

**Labour Market Performance of Immigrants and
the Assimilation Process:
An Analysis Based on Panel Data**

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Abstract

When immigrants enter the Canadian labour market, they earn less than the native born. As time spent in Canada lengthens, this earning gap diminishes in a process known as assimilation. This paper compares the wages of immigrants to the native born using panel data from Survey of Labour and Income Dynamics, 1996 – 2001. General least squares regression with random effects is used to analyse male and female earnings separately. The estimates show that both male and female immigrants have a very long assimilation process, and it is unlikely for them to catch up in earnings with the native born. The result implies incompatibility between existing immigration policy and Canadian labour market demand, and suggests that the policy aim at long-term labour market demand for immigrants.

1. Introduction

In 1962 Canada put in place an immigration policy whereby admission was based on characteristics of the applicants, such as age, education, employment opportunities in Canada and fluency in English or French. This policy was refined in 1967 by allocating points to applicants based on the above-mentioned observable characteristics, which has set up a prototype of the present points system. Immigration admission is then based on whether the applicant's total points exceed the pass mark.

Such a points system is designed to guarantee the good quality of incoming immigrants' human capital and high probability of their career success in Canada. Green and Green (1995) found that the points system allows for partial control over occupational composition, and that the inflow of labour force participants could have been shifted away from lower skilled occupations towards higher skilled categories. However, the recognition of family members, refugees and assisted relatives as immigrant categories in the late 1970s has reduced the proportion of immigration based on the points system and led to a decline in the average skill level of immigrants. On the other hand, changes in the proportion of immigrants by source country over time had much larger effects on the skill level of the inflow of immigrants, pushing them away from high-skilled professionals and towards low-skilled manufacturing workers. One measure of labour market success is individual's employment earnings, new immigrants' earnings are usually compared to the earnings of the native born to study the entry effect in wage differentials.

2. Literature Review

Many economists have shown that more recent immigrants are facing greater challenges competing in Canada's labour markets, in spite of an upward trend in their educational attainments. Baker and Benjamin (1994), Bloom, Grenier, and Gunderson (1995), and Aydemir (2003) compared labour market outcomes of immigrants to those of the Canadian-born by years-since-migration (YSM), gender and education level. They all found that the economic performance of immigrants has declined over the past two decades. The entry earnings of more recent immigrant cohorts have deteriorated significantly, with lower earnings, low employment and low labour force participation rates. Gray, Mills and Zandvakili (2003) also stated that the earnings gap remained stable over the 1990s.

Frenette and Morrisette (2003) examined the earnings disparity between immigrant cohorts and Canadian-born workers, and found that recent immigrants, in comparison to the earlier cohorts, are facing even larger entry earning gaps while lower growth rates to catch up with native Canadians. By using the 1981-2001 Census data, they compared the immigrant cohorts to the Canadian-born, and found higher average educational attainment of the immigrants. The education difference is growing for these years, as recent immigrants have much higher proportions of university graduates than the Canadian-born labour force participants. However, recent immigrants have shorter work experience, higher marital rates, larger share of visible minorities, and higher proportions settling in larger urban areas than the Canadian-born. Since immigrants' foreign work experience is not generally recognized by Canadian employers, they are treated as new entrants to the labour

market, and their performance is highly influenced by business cycle fluctuations. During economic recessions with fewer job vacancies, immigrants have to take the low-compensation positions. Frenette and Morrisette found a substantial deterioration of entry earnings of immigrants in the two decades: the earning differential between immigrants and Canadian-born about doubled between 1980 and 2000. Following Green and Worswick (2003), they also partially attributed the poor performance of recent immigrants to the deterioration in the age-earnings profile of all new labour market participants. On the other hand, recent immigrants have not shown as high a assimilation rate as the earlier cohorts. As a long-term consequence, it takes a much longer time for their earnings to converge with their Canadian counterparts.

Ferrer and Riddell (2004) also studied the returns to immigrants' education and skills to examine Citizenship and Immigration Canada's effort to assess credentials. Educational attainment is divided into years of schooling and degree received to separate their different effects on earnings. The estimation of Census data shows lower returns to foreign years of schooling and foreign work experience than comparable Canadian-born workers, but the same (if not higher) returns to diplomas, certificates or degrees obtained by these immigrants. Immigrants with high school diplomas and bachelor's degrees have earning gains in Canada similar to their Canadian counterparts, while those with college diplomas, trade certificates or university postgraduate degrees enjoy even higher returns than the Canadian-born. Thus, completion of an educational program by an immigrant yields significantly higher earnings gain than does unfinished education. Region of origin is

suggested to be one possible reason for differential recognition of credentials. This is because immigrants from the US or European countries, with education systems traditionally thought to be similar to that of Canada, tend to have returns to education similar in both dimensions as Canadian-born, whereas immigrants from other countries have lower returns to schooling years but higher returns to diplomas and degrees.

Sweetman (2003) analyzed the consistency of the immigrants' education from the source country with Canadian education by using 1986, 1991 and 1996 Canadian censuses data. He found a positive relationship between this consistency and immigrant earnings in Canada. On the other hand, if immigration occurred at a young age, a person's earning is not affected by his/her source country. So he indicated the consistency of educational system an important factor in earning profiles. Some U.S. researches also tried to find the reason why the foreign born generally have a lower return to their education than the native born. Chiswick and Miller (2005) studied male workers from the 2000 Census of the United States, and divided their education into occupational average level and under-education level. Both immigrants and the native born have same return to their required education level. However, immigrants from non-English speaking developing countries have stronger effect of under-education but smaller return to over-education than the native born. This difference accounts for the majority of differentials in return to education, and it could also be linked to immigrants' countries of origin, for instance, English-speaking immigrants from a developed country have similar return patterns to the native born.

Although recent immigrants may initially earn significantly less than their native-born counterparts or immigrants from earlier cohorts, they are often expected to enjoy higher earnings growth, and the negative entry effect decreases or even dissipates. This phenomenon, usually called assimilation, is seen as a reward to intensive effort in human capital investment, such as increase in language fluency, signaling skills and expertise, and familiarity with the local labour market, all associated with work experience in Canada.

However, empirical studies have shown somewhat pessimistic prospects of assimilation for recent immigrants. Baker and Benjamin (1994) and Bloom, Grenier and Gunderson (1995) both analyzed 1971, 1981 and 1991 Canadian Census data and found only modest evidence of assimilation for recent immigrant cohorts, but significant evidence of permanent cohort effects, which suggests lower earnings will persist over time. They attributed the declining immigrant productivity to changes in the composition of immigrants by immigration class over arrival periods, and to changes in the distribution of immigrants across source countries. The removal of preferential treatment from traditional source countries led to an expansion of the pool of immigrants and a significant change in the composition of more recent immigrant cohorts. Gray, Mills and Zandvakili (2003) found that the structure of income differentials associated with education levels and age groups are roughly similar for immigrant groups and Canadian-born workers; that result makes more ambiguous the explanation of recent immigrants' performance.

3. Data file and descriptions

Most of the literature use cross-sectional data files such as the Census. However, this paper exploits panel data from the Survey of Labour and Income Dynamics (SLID). Introduced in 1993 by Statistics Canada, SLID became a replacement of the Survey of Consumer Finances (SCF) and Labour Market Activity Survey (LMAS) since 1996¹. SLID is a longitudinal survey on labour market activities, transitions and incomes of Canadian individuals, families and households. The SLID file provides a large selection of human capital variables and demographic characteristics such as education, family composition, ethnic background. Most importantly for present purposes, the file has detailed information on the year of immigrant arrival, which is not available on public data. The longitudinal sample weights are applied to the data set to generalize the results to the Canadian population.

Two overlapping six-year SLID panels are available, 1993 - 1998 and 1996 - 2001; each panel consists of about 30,000 adults. In this paper, the second panel of 1996 - 2001 is chosen in order to analyze the most recent trend in labour market performance. Two interviews are conducted in each of the six survey years: labour force activity information referring to the previous calendar year is collected in January and income information is collected in May.

In this study, the SLID sample is restricted to individuals aged between 16 and 69 in the survey years. Paid workers are selected for analysis, and self-employed and unpaid family workers, which together account for less than one percent of the population, are excluded.

¹ Statistics Canada (2005) "Survey of Labour and Income Dynamics (SLID) - A survey overview" (<http://www.statcan.ca.libaccess.lib.mcmaster.ca/english/freepub/75F0011XIE/75F0011XIE2005001.htm>)

By this restriction, the variable of composite hourly wage, calculated based on the implicit earnings for all paid-worker jobs, can be used to measure a person's earnings, or labour market performance. Since about 80 percent of the income information is obtained from the respondents' income tax files by permission, the reliability of the income-related variables is high. The 1996-2001 panels of SLID provide a data set of 26374 men, including 2260 immigrants, and 25577 women, including 2167 immigrants. However, there are gaps within the panel, such that each person has only four, rather than six, observations on average. This is partly because of the restriction set on age: after the first year, those turning older than 69 will leave the panel, while new entrants over 16 will be added to the data. Another cause of the gap stems from exclusion of observations missing key variables in such as wages, experience between periods of labour market inactivity, or years since migration for immigrants.

The SLID reports number of years of work experience (full-year full-time equivalents) that is not available in Census. This variable could be a more accurate measure of experience than the common proxy calculated as age less years of schooling and less 6. However, SLID does not report whether work experience is accumulated inside or outside Canada and, therefore, an immigrant's experience cannot be separated into experience before immigration and after. Then there is also a tradeoff between accuracy and separability. Because the after-migration effect for immigrants could be captured by years since immigration, a key variable in estimating assimilation process, the full-year full-time equivalent years of experience is thus used in the analysis.

A dummy variable of immigration status measures the earning differentials between immigrants and native born Canadians. Other key explanatory variables usually used in wage earning models include age and educational attainment. A series of dummies indicating visible minority, marital status, city and province of residence and immigrant's country of origin are introduced to control for the effects of demographic characteristics.

Table 1 reports mean values of selected characteristics for native born and immigrants, by gender, over all the six survey years. The first two columns compare male immigrants and native-born Canadians, and some significant differences are found between the two groups. The immigrants have relatively high values for some characteristics associated with higher earnings, such as age, work experience, educational attainment, being married and residence in major cities, but low values in others, such as proficiency in one or other official language and whether receiving social assistance. The average hourly wage for male immigrants is \$15.33, which is higher than the native born by \$1.57. The average age of male immigrants is 38.68, 5.26 years more than native born. Since current Canadian immigration policy encourages skilled workers aged between 21 and 49, then a large immigrant population starts their career in Canada after twenty years old, the average age is therefore upward biased, and higher than the native-born. In the same manner, as longer work experience before migration is given more weight in immigration policy, immigrants (especially those in the skilled-worker class) usually land in Canada with some previous experience, which is different from the native new entrants to the labour force. On average, immigrants have experience of 15.4 years, 2.6 years longer than the natives. Over 63

percent of immigrants are employed with a full-time job for a full-year, a ratio that is higher than the native born by 13 percentage point. It is then, not surprising to see that a relatively small proportion of immigrants receive social assistance such as employment insurance benefits.

The male's distribution of highest educational level is also in favour of the immigrant group, a quarter of whom have university degrees and higher, whereas less than 15 percent of the native born have equivalent education. This might result from the immigration points system and a self-selection mechanism, because university graduates are scored much higher than the other education levels and better educated people are more likely to move. In order to test whether there is poorer recognition of an immigrant's educational attainment obtained in a foreign country than those obtained in Canada, three dummies indicating foreign education are derived. If the immigrant's year of award of postsecondary certificate or highest university degree precedes the year of immigration, his highest educational attainment is treated as foreign. Eight percent of immigrants earned their highest university degree before immigration, which is about one third of all immigrants with university degrees. The proportion of immigrants with foreign postsecondary certificates is 9 percent, also one third of that category. The year of graduation from high school is not available in SLID, an indicator of the place where most of a person's elementary and high school education is received could be introduced as a proxy for foreign education. Probably an immigrant might have been primarily educated in a foreign country but, after arriving in Canada, continued studying in a Canadian high school and

completed the education there. About half of immigrants with high school education graduated from foreign schools, which account for 15.3 percent of male immigrant population.

One third of immigrants report one of Canada's official languages as their mother tongue, compared to 95 percent of the native born. The visible minority proportion of male immigrants is 40 percentage points higher than that of the natives. Two thirds of immigrants are married, compared to less than 50 percent for natives. Immigrants are more likely to choose major cities like Toronto, Vancouver and Montreal for their residence. About 58 percent of them are living in these three cities and surrounding areas, more than two times the ratio for the natives. On arriving in a new country, it is natural for immigrants to favour big cities, where they have better access to employment information, more employment opportunities, higher exposure to the society, and gain support from others recently settled from their countries of origin.

The third and fourth columns of Table 1 compare female immigrants and native born Canadians. Female employees generally have lower hourly wage and less work experience than their male counterparts. Female immigrants earn \$12.02 per hour on average, 67 cents higher than the native born; immigrants also lead in average age and work experience, by 6 years and 2.6 years respectively. The proportion with full-time full-year jobs is lower for both female groups than males, but immigrant women have a proportion that is 13 percentage points higher than for natives women. There is little difference in the distribution of education level between female immigrants and natives. One third of both

immigrant and native women have completed high school education and about 20 percent have university degrees, and 6.7 percent of them are obtained before immigration. Although a larger proportion of female immigrants than men speak English or French, the ratio is still as low as 40 percent. Their visible minority proportion, marital status and residence in major cities are similar to their male counterparts of both groups. The average years since migration (YSM) is about 20 years for both male and female immigrants.

Table 2 shows the countries of origin for immigrants. The U.K. is the largest source for both genders. Western and Eastern Europe have similar proportions, ranging from 7 to 9 percent. Almost 15 percent male immigrants come from South Europe, but the female share is slightly less than 10 percent. In total, about 45 percent of all immigrants have European background. They are mainly the beneficiaries from the old immigration policies prior to where preference was given to these traditional countries.

After the adoption of points system, a substantial change happened to the source country composition, and an increasing number of immigrants from less developed countries flowed into Canada. Nowadays, Asian countries have become the largest source of immigrants. As reported by Citizenship and Immigration Canada², China and India rank highest in the top source country chart in 2003, and they alone accounted for over one quarter of immigrant inflow in that year. The top five countries are all in Asia, and the U.K. was in 9th place with a share of only 2.3 percent. In fact, starting from the sixth place (USA), no single country accounts for more than three percent. Such a trend toward

² Canada - Permanent Residents by Top Source Countries 2003, published by Strategic Research and Statistics Division, Citizenship and Immigration Canada (CIC) Feb. 2005. (<http://www.cic.gc.ca/english/pub/facts2003/permanent/12.html>)

diversification in countries of origin is also reflected in the SLID data, which shows a large proportion of Asian immigrants during 1996 to 2001: about 34 percent of male and 30 percent of female migrants were from Asia (including the Mideast).

4. Regression Analysis

4.1. Native born Canadian's earning profile

The earnings function of native-born is:

$$\ln W_i = b_1 (AGE_i - 30) + b_2 (AGE_i - 30)^2 + b_3 (EXP_i - 5) + b_4 (EXP_i - 5)^2 + c_k X_{k,i} + U_i \quad (1)$$

where W_i is the hourly earnings; AGE_i is the individual's age in the reference year; EXP_i is the number of years of full-year equivalent labour market experience; $X_{k,i}$ is a vector of socio-economic characteristics such as marital status, educational attainment and place of residence; U_i is the residual term. Since the average age of all the observations is over thirty, we use age less thirty to make the horizontal abscissa begin at the age of thirty. In like manner, the variable of experience less five starts the model with five years of experience. Then the vertical intercept shows the log wage of a thirty-year old native born in the default groups with five full-year equivalent experience.

Because the panel data file provides six years information of each individual, the general least square regression (GLS) is run with random effects to control over the time series factor. The results for male native born are shown in the first column of Table 3. There are significantly positive returns to diplomas, certificates or degrees. The earnings of high school graduates are 7.2 percent higher than for those who have not graduated, ceteris

paribus; a postsecondary certificate increases the wage by 15.3 percent. Most significantly, individuals with university degrees or higher educational attainments earn 35 percent more than those without completed high school. A French speaking Canadian worker earns 0.7 percent more than an English speaker, and a male whose mother tongue is not one of the two official languages might have a lower wage rate than those speaks English by 0.2 percentage points. However, the joint test of the two language dummies is not significant. This might be explained by the low proportion (less than 5 percent) of the native born speaking other languages and the correlation between French speakers and Quebec. A full-year full-time job yields a 5.8 percent higher wage rate. A native born visible minority is estimated to earn 1.9 percent less than a white person with the same characteristics, while a married Canadian male earns 5.5 percent more than a single (never married, divorced, or widowed) male. Those living in Toronto, Vancouver and Montreal enjoy earnings higher than elsewhere in Canada by 7.8, 2.1 and 7.1 percent, respectively. Ontario is the default province: men residing in other provinces have significantly lower earnings except for those in British Columbia, USA and the territories, but the positive coefficients of the latter two areas are insignificant.

It is a little more complicated to interpret the effects of age and work experience when they are entered in quadratic forms, as defined in most labour-earning literature. The age profile is $0.0176(AGE - 30) - 0.0005 (AGE - 30)^2$, which implies diminishing returns to age with a maximum at age 48. The experience profile is $0.0167(EXP - 5) - 0.0004(EXP - 5)^2$, which implies that the earnings of a male will increase by 7.4 percent after 10 years of

experience, 16.7 percent after 20 years, and 18.6 after 30 years. The maximum return occurs at about 28 years of experience.

The results for native born females are reported in the first column of Table 4. Most coefficients are similar to those for males, but we see that the age-earning profile is flatter for women, with the peak appearing about six years earlier, and that the highest return to work experience is 35 years, seven year later than for males. Women with a university degree earn 43 percent more than high school dropouts.

4.2. Immigrant and native born pooled data without immigrant-specific returns

The native born and immigrant observations are pooled together and the equation estimated. The estimating equation for immigrants is adopted from Chiswick (1978). In addition to an immigrant dummy, a new variable year-since-migration (*YSM*) is introduced to measure the assimilation process, and dummy variables are used to measure the effect of the country of origin. The earnings function for the immigrants then becomes:

$$\ln W_i = a IM_i + b_1 (AGE_i - 30) + b_2 (AGE_i - 30)^2 + b_3 (EXP_i - 5) + b_4 (EXP_i - 5)^2 + b_5 YSM_i + b_6 YSM_i^2 + b_7 COUNTRY_i + c_k X_{k,i} + U_i \quad (2)$$

where *IM* is the immigrant dummy variable to measure the earning differentials in the intercept; *YSM* is year-since-migration, and *COUNTRY* is a vector of dummy variables indicating country of origin. On arriving in Canada immigrants may earn less than the native born, but the earnings differential is reduced over time if the coefficient of *YSM* is positive.

The second column of Table 3 presents the estimated marginal effects for male native born and immigrants. The estimated coefficients of age, work experience and full time position are close to those in the first column, the native Canadian regression result.

United Kingdom is chosen as the default country of origin for immigrants, and the immigration dummy measures the wage differential between a native born and a British immigrant at age 30 with 5 years experience. Its significant negative coefficient shows that the immigrant earns 15 percent lower than a native born, other things being equal. However, immigrants gain additional returns to their residence in Canada due to the assimilation process, the effect measured by YSM in our model: $0.011YSM - 0.0001YSM^2$. The percentage increase in earnings at different YSM is about 1.1 for 1 year; 5.2 for 5 years; 9.8, 10 years; 17.2, 20 years; and 22.2 for 30 years.

With immigrant data included in the regression, the proportion of people who do not speak English or French increases and their wages are 1.3 percent lower than the English speakers. There is also a strong negative effect associated with the visible minority group, who earn an estimated 4.1 percent less than whites. Immigrants born in other major source countries earn less than those from U.K, the default country of origin.

For females, the results in the second column of Table 4 show that the earning gap between immigrants and native born is as high as 22.2 percentage points, much wider than males, but their YSM coefficient estimates are higher in absolute value than the males. Thus the female's assimilation process might be quite different from the males. On the other hand, there is no evidence that a female visible minority earns less than a white. Like males,

almost all the source country dummies have negative coefficient estimates.

4.3. Immigrant and native born pooled data with immigrant-specific returns

In the third specification, immigrants can have returns to education and work experience that differ from those for the native born, and thus their earnings function may have different slope coefficients. That is, the earnings function is modeled as:

$$\ln W_i = a IM_i + (b_1 + b_{1m})(AGE_i - 30) + (b_2 + b_{2m})(AGE_i - 30)^2 + (b_3 + b_{3m})(EXP_i - 5) + (b_4 + b_{4m})(EXP_i - 5)^2 + b_{5m} YSM_i + b_{5m} YSM_i^2 + b_{6m} COUNTRY_i + c_k X_{k,i} + U_i \quad (3)$$

where the subscript m means immigrant-specific.

Equation (3) can be written into (4), which includes interacted terms between immigration status and other variables

$$\ln W_i = a IM_i + b_1 AGE_i + b_{1m} AGE_i * IM_i + b_2 AGE_i^2 + b_{2m} AGE_i^2 * IM_i + b_3 EXP_i + b_{3m} EXP_i * IM_i + b_4 EXP_i^2 + b_{4m} EXP_i^2 * IM_i + b_{5m} YSM_i + b_{5m} YSM_i^2 + b_{6m} COUNTRY_i + c_k X_{k,i} + U_i \quad (4)$$

The result of the GLS regression with random effect is reported in Table 3 column (3) for males and Table 4 column (3) for females.

The estimates of a male immigrant's age profiles put him in a slightly disadvantageous position in comparison to a male native born: although immigrants have peak earnings about three years earlier than the native born, their marginal increase in earnings is generally lower. However, the estimated coefficients of the interaction between male immigrant and experience are both insignificantly positive, so there is no evidence in the

SLID data that immigrants suffer from a lower return to their work experience. The coefficients of years since migration terms are both lower in absolute value than those in Column (2), which implies a smaller effect on wage growth. The percentage increase in earnings at different *YSM* is then 0.9 for 1 year; 4.4 for 5 years; 8.3, 10 years; 14.4, 20 years; and 18.3 for 30 years. However, a more accurate assimilation process should be estimated together with age and experience, because the two variables will increase with time spent in Canada. A comparison of the marginal effect of years between immigrants and the native born is presented in Table 5, and will be further discussed in the section 4.5.

The male immigrants' educational attainments before immigration all have negative coefficient estimates, which might indicate lower returns to their education than those obtained in Canada after immigration. However, the differences in postsecondary certificate and university degree holders are not significant.

The regression result of females is reported in column (3) of Table 4, where most of the coefficient estimates of the control variables are not too far away from the second column. When the immigrant-specific factors are controlled, female immigrants tend to earn 25.4 percent lower than the native born at age thirty with five years experience. However, the years since migration variables have higher coefficient estimates, which make the assimilation process shorter than if calculated by column (2). Although female immigrants do not seem to have lower return to their ages than native born women, but they do suffer substantially from the lower returns to work experience. The negative coefficient of the immigrant and experience interacted variable offsets the gain from *YSM* and results in a

persistently lower magnitude in earnings growth than for the native born.

4.4. Regression with immigrant data only

Finally an equation with immigrant data only is regressed and the result is reported in column (4) of Table 3 and 4 for males and females separately. The coefficient estimates of YSM, age, experience and schooling years are similar to those in column (3) with adjustment of immigrant-specific effects. However, the significance level of all these estimates and the overall explanatory power of the earnings function become lower because of the small immigrant sample size.

The immigrant's foreign education background does not benefit them in terms of earnings: men tend to have lower returns to their foreign education than a Canadian equivalent at all levels, but women only suffer from lower returns to pre-immigration university degrees. This might indicate a poor recognition of the immigrants' foreign educational attainment in Canadian labour market.

The coefficient of the visible minority dummy for males is substantially negative, but female immigrant of visible minority earns 11 percent more than a white. On the other hand, the coefficients of men's residence in the CMA cities like Toronto and Montreal are significantly negative. Male immigrants living in these major cities are therefore not rewarded by their residence decisions, in spite of the great tendency for them to gather in there. However, female immigrants living in Toronto and Montreal earn significantly more than those in other cities. The contrary effects of visible minority and CMA cities between

men and women are probably caused by the large income variability within each category. As shown in Table 1, the immigrants' proportion of visible minority and CMA cities are high, comparing to the native born, and enlarges the heterogeneity of earnings among non-white immigrants and among those living in major cities as well.

4.5. Wage profiles comparison between immigrants and the native born

To compare the assimilation process, I simulate the wage profile for immigrants and the native born, using regression estimates from the third column of Table 3 and 4. The comparison is conducted under different scenarios for either gender group: men's results are reported by Figure 1 to 4, and women's by Figure 5 to 8. The starting age for all the representatives is twenty, and they have zero full-time full year experience.

The first pair of males are both English speakers who have completed high school education. The immigrant was mainly educated in U.K and migrated to Canada at age twenty, before which he had never worked. After arriving in Canada, he is assumed to work full time full year for the rest of his career. Then his age, years since migration and experience all increase by one for every one more year spent. Likewise, the native born Canadian's wage profile also starts at twenty years old with no experience. Additionally, they are assumed to have the same marital status and city of residence, those characteristic dummies do not need to be included in comparison. Their earning profiles are simulated from age 20 to 60 in Figure 1 in log wage terms. Initially the immigrant's wage is higher than the native born, mainly due to the negative coefficients of immigration status and

foreign education. However, As time passes, experience starts to play a more important role in their wage growth, and male immigrants' superiority in experience exceeds the inferiority in age and, in combination with the extra gain from YSM, their earnings rise permanently faster than the native born, which is shown by the immigrant's steeper earnings curve. After twenty years working in Canada, he could catch up and even exceed the native worker.

The restriction in the first scenario should be noticed that both of them are assumed to work full-time full-year and they accumulate experience along with time at the same speed. However, this assumption does not reflect the prevailing situation, especially for the new labour market entrants, who probably have to spend several months or even years in job-searching and start with part-time jobs. An alternative scenario that could therefore be considered is where all the individuals work full-time jobs for only six months in a year. Then every year a person's age and years since migration increase by 1, but the full-year full-time experience increases by 0.5. (The choice of 0.5 is because the likelihood of a full-time full-year job ranges between 40 and 60 percent, as reported in Table 1.) Figure 2 plots the earnings profiles of both representatives and shows a longer assimilation for the immigrant. It takes about 24 years for the immigrant's earnings curve to intersect the native's, when they are 44 years old. But the change of slope (due to the change in experience assumption) doesn't affect the length of assimilation substantially.

Under the second scenario, immigrants from another large group of source countries, Eastern Asia, is selected. The immigrant representative is compared to a native born whose

doesn't speak English or French. In Figure 3, their initial earnings gap (the distance between the intercepts) at age twenty is wider than that under the first scenario, *ceteris paribus*. This is obviously due to the negative coefficients of the interacted variable of other languages and immigration and the Eastern Asian source country dummy. While the rest assumptions on education and full-time full-year job remain unchanged, the slopes of their wage profiles are still the same as those in Figure 1. However, the larger earnings differential has made the immigrant's assimilation process as long as 32 years when male native born's wage rate has passed the maximum and starts to decline. On the other hand, if we apply full-time half-year restriction on the simulation, Figure 4 indicates that the immigrant cannot possibly catch up in earnings until the end of their career life. Therefore, the assimilation period is quite sensitive to the initial earnings gap.

Figure 5 compare female U.K. immigrants to the native born with no experience at age twenty. Under full-time full-year job scenario, the immigrant's earnings profile crosses the native's at age 34, which implies an assimilation process of 14 years, shorter than her male counterpart by 6 years. When both women work full-time half-year, Figure 6 shows an even earlier intersection of their earnings curves at age 31. This is because the immigrant's return to experience is lower than the native born, and the earnings gap is then narrowed at a quicker rate when the accumulation of experience is smaller.

In Figure 7 a female immigrant from Eastern Asia is compared to a native born and the intercept difference is widened by the negative coefficients of other languages and country of origin. Then it takes 19 years for the immigrant to catch up in earnings. On the other

hand, the full-time half-year job assumption of Figure 8 doesn't substantially change the assimilation period. Like their male counterparts, the assimilation process is more sensitive to the change in the intercept than in the slopes.

5. Conclusion

The labour market performance of immigrants in Canada is studied in terms of their hourly wage earnings. Both male and female immigrants' average hourly wages are higher than the native born. However, when human capital variables are controlled for, the GLS regression shows a significantly negative effect of being an immigrant. Given the number of years of experience, a female immigrant's wage earning increases by a smaller percentage and reaches the maximum later than a native born. But the effect on log wage of a male immigrant's experience is higher than that of a native born. For both genders, a foreign-obtained university degree brings immigrants lower returns than a Canadian degree, but immigrants with less education vary in returns to their foreign educational attainment between males and females.

By simulating the earning profiles for different representatives of both groups, I find that the assimilation process of male immigrants is more sensitive to the difference in intercepts than that in slope. An immigrant from a non-English speaking Asian country tends to take ten years longer than one from U.K. to catch up in earnings with a native born counterpart. For the female immigrants, Years since migration (YSM) is more important in deciding their earning growth rates than for the males. Additionally, the smaller initial

earning differential between female immigrants and the native born has shortened the assimilation process. The variance of earnings catching time is wide, ranging from less than 15 years for a female U.K. immigrant to more than 30 years for a male Eastern Asian immigrant. Therefore, it is important for the immigration authority to take into account the international transferability of applicants' skills, such as language and education. Although the present point system of immigration policy gives weights to the individual's human capital characteristics, the productivity of the new arrivals is not fully recognized by Canadian labour market, as shown by the negative coefficients of these interacted immigrant-specific variables. It might take longer than one generation for immigrants from non-official language speaking developing countries to be integrated into the Canadian society and labour market. Due to the long time period of immigration legislation and processing, an immigration decision criteria based on future market demand is highly recommended. More detailed studies of a variety of Canadian industries and an overall economic forecast should be conducted in order to predict the future human resource requirement, and the points given to the immigration applicants could be adjusted accordingly. Immigrants admitted by these standards would be more fit for the labour market when they land in Canada, and the assimilation process could be shortened.

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Table 1. Mean Observable Characteristics by immigrant status (SLID 1996-2001)

	<i>Males</i>		<i>Females</i>	
	<i>Native-born (96247)</i>	<i>Immigrants (8340)</i>	<i>Native-born (94520)</i>	<i>Immigrants (8261)</i>
Wage Rate (\$/hour)	13.759	15.329	11.350	12.018
Age (years)	33.409	38.676	32.958	38.929
Experience (years)	12.813	15.407	9.580	12.170
Years Since Migration (YSM)	-	19.978	-	20.496
Full-time Full-year Job	0.504	0.631	0.396	0.527
Receiving Compensation	0.289	0.212	0.244	0.194
Less than High School	0.200	0.159	0.132	0.148
Graduated High School	0.352	0.298	0.352	0.330
Postsecondary certificate	0.299	0.285	0.330	0.305
University Degree	0.146	0.252	0.183	0.212
Foreign High School	-	0.153	-	0.176
Certificate before Immigration	-	0.090	-	0.073
University before Immigration	-	0.084	-	0.067
English	0.679	0.322	0.701	0.381
French	0.272	0.022	0.252	0.015
Visible Minority	0.020	0.434	0.027	0.439
Married	0.491	0.664	0.494	0.625
Toronto	0.082	0.344	0.090	0.373
Vancouver	0.046	0.128	0.055	0.112
Montreal	0.100	0.104	0.101	0.080

* sample size is reported in parentheses.

Table 2. Percentages of countries of origin for immigrants by genders (SLID 1996-2001)

	<i>Male (8340)</i>	<i>Female (8261)</i>
U.K.	0.155	0.166
Western Europe	0.074	0.092
Eastern Europe	0.076	0.084
Northern Europe	0.005	0.004
Southern Europe	0.147	0.099
Eastern Asia	0.097	0.080
Southeast Asia	0.112	0.131
Southern Asia	0.091	0.039
Middle East	0.040	0.049
USA	0.031	0.066
Caribbean	0.036	0.052
Mexico and Central America	0.021	0.021
South America	0.055	0.032
Africa	0.041	0.058
Australia, New Zealand	0.013	0.025

Table 3. Random Effects Earning Functions, Males, SLID 1996-2001 Panel Data

	(1) Native born Canadians		(2) No Immigrant- specific returns		(3) With Immigrant- specific returns			(4) Immigrants				
	Coefficients	Std. Err	Coefficients	Std. Err	Coefficients	Std. Err		Coefficients	Std. Err			
Immigration Status (IM)			-0.1497	0.0270	-5.55	-0.1350	0.0312	-4.33				
YSM	-	-	0.0110	0.0018	6.16	0.0094	0.0019	4.84	0.0101	0.0022	4.62	
YSM ²	-	-	-0.00012	0.00004	-3.49	-0.00011	0.00004	-2.97	-0.00012	0.00004	-2.88	
Age - 30	0.0176	0.0005	33.85	0.0172	0.0005	34.64	0.0178	0.0005	33.94	0.0112	0.0019	5.98
(Age - 30) ²	-0.00049	0.00002	-22.94	-0.00050	0.00002	-25.01	-0.00050	0.00002	-22.96	-0.00040	0.00007	-6.14
(Age - 30)*IM						-0.0052	0.0017	-3.14				
(Age - 30) ² *IM						0.00009	0.00006	1.52				
Experience - 5	0.0167	0.0007	22.47	0.0167	0.0007	23.74	0.0164	0.0007	21.93	0.0194	0.0022	8.66
(Experience - 5) ²	-0.00037	0.00002	-15.99	-0.00035	0.00002	-16.27	-0.00036	0.00002	-15.69	-0.00031	0.00006	-5.01
(Experience - 5)*IM						0.0029	0.0021	1.39				
(Experience - 5) ² *IM						0.00003	0.00006	0.56				
<i>Educational Attainment: (Default: Less than High School, Native Born)</i>												
Graduated High School	0.0720	0.0038	19.03	0.0690	0.0037	18.59	0.0699	0.0037	18.72	0.0405	0.0210	1.93
Postsecondary certificate	0.1534	0.0046	33.51	0.1502	0.0045	33.61	0.1493	0.0045	33.28	0.0655	0.0207	3.16
University Degree	0.3500	0.0064	54.74	0.3432	0.0061	56.3	0.3428	0.0062	55.61	0.2695	0.0233	11.57
Foreign High School							-0.0571	0.0191	-2.99	-0.0760	0.0264	-2.88
Certificate before Immigration							-0.0192	0.0262	-0.73	0.0215	0.0304	0.71
University before Immigration							-0.0416	0.0279	-1.49	-0.0037	0.0338	-0.11
<i>Mother tongue: (Default: English, both immigrant and native born)</i>												
French	0.0068	0.0081	0.84	0.0032	0.0079	0.41	0.0032	0.0080	0.4	-0.0420	0.0617	-0.68
Other language	-0.0019	0.0109	-0.18	-0.0130	0.0099	-1.32	0.0009	0.0110	0.08	-0.0418	0.0274	-1.53
French * IM							0.0454	0.0469	0.97			
Other language * IM							-0.0588	0.0263	-2.23			
Full-Year Full-Time Job	0.0584	0.0023	25.79	0.0589	0.0022	27	0.0589	0.0022	27.04	0.0685	0.0080	8.58
Visible Minority	-0.0178	0.0171	-1.04	-0.0406	0.0152	-2.67	-0.0415	0.0153	-2.72	-0.1331	0.0368	-3.62
Married	0.0550	0.0036	15.2	0.0587	0.0035	16.65	0.0591	0.0035	16.77	0.1186	0.0150	7.9
Toronto	0.0783	0.0095	8.28	0.0586	0.0084	6.98	0.0570	0.0084	6.78	-0.0466	0.0203	-2.29
Vancouver	0.0206	0.0134	1.54	0.0316	0.0122	2.59	0.0323	0.0122	2.65	0.0364	0.0357	1.02
Montreal	0.0707	0.0096	7.36	0.0657	0.0094	7	0.0651	0.0094	6.93	-0.1177	0.0531	-2.21
<i>Province of Residence (Default: Ontario)</i>												
Alberta	-0.0209	0.0070	-2.99	-0.0372	0.0067	-5.54	-0.0370	0.0067	-5.5	-0.1978	0.0240	-8.25
Quebec	-0.0850	0.0091	-9.37	-0.0863	0.0089	-9.73	-0.0870	0.0089	-9.81	0.0222	0.0489	0.45
British Columbia	0.0549	0.0085	6.44	0.0512	0.0083	6.18	0.0510	0.0083	6.16	0.0335	0.0330	1.01
Newfoundland	-0.1900	0.0087	-21.81	-0.1972	0.0087	-22.64	-0.1975	0.0087	-22.67	-0.1350	0.0954	-1.42
New Brunswick	-0.2003	0.0082	-24.48	-0.2065	0.0081	-25.54	-0.2069	0.0081	-25.58	-0.2333	0.0483	-4.83
Prince Edward Island	-0.2591	0.0097	-26.69	-0.2626	0.0097	-27.16	-0.2632	0.0097	-27.2	-0.0847	0.0728	-1.16
Nova Scotia	-0.1977	0.0078	-25.23	-0.2068	0.0077	-26.72	-0.2069	0.0077	-26.72	-0.3596	0.0435	-8.27
Manitoba	-0.1059	0.0080	-13.27	-0.1186	0.0078	-15.3	-0.1191	0.0078	-15.36	-0.2899	0.0306	-9.49
Saskatchewan	-0.1052	0.0080	-13.22	-0.1140	0.0079	-14.45	-0.1135	0.0079	-14.38	-0.1788	0.0507	-3.52
USA	0.0936	0.1179	0.79	0.0640	0.0841	0.76	0.0734	0.0841	0.87	0.0169	0.1269	0.13
North Territories	0.0133	0.0579	0.23	0.0105	0.0582	0.18	0.0090	0.0582	0.15			
<i>Country of Origin (Default: UK)</i>												
Western Europe				-0.0384	0.0272	-1.41	-0.0163	0.0327	-0.5	-0.0251	0.0366	-0.69
Eastern Europe				-0.0448	0.0294	-1.53	0.0005	0.0353	0.01	-0.0102	0.0398	-0.26
Northern Europe				0.1942	0.0883	2.2	0.2343	0.0903	2.59	0.2526	0.1006	2.51
Southern Europe				-0.0575	0.0250	-2.3	-0.0080	0.0323	-0.25	-0.0281	0.0366	-0.77
Eastern Asia				-0.1358	0.0331	-4.1	-0.0799	0.0386	-2.07	0.0102	0.0507	0.2
Southeast Asia				-0.1063	0.0314	-3.39	-0.0657	0.0357	-1.84	0.0551	0.0483	1.14
Southern Asia				-0.0534	0.0353	-1.51	0.0016	0.0388	0.04	0.0841	0.0506	1.66
Middle East				-0.1163	0.0434	-2.68	-0.0548	0.0476	-1.15	0.0148	0.0587	0.25
USA				-0.0155	0.0308	-0.5	-0.0009	0.0318	-0.03	-0.0144	0.0371	-0.39
Caribbean				0.0068	0.0435	0.16	0.0137	0.0443	0.31	0.1240	0.0557	2.23
Mexico and Central America				-0.0934	0.0397	-2.35	-0.0661	0.0450	-1.47	-0.0015	0.0528	-0.03
South America				-0.1203	0.0365	-3.29	-0.1059	0.0377	-2.81	-0.0121	0.0438	-0.28
Africa				0.0493	0.0407	1.21	0.0946	0.0427	2.22	0.1599	0.0515	3.11
Australia, New Zealand				0.0879	0.0767	1.15	0.1238	0.0778	1.59	0.1995	0.0892	2.24
Intercept	2.3005	0.0066	347.8	2.3074	0.0064	360.31	2.3096	0.0065	353.81	2.2198	0.0390	56.91
Sample Size	96247			104587			104587			8340		
R-squared	0.4650			0.4612			0.4615			0.3889		

Note: Dependent variable is the natural logarithm of hourly wage.

Table 4. Random Effects Earning Functions for Females, SLID 1996-2001 Panel Data

	(1) Native born Canadians		(2) No Immigrant- specific returns		(3) With Immigrant- specific returns		(4) Immigrants					
	Coefficients	Std. Err		Std. Err	Coefficients	Std. Err	Coefficients	Std. Err				
Immigration Status (IM)			-0.2224	0.0273	-8.15	-0.2537	0.0307	-8.27		immi		
YSM			0.0194	0.0018	10.51	0.0235	0.0020	11.7	0.0238	0.0022	10.95	
YSM ²			-0.00029	0.00004	-8.04	-0.00032	0.00004	-8.6	-0.00033	0.00004	-8.15	
Age - 30	0.0091	0.0004	24.68	0.0094	0.0004	26.63	0.0091	0.0004	24.61	0.0104	0.0014	7.37
(Age - 30) ²	-0.00038	0.00002	-23.84	-0.00039	0.00002	-26.23	-0.00038	0.00002	-23.75	-0.00047	0.00005	-9.46
(Age - 30)*IM						-0.0003	0.0013	-0.24				
(Age - 30) ² *IM						-0.00005	0.00005	-1.11				
Experience - 5	0.0189	0.0006	31.2	0.0180	0.0006	31.33	0.0191	0.0006	31.32	0.0098	0.0018	5.36
(Experience - 5) ²	-0.00032	0.00002	-14.1	-0.00029	0.00002	-13.62	-0.00033	0.00002	-14.26	-0.00006	0.00006	-0.95
(Experience - 5)*IM						-0.0102	0.0018	-5.69				
(Experience - 5) ² *IM						0.00030	0.00006	4.7				
<i>Educational Attainment: (Default: Less than High School, Native Born)</i>												
Graduated High School	0.0521	0.0039	13.35	0.0534	0.0038	14.09	0.0537	0.0038	14.09	0.0816	0.0178	4.58
Postsecondary certificate	0.1424	0.0047	30.36	0.1441	0.0045	31.72	0.1440	0.0046	31.58	0.1676	0.0193	8.7
University Degree	0.4264	0.0057	74.68	0.4269	0.0055	77.63	0.4292	0.0055	77.6	0.4632	0.0221	20.92
Foreign High School Certificate before Immigration							0.0047	0.0170	0.28	0.0022	0.0221	0.1
University before Immigration							0.0434	0.0264	1.64	0.0450	0.0299	1.5
							-0.0546	0.0279	-1.95	-0.0689	0.0327	-2.11
<i>Mother tongue: (Default: English, both immigrant and native born)</i>												
French	0.0022	0.0078	0.28	-0.0023	0.0077	-0.3	-0.0008	0.0077	-0.1	-0.1817	0.0611	-2.97
Other language	0.0092	0.0107	0.86	0.0025	0.0098	0.25	0.0071	0.0107	0.66	-0.0125	0.0270	-0.46
French * IM							-0.0912	0.0509	-1.79			
Other language * IM							-0.0199	0.0264	-0.75			
Full-Year Full-Time Job	0.0653	0.0021	30.7	0.0639	0.0020	31.33	0.0638	0.0020	31.27	0.0451	0.0072	6.27
Visible Minority	-0.0234	0.0143	-1.63	0.0024	0.0131	0.18	-0.0016	0.0132	-0.12	0.1132	0.0354	3.2
Married	0.0383	0.0031	12.39	0.0373	0.0030	12.41	0.0371	0.0030	12.35	0.0138	0.0125	1.11
Toronto	0.1140	0.0089	12.83	0.1055	0.0081	13.1	0.1060	0.0081	13.15	0.0689	0.0212	3.26
Vancouver	0.0340	0.0118	2.89	0.0537	0.0108	4.96	0.0531	0.0108	4.9	0.1358	0.0298	4.56
Montreal	0.0786	0.0089	8.85	0.0772	0.0087	8.87	0.0773	0.0087	8.88	-0.0007	0.0489	-0.01
<i>Province of Residence (Default: Ontario)</i>												
Alberta	-0.0520	0.0067	-7.81	-0.0546	0.0064	-8.51	-0.0540	0.0064	-8.43	-0.0840	0.0237	-3.54
Quebec	-0.0597	0.0087	-6.87	-0.0558	0.0086	-6.53	-0.0560	0.0085	-6.56	0.0423	0.0502	0.84
British Columbia	0.0260	0.0083	3.12	0.0196	0.0079	2.47	0.0200	0.0079	2.53	-0.0196	0.0258	-0.76
Newfoundland	-0.2435	0.0086	-28.36	-0.2441	0.0086	-28.46	-0.2426	0.0086	-28.28	0.1458	0.1451	1.01
New Brunswick	-0.2086	0.0079	-26.32	-0.2056	0.0079	-26.09	-0.2050	0.0079	-26.02	0.0213	0.0684	0.31
Prince Edward Island	-0.2155	0.0093	-23.15	-0.2147	0.0092	-23.42	-0.2140	0.0092	-23.37	-0.1573	0.0465	-3.39
Nova Scotia	-0.2051	0.0077	-26.52	-0.2064	0.0077	-26.9	-0.2055	0.0077	-26.79	-0.2254	0.0585	-3.85
Manitoba	-0.0964	0.0076	-12.63	-0.1012	0.0074	-13.64	-0.1007	0.0074	-13.58	-0.1667	0.0308	-5.41
Saskatchewan	-0.1008	0.0078	-12.92	-0.1004	0.0077	-12.99	-0.0999	0.0077	-12.93	-0.0084	0.0538	-0.16
USA	-0.2725	0.0720	-3.78	-0.2468	0.0634	-3.89	-0.2411	0.0635	-3.8	-0.1328	0.1412	-0.94
North Territories	-0.1683	0.1436	-1.17	-0.1676	0.1448	-1.16	-0.1700	0.1446	-1.18			
<i>Country of Origin (Default: U.K.)</i>												
Western Europe				-0.1581	0.0264	-5.99	-0.1577	0.0331	-4.77	-0.1509	0.0366	-4.13
Eastern Europe				-0.0990	0.0297	-3.33	-0.0689	0.0359	-1.92	-0.0593	0.0397	-1.49
Northern Europe				0.0285	0.0745	0.38	0.0280	0.0771	0.36	0.0402	0.0842	0.48
Southern Europe				-0.0938	0.0289	-3.25	-0.0685	0.0356	-1.93	-0.0474	0.0396	-1.2
Eastern Asia				-0.1100	0.0337	-3.26	-0.0867	0.0393	-2.2	-0.1934	0.0524	-3.69
Southeast Asia				-0.0958	0.0298	-3.22	-0.0666	0.0352	-1.89	-0.1524	0.0489	-3.12
Southern Asia				-0.1138	0.0398	-2.86	-0.0928	0.0439	-2.11	-0.1830	0.0563	-3.25
Middle East				-0.0185	0.0447	-0.41	-0.0198	0.0491	-0.4	-0.1119	0.0600	-1.86
USA				-0.0553	0.0262	-2.11	-0.0438	0.0265	-1.65	-0.0529	0.0295	-1.79
Caribbean				-0.0804	0.0388	-2.07	-0.0629	0.0392	-1.6	-0.1439	0.0510	-2.82
Mexico and Central America				-0.1882	0.0431	-4.37	-0.1854	0.0472	-3.93	-0.2587	0.0569	-4.54
South America				-0.1303	0.0451	-2.89	-0.1088	0.0463	-2.35	-0.1520	0.0530	-2.87
Africa				-0.0476	0.0386	-1.23	-0.0185	0.0422	-0.44	-0.1074	0.0514	-2.09
Australia, New Zealand				0.1137	0.0454	2.51	0.1143	0.0461	2.48	0.0963	0.0510	1.89
Intercept	2.1108	0.0060	350.13	2.1134	0.0059	361.23	2.1102	0.0059	357.43	1.8454	0.0367	50.25
Sample Size	94521			102782			102782			8261		
R-squared	0.4852			0.4307			0.4319			0.3902		

Note: Dependent variable is the natural logarithm of hourly wage.

Figure 1. Male Wage Profiles of the Native Born and U.K. Immigrants
(English Speaking, High School Graduates, Full Time Full Year experience)

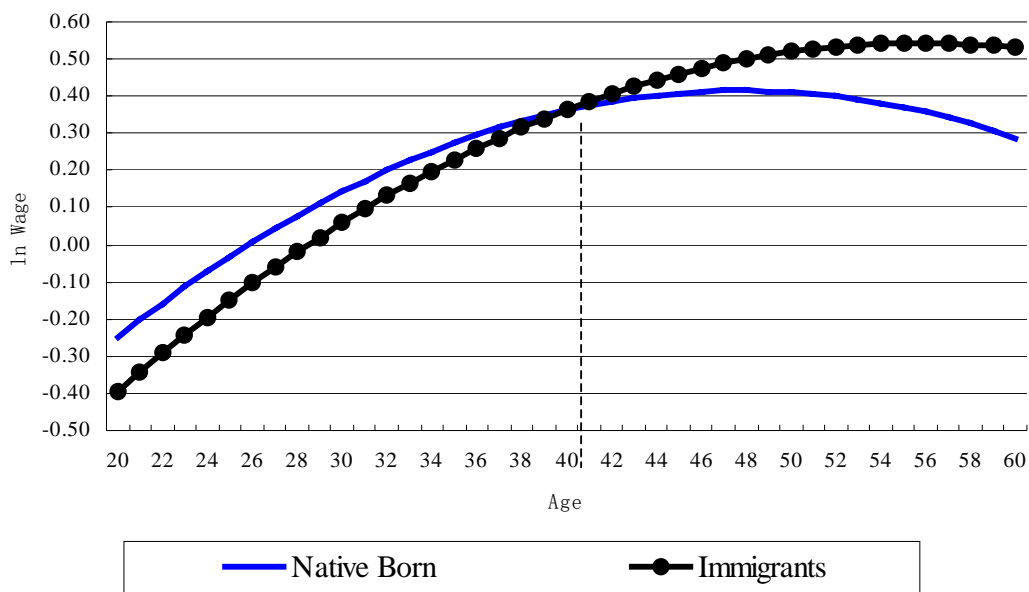


Figure 2. Male Wage Profiles of the Native Born and U.K. Immigrants
(English Speaking, High School Graduates, Full Time Half Year experience)

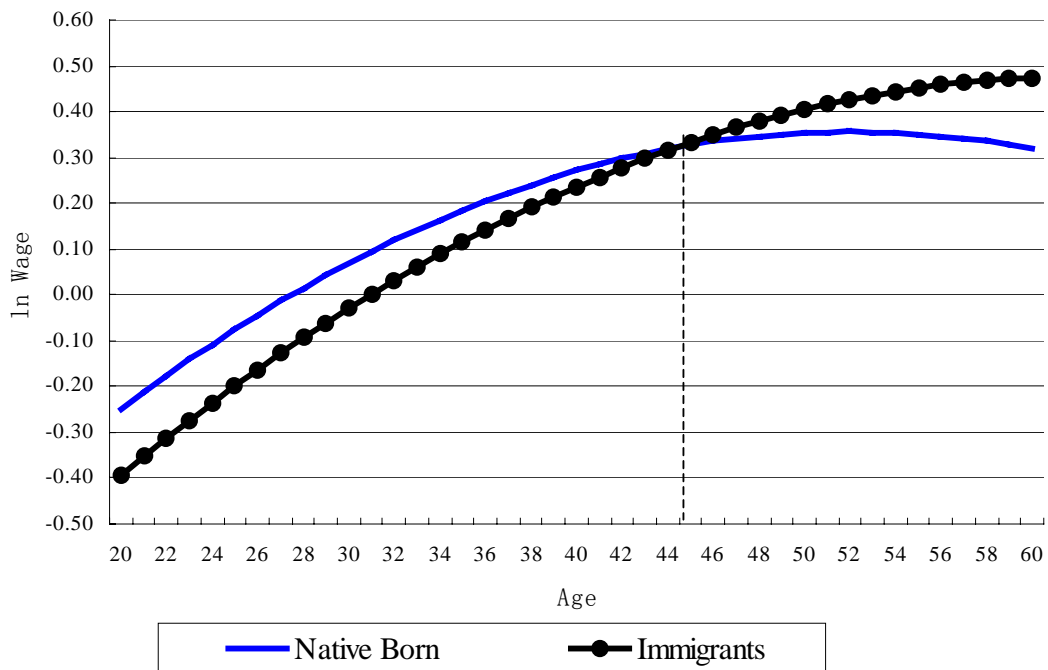


Figure 3. Male Wage Profiles of the Native Born and Eastern Asian Immigrants
(Speaking Other languages, High School Graduates, Full Time Full Year experience)

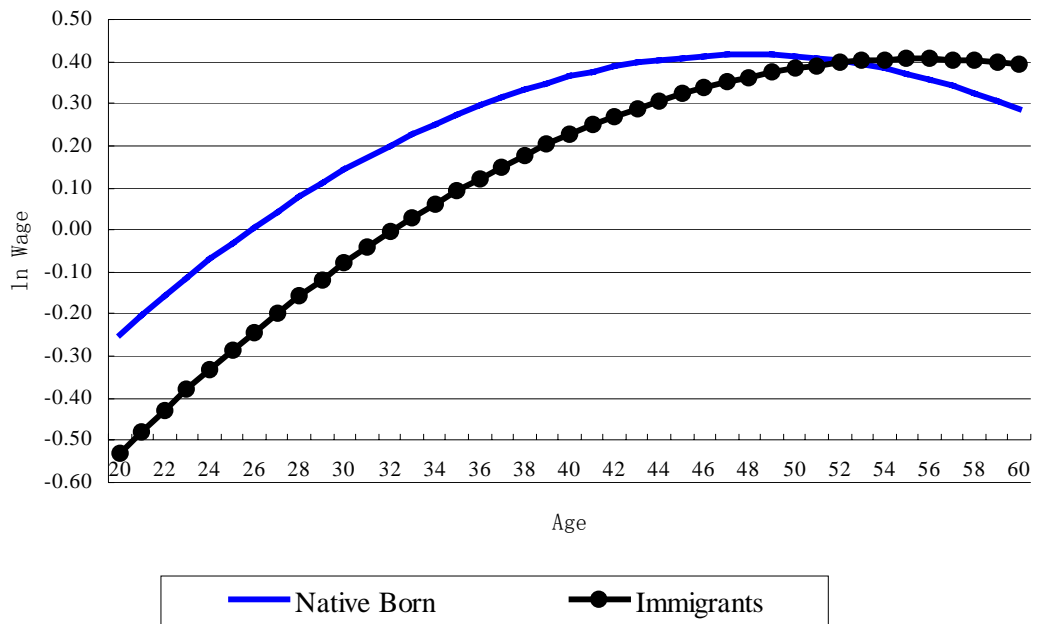


Figure 4. Male Wage Profiles of the Native Born and Eastern Asian Immigrants
(Speaking Other Languages, High School Graduates, Full Time Half Year experience)

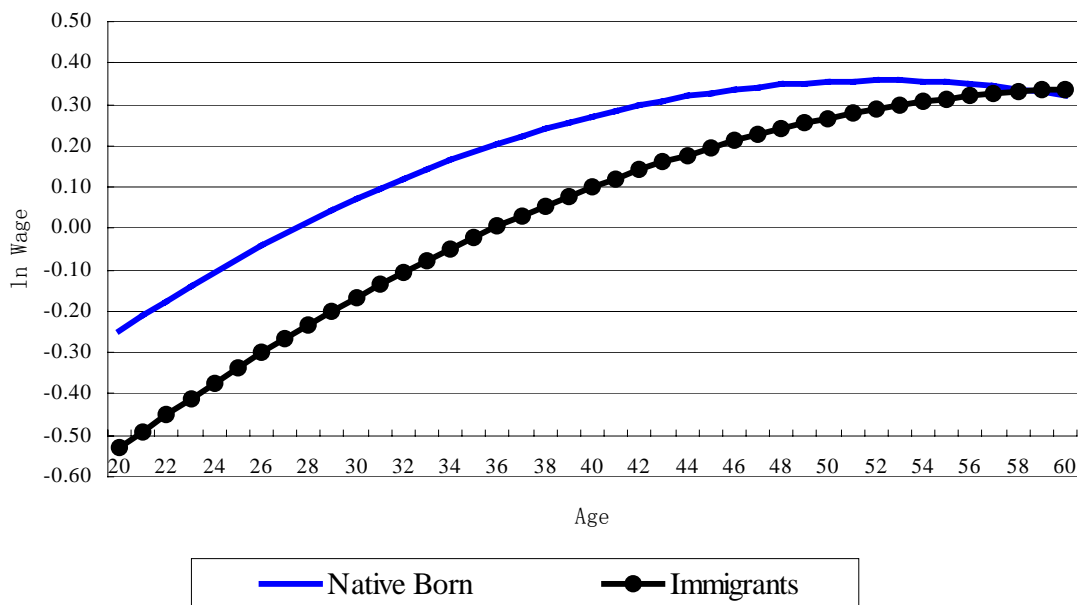


Figure 5. Female Wage Profiles of the Native Born and U.K. Immigrants
(English Speaking, High School Graduates, Full Time Full Year experience)

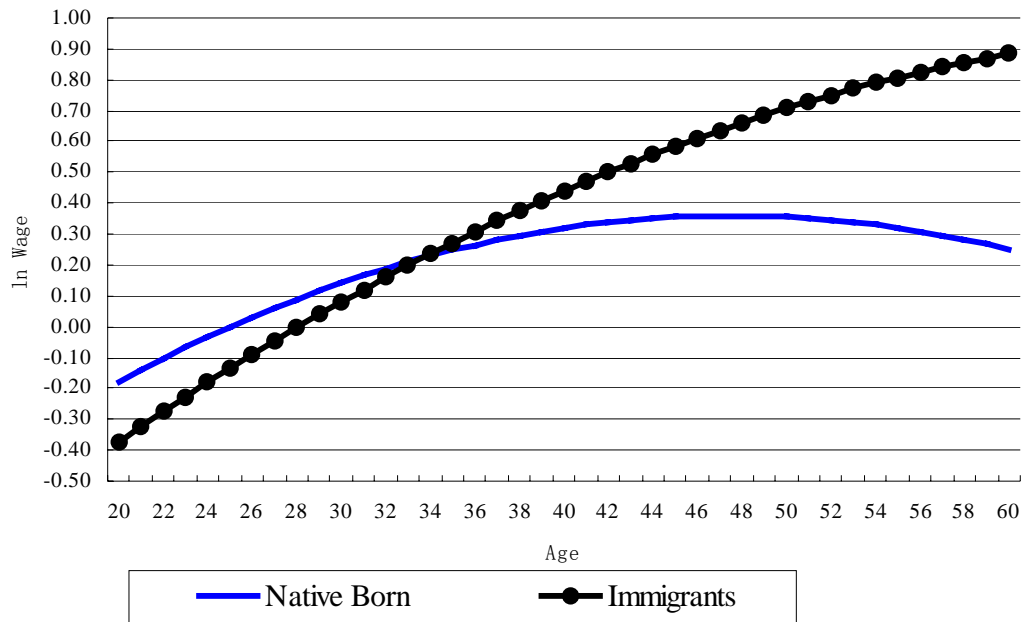


Figure 6. Female Wage Profiles of the Native Born and U.K. Immigrants
(English Speaking, High School Graduates, Full Time Half Year experience)

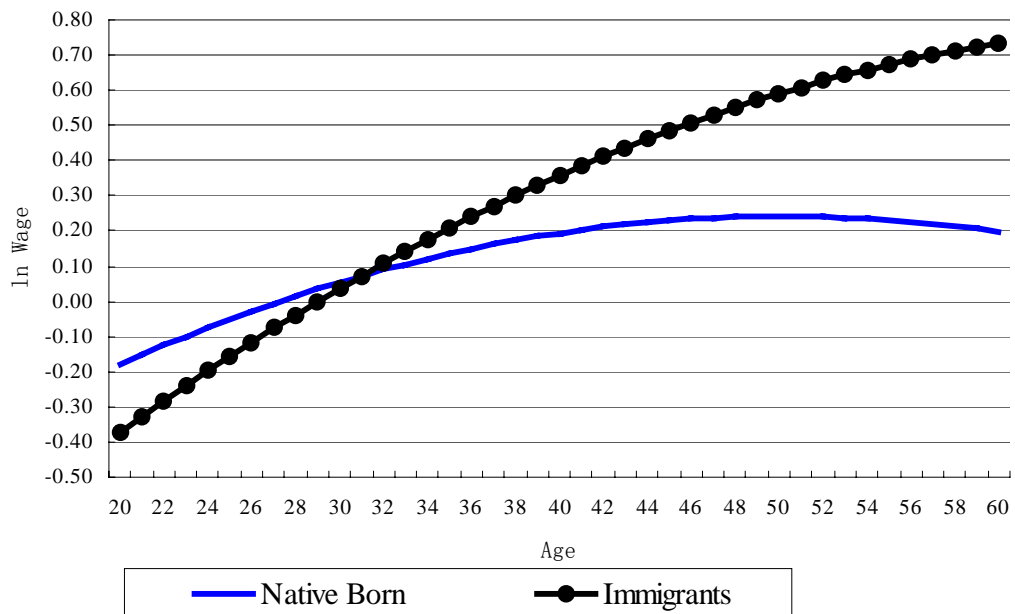


Figure 7. Female Wage Profiles of the Native Born and Eastern Asian Immigrants (Speaking Other Languages, High School Graduates, Full Time Full Year experience)

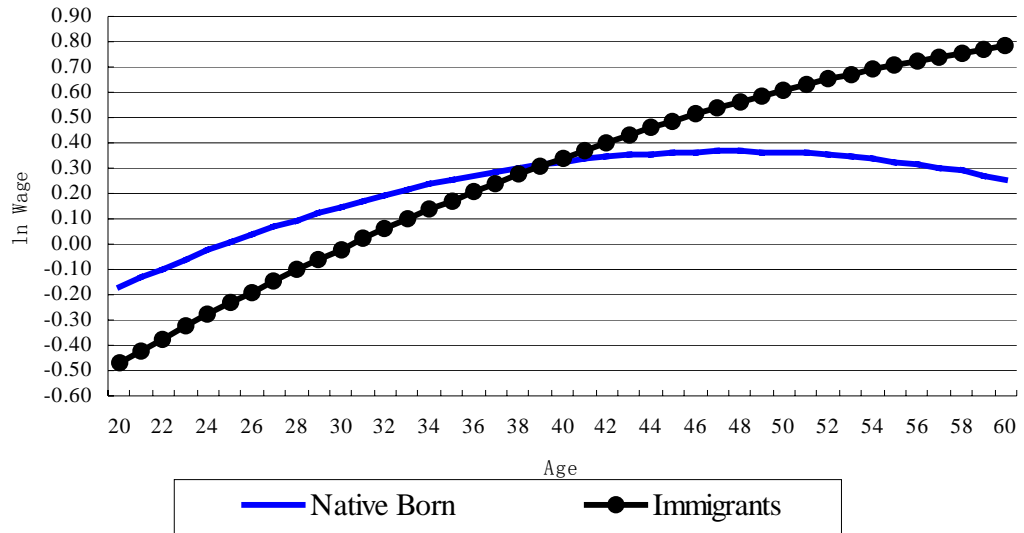


Figure 8. Female Wage Profiles of the Native Born and Eastern Asian Immigrants (Speaking Other Languages, High School Graduates, Full Time Half Year experience)

