

Education, Credentials and Immigrant Earnings*

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Introduction

The extent to which the education and skills of immigrants are utilized and rewarded in the labour market is a major policy issue. Indeed, in Canada some analysts claim that the unrecognized skills and credentials of the foreign born represent a substantial loss to the economy and a significant burden on new arrivals.¹ Because of these concerns, several recent government reports have identified the recognition of immigrants' credentials as a priority for Canadian immigration and labour market policy.² As stated recently by the federal Minister of Citizenship and Immigration, "It is important to reduce any barriers faced by new immigrants in settling into their new communities. This is why we have changed the selection criteria for certain immigrants and why our partners are working to resolve the problem of credential recognition."³

This study examines how the human capital of immigrants is rewarded in the Canadian labour market. In order to focus on the recognition of immigrants' credentials, we distinguish between two dimensions of educational attainment: years of completed schooling and degrees, diplomas or certificates received. Doing so allows us to estimate "sheepskin" effects -- the gain in earnings associated with receipt of a degree or diploma, controlling for years of completed schooling. Using data from the 1981, 1986, 1991 and 1996 Censuses, we study the evolution of the returns to the human capital of immigrant and native-born workers in Canada. Like earlier studies, we find that the labour market experience of immigrants in their country of origin is valued much less than the experience of comparable native-born workers. A similar result holds for the years of schooling of immigrants. However, the estimated sheepskin effects for immigrants are generally much higher than those of native-born Canadians. Thus, the frequently heard claim that the credentials of immigrants are not recognized needs to be treated with some caution. For immigrants the increase in earnings associated with a degree or diploma (for

¹ The Conference Board of Canada estimates the loss of income associated with unrecognized skills/credentials of the foreign born to be approximately 3.2 billion dollars, and identifies immigrants as one of the groups most disadvantaged in the labour market because of unrecognized learning (Conference Board of Canada, 2001). Reitz (2001) estimates that the annual loss due to under-utilization of immigrants' skills is 2.4 billion dollars.

² See, for example, Advisory Council on Science and technology (2000) and Human Resources development Canada (2002).

given years of education and experience) is higher than that of a comparable Canadian worker.

Our paper offers additional insights into the decline in the earnings of recent immigrants, in particular into the extent to which the decline is associated with lower valuation of credentials. To explore this avenue, we analyse the dynamics of the valuation of years of schooling and credentials between 1980 and 1995. In order to account for changes in the distribution of the immigrant population, we also examine the relationship between country of origin and the value placed by employers on the human capital of immigrants. Although we find important differences regarding how the market rewards the credentials of immigrants from the US/UK, Europe, Asia, Africa, and South America, there is little evidence that there have been downward trends in the valuation of immigrant credentials between 1980 and 1995.

Background and previous literature

According to human capital theory, two factors may influence the earnings differential between natives and immigrants. First, migration decisions may create a selection bias amongst the immigrant population that can be either positive or negative. On one hand, people with superior ability may have more to gain from migrating. If so, immigrant selection is positive. The higher than average ability of immigrants will eventually translate into higher labour market earnings. On the other hand, the decision to immigrate may arise from the desire to improve on a situation of excessive distress in the country of origin. In these cases, selection bias is less likely to be positive, and could even be negative if circumstances in the country of origin interfere with human capital accumulation, as is the case when the country of origin is at war or at low levels of development. In general, this ability bias will lead to permanent differences in earnings between the native born and immigrants. A second reason for the difference in earnings between natives and immigrants is the depreciation of skills. Most human capital has a country-specific component (knowledge of institutions, culture and customs, establishment of networks, etc.) that is absent in recent immigrants. Therefore, the market

³ The Honourable Denis Coderre, Minister of Citizenship and Immigration, press release, Ottawa, January 21, 2003.

value placed on immigrants' skills, when obtained in a foreign country, is likely to fall below that of natives. In this case, the gradual accumulation of local human capital (assimilation) tends to close the earning differential.⁴ Both reasons imply that immigrants from countries with institutional structures and levels of development closer to the host country are expected to do better. Not only it is more likely that the decision to migrate leads to a positive selection bias, it is also more likely that their human capital does not depreciate as much.

To assess these possibilities, researchers should be able to follow immigrants' earnings and characteristics from their arrival until they have spent 15 or 20 years in the country. This sort of longitudinal information is usually unavailable and most of the empirical work on native-immigrant earnings differentials uses pooled data from a series of cross-sectional surveys, such as the Census of Population, that are conducted periodically. This quasi-panel methodology allows researchers to follow *groups of individuals* with the same characteristics. Using several census years it is possible to identify immigrants in the first 5 years of residence in the country and match this group with those that have been between 6 and 10 years in the country according to the next census.⁵ The earnings behaviour of Canadian immigrants, using this quasi-panel approach, is examined in Baker and Benjamin (1994), Bloom, Grenier and Gunderson (1995) and Grant (1999). These studies report that the entry earnings of recent immigrants have been declining since the early 1970s. Furthermore, they find that, except for those entering between 1986 and 1990, changes in the assimilation profile of these recent cohorts are not sufficient to compensate for the lower entry earnings. McDonald and Worswick (1998), on the other hand, use data from the Survey of Consumer Finances to investigate the influence of job tenure and macroeconomic conditions on the earnings of immigrants. They do not find evidence of a decline in immigrant quality. Moreover, according to them, the assimilation profile is faster for the 1971-75 and the 1976-80 entering cohorts.

One explanation offered to account for this decline in immigrant earnings is the change in the composition of the immigrant population regarding country of origin.

⁴ There could be, however, long term consequences to initial lack of local human capital. See Beaudry and DiNardo (1991).

⁵ See, for example, Chiswick (1978), Borjas (1985), and Lalonde and Topel (1992).

Between the late 1970s and the first half of the 1990s, immigration from traditional source countries (the US and the UK) declined markedly, while immigration from other European countries, Asia, South America, Africa and the rest of the world increased considerably. Therefore, a larger fraction of recent immigrants may have experienced more difficulty adapting to the Canadian labour market. This could occur for several reasons, ranging from stronger cultural differences to the fact that lack of information may render their human capital less valuable for Canadian employers.

Labour market researchers have only recently, however, started to study the effect of immigrant education on earnings. Friedberg (2000) studies the case for Israel and shows that the returns to human capital significantly differ between immigrants and the native born, particularly during the first years in the host country. Bratsberg and Terrell (2002) found important differences in the rates of return to education by country of origin among US immigrants when studying the influence of source country-school quality on the returns to education of immigrants to the US. Studies by Bratsberg and Ragan (2002) and Clark and Jaeger (2002) find that acquiring schooling in the US leads to significant earnings differentials among immigrants. The focus of these papers is usually on only one measure of schooling -- years of education.

In Canada, Finnie and Meng (2002) have examined the influence of literacy on immigrant earnings, while Schaafsma and Sweetman (2001) explore the importance of age at immigration on the economic success of immigrants. As part of their analysis they report that the returns to Canadian immigrants for foreign and local human capital are different.

To our knowledge, ours is the only paper that explores the issue of the value of immigrant credentials and their role in immigrant earnings.⁶ Unlike most papers, which focus only on years of schooling, we are able to differentiate the effect of both measures of educational attainment. This allows us to explore in detail the issue of immigrant credentials and how they are rewarded in the Canadian labour market. Because our data do not contain fine enough information about the country in which a particular degree was obtained, we cannot distinguish between Canadian and foreign education. This

⁶ Li (2000) considers the issue of immigrant credentials. He uses one measure of schooling, specified as dummy variables corresponding to degrees. Therefore, his use of the term “credentials” is very different from ours.

compels us to interpret our results as referring to the value of credentials held by immigrants, rather than to the value of foreign education. We find that the "discounting" of immigrants' human capital affects years of schooling as well as years of labour market experience, whereas diplomas and degrees generally have larger incremental impacts on the earnings of immigrants than is the case for otherwise comparable Canadians.

Data

For our analysis, we use data from the 1981, 1986, 1991 and 1996 Censuses to create an artificial panel. We restrict the analysis to full time, full year male workers between 16 and 64 years of age, in Quebec, Ontario and the Western provinces⁷. The provinces left out have a small number of immigrants and for reasons of confidentiality many variables in the public use census file are more broadly categorized there. By restricting the sample this way, we lose a small number of observations but gain detail for important variables such as year of arrival in Canada. In each case, we include all the immigrant population and take a 25% random sample of natives from each census year as a reference group.

Our measure of labour market returns is the logarithm of weekly wages and salaries (excluding self-employment income). This feature, together with our focus on full time, full year workers, renders our sample different, to some extent, from that employed by others in the literature. These sample restrictions were chosen because we are interested in the "skill price" of labour services, which is better approximated by our measure of earnings⁸. This way, we abstract from various labour supply considerations relating to hours and weeks of work. We also exclude self-employment income as it typically includes returns to physical and human capital as well as entrepreneurship.

The variables are compatible across these censuses, particularly the education variables, with the exception of the indicator for high school graduation. We created this variable for the 1981 and 1986 samples, for which it did not exist, from other census information. We identify five variables for educational diplomas: high school, trades

⁷ Most previous studies of immigrant earnings in Canada focus only on men. The analysis of a similar female sample deserves a paper of its own and it is the object of current research.

certificates or college diplomas that do not require high school, college or other post secondary diplomas from non-university institutions (requiring high school graduation), university bachelor's degrees, and university postgraduate degrees (degrees in medicine, veterinary and optometry, master's degrees and doctorates).

Age at arrival is a categorical variable taking five values: 0-13, 14-19, 20-35, and 36-64. In order to have a consistent definition of place of birth for immigrants through the four census years, we create six dummies for country of origin according to the wide categories of the 1981 Census. These are the US/UK, Europe (including Eastern Europe and Ireland), Asia (including the Middle East), South and Central America, Africa and Other (includes Caribbean and Bermuda, Oceania and other regions not elsewhere specified).

We also include controls for province, census metropolitan area, and language. However, we could not include aboriginal and visible minority indicators as controls because the definition of these variables changes considerably through the censuses.

Table 1 shows the means of individual characteristics and labour market outcomes for both Canadian and immigrant workers, this last group separated according to their age at immigration and labeled "old" and "young". There is little variation between immigrants and Canadians with respect to weeks and weekly hours worked in any particular year, although weekly hours have been increasing over time for both groups. During the early 1980s, the average immigrant enjoyed weekly wages that were 4% above those of natives. This earnings advantage of immigrants progressively deteriorates over the next fifteen years. By 1995 the average weekly wage of immigrants was 97% of the average Canadian worker. When considering both age groups separately, however, we observe that most of the deterioration in immigrant earnings affects mostly older immigrants. The fall in relative earnings of young immigrants is only 2%, whereas it is around 9% for immigrants arriving in Canada after the age of 19.

Educational attainment increased over time for all groups in our sample, both in terms of years of schooling and in terms of degrees. The fraction of workers with post-secondary diplomas or degrees increased over the period for all groups, although more so

⁸ Several previous studies, including Baker and Benjamin (1994), Grant (1999) and Schaafsma and Sweetman (2001), use a somewhat broader sample consisting of those who worked 40 or more weeks in the reference year and reported positive earnings. Results using this broader sample are available on request.

for young immigrants (47% to 57%) than for native-born Canadians (42% to 55%) or for older immigrants (56% to 62%). Note, however, that immigrants, in particular older immigrants, still have an advantage in terms of measured human capital relative to Canadian workers. Compared to the native born, older immigrants have, on average, 7 more years of experience,⁹ and similar years of education. Immigrant-native born differences in education are even more evident in terms of degrees than in years of schooling. Not only is the fraction of older immigrants with post-secondary education greater, but also the distribution of post-secondary degrees is skewed towards higher level degrees. That is, a higher fraction of older immigrants hold university bachelor's or postgraduate degrees than either young immigrants or Canadians in any year of our sample. In particular, the fraction of older immigrant workers holding a postgraduate degree is more than double that of Canadians. Therefore, there is a priori, nothing to indicate that lack of human capital is responsible for the decline in immigrant earnings.

Table 1 also reveals that an important source of change in immigrant characteristics is the shift in country of origin. Several facts are worth noting:

- A decline of 41% in European immigration (46% decline in the fraction of immigrants from the UK) among older immigrants. The reduction in the fraction of young immigrants from Europe is much smaller (about 20%).
- An increase in Asian migration, which more than doubles between 1981 and 1996.
- An increase in South American immigration. The proportion of immigrants from South America increases by 42%.

The new pattern of immigration by region of origin suggests that recent immigrants from “non-traditional sources” -- the expression used to refer to places other than the US and the UK -- may have less cultural affinity with the local labour market. As mentioned above, not only obvious issues like language, technological development, and customs are at play, but also local employers' familiarity with foreign institutions (educational or otherwise). All of these are potentially contributing factors to the decline in immigrant earnings despite the fact that their measured human capital has not decreased relative to

⁹ That is potential experience: experience = age - years of education - 6.

that of Canadians. Among other factors, immigrants from a non-traditional source country may find that the degree they hold has a lower value than a similar Canadian degree because employers do not have information about the institution that issued this credential, or because the educational program has different content than the equivalent Canadian program. In the first case, it is more likely that differences disappear over time as information disseminates, whereas in the latter case differences could persist for longer periods.

We examine this possibility further in Table 2. Here we display the same labour market indicators as in Table 1 for three main groups of immigrants: The Anglophone immigrants (from US / UK), other Europeans, and immigrants from Asia. We restrict the immigrant sample to those with 10 years of experience or less in the local labour market to focus on the period in which the depreciation of immigrants' human capital is the highest. We provide two different native-born reference groups. One includes Canadian workers with 10 years or less of experience in the labour market (NAT(10)). The second reference group is composed of native-born workers with between 10 and 20 years of labour market experience (NAT(20)). Note that the average immigrant in Table 2 has similar overall experience to the workers in the reference group NAT(20), around 16 years of experience. In contrast, their "Canadian experience" (measured by the "years since migration" variable) is similar to the group in NAT(10), around 6 years. This way, we are able to observe the importance of local and foreign experience for the earnings of different immigrant groups. Table 2 shows that immigrants from the US/UK have earnings similar to the NAT(20) reference group, Canadian workers with the same total experience, whereas immigrants from other origins are closer to the NAT(10) reference group. For the former group, experience acquired in the home country seems to be relevant in the new labour market. However, employers do not seem to value the foreign experience of immigrants from non-traditional sources.

In the case of immigrants from Europe, the distribution of educational attainment has changed considerably over the sample years. During the 1980s education levels were lower than those of either group of Canadian workers. During the 1990s, they reached levels closer to those of Canadians with similar potential experience (NAT(20)). This is most likely due to the shift, within European migration, from Southern Europe to Eastern

Europe that started during the late 1980s. Despite the rise in education levels for this group, their earnings fell relative to those of Canadians.

Immigrants from Asia are the group that suffered most from the decline in earnings. In 1981, Asian immigrants earned around 77% of the earnings of native-born Canadians with 20 years of experience and the same as Canadian workers with 10 years of experience. By 1996, Asians received 67% of the earnings of the more experienced Canadian workers (NAT(20)) and 87% of the earnings of Canadians with 10 years of experience. Note that, for this group, educational attainment also worsened over the years. However, this is unlikely to explain all the earnings decline, since earnings were already low in 1981 (relative to either Canadian group) despite the fact that education levels at that time were higher than those of either Canadian group. Additionally, comparisons between this immigrant group and the native-born are more difficult because their distribution of educational attainment is more dispersed than that of Canadian workers. There are a greater percentage of Asian immigrants with high school graduation or less (46% versus 40% of Canadians), but those with post secondary education are more likely to have higher degrees (In 1995, 36% of Asians had a university education and 11% held a post graduate degree, whereas only 29% of Canadians had university education, and only 4% held a post graduate degree). Overall, a look at the raw data in Table 2 suggests that the human capital (experience and possibly also education) of immigrants from the US/UK is not discounted by Canadian employers, while that of European immigrants is somewhat discounted, and human capital of Asian immigrants is substantially discounted.

Tables 1 and 2 suggest that the Canadian labour market does place a different value on the foreign human capital of immigrants by region of origin. This observation supports the hypothesis that lower quantities of human capital may not be the main reason for the decline in the earnings of recent immigrants. Rather, it seems that the shift in the country of origin results in imports of human capital that are less valued by local employers. Our study aims to determine the value that the market places on foreign credentials and the different factors that influence this value. We also analyze the influence of country of origin on this valuation. In terms of policy, this means that if the market is indeed failing in recognizing the degrees of recent immigrants, raising the

educational requirements of immigrants may not be the only policy action to stress. Additional policies, like credential recognition or special courses to update foreign credentials could also be necessary.

Since our focus lies on the value that credentials hold for immigrants, independently of the number of years of education, we need to know the relationship between both measures of education. Table 3 shows the extent of this variation in years of education and degrees for both segments of the population. In accordance with the results from Table 1, the distribution of years of education for immigrants is skewed towards more years¹⁰ and the distribution of degrees is skewed towards higher degrees. Immigrants also show a considerable variation in years of schooling for any given degree. In fact, this variability is higher than for Canadians. Therefore, in the case of immigrants, years of schooling may be less informative than degrees for Canadian employers.

Empirical analysis

As previously mentioned, we wish to examine the value that the Canadian labour market places on immigrant credentials. To do this, we take advantage of an important feature of the Canadian Census, that it provides extensive information on educational attainment. In particular, the Census reports both years of schooling and all diplomas, certificates, and degrees received rather than simply the highest degree. We construct the "years of education" variable as the sum of years spent in primary and secondary schooling, years spent in university and years spent in post secondary institutions other than university. We also generate degree dummies corresponding to whether the individual has a high school diploma ("High School"), a trades certificate or college diploma but not a high school diploma (labeled "T/C without HS"), a college diploma or trades certificate and high school graduation ("T/C with HS"), a university bachelor's degree ("Bachelor") and a postgraduate degree ("Graduate"). Note that these credential dummies are specified in a cumulative fashion (for example, the 'High School' dummy equals one for all those with a high school diploma, including those with higher degrees).

¹⁰ 47% of all immigrants have more than 14 years of education versus 36% of Canadians. On the other hand, 22% of all immigrants have a university degree versus 16% of Canadians.

While we usually control for all degrees in our regressions, our focus will be on university bachelor's and postgraduate degrees.

In a previous study (Ferrer and Riddell, 2002) we found that credentials or "sheepskin effects" are relevant in the Canadian labour market. Degrees or diplomas have a significant value for Canadian workers even after we control for years of schooling and other measures of human capital. Sheepskin effects can be interpreted as the value of program completion -- the difference in earnings between those with a degree or diploma and non-completers with the same years of schooling. To explore the possibility that both variables have different values for the immigrant and Canadian population, we run standard log earnings equation for each group. The dependent variable is the logarithm of weekly wages (annual wages and salaries divided by weeks worked during the year). The regression includes both years of completed schooling and dummies for degrees received that allow for discrete increases in earnings associated with the receipt of a diploma, certificate or degree. If Canadian employers are failing to recognize immigrant credentials, the coefficient for these variables should be lower than those of Canadian credentials. Although not reported, the regressions also include controls for marital status, language, province and census metropolitan area and census year, as well as cohort arrival years to control for changes in immigrant quality.

The first column of Table 4 shows the estimated coefficients of different types of credentials for native-born workers and the second and third columns for immigrants. Comparing columns 1 and 2, we find that credential effects are significant for both groups but that the impact of degrees on immigrant earnings is uniformly higher than the corresponding impacts for native-born Canadians. The estimated sheepskin effects for high school completion and bachelor's degrees are 15-20% higher for immigrants than the native born, while the credential effects for college diplomas, trades certificates and postgraduate degrees are almost double those for Canadians. At the same time, years of completed schooling and experience have smaller effects on immigrant earnings than for the native born.

Note, however, that the cumulated value for an immigrant worker with a bachelor's degree is 5% higher than for a Canadian worker with a similar degree and years of education. Postgraduate degrees add 7% to the earnings of Canadian males. They

have, however, considerably more importance for immigrant males, yielding an increase of 17% on their earnings.

Friedberg (2000) argues that estimates that do not control for the foreign component of human capital are generally biased. Unfortunately, the Canadian census does not have information as to where a particular degree was originated. Inference is also difficult, as the age at migration variable is coded in intervals. This limits the possibility of controlling for foreign education. However, following Schaafsma and Sweetman (2001), we can separate the effect of immigrant human capital into their Canadian, foreign and unknown components. Our results are similar to theirs and are presented in the last column of Table 4. Foreign experience does not exert a significant impact on male immigrant earnings, whereas both foreign and Canadian education do influence immigrant earnings, and the estimated magnitudes of these effects are similar. Interestingly, the estimated sheepskin effects do not change much when we distinguish between Canadian and foreign experience.

Table 5 examines the differences between the value of education of immigrants and Canadians in more detail by estimating pooled regressions for both groups. We report regressions separately for immigrants arriving in Canada before and after the age of 20. In this manner, we can imperfectly¹¹ control for Canadian-acquired education. The regression for immigrants arriving before the age of twenty will show if any observed differences are related to the foreign attributes of education or to some other characteristic intrinsic to immigrants. Consider columns 1 (a pooled regression of immigrants and Canadians that does not allow for separate returns to education for the two groups) and 2 (a pooled regression that allows the effect of human capital variables on earnings to differ between immigrants and native-born) in Table 5. Immigrants experience lower returns to experience and years of schooling than do Canadians, as indicated by the significant negative returns to immigrant experience and years of education. However, immigrants derive higher returns from their degrees (except for high school) than do Canadians (5 to 6% higher for post secondary degrees and 12% higher for postgraduate degrees).¹² Surprisingly, bachelor's degrees are barely significant

¹¹ We discuss this matter below in more detail.

¹² All percentage effects are calculated as $1 - e^{\beta}$.

(though positive). Compare these results with those obtained for immigrants arriving in Canada before 20 years of age (column 4 in Table 5). The returns to immigrant experience and years of education are negative and significant for this group of immigrants. The magnitudes of the estimated coefficients are, however, much smaller than for immigrants arriving after 20 years of age. Furthermore, the returns to credentials for those arriving before being 20 years old are not significantly different from those of Canadians.

A caveat of our analysis is that the Census does not contain information about where a particular degree truly originated. We implicitly infer that the education of immigrants is “foreign” education. The restriction we placed on the sample concerning the age at migration (after 20 years of age) gives us some assurance that high school education was indeed acquired in a foreign country. However, the Canadian schooling system has multiple avenues to acquiring post secondary education. Immigrants arriving in their early 20’s can obtain Canadian degrees with relative ease. This is particularly the case for short duration educational programs like trade school and community college programs, some of which do not require high school graduation. However, the argument can also be made for university programs. Additionally, immigrants arriving in Canada between the ages of 20 and 30 and exhibiting a graduate degree are very likely to have obtained this degree in Canada. Unfortunately, the census does not allow for a finer differentiation of the age at arrival variable.¹³ These limitations of the Census data make the returns to post secondary education difficult to interpret. To determine if the returns to immigrant bachelor's and postgraduate degrees are related to the fact that these could have (potentially) been obtained in Canada, we regress the same earnings equation on a sub-sample of Canadians and immigrants arriving after 35 years of age (Column 5 in Table 5). The likelihood of going back to school, particularly to obtain costly degrees, decreases with age. Therefore we would expect the returns to credentials to be different for this group. However, the pattern is the same as we have observed for other groups: no additional returns to high school and university bachelor's degrees and even higher

¹³ Even if we had detailed information regarding the age at immigration, a foreign student may later decide to become an immigrant. Because age at immigration would be greater than years of schooling, his education would be mistakenly classified as foreign.

returns to the rest of the degrees. Therefore we find no support for the hypothesis that the low value of a bachelor's degree is due to the fact that it was acquired in Canada.

In our paper about the value of credentials for Canadian workers, we found that most of the value of high school graduation arises from the fact that it allows access to further education. A bachelor's degree could exhibit this feature for immigrants. Therefore most of the extra value that this degree has for immigrants could result from the fact that it allows access to a (presumably Canadian) graduate degree. However, without more information about either the age of arrival or the country that issued the degree, we can only speculate about the cause of the differences in returns to Canadian and immigrant credentials.

These results highlight the importance of differentiating the effect of immigrant education on earnings, since any debate over the worth of immigrant human capital should acknowledge that the price of immigrant and Canadian skills is different. Such differentiation should also consider that credentials and years of education are not exchangeable measures of human capital, in particular not in the case of immigrants. In addition, they strongly suggest that, contrary to the common belief, the Canadian market does seem to recognize the value of immigrant credentials.

The value of immigrant credentials

Year and cohort effects

This section examines changes over time in the economic return to years of completed schooling and credentials. We also analyze whether the composition of immigrant cohorts has influenced observed changes in the value of education.

Several important developments took place in Canada's economy during the sample period. Two major recessions were experienced in the early 1980s and early 1990s, followed by a period of strong growth in the latter half of the 1980s. One issue is whether these changes in aggregate economic activity affected the returns to education of immigrants and native-born Canadians. In this respect, the 1981 census is based on labour force activity in 1980, a cyclical peak year just prior to the 1981-82 recession. The 1986 census is based on work activity in 1985, when the Canadian economy was operating at normal levels of activity, having recovered from the 1981-82 recession but

prior to the boom period of the late 1980s. In 1990 the economy was entering a deep recession, while in 1995 the economy was still in the recovery phase from the severe recession of 1990-1992 and the period of stagnation that followed that downturn. Thus the four census years cover a variety of business cycle experiences.

Another important development during the 1980s and 1990s was rapid growth in demand for skilled workers, as well as rapid growth in the supply of well-educated workers. The aggregate evidence shows little rise in the educational wage premium, as measured by the gap in wages between high school graduates and university graduates. This suggests that the growth in supply may have been sufficient to prevent a widening of wage differentials between more- and less-educated workers (Card and Lemieux, 2001; Murphy, Riddell and Romer, 2001). However, there was an increase in the educational wage premium for younger workers.

Finally, as mentioned in the introduction, compared to earlier immigrant cohorts, there was a substantial decline in the earnings of immigrants relative to the native born for immigrant cohorts arriving in the 1980s and 1990s. One issue we wish to explore is whether changes in the returns to education contributed to this development.

To examine these developments, our next regression allows the impacts of human capital variables on earnings to vary over time. This way we investigate whether changes in the market value of years of education or credentials took place between 1981 and 1996. In view of the results presented in Table 5, we confine the sample to immigrants that arrived in Canada after 20 years of age, since credentials valuation is not an issue for those arriving at earlier ages. We also include a measure of immigrant assimilation by introducing the variable "years since migration" (YSM) to the earnings equation. The results from this regression are presented in Figure 1. We report the coefficients behind this figure in Table 1A in the appendix.

Figure 1 shows the change in the returns to credentials (Figures 1(a) and 1(b)) for Canadians and immigrants respectively, and years of education (Figure 1(c)) through the sample years. For native-born Canadians, the variations over time in the returns to years of schooling and credentials are relatively small. The estimated coefficient on years of schooling is very steady in the 0.31 to 0.33 range. Sheepskin effects associated with high school completion are in the 5-8 % range in the four census years and those for college

diplomas or trade certificates (without high school completion) fall within a similar range of about 5-7%. More variation in the credential effects is evident for higher degrees. The premium associated with completing a college diploma or trade certificate (over and above that associated with high school graduation) is small and insignificant in 1981 and 1996, but positive, statistically significant, and equal to approximately 3% in 1986 and 6% in 1991. The estimated sheepskin effects for university bachelor's degrees are large in all four census years, and range in value from a low of 12% in 1996 to 18% in 1991. The greatest variation is that for the returns to university postgraduate degrees, which decline from 11% in 1981 to 7% in 1991 before recovering to around 7% in 1996.

The time series pattern is similar for immigrants. The economic returns to years of schooling and most credentials display relatively little change over the period, the principal exception being an increase in the value of a graduate degree. Additionally, the same patterns from previous tables emerge. The returns to years of education are significantly lower for immigrants than for Canadians (with the difference increasing over the years) whereas the marginal value of immigrant credentials is equal to or higher than that of Canadians. For both high school diplomas and university bachelor's degrees, the estimated sheepskin effects are small and statistically insignificant in all four years, indicating that immigrants receive the same earnings gain from these credentials as the native-born. The estimated credential effects associated with the remaining degrees imply a substantial additional return for immigrants. The estimated sheepskin effects for trade school or community college display some variation over time, falling from 7% in 1981 to 4% in 1991 before rebounding to approximately 9% in 1996. Those associated with trade school or college following high school completion are fairly constant over time, in the 4-6% range. The most substantial change in immigrant sheepskin effects is that associated with postgraduate degrees. These increase from a small (and not statistically significant) level in 1981 to 13-14% in the remaining census years.

Despite the variation experienced over the sample years, it is hard to see a general trend in the valuation of credentials. Panel 1 in Table 6 displays the p-values of an F-test on the significance of differences in the marginal value of a degree between 1981 and 1996. It shows that the value of high school, and bachelor degrees has not changed through the sample years either for native-born Canadians or immigrants. Graduate

degrees have significantly (10% confidence level) diminished for Canadians, and significantly increased (at 5% confidence level) for immigrants, during this period.

As mentioned in the introduction, part of the debate about the declining earnings of immigrants revolves about whether recent immigrants have lower levels of human capital than earlier cohorts. Our examination of the raw data did not suggest that this is the case. However, given our focus on the role of credentials for immigrant labour market returns, it is relevant to explore whether there is cohort component specifically associated with the value of credentials. In particular, we are interested in any differences in cohort assimilation by degree received. The following is the most flexible specification of earnings that permits us to trace immigrant cohorts with specific degrees through the four census years.

$$\ln wg = X'\beta + \sum_{ijt} \theta_{ij} Degree_i * COH_j * YR_t + \varepsilon \quad (1)$$

where X is a set of control variables, COH_j refers to the immigrant cohort arriving at time j , $Degree_i$ is a dummy for each of the credentials considered (i = high school graduation, C/T without high school, C/T with high school, university bachelor's and postgraduate degrees), YR_t refers to the Census year (t = 1981, 1986, 1991 and 1996) and θ_{ijt} is the coefficient of the returns to immigrants holding degree i in cohort j at time t . Cohort j is composed by immigrants arriving between $(j-4)$ and j , (j = 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995). Using equation (1) we can explore not only whether changes observed in the returns to credentials have a cohort-specific component, but also whether immigrants with different degrees assimilate differently.

Results from the above regression are summarized in Table 2A in the appendix. For the sake of space we only report coefficients for cohorts 1975 and younger. Figure 2 shows the results for recent immigrant cohorts with different degrees. Figures 2(b) through 2(f) plot the evolution of the marginal return to a particular degree for immigrants, relative to the marginal return that the same degree has for Canadians. Figure 2(a) represents the returns to years of education for recent cohorts.

Cohort variation is important in explaining the returns to years of education. The general pattern seems to be a strong increase in the returns to years of schooling during

the first five years in Canada, followed by an almost equally strong decline. Although it follows this general path, the 80 cohort shows much higher returns to years of education than any other cohort. Later cohorts experience lower initial returns to their years of schooling.

Differences in the value of credentials at the time of entry do not follow a downward trend, as could be expected if the degrees of successive cohorts had lower value for Canadian employers. The observed differences seem more due to economic conditions at the time of entry. For most degrees, particularly bachelor's degree, the 80 cohort shows a deep loss in initial earnings when compared to the previous cohort. However, initial earnings of the 85 cohort recover and, in most cases, surpass those of the previous cohorts. For subsequent cohorts, initial earnings remain at the same, or slightly higher, level than those of their predecessors. In terms of assimilation, it is worth noting that even the low initial earnings of the 80 cohort recover over time by experiencing a faster assimilation than other cohorts. The earnings recovery of the 85, and 90 cohorts in terms both of entry earnings and assimilation, indicates that any devaluation that the 80 cohort experienced regarding their credentials is intrinsic to this particular cohort and it does not seem to indicate an ongoing problem for successive cohorts of immigrants.¹⁴

To give an idea about the cross cohort differences in marginal returns for a given degree, the second panel of Table 6 shows the P-values of a test of the joint significance of the difference in returns across cohorts during the first 5, 10 and 15 years of stay in Canada, by degree. Observe that there is no evidence of significant differences in the returns of different cohorts at similar points of their stay in Canada. Only for bachelor degrees, recent cohorts of immigrants seem to be receiving higher marginal returns to this diploma than previous cohorts, after 15 years in Canada.¹⁵

Region of origin effects

¹⁴ We re-estimate equation (1) for a sub-sample consisting of immigrants plus a cohort of young Canadians (those with 5 years of experience or less in 1981). If the years between 1976 and 1980 were “bad ones” to enter the job market, they should affect Canadians as well and we should expect immigrants to show higher returns to credentials when compared to this group. The performance of the 80 cohort is almost identical when compared with both Canadian reference groups, providing no support for the theory that this cohort entered Canada at “bad time”.

¹⁵ In addition, an F-test of the significance of different assimilation rates by degree rejects this hypothesis.

There exists the possibility that changes in the composition of the immigrant population by country of origin are driving the returns to credentials. Given that this characteristic has changed substantially over the sample years, we wish to assess if this could be responsible for the observed returns to immigrant credentials. For instance, if the value that the market places on the returns to Asian diplomas is significantly lower than those of other immigrants, the increase in Asian migration may be responsible for these declining returns.

Figure 3 shows the results of a regression in which we add the interaction of each of the education variables with the six main areas of origin: US/UK, Europe and Asia, South America, Africa and Other. Therefore, each of these variables reflects the distinct increase in earnings due to the area where the degree originated. The coefficients underlying this figure are reported in table 3A in the appendix. Some differences become apparent. The coefficient for high school diplomas, which was generally not significant in previous regressions, becomes high and significant for Asian immigrants. Europeans and South Americans with a bachelor's degree have significantly higher returns than other immigrants with this degree, while Asians with a bachelor degree earn no significant returns relative to Canadians. This seems to indicate that the low returns to bachelor degrees observed elsewhere in this analysis are driven by Asian immigrants. Finally, although graduate degrees of all immigrant groups are significantly higher than those of Canadians are, it is worth noting that the magnitude of these differences is significantly higher for immigrants from non-traditional source countries. Immigrants with a graduate degree from the US / UK experience significantly lower returns than other immigrant groups do.

To give an idea of the importance of these differences for each of these degrees, the third panel of Table 6 reports the results from a F-test of the difference in the total returns to each diploma from each country, relative to the returns to Canadians with similar degrees. Only high school degrees for Asian immigrants are significantly lower than those of Canadians. For Bachelor degrees, returns to Europeans and South Americans are significantly higher (the p-value of the test for African immigrants rejects the hypothesis of different returns with a 0.13 probability, which is worth considering as significant given the small number of African immigrants).

Once more, the limits of the Census information force us to make simplifying assumptions. In particular, we have to assume that the degree was issued by the immigrant home country.¹⁶ More importantly, as was discussed before, degrees could have been obtained in Canada. Unfortunately, there is no much we can do to control for this fact in the absence of additional information on age at migration or specific information about where the degree originated. A regression similar to that in Table A3, performed on a sub-sample of Canadians plus immigrants arriving after 35 years of age, reveals that Europeans and South Americans have some returns to bachelor's degrees, while Asians and Africans experience negative returns. These coefficients, however, are not statistically significant. We observe very substantial returns (around 25% or more) for graduate degrees for immigrants from Asia, South America and Africa.

Conclusions

Our principal finding is that -- despite much belief to the contrary -- immigrant credentials do appear to be valued in the Canadian labour market. In particular, relative to immigrants without a degree or diploma, immigrants who have completed an educational program receive substantial earnings gains associated with these educational credentials. These earnings gains are as high as, or in many cases greater than, the earnings gains received by native-born Canadians for equivalent degrees, certificates or diplomas.

In the case of high school diplomas and university bachelor's degrees, we generally find that the associated earnings gain is approximately the same for immigrants and for the native-born. Native-born Canadians who graduate from high school earn about 6 percent more than their counterparts with the same years of schooling but without having completed secondary school. A similar earnings premium of approximately 6 percent is received by immigrants with a high school diploma. Similarly, both native-born Canadians and immigrants with a university bachelor's degree receive substantially higher -- typically in the range of 15-20% higher -- earnings than otherwise comparable individuals without a university degree.

¹⁶ This does not need to be the case. A Spanish immigrant, for instance, may have obtained his PhD in the US before arriving to Canada.

For college diplomas and trade certificates (with or without high school graduation) and university postgraduate degrees, the earnings gain for immigrants exceeds that for the native-born. The largest difference in the estimated sheepskin effects between immigrants and native-born is that associated with university postgraduate degrees.

The fact that immigrant sheepskin effects are equal to or greater than those of the native-born does not of course imply that average earnings of immigrants with a given level of educational attainment are on a par with those of similarly educated Canadians. The magnitudes of the immigrant credential effects we estimate are relative to immigrants without the degree or diploma but with otherwise similar characteristics. What our results do imply is that the gap in earnings between immigrants and the native-born is narrowed (or at least not widened) by completion of educational programs. The result is analogous to the impact of education on the gender earnings differential. In Canada, the returns to education are substantially higher for women than for men. This does not imply that well-educated women earn more, on average, than well-educated men. However, it does imply that the gender earnings gap is much smaller among the well educated than among those with low levels of education.

We find little evidence of changes over time in the estimated sheepskin effects. The most substantial change over the sample period is that for postgraduate degrees, the incremental value of which has been decreasing for native-born Canadians but increasing for immigrants.

We also examine whether the returns to human capital differ across immigrant cohorts arriving in Canada in different time periods. The 1976-80 arrival cohort shows low initial returns to university bachelor's and postgraduate degrees, but these returns recover quickly.

Another dimension we investigate is that of country (or region) of origin. For immigrants from the US/UK, there are generally no differences in the magnitudes of sheepskin effects compared to the native-born. However, immigrants from other regions generally experience larger earnings gains associated with university bachelor's degrees (except in the case of Asian immigrants) and postgraduate degrees.

References

- Advisory Council on Science and Technology. *Stepping Up: Skills and Opportunities in the Knowledge Economy*. Report of the Expert Panel on Skills. Ottawa: Industry Canada, 2000.
- Baker, Michael and Dwayne Benjamin. "The Performance of Immigrants in the Canadian Labor Market," *Journal of Labor Economics* 12 (July 1994) 369-405.
- Beaudry, Paul and Green, David. "Cohort Patterns in Canadian Earnings and the Skill-Biased Technical Change Hypothesis" UBC Working Paper (March 1997).
- Beaudry, Paul and DiNardo, John. "The Effect of Implicit Contracts on the Movement of Wages over the Business Cycle: Evidence from Micro Data", *Quarterly Journal of Economics*, vol.99, n 4, pp. 665-88.
- Bloom, David E., Gilles Grenier and Morley Gunderson. "The Changing Labour Market Position of Canadian Immigrants," *Canadian Journal of Economics* 28 (1995) 987-1005.
- Borjas, G. "Assimilation and Changes in Cohort Quality Revisited: What Happened to Immigrant Earnings in the 1980's", *Journal of Labor Economics* 3 (October 1985) 463-89.
- Borjas, G. "Assimilation, Changes in Cohort Quality Revisited and the Earnings of Immigrants", *Journal of Labor Economics* vol. 13, n.2 (April 1995) 201-45.
- Bratsberg, B. and Terrell, D. "School Quality and Returns to Education of US Immigrants", *Economic Inquiry*, vol.40, n 2, pp. 177-98.
- Bratsberg, B. and Ragan, J. "The Impact of Host Country Schooling on Earnings: A Study of Male Immigrants in the US", *Journal of Human Resources*, 37(1), winter (2002), pp. 63-105.
- Chiswick, B.R. "The Effect of Americanization on the Earnings of Foreign-Born Men" *Journal of Political Economy* 86 (No. 5, 1978) 897-921.
- Clark, M. and Jaeger, D. "Natives, the Foreign Born and High School Equivalents: New Evidence on the Returns to the GED". Princeton University Industrial Relations Section Working Paper #462. April 2002.
- Conference Board of Canada. *Brain Gain: The Economic Benefits of Recognizing*

- Learning and Learning Credentials in Canada*. Ottawa: The Conference Board of Canada, 2001.
- Ferrer, Ana M. and W. Craig Riddell. "The Role of Credentials in the Canadian Labour Market" *Canadian Journal of Economics* 35 (November 2002) 879-905.
- Finnie, Ross and Ronald Meng. "Minorities, Cognitive Skills and Incomes of Canadians" *Canadian Public Policy* 28 (June 2002) 257-73.
- Friedberg, Rachel M. "You can't take it with you? Immigrant Assimilation and the Portability of Human Capital," *Journal of Labor Economics* 18 (April 2000) 221-51.
- _____. "The Labor Market Assimilation of Immigrants: The Role of Age at Arrival" (191). Unpublished paper, MIT.
- Grant, Mary L. "Evidence of new immigrant assimilation in Canada," *Canadian Journal of Economics* 32 (1999) 930-55.
- Human Resources Development Canada. *Knowledge Matters: Skills and Learning for Canadians*. Ottawa: Human Resources Development Canada, 2002.
- Lam, Kit-Chun and Liu, Pak-Wai. "Earnings divergence of Immigrants", *Journal of Labor Economics* 20(1) (January 2002) 86-104.
- Li, David. "The Market Worth of Immigrants' Educational Credentials", *Canadian Public Policy*, vol.XXVII, n.1, 2001
- McDonald, T. and Worswick, C. "The Earnings of Immigrant Men in Canada: Job Tenure, Cohort and Macroeconomic Conditions," *Industrial and Labor Relations Review* 51 (April 1998) 465-82.
- Reitz, Jeffrey G. "Immigrant skill utilization in the Canadian labour market: implications of human capital research" *Journal of International Migration and Integration* 2 (No. 3, 2001) 347-78.
- Schaafsma, Joseph and Arthur Sweetman. "Immigrant Earnings: Age at Immigration Matters" *Canadian Journal of Economics* 34 (November 2001) 1066-99.

Table 1. Basic Characteristics by Census Year (FTFY Males)

	1981		1986		1991		1996					
	IMMIGRANTS		CAN	IMMIGRANTS		CAN	IMMIGRANTS		CAN	IMMIGRANTS		CAN
	Old*	Young*		Old*	Young*		Old*	Young*		Old*	Young*	
Weekly wage	791	765	751	756	751	735	747	742	731	712	739	741
Hours worked	40	41	40	40	41	41	39	40	41	41	43	42
Weeks worked	52	52	52	52	52	52	52	52	52	52	52	52
Age	45	36	38	46	37	38	46	38	38	46	40	40
Experience	26	18	20	27	18	19	26	18	19	26	20	20
Years of Education	13	13	12	13	13	13	14	13	13	14	14	14
% less than HS	32	35	36	33	31	33	26	26	26	22	22	22
% High School	10	19	22	12	20	22	15	22	24	15	22	24
% PS non University	35	29	26	31	28	27	33	31	32	30	33	33
% University	13	14	13	15	16	14	17	17	14	20	19	17
% Grad. Studies	8	4	3	9	5	4	10	4	4	12	5	5
Years s. Migration	16	22	-	18	25	-	17	26	-	16	29	-
% USA	5	7	-	4	6	-	4	5	-	4	5	-
%UK	24	23	-	21	21	-	16	20	-	13	19	-
%Europe	44	57	-	41	54	-	34	50	-	27	45	-
% Asia	15	8	-	20	10	-	28	14	-	36	18	-
%South America	8	4	-	10	6	-	12	8	-	13	9	-
% Other places	5	2	-	5	3	-	7	3	-	7	4	-
Observations	9652	4876	13312	9040	5427	13381	14229	8229	22059	12518	8055	19546

(*) Old indicates immigrants arriving in Canada after 20 years of age. Young indicates immigrants arriving in Canada before 19 years of age.
 Authors' tabulation using pooled data from the 1981, 1986, 1991 and 1996 Canadian Census.

Table 2. Basic Characteristics by Census Year and Country of Origin (FTFY males)

	1981					1986					1991					1996				
	CAN (10)	CAN (20)	USA/ UK	EUR	ASIA	CAN (10)	CAN (20)	USA/ UK	EUR	ASIA	CAN (10)	CAN (20)	USA/ UK	EUR	ASIA	CAN (10)	CAN (20)	USA/ UK	EUR	ASIA
Weekly wage	629	817	863	678	632	593	778	855	619	549	601	758	859	638	546	582	758	798	609	507
Hours wrk	41	41	41	41	40	41	41	42	41	40	40	41	42	40	38	42	43	43	42	40
Weeks wrk	52	52	52	52	51	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Age	25	34	36	35	35	26	35	38	36	35	27	35	38	37	36	27	36	38	37	37
Exp	6	15	15	17	15	6	15	17	17	16	6	15	16	17	16	6	16	16	17	17
YSM	-	-	6	6	6	-	-	6	5	6	-	-	5	5	5	-	-	5	5	5
Years of Edu	14	13	15	11	14	14	14	15	13	13	14	14	15	14	14	15	14	15	14	14
% less than HS	25	27	16	43	25	21	25	12	31	36	14	21	8	22	28	13	17	7	17	27
% High School	28	23	12	11	17	26	23	15	10	20	27	25	15	16	21	26	23	17	17	19
% PS non Univ.	26	30	42	32	22	31	31	44	33	16	35	34	39	37	18	32	38	36	38	18
% University	17	15	16	8	27	18	17	17	13	19	20	16	22	13	24	25	17	25	14	25
% Grad. Studies	4	5	14	6	9	4	5	12	13	10	4	4	16	13	9	4	5	16	14	11
# Obsv.	4217	3613	843	789	1042	3879	4143	479	485	956	5824	7413	531	932	2048	4221	6404	416	1082	2493

Nat(10) indicates Canadian born individuals with 10 years of labor market experience. Nat(20) indicates Canadian born individuals with 20 years of labor market experience
 Authors' tabulation using pooled data from the 1981, 1986, 1991 and 1996 Canadian Census.

Table 3. Cross-Tabulation of Highest Degree Received by Completed Years of Education (FTFY males)

Years of School	No Degree		High School Graduation		Post Secondary (w/o High School)		Post Secondary (with High School)		University BA		Graduate		Year Total (%Share)	
	CAN	IMM	CAN	IMM	CAN	IMM	CAN	IMM	CAN	IMM	CAN	IMM	CAN	IMM
0 to 6	829	3495	0	0	60	106	4	2	0	0	0	0	893 (0.8)	3603 (3.3)
6 to 9	11741	12752	453	176	1374	1585	90	68	2	4	0	0	13660 (12.6)	14585 (13.3)
10	7787	5198	806	717	1297	1217	137	170	1	2	0	0	9928 (9.1)	7304 (6.7)
11	6289	3239	2054	1091	1687	1419	377	290	11	9	0	0	10418 (9.6)	6048 (5.5)
12	6273	5351	10952	6615	1968	1854	1675	1418	24	19	0	1	20892 (19.2)	15258 (13.9)
13	1631	2129	6113	4994	2146	1966	3486	2575	143	121	3	6	13522 (12.5)	11791 (10.8)
14	419	543	2955	2496	1758	1919	3804	3283	399	517	3	14	9338 (8.6)	8772 (8.0)
15	193	283	1665	1630	1328	1667	3289	3408	900	1131	27	47	7402 (6.8)	8166 (7.5)
16	84	172	814	877	1109	1710	2901	3782	3068	3398	90	325	8066 (7.4)	10264 (9.4)
17	33	69	256	387	253	783	1121	2248	4187	4991	347	767	6197 (5.7)	9245 (8.4)
18	6	30	64	105	23	86	328	652	2683	3731	1113	2403	4217 (3.9)	6549 (6.0)
19	2	9	20	33	11	35	102	303	1307	1925	1337	2981	2779 (2.6)	5286 (4.8)
20	0	2	7	12	3	10	31	124	462	858	279	530	782 (0.7)	1536 (1.4)
21	0	4	1	9	4	5	11	154	183	417	158	300	357 (0.3)	789 (0.7)
22	0	0	0	1	0	2	1	16	42	117	54	152	97 (0.1)	288 (0.3)
23	0	0	0	0	0	0	0	3	7	34	14	69	21 (0.0)	106 (0.1)
Degree Total	35287	33276	26160	19143	12921	14364	17357	18396	13419	16816	3425	7595	108569	109590
% Degree Share	33	30	24	18	12	13	16	17	13	15	3	7	100	100

Source: authors' calculations from the 19981, 1986, 1991 and 1996 Census of Population. Ottawa: Statistics Canada.

Table 4. Returns to Credentials (FTFY males)

	<u>Canadians</u>	<u>Immigrants</u>	
Experience	0.037 (0.0006)	0.025 (0.0006)	--
Exp² (/100)	-0.060 (0.0012)	-0.044 (0.0011)	--
Edu Years	0.033 (0.0009)	0.018 (0.0007)	--
Canadian Exp	--	--	0.006 (0.0008)
Can Exp² (/100)	--	--	-0.000 (0.0017)
Foreign Exp	--	--	0.000 (0.0007)
Foreign Exp² (/100)	--	--	-0.000 (0.0017)
Unknown Exp	--	--	0.005 (0.0008)
Unknw Exp² (/100)	--	--	0.000 (0.0028)
Can Edu Years	--	--	0.022 (0.0013)
Foreign Edu Years	--	--	0.025 (0.0008)
Unknown Edu Yrs	--	--	0.020 (0.0020)
High School	0.058 (0.0049)	0.067 (0.0056)	0.068 (0.0057)
T/C without HS	0.059 (0.0056)	0.105 (0.0056)	0.102 (0.0056)
T/C with HS	0.032 (0.0046)	0.065 (0.0050)	0.058 (0.0050)
University-BA	0.154 (0.0062)	0.184 (0.0062)	0.160 (0.0064)
University-Grad	0.065 (0.0090)	0.153 (0.0076)	0.148 (0.0077)
Obs	68298	72319	72319
R-squared	0.284	0.266	0.256

NOTE: (1) Regression also includes controls for marital status, language, province and cma, and census year, as well as cohort dummies to control for immigrant quality.

(2) Samples are constructed using pooled data from the 1981, 1986, 1991 and 1996 Canadian Census and include 16-65 years old, full time-full year workers.

Table 5. Returns to Credentials by Age at Immigration (FTFY males)

	Arrived after 20		Arrived before 20		Arrived after 35
Experience	0.035	0.037	0.037	0.037	0.037
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0006)
Exp2 (/100)	-0.057	-0.059	-0.059	-0.060	-0.060
	(0.0001)	(0.0012)	(0.0001)	(0.0011)	(0.0092)
Ed. Years	0.029	0.032	0.032	0.033	0.033
	(0.0007)	(0.0009)	(0.0008)	(0.0009)	(0.0009)
HS Grad	0.062	0.060	0.059	0.058	0.058
	(0.0044)	(0.0049)	(0.0045)	(0.0049)	(0.0049)
T/C without HS	0.070	0.060	0.061	0.059	0.059
	(0.0049)	(0.0056)	(0.0034)	(0.0056)	(0.0056)
T/C with HS	0.039	0.031	0.051	0.033	0.032
	(0.0040)	(0.0046)	(0.0042)	(0.0046)	(0.0046)
University-BA	0.165	0.155	0.157	0.155	0.154
	(0.0053)	(0.0062)	(0.0057)	(0.0062)	(0.0062)
University-Grad	0.093	0.065	0.065	0.065	0.065
	(0.0071)	(0.0090)	(0.0082)	(0.0090)	(0.0090)
Exp * IMM	--	-0.019	--	-0.0023	-0.0027
		(0.0000)		(0.0011)	(0.0039)
Exp2 * IMM	--	0.028	--	0.006	0.036
		(0.0019)		(0.0023)	(0.0058)
Years of Ed*IMM	--	-0.015	--	-0.006	-0.023
		(0.0013)		(0.0016)	(0.0026)
HS*IMM	--	0.006	--	0.008	0.007
		(0.0090)		(0.0097)	(0.0200)
T/C w/o HS* imm	--	0.054	--	0.015	0.072
		(0.0090)		(0.0106)	(0.0201)
T/C with HS*imm	--	0.049	--	0.005	0.063
		(0.0080)		(0.0088)	(0.0181)
Univ-BA * imm	--	0.022	--	0.021	-0.007
		(0.0101)		(0.0116)	(0.0226)
Univ-Grad * imm	--	0.119	--	0.005	0.174
		(0.0130)		(0.0161)	(0.0259)
Obs	113,737	113,737	95,178	95,178	76,417
R-squared	0.276	0.278	0.284	0.284	0.283

NOTE: (1) Regressions also include controls for marital status, language, province and cma, as well as cohort dummies to control for immigrant quality.

Table 6. Differences in the Returns to Credentials

	Panel 1. Differences between 1981 and 1996*		
	HS	Bachelor	Graduate
Canadians (marginal value)	0.205	0.266	0.108
Immigr. (marginal value)	0.889	0.884	0.044
	Panel 2. Differences across cohorts **		
0-5 YSM	0.468	0.087	0.336
6-10 YSM	0.927	0.0540	0.875
11-15 YSM	0.046	0.022	0.260
	Panel 2. Differences across countries ***		
	HS	Bachelor	Graduate
US / UK	0.395	0.326	0.012
Europe	0.189	0.000	0.000
Asia	0.018	0.121	0.000
South America	0.295	0.031	0.000
Africa	0.396	0.126	0.002
<p>(*) Panel 1 shows p-values of an F-test on the significance of differences in marginal value of the degree between 1981 and 1996. (**) Panel 2 shows p-values of an F-test on the joint significance of differences across cohorts (***) Panel 3 shows p-values of an F test on the significance of the total returns to credentials for a given group relative to the total returns of that credential for Canadian workers.</p>			

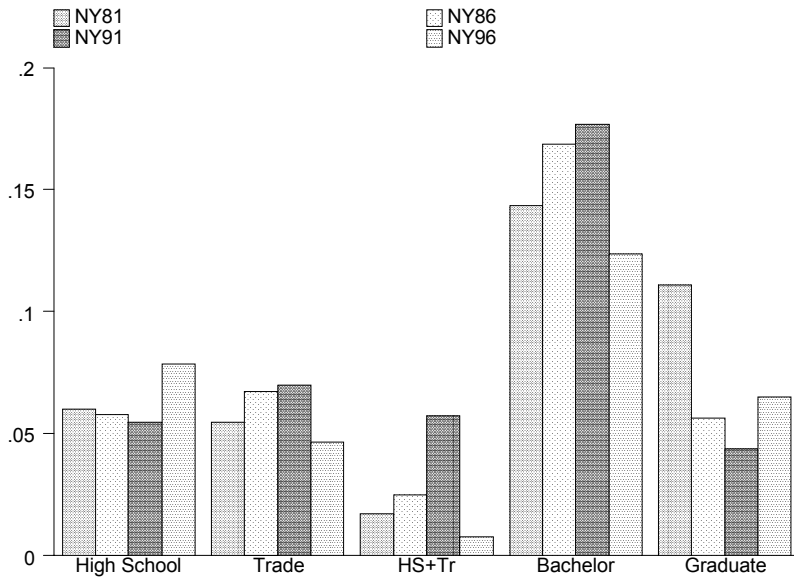


Fig. 1(a) Marginal Returns to Canadian Credentials by Year

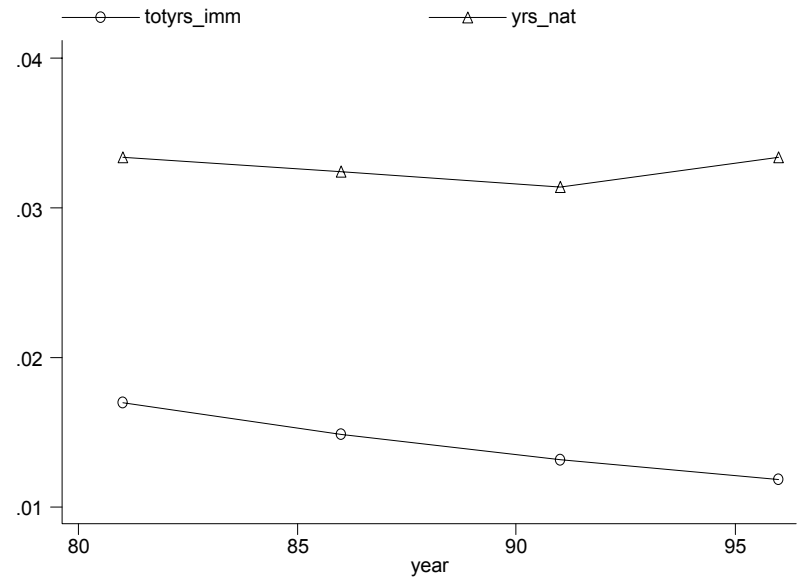


Fig. 1(c) Returns to Years of Education

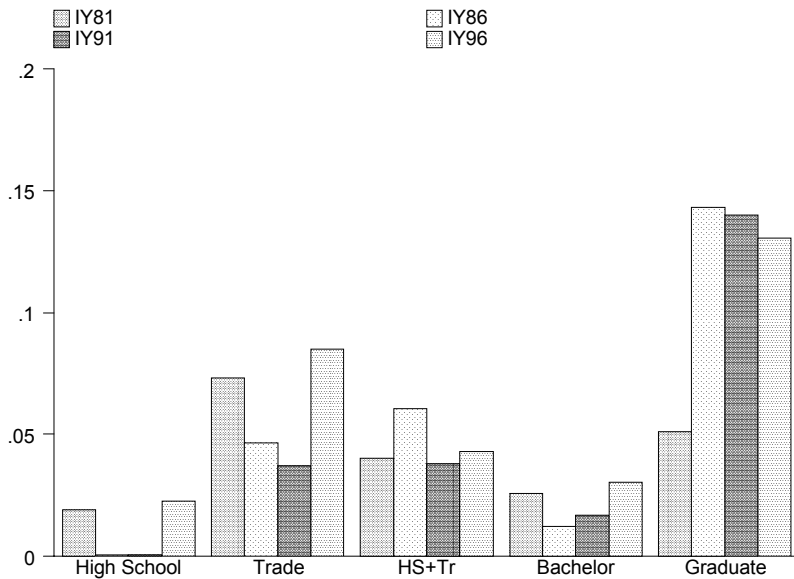


Fig. 1(b) Marginal Returns to Immigrant Credentials by Year

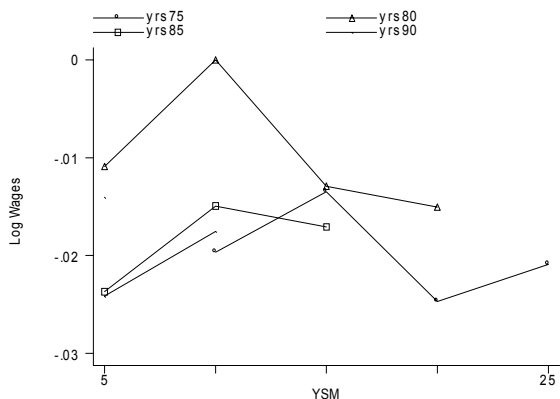


Fig. 2(a) Returns to Years of Education by cohort

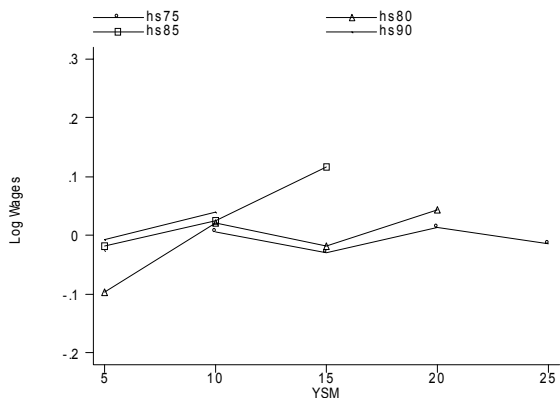


Fig. 2(b) Returns to High School Diploma by cohort

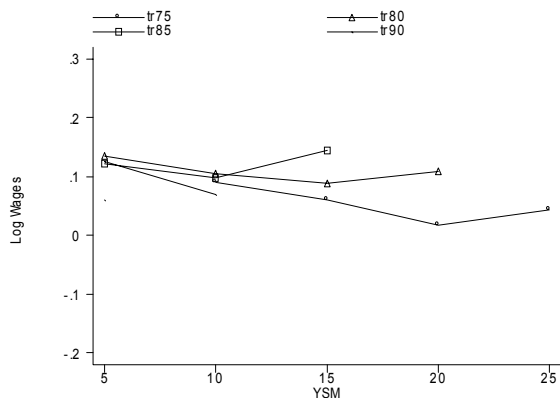


Fig. 2(c) Returns to Trades Certificate (no HS) by cohort

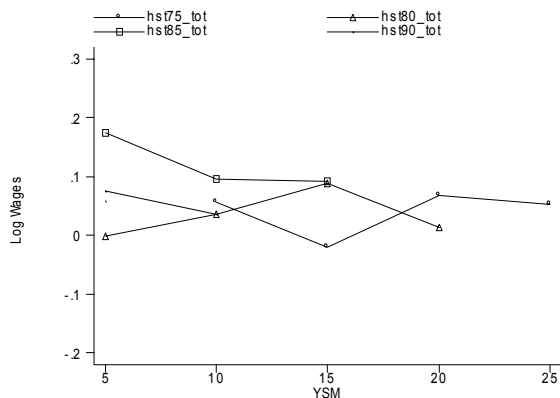


Fig. 2(d) Returns to Post Secondary Diplomas by cohort

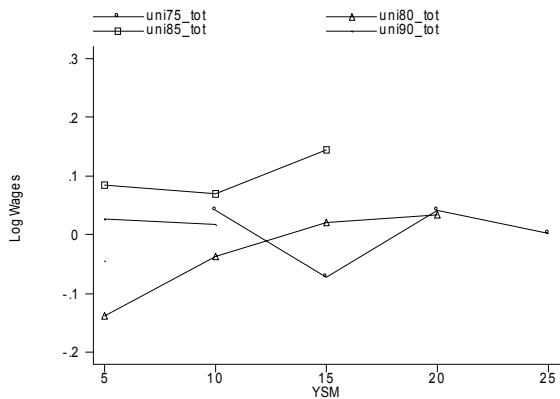


Fig. 2(e) Returns to Bachelor Diplomas by cohort

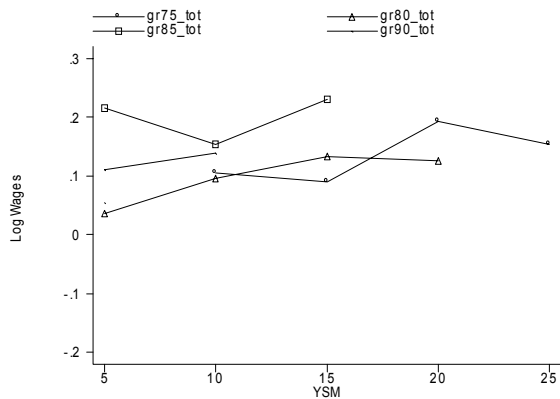


Fig. 2(f) Returns to Graduated Diplomas by cohort

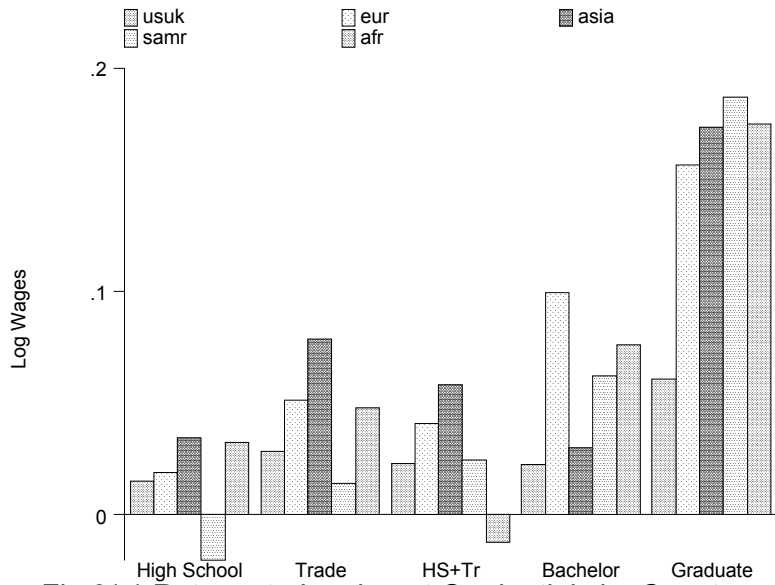


Fig.3(a) Returns to Immigrant Credentials by Country

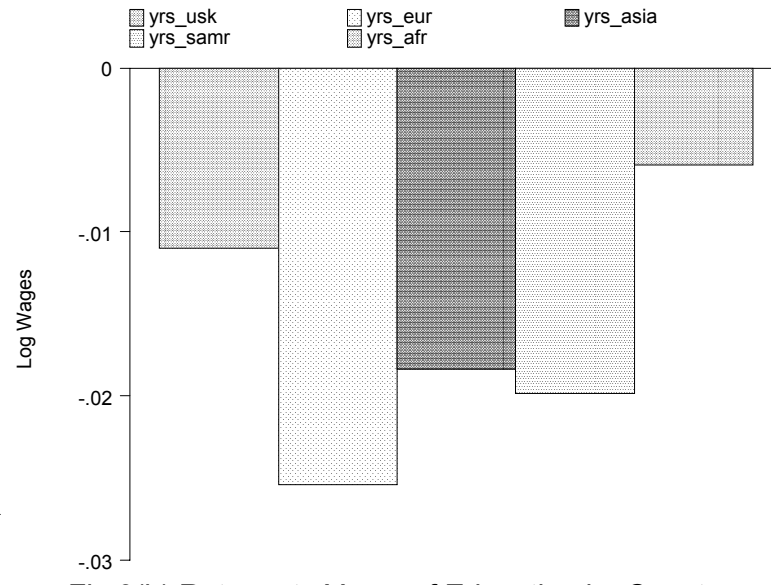


Fig.3(b) Returns to Years of Education by Country

Table 1A. Returns to Credentials, Year Effects (FTFY Males)

Edu.Yrs_81	0.033	Edu.Yrs_81*Imm	- 0.017	Bachelor_81	0.144
	(0.0016)		(0.0021)		(0.0137)
Edu.Yrs_86	0.032	Edu.Yrs_86*Imm	- 0.018	Bachelor_86	0.169
	(0.0016)		(0.0016)		(0.0137)
Edu.Yrs_91	0.031	Edu.Yrs_91*Imm	- 0.018	Bachelor_91	0.177
	(0.0014)		(0.0016)		(0.0101)
Edu.Yrs_96	0.033	Edu.Yrs_96*Imm	- 0.022	Bachelor_96	0.123
	(0.0017)		(0.0021)		(0.0118)
HS Grad_81	0.060	HS Grad_81*Imm	0.019	Bachelor_81*Imm	0.026
	(0.0098)		(0.0184)		(0.0217)
HS Grad_86	0.058	HS Grad_86*Imm	0.001	Bachelor_86*Imm	0.012
	(0.0108)		(0.0193)		(0.0217)
HS Grad_91	0.055	HS Grad_91*Imm	0.001	Bachelor_91*Imm	0.017
	(0.0084)		(0.0151)		(0.0160)
HS Grad_96	0.079	HS Grad_96*Imm	0.023	Bachelor_96*Imm	0.030
	(0.0111)		(0.0200)		(0.0199)
Trade_81	0.055	Trade_81*Imm	0.073	Graduate_81	0.111
	(0.0109)		(0.0168)		(0.0232)
Trade_86	0.067	Trade_86*Imm	0.047	Graduate_86	0.056
	(0.0125)		(0.0196)		(0.0200)
Trade_91	0.070	Trade_91*Imm	0.037	Graduate_91	0.044
	(0.0101)		(0.0166)		(0.0146)
Trade_96	0.046	Trade_96*Imm	0.085	Graduate_96	0.065
	(0.0111)		(0.0189)		(0.0166)
T/C w HS_81	0.017	T/C w HS_81*Imm	0.040	Grad_81 *Imm	0.051
	(0.0106)		(0.0180)		(0.0313)
T/C w HS_86	0.025	T/C w HS_86*Imm	0.060	Grad_86 *Imm	0.143
	(0.0106)		(0.0180)		(0.0288)
T/C w HS_91	0.057	T/C w HS_91*Imm	0.038	Grad_91 *Imm	0.140
	(0.0072)		(0.0271)		(0.0213)
T/C w HS_96	0.008	T/C w HS_96*Imm	0.043	Grad_96 *Imm	0.130
	(0.0096)		(0.0172)		(0.0242)
Obs			113,737		
R-squared			0.280		
(1) Regression includes controls for marital status, language, province and cma, exp, exp2, immigrant exp. and immigrant exp2, ysm and ysm2, as well as cohort dummies to control for immigrant quality.					

Table 2A. Returns to Credentials, Cohort Effects (FTFY Males)

EdY*c75*y81	-0.020	Hs*c75*y81	0.007	T*c75*y81	0.090	HT*c75*y81	0.049	B*c75*y81	0.034	G*c75*y81	0.064
	(0.0037)		(0.0329)		(0.0343)		(0.0291)		(0.0328)		(0.0444)
EdY*c75*y86	-0.013	HS*c75*y86	-0.028	T*c75*y86	0.060	HT*c75*y86	0.008	B*c75*y86	-0.045	G*c75*y86	0.164
	(0.0043)		(0.0378)		(0.0396)		(0.0316)		(0.0401)		(0.0434)
EdY*c75*y91	-0.025	HS*c75*y91	0.013	T*c75*y91	0.018	HT*c75*y91	0.055	B*c75*y91	0.027	G*c75*y91	0.152
	(0.0034)		(0.0296)		(0.0314)		(0.0237)		(0.0294)		(0.0336)
EdY*c75*y96	-0.021	HS*c75*y96	-0.014	T*c75*y96	0.043	HT*c75*y96	0.067	B*c75*y96	0.015	G*c75*y96	0.153
	(0.0040)		(0.0441)		(0.0405)		(0.0359)		(0.0402)		(0.0442)
EdY*c80*y81	-0.011	HS*c80*y81	-0.097	T*c80*y81	0.135	HT*c80*y81	0.095	B*c80*y81	-0.042	G*c80*y81	0.175
	(0.0053)		(0.0483)		(0.0461)		(0.0456)		(0.0557)		(0.0710)
EdY*c80*y86	-0.000	HS*c80*y86	0.021	T*c80*y86	0.106	HT*c80*y86	0.015	B*c80*y86	-0.059	G*c80*y86	0.133
	(0.0049)		(0.0398)		(0.0452)		(0.0355)		(0.0431)		(0.0573)
EdY*c80*y91	-0.013	HS*c80*y91	-0.019	T*c80*y91	0.088	HT*c80*y91	0.108	B*c80*y91	0.040	G*c80*y91	0.111
	(0.0041)		(0.0345)		(0.0375)		(0.0278)		(0.0333)		(0.0456)
EdY*c80*y96	-0.015	HS*c80*y96	0.044	T*c80*y96	0.109	HT*c80*y96	-0.029	B*c80*y96	-0.010	G*c80*y96	0.092
	(0.0054)		(0.0426)		(0.0442)		(0.0367)		(0.0432)		(0.0539)
EdY*c85*y86	-0.024	HS*c85*y86	-0.018	T*c85*y86	0.123	HT*c85*y86	0.193	B*c85*y86	0.103	G*c85*y86	0.131
	(0.0067)		(0.0548)		(0.0718)		(0.0524)		(0.0612)		(0.0677)
EdY*c85*y91	-0.015	HS*c85*y91	0.025	T*c85*y91	0.097	Ht*c85*y91	0.071	B*c85*y91	0.044	G*c85*y91	0.085
	(0.0046)		(0.0351)		(0.0433)		(0.0291)		(0.0373)		(0.0433)
EdY*c85*y96	-0.017	HS*c85*y96	0.116	T*c85*y96	0.145	HT*c85*y96	-0.023	B*c85*y96	0.028	G*c85*y96	0.087
	(0.0055)		(0.0504)		(0.0514)		(0.0420)		(0.0480)		(0.0510)
EdY*c90*y91	-0.024	HS*c90*y91	-0.007	T*c90*y91	0.125	HT*c90*Y91	0.082	B*c90*y91	0.033	G*c90*y91	0.085
	(0.0042)		(0.0311)		(0.0383)		(0.0271)		(0.0337)		(0.0442)
EdY*c90*y96	-0.018	HS*c90*y96	0.039	T*c90*y96	0.069	HT*c90*yy6	-0.003	B*c90*y96	-0.022	G*c90*y96	0.123
	(0.0040)		(0.0353)		(0.0381)		(0.0301)		(0.0360)		(0.0416)
EdY*c95*y96	-0.014	HS*c95*y96	-0.026	T*c95*y96	0.060	HT*c95*y96	0.085	B*c95*y96	-0.019	G*c95*y96	0.100
	(0.0048)		(0.0411)		(0.0391)		(0.0370)		(0.0413)		(0.0447)
Obs	113,737										
R-squared	0.280										
(1) Regression includes controls for marital status, language, province, cma, exp, exp2, yrs of education, high school, trade, T/C with high school, bachelor and graduate, as well as cohort dummies to control for immigrant quality.											

Table A 3. Returns to Credentials, Country Effects (FTFY Males)

Yrsed* US/UK	-0.011	Yrsed* Europe	-0.025	Yrsed* Asia	-0.018	Yrsed* S Amer	-0.020	Yrsed* Africa	-0.006
	(0.0025)		(0.0015)		(0.0020)		(0.0026)		(0.0055)
HS* US/UK	0.015	HS* Europe	0.019	HS* Asia	0.035	HS* S Amer	-0.020	HS* Africa	0.032
	(0.0177)		(0.0144)		(0.0146)		(0.0193)		(0.0385)
Trade* US/UK	0.028	Trade* Europe	0.052	Trade* Asia	0.078	Trade * S Amer	0.014	Trade* Africa	0.048
	(0.0170)		(0.0119)		(0.0179)		(0.0200)		(0.0429)
HS w Tr* US/UK	0.008	HS w Tr* Europe	0.022	HS wTr* Asia	0.024	HS w Tr* S Amer	0.045	HS w Tr* Africa	-0.045
	(0.0152)		(0.0138)		(0.0237)		(0.0178)		(0.0277)
BA* US/UK	0.007	BA* Europe	0.080	BA* Asia	-0.005	BA* S Amer	0.083	BA* Africa	0.044
	(0.0183)		(0.0193)		(0.0138)		(0.0221)		(0.0297)
Grad* US/UK	0.039	Grad* Europe	0.057	Grad* Asia	0.143	Grad* S Amer	0.125	Grad* Africa	0.099
	(0.0195)		(0.0235)		(0.0185)		(0.0333)		(0.0354)
Observations	113,737								
R-squared	0.284								
(1) Regression includes controls for marital status, language, province, cma, exp, exp2, ysm ysm, years of education, high school, T/C without high school, T/C with high school, university bachelor's and postgraduate degrees, as well as cohort dummies to control for immigrant quality.									

