.0178404	.1323715	0	0	.0912435	.28796
COH8691	.0274365	.1633521	0	0	.1403222	.3473269
COH9195	.0283155	.1658732	0	0	.144818	.3519232
COH9600	0	0	0	0	0	0
COH0106	0	0	0	0	0	0
POB_CAN	.8045616	.3965391	1	0	.0004428	.0210377
POB_USA	.0088236	.0935191	0	0	.0451279	.2075881
POB_EUW	.0586954	.2350546	0	0	.3001941	.4583501
POB_EUE	.052429	.2228913	0	0	.2681448	.443001
POB_MID	.0072187	.0846562	0	0	.0369197	.1885679
POB_SEA	.0293943	.1689097	0	0	.1503355	.357406
POB_ASI	.0230946	.1502045	0	0	.1181159	.3227508
POB_AFR	.0098958	.0989844	0	0	.0506114	.2192065
POB_LAT	.0227017	.1489513	0	0	.1161064	.3203579
POB_OTH	.0024773	.0497107	0	0	.0126699	.1118471
WKS0113	.0285086	.1664214	.0280868	.1652216	.0302442	.1712615
WKS1426	.0672527	.2504599	.0688553	.253209	.0606587	.2387073
WKS2739	.0643825	.2454339	.0659084	.248123	.0581043	.2339445
WKS4048	.1239303	.3295032	.1204927	.3255381	.1380743	.3449838
HRS0119	.0418406	.2002255	.0416874	.1998746	.0424713	.2016653
HRS2029	.0382513	.1918029	.038608	.1926596	.0367835	.188233
HRS3034	.0355875	.18526	.0356445	.185403	.035353	.1846736
HRS3539	.1132687	.3169221	.1153853	.3194876	.1045605	.3059915
HRS4549	.0959944	.2945846	.0959488	.2945222	.096182	.2948457
Observations	150165		120804		29361	

Table C.5. Summary Statistics – 2001 Census

2001	(1)		(2) IMMIG=0		(3) IMMIG=1	
	mean	sd	mean	sd	mean	sd
PROV	36.02221	12.83318	35.29773	13.15917	38.89275	10.99096
ATL	.0673741	.2506696	.0813965	.2734442	.0118142	.1080507
QUE	.2410317	.4277108	.2707306	.4443389	.1233583	.3288531
ONT	.3891064	.487549	.342028	.4743908	.5756413	.4942529
PRA	.0644677	.2455849	.0725676	.2594264	.0323739	.1769937
ALB	.1110946	.3142502	.1160462	.3202815	.0914754	.2882884
BC	.1238707	.329435	.1134053	.3170888	.1653369	.3714901
CITY	.3481192	.4763755	.2749979	.4465149	.6378422	.4806315
RURAL	.3476925	.4762392	.4079739	.4914601	.1088437	.3114478
AGE	39.88806	11.0863	39.16443	10.99818	42.75528	10.96924
EDUC	12.80614	2.902732	12.70399	2.837131	13.21088	3.116556
EXPER	21.08269	11.48643	20.46117	11.41305	23.54526	11.44575
EXPSQ	576.4169	525.8133	548.9163	512.7719	685.3806	561.5033
HRSWK	43.19881	12.42687	43.301	12.54651	42.79391	11.93266
WKSWK	47.06137	10.10734	47.1199	10.037	46.82948	10.37829
PRTWK	.073051	.260221	.0733575	.2607235	.0718363	.2582206
IMMIG	.2015225	.4011386	0	0	1	0
YRIMG	399.1576	794.5614	0	0	1980.71	13.19933
YSM	4.088863	10.06742	0	0	20.28986	13.19933
MARRI	.6891144	.4628575	.669953	.4702315	.7650362	.4239827
WAGE	42690.76	30228.06	42817.41	30097.93	42188.95	30733.59
LNWAGE	10.39191	.8309394	10.39873	.8246689	10.36487	.8548099
COH5660	.0091028	.0949735	0	0	.04517	.20768
COH6165	.0091893	.0954199	0	0	.0455996	.2086184
COH6670	.0206111	.1420789	0	0	.1022769	.3030168
COH7175	.0257932	.1585185	0	0	.1279919	.3340859
COH7680	.0208337	.1428279	0	0	.1033816	.3044613
COH8185	.0182241	.1337613	0	0	.0904321	.2868042
COH8691	.028675	.1668918	0	0	.1422916	.3493544
COH9195	.03207	.1761864	0	0	.1591383	.3658106
COH9600	.0284647	.1662969	0	0	.1412483	.3482829
COH0106	0	0	0	0	0	0
POB_CAN	.7953979	.4034118	.9959883	.0632114	.0006137	.0247662
POB_USA	.0072414	.084788	0	0	.0359335	.1861272
POB_EUW	.0476411	.2130064	0	0	.236406	.4248809
POB_EUE	.0477339	.2132033	0	0	.2368663	.4251661
POB_MID	.010018	.0995876	0	0	.0497116	.2173517
POB_SEA	.0386868	.192848	0	0	.1919725	.3938576
POB_ASI	.0269064	.1618103	0	0	.1335154	.3401361
POB_AFR	.0121824	.1096998	0	0	.0604517	.2383255
POB_LAT	.0242905	.1539502	0	0	.1205352	.3255913
POB_OTH	.0002226	.0149189	0	0	.0011047	.0332192
WKS0113	.0223117	.1476957	.0207557	.1425661	.0284767	.166333
WKS1426	.054462	.2269278	.0551343	.2282432	.0517982	.2216228
WKS2739	.0543507	.2267091	.0550879	.2281526	.05143	.2208765
WKS4048	.1361643	.3429641	.1310554	.3374622	.1564073	.3632466
HRS0119	.0315752	.1748669	.0312265	.1739301	.0329569	.1785266
HRS2029	.0338818	.1809256	.0342392	.1818437	.0324659	.1772367
HRS3034	.0321751	.1764654	.032729	.1779271	.0299804	.1705357
HRS3539	.1038532	.305071	.1062879	.3082069	.0942065	.2921202
HRS4549	.0895126	.2854832	.0899854	.2861619	.0876396	.2827744
Observations	161709		129121		32588	

Table C.6. Summary Statistics – 2006 Census

2006	(1)		(2) IMMIG=0		(3) IMMIG=1	
	mean	sd	mean	sd	mean	sd
PROV	36.10221	12.88346	35.45274	13.20561	38.94438	10.9217
ATL	.0663517	.2488967	.0803727	.2718703	.0049941	.0704933
QUE	.2444569	.4297661	.2699111	.4439151	.1330661	.3396517
ONT	.3808884	.4856067	.3359962	.4723393	.5773426	.49399
PRA	.0621898	.2415008	.0711004	.2569934	.0231962	.1505287
ALB	.1178955	.3224853	.1238513	.329413	.091832	.2887935
BC	.1251192	.330855	.115067	.3191039	.1691089	.3748543
CITY	.3490112	.476659	.2655114	.4416068	.7144171	.451699
RURAL	.311102	.4629458	.3675221	.4821321	.0642003	.2451134
AGE	40.71229	11.57153	40.10082	11.57354	43.38816	11.17604
EDUC	13.24474	2.605031	13.12304	2.548028	13.7773	2.779106
EXPER	21.46824	11.82722	20.97832	11.82709	23.61217	11.58681
EXPSQ	600.7676	539.0941	579.9692	531.0955	691.7843	563.8398
HRSWK	43.43243	12.6757	43.54746	12.85198	42.92906	11.86064
WKSWK	47.19533	9.891512	47.28391	9.781344	46.80769	10.3511
PRTWK	.0734104	.2608098	.0732927	.2606173	.0739256	.2616541
IMMIG	.1860073	.3891137	0	0	1	0
YRIMG	369.3391	772.6534	0	0	1985.616	13.78364
YSM	3.791552	9.912085	0	0	20.38389	13.78364
MARRI	.6815582	.4658733	.6588759	.4740887	.7808188	.4136985
WAGE	53562.36	66411.79	53879.18	66091.96	52175.92	67777.34
LNWAGE	10.53843	.8706345	10.55077	.8607468	10.48443	.9106945
COH5660	.0050053	.0705708	0	0	.0269089	.1618199
COH6165	.004443	.0665078	0	0	.0238862	.1526971
COH6670	.0127362	.1121342	0	0	.0684715	.2525575
COH7175	.0184871	.1347048	0	0	.0993889	.2991884
COH7680	.0221356	.1471249	0	0	.1190038	.3237983
COH8185	.011795	.1079629	0	0	.0634117	.2437061
COH8691	.0243785	.1542216	0	0	.1310619	.3374736
COH9195	.0278986	.164683	0	0	.1499869	.3570644
COH9600	.0267864	.161459	0	0	.1440071	.3511027
COH0106	.0281737	.1654693	0	0	.1514654	.3585078
POB_CAN	.8141149	.3890151	1	0	.0006571	.0256263
POB_USA	.0063925	.0796977	0	0	.0343672	.1821735
POB_EUW	.0304288	.1717645	0	0	.1635892	.3699084
POB_EUE	.0328245	.1781775	0	0	.1764687	.3812247
POB_MID	.0102672	.1008059	0	0	.0551978	.2283697
POB_SEA	.0456218	.2086641	0	0	.2452688	.4302535
POB_ASI	.024684	.1551608	0	0	.1327047	.3392609
POB_AFR	.0125529	.1113345	0	0	.0674859	.2508657
POB_LAT	.0231134	.1502641	0	0	.1242607	.3298842
POB_OTH	0	0	0	0	0	0
WKS0113	.0204366	.1414888	.0187248	.1355521	.0279275	.1647677
WKS1426	.0532183	.2244691	.0533215	.2246747	.0527665	.2235706
WKS2739	.0537805	.2255848	.0547555	.2275033	.0495137	.2169416
WKS4048	.1397133	.3466903	.1339795	.3406316	.1648048	.3710104
HRS0119	.0290354	.1679062	.0292135	.168405	.028256	.1657061
HRS2029	.0341812	.1816949	.0344615	.1824121	.0329544	.1785202
HRS3034	.0321339	.1763561	.0326521	.177725	.0298659	.1702202
HRS3539	.1057521	.307521	.1073488	.3095573	.0987646	.2983506
HRS4549	.0920625	.289115	.0926107	.2898872	.0896636	.2857038
Observations	163628		133192		30436	

Appendix D: Full Regression Results

Table D.1 OLS Regression results using specifications of Bloom et al. (1995) – cross-section and pooled.

Model	(2)	(2)	(2)	(2)	(2)	(2)	(1)
Data	1981	1986	1991	1996	2001	2006	Pooled
	LNWAGE	LNWAGE	LNWAGE	LNWAGE	LNWAGE	LNWAGE	LNWAGE
EDUC	0.0487***	0.0545***	0.0554***	0.0574***	0.0618***	0.0721***	0.0588***
	(0.000552)	(0.000595)	(0.000494)	(0.000554)	(0.000578)	(0.000672)	(0.000237)
EXPER	0.0421***	0.0528***	0.0494***	0.0507***	0.0474***	0.0479***	0.0488***
	(0.000522)	(0.000572)	(0.000465)	(0.000528)	(0.000539)	(0.000570)	(0.000220)
EXPSQ	-0.000727***	-0.000872***	-0.000813***	-0.000817***	-0.000785***	-0.000796***	-0.000808***
	(0.0000107)	(0.0000117)	(0.00000968)	(0.0000112)	(0.0000116)	(0.0000123)	(0.00000464)
MARRI	0.192***	0.196***	0.190***	0.183***	0.180***	0.210***	0.195***
	(0.00403)	(0.00431)	(0.00345)	(0.00374)	(0.00379)	(0.00397)	(0.00160)
WKS0113	-1.750***	-1.787***	-1.578***	-1.718***	-1.607***	-1.517***	-1.652***
	(0.00998)	(0.00976)	(0.00883)	(0.00939)	(0.0109)	(0.0119)	(0.00420)
WKS1426	-0.902***	-0.969***	-0.861***	-0.899***	-0.874***	-0.926***	-0.900***
	(0.00666)	(0.00680)	(0.00559)	(0.00633)	(0.00717)	(0.00764)	(0.00277)
WKS2739	-0.459***	-0.536***	-0.472***	-0.513***	-0.489***	-0.546***	-0.502***
	(0.00649)	(0.00702)	(0.00585)	(0.00636)	(0.00707)	(0.00750)	(0.00279)
WKS4048	-0.129***	-0.193***	-0.156***	-0.153***	-0.127***	-0.151***	-0.149***
	(0.00458)	(0.00535)	(0.00430)	(0.00470)	(0.00466)	(0.00486)	(0.00196)
HRS0119	-0.382***	-0.431***	-0.470***	-0.629***	-0.703***	-0.722***	-0.586***
	(0.0109)	(0.0107)	(0.00811)	(0.00789)	(0.00922)	(0.0101)	(0.00383)
HRS2029	-0.252***	-0.306***	-0.393***	-0.512***	-0.579***	-0.600***	-0.477***
	(0.0108)	(0.0102)	(0.00830)	(0.00813)	(0.00886)	(0.00932)	(0.00376)
HRS3034	-0.0883***	-0.149***	-0.219***	-0.346***	-0.385***	-0.445***	-0.294***
	(0.00902)	(0.00954)	(0.00766)	(0.00832)	(0.00900)	(0.00950)	(0.00365)
HRS3539	0.0272***	0.00352	-0.00950*	-0.0551***	-0.0771***	-0.110***	-0.0406***
	(0.00448)	(0.00502)	(0.00403)	(0.00490)	(0.00524)	(0.00549)	(0.00201)
HRS4549	0.0279***	0.0424***	0.0636***	0.0568***	0.0638***	0.0542***	0.0538***
	(0.00563)	(0.00595)	(0.00498)	(0.00524)	(0.00556)	(0.00581)	(0.00229)
YSM	0.00653***	0.00823***	0.00943***	0.0104***	0.00958***	0.0117***	0.00678***
	(0.000332)	(0.000370)	(0.000280)	(0.000284)	(0.000274)	(0.000288)	(0.000227)
IMMIG	-0.166***	-0.239***	-0.254***	-0.325***	-0.306***	-0.404***	-0.232***
	(0.00740)	(0.00870)	(0.00662)	(0.00690)	(0.00675)	(0.00724)	(0.0100)
INDEX86							0.270***
							(0.00265)
INDEX91							0.486***
							(0.00243)
INDEX96							0.511***
							(0.00252)

INDEX01							0.608***
							(0.00254)
INDEX06							0.730***
							(0.00261)
COH5660							0.0266***
							(0.00686)
COH6165							0.0544***
							(0.00765)
COH6670							0.0617***
							(0.00685)
COH7175							0.0409***
							(0.00727)
COH7680							0.0238**
							(0.00805)
COH8185							-0.0101
							(0.00919)
COH8691							-0.0434***
							(0.00933)
COH9195							-0.107***
							(0.00996)
COH9600							-0.101***
							(0.0111)
COH0106							-0.227***
							(0.0131)
_cons	8.708***	8.810***	9.035***	9.050***	9.137***	9.115***	8.533***
	(0.00897)	(0.00982)	(0.00817)	(0.00928)	(0.00946)	(0.0106)	(0.00410)
N	100529	102337	162711	150165	161709	163628	841079
R^2	0.496	0.537	0.475	0.501	0.425	0.408	0.513

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.2 Pooled OLS regressions – model (1) and (3), comparison between use of linear and quadratic YSM

Model	(1) LNWAGE	(3) LNWAGE
EDUC	0.0588***	0.0589***
	(0.000237)	(0.000237)
EXPER	0.0488***	0.0487***
	(0.000220)	(0.000220)
EXPSQ	-0.000808***	-0.000805***
	(0.00000464)	(0.00000464)
MARRI	0.195***	0.195***
	(0.00160)	(0.00160)
WKS0113	-1.652***	-1.650***
	(0.00420)	(0.00420)
WKS1426	-0.900***	-0.899***
	(0.00277)	(0.00277)
WKS2739	-0.502***	-0.501***
	(0.00279)	(0.00279)
WKS4048	-0.149***	-0.149***
	(0.00196)	(0.00196)
HRS0119	-0.586***	-0.586***
	(0.00383)	(0.00383)
HRS2029	-0.477***	-0.477***
	(0.00376)	(0.00376)
HRS3034	-0.294***	-0.294***
	(0.00365)	(0.00365)
HRS3539	-0.0406***	-0.0407***
	(0.00201)	(0.00201)
HRS4549	0.0538***	0.0539***
	(0.00229)	(0.00229)
YSM	0.00678***	0.0152***
	(0.000227)	(0.000539)
YSMSQ		-0.000179***
		(0.0000103)
IMMIG	-0.232***	-0.282***
	(0.0100)	(0.0104)
INDEX86	0.270***	0.270***
	(0.00265)	(0.00265)
INDEX91	0.486***	0.487***
	(0.00243)	(0.00243)
INDEX96	0.511***	0.512***
	(0.00252)	(0.00252)
INDEX01	0.608***	0.608***

	(0.00254)	(0.00254)
INDEX06	0.730***	0.730***
	(0.00261)	(0.00261)
COH5660	0.0266***	0.00199
	(0.00686)	(0.00701)
COH6165	0.0544***	0.0194*
	(0.00765)	(0.00792)
COH6670	0.0617***	0.0235**
	(0.00685)	(0.00720)
COH7175	0.0409***	0.00515
	(0.00727)	(0.00756)
COH7680	0.0238**	-0.00595
	(0.00805)	(0.00823)
COH8185	-0.0101	-0.0345***
	(0.00919)	(0.00930)
COH8691	-0.0434***	-0.0549***
	(0.00933)	(0.00935)
COH9195	-0.107***	-0.111***
	(0.00996)	(0.00996)
COH9600	-0.101***	-0.0893***
	(0.0111)	(0.0112)
COH0106	-0.227***	-0.201***
	(0.0131)	(0.0132)
_cons	8.533***	8.533***
	(0.00410)	(0.00410)
N	841079	841079
R^2	0.513	0.514

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.3 Pooled OLS regressions to check for robustness (See **Primary Results** – **Robustness Check**)

Model/ adjustments	(1)	(a)	**(b) or (4)**	(c)	(d)	(e)
	LNWAGE	LNWAGE (2005 dollars)	**LNWAGE**	LNWAGE (2005 dollars)	LNWKWGE (Weekly)	LNWKWGE (2005 dollars)
EDUC	0.0588***	0.0588***	**0.0579*** **	0.0579***	0.0564***	0.0564***
	(0.000237)	(0.000237)	**(0.000230)**	(0.000230)	(0.000231)	(0.000231)
EXPER	0.0488***	0.0488***	**0.0450*** **	0.0450***	0.0428***	0.0428***
	(0.000220)	(0.000220)	**(0.000216)**	(0.000216)	(0.000216)	(0.000216)
EXPSQ	-0.000808***	-0.000808***	**-0.000740*** **	-0.000740***	-0.000703***	-0.000703***
	(0.00000464)	(0.00000464)	**(0.00000456)**	(0.00000456)	(0.00000456)	(0.00000456)
MARRI	0.195***	0.195***	**0.183*** **	0.183***	0.172***	0.172***
	(0.00160)	(0.00160)	**(0.00156)**	(0.00156)	(0.00157)	(0.00157)
WKS0113	-1.652***	-1.652***				
	(0.00420)	(0.00420)				
WKS1426	-0.900***	-0.900***				
	(0.00277)	(0.00277)				
WKS2739	-0.502***	-0.502***				
	(0.00279)	(0.00279)				
WKS4048	-0.149***	-0.149***				
	(0.00196)	(0.00196)				
HRS0119	-0.586***	-0.586***				
	(0.00383)	(0.00383)				
HRS2029	-0.477***	-0.477***				
	(0.00376)	(0.00376)				
HRS3034	-0.294***	-0.294***				
	(0.00365)	(0.00365)				
HRS3539	-0.0406***	-0.0406***				
	(0.00201)	(0.00201)				
HRS4549	0.0538***	0.0538***				
	(0.00229)	(0.00229)				
YSM	0.00678***	0.00678***	**0.00681*** **	0.00681***	0.00643***	0.00643***
	(0.000227)	(0.000227)	**(0.000222)**	(0.000222)	(0.000223)	(0.000223)
IMMIG	-0.232***	-0.232***	**-0.230*** **	-0.230***	-0.219***	-0.219***
	(0.0100)	(0.0100)	**(0.00981)**	(0.00981)	(0.00985)	(0.00985)
INDEX86	0.270***	-0.0888***	**0.279*** **	-0.0798***	0.281***	-0.0777***
	(0.00265)	(0.00265)	**(0.00259)**	(0.00259)	(0.00260)	(0.00260)
INDEX91	0.486***	-0.0913***	**0.487*** **	-0.0907***	0.488***	-0.0897***
	(0.00243)	(0.00243)	**(0.00238)**	(0.00238)	(0.00239)	(0.00239)
INDEX96	0.511***	-0.177***	**0.521*** **	-0.167***	0.523***	-0.166***
	(0.00252)	(0.00252)	**(0.00246)**	(0.00246)	(0.00247)	(0.00247)
INDEX01	0.608***	-0.166***	**0.624*** **	-0.150***	0.622***	-0.152***
	(0.00254)	(0.00254)	**(0.00249)**	(0.00249)	(0.00250)	(0.00250)

INDEX06	0.730***	-0.158***	**0.748*** **	-0.141***	0.745***	-0.144***
	(0.00261)	(0.00261)	**(0.00255)**	(0.00255)	(0.00256)	(0.00256)
COH5660	0.0266***	0.0266***	**0.0249*** **	0.0249***	0.0243***	0.0243***
	(0.00686)	(0.00686)	**(0.00672)**	(0.00672)	(0.00674)	(0.00674)
COH6165	0.0544***	0.0544***	**0.0532*** **	0.0532***	0.0526***	0.0526***
	(0.00765)	(0.00765)	**(0.00749)**	(0.00749)	(0.00752)	(0.00752)
COH6670	0.0617***	0.0617***	**0.0597*** **	0.0597***	0.0590***	0.0590***
	(0.00685)	(0.00685)	**(0.00670)**	(0.00670)	(0.00673)	(0.00673)
COH7175	0.0409***	0.0409***	**0.0407*** **	0.0407***	0.0392***	0.0392***
	(0.00727)	(0.00727)	**(0.00712)**	(0.00712)	(0.00715)	(0.00715)
COH7680	0.0238**	0.0238**	**0.0254** **	0.0254**	0.0238**	0.0238**
	(0.00805)	(0.00805)	**(0.00788)**	(0.00788)	(0.00791)	(0.00791)
COH8185	-0.0101	-0.0101	**-0.00834**	-0.00834	-0.0101	-0.0101
	(0.00919)	(0.00919)	**(0.00900)**	(0.00900)	(0.00904)	(0.00904)
COH8691	-0.0434***	-0.0434***	**-0.0434*** **	-0.0434***	-0.0425***	-0.0425***
	(0.00933)	(0.00933)	**(0.00913)**	(0.00913)	(0.00917)	(0.00917)
COH9195	-0.107***	-0.107***	**-0.0994*** **	-0.0994***	-0.0971***	-0.0971***
	(0.00996)	(0.00996)	**(0.00975)**	(0.00975)	(0.00979)	(0.00979)
COH9600	-0.101***	-0.101***	**-0.0938*** **	-0.0938***	-0.0831***	-0.0831***
	(0.0111)	(0.0111)	**(0.0109)**	(0.0109)	(0.0110)	(0.0110)
COH0106	-0.227***	-0.227***	**-0.222*** **	-0.222***	-0.205***	-0.205***
	(0.0131)	(0.0131)	**(0.0128)**	(0.0128)	(0.0129)	(0.0129)
LNWKS			**0.853*** **	0.853***		
			(0.00172)	(0.00172)		
PRTWK			**-0.721*** **	-0.721***	-0.672***	-0.672***
			(0.00267)	(0.00267)	(0.00262)	(0.00262)
_cons	8.533***	9.422***	**5.209*** **	6.098***	4.696***	5.584***
	(0.00410)	(0.00410)	**(0.00715)**	(0.00715)	(0.00390)	(0.00390)
N	841079	841079	**841079**	841079	841079	841079
R^2	0.513	0.462	**0.534**	0.484	0.347	0.256

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.4a Pooled OLS regressions – effects of different countries/regions of birth

Model	(4) LNWAGE	(5) LNWAGE	(6) LNWAGE
EDUC	0.0579***	0.0578***	0.0577***
	(0.000230)	(0.000231)	(0.000231)
EXPER	0.0450***	0.0449***	0.0449***
	(0.000216)	(0.000216)	(0.000216)
EXPSQ	-0.000740***	-0.000738***	-0.000738***
	(0.00000456)	(0.00000455)	(0.00000456)
MARRI	0.183***	0.183***	0.183***
	(0.00156)	(0.00156)	(0.00156)
LNWKS	0.853***	0.852***	0.851***
	(0.00172)	(0.00172)	(0.00172)
PRTWK	-0.721***	-0.720***	-0.720***
	(0.00267)	(0.00267)	(0.00267)
YSM	0.00681***	0.00312***	0.00177***
	(0.000222)	(0.000140)	(0.000274)
IMMIG	-0.230***		
	(0.00981)		
INDEX86	0.279***	0.277***	0.277***
	(0.00259)	(0.00259)	(0.00260)
INDEX91	0.487***	0.489***	0.488***
	(0.00238)	(0.00235)	(0.00238)
INDEX96	0.521***	0.526***	0.524***
	(0.00246)	(0.00242)	(0.00245)
INDEX01	0.624***	0.631***	0.628***
	(0.00249)	(0.00242)	(0.00246)
INDEX06	0.748***	0.757***	0.753***
	(0.00255)	(0.00247)	(0.00251)
COH5660	0.0249***	-0.0197**	-0.0170**
	(0.00672)	(0.00615)	(0.00640)
COH6165	0.0532***	0.00403	0.000265
	(0.00749)	(0.00664)	(0.00709)
COH6670	0.0597***	0.0143**	0.00729
	(0.00670)	(0.00533)	(0.00613)
COH7175	0.0407***	0.0108*	0.00268
	(0.00712)	(0.00542)	(0.00650)
COH7680	0.0254**	-0.00756	-0.0104

	(0.00788)	(0.00589)	(0.00707)
COH8185	-0.00834	-0.0547***	-0.0498***
	(0.00900)	(0.00670)	(0.00783)
COH8691	-0.0434***	-0.0939***	-0.0736***
	(0.00913)	(0.00623)	(0.00758)
COH9195	-0.0994***	-0.154***	-0.125***
	(0.00975)	(0.00669)	(0.00803)
COH9600	-0.0938***	-0.159***	-0.118***
	(0.0109)	(0.00778)	(0.00909)
COH0106	-0.222***	-0.298***	-0.248***
	(0.0128)	(0.00992)	(0.0110)
POB_USA		-0.0670***	-0.0410*
		(0.00856)	(0.0163)
POB_EUW		-0.0227***	0.0497***
		(0.00483)	(0.00884)
POB_EUE		-0.0703***	-0.116***
		(0.00480)	(0.00862)
POB_MID		-0.189***	-0.275***
		(0.00940)	(0.0153)
POB_SEA		-0.167***	-0.245***
		(0.00590)	(0.00897)
POB_ASI		-0.198***	-0.258***
		(0.00607)	(0.00943)
POB_AFR		-0.128***	-0.236***
		(0.00824)	(0.0135)
POB_LAT		-0.177***	-0.232***
		(0.00681)	(0.0112)
POB_OTH		-0.0798***	-0.102**
		(0.0164)	(0.0313)
USA_YSM			0.000175
			(0.000663)
EUW_YSM			-0.00163***
			(0.000372)
EUE_YSM			0.00279***
			(0.000358)
MID_YSM			0.00653***
			(0.000876)

SEA_YSM			0.00636***
			(0.000502)
ASI_YSM			0.00500***
			(0.000523)
AFR_YSM			0.00794***
			(0.000721)
LAT_YSM			0.00430***
			(0.000559)
OTH_YSM			0.00260
			(0.00159)
_cons	5.209***	5.207***	5.215***
	(0.00715)	(0.00713)	(0.00715)
N	841079	841079	841079
R^2	0.534	0.535	0.535

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.4b Entry effects and years-to-equality by country/region of origin. (Coefficient x 100)

Effects		U.S.	West Europe	East Europe	Middle East	South/ Southeast Asia	East Asia	Africa	Latin America
Entry effect		-6.7	-2.3	-7.0	-18.9	-16.7	-19.8	-12.8	-17.7
Assimilation effect	0.312								
Cohort effect									
Reference		***Years to equality (by country/region of origin, and cohort)***							
(Before 1956)		21.5	7.3	22.5	60.6	53.5	63.5	41.0	56.7
COH5660	-1.97	27.8	**n/a**	28.8	66.9	59.8	69.8	47.3	63.0
COH6165	0.40	20.2	**n/a**	21.2	59.3	52.2	62.2	39.7	55.4
COH6670	1.43	16.9	**n/a**	17.9	56.0	48.9	58.9	36.4	52.1
COH7175	1.08	18.0	**n/a**	19.1	57.1	50.1	60.0	37.6	53.3
COH7680	-0.76	23.9	**n/a**	25.0	63.0	55.9	65.9	43.4	59.2
COH8185	-5.47	39.0	**n/a**	40.1	78.1	71.1	81.0	58.6	74.3
COH8691	-9.39	51.6	**n/a**	52.6	90.7	83.6	93.6	71.1	86.8
COH9195	-15.40	70.8	**n/a**	71.9	109.9	102.9	112.8	90.4	106.1
COH9600	-15.90	72.4	**n/a**	73.5	111.5	104.5	114.4	92.0	107.7
COH0106	-29.80	117.0	**n/a**	118.0	156.1	149.0	159.0	136.5	152.2

Table D.5 Pooled OLS regressions – by province/region of residence

Pr/Regions	Atlantic	Quebec	Ontario	Prairies	Alberta	B.C.
	LNWAGE	LNWAGE	LNWAGE	LNWAGE	LNWAGE	LNWAGE
EDUC	0.0558***	0.0651***	0.0588***	0.0530***	0.0558***	0.0438***
	(0.000844)	(0.000444)	(0.000367)	(0.000850)	(0.000743)	(0.000699)
EXPER	0.0447***	0.0463***	0.0447***	0.0447***	0.0471***	0.0444***
	(0.000784)	(0.000400)	(0.000350)	(0.000820)	(0.000711)	(0.000662)
EXPSQ	-0.000711***	-0.000741***	-0.000730***	-0.000756***	-0.000820***	-0.000730***
	(0.0000163)	(0.00000848)	(0.00000731)	(0.0000171)	(0.0000154)	(0.0000140)
MARRI	0.214***	0.174***	0.190***	0.184***	0.202***	0.183***
	(0.00594)	(0.00287)	(0.00255)	(0.00603)	(0.00503)	(0.00464)
LNWKS	0.829***	0.835***	0.869***	0.836***	0.834***	0.814***
	(0.00529)	(0.00320)	(0.00292)	(0.00670)	(0.00586)	(0.00498)
PRTWK	-0.605***	-0.619***	-0.798***	-0.736***	-0.747***	-0.735***
	(0.00931)	(0.00489)	(0.00441)	(0.0104)	(0.00944)	(0.00750)
YSM	0.000396	0.00551***	0.00610***	0.00888***	0.00500***	0.00620***
	(0.00182)	(0.000560)	(0.000307)	(0.00109)	(0.000751)	(0.000596)
IMMIG	0.0300	-0.200***	-0.225***	-0.306***	-0.216***	-0.274***
	(0.0780)	(0.0251)	(0.0135)	(0.0474)	(0.0337)	(0.0267)
INDEX86	0.295***	0.279***	0.307***	0.273***	0.239***	0.220***
	(0.00908)	(0.00482)	(0.00415)	(0.00959)	(0.00876)	(0.00810)
INDEX91	0.515***	0.470***	0.554***	0.435***	0.376***	0.414***
	(0.00833)	(0.00440)	(0.00386)	(0.00888)	(0.00795)	(0.00729)
INDEX96	0.527***	0.504***	0.580***	0.472***	0.413***	0.487***
	(0.00865)	(0.00454)	(0.00403)	(0.00919)	(0.00820)	(0.00750)
INDEX01	0.599***	0.587***	0.694***	0.567***	0.571***	0.564***
	(0.00869)	(0.00454)	(0.00411)	(0.00926)	(0.00811)	(0.00770)
INDEX06	0.717***	0.672***	0.818***	0.711***	0.790***	0.665***
	(0.00876)	(0.00461)	(0.00428)	(0.00939)	(0.00817)	(0.00794)
COH5660	-0.0331	-0.00816	0.0301***	0.0175	-0.0111	0.0218
	(0.0539)	(0.0185)	(0.00879)	(0.0321)	(0.0239)	(0.0177)
COH6165	0.0344	0.00407	0.0481***	0.0838*	0.0619*	0.0650**
	(0.0447)	(0.0192)	(0.00987)	(0.0396)	(0.0288)	(0.0208)
COH6670	0.0324	-0.0131	0.0508***	0.0960**	0.0261	0.0651***
	(0.0629)	(0.0184)	(0.00883)	(0.0327)	(0.0240)	(0.0178)

COH7175	-0.0393	-0.0383*	0.0329***	0.0706*	-0.0104	0.0480*
	(0.0520)	(0.0195)	(0.00953)	(0.0349)	(0.0248)	(0.0188)
COH7680	-0.0159	-0.0692***	0.0210	0.0241	-0.00755	0.0314
	(0.0766)	(0.0206)	(0.0108)	(0.0381)	(0.0262)	(0.0209)
COH8185	-0.122	-0.110***	0.00360	-0.0192	-0.0629*	-0.0462
	(0.0724)	(0.0231)	(0.0123)	(0.0437)	(0.0301)	(0.0242)
COH8691	-0.0731	-0.141***	-0.0553***	-0.0498	-0.142***	-0.0851***
	(0.0886)	(0.0238)	(0.0123)	(0.0467)	(0.0323)	(0.0251)
COH9195	-0.137	-0.157***	-0.119***	-0.0945	-0.177***	-0.144***
	(0.0906)	(0.0250)	(0.0133)	(0.0530)	(0.0345)	(0.0262)
COH9600	-0.237*	-0.151***	-0.121***	-0.0253	-0.142***	-0.159***
	(0.119)	(0.0282)	(0.0148)	(0.0618)	(0.0386)	(0.0289)
COH0106	-0.309	-0.228***	-0.278***	-0.162*	-0.221***	-0.260***
	(0.242)	(0.0310)	(0.0176)	(0.0732)	(0.0434)	(0.0348)
_cons	5.152***	5.130***	5.131***	5.297***	5.410***	5.656***
	(0.0220)	(0.0133)	(0.0121)	(0.0274)	(0.0240)	(0.0211)
N	60476	207155	322910	56482	88788	102257
R^2	0.567	0.550	0.551	0.520	0.498	0.501

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.6 Pooled OLS regressions – by area of residence (Big cities, medium/small cities, town/rural)

Areas	Large Cities	Med/Small Cities	Towns/Rural Areas
	LNWAGE	LNWAGE	LNWAGE
EDUC	0.0616***	0.0611***	0.0471***
	(0.000403)	(0.000427)	(0.000374)
EXPER	0.0450***	0.0480***	0.0426***
	(0.000378)	(0.000401)	(0.000348)
EXPSQ	-0.000740***	-0.000777***	-0.000713***
	(0.00000798)	(0.00000863)	(0.00000721)
MARRI	0.190***	0.203***	0.180***
	(0.00269)	(0.00286)	(0.00259)
LNWKS	0.854***	0.854***	0.840***
	(0.00305)	(0.00339)	(0.00264)
PRTWK	-0.731***	-0.790***	-0.656***
	(0.00455)	(0.00492)	(0.00442)
YSM	0.00707***	0.00761***	0.00388***
	(0.000320)	(0.000434)	(0.000522)
IMMIG	-0.261***	-0.296***	-0.115***
	(0.0144)	(0.0194)	(0.0219)
INDEX86	0.288***	0.293***	0.271***
	(0.00463)	(0.00559)	(0.00374)
INDEX91	0.517***	0.463***	0.471***
	(0.00430)	(0.00472)	(0.00359)
INDEX96	0.540***	0.493***	0.521***
	(0.00449)	(0.00488)	(0.00372)
INDEX01	0.652***	0.606***	0.604***
	(0.00460)	(0.00491)	(0.00374)
INDEX06	0.757***	0.736***	0.736***
	(0.00487)	(0.00489)	(0.00385)
COH5660	0.0115	0.0220	0.0215
	(0.00994)	(0.0127)	(0.0134)
COH6165	0.0183	0.0774***	0.0672***
	(0.0107)	(0.0147)	(0.0159)
COH6670	0.0299**	0.0746***	0.0512***
	(0.00977)	(0.0128)	(0.0148)

COH7175	0.00294	0.0605***	0.0536**
	(0.0103)	(0.0137)	(0.0164)
COH7680	-0.0200	0.0656***	0.0347
	(0.0114)	(0.0152)	(0.0189)
COH8185	-0.0511***	0.0339	0.00234
	(0.0127)	(0.0177)	(0.0227)
COH8691	-0.0805***	-0.0108	-0.0221
	(0.0130)	(0.0183)	(0.0249)
COH9195	-0.149***	-0.0167	-0.0415
	(0.0139)	(0.0199)	(0.0284)
COH9600	-0.157***	0.0428	-0.0754*
	(0.0153)	(0.0226)	(0.0356)
COH0106	-0.282***	-0.0977***	0.0107
	(0.0176)	(0.0268)	(0.0527)
_cons	5.193***	5.150***	5.375***
	(0.0129)	(0.0141)	(0.0108)
N	284319	240488	316272
R^2	0.535	0.549	0.521

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix E: List of Countries/Regions Included in Each Country/Region

Categories for dummy variables	Place of Birth from all 6 Census data
Canada	All provinces and territories
U.S.	United States of America
Western/Northern Europe and Oceania	United Kingdom Republic of Ireland France Belgium and Luxembourg Germany Netherlands Other Northern and Western Europe Other Europe Oceania and others / Oceania
Southern/Eastern Europe	Italy Poland Portugal Greece Yugoslavia / Former Yugoslavia USSR / Former USSR Austria Hungary Czechoslovakia
Middle East	West, Central Asia and the Middle East Middle East and Western Asia Western Asia
South and Southeast Asia	India Pakistan Philippines Vietnam Southern Asia / Other Southern Asia Southeast Asia / Other Southeast Asia Asia
East Asia	People's Republic of China Hong Kong East Asia / Other Eastern Asia Other East/Southeast Asia Asia
Africa	East Africa / Eastern Africa Northern Africa Southern Africa Africa / Other Africa
Latin America	Central America Jamaica Other Caribbean and Bermuda South America Central/South America, Caribbean, Bermuda