

**Languages used at home and the earnings of immigrants in
Canada**

**By Huichun Wang
(7844327)**

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Supervisor: Professor Gilles Grenier

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Abstract

This paper uses data from the 2011 National Household Survey with a sample restricted to employed immigrants aged 25-64 years. The purpose is to find the association between the languages most often and regularly used at home and immigrant earnings. The sample includes only immigrants living outside Quebec in order to focus on the use of English as opposed to the immigrants' native languages. The results suggest that home language is a significant determinant of earnings, and that those who do not speak mainly English at home earn about 10 percent less than those who speak only English at home. In terms of the other control variables, earnings are lower for females than for males. As for birthplaces, the earnings of individuals born in North America are higher than those of immigrants born in Asia, especially China, India, and the Philippines, but they are lower than those of immigrants from Europe. The negative effects of using languages other than English at home on earnings are larger in Toronto and Vancouver than in the rest of Canada.

1. Introduction

Canada is a well-diversified country with a multitude of languages being spoken. The official languages of Canada are English and French, but with the increasing trend of immigration, the languages used in Canada have become much diversified. Other than the official languages, immigrants also speak at home their mother tongues frequently. According to 2011 Census data, about 20% of the Canadian population speak a non-official language most often at home. Yet, for the immigrants whose mother tongue is not English or French, one of important element of integration into the Canadian life is to learn the official languages. According to 2011 Census data, about 3% of immigrants are not able to speak English or French. Therefore, it is important to study how language skills affect immigrant earnings.

With questions on language use included in the Census and the National Household Survey (NHS), many studies have analyzed the effects of language characteristics on the labour market. In this paper, I will focus on the effect on earnings of languages used at home. The purpose of this paper is to find the relationship between the languages spoken by the immigrants at home and their earnings. It is well known that one of the important factors that influence earnings is language skills. This paper provides explanations about earning advantages of people who have better knowledge of the official languages of the destination country. In general, I regard the people who speak an official language most frequently at home as having better knowledge and fluency of that official language of Canada. Therefore, this paper will show how the home languages affect the immigrant's earnings, for both males and females.

This paper uses the 2011 NHS dataset, with a sample restricted to employed immigrants aged from 25-64 years who live outside Quebec. The results of this paper show that home language is

a significant factor that influences immigrant earnings. Better English language fluency implies higher employment income. In addition, this paper also finds that the earning disadvantages are significant for immigrants who speak only a language other than English at home.

This paper follows the following structure. Section 2 discusses the recent literatures on the topic of language and immigrant earnings. In Section 3, I will first describe the dataset and then explain the sample restrictions. I also outline all the variables of the model and present summary statistics. In Section 4, the econometric model is presented and explained. Section 5 shows the empirical results and Section 6 provides the conclusion.

2. Literature Review

Economists have found that language skills are an important determinant of earnings. In this section, I will first discuss the studies that examine the impact of language proficiency on earnings, and then I will look at the effect of language use on earnings.

➤ Literature on language proficiency and earnings

One of the earliest studies on the effects of language characteristics on earnings was done by Grenier (1984). He examined the effects of language characteristics on the wages of Hispanic American males in 1975, using data from 1976 Survey of Income and Education. The results show that Hispanic males earned 25.8% less than whites, and more significantly, the study shows that up to one third of wage differential could be explained by language characteristics, which implies that language plays an important role in wage determination.

Tainer (1988) also uses data from 1976 Survey of Income and Education in the US to analyze the effects of language on earnings of foreign-born men in the U.S. She finds that English language proficiency affects earnings significantly. English language proficiency has an increasing relationship with earnings for all ethnic groups. In particular, the language effects are larger among foreign-born men of Hispanic ethnicity and smaller among foreign-born men of European ethnicity.

An analysis of the determinants of language fluency was done by Chiswick and Miller (1995). They consider three fundamental variables that determine language fluency: *exposure* to the host country language, *efficiency* in second language acquisition, and *economic benefits* from language fluency. *Exposure* includes exposure in the origin country and exposure after migration. The authors believe that most of the exposure to the host country language occurs after migration. *Efficiency* refers to the ability to convert exposure to language learning. Age at immigration, education, and motives for migrating are important efficiency variables. The *economic benefits* refer to the returns to becoming proficient in the host country language and include, in particular, the expected increase in earnings. The study is mainly conducted for Australia and uses 1981 and 1986 Census data. It also provides comparative analyses for the US, Canada, and Israel. The paper finds that immigrants have better language proficiency if they came to the host country at an early age, had previous exposure to the official language, and had higher educational level and longer duration of residence. Those who came to the host country at an early age and those who obtained higher education have increased learning efficiency and exposure, and those who have longer duration of residence have more exposure and economic incentives. The study also finds that earning is an increasing function of language fluency by

using a standard human capital earnings function, with OLS and instrumental variables estimation.

Chiswick and Miller (2002) investigate further the effect of language skills on immigrant earnings, using 1990 US census data with 25 to 64 year-old adult foreign-born men. They use home language to define the language variable. Specifically, English language fluency in the regression model is set equal to one for individuals who speak only English at home and equal to zero where a non-English language is spoken at home. For those who speak a non-English language at home, English language fluency is ranked from “very well”, to “well”, to “not well”, and to “not at all”. The study confirms the importance for earnings of English language fluency. The results show that the individuals who are fluent in English earn 14% more than those lacking English fluency.

Looking at the situation in Quebec, Shapiro, and Stelcner (1997) examine the earnings differential between Quebec’s three linguistic groups -Anglophones, Francophones, and Allophones- from the 1970’s to the 1990’s. They compare the earnings differential by language group with data from the 1971, 1981, and 1991 Census. The main findings are that the earning gap between Anglophones and bilingual Francophones has decreased, but the earnings of allophones are much lower than those of unilingual Francophones.

A recent study by Albouy (2008) analyzed the wage gap between Francophones and Anglophones in Canada for the period between 1970 and 2000, using Canadian Census data. The author finds that the factor that is responsible for the larger decreases of the wage gap within Quebec than in the rest of Canada is that the relative wages of Quebec Anglophones decreased more than those of other Canadian Anglophones. The author argues that, in Quebec, there was

declining demand for English-speaking labour, so that the wages of Anglophones were relatively reduced. As for the decreases in the wage gap for Canadian Francophones, he finds that over half of the reduction could be explained by increased education levels of Francophones.

Dustmann and Van Soest (2002) address the issue of endogeneity of language fluency in earnings equations, using the data from the German Socio-Economic Panel (GSOEP) for the period 1984-1994. They argue that the potential unobserved heterogeneity in the recent studies about the effects of language on earnings could result in the over-estimation of language effects, and that the potential measurement errors in language proficiency measures could result in under-estimated language effects. The study provides evidence that the measurement error bias is larger than the unobserved heterogeneity bias, which implies that the effect of language proficiency on earnings is more important than that suggested in the existing literature.

Dustmann and Fabbri (2003) further investigate the effects of language on earnings in the UK by using the 2000 Labour Force Survey. The language variables from that survey include self-assessed language ability by the respondents and interviewer assessed language ability. The earnings regression finds large and significant coefficients for English language proficiency.

Bleakley and Chin (2004) explore the effects of language skills on earnings by focusing on immigrants who arrived in the U.S. as children (defined as those who arrived under age 18). Using 1990 U.S. Census data, they find that English-language skills are positively associated with wages and education attained. They also find that children who learned English at an earlier age generally have a higher English-language proficiency. As for those who arrived in the U.S. at a later age, they find that their English-language ability is relatively lower and therefore they have lower wages. Additionally, among the childhood immigrants, the wage gap is not

significantly associated with whether or not they come from a non-English-speaking country. However, for those who arrive at a later age, wages tend to be lower for immigrants who come from a non-English-speaking country.

Boyd and Cao (2009) analyzed the impact of language proficiency on the earnings of Canadian adult immigrants, using 2001 Census data. They categorized the language proficiency into five levels based on the respondent's mother tongue, home language, and knowledge of official languages (English/French). The highest level of proficiency is for those who have English and/or French as mother tongue and use it/them most often at home. The lowest level of proficiency is for those who have a non-official language as mother tongue, use that language most often at home, and are not able to conduct a conversation in English or French. The regression results showed that lower levels of proficiency are associated with lower earnings. They also control for other variables such as place of residence, marital status, education, and type of occupation, and find them to be significant factors in the determination of earnings.

All the above studies conclude that language proficiency is positively associated with earnings and that those who have lower knowledge of the official languages of the destination country generally have reduced earnings. The studies also find that other factors affect earnings, such as education, years since immigration, marital status, and work status. In this paper, I also include them among my control variables.

➤ **Literature on language use and earnings**

In addition to language proficiency, home language and work language have been included in the questionnaires of the Census and of the National Household Survey for many years. Some studies have paid attention to the relationship between language use and earnings.

There are a few studies about language used at work and earnings. Christofides and Swidinsky (2010) examine, with 2001 Canadian Census data, the earning differentials that are related to the individual knowledge of languages and the use of different languages at work by bilingual workers. They classify the language variables into six groups, based on the individual knowledge of the official languages and their use at work. They investigate Quebec and the rest of Canada (ROC) separately. The results show that in the ROC, the earnings of individuals who are bilingual but work exclusively in English or French are higher than those who are fluent in only English, and this earning premium is larger for bilingual women who use French at work. As for the individuals in Quebec, the results show that Francophones who use English at work earn more than unilingual Francophones, and the earning premium is largest for bilingual men who frequently use English at work.

Li and Dong (2007) use language at work as a measure of participation in the enclave economy for Chinese immigrants, using 2001 Canadian Census data. The results suggest that Chinese immigrants who work in the mainstream economy have some earning advantages. They find that Chinese immigrants who work in the mainstream economy (who use English at work) earn more than those who work in the enclave economy (who use Chinese at work). They also find that salaried workers in the mainstream economy earn more than the self-employed. One of the reasons for the lower earnings in the enclave economy is the difference in the type of jobs. In the

enclave economy, the results indicate that individuals tend to work in the lower-paying industries such as manufacturing and retailing. The other reason is that the individuals in the enclave economy do not frequently use an official language at work, which further widens the earning gap.

The studies on language at work indicate that the use of official languages at work is positively associated with earnings. Li and Dong (2007) show that the individuals who use English at work generally have higher wages. Christofides and Swidinsky (2010) compare the earnings of bilingual individuals in Quebec and in the rest of Canada, and they show that bilinguals who worked in English earned the most.

Some other studies have addressed the relationship between home language and earnings. Chiswick and Miller (2003) analyze the effects of language practice on earnings, with a sample restricted to immigrant adult males in Canada, drawn from the 1991 Census. The language characteristics are classified into three groups. The first category includes immigrants who speak neither English nor French, the second one includes those who are able to speak English or French but who do not usually speak an official language at home, and the last category includes those who are able to speak English or French and usually speak an official language at home. The study finds that earnings are positively correlated with education, pre-immigration experience and duration in Canada, and proficiency in the official languages and their use. It also finds that language skills are interrelated with both schooling and pre-immigration experience. Better language proficiency enhances the effects of schooling and pre-immigration experience on earnings. In particular, the study shows that the immigrants who do not speak an official

language at home earn the least, while the immigrants who are able to speak English or French and usually speak an official language at home earn the most.

An early study on the effect of language at home on earnings in Canada was done by Veltman, Boulet and Castonguay (1979). The authors examine the income differential between different language groups in the Montreal labour market using the 1971 Census of Canada. The study extended previous research by Boulet and Raynauld (1977) and refined the language categories by adding home language to the language fluency variables. They distinguished between retentive bilingualism and integrative bilingualism. Retentive bilingualism is accompanied by mother tongue retention, which means that the mother tongue is the usual home language. Integrative bilingualism is accompanied by language transfer, which means that a second language is adopted as the usual home language. They categorized 15 language groups based on home language and mother tongue; they included the English home language groups, the French home language groups, the allophone home language groups, and the unilingual language groups. The study finds that the group that made English the home language earns more than those who acquired English but retained an allophone home language. It also noted that there were relatively fewer additional gains for those who made a language transfer to French. The results find that the people who made English their home language experience higher gains than those who retained their mother tongue as home language.

More recently, Nadeau and Seckin (2010) used examined the effects of home language on the wage gap between Canadian born and immigrant males in Quebec and the rest of Canada They used Canadian Census data for the years 1980, 1990, and 2000. The results show that the wage gap between the Canadian born and immigrants is larger in Quebec than in the rest of Canada.

Unlike most other studies that control either for the knowledge of the official languages or for home language, the study includes both language attributes. Home language is considered as an indirect way of measuring fluency in speaking an official language. In the study, the authors point out that if home language is taken as a measure of language fluency, then immigrants in the rest of Canada are more likely to be fluent in the working language where they live (English) than immigrants in Quebec (where the working language is French). Therefore, they thought that it was important to include home language as a measure of language skills.

The above studies have different interpretations of the role of home language. Veltman, Boulet, and Castonguay (1979) suggest that immigrants who speak English at home will be more integrated and have better networks than those who speak their mother tongue at home, explaining their higher wages. The other two studies, Chiswick and Miller (2003) and Nadeau and Seckin (2010), consider home language as a measure of English fluency. They think the English fluency of immigrants will be higher if they speak English at home than if they speak their mother tongue at home.

In this paper, I will focus on the language at home and analyze the effects on immigrant earnings using 2011 NHS data. I will follow the interpretation of Nadeau and Seckin (2010) that use home language as a measure of English fluency, and I will use the method of Chiswick and Miller (2003) to categorize the language variables. In particular, I will divide the language variables into four groups, to be explained in Section 3.

3. Data

3.1 Dataset

This paper uses public micro data from the Canadian National Household Survey (NHS) of 2011. The NHS provides social and economic data on the Canadian population. In total, there are 887,012 records in the dataset. It is a sample of about 2.7% of all individuals who live in Canada, excluding the individuals who live in institutional collective dwellings like hospitals and nursing homes. In the dataset, 20.7% of the sampled individuals are immigrants. There are 133 variables in the dataset, and 18 of them are related to language. Specifically, the language variables include the knowledge of official and non-official languages, mother tongue, the first official language spoken, home language, and language of work. In this paper, I will focus on the home language.

3.2 Sample Restrictions

There are several sample restrictions applied to the dataset. Firstly, this paper includes only employed immigrants aged between 25 and 64 years old. Then, I exclude the immigrants living in Quebec because two languages, French and English, are used frequently in addition to the immigrants' mother tongues. To simplify the analysis, I focus on the use of English in comparison to the use of immigrants' languages as the main issue. Lastly, I include only positive employment income. Individuals with annual employment income below \$1,000 or above \$200,000 are considered as outliers and excluded from the sample. In total, there are 62,182 observations remaining after the sample restrictions.

3.3 Variables

In this part, I introduce the variables that I use in my analysis and present some summary statistics. The dependent variable is the natural logarithm of gross wages. The independent variables include the language variables, the education variables, and the other control variables.

➤ Language Variables

The language part of the questionnaire of the NHS includes questions on mother tongue, knowledge of the official and non-official languages, language of work, and language used at home. In this paper, I focus on the language used at home. There are two questions on the languages used at home: the first one asks the language spoken most often at home, and the second one asks for any other languages that are spoken on a regular basis at home. Based on that information, I divided the language variables into four groups. As shown in Table 1, the language variables are ranked by the importance of the use of the English language, as described in the following categories: the first level (ENG1) includes the immigrants who speak English most often at home and who do not speak any other language at home on a regular basis; the second level (ENG2) includes immigrants who speak English most often at home and also speak another language at home on a regular basis; the third level (ENG3) includes those who speak a language other than English most often and also speak English on a regular basis at home; and immigrants who speak only a language other than English at home constitute the last group (ENG4).

Table 1: Language Variables

Variables	Description
ENG1 (Reference group)	Immigrants speak only English at home
ENG2	Immigrants speak English most often and also speak another language at home
ENG3	Immigrants speak a language other than English most often and also speak English at home
ENG4	Immigrants speak only a language other than English at home

➤ Place of Birth

According to the NHS, the immigrants are classified by the geographic location of their place of birth. In this paper, as shown in Table 2, I divide place of birth into eight groups: North and Central America, South America, Europe, Africa, China, India, the Philippines, and Other places. The reason I take out China, India, and the Philippines from the Asia group is because those groups constitute large shares of the immigrant population.

Table 2: Place of birth variables

Variable	Description
North and Central America (Reference group)	United States, Canada, Central America, Jamaica, other Caribbean and Bermuda
South America	South America
Europe	UK, Germany, Other Northern and Western Europe, Poland, Other Eastern Europe, Italy, Portugal, Other Southern Europe
Africa	Eastern Africa, Northern Africa, Other Africa
China	China, Hong Kong
India	India
Philippines	Philippines
Other	West Central Asia and the Middle Asia, Other Eastern Asia, Other Southeast Asia, Pakistan, Other Southern Asia, Oceania and others

➤ Education

The education level is an important determinant of earnings. In this paper, I divide the education level into three groups: high school and equivalents (HS), College and equivalents (PS), University and higher (UNI).

Table 3: Education variables (the highest education attained)

Variables	Description
High School	No certificate, diploma or degree; High school diploma or equivalent
Post-Secondary	Trades certificate or diploma (other than apprenticeship); Registered Apprenticeship certificate; College, CEGEP or other non-university certificate or diploma
University (Reference group)	University certificate and diploma below or above bachelor level, Bachelor's degree, Master's degree, Earned doctorate degree

➤ Other control variables

In this paper, I also control for the following attributes in the earnings model: gender, marital status, place of residence, years since immigration, age, work status, and number of weeks worked in year 2010.

I use dummy variables to define gender, marital status, and work status. For the marital status, I set the value equal to one if the individual never legally married. The zero values include those who are currently married, living common law, separated, divorced, or widowed. About the work status, the value is equal to one if the individual worked full-time in the year 2010; otherwise, it is equal to zero. In the regressions, I also use the log of the number of weeks worked in 2010 as another independent variable. I use a set of dummy variables to define place of residence, the most populated cities of immigrants in my sample being Toronto, Vancouver, and Calgary, while the rest of Canada is the reference.

In order to define age, years since immigration, and numbers of weeks worked, I estimated at midpoint of each categorized group. The number of years since immigration is calculated as 2010 minus the immigration year.

Table 4. Other variables

Variables	Description
Gender	Gender of individual: male, female
Marital Status	Marital status of individual: Single (Never legally married), Married (includes legally married, living common law, separated, divorced, and widowed) (the reference group is Married)
Years Since Immigration (YSM)	Years since immigration of individual (midpoint of each YRIMM group, and calculated as 2010 minus YRIMM)
Age	Age of individual (midpoint of each AGEGRP group)
Work Status	Work status of individual: full-time, part-time (reference group)
Number of weeks worked	Number of weeks individual worked for pay (midpoint of each WKSWRK group, and used log value of WKSWRK in regressions)
Place of residence	Place of current residence: Toronto, Vancouver, Calgary, Rest of Canada (ROC) (reference group)

3.4 Summary Statistics

Table 5 shows the summary statistics of the above variables. In the selected sample, 50.5% of the Canadian immigrants who live outside Quebec are males and 49.5% are females. Regarding the home language, about three out of ten immigrants speak only English at home and fifteen percent speak another language on a regular basis at home in addition to English. The largest proportion

(45%) is the group that speaks a language other than English most often at home while also speaking English on a regular basis. A very small proportion (2.1%) does not speak English at home. The use of home language does not differ significantly between males and females. There are slightly more (2 percentage points) males who speak a language other than English most often at home, and the proportions of males and females who speak only a language other than English at home are the same (about 2.1%).

As for the education level, a little less than half of the immigrants obtained education at the university level. The education level does not differ significantly between males and females. A few more males than females attained education at the university level. It is noticeable that 87% of immigrants have married, and with relatively little more married females than males in the selected sample.

Regarding the birthplaces, the largest proportion includes immigrants born in Europe, with about one out of four being born there. The largest single countries of birth are India, the Philippines, and China, each accounting for about 10 percent of immigrants. There are also many immigrants from North and Central America, South America and Africa. In regard to the gender and birthplace of immigrants, there are relatively more male immigrants born in Europe than females. The proportion of female immigrants born in the Philippines is higher (4 percentage points) than that of male immigrants; the reason for the higher proportion of females is that many of them initially come as household workers.

The summary statistics show that the top three cities in which most immigrants reside are Toronto, Vancouver, and Calgary. Over 51% of immigrants live in Toronto, 17% live in

Vancouver, and 6.2% live in Calgary. The proportions of males and females are not very different in those cities.

The average number of years since immigration is 19.6 years, and the average age of the sample immigrants is 44.9. There are 86% of the immigrants who worked full-time and full-year of 2010, with 91% among the males and 80% among the females. The average earnings of all immigrants in the sample are \$46,000. The average earnings of female immigrants are much lower than those of male immigrants, with a difference of about \$14,000.

Table 5: Mean values of all the variables

Mean Values	Overall	Male	Female
A. Language Variables			
ENG1	0.289	0.287	0.291
ENG2	0.146	0.139	0.153
ENG3	0.446	0.458	0.434
ENG4	0.021	0.021	0.021
B. Education			
HS (High School or Lower)	0.288	0.289	0.286
PS (College and Equivalent)	0.246	0.243	0.249
UNI (University and Higher)	0.465	0.466	0.463
C. Gender			
Male	0.505		
Female	0.495		
D. Marital Status			
Single	0.131	0.133	0.129
Married	0.869	0.866	0.87
E. Place of Birth			
North America	0.098	0.090	0.106
South America	0.045	0.043	0.046
Europe	0.255	0.260	0.247
Africa	0.051	0.057	0.045
China	0.093	0.088	0.095
India	0.109	0.112	0.105
Philippines	0.101	0.083	0.121
Other	0.237	0.262	0.230
F. Place of residence			
Toronto	0.514	0.510	0.518
Vancouver	0.176	0.170	0.181
Calgary	0.062	0.066	0.058
Rest of Canada (ROC)	0.248	0.254	0.243
G. Other Variables			
Years Since Immigration	19.55	19.49	19.61
Age	44.86	45.07	44.64
Full-time (work status)	0.86	0.91	0.79
Work Weeks (log value)	3.73	3.76	3.70
Mean Wages	\$45,971	\$52,812	\$38,967
Observations	62,182	31,455	30,727

Table 6 shows the average employment income and the distribution of the language variables by place of birth. Immigrants from Europe earn the most and those from China earn the least. The distribution of the language variables varies for immigrants born in different places. Seventy-two percent of the immigrants with birthplace in North America speak only English at home, while almost none (0.2%) speak only a language other than English. About half of the immigrants from South America and Europe speak only English at home, while one in four speaks a language other than English most often. Between half and two thirds of the immigrants from China, India, and the Philippines speak a language other than English most often. About 4% of the Indian immigrants, 3% of the Filipino immigrants, and 3% of the Chinese immigrants speak only their native language at home. Therefore, place of birth is a significant factor that determines the home languages of immigrants.

Table 6: Distribution of the Wages and the Language Variables (mean values), by Place of Birth

Variables	North America	South America	Europe	Africa	China	India	Philippines	Other
lnINC (log of wages)	10.438	10.414	10.587	10.470	10.246	10.308	10.345	10.320
Language Variables:								
ENG1	0.724	0.478	0.469	0.299	0.042	0.095	0.149	0.130
ENG2	0.068	0.132	0.150	0.202	0.087	0.150	0.219	0.151
ENG3	0.115	0.296	0.259	0.268	0.660	0.650	0.591	0.606
ENG4	0.002	0.006	0.011	0.017	0.025	0.035	0.028	0.033
Sample Size	6144	2812	15802	3214	5735	6805	6350	15320

Table 7 shows the distribution of the earnings and language variables for the three census metropolitan areas where the largest numbers of immigrants outside Quebec live, Toronto, Vancouver, and Calgary, and for the Rest of Canada. In the selected sample, the largest proportion (approximately 50%) of the immigrants lives in Toronto, with a sample of more than 30 thousand individuals. The second largest area is Vancouver, which has sample of a little more than 10 thousand individuals, and the third one is Calgary with a sample of about 4 thousand individuals. The rest of Canada has a sample of immigrants of about 15 thousand individuals. There are important earnings differentials among those regions. Immigrants in Calgary earn the highest and those in Vancouver earned the least. The earning difference between Vancouver and Calgary is a little more than 20 percent. Immigrants in rest of Canada earned a little less (4%) than those in Calgary, and more than those in Toronto and Vancouver. These earning differences may be explained by the economic growth and industry development in each city.

The distribution of the languages used at home is similar for immigrants residing in Toronto and Calgary. A little less than half of the immigrants speak a language other than English most often in addition to the regular use of English at home, while slightly more than one quarter of immigrants speak only English at home. In Vancouver, more than half of immigrants speak a language other than English at home most often, with only one in five speaking only English. In the rest of Canada, the largest proportion (nearly 40%) of immigrants speaks only English at home, while only one third of immigrants speak a language other than English most often. Therefore, the places where people live also influence the home languages of immigrants.

Table 7: Distribution of Wages and Language Variables (mean values), by place of residence

Variables	Toronto	Vancouver	Calgary	ROC (Rest of Canada)
lnINC (log value of wages)	10.405	10.289	10.504	10.467
Language Variables:				
ENG1	0.274	0.204	0.255	0.390
ENG2	0.151	0.150	0.146	0.134
ENG3	0.471	0.511	0.495	0.340
ENG4	0.024	0.023	0.024	0.015
Sample Size	31957	10934	3861	15430

4. Econometric Model

In the econometric model, the dependent variable is the log of gross wages and salaries. The independent variables are those just described. .

Therefore, using the standard linear regression model, the econometric equation is the following:

$$\begin{aligned} \ln(INC)_i = & a_0 + a_1 \text{Language}_i + a_2 \text{Education}_i \\ & + a_3 \text{MaritalStatus}_i + a_4 \text{Birthplace}_i + a_5 \text{YSM}_i \\ & + a_6 \text{Age}_i + a_7 \text{Workstatus}_i + a_8 \text{Weeks}_i + S_i \end{aligned}$$

where $\ln(INC)_i$ is the natural logarithm of gross wages of individual i , Language_i is a group of dummy variables for home language variable of individual i , Birthplace_i is a group of dummy variables for place of birth of individual i , MaritalStatus_i is a dummy variables for marital status of individual i as defined earlier, Education_i is a group of dummy variable for highest education

level attained of individual i , YSM_i is the number of years since immigration of individual i , Age_i is the age of individual i , $Workstatus_i$ is a dummy variable for work status (full-time or part-time) of individual i in year 2010, $Weeks_i$ is the log value of the number of weeks worked of individual i in year 2010, and α_0 is the constant term and S_i is the error term.

5. Empirical Results

➤ Regression Analysis of the effect of home language, by gender

The empirical results are reported in Table 8 for males and females combined and separately for each gender. Overall, the regression results are significant and show the expected signs for the language variables. That is, the results show that home language is a significant factor that influences immigrants' earnings. The results also imply earning advantages for immigrants who speak English at home.

For the variable of home languages, I use *ENG1* (speak only English at home) as the reference group. The regression results show that the coefficient estimates for *ENG3* and *ENG4* are negative and significant at the 1% level, which means that the individuals who do not speak English as the main language at home suffer earning disadvantages. Specifically, individuals who speak only their native language at home (*ENG4*) earn about 10% less than those who speak only English at home. This earning gap is slightly higher for males than for females. The group of individuals who speak a language other than English most often at home while speaking English as a second language (*ENG3*) earns about seven to eight percent less than those who

speaking only English. Interestingly, the earning difference is small for individuals who speak English most often but still speak another language at home, with a non-significant effect of -0.2% for the overall sample. The effect is slightly larger (-2.5%) for the male sample. Therefore, it is obvious that the home language is an important factor that determines immigrant earnings, and that the individuals who speak only English at home have earning advantages. However, speaking one's native language as a second language has little effect on earnings.

I now consider the other variables in the regressions. For the education level, I use *UNI* (highest education is university or higher) as the reference. There is no doubt that higher education implies higher employment income; therefore the coefficient estimates of the education variables are negative and significant at the 1% level. The effect of education level on earning is higher for females than for males.

Regarding the effect of marital status on earnings, I use *Married* as the reference group. In the overall regression, the earnings of married individuals are 9.5% higher than those of single individuals. As most studies have shown, for single males, the earning level is much less than that of married men, but for women, the earning difference is not much different and not statistically significant.

For the place of birth variables, where the reference group is those who born in North America, most coefficient estimates are significant at the 5% level or higher. The largest negative coefficient estimate is the one for *China*, which implies that immigrants born in China earn about 10% less than those born in North America. This earning disadvantage is larger for males than for females (minus 11.1% and minus 7.2% respectively). The second largest negative coefficient is the one of *India* (minus 6.4% overall, and minus 8.2% for females and minus 3.9% for males).

As for the place of residence, I use the Rest of Canada (ROC) as reference. The individuals who live in Calgary earn 10.8% more than those who live in the rest of Canada, and the gap is larger for females (12.1%) than for males (9.2%). The individuals who live in Vancouver have -5% lower earnings than the reference group, and the wage gap is higher for males than for females. The earning differential for those live in Toronto is minor, at minus 1.7% overall and minus 4.7% for males and minus 1.5% for females.

The results show that work status is a significant factor that influences earnings. According to the regression, the immigrants who work full-time earn much more than those who work part-time. The earning advantage is larger for the male group. The coefficient estimates for Years since migration, Age, and Work Weeks are also significant, as expected. The coefficient of YSM indicates that every additional year in Canada increases the earnings of the immigrants by 0.8%.

Table 8: OLS Regression Results, by gender

	Overall	Male	Female
Language Variables (reference: ENG1):			
ENG2	-0.002 (0.009)	-0.025* (0.013)	-0.016 (0.013)
ENG3	-0.076*** (0.007)	-0.075*** (0.010)	-0.078*** (0.010)
ENG4	-0.097*** (0.021)	-0.086*** (0.030)	-0.109*** (0.030)
Education level (reference: University):			
High school and lower (HS)	-0.426*** (0.007)	-0.395*** (0.010)	-0.457*** (0.010)
College and equivalent (PS)	-0.238*** (0.007)	-0.219*** (0.011)	-0.256*** (0.010)
Marital Status: Single	-0.095*** (0.009)	-0.185*** (0.014)	-0.015 (0.013)
Place of Birth (reference: North America):			
South America	0.004 (0.017)	0.017 (0.025)	-0.003 (0.023)
Europe	0.050*** (0.011)	0.075*** (0.016)	0.034** (0.016)
Africa	0.048*** (0.017)	0.056*** (0.022)	0.051** (0.023)
China	-0.097*** (0.014)	-0.111*** (0.021)	-0.072*** (0.020)
India	-0.064*** (0.014)	-0.039** (0.020)	-0.082*** (0.019)
Philippines	-0.023*** (0.014)	-0.059*** (0.021)	-0.003 (0.019)
Other	-0.043*** (0.012)	-0.039** (0.017)	-0.045*** (0.016)
Gender:			
Male	0.187*** (0.006)		
Place of Residence (reference: Rest of Canada):			
Toronto	-0.017** (0.007)	-0.047*** (0.010)	-0.015 (0.010)
Vancouver	-0.047*** (0.009)	-0.053** (0.014)	-0.039*** (0.013)

Calgary	0.108***	0.092***	0.121***
	(0.013)	(0.018)	(0.019)
YSM	0.008***	0.008***	0.009***
	(0.000)	(0.000)	(0.000)
Age	0.001***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)
Work status: Full-time	0.893***	0.959***	0.786***
	(0.009)	(0.016)	(0.009)
Work Weeks (log value)	0.741***	0.747***	0.726***
	(0.007)	(0.010)	(0.009)
Constant	6.859***	6.944***	6.878***
	(0.030)	(0.047)	(0.039)
Observations	62,182	31,455	30,727
R²	0.365	0.320	0.393

Notes: The OLS regression is generated by taking the weighted values. Standard errors are in brackets. * indicates that the coefficient is significant at the 10% level, ** indicates that the coefficient is significant at the 5% level, *** indicates that the coefficient is significant at the 1% level. The coefficients without a star are not significant.

➤ **Regression analysis of the effect of home language, by place of residence**

Table 9 shows regression results separately for immigrants living in Toronto, Vancouver, Calgary, and the rest of Canada (ROC).

Regarding the effect of home language on earnings, the results are similar for Toronto and Vancouver. The earning differential is minor between immigrants who speak only English at home (*ENG1*) and those who also speak a language other than English on a regular basis (*ENG2*). The most significant earning differential is between the reference group (*ENG1*) and those who do not speak English at home (*ENG4*), which is approximately 10 percent earning difference. In Calgary, the most significant earning differential is between the reference group and the group who speak a language other than English most often (*ENG3*), with earning disadvantage of 15%. Surprisingly, in Calgary, there is no gap for those who speak only a language other than English,

perhaps because this group has a small sample size. In the rest of Canada, the effects of home language on earnings are similar to those in Toronto, while the earning disadvantage for those who use a language other than English appears to be smaller.

The effects of education on earnings are similar in all the places, while the earning differential is smaller in Vancouver than in the rest of Canada. The earning advantage for university-graduated persons is most significant in Toronto, the earnings being 43.4% higher than for those who graduated from high school and 27.6% higher than for those who graduated from colleges.

For the effect of birthplaces, the earning differential varies across cities. With immigrants born in North America being the reference group, immigrants from China, India and the Philippines suffer the highest earning disadvantages. The earning differential for immigrants born in China is the most significant, at -19.3% in Vancouver and -11.2% in Toronto, while in Calgary and the rest of Canada the earning differential is just minus 4 percent and not statistically significant. For immigrants born in India, the earning differential is also significant (-11.8% in Vancouver, and -9% in Toronto, and -3.6% in Calgary). The individuals born in Europe enjoy the largest earning advantages compared to the reference group. The earning differential is +4.4% in Vancouver and about +6.5% in Calgary. The earning disadvantages for those birthplaces are not significant in the ROC, likely because the few immigrants from those countries who choose the ROC regions go there because they have good job offers.

As expected, the earnings of males tend to be higher than those of females. In particular, the earning gap is about 16% in favour of males who live in Toronto, and over 20% for those who live in the ROC. The regression results also show that age, years since immigration, work status, and numbers of weeks worked are significant factors that influence immigrant earnings. Overall,

there are some differences across the regions. The effects of home language and birthplaces on earnings appear more statistically significant in Toronto and Vancouver.

Table 9: OLS Regression Results, by place of residence

	Toronto	Vancouver	Calgary	ROC (Rest of Canada)
Language Variables (reference: ENG1):				
ENG2	0.004 (0.013)	-0.013 (0.023)	-0.041 (0.041)	-0.017 (0.019)
ENG3	-0.084*** (0.010)	-0.058*** (0.018)	-0.149*** (0.033)	-0.066*** (0.016)
ENG4	-0.102*** (0.028)	-0.097** (0.049)	-0.009 (0.087)	-0.087* (0.051)
Education level (reference: University):				
High school and lower (HS)	-0.434*** (0.010)	-0.389*** (0.017)	-0.408*** (0.031)	-0.433*** (0.015)
College and equivalent (PS)	-0.276*** (0.010)	-0.158*** (0.018)	-0.196*** (0.033)	-0.219*** (0.015)
Marital Status: Single	-0.094*** (0.012)	-0.080*** (0.022)	-0.104*** (0.041)	-0.088*** (0.022)
Place of Birth (reference: North America):				
South America	-0.011 (0.021)	-0.042 (0.065)	0.056 (0.083)	0.039 (0.037)
Europe	0.054*** (0.016)	0.044 (0.039)	0.065 (0.056)	0.054*** (0.019)
Africa	0.025* (0.022)	0.070 (0.055)	-0.044 (0.066)	0.102*** (0.032)
China	-0.112*** (0.020)	-0.193*** (0.040)	-0.039 (0.066)	0.039 (0.032)
India	-0.090*** (0.019)	-0.118*** (0.042)	-0.036 (0.065)	0.015 (0.029)
Philippines	-0.034** (0.020)	-0.055** (0.014)	-0.026 (0.064)	-0.014 (0.027)
Other	-0.048**	-0.133***	0.000	-0.024

	(0.016)	(0.037)	(0.056)	(0.024)
Gender: Male	0.159***	0.209***	0.213***	0.223***
	(0.008)	(0.014)	(0.026)	(0.012)
YSM	0.010***	0.010***	0.007***	0.006***
	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.002***	0.002**	0.003**	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Work status: Full-time	0.906***	0.820***	0.854***	0.918***
	(0.013)	(0.020)	(0.004)	(0.017)
Work Weeks (log value)	0.733***	0.709***	0.746***	0.775***
	(0.009)	(0.016)	(0.029)	(0.014)
Constant	6.848***	6.899***	6.971***	6.762***
	(0.042)	(0.075)	(0.132)	(0.030)
Observations	31,957	10,934	3,861	15,430
R²	0.363	0.367	0.334	0.379

Notes: The OLS regression is generated by taking the weighted values. Standard errors are in brackets. * indicates that the coefficient is significant at the 10% level, ** indicates that the coefficient is significant at the 5% level, *** indicates that the coefficient is significant at the 1% level. The coefficients without a star are not significant.

➤ Regression analysis of the effect of home language, by birthplace

In this part, I will analyze the regression of home languages and earnings separately by place of birth. As noted before, the largest single countries of immigrants' birth are India, the Philippines, and China, each accounting for about 10 percent of the immigrants. In addition, according to Table 5, immigrants from Europe take the largest share of the population (25.5%). Therefore, I present separate regressions for immigrants from those four regions. The results are shown in Table 10.

The effects of home language on earnings are different for immigrants from different birthplaces. Overall, nearly all coefficient estimates are negative, which implies a negative relationship between earnings and using languages other than English at home. For the India, China and the

Philippines, the largest earning differentials are for the group that speaks a language other than English most often (*ENG3*), at -7% for Indian immigrants, -5.6% for Chinese immigrants, and -2.9% for immigrants from the Philippines, compared to those who speak only English at home. As for Europe, the earning disadvantage gets larger as the level of English use decreases. The largest earning gap is for those who speak only non-English at home (*ENG4*), which is -21.8% compared to those who speak only English. None of the coefficients are statistically significant for the Philippines.

As for the places of residence, using the Rest of Canada as the reference category, individuals from China have the largest negative coefficient estimates, at -20% in Vancouver and -15% in Toronto. The second largest coefficient is for those born in India, where the earning gap is -12.8% in Vancouver and -10.4% in Toronto. Generally, the coefficient estimates for Calgary are positive, which implies that immigrants in Calgary earn more than those in the Rest of Canada. In particular, individuals from the Philippines who live in Calgary earn 12.3% more than those who live in the rest of Canada. As for individuals from Europe, the coefficient estimates are positive, which implies earning advantages for immigrants from Europe who live in the three major metropolitan areas. The earning advantage is largest in Calgary (12%) and lowest in Toronto and Vancouver (2%).

The effect of gender on earnings is large for those born in India, with males earn 26.7% more than females. Ranking second are immigrant males from Europe, who earn 21% more than females. For individuals born in China and the Philippines, the gender earning gaps are 14.9% and 12.2% respectively. The education effects are also significant as expected, and the earning differential due to education is largest for the immigrants born in China, where those who

obtained education only at high school level earn 60 percent less than the reference group, which received university education. The coefficient estimates for YSM are all significant, while the coefficient of YSM for individuals from Europe (0.003) is smaller than the ones from all other places. Similarly, the coefficients of other control variables like age, and work status are also expectedly significant.

Table 10: OLS Regression Results, by birthplace

	Europe	China	India	Philippines
Language Variables (reference: ENG1):				
ENG2	-0.071*** (0.017)	-0.014*** (0.042)	-0.016 (0.033)	-0.010 (0.028)
ENG3	-0.155*** (0.015)	-0.056*** (0.026)	-0.070*** (0.026)	-0.029 (0.025)
ENG4	-0.218*** (0.056)	-0.045 (0.067)	-0.044 (0.054)	0.005 (0.055)
Education level (reference: University):				
High school and lower (HS)	-0.395*** (0.015)	-0.592*** (0.026)	-0.402*** (0.021)	-0.247*** (0.022)
College and equivalent (PS)	-0.222*** (0.014)	-0.374*** (0.032)	-0.191*** (0.027)	-0.135*** (0.021)
Marital Status: Single	-0.138*** (0.020)	-0.098*** (0.038)	-0.034 (0.042)	-0.052** (0.023)
Gender: Male	0.211*** (0.012)	0.149*** (0.020)	0.267*** (0.018)	0.122*** (0.017)
Place of Residence (reference: ROC):				
Toronto	0.029** (0.013)	-0.149** (0.029)	-0.104*** (0.025)	-0.029 (0.021)
Vancouver	0.023 (0.020)	-0.205*** (0.032)	-0.128** (0.043)	-0.037*** (0.024)
Calgary	0.120*** (0.027)	0.019 (0.046)	0.049 (0.043)	0.123*** (0.035)
YSM	0.003*** (0.000)	0.012*** (0.001)	0.013*** (0.001)	0.014*** (0.000)
Age	0.001* (0.000)	0.002 (0.001)	0.002* (0.001)	0.001 (0.000)
Work status: Full-time	0.881*** (0.018)	0.803*** (0.031)	0.744*** (0.030)	0.731*** (0.025)
Work Weeks (log value)	0.727*** (0.015)	0.806*** (0.022)	0.811*** (0.020)	0.683*** (0.017)
Constant	7.040*** (0.064)	6.620*** (0.097)	6.743*** (0.089)	6.998*** (0.078)

Observations	6144	5735	6805	6350
R²	0.345	0.402	0.347	0.360

Notes: The OLS regression is generated by taking the weighted values. Standard errors are in brackets. * indicates that the coefficient is significant at the 10% level, ** indicates that the coefficient is significant at the 5% level, *** indicates that the coefficient is significant at the 1% level. The coefficients without a star are not significant.

In summary, from the regression analysis above, we can conclude that home language is a key factor that influences immigrant's earning. The regression results show that the individuals who speak only English at home have earning advantages. Overall, individuals who speak only their native language at home (*ENG4*) earn about 10% less than those who speak only English at home. This earning gap is slightly higher for males than for females. The language effects on earnings are similar in Toronto and in the rest of Canada, but in Calgary, the individuals who speak a language other than English most often (*ENG3*) earned 15% less than those who speak only English at home. The earning differential is largest for individuals who were born in Europe and speak only non-English at home, which is -21.8%.

Other regression results showed that education level is a significant factor to immigrant earnings. Higher levels of education are associated with higher wages. The effect of education level on earnings is higher for females than for males, lower in Vancouver than in the rest of Canada, and higher for immigrants born in China.

As for birthplaces, the results show that individuals born in China earned 10 percent less than those born in North America, and this earning differential is higher for those who live in Vancouver (19.3%). The second largest earning disadvantage is for the individuals from India, which is 6.4 percent overall and 11.8 percent in Vancouver. But for individuals from Europe, the

earnings are higher than those of the reference group of immigrants from North America, and the difference is 12% in Calgary.

The regressions also show the effects of the other control variables on earnings. The control variables include marital status, years since immigration, age, work status, and number of weeks worked in the year. Overall, single individuals earned 10 percent less than married ones; this effect is higher for male than for females. The coefficient estimates for age, years since immigration and workweeks are also significant as expected.

6. Conclusion

In conclusion, the results of this paper show that home language is a significant factor that influences immigrant earnings. Better language ability is associated with higher employment income. The results also imply earning disadvantages for immigrants who speak only languages other than English at home in Canada outside Quebec.

This paper used 2011 NHS dataset and applied OLS regression estimates. The sample was restricted to employed immigrants aged 25 to 64 years and who lived outside Quebec. The regression results show that immigrants who speak only a language other than English at home earn about 10% less than those who speak only English at home. This earning disadvantage is more significant for females than for males. The language effects on earnings are similar in Toronto and in the rest of Canada, but in Calgary, the individuals who speak a language other than English most often (*ENG3*) earned 15% less than those who speak only English at home.

The largest earning disadvantages are for individuals from Europe who speak only a language other than English at home.

This paper also shows the effects of the other control variables on earnings. The control variables include education level, marital status, place of birth, place of residence, years since immigration, age, work status, and number of weeks worked in the year. As many studies have already shown, the coefficient estimates for age, years since immigration and workweeks are significant. As for the education level, there is no doubt that a higher education level implies higher earnings. The regression results show that individuals with high school and lower education level earn less than those who obtained education at university level. Regarding marital status, this paper shows that married immigrants earn more than single ones, and the effect of marriage is higher for males than for females. The regression results also show that immigrants who were born in North America have earning advantages over those who were born in Asia, especially China, India, and the Philippines.

Reference:

- Albouy, D. (2008). The wage gap between Francophones and Anglophones: A Canadian perspective, 1970–2000. *Canadian Journal of Economics*, 41(4), 1211-1238.
- Bleakley, H., & Chin, A. (2004). Language skills and earnings: Evidence from childhood immigrants. *Review of Economics and Statistics*, 86(2), 481-496.
- Boulet, J. A., & Raynauld, A. (1977). *L'analyse des disparités de revenus suivant l'origine ethnique et la langue sur le marché montréalais en 1961*, Economic Council of Canada (No. 83). Discussion Paper.
- Boyd, M., & Cao, X. (2009). Immigrant Language Proficiency, Earnings, and Language Policies. *Canadian Studies in Population*, 36(1-2), 63 – 86.
- Christofides, L. N., & Swidinsky, R. (2010). The economic returns to the knowledge and use of a second official language: English in Quebec and French in the Rest-of-Canada. *Canadian Public Policy*, 36(2), 137-158.
- Chiswick, B. R., & Miller, P. W. (1995). The Endogeneity between Language and Earnings: International Analyses. *Journal of Labor Economics*, 13(2), 246-288.
- Chiswick, B. R., & Miller, P. W. (2002) Immigrant earnings: Language skills, linguistic concentrations and the business cycle. *Journal of Population Economics*, Vol.15, No.1, 31-57
- Chiswick, B. R., & Miller, P. W. (2003). The Complementarity of Language and Other Human Capital: Immigrant Earnings in Canada. *Economics of Education Review*, 22(5), 469-480.
- Dustmann, C., & Van Soest, A. (2002). Language and the Earnings of Immigrants. *Industrial and Labor Relations Review*, 55(3), 473-492.
- Dustmann, C., & Fabbri, F. (2003). Language proficiency and labour market performance of immigrants in the UK. *The Economic Journal*, 113(489), 695-717.
- Grenier, G. (1984). The Effects of Language Characteristics on the Wages of Hispanic-American Males. *The Journal of Human Resources*, 19(1), 35–52.
- Li, P. S., & Dong, C. (2007). Earnings of Chinese immigrants in the enclave and mainstream economy. *Canadian Review of Sociology*, 44(1), 65-99.
- Nadeau, S., & Seckin, A. (2010). The immigrant wage gap in Canada: Quebec and the rest of Canada. *Canadian Public Policy*, 36(3), 265-285.
- Shapiro, D. M., & Stelcner, M. (1997). Language and Earnings in Quebec: Trends over Twenty Years, 1970-1990. *Canadian Public Policy*, 23(2), 115-140.

Tainer, E. (1988). English Language Proficiency and the Determination of Earnings among Foreign-Born Men. *The Journal of Human Resources*, 23(1), 108-122.

Veltman, C. J., Boulet, J. A., & Castonguay, C. (1979). The economic context of bilingualism and language transfer in the Montreal metropolitan area. *The Canadian Journal of Economics*, 12(3), 468-479.