Employment Rate Gaps between Immigrants and Non-immigrants in Canada in the Last Three Decades

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Abstract:

This study uses six Canadian censuses spanning from 1981 to 2006 and the 2011 National Household Survey to examine employment rate gaps between immigrants and non-immigrants during thirty years. Recent immigrants are found to have lower probabilities of being employed than Canadian-born people. The employment rate gaps of immigrants are analyzed through the estimations of entry, assimilation and cohort effects. The entry effect is the estimated immigrants' employment penalty at the year of arrival; the assimilation effect refers to the difference in the returns to experience between immigrants and natives; and the cohort effect represents immigrants' "quality" change through different arriving cohorts. The paper identifies some of the reasons leading to a worsened labour market performance of recent immigrants. Entry effects and cohort effects can be explained by the shift in the composition of new immigrants and by the macroeconomic conditions. The speed of assimilation effect can be related to the distribution of educational achievements of recent immigrants and to the concentration of places of residence.

1. Introduction

Multiculturalism is a major national project and policy in Canada given that more than 20 percent of the population was not born in Canada. Therefore, making full use of the human capital of immigrants is very important for the performance of the Canadian economy. The country's prosperity depends on to how immigrants do when they come to Canada and "immigration policy is often evaluated in terms of the success with which immigrants become established in the new labour market" (McDonald and Worswick, 1997). There is a concern about the deterioration of recent immigrants' performance in the labour market, which is reflected in their low employment and wage rates. If one observes very poor outcomes of recent arrivals in the labour market, this may pose a special burden on social welfare programs.

The previous research has considered mainly two major outcomes for immigrants in the labour market: earnings and employment. The study of immigrants' earnings was initiated by Chiswick (1978) with US data from 1970, and many other studies followed. There are also a few studies on the employment outcomes of immigrants, such as Frank (2013) and Zietsma (2007). My research will focus on immigrants' employment rates in the Canadian labour market. Unlike most other studies, I will consider a long period; specifically, I will use the 1981, 1986, 1991, 1996, 2001 and 2006 censuses, and the 2011 National Household Survey (NHS), to do a 30-year investigation on immigrants' employment rates.

Previous studies have provided a consistent outlook at how the composition of immigrants changed through time. Recent immigrants tend to be more educated than

earlier ones, but Baker and Benjamin (1994) argued that foreign credentials were devalued in the Canadian labour market. Through time, the immigration sources have shifted from developed countries, such as the US, the UK, and European countries, to developing countries from Asia, Africa, and Latin America. As a result, the proportion of recent immigrants whose mother tongue is English or French is smaller than it used to be. One of the main points of my research will be to find out whether the above conclusions are still valid using the most recent Canadian data.

Some previous studies (see, for example, Bloom, Grenier and Gunderson, 1995) have specified entry effects, assimilation effects, and cohort effects as three major determinants of the evolution of immigrants' earnings and employment. The entry effect is the estimated immigrants' earnings gap or employment penalty at the year of arrival, the assimilation effect refers to the difference in the returns to experience between immigrants and natives, and the cohort effect represents immigrants' "quality" change through different arriving cohorts. Bloom, Grenier, and Gunderson (1995) used the 1971, 1981, and 1986 Canadian censuses to demonstrate the existence of negative entry effects and positive assimilation effects. The cohort effect captures some unobserved qualities of immigrants who arrived during the same year as well as the possibility of discrimination against visible minorities.

My empirical results aim at identifying the entry and assimilation effects in both pooled and separate regressions. The two effects are expected to be different in each representative census year, due to the different economic conditions and the changing immigrants' characteristics. Cohort effects will be analyzed in my pooled regressions;

without the cohort effects, immigrants' assimilation rates tend to be biased (Borjas, 1985). In addition to the investigation of the three effects, my research also tries to find the potential causes of the employment deterioration among recent immigrants.

My paper is organized as follows. In section 2, I provide a literature review that includes studies on earnings and employment of immigrants. Section 3 describes the data and presents summary statistics of some key variables from 1981 to 2011. Section 4 presents the econometric model and methodology. The results and their interpretations are shown in section 5. Finally, the conclusion is presented in the last section.

2. Literature review

Many studies have addressed the question that Canada's immigrants are facing important obstacles in obtaining jobs with good wages. One would expect that employment rate gaps between immigrants and Canadian-born individuals are affected by similar factors as wage gaps. However, most previous studies have focused on earnings gaps between the immigrants and the Canadian-born. Therefore, I first summarize the studies on immigrants' labour market performance in terms of their earnings, and I then discuss employment rate gaps between the two groups in the second part of this literature review.

Studies on earnings:

The research on the earnings of immigrants was started by the very influential study of Chiswick (1978). Using US data from 1970, he estimates a negative entry effect for newly arrived male immigrants, which means that they have lower earnings

in their entry years than US-born males controlling for a number of observable factors. However, those immigrants' earnings gradually increase and exceed the level of the native-born after 10-15 years. This implies that immigrants' "human capital" (working experience and education) is devalued when they arrive, but in fact they are positively selected. If immigrants are positively selected and are among the most motivated and able, their employment rate as well as their wage levels may eventually exceed that of natives. Therefore, the effect of the variable years since migration should be positive enough to overcome the negative entry effect in Chiswick's empirical results.

After Chiswick's (1978) study, Borjas (1985) used the 1970 and the 1980 Public Use Sample from the U.S. census and investigated 18 specific immigrant cohorts to test the validity of Chiswick's (1978) broad conclusion. Based on a cohort analysis, he suggested that for most immigrant groups, the assimilation rate into the U.S. labour market is not as rapid as the one calculated from the results generated by cross-section studies. Therefore, the overtaking point (the time when the earning gap between immigrants and their comparable native-born individuals vanishes) will take place much later than the point estimated in cross-section studies. Importantly, Borjas conjectures that the decrease in immigrants' quality (such as in working experience and education) contributes to the overestimation of their assimilation rate.

Baker and Benjamin (1994) conduct a similar analysis using the 1971, 1981, and 1986 Canadian censuses and draw a pessimistic picture of immigrants' prospects with respect to their earnings. They show that the entry earnings of new immigrants have been decreasing during this period, and that there is a uniformly low assimilation rate

across successive immigrant cohorts. Therefore, it might be impossible for the earnings of recent immigrants to converge with natives' throughout their entire working lives. Their empirical results identify the immigrants' composition shift from developed countries to developing countries as an important contributing factor. As a result, the growing proportion of visible minorities explains the possible increasing role of discrimination, while the larger extent of devaluation of foreign working experience and education explains the deterioration of immigrants' situations in the labour market.

Bloom, Grenier, and Gunderson (1995) pooled the 1971, 1981, and 1986 Canadian census data to evaluate Canadian immigrants' earnings compared to those of Canadian-born individuals. To be specific, in order to figure out how immigrants assimilate into the Canadian labour market, the authors focus on the factors such as the entry effect, the assimilation effect, the cohort effect, and immigrants' personal characteristics. The entry effect represents the earnings differential between immigrants and Canadian-born individuals at the year of entry of a specific immigrant cohort. The assimilation effect is the speed at which immigrants' earnings to converge to the level of Canadian-born residents. The cohort effect measures how immigrant cohorts' unobserved quality changes over time. Finally the personal characteristics capture immigrants' human capital determinants of earning. Based on their empirical results for both males and females, the negative entry effect and positive assimilation effect are estimated as expected. Interestingly, the absolute values of the entry and assimilation effects increase from the 1971 census to the 1986 census. Importantly,

the results show that the entry effect and assimilation effects are substantially larger in 1981 and 1986. Further, the paper shows that men and women from Asia, Africa, and Latin America experience substantially lower entry effects and higher assimilation effects than those from Europe and the United States. However, the faster assimilation rates of immigrants from Asia, Africa, and Latin America are insufficient to compensate for the larger negative entry effects, as the empirical results show that they take many more years to catch up with Canadian-born individuals than those from Europe and United States. Overall, this research indicates that the deterioration of recent immigrants' earnings in the early 1980s could be attributed to reduced immigrant quality (negative cohort effect), a changing composition of immigrants (larger group of visible minorities), and a lower absorptive capacity of the labour market in recession years.

Bloom, Grenier and Gunderson (1995) and Baker and Benjamin (1995) argue that immigrants in Canada have not only declining entry earnings over time but also low assimilation rates. However, Grant (1999) provides a different point of view. She uses the 1981, 1986, and 1991 Canadian censuses to investigate the performance of cohorts arriving in the 1980s. Her empirical results suggest that the pessimistic predictions of the previous studies were not realized, since the assimilation rates of those arriving in the 1980s are observed to be higher than those of their predecessors.

Aydemir and Skuterud (2005) use the 1981, 1986, 1991, 1996, and 2001 Canadian Censuses to explain the causes of the deteriorating entry earnings among successive cohorts from 1966 to 2000. The analysis is conducted for both men and

women. They show that about one-quarter of men's overall entry earnings deterioration can be attributed to the declining wage returns on foreign labour market experience, and this factor can explain about half of women's entry earnings deterioration. They also find that the devaluation of foreign education is not responsible for this deterioration. From their findings, the increasing proportion of non-traditional Asian immigrants and the resulting decline in the knowledge of an official language are other important factors that explain the deterioration.

Using 2006 Canadian census data, Coulombe, Grenier, and Nadeau (2014) analyze the determinants of the wage gap between immigrants and Canadian natives in regressions that include the GDP per capita in an immigrant's country of birth as a proxy for the quality of the education and work experience acquired in that country. The most important finding is that Canadian immigrants' returns to schooling and work experience, as estimated in their earnings in Canada, are positively related to the GDP per capita of their countries of birth. Additionally, they apply a variant of the Blinder-Oaxaca method and show that immigrants' lower human capital quality completely negates their endowment advantage in the areas of schooling and work experience. This study suggests that the worsening of the immigrant wage gap in Canada over the last couple of decades is mainly due to the decreasing human capital quality among immigrants.

In summary, all the studies above have the consistent finding that immigrants' earnings have deteriorated during recent decades. The deterioration can be attributed to several reasons, such as language barriers, devaluation of foreign credentials and

work experience, changing countries of origin, and the declined quality of human capital. The next subsection will present the literature review on employment.

Studies on employment and unemployment:

McDonald and Worswick (1997) use data from the Survey of Consumer Finances between 1982 and 1993 to investigate the incidence of unemployment of the immigrants. They show that recent immigrant men have higher unemployment probabilities than non-immigrants, with the difference being larger in recession years. The authors conclude that unemployment assimilation of immigrants is sensitive to the macroeconomic conditions of the survey years. They pool 11 surveys together and their findings confirm that recent immigrants perform worse than previous cohorts of immigrants. First, the immigrant unemployment differential moves counter-cyclically for recent immigrant cohorts, meaning that the unemployment differential is higher in bad economic conditions. Second, the gap among the group with university education is larger than the one among other education groups. The third finding is that immigrants' employment assimilation rate is faster in recessions, and in the long run their unemployment rate will converge to the one of the local-born. Therefore, the high unemployment rates among recent immigrant cohorts in recessions are not likely to persist over the lifetime of immigrants.

Zietsma (2007) provides an outlook of immigrants' employment outcomes using the 2006 Canadian Labour Force Survey. She suggests that immigrants who landed between 2001 and 2006 have the most difficulty in the labour market. Three main factors leading to this deterioration are identified: lack of Canadian work experience,

lack of recognition of foreign credentials and work experience, and lack of skills in official languages. Interestingly, the author finds that immigrants who landed in Alberta and Manitoba have higher employment rates than those in other provinces, while immigrants living in Quebec suffer the largest gap between their employment rates and the ones of the Canadian-born Quebecers. Similarly, immigrants living in Toronto and Vancouver have smaller gaps, whereas those living in Montreal experience larger gaps. The results also show that immigrants between the ages of 25 and 64 are more highly educated than their Canadian-born counterparts. However, the employment rate gap is substantially higher within university-educated group. This is similar to the findings of Gilmore and Le Petit (2008), who suggested that recent immigrants who have university and post graduate degrees have lower employment rates than their Canadian-born counterparts. This remarkable gap reflects the devaluation of foreign credentials.

Analyzing further the particular situation of Quebec, Grenier and Nadeau (2011) investigate the reasons for the larger employment rate gap between immigrants and Canadian-born individuals in Montreal than in Toronto. The data is the 2006 Census Micro-data Master File. The sample is randomly selected and it contains data for 20 per cent of the population. According to the empirical results, the reasons that explain the larger gap in Montreal include the knowledge of French, the difference in the countries of origin, the different immigration policies in Quebec, the possible higher discrimination against immigrants in Montreal, and finally the different labour market institutions. The basic finding of their research is that language is the main reason

explaining the higher unemployment rate gap in Montreal. In Montreal, the lack of knowledge of French has a larger negative effect on immigrants' employment than does the lack of knowledge of English in Toronto. Also, the immigrants' knowledge of French is less rewarded than is the case for Canadian-born individuals in Montreal. Another major reason is that immigrants' foreign work experience is devalued in Montreal. In contrast, the employment rate gap in Toronto can be attributed mainly to place of birth for males and to language for females.

Frank (2013) addresses the question of Canada's recent immigrant professionals reporting difficulty in finding a job in the occupation in which they were trained in their original countries. The author states that this difficulty could be attributed to visible minority status, area of residence, and human capital factors. Frank's paper is conducted by using Statistics Canada's Longitudinal Survey of Immigrants to Canada (LSIC), which consists of three waves of data representing a cohort of immigrants who arrived in Canada between October 1, 2000, and September 30, 2001. She suggests that visible minority immigrants have a lower chance of obtaining employment in their pre-migration or intended occupations than non-visible minority immigrants, even when human capital factors and occupational characteristics are controlled for. Also, her results indicate that immigrants who live in a major CMA (Vancouver, Toronto, and Montreal) obtain employment at a slower rate than immigrants who live elsewhere in Canada. In addition, immigrants with higher levels of education and with English or French proficiency obtain jobs more quickly than others. Finally, among the occupational characteristics, the results state that

immigrants who are seeking high-status occupations reveal a slower rate of obtaining job matches.

In conclusion, the literature generally agrees to the following three facts of immigrants' labour market outcome: (1) immigrants' entry earnings and employment rates are lower than those of their Canadian-born counterparts; (2) immigrants experience positive assimilation in their earnings and employment and the gaps disappear after living in Canada for a certain number of years; and (3) recent immigrant cohorts perform worse than earlier cohorts. Also, the studies provide some possible explanations for the deterioration of immigrants' labour market performance in the labour market. Those include the shift in immigrant source countries, the declining knowledge of official languages, the devaluation of foreign credentials and experience, the location of residence, and the ethnic enclaves. Based on the empirical results and econometric strategies of these previous studies, this research plans to cover a long period to identify how immigrants assimilate into local labour market in terms of employment rates.

3, Data Description and Summary Statistics

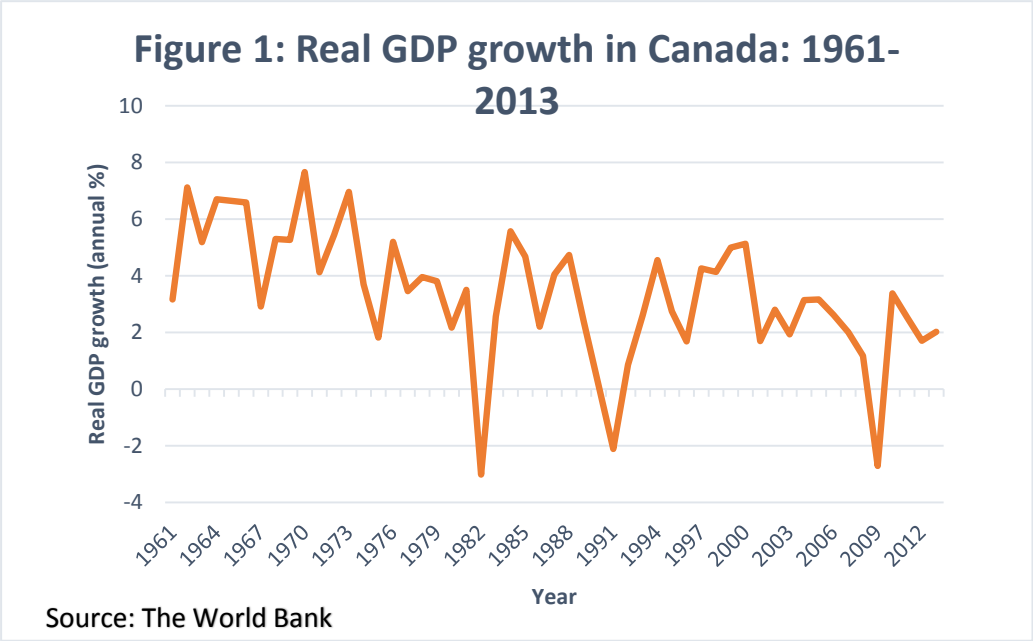
3.1 Data Description

My research is based on data drawn from the Public Use Micro-data Files (PUMF) of the Canadian Censuses of 1981, 1986, 1991, 1996, 2001 and 2006, and from the 2011 National Household Survey. Those files contain information on demographic, social, and economic characteristics of people living in Canada. Some

of the characteristics used in this paper as the key independent variables are thought to be highly correlated to individuals' employment condition. The seven data sets are extracted from ODESI, which is a data portal for researchers. The files contain respectively 2.7%, 2.7%, 2.7%, 2.8%, 3%, 2%, and 2% of the Canadian population in the specific years of 2011, 2006, 2001, 1996, 1991, 1986, and 1981.

The labour market conditions in the seven representative years are not the same, which allows this paper to partially take into account the impact of recessions on immigrants' employment outcomes. However, the analysis is limited by the fact that the censuses are taken only every five years, which is a very low frequency. In Canada, the periods of 1981-1982, 1991-1992, and 2008-2009 can be considered as three major recessions occurring in the past 30 years (Cross and Bergevin 2012). Since the effects of recessions are still felt a few years after they start, the 1986, 1996, and 2011 data sets are at the end of recessions and the respondents can be considered as being more affected by economic conditions than those in the other data sets. The data for 1981 and 1991 were collected just before or just at the beginning of a recession, and those for 2001 and 2006 were not during a recession. In general, the growth rate in real GDP is used to measure business cycle. Figure 1, based on data from the World Bank, shows the annual percentage GDP growth of Canada from 1961 to 2013. The figure indicates that there are five notable troughs occurring in the last 30 years: 1982, 1986, 1991, 1996, and 2009, with the 1982, 1991 and 2009 recessions being harsher than the others. In the recession years, immigrants are expected to be more vulnerable with respect to their employment outcomes than in expansion years.

The empirical results in later section will provide an examination of this hypothesis.



The analysis of this paper is done with only the respondents aged between 25 and 64, since this range represents the most appropriate sample of working-age people in the Canadian labour market. Individuals under 25 years old may still be studying, and those older than 64 are more likely to be retired. I also exclude individuals living in the Atlantic Provinces (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick) and Northern Canada, due to the fact that information on those provinces and territories is not consistent across the seven data sets. Note that very few immigrants live in those areas. For example, in 2011, while the proportion of the entire Canadian population living in those areas was 7.2%, it was only 0.6% for the immigrants. Therefore, excluding those geographic areas will impose very little impact on my empirical results. Additionally, I exclude individuals who are born in Oceania, again due to the inconsistent description of this category across the seven data sets.

3.2 Summary Statistics: Employment rates

After recoding the variables in all seven data sets, I append them together and save it as a new file. I generate a variable for years since migration (YSM) and compare it to the employment rate. YSM indicates how many years an immigrant has spent in Canada, and we expect that YSM and employment rate should be positively correlated. The estimated parameter can be interpreted as immigrants' positive assimilation effect in the Canadian labour market. Additionally, we expect that the marginal benefit of YSM to go down when YSM increases, a consequence of nonlinearity.

Figure 2a to Figure 2g provide some basic ideas of how immigrants' employment varies from 1981 to 2011, compared with that of the native-born Canadians. The red horizontal lines represent the average employment rate of the Canadian-born individuals in each specific year, which is used as the benchmark to evaluate the speed of assimilation of immigrants. The blue lines represent the employment rates of immigrants with different years since migration

Figure 2: Comparisons of employment rates of immigrants and non-immigrants, Canada, 1981 to 2011.

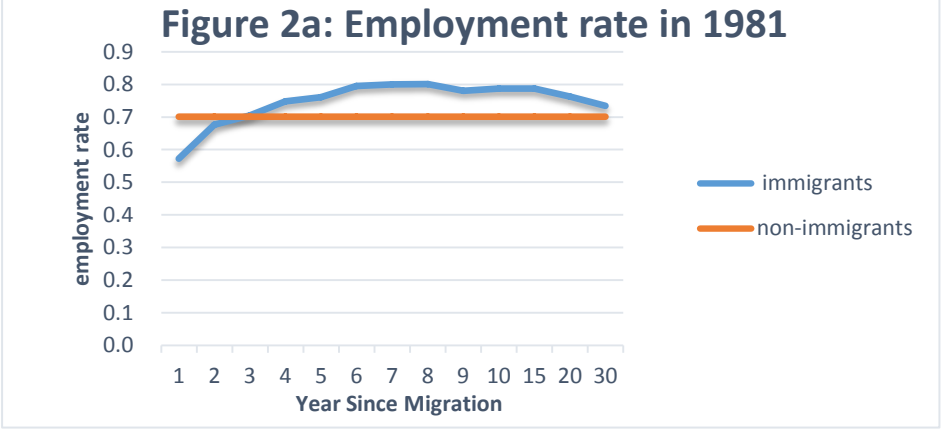


Figure 2b: Employment rate in 1986

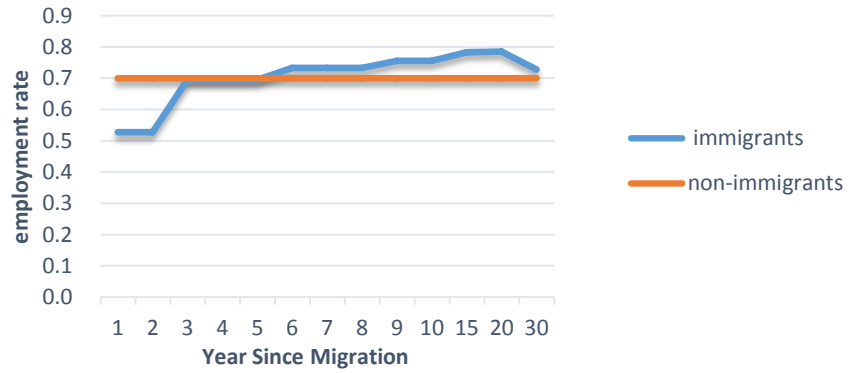


Figure 2c: Employment rate in 1991

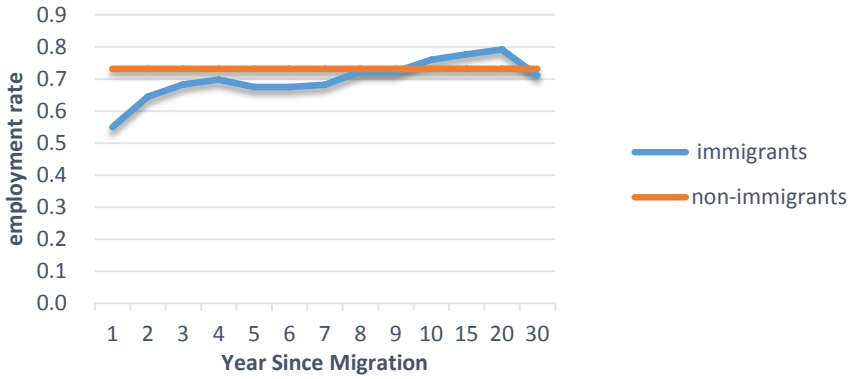
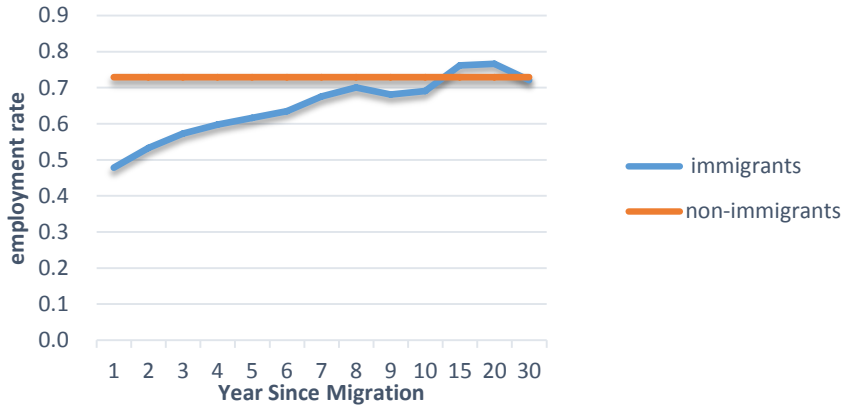
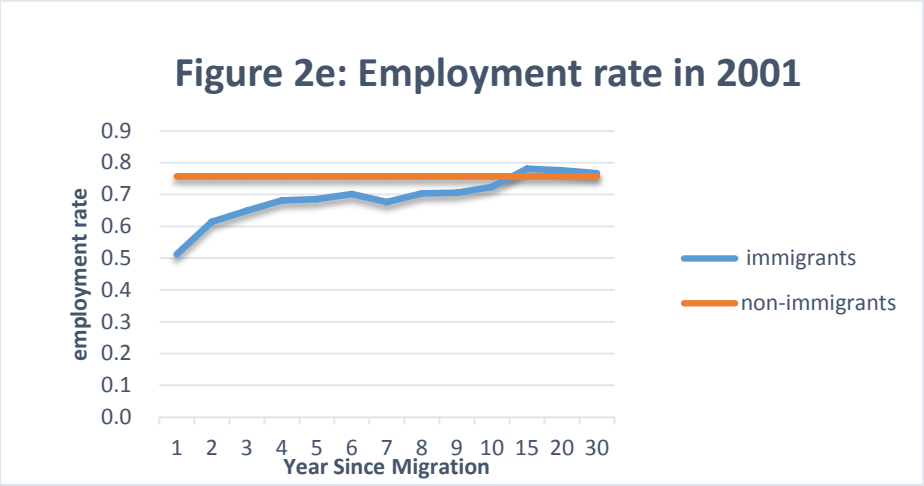
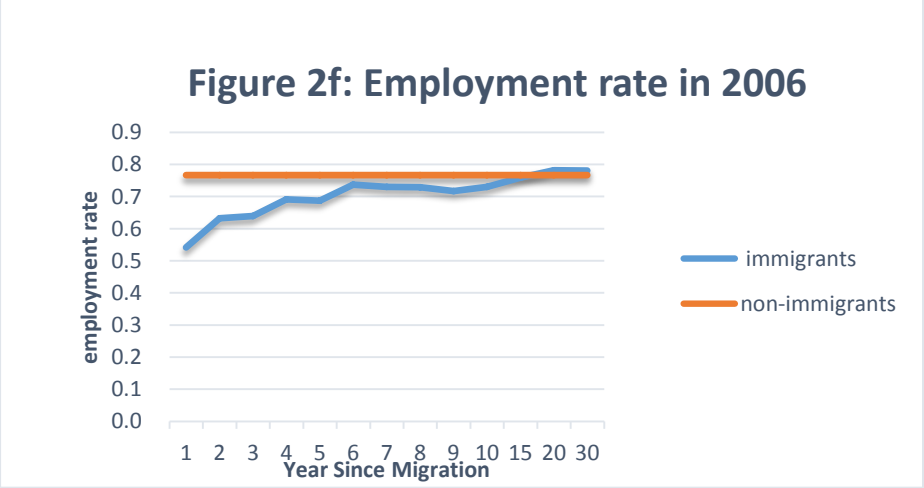
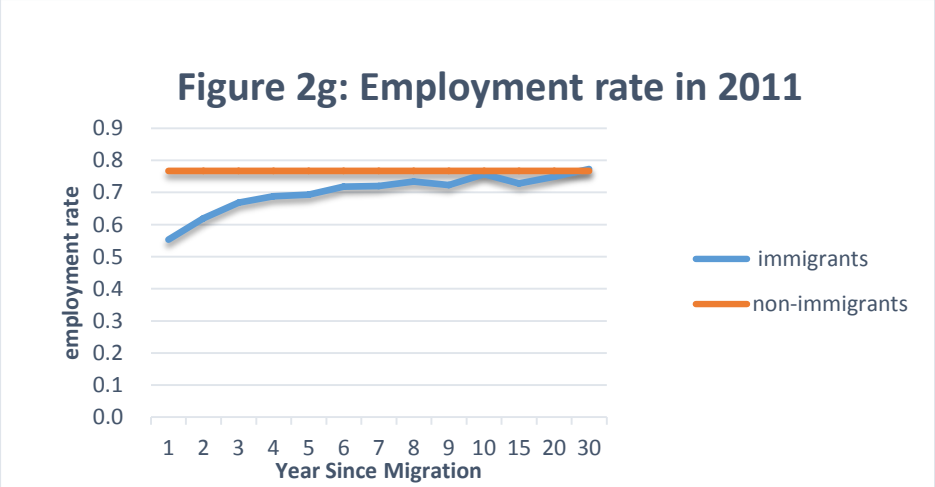


Figure 2d: Employment rate in 1996







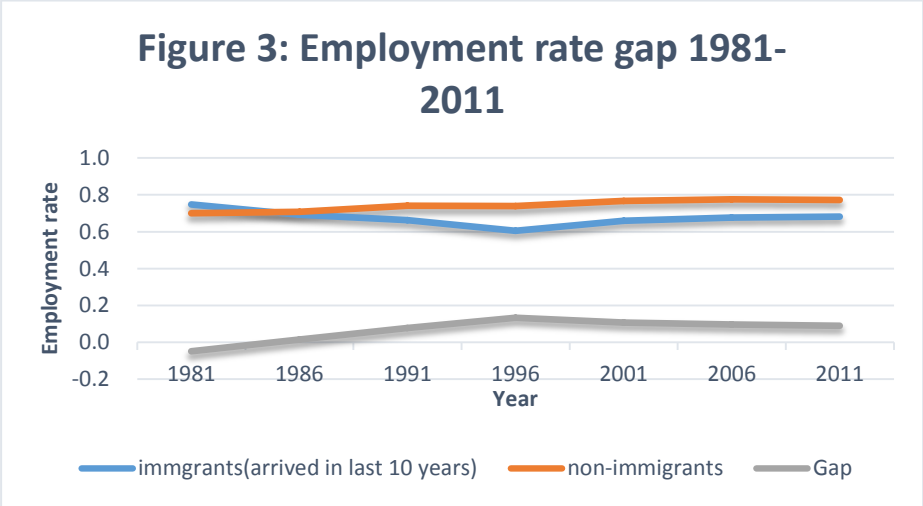


Let us first consider Figure 2a, which shows the average employment rate of Canadian-born individuals and the average assimilating trend of immigrants in 1981. When immigrants arrived, during the first three years, they had a lower employment rate than the one of the Canadian-born individuals, a reflection of immigrants'

negative entry effect in the Canadian labour market. When the two lines intersect, in the third year after arrival, immigrants achieve average employment rate equality. At the eighth year after migration, the average employment rate of immigrants achieves its peak and it begins to decline, indicating the existence of a non-linear pattern. An interesting fact is that immigrants who arrived more than 3 or 4 years prior 1981 have higher average employment rates than Canadian-born individuals.

Consistent with previous studies, the figures for the census years after 1981 indicate that the labour market performance of immigrants worsens. We can observe that the employment rate gaps between new immigrants who landed in Canada fewer than 3 years prior to the census years and the non-immigrants increased for the recent cohorts. In addition, it takes new immigrants increasingly longer to assimilate into the Canadian labour market. From Figure 2g based on the 2011 data, the two lines converge when YSM equals 30. That is, to say that immigrants who arrived in 1981 achieve employment rate equality with locals 30 years after landing in Canada.

There are several possible reasons to explain this deterioration. Recent cohorts may face larger employment gap at the time of entry (entry effect). On the other hand, the speed of assimilation rate of recent cohorts could be different from that of the previous cohorts (assimilation effect). Another possible explanation is lower values of unobserved qualities, such as motivation, ambition, and ability among recent immigrants (cohort effect).



Bloom, Grenier, and Gunderson (1995) indicated the importance of economic conditions on immigrants' performance at the point of entry in the Canadian labour market. In Figure 3, I show the average employment rates of non-immigrants and of immigrants who landed in Canada fewer than 10 years earlier across each data set. The figure shows that in 1981, the average employment rate of the recent immigrants was even higher than that of the Canadian-born individuals. However, the gap begins to increase from 1986 and thereafter and achieves a peak in 1996. After 1996, the gap starts dropping continuously until 2011. Even though the gap has decreased, it still remains at around 10 percentage points in 2011.

3.3 Summary Statistics: Education, Mother Tongue, Place of Residence, and Place of Birth.

Previous studies have shown that the sources of immigration have shifted from developed countries to developing countries, and that an increasing proportion of visible minorities might be a reason of recent cohorts' employment rate deterioration. In particular, this underlines the potential role of discrimination. Some studies, such as Gilmore and Le Petit (2008), also indicated the importance of devalued foreign

credentials. In addition, Warman (2003) notes that the knowledge of official languages (both English and French) is important to influence immigrants' performance in the labour market. The intensified language barrier among recent immigrants may be due to their increasing willingness to concentrate in ethnic enclaves, such as major CMAs. In ethnic enclaves, immigrants barely have a chance to speak official languages, since they can perfectly communicate with others in the communities using their mother languages. A good example is Richmond, British Columbia, a large Chinese community.

Therefore, it is important to look at how some of those factors changed through the period between 1981 and 2011. In table 1 to table 4, I report immigrants' characteristics in each specific year with respect to their education, mother tongue, place of residence, and place of birth.

Table 1: Distribution of Education Level for Immigrants

	1981	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**
No degree	36.1%	36.3%	29.4%	26.2%	20.2%	9.9%	9.0%
High School	15.6%	17.9%	21.9%	21.5%	18.9%	17.2%	15.4%
College	29.7%	26.3%	26.8%	27.5%	25.1%	25.3%	25.6%
Bachelor	10.7%	10.8%	12.3%	14.7%	20.5%	27.0%	27.2%
Post Graduate	8.0%	8.6%	9.2%	10.2%	15.3%	20.2%	22.8%

Source: From Appendix Table.A1

In 1981, 36.1% immigrants did not receive any degree, which was the largest proportion among the five levels that are shown. The second largest proportion is the group of immigrants who are college educated. This may be the result of the

introduction of the skill-oriented point system in 1967. Immigrants with bachelor or post-graduate education only account for about 19 percent of the total. From 1981 to 1996, the proportion of immigrants with no degree shows a 10 percentage point decline and the proportion of high school educated immigrants increases from 15.6% to 21.5%. The proportions of college, bachelor, and post-graduate educated immigrants did not differ much, but we observe a slight decrease in the proportion of college-educated immigrants and a slight increase in the proportion of bachelor and post-graduate educated immigrants. We observe notable changes in 2001 and 2006. Between 1996 and 2006, the proportion of immigrants with no degree decreased substantially, from 26.2% to 9.9%. As a result, the proportion of bachelor and post-graduate educated immigrants increases noticeably from 24.9% to 47.2%. In 2011, the distribution remains about the same, but there is still an observable shift from the less-educated immigrants to the more-educated ones. To summarize, during the period of 1981-2011, the proportions of new immigrants who received higher education rose significantly.

Table 2: Distribution of Mother Tongue for Immigrants

	1981	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**
English	39.3%	29.5%	20.7%	16.1%	13.3%	13.0%	13.5%
French	4.7%	3.8%	2.7%	2.4%	2.9%	3.7%	4.8%
Non-Official	55.9%	67.0%	76.6%	81.6%	83.9%	83.4%	81.8%

Source: From Appendix Table.A1

English and French are the official languages in Canada. Therefore I divide mother tongue into English, French, and non-official languages, and table 2 shows the

distribution of mother tongue in each year. It is important to be aware that a small number of respondents gave two or more mother tongues. In order to avoid confusion, those observations are dropped in my sample. In 1981, the proportions of English, French, and non-official languages are 39.3%, 4.7%, and 55.9% respectively. During the 30-year period, the percentage of French-speaking immigrants does not fluctuate much. The notable trend is the shift from English mother tongue to non-official mother tongues immigrants.

Table 3: Distribution of Place of Residence for Immigrants

	1981	1986	1991	1996	2001	2006	2011
Vancouver	11.7%	11.3%	12.8%	16.5%	17.9%	17.4%	15.2%
Toronto	35.7%	36.2%	41.8%	43.7%	44.8%	47.9%	41.5%
Montreal	13.5%	14.5%	14.1%	13.2%	12.2%	15.7%	18.0%
Rest of Canada	39.1%	38.0%	31.2%	26.6%	25.1%	19.1%	25.3%

Source: From Appendix Table.A1

Table 3 reports the distribution of immigrants' places of residence from 1981 to 2011. The data for all the years show that the immigrants are concentrated in the three major CMAs (Vancouver, Toronto, and Montreal). The overall proportion of those cities was equal to 60.9% in 1981, and it increased during the 30 year period. Immigrants are now less likely to live in other areas of Canada than they used to. Note that the total percentages of major CMAs declined from 80.9% in 2006 to 74.7% in 2011. In 2011, there is a notable immigrant inflow to other areas, maybe a consequence of the recent economic prosperity or Edmonton and Calgary. In summary, immigrants are more likely to live in major CMAs, but the percentage changes in the places of residence during 30 years are not as large as those for the variables of education and mother tongue.

The last table in this section shows the distribution of the places of birth of the immigrants. In 1981, most immigrants were from Europe and Asia, accounting for 36.6% and 34.2% of the total respectively. The third-largest group was the United States and the United Kingdom, with 20.7%. In the last 30 years, the proportions of immigrants from the U.S., the U.K. and Europe decreased gradually, accounting for only 15.1% in 2011. Similarly, the proportion of immigrants born in South America also showed a decreasing trend. In contrast, we observe a notable growth among immigrants from Africa and Asia. However, there is stabilization in the proportions after 2001. Prior to 2001, the proportion of Asian immigrants grew at a very fast rate, from 34.2% in 1981 to 60.1% in 2001, but it has remained constant at around 61% since then. The overall picture of the distribution of immigrants' countries of origin changed drastically from 1981 to 2011. Today, well over half of the immigrants in the Canadian labour market come from Asia.

Table 4: Distribution of Place of Birth for Immigrants

	1981	**1986**	**1991**	**1996**	**2001**	**2006**	**2011**
US & UK	20.7%	16.1%	8.7%	5.4%	4.1%	4.0%	3.5%
Europe	36.6%	20.3%	20.1%	18.2%	17.2%	15.4%	11.6%
Africa	6.4%	5.5%	6.7%	7.1%	8.0%	9.4%	11.3%
Asia	34.2%	42.8%	49.3%	55.4%	60.1%	61.8%	60.9%
South America	15.9%	15.0%	15.0%	13.9%	10.6%	9.4%	10.9%

Source: From Appendix Table.A1

4. Empirical Strategy and Models

In the first part of my research, I will use a probit model to analyze employment probabilities among immigrants and Canadian-born in each data set from

1981 to 2011. I will control for education, age, gender, place of residence, mother tongue, country of origin, marital status, and years since migration (YSM). Given that employment status is a binary variable, the probit model is an appropriate specification of the functional form. I also estimated a simple linear probability model, and the results were similar to the results of probit model. Therefore, I will report only the results of the probit specification.

The probit model can be constructed from a latent unobservable variable model, with auxiliary random variable *Y**,

$$Y^* = X'\beta + \varepsilon$$

The dependent variable Y is an indicator of this latent variable, which is defined as,

$$Y = \begin{cases} 1 & if\ Y^* > 0 \\ 0 & otherwise \end{cases}$$

Then Y is a binary variable in this case, and its model can be specified as,

$$\begin{aligned} Prob\{Y = 1|X\} &= Prob\{Y^* > 0|X\} = Prob\{X'\beta + \varepsilon > 0|X\} \\ &= \Phi(\beta_0 + \beta_1 Immigrant + \beta_2 YSM + \beta_3 YSM^2 + \beta_4 Age + \beta_5 Age^2 \\ &+ \beta_6 Male + \beta_7 Single + \beta_8 Education + \beta_9 Province + \beta_{10} CMA \\ &+ \beta_{11} Mother\ Tongue) + \varepsilon \qquad (1) \end{aligned}$$

where $\Phi()$ is the cumulative distribution function of the standard normal distribution. *X* is the matrix which represents independent variables with all of their observations, while *X'* is the transpose of *X*. The dependent and independent variables are defined below.

The second model used in this paper combines all seven data sets together and adds six cohort dummies to identify cohort effects. The independent variables can be

specified as,

$$\Phi(X'\beta) = \Phi\{\beta_0 + \beta_1 Immigrant + \beta_2 YSM + \beta_3 YSM^2 + \beta_4 Age + \beta_5 Age^2 + \beta_6 Male + \beta_7 Single + \beta_8 Education + \beta_9 Province + \beta_{10} CMA + \beta_{11} Mother\ Tongue + \beta_{12} Cohort\ Dummies + \varepsilon\} \quad (2)$$

Dependent Variable

Employment Status

Similarly to Zietsma (2007) and Grenier and Nadeau (2011), my research focuses on the employment rate which is the joint outcome of the labour force participation decision and the probability of having a job. This is different from the work of McDonald and Worswick (1997), whose dependent variable is unemployment. Based on that definition, I generate a dependent dummy variable, which is equal to 1 if an observed individual is employed, and 0 if the individual is not employed. It is generated based on the reported employment status during the reference week, and employed implies that an individual works either full time or part time.

Independent Variables

Immigrant: Immigrant Status

I use immigrant status as a dummy variable, with the value 0 for Canadian-born individuals and 1 for immigrants. Individuals who hold study and work permits are dropped from the estimating samples, since they do not have Canadian citizenship. In equations (1) and (2), *Immigrant* represents the individual's immigrant status instead of countries of origin. This variable must be included in the first two equations

because it is required to estimate the entry effect in each probit regression.

YSM: Years since Migration

Years since migration (YSM) is a very important variable that is employed to estimate the immigrants' assimilation rate. YSM is set to zero for Canadian-born individuals, and it can measure the changes in the employment rate for immigrants as the number of years living in Canada increases. Also, I specify square of YSM in the equation to capture its non-linear effects. This captures the existence of a concave pattern.

Age:

In the earlier censuses, from 1981 to 2001, age is given in single years. In 2006 and 2011, respondents' ages are classified in five-year groups. Since not all censuses have the same description on age, I uniformly specify age as single years, taking the midpoint in each age group in the 2006 and 2011 data. For example, for the 25 to 29 year old age group, I recode it as age 27. A second variable, age squared, is generated to identify non-linear effect. Again, this indicates the existence of non-linear pattern.

Gender and Marital Status:

Gender and marital status are important control variables which determine individuals' employment rates. I define *Male* as the dummy variable, which is equal to 1 if the respondent is male and to 0 for females. The expected sign of its coefficient is positive. That is, if we hold other characteristics constant, men are expected to have a higher probability of being employed than women.

I specify *Single* as a dummy variable to indicate respondents' marital status.

Single equals 1 if the respondents have never been legally married, and it equals 0 if they are legally married or live common law. I have dropped the respondents who are separated, divorced, and widowed. Since the observations I dropped only account for around 10% in every census, there might be no notable effect on the regression results.

Education dummy variables:

The education level is important in determining individuals' employment rates. In particular, I divide the education level in five groups: no degree diploma, high school, college degree, university degree, and post-graduate degree. I use no degree as the reference group. The basic expectation is that the higher the education level that individuals have, the higher the probability that they will be employed. Therefore, the coefficients of the dummy variables should be positive and increasing in education level.

Place of residence: Province and Census Metropolitan Area (CMA):

This group of dummy variables captures the regional effects on individuals' employment rates. I divide those variables in two subgroups: *Province* and *Census Metropolitan Area* (*CMA*). The Province variables include Ontario, British Columbia, Quebec, and the Prairie Provinces (Manitoba, Saskatchewan, and Alberta). As mentioned earlier, I drop residents from the Atlantic Provinces and Northern Canada due to their inconsistent descriptions across censuses. In the estimating equation, I use individuals who live in Ontario as the reference group. The metropolitan areas are divided into Toronto, Vancouver, Montreal, and the rest of Canada. Toronto,

Vancouver, and Montreal are identified as the three largest CMAs in Canada, and most of the immigrants are concentrated in those cities. The rest of Canada includes Canadian other cities and regions that do not belong to metropolitan areas. I use the rest of Canada as the reference group in the regressions.

Mother Tongue: Knowledge of Official Languages

Knowledge of official languages is necessary, since Grenier and Nadeau (2011) suggest that not knowing official languages in Canada causes barriers for immigrants. I generate *Non-Official* as a dummy variable with value of 1 if the reported mother tongue is not an official language. It equals to 0 if the respondent's mother tongue is English or French. The other dummy variables are simply defined as *English* and *French*. I use immigrants who speak non-official mother tongues as the reference group. Since speaking an official mother tongue can help with individuals' employment, the coefficients of these two dummy variables are expected to be positive. However, having French mother tongue may have negative impact on employment in the rest of Canada, since Quebec is the only French-speaking province in Canada. Therefore I generate an interaction term by multiplying *French* and *Quebec*, and this interacted dummy variable is expected to have a positive coefficient.

Cohort Effects:

The cohort effects partly capture the unobserved quality of immigrant cohorts that arrived at different points in time. For example, if the education quality of a specific cohort improves compared to earlier cohorts, then its corresponding coefficient for the cohort effect should be positive (Bloom, Grenier, and Gunderson

1995). Borjas (1985) points out that the estimates of the assimilation effects are biased if one estimates the specification without generating cohort effects. This study pools the 1981, 1986, 1991, 1996, 2001, 2006, 2011 cross-sectional censuses as a 'pseudo-longitudinal' data set. I generate cohort dummies with the cohort that arrived before 1960 as the reference group. Then I generate each cohort dummy using five-year intervals from 1961 to 2011. Note that the cohort effects cannot be used in regressions with one cross-sectional survey, since the YSM variable is perfectly collinear with the cohort effects. However, the collinearity is avoided in pooled regressions when using several cross-sectional data sets.

Causes of Employment Deterioration of Recent Immigrants

The strategy and models discussed above are designed to examine the entry effects and assimilation effects in separate census years as well as the entry effects, assimilation effects and cohort effects based on a pooled data structure. Figure 2 showed that recent immigrants are experiencing increasing difficulties in gaining employment. Therefore, I am interested in investigating some potential causes of this issue, including countries of origin, concentration of the places of residence, and other interaction terms.

Countries of origin:

Some previous studies use visible minorities as a group of dummy variables to analyze the discrimination problem in the labour market. However, the definitions of visible minorities are not consistent across the seven data sets. However, a simpler way is to generate a place of birth indicator as a group of dummy variables which can

be used to investigate the potential role of discrimination. Note that this group of variables was not included in the previous equations, since it was perfectly collinear with the immigrant dummy variable. When I include place of birth dummies, the immigrant variable is dropped from the equation. This category is divided into six groups which include individuals born in Canada (the reference group), English speaking countries (U.K. and U.S.), Europe, Africa, Asia, and Latin America.

Interaction terms:

I add two interaction terms in the model in order to identify the reasons leading to this deterioration. The first one is an interaction term of immigrant status and the education dummies, and the second one is an interaction term between immigrant status and CMAs. For the first interaction term, I multiply the immigrant dummy variable with the dummies of education level except the reference group. The second interaction term is generated similarly. I multiply the immigrant dummy with each of the dummy variable for the place of residence except for the reference group. These interaction dummy variables are used to investigate effects of education level and place of residence on the entry effects. The model can be described as follows,

$$\begin{aligned}\Phi(\mathrm{X}'\beta) = \Phi\{&\beta_0 + \beta_1 YSM + \beta_2 YSM^2 + \beta_3 Age + \beta_4 Age^2 + \beta_5 Male + \beta_6 Single \\ &+ \beta_7 Education + \beta_8 Immgrant * Education + \beta_9 Province \\ &+ \beta_{10} CMA + \beta_{11} Immigrant * CMA + \beta_{12} Mother\ Tongue \\ &+ \beta_{13} Place\ of\ Birth + \varepsilon\} \qquad (3)\end{aligned}$$

5. Empirical Results and Discussion:

5.1 Entry, Assimilation, and Cohort Effects

The empirical results of the separate and pooled regressions are presented in table 5. The coefficients for the entry, assimilation and cohort effects are shown, while the coefficients of the other variables are shown in Appendix table A2. All of the coefficients are reported in the form of dF/dx, which is equal to marginal effect in probit model calculated at the means of the other independent variables. Individual regressions based on specific data sets are reported in the first seven columns with the corresponding census year shown at the top, while the regression based on pooled data is reported in the last column.

This presentation is similar to the one of Bloom, Grenier and Gunderson (1995). Table 5 confirms the expected negative entry effects and positive assimilation effects in both the separate and the pooled regressions. In 1981, the results indicate that immigrants had, on average, a 21.5 percentage point lower probability of being employed at the time of entry than comparable Canadian-born individuals. The probability of being employed increases at the rate of 5.3 percentage points the first year after landing in Canada. Note that my econometric models also include YSM squared to identify the concave relation between YSM and the probability of being employed. Therefore, I also report the marginal effects of YSM squared in Table 5, since its non-linearity indicates the diminishing marginal return of YSM on immigrants' employment rate. The table shows that the assimilation rate diminished at 0.3 percentage points per year in 1981. One can calculate the number of years it takes

for immigrants' employment rate to catch up with that of local counterparts based on the coefficients of YSM (i.e. years to equality). It measures how many years it takes for the positive assimilation effects to offset the negative entry effect. The procedure is to find the solution of a quadratic equation: $\widehat{\beta_1} + \widehat{\beta_2}YSM + \widehat{\beta_3}YSM^2 = 0$. However, it is very possible that there is no year to equality with a quadratic version of YSM if the quadratic curve reaches a maximum before crossing the line. After calculations, I found that most data sets did not produce a value for years to equality, the exceptions being 1981 (6.31 years to equality) and 1986 (11.40 years to equality).

Table 5

Entry, Assimilation, and cohort effects, Canadian immigrants, 1981, 1986, 1991, 1996, 2001, 2006, and 2011

Marginal Effects	1981	1986	1991	1996	2001	2006	2011	Pooled data, controlling for cohort effects
Entry Effect	-0.215	-0.269	-0.280	-0.376	-0.416	-0.368	-0.346	-0.207
	(-14.05)***	(-13.32)***	(-27.13)***	(-36.05)***	(-41.99)***	(-35.95)***	(-38.44)***	(-43.43)***
Assimilation	0.053	0.035	0.041	0.049	0.064	0.045	0.040	0.020
Effect, YSM	(9.19)***	(5.13)***	(9.74)***	(13.22)***	(19.18)***	(13.15)***	(13.17)***	(51.79)***
Assimilation	-0.003	-0.001	-0.002	-0.003	-0.004	-0.002	-0.002	0.000
Effect,YSM^2	(-6.4)***	(-2.23)**	(-5.51)***	(-7.41)***	(-12.47)***	(-7.84)***	(-7.86)***	(-36.78)***
Cohort Effect:								
Cohort pre-60 (Reference)								-
Cohort 61-65								-0.017
								(-1.64)*
Cohort 66-70								-0.018
								(-3.17)***
Cohort 71-75								0.014
								(2.86)***
Cohort 76-80								0.003
								(0.35)
Cohort 81-85								-0.012
								(-3.52)***
Cohort 86-90								-0.032
								(-7.56)***
Cohort 91-95								-0.068
								(-16.04)***
Cohort 96-00								-0.070
								(-15.75)***
Cohort 01-05								-0.067
								(-15.04)***
Cohort 06-10								-0.068
								(-13.40)***
N	177872	195131	329501	330058	336620	349355	365943	2168588

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01,the estimated marginal effect is significant at 10%, 5%, and 1% level.

The full regression results are shown in Appendix table A2

The following variables are included as controls: age, gender, marital status, education, place of residence, and mother tongues

The entry effect in 1986 is larger than the one in 1981, in which immigrants have

a 26.9 percentage point disadvantage in the probability of being employed when they arrive compared to Canadian-born individuals. Moreover, their annual assimilation rate decreased from 0.053 to 0.035. Both higher absolute values of entry effect and lower assimilation effect indicate a slower initial assimilation process among immigrants in the 1986 census. Note that the period from 1981 to 1986 was marked by one of Canada's longest and deepest recessions since the 1930s (Bloom, Grenier and Gunderson 1995). Figure 3 above indicated that real GDP growth rate in 1982 was equal to -3.02 percent, which is the lowest level from 1961 to 2013. Moreover, the data show that the year 1986 is another trough of the Canadian economy.

After 1986 the negative entry effects continues to gradually increase until 2001, maybe a consequence of the other two economic downturns in 1991 and in 1996. Another possible reason is the change in the composition of countries of origin. The negative entry effect achieves its maximum absolute value at -0.416 in the 2001 census. That is, in 2001 immigrants who arrived have, on average, a 41.6 percentage point employment rate disadvantage at entry compared to Canadian-born individuals. In addition to the entry effects, the assimilation effects show an increasing trend from 1986 to 2001. Note that the entry effect exhibits a substantial rise from -0.280 in 1991 to -0.376 in 1996, while the assimilation effect did not increase much in 1996. This is consistent with the result of Figure 2, which shows that the average employment rate gap between immigrants and Canadian-born individuals is the largest in 1996. The results above indicate that the Canadian labour market may show some inability to absorb new immigrants when the economic situation is weak. In the last two data sets,

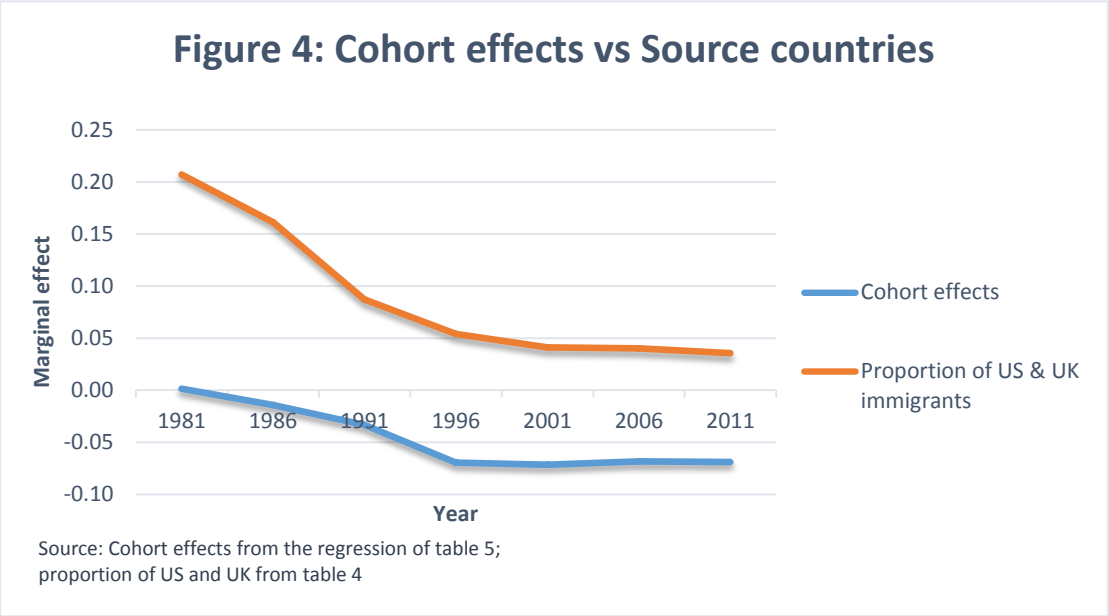
the absolute values of the entry effect declined slightly, although they still remain at a high level. From the history of Canada's economy (based on the data from figure 3), I suggest that Canada had similar economic conditions in 2006 as it did in 1981. Taking into account the economic conditions, table 5 shows that recent immigrant cohorts still suffer large employment penalties, due to a larger entry effect and a smaller assimilation effect in 2006 than in 1981. Thus, immigrants' employment deterioration cannot be attributed solely to the economy's inability to absorb them during downturns. Section 5.2 will discuss other determinants which may cause immigrants to suffer larger employment penalties in recent years.

However, as mentioned above, the results of the separate regressions ignore the possibility of unobserved heterogeneity across cohorts. Using a 'pseudo-longitudinal' data set, the last column of the table shows the results of a pooled regression that controls for cohort effects. Taking immigrants who migrate before 1960 as the reference group, the pooled results indicate that, with the exception of the 1971-75 and 1976-80 immigrant cohorts, each successive cohort has lower employment rate at the time of entry, even after controlling for other determinants of employment. It is interesting to note that the four most recent cohorts have almost the same values, an indication that the cohort effect tends to stabilize after 1990.

The results indicate that the absolute values of both entry effect and assimilation effects are reduced dramatically compared to cross-sectional regressions. I will not do a detailed analysis of immigrant cohorts who arrived from 1961 to 1980, because either the magnitudes of their marginal effects are small or the effects are not

statistically significant. In contrast, the cohort effects start to reveal larger magnitudes and absolute values of the t statistics in 1981 and thereafter. For example, the 1981-85 cohort shows a 1.4 percentage point lower employment rate relative to pre-1960 cohort. This suggests that the unobserved quality of the 1981-85 cohort slightly decreased. The overall picture shows the decreasing immigrants' quality since 1981, and the lowest quality occurs with the 1996-00 cohort. Also note that immigrants who migrated from 1991 to 2010 have around 7 percentage point employment disadvantage in terms of their cohort effects. As a result, the very large entry effects in 1996, 2001, 2006, and 2001 censuses can be partly attributed to the decreased quality among those immigrants.

Coulombe, Grenier, and Nadeau (2014) showed that immigrants' quality of human capital is positively correlated to their country's GDP per capita. In particular, they relate GDP per capita to the return to schooling and work experience obtained outside of Canada. Therefore, plotting the estimated coefficients of the cohort effects and the data in section 3, figure 4 compares, from 1981 to 2011, the trends in those cohort effects and in the proportion of immigrants born in the US and the UK, two countries with the highest GDP per capita. We observe that both statistics decreased substantially from 1981 to 1996 (mainly due to the large inflows of Asian immigrants), and that they remain stable after 1996. Thus, my empirical results suggest that the shift in immigrants' origins from relatively rich countries to relatively poor ones contributes to the explanation of to the declining quality of immigrants' human capital in recent decades.



5.2 Analysis of the Effects of the Control Variables

I also analyze the other factors which impact native-born and immigrants' employment rates. In this subsection, I discuss the marginal effects of countries of origin, mother tongues, schooling, and place of residence, which can help us better understand immigrants' employment deterioration in the Canadian labour market. For each control variable, I divide the analysis into two parts. First, I present the pooled regression results for male and female separately, in which we can distinguish the different marginal effects between genders. Then for males and females together, I present separate regressions using different census years, in which we can observe how the estimated marginal effects change with time.

5.2.1 Countries of Origin and Mother Tongues.

Table 6 reports part of the regression results based on the pooled data. Note that the dummy variable Male was dropped, in order to estimate the regression equations for males and females separately.

The negative marginal effects of US & UK for both genders indicate a negative entry effects for immigrants born in those countries. In the pooled data, males born in the US or the UK suffer the lowest employment penalties at entry in the Canadian labour market, in which they only have a 5.2 percentage point employment disadvantage compared to Canadian-born males. For European males, the employment disadvantage at entry is higher at 15.9 percentage points. However, we observe some degree of potential discrimination against visible minorities, since African and Asia males suffer the largest employment penalties in the data. If we consider immigrants born in the US, the UK, and Europe as the non-visible minorities, then the weighted average of the marginal effects for this group is -11.5 percentage points. Therefore, we observe that African, Asian, and South American immigrants exhibit 18.6 percentage points, 15.5 percentage points, and 10.6 percentage points respectively greater employment disadvantages than comparable immigrants who are non-visible minorities. However, the discrimination against visible minorities cannot be the full explanation. Lower human capital quality in countries other than the US, the UK, and Europe may be the other reason. After controlling for the place of birth, having an official language as mother tongues reveals a relatively lower benefit. For men, English mother tongue only leads to a 2.6 percentage point higher employment rate than having neither English nor French as mother tongue. Having French as mother tongue provides men with a 0.7 percentage point benefit, but the interaction term shows that this benefit increases to 4.5 percentage points if the individuals live in Quebec.

The right column of table 6 shows that the picture for females is fairly similar to that for males, but the pooled regression for women indicates larger marginal effects than for male immigrants from all source countries. That is, female immigrants suffer more severe employment penalties at entry than male immigrants. Using a similar method as before, the weighted average of marginal effects for female non-visible minorities is -18.9 percentage points. Thus we observe that African, Asian, and South American immigrants have 11.7 percentage points, 9.2 percentage points, and 2.5 percentage points respectively greater employment disadvantages than comparable immigrants who are non-visible minorities. The difference between genders indicates a greater discrimination against visible minorities among female immigrants. In addition to the countries of origin, the estimates show that the knowledge of official languages is more important for females than for males.

Table 6

Marginal entry effects of place of origin and language, Pooled regression for males and females separately

	Male		Female	
	Marginal Effect	t statistics	Marginal Effect	t statistics
US&UK	-0.052	(-8.20)***	-0.193	(-27.40)***
Europe	-0.159	(-29.31)***	-0.205	(-33.55)***
Africa	-0.301	(-42.35)***	-0.326	(-41.43)***
Asia	-0.271	(-51.33)***	-0.301	(-54.19)***
South America	-0.221	(-34.06)***	-0.234	(-34.52)***
English	0.026	(16.95)***	0.036	(18.62)***
French	0.007	(3.01)***	0.010	(3.62)***
French_Quebec	0.045	(16.59)***	0.051	(13.82)***
N	1025168		1059312	

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01,the estimated marginal effect is significant at 10%, 5%, and 1% level.

The full regression results are shown in Appendix table A3

The following variables are included as controls: immigrant status, YSM, age, gender, marital status, education, place of residence, and mother tongues

Table 7 shows how the entry effects of countries of origin and the marginal effects of knowledge of official languages vary over time. An interesting result is that immigrants who are born in the US and the UK encountered an important employment deterioration between 1981 and 1986, and the substantial negative entry effects among this group did not diminish until 2011. The pronounced negative entry effect in 1986 may be due to the severe recession in the early 1980s, but it remains unknown whether this is a long lasting effect. A possible explanation is that the increasing proportion of immigrants from other source countries (such as Asia) resulted in a deterioration of all immigrants' performance in the labour market.

Many studies such as Bloom, Grenier and Gunderson (1995) suggest that there is discrimination against visible minorities. To construct figure 5, I first calculated the weighted averages of the marginal effects for immigrants born in the US, the UK and Europe in each census year, which indicate the weighted average employment disadvantage (with respect to Canadian-born) for non-visible minorities. Then I calculated in the same way the weighted averages of the employment disadvantages for visible minorities (African, Asian, South American immigrants). Therefore, figure 5 shows how discrimination may have evolved from 1981 to 2011. In the overall picture, the gap for the three visible minorities (potentially due to discrimination) increased during the period. Note that the recession in the early 1980s had a larger impact on the non-visible minorities, since the gap decreases slightly in 1986. However, the gap became more pronounced after 1986, and it increased remarkably

between 1991 and 2001. Although there was a severe recession in 2008-2009, contrary to our expectation, the gap tended to decrease slightly.

From 1981 to 2011, table 7 shows that the effect of mother tongue also varies over time. In order to focus on the language issue, I will only discuss on the variables of English mother tongue and French mother tongue in Quebec. The marginal benefit of having an official language as mother tongue (English in the rest of Canada and French in Quebec) did not change much if we only look at the 1981 and 2011 data sets. But the overall trends indicate that the values of the marginal effects are relatively higher in 1996, 2001 and 2006. Keeping in mind the descriptive data presented in table 2, there were 81.6%, 83.9%, and 83.4% of immigrants whose mother tongues are neither English nor French in 1996, 2001, and 2006 respectively. Note that in 1981, this proportion was only 55.9%. Therefore, I conclude that the increased importance of the language barrier can be one of the explanations for employment rate deterioration among recent immigrants.

Table 7

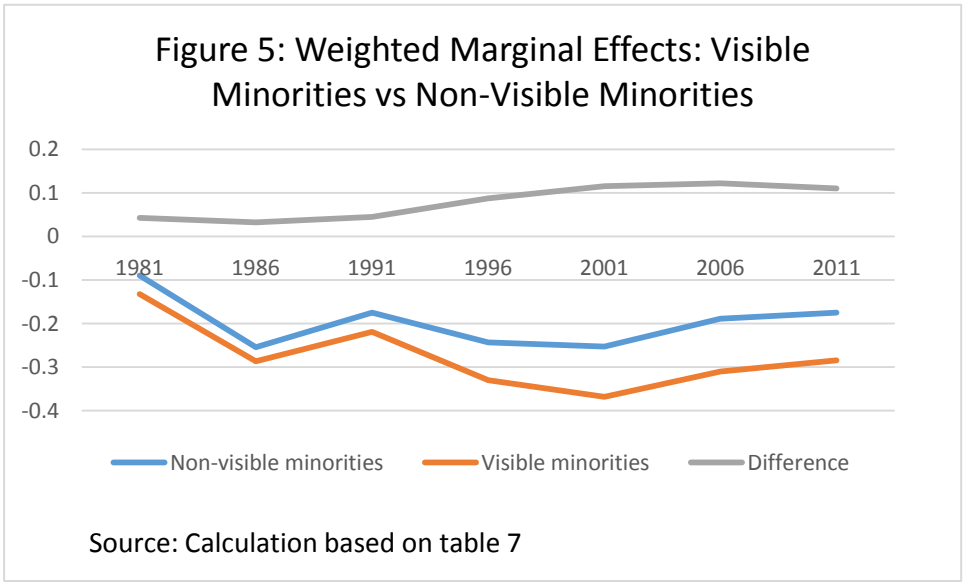
Marginal entry effects of place of origin and language, separate regressions, 1981, 1986, 1991, 1996, 2001 and 2006 censuses, 2011 NHS

Marginal Effects	1981	1986	1991	1996	2001	2006	2011
US&UK	-0.086	-0.262	-0.139	-0.153	-0.193	-0.184	-0.159
	(-6.78)***	(-11.38)***	(-11.14)***	(-11.38)***	(-14.18)***	(-13.37)***	(-11.80)***
Europe	-0.093	-0.249	-0.191	-0.271	-0.267	-0.191	-0.180
	(-6.49)***	(-11.12)***	(-17.77)***	(-24.98)***	(-25.66)***	(-18.12)***	(-17.80)***
Africa	-0.150	-0.352	-0.264	-0.394	-0.399	-0.337	-0.332
	(-6.27)***	(-11.71)***	(-17.21)***	(-28.03)***	(-30.87)***	(-26.87)***	(-30.99)***
Asia	-0.137	-0.282	-0.215	-0.337	-0.377	-0.315	-0.287
	(-8.94)***	(-12.88)***	(-22.28)***	(-34.09)***	(-39.97)***	(-33.00)***	(-34.19)***
South America	-0.115	-0.276	-0.215	-0.272	-0.295	-0.254	-0.222
	(-6.41)***	(-11.63)***	(-18.19)***	(-23.33)***	(-24.68)***	(-21.12)***	(-21.13)***
English	0.024	0.012	0.028	0.034	0.046	0.031	0.025
	(5.51)***	(3.00)***	(8.71)***	(10.20)***	(14.92)***	(10.35)***	(8.46)***
French	-0.022	-0.031	0.008	0.008	0.024	0.012	0.030
	(-2.77)***	(-4.83)***	(1.69)*	(1.56)	(5.25)***	(2.53)**	(6.14)***
French_Quebec	0.036	0.044	0.043	0.069	0.056	0.061	0.041
	(4.30)***	(5.46)***	(7.50)***	(11.65)***	(9.89)***	(11.34)***	(7.49)***

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01, the estimated marginal effect is significant at 10%, 5%, and 1% level.

The full regression results are shown in Appendix table A4

The following variables are included as controls: immigrant status, YSM, age, gender, marital status, education, place of residence, and mother tongues.



Source: Calculation based on table 7

5.2.2 Return to Education and Interacted Effects

Table 8 displays the pooled regression results for males and females separately in terms of the effects of their education levels. This table shows the marginal effects of different education levels on individuals' employment status, as well as the marginal effects of the interactions between education levels and immigrant status.

Note that I use individuals with no degree as the reference group. For example, there is a 7 percentage point higher employment rate for high school educated non-immigrants men than for the reference group. For both males and females, the marginal effect increases as their education level increases. As has been usually found, the return to education is much higher among females.

However, the marginal effects for the interaction dummies show some disconcerting results for immigrants. For example, Canadian-born men with a post-graduate degree have an 11.4 percentage point higher employment rate than the reference group. But the marginal effect of IMM_Post shows that the advantage of holding a post-graduate degree declines by 12.5 percentage points for immigrant males. The same is true for immigrant males with a bachelors' degree. Since the marginal effect of IMM_Post overwhelms that of Post-graduate, we can conclude that immigrant males who have a post-graduate degree have even lower employment rates than non-immigrant males with no degree. The marginal effect does not diminish as much for college-educated immigrant males, which may be an indication that the Canadian labour market has higher needs for skilled labour.

The empirical results for females tell a different story. Even though the marginal

effects of the interacted dummies are larger than those of males, all those negative effects are not large enough to offset the entire returns to education. For example, immigrant females with a bachelors' degree still have a 7.1 percentage point (0.250 - 0.179) higher employment rates than non-immigrant females with no degree. Similarly to immigrant males, college-educated immigrant females have the highest return to education, which is a 9.6 percentage point employment advantage over Canadian-born females with no degree.

Table 8
Marginal effects of education, Pooled regression for males and females separately

	Male		Female	
	Marginal Effect	t statistics	Marginal Effect	t statistics
High school	0.070	(72.81)***	0.156	(125.40)***
College	0.094	(106.62)***	0.234	(198.11)***
Bachelor	0.113	(98.54)***	0.250	(169.93)***
Post-graduate	0.114	(82.18)***	0.258	(132.71)***
IMM_High	-0.081	(-17.69)***	-0.138	(-26.98)***
IMM_College	-0.072	(-17.22)***	-0.138	(-28.89)***
IMM_Bachelor	-0.120	(-24.44)***	-0.179	(-32.91)***
IMM_Post	-0.125	(-23.56)***	-0.226	(-34.44)***

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01, the estimated marginal effect is significant at 10%, 5%, and 1% level.

The full regression results are shown in Appendix table A5

The following variables are included as controls: immigrant status, YSM, age, gender, marital status, education, place of residence, and mother tongues.

Table 9 shows the variation in the educational dummy variables over time. In 1981, except for those who are college educated, immigrants with other education levels have almost no employment advantage compared to the reference group. The most disconcerting result is that immigrants with post-graduate degrees have a 3.3 percentage point disadvantage compared to Canadian-born individuals with no degree. From 1986 to 2011, the returns to bachelor and post-graduate degrees among

immigrants increased substantially, while the returns to high school and college degrees remained unchanged. Until 2011, immigrants with high school, college, bachelor, and post-graduate degrees have -0.9 percentage point, 6.6 percentage point, 4 percentage points, and 1.4 percentage points respectively higher employment rates than the reference group, respectively. In the overall picture, although there are major devaluations of immigrants' foreign-obtained education in the Canadian labour market, my empirical results indicate that these devaluations were reduced from 1981 to 2011. Therefore, similar to the findings in Aydemir and Skuterud (2005), strengthening of foreign education cannot be the explanation of immigrants' employment deterioration. On the contrary, the increased proportion of university and post-graduate educated immigrants during 1981-2011 is eliminating this deterioration.

Table 9

Marginal effects of education , separate regressions, 1981, 1986, 1991, 1996, 2001 and 2006 censuses, 2011 NHS

Marginal Effects	1981	1986	1991	1996	2001	2006	2011
High school	0.098	0.105	0.106	0.120	0.100	0.109	0.117
	(34.04)***	(39.22)***	(54.19)***	(58.59)***	(50.45)***	(53.39)***	(54.89)***
College	0.149	0.149	0.157	0.169	0.147	0.158	0.177
	(55.61)***	(59.08)***	(84.30)***	(87.52)***	(78.56)***	(80.27)***	(84.75)***
Bachelor	0.162	0.175	0.175	0.205	0.162	0.162	0.185
	(37.22)***	(46.52)***	(68.61)***	(83.04)***	(70.53)***	(73.11)***	(85.25)***
Post-graduate	0.192	0.195	0.186	0.208	0.165	0.163	0.182
	(32.34)***	(37.60)***	(54.68)***	(65.29)***	(57.39)***	(62.03)***	(72.77)***
IMM_High	-0.100	-0.065	-0.078	-0.101	-0.104	-0.120	-0.126
	(-7.35)***	(-4.75)***	(-9.14)***	(-12.77)***	(-12.94)***	(-12.37)***	(-13.65)***
IMM_College	-0.091	-0.073	-0.092	-0.086	-0.095	-0.101	-0.111
	(-7.73)***	(-5.67)***	(-10.99)***	(-11.56)***	(-12.58)***	(-11.24)***	(-13.36)***
IMM_Bachelor	-0.160	-0.139	-0.134	-0.175	-0.152	-0.118	-0.145
	(-9.00)***	(-7.71)***	(-11.60)***	(-18.04)***	(-17.72)***	(-12.62)***	(-16.60)***
IMM_Post	-0.225	-0.218	-0.192	-0.197	-0.145	-0.137	-0.168
	(-10.04)***	(-10.09)***	(-13.80)***	(-16.64)***	(-14.70)***	(-13.19)***	(-17.72)***

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01, the estimated marginal effect is significant at 10%, 5%, and 1% level.

The full regression results are shown in Appendix table A6

The following variables are included as controls: immigrant status, YSM, age, gender, marital status, education, place of residence, and mother tongues.

5.2.3 Place of Residence and Interacted Effects

In this subsection, I use the same approach as for the returns to education to analyze the effect of the place of residence on immigrants' employment. Table 10 reports the pooled regression for males and females separately, and table 11 presents the separate regressions for different census years.

From the empirical results, the pooled data show that Canadian-born males who live in Vancouver, Toronto, and Montreal have around a 3 percentage point employment status advantage compared to those who live in the rest of Canada; similarly, females living in those three major CMAs have around a 4.2 percentage point employment status advantage.

The interaction dummies indicate that the employment advantages of living in major CMAs among immigrants are lower. Even worse, except in Toronto, male immigrants living in major CMAs have lower employment rates than those living in the rest of Canada. Similarly, female immigrants living in major CMAs have lower probabilities of being employed than those living in the rest of Canada. However, this disadvantage of living in major CMAs is weaker among female immigrants than among male immigrants.

Table 10
Marginal effects of living in major CMAs, Pooled regression for males and females separately

	Male		Female	
	Marginal Effect	t statistics	Marginal Effect	t statistics
Vancouver	0.033	(16.74)***	0.045	(16.65)***
Toronto	0.030	(21.40)***	0.037	(20.17)***
Montreal	0.029	(22.71)***	0.045	(25.68)***
IMM_Vancouver	-0.043	(-9.03)***	-0.018	(-3.21)***
IMM_Toronto	-0.023	(-6.45)***	-0.021	(-5.00)***
IMM_Montreal	-0.060	(-12.54)***	-0.029	(-5.09)***

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01, the estimated marginal effect is significant at 10%, 5%, and 1% level.

The full regression results are shown in Appendix table A5

The following variables are included as controls: immigrant status, YSM, age, gender, marital status, education, place of residence, and mother tongues.

Table 11 reports the same effects for each census year, using both genders together. In 1981, Canadian-born individuals living in Vancouver, Toronto and Montreal respectively had employment advantages of 6 percentage points, 6.3 percentage points, and 4.9 percentage points compared to those living in the rest of Canada. However, all the marginal effects of the interaction dummies are not statistically significant, even at the 10% significance level. The results indicate that in 1981 immigrants did not suffer any negative impact on their employment from living in the three major CMAs. In 1986, the last interaction dummy, IMM_Montreal starts being negative, and it is statistically significant at the 5% level. An employment rate gap between immigrants and non-immigrants in Toronto emerges in 1991. Since 1996, all the marginal effects of interaction dummies begin to turn negative and statistically significant at the 1% level. In other words, starting in 1996, immigrants suffer

employment disadvantages in all three major CMAs, and these disadvantages have persisted until 2011.

A notable result is that immigrants' employment rate disadvantages are the most apparent in Montreal, when compared to Vancouver and Toronto. Compared to non-immigrants living in the rest of Canada, living in Montreal leads immigrants to always suffer lower employment rates from 1991 to 2011. The fact that immigrants have more difficulty integrating into Montreal's labour market can be explained by several factors. Grenier and Nadeau (2011) show that the lack of knowledge of French in Montreal has a larger negative effect on immigrants' employment rates than the lack of knowledge of English in Toronto. In addition, immigrants suffer greater language related discrimination in Montreal, in that immigrants' knowledge of French is less rewarded than that of Canadian-born individuals. Vancouver and Toronto are considered to be the most multicultural areas in Canada, so that large numbers of immigrants choose those areas as destinations. Also, note that there are many large communities of visible minorities in Vancouver and Toronto. For example, Greater Vancouver has a Chinese community in Richmond and an Indian community in Surrey. Most immigrants tend to live in communities where their own culture have a heavy preserve phenomenon, and doing so slows down their process of learning official languages. This may explain the persistent employment rate gaps in Vancouver and Toronto.

Table 11

Marginal effects of living in major CMAs, separate regressions, 1981, 1986, 1991, 1996, 2001 and 2006 censuses, 2011 NHS

Marginal Effects	1981	1986	1991	1996	2001	2006	2011
Vancouver	0.060	0.049	0.043	0.046	0.048	0.024	0.036
	(9.49)***	(8.35)***	(9.74)***	(10.20)***	(11.68)***	(5.91)***	(9.31)***
Toronto	0.063	0.053	0.037	0.038	0.038	0.015	0.029
	(14.60)***	(13.24)***	(12.51)***	(12.21)***	(13.04)***	(5.55)***	(10.72)***
Montreal	0.049	0.044	0.034	0.039	0.044	0.035	0.030
	(13.03)***	(12.35)***	(12.55)***	(13.88)***	(16.46)***	(13.45)***	(11.20)***
IMM_Vancouver	0.003	0.016	-0.003	-0.065	-0.050	-0.017	-0.028
	(0.19)	(1.02)	(-0.29)	(-6.96)***	(-5.99)***	(-3.83)***	(-3.56)***
IMM_Toronto	-0.017	0.016	-0.015	-0.033	-0.018	-0.014	-0.037
	(-1.50)	(1.44)	(-1.98)**	(-4.68)***	(-2.79)***	(-2.08)**	(-5.82)***
IMM_Montreal	-0.017	-0.033	-0.053	-0.061	-0.068	-0.050	-0.061
	(-1.22)	(-2.33)**	(-5.08)***	(-6.26)***	(-7.16)***	(-5.39)***	(-7.44)***

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01, the estimated marginal effect is significant at 10%, 5%, and 1% level.

The full regression results are shown in Appendix table A6

The following variables are included as controls: immigrant status, YSM, age, gender, marital status, education, place of residence, and mother tongues.

In summary, since 1981 Canadian immigrants' employment has deteriorated as they find it increasingly harder to assimilate into the Canadian labour market. Empirically, their entry effect increased substantially in magnitude between 1981 and 2001, and it has remained at a historically high level in the following ten years. In addition, the speed of assimilation into the labour market has slowed down in the past several decades. Based on figure 2, new immigrants need a longer time to fully assimilate into labour market. To analyze the factors leading to this deterioration, I included mother tongue, country of origin, education and place of residence in the regressions. The results show that the shift in the countries of origin could be the major factor in explaining the deterioration of labour market performance of recent immigrants. Another potential reason of this deterioration could be the deteriorated

performance of highly educated immigrants relative to their Canadian born counter parts.

6. Conclusion

This paper has described the increasing deterioration of the employment prospects of immigrants in the Canadian labour market and has identified some potential mechanisms leading to this deterioration. This paper investigated immigrants' employment rates in terms of entry, assimilation, and cohort effects, and the paper also took economic conditions into account. Controlling for human capital and other factors, the entry effect is 21.5 percentage points in 1981; in 2001, that same entry effect becomes 41.6 percentage points. The cohort effects also show that recent new immigrants perform worse than previous ones.

To identify the potential mechanisms leading to this deterioration, I have considered different factors in the regressions. Using each survey data and estimating regressions separately, I found that the assimilation rate of new immigrants has slowed down recently, and that the performance of new cohorts has worsened. I also used interaction terms to identify the causes of the performance of the immigrants. The interaction terms between education level and immigrant status indicate that the benefit of obtaining higher education for immigrants is much less than the one for the Canadian-born workers. That is, the employment rate gap between highly-educated immigrants and non-immigrants is larger than the gap between lowly-educated immigrants and their Canadian-born counterparts. Similarly, the interaction terms

between immigrants and the place of residence show that concentration of immigrants in the large metropolitan areas could be another reason to explain this deterioration.

Future research can be extended in the following two directions. First, I have identified several factors leading to the recent deterioration of immigrants' labour market performance. It would be useful to quantify the relative importance of those factors and to provide corresponding policy recommendations for Citizenship and Immigration Canada (CIC). In addition, CIC could adjust their immigrants' selection policy and accelerate the process for the immigrants who are thought to adapt quickly to the Canadian labour market. Second, the paper has determined that the assimilation rate of new immigrants has slowed down recently, which has caused the deterioration of new immigrants' performances in the labour market. Therefore, it would be interesting to examine which factors determine the assimilation rates of new immigrants.

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Appendix

Table A1: Descriptive statistics of the samples of immigrants (mean and numbers of observations), 1981, 1986, 1991, 1996, 2001, 2006, and 2011.

	1981	1986	1991	1996	2001	2006	2011
Employed	0.749	0.693	0.663	0.606	0.659	0.678	0.682
Male	0.493	0.477	0.485	0.474	0.466	0.467	0.463
Age	36.6	37.648	37.671	38.599	39.141	39.416	39.553
Single	0.115	0.134	0.178	0.181	0.159	0.135	0.119
English	0.393	0.295	0.207	0.161	0.133	0.130	0.135
French	0.047	0.038	0.027	0.024	0.029	0.037	0.048
Non_official	0.559	0.670	0.766	0.816	0.839	0.834	0.818
No degree	0.361	0.363	0.294	0.262	0.202	0.099	0.089
High School	0.156	0.179	0.219	0.215	0.189	0.172	0.152
College	0.297	0.263	0.268	0.275	0.251	0.253	0.254
Bachelor	0.107	0.108	0.123	0.147	0.205	0.270	0.270
Post Graduate	0.080	0.086	0.092	0.102	0.153	0.202	0.226
US&UK	0.207	0.161	0.087	0.054	0.041	0.040	0.035
Europe	0.366	0.203	0.201	0.182	0.172	0.154	0.116
Africa	0.064	0.055	0.067	0.071	0.080	0.094	0.113
Asia	0.342	0.428	0.493	0.554	0.601	0.618	0.609
South America	0.159	0.150	0.150	0.139	0.106	0.094	0.109
Quebec	0.151	0.163	0.156	0.146	0.136	0.166	0.194
Ontario	0.515	0.502	0.557	0.566	0.567	0.557	0.482
Prairie	0.164	0.182	0.130	0.098	0.095	0.092	0.159
BC	0.170	0.154	0.157	0.190	0.202	0.186	0.165
Vancouver	0.117	0.113	0.128	0.165	0.179	0.174	0.152
Toronto	0.357	0.362	0.418	0.437	0.448	0.479	0.415
Montreal	0.135	0.145	0.141	0.132	0.122	0.157	0.180
Rest of Canada	0.391	0.380	0.312	0.266	0.251	0.191	0.253
N	12662	10194	21618	29185	30670	28362	34665

Table A2: Full regression result

Entry, Assimilation, and cohort effects, Canadian immigrants, 1981, 1986, 1991, 1996, 2001, 2006, and 2011

Marginal Effects	1981	1986	1991	1996	2001	2006	2011	Pooled data, controlling for cohort effects
Entry Effect	-0.215	-0.269	-0.280	-0.376	-0.416	-0.368	-0.346	-0.207
	(-14.05)***	(-13.32)***	(-27.13)***	(-36.05)***	(-41.99)***	(-35.95)***	(-38.44)***	(-43.43)***
Assimilation	0.053	0.035	0.041	0.049	0.064	0.045	0.040	0.020
Effect	(9.19)***	(5.13)***	(9.74)***	(13.22)***	(19.18)***	(13.15)***	(13.17)***	(51.79)***
Assimilation	-0.003	-0.001	-0.002	-0.003	-0.004	-0.002	-0.002	0.000
Effect,YSM^2	(-6.4)***	(-2.23)**	(-5.51)***	(-7.41)***	(-12.47)***	(-7.84)***	(-7.86)***	(-36.78)***
Cohort Effect:								
Cohort pre-60								-
Cohort 61-65								-0.017
								(-1.64)*
Cohort 66-70								-0.018
								(-3.17)***
Cohort 71-75								0.014
								(2.86)***
Cohort 76-80								0.003
								(0.35)
Cohort 81-85								-0.012
								(-3.52)***
Cohort 86-90								-0.032
								(-7.56)***
Cohort 91-95								-0.068
								(-16.04)***
Cohort 96-00								-0.070
								(-15.75)***
Cohort 01-05								-0.067
								(-15.04)***
Cohort 06-10								-0.068
								(-13.40)***
Age	0.034	0.038	0.045	0.045	0.046	0.044	0.046	0.044
	(40.95)***	(47.40)***	(75.04)***	(72.21)***	(78.73)***	(77.99)***	(83.06)***	(190.04)***
Age^2	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-47.63)***	(-55.98)***	(-87.18)***	(-85.44)***	(-93.76)***	(-92.05)***	(-96.25)***	(-220.65)***
Male	0.334	0.257	0.175	0.147	0.129	0.114	0.095	0.161
	(148.80)***	(120.95)***	(111.22)***	(92.74)***	(86.35)***	(79.76)***	(67.22)***	(267.29)***
Single	0.019	-0.030	-0.041	-0.073	-0.062	-0.050	-0.088	-0.048
	(5.44)***	(-9.41)***	(-19.42)***	(-34.46)***	(-31.56)***	(-27.38)***	(-45.17)***	(-60.09)***
High school	0.093	0.103	0.103	0.114	0.094	0.104	0.111	0.104
	(33.26)***	(39.13)***	(53.87)***	(57.68)***	(49.09)***	(52.18)***	(53.04)***	(138.23)***
College	0.145	0.147	0.153	0.164	0.142	0.154	0.170	0.159
	(55.74)***	(59.53)***	(84.60)***	(88.39)***	(78.67)***	(80.15)***	(84.09)***	(225.06)***
Bachelor	0.154	0.169	0.171	0.196	0.153	0.157	0.179	0.173
	(37.13)***	(46.64)***	(69.41)***	(84.05)***	(70.89)***	(74.98)***	(86.48)***	(200.48)***
Post-graduate	0.180	0.184	0.177	0.198	0.158	0.158	0.174	0.176
	(32.52)***	(37.64)***	(55.65)***	(68.07)***	(61.07)***	(65.92)***	(76.27)***	(166.58)***
Quebec	-0.110	-0.129	-0.103	-0.104	-0.081	-0.066	-0.043	-0.083
	(-16.67)***	(-19.11)***	(-20.94)***	(-21.07)***	(-16.86)***	(-14.54)***	(-9.95)***	(-44.95)***
Prairie	0.029	0.008	0.030	0.050	0.039	0.039	0.048	0.037
	(8.38)***	(2.56)**	(12.39)***	(20.67)***	(17.33)***	(18.05)***	(22.91)***	(41.00)***
BC	-0.055	-0.097	-0.051	-0.015	-0.037	-0.011	-0.016	-0.033
	(-10.98)***	(-19.89)***	(-14.54)***	(-4.37)***	(-11.72)***	(-3.62)***	(-5.45)***	(-25.55)***

Vancouver	0.062	0.050	0.044	0.036	0.038	0.021	0.035	0.037
	(10.27)***	(8.82)***	(10.63)***	(8.61)***	(10.11)***	(5.47)***	(9.56)***	(23.34)***
Toronto	0.063	0.055	0.037	0.037	0.039	0.020	0.025	0.034
	(15.73)***	(14.43)***	(13.38)***	(13.37)***	(15.04)***	(8.04)***	(10.39)***	(32.29)***
Montreal	0.049	0.046	0.033	0.038	0.043	0.034	0.028	0.037
	(13.24)***	(12.73)***	(12.25)***	(13.67)***	(16.13)***	(13.00)***	(10.65)***	(34.36)***
English	0.018	0.013	0.027	0.039	0.050	0.031	0.025	0.028
	(4.07)***	(3.20)***	(8.64)***	(12.36)***	(16.39)***	(10.50)***	(8.51)***	(24.04)***
French	-0.027	-0.030	0.007	0.012	0.028	0.012	0.030	0.006
	(-3.85)***	(-4.86)***	-1.410	(2.44)**	(5.82)***	(2.47)**	(6.08)***	(2.96)***
French_QC	0.033	0.043	0.044	0.068	0.055	0.060	0.040	0.047
	(4.10)***	(5.53)***	(7.57)***	(11.67)***	(9.73)***	(11.05)***	(7.17)***	(21.00)***
Pseudo R^2	0.187	0.153	0.134	0.132	0.126	0.109	0.105	0.123
N	177872	195131	329501	330058	336620	349355	365943	2168588

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01,the estimated marginal effect is significant at 10%, 5%, and 1% level.

Table A3: Full regression results

Pooled regression for males and females separately

	Male		Female	
	Marginal Effect	**t statistics**	**Marginal Effect**	**t statistics**
YSM	0.020	(12.65)***	0.021	(10.42)***
YSM^2	-0.001	(-3.99)***	0.000	(-1.57)
Age	0.031	(110.22)***	0.055	(149.89)***
Age^2	0.000	(-137.27)***	-0.001	(-167.12)***
Single	-0.137	(-136.33)***	0.058	(45.43)***
High School	0.067	(71.31)***	0.148	(122.63)***
College	0.091	(105.95)***	0.226	(197.71)***
Bachelor	0.107	(99.32)***	0.241	(172.85)***
Post Graduate	0.108	(84.96)***	0.244	(137.04)***
Quebec	-0.065	(-28.44)***	-0.102	(-34.19)***
Prairie	0.038	(34.63)***	0.037	(25.42)***
BC	-0.029	(-18.35)***	-0.035	(-16.90)***
US&UK	-0.052	(-8.20)***	-0.193	(-27.40)***
Europe	-0.159	(-29.31)***	-0.205	(-33.55)***
Africa	-0.301	(-42.35)***	-0.326	(-41.43)***
Asia	-0.271	(-51.33)***	-0.301	(-54.19)***
South America	-0.221	(-34.06)***	-0.234	(-34.52)***
Vancouver	0.030	(15.80)***	0.044	(17.39)***
Toronto	0.030	(23.23)***	0.035	(20.81)***
Montreal	0.028	(21.70)***	0.044	(25.84)***
English	0.026	(16.95)***	0.036	(18.62)***
French	0.007	(3.01)***	0.010	(3.62)***
French_Quebec	0.045	(16.59)***	0.051	(13.82)***
Pseudo R^2	0.112		0.106	
N	1025168		1059312	

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01,the estimated marginal effect is significant at 10%, 5%, and 1% level.

Table A4: Full regression results

Separated regressions, using 1981, 1986, 1991, 1996, 2001, 2006, and 2011 censuses

Marginal Effects	1981	1986	1991	1996	2001	2006	2011
YSM	0.028	0.036	0.016	0.027	0.041	0.021	0.015
	(5.38)***	(5.34)***	(4.26)***	(8.05)***	(13.65)***	(6.93)***	(5.69)***
YSM^2	-0.002	-0.001	0.000	-0.001	-0.002	-0.001	0.000
	(-3.17)***	(-2.46)**	(-0.40)	(-2.75)***	(-7.08)***	(-1.81)*	(-0.68)
Age	0.034	0.038	0.045	0.045	0.046	0.044	0.046
	(41.12)***	(47.37)***	(74.99)***	(72.42)***	(79.03)***	(78.25)***	(83.32)***
Age^2	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-47.76)***	(-55.96)***	(-87.12)***	(-85.61)***	(-93.97)***	(-92.24)***	(-96.42)***
Male	0.334	0.257	0.175	0.148	0.129	0.114	0.095
	(148.77)***	(120.97)***	(111.26)***	(92.95)***	(86.40)***	(79.85)***	(67.19)***
Single	0.019	-0.030	-0.041	-0.072	-0.061	-0.050	-0.087
	(5.48)***	(-9.37)***	(-19.23)***	(-34.03)***	(-31.03)***	(-26.98)***	(-44.64)***
High school	0.093	0.103	0.102	0.114	0.094	0.104	0.111
	(33.31)***	(39.12)***	(53.81)***	(57.66)***	(49.01)***	(52.08)***	(53.02)***
College	0.145	0.147	0.153	0.164	0.141	0.153	0.170
	(55.81)***	(59.43)***	(84.36)***	(88.04)***	(78.12)***	(79.88)***	(83.97)***
Bachelor	0.154	0.169	0.171	0.196	0.153	0.157	0.179
	(37.06)***	(46.66)***	(69.35)***	(84.13)***	(70.88)***	(75.01)***	(86.44)***
Post-graduate	0.179	0.184	0.177	0.198	0.157	0.157	0.173
	(32.33)***	(37.57)***	(55.43)***	(67.62)***	(60.19)***	(65.20)***	(75.75)***
Quebec	-0.112	-0.129	-0.102	-0.104	-0.082	-0.068	-0.046
	(-16.86)***	(-19.02)***	(-20.86)***	(-21.13)***	(-17.09)***	(-14.93)***	(-10.37)***
Prairie	0.029	0.009	0.030	0.050	0.039	0.039	0.048
	(8.61)***	(2.62)***	(12.49)***	(20.74)***	(17.43)***	(18.16)***	(22.84)***
BC	-0.055	-0.096	-0.051	-0.015	-0.037	-0.011	-0.016
	(-10.94)***	(-19.88)***	(-14.54)***	(-4.35)***	(-11.54)***	(-3.52)***	(-5.52)***
US&UK	-0.086	-0.262	-0.139	-0.153	-0.193	-0.184	-0.159
	(-6.78)***	(-11.38)***	(-11.14)***	(-11.38)***	(-14.18)***	(-13.37)***	(-11.80)***
Europe	-0.093	-0.249	-0.191	-0.271	-0.267	-0.191	-0.180
	(-6.49)***	(-11.12)***	(-17.77)***	(-24.98)***	(-25.66)***	(-18.12)***	(-17.80)***
Africa	-0.150	-0.352	-0.264	-0.394	-0.399	-0.337	-0.332
	(-6.27)***	(-11.71)***	(-17.21)***	(-28.03)***	(-30.87)***	(-26.87)***	(-30.99)***
Asia	-0.137	-0.282	-0.215	-0.337	-0.377	-0.315	-0.287
	(-8.94)***	(-12.88)***	(-22.28)***	(-34.09)***	(-39.97)***	(-33.00)***	(-34.19)***
South America	-0.115	-0.276	-0.215	-0.272	-0.295	-0.254	-0.222
	(-6.41)***	(-11.63)***	(-18.19)***	(-23.33)***	(-24.68)***	(-21.12)***	(-21.13)***
Vancouver	0.062	0.050	0.044	0.038	0.041	0.023	0.036
	(10.30)***	(8.87)***	(10.51)***	(8.97)***	(10.86)***	(5.91)***	(9.84)***
Toronto	0.062	0.055	0.037	0.037	0.039	0.020	0.026
	(15.44)***	(14.50)***	(13.35)***	(13.27)***	(15.06)***	(8.01)***	(10.61)***
Montreal	0.049	0.046	0.033	0.038	0.043	0.033	0.028
	(13.13)***	(12.77)***	(12.25)***	(13.71)***	(16.04)***	(12.78)***	(10.57)***
English	0.024	0.012	0.028	0.034	0.046	0.031	0.025
	(5.51)***	(3.00)***	(8.71)***	(10.20)***	(14.92)***	(10.35)***	(8.46)***
French	-0.022	-0.031	0.008	0.008	0.024	0.012	0.030
	(-2.77)***	(-4.83)***	(1.69)*	1.560	(5.25)***	(2.53)**	(6.14)***
French_Quebec	0.036	0.044	0.043	0.069	0.056	0.061	0.041
	(4.30)***	(5.46)***	(7.50)***	(11.65)***	(9.89)***	(11.34)***	(7.49)***
Pseudo R^2	0.186	0.153	0.134	0.132	0.125	0.108	0.105
N	177872	195131	329501	330058	336620	349355	365943

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01,the estimated marginal effect is significant at 10%, 5%, and 1% level.

Table A5: Full regression results (with interaction terms)

Pooled regression for males and females separately

	Male		Female	
	Marginal Effect	**t statistics**	**Marginal Effect**	**t statistics**
YSM	0.028	(17.45)***	0.035	(10.42)***
YSM^2	-0.001	(-8.68)***	-0.002	(-1.57)
Age	0.031	(110.99)***	0.055	(149.89)***
Age^2	0.000	(-138.02)***	-0.001	(-167.12)***
Single	-0.138	(-136.75)***	0.056	(45.43)***
High School	0.070	(72.81)***	0.156	(125.40)***
College	0.094	(106.62)***	0.234	(198.11)***
Bachelor	0.113	(98.54)***	0.250	(169.93)***
Post Graduate	0.114	(82.18)***	0.258	(132.71)***
IMM_High	-0.081	(-17.69)***	-0.138	(-26.98)***
IMM_College	-0.072	(-17.22)***	-0.138	(-28.89)***
IMM_Bachelor	-0.120	(-24.44)***	-0.179	(-32.91)***
IMM_Post	-0.125	(-23.56)***	-0.226	(-34.44)***
Quebec	-0.057	(-28.44)***	-0.102	(-34.19)***
Prairie	0.038	(34.63)***	0.037	(25.42)***
BC	-0.029	(-18.35)***	-0.035	(-16.90)***
US&UK	-0.006	(-8.20)***	-0.193	(-27.40)***
Europe	-0.077	(-29.31)***	-0.205	(-33.55)***
Africa	-0.173	(-42.35)***	-0.326	(-41.43)***
Asia	-0.164	(-51.33)***	-0.301	(-54.19)***
South America	-0.131	(-34.06)***	-0.234	(-34.52)***
Vancouver	0.033	(16.74)***	0.045	(16.65)***
Toronto	0.030	(21.40)***	0.037	(20.17)***
Montreal	0.029	(22.71)***	0.045	(25.68)***
IMM_Vancouver	-0.043	(-9.03)***	-0.018	(-3.21)***
IMM_Toronto	-0.023	(-6.45)***	-0.021	(-5.00)***
IMM_Montreal	-0.060	(-12.54)***	-0.029	(-5.09)***
English	0.025	(16.30)***	0.035	(18.62)***
French	0.008	(3.18)***	0.011	(3.62)***
French_Quebec	0.037	(13.09)***	0.046	(13.82)***
Pseudo R^2	0.114		0.108	
N	1025168		1059312	

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01,the estimated marginal effect is significant at 10%, 5%, and 1% level.

Table A6: Full regression results (with interaction terms)

Separated regressions, using 1981, 1986, 1991, 1996, 2001, 2006, and 2011 censuses

Marginal Effects	1981	1986	1991	1996	2001	2006	2011
YSM	0.040	0.033	0.024	0.035	0.048	0.031	0.030
	(5.38)***	(5.34)***	(4.26)***	(8.05)***	(13.65)***	(6.93)***	(5.69)***
YSM^2	-0.002	-0.001	0.000	-0.001	-0.002	-0.001	-0.001
	(-3.17)***	(-2.46)**	(-0.40)	(-2.75)***	(-7.08)***	(-1.81)*	(-0.68)
Age	0.034	0.038	0.045	0.045	0.046	0.044	0.046
	(41.12)***	(47.37)***	(74.99)***	(72.42)***	(79.03)***	(78.25)***	(83.32)***
Age^2	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-47.76)***	(-55.96)***	(-87.12)***	(-85.61)***	(-93.97)***	(-92.24)***	(-96.42)***
Male	0.334	0.257	0.175	0.148	0.129	0.114	0.096
	(148.77)***	(120.97)***	(111.26)***	(92.95)***	(86.40)***	(79.85)***	(67.19)***
Single	0.019	-0.030	-0.041	-0.072	-0.061	-0.050	-0.088
	(5.48)***	(-9.37)***	(-19.23)***	(-34.03)***	(-31.03)***	(-26.98)***	(-44.64)***
High school	0.098	0.105	0.106	0.120	0.100	0.109	0.117
	(34.04)***	(39.22)***	(54.19)***	(58.59)***	(50.45)***	(53.39)***	(54.89)***
College	0.149	0.149	0.157	0.169	0.147	0.158	0.177
	(55.61)***	(59.08)***	(84.30)***	(87.52)***	(78.56)***	(80.27)***	(84.75)***
Bachelor	0.162	0.175	0.175	0.205	0.162	0.162	0.185
	(37.22)***	(46.52)***	(68.61)***	(83.04)***	(70.53)***	(73.11)***	(85.25)***
Post-graduate	0.192	0.195	0.186	0.208	0.165	0.163	0.182
	(32.34)***	(37.60)***	(54.68)***	(65.29)***	(57.39)***	(62.03)***	(72.77)***
IMM_High	-0.100	-0.065	-0.078	-0.101	-0.104	-0.120	-0.126
	(-7.35)***	(-4.75)***	(-9.14)***	(-12.77)***	(-12.94)***	(-12.37)***	(-13.65)***
IMM_College	-0.091	-0.073	-0.092	-0.086	-0.095	-0.101	-0.111
	(-7.73)***	(-5.67)***	(-10.99)***	(-11.56)***	(-12.58)***	(-11.24)***	(-13.36)***
IMM_Bachelor	-0.160	-0.139	-0.134	-0.175	-0.152	-0.118	-0.145
	(-9.00)***	(-7.71)***	(-11.60)***	(-18.04)***	(-17.72)***	(-12.62)***	(-16.60)***
IMM_Post	-0.225	-0.218	-0.192	-0.197	-0.145	-0.137	-0.168
	(-10.04)***	(-10.09)***	(-13.80)***	(-16.64)***	(-14.70)***	(-13.19)***	(-17.72)***
Quebec	-0.112	-0.129	-0.102	-0.104	-0.082	-0.068	-0.046
	(-16.86)***	(-19.02)***	(-20.86)***	(-21.13)***	(-17.09)***	(-14.93)***	(-10.37)***
Prairie	0.029	0.009	0.030	0.050	0.039	0.039	0.048
	(8.61)***	(2.62)***	(12.49)***	(20.74)***	(17.43)***	(18.16)***	(22.84)***
BC	-0.055	-0.096	-0.051	-0.015	-0.037	-0.011	-0.016
	(-10.94)***	(-19.88)***	(-14.54)***	(-4.35)***	(-11.54)***	(-3.52)***	(-5.52)***
US&UK	-0.086	-0.262	-0.139	-0.153	-0.193	-0.184	-0.159
	(-6.78)***	(-11.38)***	(-11.14)***	(-11.38)***	(-14.18)***	(-13.37)***	(-11.80)***
Europe	-0.093	-0.249	-0.191	-0.271	-0.267	-0.191	-0.180
	(-6.49)***	(-11.12)***	(-17.77)***	(-24.98)***	(-25.66)***	(-18.12)***	(-17.80)***
Africa	-0.150	-0.352	-0.264	-0.394	-0.399	-0.337	-0.332
	(-6.27)***	(-11.71)***	(-17.21)***	(-28.03)***	(-30.87)***	(-26.87)***	(-30.99)***
Asia	-0.137	-0.282	-0.215	-0.337	-0.377	-0.315	-0.287
	(-8.94)***	(-12.88)***	(-22.28)***	(-34.09)***	(-39.97)***	(-33.00)***	(-34.19)***
South America	-0.115	-0.276	-0.215	-0.272	-0.295	-0.254	-0.222
	(-6.41)***	(-11.63)***	(-18.19)***	(-23.33)***	(-24.68)***	(-21.12)***	(-21.13)***
Vancouver	0.060	0.049	0.043	0.046	0.048	0.024	0.036
	(9.49)***	(8.35)***	(9.74)***	(10.20)***	(11.68)***	(5.91)***	(9.31)***
Toronto	0.063	0.053	0.037	0.038	0.038	0.015	0.029
	(14.60)***	(13.24)***	(12.51)***	(12.21)***	(13.04)***	(5.55)***	(10.72)***
Montreal	0.049	0.044	0.034	0.039	0.044	0.035	0.030
	(13.03)***	(12.35)***	(12.55)***	(13.88)***	(16.46)***	(13.45)***	(11.20)***
IMM_Vancouver	0.003	0.016	-0.003	-0.065	-0.050	-0.017	-0.028
	(0.19)	(1.02)	(-0.29)	(-6.96)***	(-5.99)***	(-3.83)***	(-3.56)***
IMM_Toronto	-0.017	0.016	-0.015	-0.033	-0.018	-0.014	-0.037
	(-1.50)	(1.44)	(-1.98)**	(-4.68)***	(-2.79)***	(-2.08)**	(-5.82)***
IMM_Montreal	-0.017	-0.033	-0.053	-0.061	-0.068	-0.050	-0.061
	(-1.22)	(-2.33)**	(-5.08)***	(-6.26)***	(-7.16)***	(-5.39)***	(-7.44)***

English	0.025	0.012	0.028	0.034	0.046	0.031	0.026
	(5.51)***	(3.00)***	(8.71)***	(10.20)***	(14.92)***	(10.35)***	(8.46)***
French	-0.022	-0.031	0.008	0.008	0.024	0.012	0.031
	(-2.77)***	(-4.83)***	(1.69)*	1.560	(5.25)***	(2.53)**	(6.14)***
French Quebec	0.036	0.044	0.043	0.069	0.056	0.061	0.034
	(4.30)***	(5.46)***	(7.50)***	(11.65)***	(9.89)***	(11.34)***	(7.49)***
Pseudo R^2	0.186	0.153	0.134	0.132	0.125	0.108	0.105
N	177872	195131	329501	330058	336620	349355	365943

Note: t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01,the estimated marginal effect is significant at 10%, 5%, and 1% level.