

**LANGUAGE PROFICIENCY AND LABOUR MARKET  
PERFORMANCE OF IMMIGRANTS IN CANADA**

by

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## **1. Introduction**

Immigration, defined as the permanent movement of people from one country, called the source country, to another, called the destination country, has become one of most ubiquitous phenomena in both the developed and developing countries in the past few decades. Over the last few years, facts and figures from the Organization for Economic Co-operation and Development (the OECD) have shown that there has been a sharp increase in the number of foreign-born persons in the OECD countries (see the OECD Immigration Database for 2014). Similarly, according to the United Nations Department of Economics and Social Affairs (UNDESA), about 3.2 percent of the world's population resides outside their countries of birth as of 2013. This is a 0.3 percent increase from the estimated proportion of 2.9 percent in 1990. This upsurge in the number of immigrants in the OECD countries can be largely attributed to both the relative political stability and the comparatively better economic opportunities available in those countries.

Canada, a member of the OECD block, has been receiving huge numbers of immigrants for many years. In 2013/2014 alone, Canada welcomed about 267,716 immigrants from various countries across the globe (please see the Statistics Canada CANSIM Tables for 2014). This represents approximately 0.77 percent of Canada's population. With the rising stocks of immigrants in Canada, many researchers have endeavoured to keep abreast with how immigrants perform in the Canadian labour market. The findings of their research have one thing in common: although Canada is generally considered as a multicultural society where diversity is appreciated, there is strong evidence suggesting that visible minorities are progressively facing hurdles in the

Canadian job market (see Picot and Sweetman 2012; and Goldmann, Sweetman, and Warman 2011). The research on how immigrants perform in the Canadian labour market has two main streams. The first stream focuses on the widening earnings gap between native-born Canadians and immigrant workers (e.g., Pendakur and Pendakur 2002), and the second one delves deeper to investigate why some immigrants are observed to be rewarded more in the Canadian labour market than others.

The point of confluence of these two research streams is that language proficiency is a major engine driving the earnings gap between native Canadians and immigrants. Similarly, some immigrants tend to outperform their counterparts because they have adequate language skills that give them an edge in the Canadian job market. In the context of Canada, where English and French are the official languages, language proficiency is defined as one's ability to speak, read, and write either or both languages. Language proficiency is a useful indicator of how well immigrants are integrated into the economic, social, and political ways of life in Canada. In the social sphere, an immigrant's ability to speak/read/write English and/or French facilitates how they interact with other members of the Canadian society. This interaction ranges from the casual conversations in schools, sports facilities, and restaurants, to more formal arenas such as courtrooms. Politically, knowing English and /or French in Canada allows one to express their political views including appealing to the electorate for elective positions. Finally, language proficiency helps people negotiate financial contracts, interview for jobs, and catalyze healthy communication at workplaces among others.

Having briefly discussed the immense role that language proficiency plays, this paper has two major objectives. Firstly, it investigates the determinants of language

proficiency among immigrants in Canada. The other overarching goal of the paper is to examine how language proficiency impacts on immigrants' performance in the Canadian labour market. To put it more succinctly, the paper intends to answer the following questions:

- 1) What are the determinants of immigrants' proficiency in Canada's official languages?
- 2) How do the determinants of language proficiency compare and contrast for male and female immigrants?
- 3) How does language proficiency affect immigrants' labour market performance in Canada? Is this effect the same for male and female immigrants?
- 4) Does proficiency in English language affect labour productivity in the same way that French does?
- 5) How does the effect of language proficiency on immigrants' earnings evolve overtime for males and females?

To answer the above questions, the empirical analysis of this study employs the three waves of the Longitudinal Survey of Immigrants in Canada (henceforth LSIC) panel dataset. This paper, to the best of my knowledge, contributes to the existing literature on immigrant earnings in Canada by studying the dynamics of how proficiency in English and French languages affects the labour market outcomes for male and female immigrants in Canada. The paper digresses from the literature by incorporating how the relationship between immigrants' earnings and language proficiency in English and French languages changes across the three LSIC data panels. The rest of the paper is organized as follows. Section 2 discusses the literature review. Section 3 describes the LSIC dataset and presents the descriptive statistics. Section 4 outlines the methodology.

Section 5 covers the results and main discussions of the paper. Section 6 describes the conclusion and summary remarks as well the policy implications of this study.

## **2. Literature Review**

There exists a plethora of published work on the widening earnings gap between native Canadians and immigrants. Skuterud (2010) exploits the master files of the 2001 and 2006 Canadian Censuses to show that the rising earnings gap could be attributed to discrimination in the Canadian labour market. His work demonstrates that immigrant workers are negatively discriminated against in the Canadian labour market, although the degree of discrimination decreases across successive generations. Earnings of immigrants improve across generations as children of immigrants are better positioned to acquire language proficiency and early job experience (e.g., Worswick 2004; Chiswick 1988; and Baker and Benjamin 1997). In the United States, pioneering work by Borjas (1985) and Chiswick (1986) have also shown that immigrants earn less than native-born Americans, although it has been observed that immigrants attain parity and eventually overtake the latter group overtime (Chiswick 1978). Furthermore, Hum and Simpson (1999) use the Survey of Labour and Income Dynamics (SLID) to assess how visible minority status impacts the earnings of immigrants in Canada. They construct a dummy variable for visible minority status and after controlling for language variation, country of origin, education level, age, and marital status, they find that Black and Indo-Pakistani men earn about 19 percent and 13 percent lower wages than the Whites, respectively. Similarly, after correcting for sample-selection bias using the Heckman method, they conclude that

the effect of visible minority status on the earnings for Arabs and Latin American workers is statistically different from zero.

Besides discrimination in the Canadian labour market, language proficiency has also been identified as one of the other factors that exacerbate the earnings wedge between immigrants and native Canadians. Firstly, language proficiency, as one may expect, is essential in facilitating communication at workplaces. This implies that workers who are proficient in both or either of Canada's official languages, are expected to be rewarded more in the labour market relative to those with weaker or non-existent language skills, *ceteris paribus*. In this regard, most workers who were born in Canada develop these necessary language skills early enough and this gives them a competitive edge against immigrants, some of who may have to sharpen their language skills upon arrival in Canada. Secondly, language proficiency is considered as a form of human capital which augments workers' performance in the labour market (e.g., Chiswick and Miller 2002; Bellante and Kogut 1998; and Shields and Price 2002). Consequently, Canada-born workers are observed to be earning more than immigrants as they possess strong language skills that make them more productive in the labour market. Varying levels of language proficiency could also explain why some immigrants are observed to be earning wages more than others.

Although language proficiency, which essentially entails speaking, writing and reading abilities, is unanimously regarded as an important determinant of an immigrant's earnings, research has given conflicting results regarding which aspect of the language proficiency best predicts immigrants' earnings in the labour market. Carnevale, Fry, and Lowell (2001) use the National Adult Literacy Survey (NALS) to investigate the



language skill that is rewarded the most in the U.S. labour market. After regressing the language skill dummies on log weekly wages, they observed that, although the three components of language skills complement each other, an immigrant's ability to comprehend spoken English is the most important indicator of the wages that they earn. In contrast, Chiswick (1991) using earlier data observes that reading and writing skills are rewarded more than speaking skills in the U.S. labour market among immigrants.

Apart from the studies that compare how immigrants' earnings measure against the earnings of native Canadians, some studies investigate why some immigrants earn more than others. Goldman, Sweetman, and Warman (2011) use the Longitudinal Survey of Immigrants in Canada (LSIC) dataset to investigate whether an immigrant's occupation match between the source and the host country has any effect on their earnings in the Canadian job market. They also test if language skills complement occupation match and consequently earnings. After controlling for education, age, marital status, and pre- and post-immigration work experience, they establish that there is no significant complementarity between language skills and occupation match, although the former is positively correlated with an immigrant's weekly earnings. On the other hand, their study shows that immigrants who match their pre-immigration occupation with the one obtained post-immigration earn more than those who do not, albeit with a zero rate of return to pre-immigration experience, *ceteris paribus*. Also, they find that there exists no value to matching occupations for immigrants without postsecondary education and that pre-immigration work experience is almost fully discounted. They argue that these findings best accurately explain poor earnings of immigrants in developed countries such as Canada.

Aydemir and Skuterud (2005) use Canadian Census data over 1981 - 2001 to explore the plausible factors behind the deterioration of entry earnings of different cohorts of Canadian immigrants. Using a similar methodology to that employed by Goldman, Sweetman, and Warman, their results suggest that there exists a significant deterioration in returns to pre-immigration labor market experience in men, more so among those who come from non-traditional countries, most of which are in Africa and Latin America. Their findings also attribute this deterioration of entry earnings to lower assimilation rates, which are largely dependent on an immigrant's language skills set. In fact, they establish that roughly about one-thirds of the earning differential over time is attributed to changes in the cohorts' language abilities and an immigrant's region of birth. Thus, some immigrants earn more than their counterparts simply because they come from certain countries, presumably those with superior education standards and probably from countries where the primary official languages include English and French.

Furthermore, Boyd and Cao (2009) employ the Public Use Microdata Files for 2001 Canadian Census data to investigate how language proficiency affects earnings of immigrants at different income levels. Applying the method of quantile regressions, they conclude that immigrants who are proficient in English and/or French receive more weekly earnings than those with lower levels of language proficiency. Moreover, their empirical study shows that the language proficiency advantage is greatest for immigrants who are in the top end of the income distribution. Interestingly, immigrants at the top end of income distribution are penalized more relative to those at the lower end for being less proficient in English and/or French.

Studies on the relationship between language proficiency and immigrants' earnings in other countries have yielded quite similar results to those observed in Canada. Dustmann and Fabbri (2003) examine the effects of immigrants' fluency and literacy in English on their labour market performance in the United Kingdom. Using the 2000 Labour Force Survey data, the authors first analyze the determinants of language fluency and literacy using linear probability models and then study how language ability affects the labour market outcomes of immigrants in the UK. Their results suggest that the probability of being fluent and literate in English increases with years of education and decreases with age. Additionally, they establish that males and immigrants from the Caribbean and Africa tend to be more proficient in English than those from other regions. Strikingly, being fluent in English increases an immigrant's employment probability by approximately 22 percent points and is also associated with about 19% higher wages. Dustmann (1994) points out similar results using the first wave of the German Socio-Economic Panel (SOEP) to analyze the earnings of the migrant workers in West Germany. Being in the workforce has been shown to have a positive impact on the probability of being fluent in German as people more often use the language at work. Additionally, his work finds that immigrants from different countries have different probabilities of being proficient in German due to varying extents of exposure to the language.

Contrary to what many researchers have concluded in the literature, Hayfron (2001) finds that language proficiency has no significant impact on immigrants' earnings in Norway. Using a probit model, he explores the impact of language training on Norwegian language proficiency of male immigrants from less developed countries and

consequently the relationship between language proficiency and earnings. His argument is that although immigrants have to be proficient in the Norwegian language to be employed in the labour market, there are other important factors that determine their earnings, not necessarily language proficiency.

Chiswick and Miller (2003) study the effects of language practice on male earnings using a randomly selected sample of 3% from the Canadian Census of 1991, individual Public Use Micro-data file. They construct four categories of language state: speaks neither French nor English, speaks English and/or French, speaks a non-official language at home, and speaks an official language at home. They then regress the log of wages on the aforementioned language categories while controlling for education and pre-immigration work experience. After correcting for sample selection bias, Chiswick and Miller show that language practice complements both schooling and pre-immigration job experience. Indeed, their results show that an immigrant's earnings function is increasing in language skills, everything else remaining constant. They call this a direct effect on earnings. Remarkably, their analysis points out that those immigrants who speak none of the official languages at home earn between 10 to 12 percent lower than those who speak one or both official languages at home. This is true because speaking the language at home makes it a lot easier to master the most technical aspects of the language in an informal setting.

Admittedly, one of the challenges that often arise when one is analyzing the determinants of immigrant's earnings is that people have different inherent abilities that are individual-specific which allow them to become more proficient in languages and thereby earn higher wages than others - the endogeneity effect. Basic econometric theory

suggests that there is a need to control for these factors lest we get biased coefficient estimates. Bleakley and Chin (2004) tackle immigrant earnings and the endogeneity of language skills by suggesting that language skills are more easily learnt at young age than during adulthood. Using the data from the 1990 U.S. Census in the Integrated Public Use Micro-samples Series (IPUMS), they construct instrumental variables based on age at arrival interacted with a dummy for non-English speaking country as the identifying instrument. The results are consistent with other findings in the literature. First and foremost, improving one's language skills by 1 unit increases log wages by 0.33 points. Moreover, the effects of language skills using IV estimation are greater in magnitude than the ones ignoring endogeneity, which suggests that there is a substantial downward bias in the usual OLS estimates when we estimate the log-wage equation without addressing the endogeneity between language proficiency and age.

Additionally, Chiswick and Miller (1995) assess the endogeneity between language fluency and earnings of immigrants in Australia using the 1981 and 1986 Census data. To check the robustness of their findings, they compare their results with the estimates of the earnings equations for immigrants in the United States, Canada, and Israel. In their study, they find that language fluency is determined by three main factors: exposure to the language, economic incentives from being fluent in the language, and the efficiency at which language fluency is achieved. They demonstrate that the endogeneity between language fluency and earnings leads to biased estimates that may result in multiple conclusions. To ameliorate this bias, they use birthplace coefficients as the instrumental variables.

Dustmann and van Soest (2002) also explore the challenges posed by the unobserved heterogeneity in their analysis of earnings of immigrants using the 10-year panel data for German immigrants. They establish that endogeneity leads to overestimation of the effect of German language proficiency on immigrants earnings. Furthermore, they show that potential measurement errors when one is reporting their own language proficiency measure underestimates the impact of language proficiency immigrant's earnings.

### **3. Data and Descriptive Statistics**

#### **3.1. Data**

In this study, I utilize the rich LSIC dataset, which is a sample comprising immigrants aged 15 years and over, who applied to immigrate to Canada through a Canadian Mission Abroad (CMA) between October 1<sup>st</sup>, 2000 and September 30<sup>th</sup>, 2001. This longitudinal survey was pioneered in 1997 to provide the Canadian government and other stakeholders with useful information on how immigrants are integrated into Canada, and also to identify potential challenges that immigrants may be facing as they adapt to life in Canada. The survey includes key information on household characteristics, immigrants' language skills, education variables, employment, health, and immigrants' perceptions of life in Canada. To keep the data pure, persons who applied from within Canada, previous temporary workers and students in Canada are excluded. To get a larger cluster of those working in the Canadian labour market, I further restrict my analysis to those who are below 65 years in each wave.

The survey is done in three waves: wave 1 is collected six months after landing, while waves 2 and 3 are collected two and four years after landing in Canada, respectively (that is, in years 2003 and 2005, respectively). Questions are amended in subsequent waves to enhance the quality of the information collected. One of the many strengths of LSIC data is that it is collected through face-to-face and phone interviews using a computer-assisted interview program. This computer-assisted program contains an in-built mechanism for detecting errors in the information collected.

The LSIC sample is designed using 12 cohorts comprising 12 independent monthly samples collected across 12 consecutive months. Sampling stratification is done in two stages. The first stage involves the selection of an Immigrating Unit (IU) using selection probability methods. In the second stage, an IU member, who becomes a Longitudinal Respondent (LR) and who is traced throughout the survey, is selected from each IU.

Despite having a system for checking for errors in the survey, there are two main issues that could greatly affect the quality of the LSIC dataset. These are the respondent attrition and the issue of missing values in some observations. Respondent attrition occurs when individuals who were intended to be part of the survey decide to discontinue their participation in one or more cycles. The sample is designed in a way that only a subset of immigrants who were interviewed in wave 1 are interviewed in wave 2. Consequently, only those who responded in wave 2 are targeted in wave 3. The initial sample size of this longitudinal survey was about 20,300. Table A in the appendix section summarizes the attrition rates for the three waves.<sup>1</sup>

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<sup>1</sup> The attrition rate of 41% in wave 1 denotes the proportion of immigrants who initially agreed to participate in the survey, but failed to respond when the first wave of the survey was launched.

There are several reasons for respondent attrition. These factors can be broadly categorized into either random reasons, which are not correlated with the regressors, or nonrandom reasons which are correlated with regressors. Attrition and missing values due to random factors do not generally affect our coefficient estimates based on econometric theory, but if they are due to nonrandom causes that are correlated with the regressors, our standard OLS estimates become biased. Additionally, the usual statistical inferences are rendered invalid. Correcting for attrition bias is beyond the scope of this paper as it involves somewhat complicated statistical methods. Since this is a voluntary and non-pecuniary survey, it is reasonable to assume that respondent attrition is nonrandom.

### **3.2. Descriptive Statistics**

The key summary statistics for our analysis sample are reported in Tables 1 - 7. Tables 1 - 3 report the data on weighted mean weekly wages, years of education, and age for immigrants in Canada according to their English language skills. From Tables 1- 3, we can infer that immigrants who cannot speak, read, and write English language, together with those with poor speaking, reading and writing abilities in English language appear to be generally older and have fewer years of education compared to immigrants with better English language skills. More importantly, immigrants who speak, read, and write English language very well earn the most wages per week on average.

Tables 4 - 6 present the weighted mean weekly wages, years of education, and age for immigrants in Canadian according to their French language skills. From these tables, it is evident that proficiency in French language among immigrants has a somewhat counterintuitive relationship with age and years of education. While the data seem to be



suggesting that immigrants who cannot speak, read, and write French language are slightly older than those who under the other categories of French language, there are no statistical differences in age among immigrants who speak, read and write some French.

The above mentioned puzzle can be explained by the data in Table 7, which outlines the proportions of male and female immigrants according to their proficiencies in French and English languages. According to Table 7, in wave 1, approximately 8.9% of immigrants speak English language poorly and only 3.1% of respondents cannot speak English. In the French category in wave 1, roughly 81.7% of immigrants reported that they cannot speak French language and only about 8% have poor speaking ability in French language. Therefore, the majority of immigrants either cannot speak, read, and write in French language or they have poor speaking, reading, and writing abilities. However, the opposite is true for immigrants' proficiency in the English language - most immigrants speak, read, and write in English very well, while those who cannot speak, read, or write English form the smallest group. This observation holds for both males and females across the three panels.

The data in Table 7 and the characteristics of immigrants based on proficiency in the two languages suggest that English language skills, and not French language skills, explain much of the variation in immigrant earnings in Canada. This might be different in the Quebec province where French is used in most occasions.

Looking across the three panels of the LSIC data, Tables 1 - 6 show that average weekly earnings of immigrants in Canada improve as one move from wave 1 to wave 2. This is then followed by a downward trend as we go from wave 2 to wave 3. There are two plausible explanations for this phenomenon. Firstly, the erratic trend could be due to changes in the demographic and socio-economic characteristics of immigrants across the

three panels. For instance, the rise in average weekly wages as we move from panel 1 to panel 2 could be as a result of more immigrants acquiring higher language proficiency levels or more education two years after landing in Canada, which then translates to higher earnings. In contrast, the fall in earnings from panel 2 to panel 3 could perhaps be due to a large attrition of immigrants with more years of education or those with better language skills.

## **4. Empirical Methodology**

### **4.1. Determinants of Language Proficiency**

One of the overarching goals of this paper is to empirically analyze the determinants of language proficiency among immigrants in Canada. To achieve this objective, I first construct English and French language proficiency categories using the information on the Language Skills (LS) section of the survey. The constructed categories are summarized below.

Chart 1. Language Categories and their Descriptions

Language Category	Description
01	Speaks/reads/writes English/French poorly
02	Speaks/reads/writes English/French fairly well
03	Speaks/reads/writes English/French well
04	Speaks/reads/write English/French very well
05	Cannot Speak/read/write English/French

Language proficiency doesn't originate from a vacuum. There are many factors that determine an immigrant's ability to speak, read, and write in English and French. Some of these factors include, but are not limited to, age, sex, number of children, marital status, country of birth, years of education, expected economic incentives from speaking the language, participation in the Canadian labour force, and many more. An immigrant's age is a good predictor of how well they can learn a new language. It is widely accepted that younger people tend to be good at absorbing elements of a new language faster compared to older ones. On the other hand, one may argue, albeit with controversy, that men have greater opportunity to acquire better language skills than females as they are more likely to be working, meaning they practice their language skills often at work. Country of birth is an important determinant of English and French language proficiency as different countries have different official languages. It is logical to posit that an immigrant from a country where English and/or French is widely used is better suited to achieve higher levels of proficiency in the language(s) relative to someone from a country where languages other than English and French are spoken. Moreover, immigrants who have attended schools where English and/or French is the medium of instruction are expected to be generally better at the language(s) than those who didn't. Last but not the least, research has shown that proficiency in a particular language is driven by one's expectation of the economic incentives that come with being proficient in the language (e.g., Chiswick and Miller 1995). This demonstrates that immigrants who anticipate to be working in Canada at some point in time will strive to learn either of or both English and French languages.

In the analysis of the determinants of language proficiency among immigrants in Canada, a probit model outlined below is employed, with each determinant used as a

regressor. Let  $Y_{i,j}$  be a dummy variable representing proficiency in language  $i$  and language aspect  $j$ , where  $i = \{\text{English, French}\}$  and  $j = \{\text{speaking, reading, writing}\}$ . To make things clearer,  $Y_{i,j} = 0$  if an immigrant either poorly speaks/reads/writes language  $i$ , denoted by language category 1 in Chart 1 above, or cannot speak/read/write language  $i$ , denoted by language category 5 above in the same chart. Moreover,  $Y_{i,j} = 1$  if an immigrant has a speaking/reading/writing ability that falls under categories 2 - 4 in Chart 1 above. Similarly, let  $X$  be a vector of regressors that determine language proficiency such as age, sex, marital status, region of birth, years of education, and weekly wage. Finally, let  $\beta$  denote a vector of regression coefficients that we wish to estimate in our probit model. Our simple probit model therefore has the following rudimentary specification:

$$P(Y_{i,j} = 1) = \Phi(X'\beta) \quad (1)$$

where  $\Phi$  is the cumulative distribution function (CDF) of the standard normal distribution. Equation (1) above will tell us how the probability of being proficient in language  $i$  changes with each of the independent variables. Separate probit regressions are run for each of the three waves of immigrants using an indicator variable, proficiency in each aspect of the two official languages, as the dependent variable.

## **4.2. Earnings Equations of Immigrants in Canada**

The other prime objective of this paper is to estimate how the log of immigrants' weekly wages is affected by proficiency in one or both of Canada's two official languages. This analysis will involve controlling for other variables such as age, age squared/100, education, marital status, size of the city of residence, and gender. These

variables are important because they affect how much an immigrant earns in the labour market. The gender term will be used to ascertain whether a gender wage gap exists among immigrant workers. On the other hand, age is useful in predicting a person's productivity in the labour market as relatively younger workers tend to have different productivity than old workers, *ceteris paribus*. The quadratic term, age squared/100, will enable us to determine the diminishing effects of age, if any, on workers earnings. In particular, the age squared/100 coefficient helps in pinning down the shape of the age-earnings profile of both male and female immigrants. As one may expected and in fact as supported by the literature presented earlier, years of education are important because more educated immigrants earn more, *ceteris paribus*. The education term is taken to be an immigrant's highest schooling level achieved. I construct a dummy variable for gender, which takes the value 1 if an individual is a male and 0 otherwise. Similarly, a marital status dummy equal to 1 when an immigrant is married and 0 otherwise is created. The age variable is defined as the immigrant's age at the time of the survey.

To study the relationship between the log of wages and the variables earlier mentioned, the following model is adopted.

$$\ln(\text{Wage}_t) = Z_t \delta + \gamma \text{LanguageCAT}_{i,j,t} + \varepsilon_t \quad (2)$$

where the subscripts  $i, j$ , and  $t$  index language, language aspect, and wave/panel respectively.  $Z$  is a vector containing all the independent variables other than the language variables. These variables are: education, weekly work hours, marital status, size of the city of residence, age, and age squared divided by 100.  $\varepsilon$  is the regression error term. In equation (2), LanguageCAT represents the language variables. It includes four of the five language categories of each aspect of English and French languages. The fifth language

category, cannot speak/read/write English and/or French has been dropped to avoid perfect multicollinearity. The estimates of the LanguageCAT coefficients will capture how the earnings of immigrants with some proficiency in English and/or French language compare to those without any knowledge of English and/or French.

Equation (2) is estimated by means of OLS regression using version 13 of the STATA program. Separate equations for male and female immigrants are estimated in each panel of the LSIC dataset. Secondly, separate earnings equations for male and female immigrants are estimated for the pooled observations across all three waves together. The results from the pooled OLS regressions will allow us to determine whether there are any systematic difference across the waves, and whether the results obtained using each of the three panels are similar to those of the pooled OLS regressions. To comply with Statistics Canada's privacy requirements, the descriptive statistics and the regressions are weighted using the weight variable provided in the data. The weight variable also attenuates any underlying sample selection bias as it corrects for the differences in sample sizes across the three waves.

## **5. Results and Discussions**

### **5.1. Results of the probit regressions**

The results of the probit regressions are presented in Tables 8 - 13. Tables 8 - 10 gives the estimates of the probit regressions for immigrants' proficiency in speaking, reading, and writing the English language, respectively. In contrast, Tables 11 - 13 contain the estimates of the probit regressions for immigrants' proficiency in speaking, reading, and writing the French language, respectively. The coefficient estimates of these

probit regressions cannot be directly interpreted as the changes in the probabilities of the dependent variables, but rather as the effects of the regressors on z-scores, which can then be used to compute the probabilities.<sup>2</sup> Fortunately, the probit function is monotonic, which means that higher (lower) estimated coefficients of the probit regression correspond to higher (lower) predicted probabilities. This means that a large positive (negative) coefficient suggests a large increase (decrease) in the predicted probability of our binary variable, *ceteris paribus*.

According to the coefficient estimates reported in Tables 8 - 13, male immigrants have higher probabilities of being proficient in all aspects of the English and French languages, as indicated by positive coefficients on the dummy variable, male. This can perhaps be attributed to the higher participation of men in the Canadian labour force, which allows them to learn and practice the language(s) easily at work. The results of the probit regression shown in Table 8 also suggest that age tends to reduce an immigrant's probability of speaking the English language, *ceteris paribus*. For age, one can argue that younger immigrants have better opportunities to acquire speaking skills faster than the older immigrants.

Furthermore, an extra year of education significantly increases the probability of speaking the English language as shown by the positive coefficients on the education term in Table 8. Since the estimated coefficient of education in wave 3, reported as 0.12, is significantly larger than those in waves 1 and 2, reported as 0.10 in both waves, we can say that the increase in probability of speaking the English language attributable to one more year of education is strongest in wave 3. Additionally, the coefficients of marital status, a dummy variable taking the value 1 when an immigrant is married and zero

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<sup>2</sup> Chapter 17 of Wooldridge (2010) explores this discussion in details.

otherwise, are significantly negative perhaps because immigrants tend to marry partners from their native countries. This nonrandom pairing robs them of the opportunity to brush up on their speaking skills at home than they would have had they married a partner who was born in Canada.

Using North America as the source region benchmark, the estimated coefficients of the regions of birth show that immigrants from regions other than North America have significantly lower probabilities of speaking the English language, everything else remaining constant.<sup>3</sup> According to the results presented in Table 8, the estimated coefficient of the Europe region is -1.03 in wave 1. In the same wave, we have an estimated coefficient of -1.79 for Asia, -1.49 for Africa, -2.0 for Middle East, and -0.48 for Oceania and Australia. These estimates, again without taking them directly as probabilities, reveal that immigrants from regions other than the North America tend to have significantly less probabilities of achieving proficiency in speaking the English language, as indicated by the negative signs on the estimates, all things remaining constant. Similarly, the estimated coefficients imply that immigrants from the Middle East and Oceania and Australia have the lowest and highest probabilities of proficiency levels in speaking the English language, respectively. One thing that is not clear from Table 8, though, is how the probabilities of speaking English language change across the three panels. For immigrants from Europe, Asia, Africa, and the Caribbean, the estimated coefficients suggest that the probability of speaking the English language decreases as we move from wave 1 to wave 2. However, for immigrants from the Middle East, South and Central America, and Australia and Oceania, the probabilities of speaking the English

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<sup>3</sup> See the list of countries under each region in Table B in the Appendix section.



language appear to be decreasing from wave 1 to wave 2 , after which they increase as we move to wave 3.

The size of the city of residence is also an important determinant of language proficiency. Immigrants who live in large cities have higher probabilities of speaking English and French languages compared to those who reside in small or medium-sized cities.<sup>4</sup> This is reasonable because bigger cities tend to have better facilities for assisting newcomers in learning the languages. Furthermore, immigrants are exposed to many people who speak the languages in bigger cities than they would have been in smaller or mid-sized cities. The estimates in Table 8 also reveal that proficiency in reading and writing the English language have significant effects of augmenting proficiency in speaking the language. The estimated coefficient on proficiency in reading in the English language is approximately 1.40 in wave 1, whereas in the same wave, the coefficient of proficiency in writing the English language is about 1.20. Based on the magnitude of these estimates, we can infer that proficiency in reading the English language have a larger effect on the probability of speaking in the English language than does the proficiency in writing the English language. In addition to the above, there is a pattern of increasing complementarities among the three English language skills from panel 1 to panel 3. This can perhaps be attributed to some immigrants enrolling in programs that help them in learning the English language after landing in Canada.

Table 9 and Table 10 report the coefficient estimates of the determinants of proficiency in reading and writing English, respectively. Analogous to the results in Table 8 on the determinants of proficiency in speaking English, we can deduce that being a male increases an immigrant's probability of reading and writing in English, keeping

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<sup>4</sup> The criteria used in determining the size of the city of residence are presented in the appendix section.

other things constant. More generally, age and being married tend to lower an immigrant's chance of being able to read or write in English, all things kept constant. On the contrary, an extra year of education increases an immigrant's probability of being proficient in reading and writing in the English language. From Table 9 and Table 10, it is clear that immigrants who are residents of large cities have more probability of reading and writing in English compared to those residing in smaller or mid-sized cities. However, the effects of the size of the city of residence on proficiency in reading and writing English are smaller than the effects on proficiency in speaking the English language. Finally, Table 9 and Table 10 illustrate that immigrants from regions other than the North America have lower probabilities of being proficient in reading and writing in the English language, *ceteris paribus*.

The results of the probit regression estimates of proficiency in speaking, reading, and writing French language are presented in Tables 11 - 13, respectively. From these three tables, we can conclude that age, marital status, education, and gender do not have any significant impact on an immigrant's proficiency in all three skills of the French language. This is perhaps not surprising given the small sample size of immigrants who speak, read, and write in the French language. As seen in the determinants of proficiency in English language, being proficient in one aspect of the French language significantly complements proficiency in the other aspects. Furthermore, being a resident of a larger city greatly increases the probability of being proficient in all three aspects of the French language, *ceteris paribus*.

## 5.2. Results of the earnings equations

Table 14 reports results of the OLS regression of earnings equations for female immigrants. Table 15 presents the results of the OLS regression of earnings equations for male immigrants. Table 16 outlines the results of the pooled OLS regression for all three waves of immigrants in Canada for each of males and females separately. In the three tables mentioned above, the fifth language category, which is the category for those who cannot speak/read/write French/English, is used as the benchmark. Also, the age squared term has been divided by 100 to give a larger estimated coefficients that we can interpret more readily.

From Table 14, we can see that females' speaking and writing abilities in the English language are rewarded more than their reading ability in the language. As expected, female immigrants who have higher proficiency levels in the English and French languages, as indicated by the language categories, earn more than those with lower proficiency levels. Looking at the speaking aspect in wave 1, for example, female immigrants who speak the English language very well earn about 86% more earnings per week compared to those who cannot speak English. Those who can read English very well earn approximately 66% weekly earnings more than those with zero reading ability. Additionally, writing in English very well is associated with about 60% more weekly earnings than not being able to write in English at all. In Table 15 however, male immigrants who speak English language very well earn about 68% more weekly income in wave 1 than those who cannot. For the three English language skills in both Table 14 and Table 15, there is a general upward trend as we move from wave 1 to wave 3. In the French language category, writing French doesn't significantly increase earnings of both

male and female immigrants. However, immigrants (males and females) who can read and speak French language are positively rewarded in the labour market.

Education has a positive significant effect on the earnings of immigrants in Canada. All else being constant, Table 14 demonstrates that an extra year of education increases earnings of a female immigrant by 2.5% in wave 1, whereas in wave 2 and wave 3, one more year of education is associated with a 3.6% and a 4.4% increase in weekly earnings, *ceteris paribus*. In contrast, we can glean from Table 15 that an extra year of education increases weekly earnings of male immigrants by 4.8% in wave 1, by 5.2% in wave 2, and by 5.5% in wave 3. Immigrants who are married earn more than those who aren't according to the estimates in Table 14 and Table 15. Last but not the least, immigrants who live in large cities earn more income per week compared to those who live in smaller cities. The effect is bigger for male immigrants than for the females. This observation can be supported by the view that larger cities have larger concentrations of better paying jobs than the relatively smaller cities. All being constant, relatively older immigrants tend to earn more weekly income compared to younger ones, although the age-earnings curve flattens out with age. The effect of age on earnings is bigger for males than for females. When we compare the coefficients of the age squared/100 term, we can see that the age-earnings profiles of males flatten out at a faster rate than that of female immigrants.

Finally, Table 16 reports the estimates of the pooled earnings equations across all three waves for males and females. The data in this table further support the findings across separate waves reported in Table 14 and Table 15. Firstly, speaking and writing abilities in English language significantly increase earnings for female immigrants, whereas for males, all the three aspects of the English language appear to have a

significant positive effect on weekly earnings, *ceteris paribus*. Similarly, reading and speaking abilities in the French language are positively rewarded more than the writing abilities. Again as seen in Table 15 and Table 16, the age-earnings profiles of male immigrants are steeper, but they flatten out at a faster rate than those of female immigrants, as shown by the sign and magnitude of the coefficient of age squared/100 term .

## **6. Summary and Conclusion**

In summary, varying English and French language skills can explain a good deal of why some immigrants in Canada earn more than others. Using the LSIC dataset, probit regressions are used to examine how various determinants affect proficiency in the English and French languages. The results of the probit regressions suggest that males have higher probabilities of being proficient in the English and French languages than females, all else being constant. Also, age and being married reduce an immigrant's probability of being proficient in speaking, reading, and writing the English and French languages. In contrast, one more year of education increases an immigrant's probability of being proficient in speaking, reading, and writing the English language. Additionally, immigrants who were born in regions other than the North America have less probabilities of being proficient in speaking, reading, and writing English language.

Similarly, the findings also suggest that immigrants who have better language skills earn more weekly wages than their counterparts who do not. The effect of language proficiency on earnings for both female and male immigrants tend to persist over time, with the effect strongest in wave 3. Also, earnings for male and female immigrants tend

to increase with age up to a certain age beyond which they flatten out. For males, the age-earnings curve is steeper, but then flattens out faster than for females. Interestingly, proficiency in the French language has been shown to have somewhat insignificant impact on immigrant earnings in Canada. Additionally, I find a statistically significant positive relationship between the logarithm of weekly wages, and years of education, and the size of the city of residence.

This study has some possible implications for Canadian immigration policy. Firstly, there is a need to improve facilities that help immigrants acquire speaking and writing abilities in English language - which have been shown to have significant positive effect on earnings. Furthermore, the government should facilitate new immigrants settling in relatively larger cities as this has been shown to have positive effect on earnings. Last but not least, if the main objective of the Canadian government is to bring in newcomers who will do well in the labour market, then they should relax the requirements for the most educated and middle-aged immigrants for these are the most productive group in the job market.

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## Tables

Table 1. Weighted mean weekly wages, mean years of education and mean age for Canadian immigrants by language skills and category

Language Proficiency variable	Mean weekly wage	Years of educ.	Age
<b>Speak English language</b>			
01 - speaks poorly			
Wave 1	311.71 (157.38)	6.84 (3.10)	33.96 (10.05)
Wave 2	315.46 (162.53)	6.82 (3.10)	34.26 (10.25)
Wave 3	312.28 (158.38)	6.97 (3.09)	34.17 (10.03)
02 - speaks fairly well			
Wave 1	349.11 (234.81)	8.45 (2.74)	32.26 (8.50)
Wave 2	397.17 (584.62)	8.35 (2.77)	32.74 (8.79)
Wave 3	355.33 (255.37)	8.40 (2.76)	32.39 (8.49)
03 - speaks well			
Wave 1	397.40 (308.58)	9.18 (2.39)	32.38 (7.79)
Wave 2	424.58 (305.65)	9.16 (2.42)	32.53 (8.01)
Wave 3	403.75 (295.15)	9.22 (2.35)	32.85 (7.96)
04 - speaks very well			
Wave 1	465.73 (416.54)	9.54 (2.10)	32.81 (7.84)
Wave 2	531.89 (628.42)	9.52 (2.23)	32.86 (7.91)
Wave 3	466.86 (409.72)	9.50 (2.11)	33.28 (8.08)
05 - cannot speak English			
Wave 1	321.18 (129.46)	3.74 (2.63)	41.33 (13.34)
Wave 2	333.98 (138.01)	3.68 (2.65)	41.94 (13.19)
Wave 3	330.13 (137.30)	4.10 (2.83)	40.67 (13.45)

Note: The standard deviations are presented in parentheses.

Table 2. Weighted mean weekly wages, mean years of education and mean age for Canadian immigrants by language skills and category

Language Proficiency variable	Mean weekly wage	Years of educ.	Age
<b>Read English language</b>			
01 - reads poorly			
Wave 1	304.37 (174.69)	6.34 (3.05)	34.54 (10.35)
Wave 2	300.56 (137.32)	6.40 (3.10)	34.78 (10.47)
Wave 3	296.91 (136.42)	6.37 (3.12)	34.39 (10.14)
02 - reads fairly well			
Wave 1	331.02 (185.17)	7.65 (2.93)	32.26 (8.57)
Wave 2	348.44 (262.00)	7.67 (2.91)	32.71 (8.77)
Wave 3	332.03 (186.52)	7.73 (2.89)	32.80 (8.66)
03 - reads well			
Wave 1	368.68 (244.70)	8.77 (2.54)	32.65 (8.35)
Wave 2	399.03 (427.43)	8.64 (2.64)	32.95 (8.54)
Wave 3	375.94 (256.02)	8.76 (2.87)	33.16 (8.38)
04 - reads very well			
Wave 1	444.49 (392.21)	9.50 (2.17)	32.61 (7.87)
Wave 2	502.03 (581.81)	9.48 (2.26)	32.72 (8.05)
Wave 3	447.18 (383.07)	9.46 (2.18)	32.98 (8.14)
05 - cannot read English			
Wave 1	311.57 (123.71)	3.65(2.48)	41.11 (13.19)
Wave 2	326.37 (126.40)	3.70 (2.55)	41.22 (13.31)
Wave 3	322.72 (129.31)	4.06 (2.83)	41.67 (13.56)

Note: The standard deviations are presented in parentheses.

Table 3. Weighted mean weekly wages, mean years of education and mean age for Canadian immigrants by language skills and category

Language Proficiency variable	Mean weekly wage	Years of educ.	Age
<b>Write English language</b>			
01 - writes poorly			
Wave 1	307.06 (144.24)	7.02 (2.97)	33.30 (9.32)
Wave 2	313.25 (142.25)	6.97 (3.02)	34.06 (9.72)
Wave 3	298.12 (132.27)	7.00 (2.97)	34.21 (9.28)
02 - writes fairly well			
Wave 1	339.60 (216.91)	8.25 (2.80)	32.32 (8.02)
Wave 2	374.89 (504.58)	8.26 (2.81)	32.57 (7.99)
Wave 3	347.00 (220.56)	8.24 (2.85)	32.48 (7.96)
03 - writes well			
Wave 1	389.23 (284.32)	8.77 (2.54)	32.75 (8.34)
Wave 2	424.58 (457.01)	8.84 (2.62)	32.97 (8.61)
Wave 3	400.09 (311.11)	9.01 (2.49)	33.13 (8.43)
04 - writes very well			
Wave 1	447.57 (396.56)	9.42 (2.23)	32.61 (8.03)
Wave 2	502.01 (551.99)	9.39 (2.33)	32.73 (8.22)
Wave 3	447.74 (378.76)	9.40 (2.22)	33.02 (8.29)
05 - cannot write English			
Wave 1	310.53 (121.22)	3.99 (2.73)	40.63 (12.89)
Wave 2	324.89 (126.11)	4.03 (2.55)	40.90 (12.95)
Wave 3	319.08 (124.67)	4.33 (2.87)	39.65 (13.10)

Note: The standard deviations are presented in parentheses.

Table 4. Weighted mean weekly wages, mean years of education and mean age for Canadian immigrants by language skills and category

Language Proficiency variable	Mean weekly wage	Years of educ.	Age
<b>Speak French language</b>			
01 - speaks poorly			
Wave 1	460.76 (390.90)	9.13 (2.54)	32.92 (7.87)
Wave 2	530.91 (597.70)	9.06 (2.56)	32.93 (7.92)
Wave 3	471.58 (419.90)	8.99 (2.48)	32.53 (7.78)
02 - speaks fairly well			
Wave 1	450.87 (342.55)	9.25 (2.45)	32.04 (8.13)
Wave 2	486.01 (380.10)	9.03 (2.62)	31.91 (8.47)
Wave 3	420.39 (292.93)	9.04 (2.61)	31.61 (8.21)
03 - speaks well			
Wave 1	395.35 (385.53)	8.70 (2.72)	31.69 (6.71)
Wave 2	389.41 (399.09)	8.83 (2.62)	32.31 (6.83)
Wave 3	375.52(363.12)	8.92 (2.56)	32.51 (6.69)
04 - speaks very well			
Wave 1	416.28 (429.58)	9.26 (2.34)	31.74 (6.28)
Wave 2	558.69 (1224.66)	9.22 (2.39)	32.12 (6.83)
Wave 3	403.70 (334.19)	9.28 (2.35)	32.22 (6.47)
05 - cannot speak French			
Wave 1	392.69 (311.64)	8.61 (2.83)	33.20 (8.92)
Wave 2	422.56 (377.87)	8.53 (2.91)	33.45 (9.14)
Wave 3	398.78 (313.23)	8.66 (2.79)	33.58 (9.01)

Note: The standard deviations are presented in parentheses.

Table 5. Weighted mean weekly wages, mean years of education and mean age for Canadian immigrants by language skills and category

Language Proficiency variable	Mean weekly wage	Years of educ.	Age
<b>Read French language</b>			
01 - reads poorly			
Wave 1	452.93 (377.74)	9.17 (2.42)	32.67 (7.69)
Wave 2	514.65 (645.27)	9.20 (2.46)	32.73 (7.79)
Wave 3	453.54 (406.15)	9.09 (2.42)	32.63 (8.12)
02 - reads fairly well			
Wave 1	468.15 (429.75)	9.10 (2.57)	31.73 (7.27)
Wave 2	518.36 (451.55)	8.81 (2.58)	31.59 (7.56)
Wave 3	438.59 (388.89)	8.76 (2.63)	31.56 (7.41)
03 - reads well			
Wave 1	403.71 (348.22)	9.25 (2.59)	33.11 (7.96)
Wave 2	437.80 (392.22)	9.09 (2.77)	33.64 (8.02)
Wave 3	427.14 (376.64)	9.19 (2.62)	33.62 (8.19)
04 - reads very well			
Wave 1	420.52 (404.60)	9.09 (2.48)	31.51 (6.59)
Wave 2	539.22 (1098.41)	9.15 (2.43)	31.72 (7.04)
Wave 3	405.08 (324.61)	9.16 (2.41)	31.86 (6.77)
05 - cannot read French			
Wave 1	393.06 (312.76)	8.61 (2.83)	33.23 (8.93)
Wave 2	422.99 (379.42)	8.52 (2.91)	33.50 (9.15)
Wave 3	399.36 (314.41)	8.65 (2.79)	33.60 (8.98)

Note: The standard deviations are presented in parentheses.

Table 6. Weighted mean weekly wages, mean years of education and mean age for Canadian immigrants by language skills and category

Language Proficiency variable	Mean weekly wage	Years of educ.	Age
<b>Write French language</b>			
01 - writes poorly			
Wave 1	444.70 (390.64)	9.08 (2.64)	32.60 (8.00)
Wave 2	505.89 (641.43)	8.85 (2.79)	32.45 (8.14)
Wave 3	430.68 (406.71)	8.81 (2.69)	32.54 (8.34)
02 - writes fairly well			
Wave 1	455.59 (394.92)	9.58 (2.24)	31.69 (6.65)
Wave 2	485.63 (423.64)	9.38 (2.37)	31.72 (7.10)
Wave 3	441.88 (390.63)	9.49 (2.45)	31.93 (6.94)
03 - writes well			
Wave 1	381.22 (307.14)	8.65 (2.83)	32.16 (8.22)
Wave 2	398.34 (275.80)	8.94 (2.68)	32.89 (8.07)
Wave 3	380.03(269.78)	9.03 (2.41)	32.47 (7.81)
04 - writes very well			
Wave 1	414.48 (421.53)	9.18 (2.35)	31.49 (6.24)
Wave 2	553.30 (1225.53)	9.14 (2.38)	31.70 (6.81)
Wave 3	397.44 (327.27)	9.19 (2.38)	31.94 (6.54)
05 - cannot write French			
Wave 1	395.42 (315.09)	8.62 (2.82)	33.23 (8.90)
Wave 2	426.80 (381.45)	8.55 (2.90)	33.50 (9.10)
Wave 3	402.82 (317.52)	8.67 (2.78)	33.58 (8.96)

Note: The standard deviations are presented in parentheses.

Table 7. Summary of proportions (%) of immigrants and language proficiency

	Males			Females		
	wave1	wave2	wave 3	wave 1	wave 2	wave3
<b>Speaking English</b>						
01 - poorly	8.91	9.32	8.42	14.06	15.12	14.68
02 - fairly well	18.79	19.55	18.88	19.39	20.02	19.10
03 - well	32.51	32.69	32.68	26.24	25.56	26.23
04 - very well	36.73	35.18	36.89	35.21	34.03	35.35
05 - cannot	3.07	3.26	3.13	5.10	5.27	4.64
<b>Reading English</b>						
01 - poorly	3.95	3.90	3.40	6.62	7.00	7.19
02 - fairly	11.17	11.26	10.75	13.42	13.90	13.61
03 - fairly well	23.87	25.26	24.92	22.27	22.00	20.50
04 - very well	58.12	56.45	58.25	51.46	50.35	52.90
05- cannot	2.89	3.12	2.68	6.23	6.75	5.80
<b>Writing English</b>						
01 - poorly	6.26	6.03	6.03	8.82	9.46	9.42
02 - fairly	14.57	15.18	13.95	15.46	16.33	15.45
03 - fairly well	24.42	25.53	24.35	23.83	23.77	23.41
04 - very well	51.20	49.60	52.40	45.20	43.38	45.16
05 - cannot	3.55	3.65	3.27	6.68	7.07	6.55
<b>Speaking French</b>						
01 - poorly	7.97	8.43	8.46	7.14	6.81	7.17
02 - fairly	2.23	2.54	2.03	2.24	2.70	2.27
03 - fairly well	2.30	2.43	2.37	2.37	1.59	1.97
04 - very well	5.80	5.95	6.12	5.35	5.92	5.53
05- cannot	81.70	80.66	81.02	82.89	82.97	83.26
<b>Reading French</b>						
01- poorly	5.49	5.68	5.76	4.91	5.26	5.51
02 - fairly	2.70	3.01	2.94	2.97	2.98	3.18
03 - well	3.20	3.33	3.15	2.76	1.92	2.15
04 - very well	7.12	7.32	7.28	7.05	7.78	7.24
05- cannot	81.49	80.66	80.87	82.31	82.06	81.93
<b>Writing French</b>						
01 - poorly	6.22	6.45	6.56	5.03	6.45	5.17
02 - fairly well	2.50	2.82	2.55	2.69	2.82	2.79
03 - well	1.94	1.84	1.64	2.18	1.84	2.07
04 - very well	5.74	6.02	6.16	5.42	6.02	5.42
05- cannot	83.60	82.86	83.10	84.68	82.86	84.54



Table 8. Probit regression estimates of proficiency in speaking English language

Variables	Coefficients		
	Wave 1	Wave 2	Wave 3
<b>Region of birth</b>			
01 - Europe	-1.028 (0.150)***	-1.050 (0.192)****	-1.099 (0.194)***
02 - Asia	-1.785 (0.142)***	-1.781 (0.178)***	-1.837 (0.181)***
03 - Africa	-1.492 (0.202)***	-1.492 (0.244)***	-1.319 (0.270)***
04 - Middle East	-1.999 (0.162)***	-2.018 (0.207)***	-2.143 (0.206)***
05 - Caribbean & Guyana	-1.922 (0.255)***	-2.327 (0.319)***	-2.801 (0.279)***
06 - South & Central America	-1.534 (0.173)***	-1.677 (0.245)***	-1.618 (0.225)***
07 - Oceania & Australia	-0.480 (0.272)*	-1.681 (0.450)***	-1.420 (0.332)***
Age	-0.011 (0.003)***	-0.012 (0.004)***	-0.009 (0.004)**
Marital status	-0.179 (0.053)***	-0.095 (0.089)	-0.195 (0.090)**
Years of education	0.110 (0.009)***	0.111 (0.012)***	0.115 (0.012)***
Male	0.166 (0.053)***	0.153 (0.068)**	0.174 (0.066)***
Large city	1.209 (0.064)***	1.190 (0.072)***	1.214 (0.098)***
Medium city	1.118 (0.051)***	1.182 (0.092)***	1.201 (0.080)***
Proficiency - reading English	1.403 (0.102)***	1.511 (0.131)***	1.541 (0.133)***
Proficiency - writing English	1.204 (0.083)***	1.315 (0.107)***	1.332 (0.105)***
Observations	6147	3986	3638

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at

10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.

Table 9. Probit regression estimates of proficiency in reading English

Variables	Coefficients		
	Wave 1	Wave 2	Wave 3
Region of birth			
01 - Europe	-0.970 (0.201)***	-1.089 (0.239)****	-1.132 (0.240)***
02 - Asia	-0.984 (0.155)***	-1.104 (0.192)***	-1.236 (0.196)***
03 - Middle East	-1.008 (0.285)***	-1.019 (0.360)***	-1.171 (0.473)***
04 - Africa	-0.754 (0.204)***	-0.903 (0.269)***	-1.135 (0.264)***
05 - Caribbean & Guyana	-1.302 (0.246)***	-1.353 (0.330)***	-1.775 (0.281)***
06 - South & Central America	-1.077 (0.214)***	-1.170 (0.280)***	-1.401 (0.301)***
07 - Oceania & Australia	-0.594 (0.318)*	-	-
Age	-0.014 (0.004)***	-0.012 (0.004)***	-0.011 (0.004)**
Marital status	-0.155 (0.108)	-0.020 (0.135)	0.030 (0.149)
Years of education	0.109 (0.013)***	0.105 (0.016)***	0.105 (0.017)***
Male	0.297 (0.081)***	0.300 (0.099)***	0.476 (0.097)***
Large city	0.221 (0.066)**	0.188 (0.068)***	0.210 (0.093)**
Medium city	0.106 (0.019)***	0.113 (0.012)***	0.122 (0.010)***
Proficiency - speaking English	1.272 (0.087)***	1.372 (0.114)***	1.377 (0.115)***
Proficiency - writing English	1.681 (0.084)***	1.716 (0.111)***	1.743 (0.109)***
Observations	6174	3986	3613

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at

10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.

Table 10. Probit regression estimates of proficiency in writing English language

Variables	Coefficients		
	Wave 1	Wave 2	Wave 3
<b>Region of birth</b>			
01 - Europe	-1.404 (0.160)***	-1.352 (0.211)****	-1.417 (0.202)***
02 - Asia	-1.362 (0.138)***	-1.281 (0.184)***	-1.379 (0.176)***
03 - Africa	-1.408 (0.206)***	-1.361 (0.265)***	-1.626 (0.261)***
04 - Middle East	-1.651 (0.171)***	-1.510 (0.231)***	-1.701 (0.214)***
05 - Caribbean & Guyana	-2.086 (0.253)***	-1.657 (0.320)***	-1.606 (0.314)***
06 - South & Central America	-2.030 (0.180)***	-1.907 (0.229)***	-2.035 (0.223)***
07 - Oceania & Australia	-1.165 (0.349)***	-1.073 (0.565)*	-1.309 (0.456)***
Age	-0.004 (0.003)	-0.005 (0.004)	-0.007 (0.004)
Marital status	-0.120 (0.079)	-0.274 (0.111)	-0.287 (0.109)*
Years of education	0.084 (0.010)***	0.074 (0.014)***	0.085 (0.013)***
Male	0.040 (0.062)	0.093 (0.081)	0.092 (0.079)
Large city	1.123 (0.088)***	1.114 (0.019)***	1.181 (0.104)***
Medium city	1.101 (0.098)***	1.112 (0.102)***	1.169 (0.086)***
Proficiency - speaking English	1.131 (0.078)***	1.232 (0.099)***	1.227 (0.097)***
Proficiency - reading English	1.772 (0.095)***	1.781 (0.121)***	1.810 (0.121)***
Observations	6147	4018	3638

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at 10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.

Table 11. Probit regression estimates of proficiency in speaking French language

Variables	Coefficients		
	Wave 1	Wave 2	Wave 3
Region of birth			
02 - Europe	-1.255 (0.330)	-2.573 (0.314)****	-2.602 (0.319)***
03 - Asia	-2.833 (0.339)**	-3.137 (0.323)***	-3.114 (0.326)***
04 - Middle East	-1.431 (0.372)	-2.695 (0.341)***	-2.743 (0.370)***
05 - Africa	0.361 (0.338)	-0.808 (0.343)***	-0.790 (0.345)***
06 - Caribbean & Guyana	0.406 (0.434)	-2.128 (0.477)***	-2.127 (0.452)***
07 - South & Central America	-0.013 (0.357)	-2.344 (0.337)***	-2.350 (0.348)***
08 - Oceania & Australia	-0.385 (0.112)***	-2.285 (0.430)***	- -
Age	0.006 (0.006)	0.005 (0.007)	0.005 (0.007)
Marital status	-0.215 (0.102)**	-0.105 (0.136)	-0.219 (0.135)
Years of education	0.020 (0.021)	0.018 (0.025)	0.017 (0.025)***
Male	0.044 (0.104)	-0.012 (0.130)	0.061 (0.125)***
Large city	1.431 (0.102)***	1.410 (0.120)***	1.330 (0.125)***
Medium city	1.230 (0.336)***	1.119 (0.356)***	1.220 (0.345)***
Proficiency - reading French	1.999 (0.021)***	2.003 (0.170)***	1.876 (0.162)***
Proficiency - writing French	1.637 (0.134)***	1.503 (0.174)***	1.633 (0.166)***
Observations	6132	3986	3638

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at 10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.

Table 12. Probit regression estimates of proficiency in reading French language

Variables	Coefficients		
	Wave 1	Wave 2	Wave 3
Region of birth			
02 - Europe	1.230 (0.283)***	-1.573 (0.253)****	1.368 (0.234)***
03 - Asia	0.552 (0.280)**	-2.173 (0.239)***	-2.040 (0.224)***
04 - Middle East	0.987 (0.338)***	-1.754 (0.329)***	-1.591 (0.326)***
05 - Africa	0.719 (0.316)**	-1.071 (0.382)***	-1.801 (0.347)***
06 - Caribbean & Guyana	0.977 (0.450)**	-1.396 (0.497)***	-1.468 (0.488)***
07 - South & Central America	1.305 (0.303)***	-1.531 (0.273)***	-1.299 (0.256)***
08 - Oceania & Australia	- -	- -	- -
Age	0.003 (0.005)	0.011 (0.006)	-0.002 (0.006)
Marital status	-0.099 (0.102)	-0.140 (0.130)	0.065 (0.131)
Years of education	0.020 (0.014)	0.008 (0.017)	-0.012 (0.016)
Male	0.003 (0.005)	0.038 (0.101)	0.038 (0.092)
Large city	0.860 (0.432)**	0.871 (0.445)**	0.960 (0.560)*
Medium city	0.662 (0.210)***	0.646 (0.245)**	0.733 (0.283)***
Proficiency - speaking French	2.158 (0.177)***	2.094 (0.215)***	1.957 (0.206)***
Proficiency - writing French	2.677 (0.189)***	2.595 (0.226)***	2.669 (0.212)***
Observations	6132	3986	3613

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at 10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.

Table 13. Probit regression estimates of proficiency in writing French language

Variables	Coefficients		
	Wave 1	Wave 2	Wave 3
Region of birth			
02 - Europe	-0.484 (0.321)	-2.931 (0.416) ****	-3.140 (0.445) ***
03 - Asia	-0.752 (0.310) **	-3.175 (0.373) ***	-3.463 (0.408) ***
04 - Middle East	0.179 (0.356)	-2.443 (0.419) ***	-2.727 (0.489) ***
05 - Africa	0.351 (0.317)	-1.140 (0.364) ***	-1.451 (0.393) ***
06 - Caribbean & Guyana	0.401 (0.345)	-2.110 (0.405) ***	-2.223 (0.428) ***
07 - South & Central America	-1.305 (0.366) ***	-3.485 (0.445) ***	-4.065 (0.491) ***
08 - Oceania & Australia	-0.422 (0.323)	-2.181 (0.455) ***	-2.225 (0.532) ***
Age	-0.010 (0.008)	-0.011 (0.010)	-0.009 (0.010)
Marital status	-0.040 (0.132)	-0.070 (0.174)	-0.165 (0.176)
Years of education	0.065 (0.022) ***	0.075 (0.028) ***	0.098 (0.029) ***
Male	-0.185 (0.112) *	-0.188 (0.139)	-0.258 (0.135) *
Large city	0.848 (0.465) *	0.865 (0.480) *	0.894 (0.449) **
Medium city	0.833 (0.410) **	0.842 (0.398) **	0.875 (0.402) **
Proficiency - speaking French	1.620 (0.134) ***	1.514 (0.176) ***	1.612 (0.169) ***
Proficiency - reading French	2.479 (0.152) ***	2.458 (0.186) ***	2.520 (0.181) ***
Observations	6132	3986	3638

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at 10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.

Table 14. OLS regression estimates of earnings equations for female immigrants

Variables	Coefficients		
	Wave 1	Wave 2	Wave 3
Speaking English			
01 - poorly	0.843 (0.207)***	0.870 (0.228)***	0.874 (0.222)***
02 - fairly well	0.801 (0.201)***	0.819 (0.245)***	0.826 (0.231)***
03 - well	0.746 (0.214)***	0.703 (0.249)***	0.756 (0.239)***
04 - very well	0.859 (0.215)***	0.802 (0.252)***	0.885 (0.242)***
Reading English			
01 - poorly	0.389 (0.207)*	0.263 (0.357)	0.275 (0.360)
02 - fairly	0.301 (0.209)	0.305 (0.362)	0.224 (0.381)
03 - fairly well	0.366 (0.213)*	0.322 (0.366)	0.221 (0.386)
04 - very well	0.659 (0.221)***	0.668 (0.378)*	0.719 (0.396)*
Writing English			
01 - poorly	0.546 (0.285)*	0.664 (0.334)**	0.684 (0.346)**
02 - fairly	0.553 (0.284)*	0.503 (0.337)	0.686 (0.348)**
03 - fairly well	0.556 (0.287)*	0.795 (0.338)**	0.668 (0.354)*
04 - very well	0.603 (0.293)**	0.878 (0.348)**	0.674 (0.362)*
Speaking French			
01 - poorly	-0.053 (0.140)	-0.194 (0.181)	-0.046 (0.157)
02 - fairly	0.141 (0.300)	0.298 (0.180)*	0.226 (0.331)
03 - fairly well	0.341 (0.173)**	0.393 (0.202)*	0.226 (0.127)*
04 - very well	0.356 (0.144)**	0.400 (0.234)*	0.415 (0.218)*
Reading French			
01 - poorly	0.020 (0.144)	0.203 (0.160)	0.313 (0.140)**
02 - fairly	0.196 (0.115)*	0.492 (0.290)*	0.383 (0.248)
03 - well	0.432 (0.215)**	0.468 (0.323)	0.543 (0.310)*
04 - very well	0.637 (0.264)**	0.735 (0.303)**	0.765 (0.287)***
Writing French			
01 - poorly	-0.048 (0.175)	-0.115 (0.210)	-0.055 (0.185)
02 - fairly well	0.252 (0.258)	0.187 (0.286)	0.007 (0.273)
03 - well	0.221 (0.276)	0.096 (0.319)	0.151 (0.327)
04 - very well	0.057 (0.297)	0.237 (0.340)	0.282 (0.337)
Education	0.025 (0.009)***	0.036 (0.011)***	0.044 (0.011)***
Weekly hours	0.001 (0.001)***	0.001 (0.000)***	0.001 (0.000)***
Marital status	0.636 (0.064)***	0.678 (0.085)***	0.733 (0.083)***
Large city	1.110 (0.333)***	1.121 (0.352)***	1.245 (0.360)***
Medium city	1.085 (0.295)***	1.066 (0.348)***	1.130 (0.326)***
Age	0.052 (0.003)***	0.053 (0.003)***	0.057 (0.003)***
Age squared/100	-0.062 (0.008)***	-0.064 (0.007)***	-0.063 (0.006)***
Observations	2392	1573	1456
R <sup>2</sup>	0.769	0.770	0.771

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at

10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.

Table 15. OLS regression estimates of earnings equations for male immigrants in Canada

Variables	Coefficients		
	Wave 1	Wave 2	Wave 3
Speaking English			
01 - poorly	0.538 (0.249)*	0.540 (0.218)**	0.883 (0.319)***
02 - fairly well	0.607 (0.253)***	0.564 (0.223)**	0.923 (0.328)***
03 - well	0.672 (0.254)***	0.630 (0.225)***	0.931 (0.331)***
04 - very well	0.684 (0.258)***	0.642 (0.230)***	0.979 (0.338)***
Reading English			
01 - poorly	0.623 (0.326)**	0.816 (0.304)**	0.809(0.381)***
02 - fairly	0.711 (0.316)**	0.818 (0.334)***	0.820 (0.416)***
03 - fairly well	0.778 (0.316)**	0.822 (0.332)***	0.836 (0.418)***
04 - very well	0.784 (0.317)**	0.881 (0.334)***	0.881 (0.417)***
Writing English			
01 - poorly	0.522 (0.283)***	0.534 (0.292)*	0.608 (0.287)***
02 - fairly	0.695 (0.272)***	0.693 (0.272)***	0.749 (0.271)***
03 - fairly well	0.711 (0.271)***	0.782 (0.270)***	0.812 (0.269)***
04 - very well	0.720 (0.271)***	0.722 (0.273)***	0.809 (0.268)***
Speaking French			
01 - poorly	0.238 (0.103)**	0.098 (0.103)	0.167 (0.113)
02 - fairly	0.241 (0.129)*	0.244 (0.118)**	0.248 (0.128)**
03 - fairly well	0.354 (0.131)**	0.324 (0.164)*	0.369 (0.188)**
04 - very well	0.447 (0.230)**	0.174 (0.251)	0.677 (0.252)***
Reading French			
01- poorly	0.013 (0.108)	0.142 (0.124)	0.135 (0.127)
02 - fairly	0.231 (0.119)**	0.235 (0.118)**	0.237 (0.110)**
03 - well	0.226 (0.116)**	0.247 (0.116)**	0.250 (0.128)**
04 - very well	0.229 (0.124)*	0.238 (0.145)*	0.201 (0.143)
Writing French			
01 - poorly	-0.022 (0.129)	-0.104 (0.135)	-0.249 (0.129)*
02 - fairly well	0.182 (0.178)	0.073 (0.201)	0.148 (0.197)
03 - well	0.288 (0.213)	0.129 (0.241)	0.145 (0.227)
04 - very well	0.026 (0.225)	0.046 (0.271)	0.027 (0.279)
Education	0.048 (0.006)***	0.052 (0.008)***	0.055 (0.008)***
Weekly hours	0.001 (0.000)***	0.001 (0.000)***	0.001 (0.000)***
Marital status	0.220 (0.042)***	0.192 (0.056)***	0.237 (0.054)***
Large city	1.935 (0.230)***	1.940 (0.245)***	1.965 (0.270)***
Medium city	1.060 (0.450)**	1.120 (0.550)**	1.118 (0.525)**
Age	0.060 (0.003)***	0.061 (0.003)***	0.066 (0.003)***
Age squared/100	-0.072 (0.010)***	-0.076 (0.012)***	-0.073 (0.014)***
Observations	3786	2448	2185
R <sup>2</sup>	0.776	0.773	0.776

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at

10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.



Table 16: Pooled OLS regression estimates of earnings equations for all immigrants

Variables	Coefficients	
	Females	Males
Speaking English		
01 - poorly	0.835 (0.104)***	0.848 (0.103)***
02 - fairly well	1.266 (0.116)***	0.863 (0.108)***
03 - well	1.202 (0.120)***	0.739 (0.108)***
04 - very well	1.292 (0.124)***	0.939 (0.111)***
Reading English		
01 - poorly	0.088 (0.152)	0.508 (0.137)***
02 - fairly	0.013 (0.163)	0.457 (0.148)***
03 - fairly well	0.002 (0.168)	0.365 (0.149)**
04 - very well	0.040 (0.176)	0.364 (0.151)**
Writing English		
01 - poorly	0.500 (0.141)***	0.481 (0.121)***
02 - fairly	0.504 (0.149)***	0.604 (0.126)***
03 - fairly well	0.752 (0.153)***	0.791 (0.125)***
04 - very well	0.883 (0.159)***	0.975 (0.128)***
Speaking French		
01 - poorly	-2.009 (0.101)**	0.092 (0.068)
02 - fairly	0.180 (0.157)*	0.195 (0.111)
03 - fairly well	0.283 (0.186)	0.385 (0.115)**
04 - very well	0.257 (0.196)	0.394 (0.141)**
Reading French		
01 - poorly	0.204 (0.111)*	0.121 (0.082)
02 - fairly	0.342 (0.171)**	0.310 (0.113)***
03 - well	0.181 (0.179)	0.350 (0.121)***
04 - very well	0.486 (0.180)***	0.358 (0.145)**
Writing French		
01 - poorly	0.116 (0.122)	-0.094 (0.086)
02 - fairly well	0.184 (0.169)	0.115 (0.117)
03 - well	0.075 (0.186)	0.314 (0.144)**
04 - very well	0.185 (0.203)	0.353 (0.158)**
Education	0.035 (0.006)***	0.052 (0.005)***
Weekly hours	0.001 (0.000)***	0.001 (0.000)***
Marital status	0.769 (0.043)***	0.250 (0.033)***
Large city	1.195 (0.402)***	1.263 (0.553)**
Medium city	1.148 (0.379)***	1.201 (0.480)**
Age	0.057 (0.001)***	0.065 (0.001)***
Age squared/100	-0.060 (0.006)***	-0.067 (0.009)***
Observations	4807	7312
R <sup>2</sup>	0.767	0.773

Note: The robust standard errors are presented in the parentheses and \* denotes statistical significance at

10% level, \*\* denotes statistical significance at 5% level, and \*\*\* statistical significance at 1% level.

## Appendix

Table A. Number of respondents in each wave and the attrition rates

Cycle	Respondents	Attrition Rates
Wave 1	12,040	41%
Wave 2	9,500	21%
Wave 3	7,500	21%

Table B. Definition of variables

Variable	Definition
Age .....	An immigrant's age at the time of the survey
Age squared/100...	$(\text{Age} * \text{age})/100$
Education.....	Immigrant's years of fulltime education at the time of survey
Male.....	Dummy variable = 1, if male, and 0 otherwise
Marital status.....	Dummy variable = 1 if married, and 0 otherwise
Large city.....	City with population over 500,000
Medium city.....	City with population between 500,000 and 100,000
Small city.....	City with population less than 100,000
Weekly hours.....	Number of hours an immigrant spend at workplace
Europe.....	Ukraine, Albania, Bulgaria, Italy, U.K., France, Belgium, Belarus, Germany, Czech Republic, Greece, Poland, Serbia, Turkey, Norway, Slovenia, Andorra
Asia.....	China, Philippines, Thailand, Russia, Japan, Vietnam, Korea, India, Bangladesh, Cambodia, Nepal, Sri Lanka, Indonesia
North America.....	The United States, used as the default region