

# Explaining the Deteriorating Entry Earnings of Canada's Immigrant Cohorts: 1966-2000

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## Abstract

Using the 1981, 1986, 1991, 1996 and 2001 Canadian Censuses we explore causes of the deterioration in entry earnings of successive cohorts of immigrant men and women. Roughly one-third of the deterioration is explained by compositional shifts in language ability and region of birth. We find no evidence of a decline in the returns to foreign education for either immigrant men or women, but a definite deterioration in the returns to foreign labour market experience, which has occurred most strongly among men from non-traditional source countries. We are able to explain roughly two-thirds of the male deterioration and one-half of the female without any reference to entry labour market conditions. When we also account for entry conditions, our results suggest Canada's immigrants of the late 1990s would otherwise have enjoyed entry earnings that were equal to or higher than their counterparts of the 1960s.

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## 1. Introduction

Following the work of Chiswick (1978) and Borjas (1985) on the economic assimilation of immigrants in the U.S., there now exist a number of Canadian studies documenting changes in the earnings profiles of different cohorts of Canadian immigrant men (Baker and Benjamin, 1994; Bloom, Grenier, and Gunderson, 1995; Grant, 1999; and Frenette and Morrisette, 2003). The outstanding finding of this research is a substantial deterioration in the entry earnings of more recent male immigrant cohorts through the 1970s, 1980s and first half of the 1990s. In addition to lower earnings, this deterioration has been observed in relatively low employment and labour force participation rates of more recent arrivals (Aydemir, 2003). These findings are of concern to Canadian policy makers because they imply that, despite an upward trend in the educational attainment of Canada's new immigrants over this period, more recent arrivals are, if anything, facing greater challenges competing in Canada's labour markets. This raises questions about the role of immigration in providing Canada with a source of highly skilled individuals to boost economic growth. It also has important implications for the take-up of government transfer programs, such as social assistance and child tax benefits, as well as for income tax revenues.

In an effort to explain this deterioration in the economic outcomes of Canadian immigrant men, a follow-up literature is now building that is focused on possible causes. Green and Worswick (2003) compare the experiences of more recent male immigrant cohorts to Canadian-born men who entered the Canadian labour market at the same time. Their findings suggest that an important part of the decline in the entry earnings of immigrants is a result of a more general economic trend that served to similarly reduce the earnings of native-born labour market entrants. Further, their results suggest that the immigrant cohorts of the 1990s received a lower return to their foreign labour market experience than did otherwise similar immigrants of the 1980s. Aydemir (2003) investigates the role of the business cycle on declining immigrant labour force participation and employment rates. His findings point to the more severe labour market conditions faced by immigrant men of the early 1980s and early 1990s, which appear to have had a permanent scarring effect on the future labour force participation rates of these cohorts. Finally, Ferrer and Riddell (2003) directly address the popular perception that the educational credentials of more recent

immigrants are not recognized by Canadian employers, at least partly as a result of the country of origin composition of these immigrant cohorts. Their findings suggest that foreign credentials continue to receive large and significant returns implying that returns to foreign education are not responsible for the deteriorating entry earnings of more recent cohorts.

These studies use a variety of different data sources, definitions of earnings and empirical specifications to explore a variety of alternative explanations. As a result, it is difficult to assess how much of the overall deterioration in immigrant entry earnings can be attributed to each explanation. This paper contributes to the literature by estimating a more flexible empirical specification which nests all of the existing explanations, including changes in the language abilities and region of birth composition of more recent cohorts, changes in the returns to foreign experience and schooling, the scarring effects of entering Canada at different points in the economic cycle, and the effect of more general labour market trends that have affected immigrants and recent native-born labour market entrants similarly. In addition, we deviate from the norm in this literature of focusing exclusively on men by estimating all our specifications separately for men and women. Finally, we update the existing literature by using the most recent Canadian Census data.<sup>1</sup> The 2001 Census data not only allow us to identify whether the previously observed decline in entry earnings continued for the most recent immigrant cohort, but when combined with the 1981, 1986, 1991 and 1996 Censuses, gives us two complete decades of repeated cross-sections to document and explain long-term changes in immigrant cohort entry earnings and assimilation profiles.

Our baseline estimates, which control for the current unemployment rate, indicate that immigrant men who arrived between 1995 and 1999 had full-year, full-time entry earnings that were 27 percent lower than immigrant men from the 1965-1969 arrival cohort with similar amounts of foreign labour market experience and years of schooling. Among women, the comparable differential is only slightly smaller at 22 percent. Perhaps surprisingly, given the awareness of and efforts to address the economic challenges facing Canada's new arrivals in the latter half of the 1990s, these differentials represent only modest improvements from the 1990-1994 cohort, whose entry earnings were 34 (men) and 30 (women) percent lower than the 1965-1969 cohort. When compared to the 1980-1984 and 1985-1989 cohorts, who had

entry earnings that were 10 and 18 (men) and 14 and 13 (women) percent lower than the 1965-1969 cohort respectively, there is clearly still cause for concern.

What explains the continued deterioration of immigrant entry earnings into the 1990s? Our results indicate that for both men and women roughly one-third of the deterioration can be explained by compositional shifts in the language abilities and region of origin of recent immigrant cohorts. We find little or no evidence in either our male or female samples of declining returns to foreign education. We do, however, identify a clear deterioration in the returns to foreign labour market experience among immigrant men and women, which has occurred by far most strongly among immigrant men from non-traditional source countries. In sum, we are able to explain roughly two-thirds of the male deterioration and one-half of the female without any reference to entry labour market conditions. When we also account for entry conditions, our results suggest that Canada's immigrant men and women who arrived in the 1995-1999 period would otherwise be enjoying entry earnings that were equal to or higher than the entry earnings of observationally equivalent immigrants who arrived in the 1965-1969 period.

## 2. Empirical Identification

### 2.1. Analysis

The standard approach to identifying immigrant entry earnings and assimilation effects in the literature is based on the work of Chiswick (1978) and Borjas (1985) and involves the estimation of the reduced form (or some variant of):

$$\log W = \beta_0 + \beta_1 EXP + \beta_2 EXP^2 + \beta_3 S + I \cdot \left( \delta_1 + \sum_{j=2}^k \delta_j C_j + \alpha_{11} YSM + \sum_{j=2}^k \alpha_{1j} (C_j \cdot YSM) + \alpha_2 YSM^2 \right) + u \quad (1)$$

where  $W$  is the weekly wage;  $EXP$  is years of labour market experience;  $S$  is years of schooling;  $I$  is an immigrant dummy;  $C_j$  are  $k - 1$  cohort dummies identifying the period of arrival;  $YSM$  is years since migration; and  $u$  is an iid error term. The cohort dummies and  $YSM$  variables are always equal to 0 for the Canadian-born. Estimating equation (1) on a pooled sample of immigrants and natives, we can interpret

the estimates of  $\delta_j$  as the entry earnings of cohort  $j$  relative to the excluded cohort (usually the earliest), after controlling for years of experience and schooling. Since cohort and years since migration are collinear within a cross-section of data, more than a single cross-section is needed to identify this model. In addition to identifying entry earnings effects, the quadratic  $YSM$  profile in (1) provides evidence of the extent to which immigrants are able to assimilate into host country labour markets. By interacting the full set of cohort dummies and  $YSM$ , information on which cohorts are assimilating more or less quickly is obtained.<sup>2</sup>

A weakness of specification (1) is the estimated  $YSM$  profiles are difficult to interpret. To the extent that the sample contains school-aged immigrants or immigrants who return to school upon arrival in the host country, the profiles will reflect not only the relative return to Canadian labour market experience for immigrants, but also human capital investments. Which of these two possibilities is driving the estimated assimilation patterns will however have very different policy implications. In addition, equation (1) assumes that Canadian-born and immigrant workers obtain the same returns to experience and schooling. Since on average the experience and schooling of immigrants will contain foreign elements which may not be directly transferable in the host country, we should expect immigrants to experience smaller returns to their experience and schooling. Indeed, there is strong evidence of such a differential in the U.S. (Kossoudji, 1989, Schoeni, 1988, Kee, 1995 and Chiswick and Miller, 1985) and Canadian (Schaafsma and Sweetman, 2001) literature. To allow for the possibility of different returns, equation (1) can be extended as follows:

$$\log W = \beta_0 + \beta_1 EXP + \beta_2 EXP^2 + \beta_3 S + I \cdot \left( \delta_1 + \sum_{j=2}^k \delta_j C_j + \gamma_1 EXP + \gamma_2 EXP^2 + \gamma_3 S + \alpha_{11} YSM + \sum_{j=2}^k \alpha_{1j} (C_j \cdot YSM) + \alpha_2 YSM^2 \right) + u. \quad (2)$$

If the returns to experience and schooling are different for immigrants and natives, the estimated cohort effects from (2) will differ from those in (1). Since we are ultimately interested in explaining these cohort

effects, it is important to first decide on a “baseline” specification that identifies the cohort effects that are to be explained.

Even in equation (2) it is unclear how the estimated returns to *YSM* should be interpreted. Allowing for immigrant-specific total experience profiles, does the *YSM* profile identify returns to Canadian experience or Canadian schooling? Our preferred specification which we use to identify the magnitude of the entry earnings deterioration across immigrants cohorts allows for these differentials. If we define  $EXP = EXP_c + EXP_f$  and  $S = S_c + S_f$ , where the subscripts denote Canadian and foreign sources, and relax all between-term restrictions, we obtain a fully flexible version of (2) given by:

$$\log W = \beta_0 + \beta_1 EXP_c + \beta_2 EXP_c^2 + \beta_3 S_c + I \cdot \left( \delta_1 + \sum_{j=2}^k \delta_j C_j + \gamma_{11c} EXP_c + \sum_{j=2}^k \gamma_{1jc} (C_j \cdot EXP_c) + \gamma_{1f} EXP_f + \gamma_{2c} EXP_c^2 + \gamma_{2f} EXP_f^2 + \gamma_{cf} (EXP_c \cdot EXP_f) + \gamma_{3c} S_c + \gamma_{3f} S_f \right) + u. \quad (3)$$

where the  $(EXP_c \cdot EXP_f)$  term is a consequence of  $EXP^2$  in (2). As usual our estimates of  $\delta_j, j = 2, \dots, k$  provide evidence on the relative entry earnings of different cohorts. However, in (3) we allow assimilation profiles to differ depending on whether the years since migration were spent obtaining Canadian labour market experience or Canadian schooling. The immigrant and native-born coefficients on  $EXP_c$  (and their quadratic terms) provide us with information on whether immigrants experience assimilation relative to native-born workers with similar amounts of total experience.

An important complication in identifying the cohort effects in equations (1), (2) and (3) is distinguishing them from current year effects. A solution is to identify common fixed year effects for immigrants and natives using the native-born portion of the sample. Aydemir (2003) however provides evidence that immigrants and natives are not equally sensitive to the business cycle. Further, since age, cohort, and year are perfectly collinear this strategy precludes us from identifying native cohort effects. We instead take the approach of assuming the provincial unemployment rate identifies period effects and include it (with an immigrant interaction) in all our specifications.<sup>3</sup> In including an aggregate variable in a regression of microdata, Moulton (1990) has shown that the ordinary least squares (OLS) assumption of

independently distributed error terms becomes seriously invalid, which results in standard errors being severely biased downward.<sup>4</sup> In comparing the usual OLS standard errors and those obtained from clustering the errors, we find that allowing for correlated errors within provinces increases the estimated standard error of the coefficient on our unemployment rate by a factor of up to 13 when we do not include province fixed effects and by up to 5 when we do. Since inferences in some cases depend on whether or not we adjust our standard errors, we report adjusted standard errors throughout. In all specifications we include dummies for marital status, province, Montreal, Toronto, and Vancouver and a separate dummy indicating residence in a rural area.

## *2.2. Data*

The analysis that follows uses the complete 20 percent microdata files of the 1981, 1986, 1991, 1996 and 2001 Canadian Censuses.<sup>5</sup> Sample means of all the variables used in the analysis are shown in the appendix. The dependent variable in all specifications is log weekly earnings, adjusted for inflation, where earnings are defined as the sum of employment income and income from farm and non-farm self-employment. In order to abstract from labour supply considerations as much as possible, we restrict both our male and female samples to individuals who worked full-year full-time in the income reference year (i.e. the year preceding the Census year).<sup>6</sup> In this respect the Census is a preferred data source to the IMDB-tax data used by De Silva (1997) and Green and Worswick (2003), since estimated cohort effects are more likely to reflect wage (and ideally productivity) differentials than differences in either the intensive or extensive margins of labour supply. Of course, our restriction to full-year full-time workers introduces potential sample selection bias complications, particularly for our sample of women. We have, however, estimated all our specifications using the much larger samples of all individuals with positive earnings and identified remarkably similar deteriorations in entry earnings for both men and women and no change in any of our main findings.<sup>7</sup>

In addition to the full-year full-time sample restrictions, we restrict our samples to immigrants who arrived in Canada between 1965 and 1999 and native-born Canadians who entered the labour market in the period between 1965 and 1999. We use potential experience ( $\text{age} - \text{total years of schooling} - 6$ ) as our measure of experience throughout and assume that the Canadian-born entered the labour market in the year in which experience is 1. Finally, we only include immigrants and natives who were between the ages of 18 and 54 in the Census year. We take a 20 percent random sample of natives, which leaves us with 404,033 male and 278,272 female natives and 413,901 male and 285,123 female immigrants.

An additional advantage of the Census data over the alternative IMDB-tax data is the latter include only immigrants so that the comparison earnings data on natives must be obtained from another source. Since this source is typically survey data, there are reasons to suspect the comparability of the immigrant and native earnings.<sup>8</sup> An important advantage of the 20 percent Census files over the 3 percent public-use files is that year of migration is coded in single years as opposed to multi-year periods. This detail allows us to split years of experience and schooling uniquely into their Canadian and foreign components.<sup>9</sup> In addition, the complete 20 percent samples allow us to simultaneously estimate the effects of a group of detailed geography, language and region of birth variables, as well as experience and schooling effects interacted with six cohort dummies while maintaining considerable precision in identification.

We begin the following section by estimating specifications (1) and (2). We then move on to our preferred specification which distinguishes Canadian from foreign experience and schooling. Our results emphasize the importance of this distinction as the estimated cohort effects are substantially smaller in magnitude than the estimates from (1) and (2). The remainder of the paper is concerned with explaining these cohort effects. We do this by first introducing controls for language ability and region of birth. We then extend (3) by allowing the returns to foreign experience and schooling to vary between cohorts. Finally, we examine the role of entry labour market conditions. This is done by adding the unemployment rate at labour market entry and introducing native entry cohort effects similar to the approach of Green and Worswick (2003).



### 3. Empirical Results

#### 3.1. Results from the standard specification

The results from estimating equation (1) are presented in column 1 of table 1. The cohort effect estimates indicate that the entry earnings of Canada's immigrant men and women declined with each successive cohort throughout the period from the late 1960s to the early 1990s. The coefficient on the 1990-95 cohort\*immigrant interaction term indicates that by the early 1990s, new immigrant men to Canada had earnings that were 61 log points lower than the entry earnings of immigrant men arriving in the late 1960s. This trend is now well documented in the Canadian literature. What is less well known is that immigrant women experienced a very similar deterioration in their entry earnings. The comparable differential in our sample of women is 63 log points. Further, the most recent Census data suggest that there was a modest reversal of this trend in the latter half of the 1990s as the differential declined to 51 log points for both men and women. Given the improved labour market conditions of the 1990s and the efforts of policy makers to improve the selection process during the decade, it is perhaps surprising that the reversal has not been larger. When compared to the 1980s cohorts, who had entry earnings that were between 28 and 40 (men) and 36 and 40 (women) log points lower than the 1965-1969 cohort, Canada's most recent immigrants appear to be facing similar challenges to those faced by the arrivals of the early 1990s.

The years since migration point estimates however also suggest that the 1990s immigrant cohorts, both male and female, experienced considerably higher assimilation rates than did previous cohorts. Duleep and Regets (1997) identify a similar negative correlation between entry earnings and assimilation rates using U.S. data and caution against interpreting cohort effects as immigrant quality differences as this pattern may simply reflect greater human capital investments among more recent cohorts.<sup>10</sup> Following-up on this idea, Green and Worswick (2003) focus instead on the present value of future earnings to identify differences in immigrant quality between cohorts. The difficulty with this approach is that in our data the most recent cohort have on average been in Canada only 2.5 years. As a result, estimating assimilation involves a substantial amount of imprecision. Even with our sample of over 17,000 immigrant men in this

cohort, we are unable to reject the null that the 1965-1969 and 1995-1999 cohorts have equal assimilation rates, despite a point estimate that suggests that the most recent cohort experienced earnings increases upon arrival that were 1.5 log points higher per year than the earliest cohort. Furthermore, it is unclear how much of the increase in the assimilation rates of more recent cohorts is an artifact of the correlation in the data between years since migration and cohort. As long as there is some concavity in the true underlying assimilation profiles, we should expect to estimate a higher assimilation rate for our most recent cohort, who are all new arrivals, than for our earliest cohort, whose years since migration are always high. Based on these considerations, we focus on the simpler question of explaining the deterioration in immigrants' entry earnings and leave the possibility of variation in earnings growth between cohorts to the final section of the paper.

In the second column of Table 1 we relax the restriction of equal native and immigrant returns to experience and schooling. As expected, the results imply substantially lower returns for immigrants. For example, the rate of return to an additional year of schooling for immigrant women is 7 percent (the sum of the native-born schooling return and years of schooling\*immigrant interaction return), compared to 10 percent for native-born women. For men with 10 years of experience, the return to an additional year of experience is 2.9 percent for native-born men, but only 1.5 percent for immigrant men. Allowing separate returns for immigrants has the effect of causing all the negative cohort effects to decline in absolute value. The declines for both men and women are however successively larger for more recent cohorts. So the difference between the entry earnings of the 1965-1969 and 1995-1999 cohorts drops from 51 percent to 44 for men and 39 for women. This suggests that equation (1) overvalued the experience and schooling of the later cohorts relatively more. This would arise, for example, if foreign experience and schooling are valued less than Canadian experience and schooling, which we expect to be true, and if more recent cohorts have proportionally more of their total experience and schooling obtained abroad, which we know to be true.

### *3.2. Effect of distinguishing Canadian and foreign experience and schooling*

Both specifications in table 1 restrict the Canadian and foreign components of immigrants' experience and schooling to be equal and identify assimilation using a years since migration (*YSM*) variable. Since we include child immigrants in our samples, the estimated returns to *YSM* not only reflect host country labour market experience, but also host country schooling. In equation (3) we drop the quadratic *YSM* profile and allow the returns to host country experience and schooling to differ from that obtained abroad. We distinguish foreign from Canadian experience and schooling by assuming schooling is continuous and using exact information on age at migration.<sup>11</sup>

The results in table 2 provide strong evidence that skills obtained through work abroad are valued less by Canadian employers than skills obtained through Canadian work experience. When the Canadian experience profile is restricted to be the same across immigrant cohorts (specification 1), the linear and quadratic Canadian experience estimates (0.052 and -0.106 ) and their immigrant interactions (-0.018 and 0.032) together imply a return to Canadian experience for immigrants that declines from 3.1 to 1.8 percent between 1 and 10 years of experience. The return to foreign experience for men over the same experience range is between 1.2 and 0.8 percent. For immigrant women the difference in returns to Canadian and foreign experience is even larger. In fact, for women the marginal return to foreign experience is rising slightly, but is very close to 0 over all within-sample values of foreign experience. For women with small amounts of foreign experience, experience from abroad appears to be essentially worthless in Canada. The Canadian experience profile for immigrant women, on the other hand, is almost identical to the Canadian experience profile for immigrant men.

We do not however find any evidence that the foreign education of immigrants is valued less than that obtained in Canada. For immigrant men the return to foreign school years is 6.1 percent, slightly higher than the return to Canadian years of 5.7 percent. For immigrant women Canadian school years raise earnings by 7.3 percent, compared to 6.8 percent for foreign years. These returns are, however, substantially lower than the schooling returns for native-born Canadians. Why is the return to Canadian schooling lower for immigrants than natives? When we condition our sample on immigrants who arrived

before the age of 18 this differential disappears, suggesting that the difference reflects the fact that the returns to schooling are not linear and Canadian school years for immigrants are on average obtained at a higher level. In an earlier draft of this paper, we introduce some non-linearity by including indicators of Canadian and foreign educational credentials similar to the approach used by Ferrer and Riddell (2000, 2003) to identify “sheepskin” effects. Interestingly, even at higher levels of education, such as a university degree, the returns to education obtained abroad appear higher than the returns to education obtained by immigrants in Canada.

In distinguishing foreign from Canadian experience and schooling the estimated cohort effects decline even further. When the Canadian experience profile is restricted to be the same for all cohorts (specification 1), the results from the male sample now suggest that the entry earnings of the 1995-1999 cohort were 36 percent lower than the 1965-1969 cohort, down from 51 and 44 percent in table 1. For women the effect of distinguishing foreign from Canadian sources of human capital is even larger. The results now suggest that the entry earnings of the 1995-1999 cohort were 21 percent lower than the 1965-1969 cohort, instead of 51 and 39 percent in table 1. In comparing the estimated returns to experience and schooling in tables 1 and 2, it is clear that this difference predominantly reflects the overvaluing of immigrant experience in table 1. For example, for an immigrant woman with 10 years of experience the estimates from table 1 suggest a return of 1 percent to an additional year. When we distinguish the source of the experience, the results suggest the increase is 2 percent if it is Canadian, but only 0.4 percent if it is foreign.

When we also allow the Canadian experience profile to vary between cohorts (specification 2), the 1995-1999 male cohort effect drops even further, whereas the female estimate is essentially unchanged. The reason appears to be that all cohorts of immigrant men, particularly those from the 1980s, obtained lower returns to their Canadian experience than did immigrants arriving in the 1965-1969 period. Accounting for this decline in earnings growth of immigrants implies less of a deterioration in entry earnings. For women, on the other hand, the 1990s cohorts appear, if anything, to have experienced larger returns to Canadian experience than their counterparts of the 1960s and 1970s. Although the point

estimates of these interactions are statistically insignificant, they do impact the estimated cohort effects. So, in our complete model that fully distinguishes Canadian from foreign, experience and schooling, we find entry earnings of the 1995-1999 cohorts to be 26 (men) and 22 (women) percent lower than the entry earnings of the 1965-1969 cohort. This continues to represent a modest improvement from the 1990-1994 cohort whose entry earnings were 34 (men) and 30 (women) percent lower than the earliest cohort. The remainder of the paper is concerned with explaining these earnings differentials.<sup>12</sup>

### *3.3. Role of language ability and region of birth.*

Table 3 explores the role of compositional changes in explaining deteriorating immigrant entry earnings. We begin, in specification 1, by adding controls for language ability. For the sake of limiting space we report only the cohort effect estimates. Although the Census data contain neither tests of or subjective questions on language ability, we are able to differentiate immigrants who report a knowledge of English or French by interacting information on mother tongue and knowledge of official languages. Arguably, an immigrant with knowledge of English or French will tend to have higher abilities in that language if it is also his or her mother tongue. The resulting cohort estimates indicate a small role for changing language abilities in explaining the deteriorating entry earnings of both immigrant men and women. The 1995-1999 cohort estimate for men declines from 27 to 23 percent, whereas the female drops from 22 to 20 percent. Similarly, the 1990-1994 cohort estimate for men drops from 34 to 30 and for women from 30 to 27 percent. These declines are explained by significantly lower earnings for all individuals with a mother tongue other than English or French and a gradual increase in the percentage of new immigrants with a foreign mother tongue.<sup>13</sup> In our samples of full-time full-year workers 79 (men) and 76 (women) percent of the 1995-1999 have a foreign mother tongue, compared to only 50 (men) and 47 (women) percent of the 1965-1969 cohort.

The estimated cohort effects fall further in the second specification of table 3 where we add a set of 13 dummies for region of birth. In fact, compositional shifts in region of birth across immigrant cohorts appear to have played a larger role in reducing entry earnings than have weakening language abilities,

particularly for men. The 1995-1999 cohort effect estimate for men declines from 23 to 15 percent and the 1990-1994 estimate from 30 to 23 percent. For women the 1995-1999 and 1991-1995 cohort effect estimates decline from 20 to 16 and 27 to 24 percent respectively. These results reflect a combination of a remarkable shift in immigration away from Canada's "traditional" source countries and significantly lower earnings among immigrants from the newer source regions. Specifically, in our male sample, 65 percent of the 1965-1969 cohort were born in Northern, Western or Southern Europe and 13 percent in Asia. In sharp contrast, 54 percent of the 1995-1999 cohort were born in Asia and only 14 percent in Northern, Western or Southern Europe. The shift is very similar in our female sample. Furthermore, in both samples immigrants from Northern, Western and Southern Europe have earnings that are higher or no more than 6 percent lower than observationally equivalent immigrants born in North America. In contrast, in both samples immigrants from all four Asian regions have conditional earnings that are always at least 10 percent lower than immigrants from North America.

These results suggest that roughly one-third of the long-term decline in the entry earnings of Canadian immigrant men and women can be explained by compositional shifts in language abilities and region of birth. Of particular importance is the shift away from Europeans with an English mother tongue (essentially Great Britain) to immigrants from Asia with a foreign mother tongue. Unfortunately, we are unable to identify the underlying factors driving our estimated language and region of birth wage effects. Although evidence exists to support an interpretation of the language effects as real productivity differences (Dustmann and van Soest, 2002), the region effects probably reflect unobserved characteristics that are correlated with region of birth. This could include differences in the quality of foreign labour market experience and schooling; familiarity with Canadian labour markets; access to effective social networks; or discrimination.

### *3.4 Declining returns to foreign experience and years of schooling.*

In table 4 we follow Green and Worswick (2003) and allow the returns to foreign experience to vary between immigrant cohorts. In addition, we introduce interactions of foreign years of schooling and

cohort. We make these extensions simultaneously because we find our schooling results are sensitive to whether or not we first introduce the experience interactions. In addition to the estimated cohort effects, we report only the interacted experience and schooling returns in order to save space.

When foreign experience and schooling interactions are introduced together the estimates for both men and women suggest significant decreases in the value of foreign experience among more recent immigrant cohorts, corroborating the findings of Green and Worswick, but little or no change in the returns to foreign education. Interestingly, the deterioration in the value of foreign experience among women is relatively modest. Evaluating the estimated quadratic foreign experience profile for immigrant men at 10 years of foreign experience, the return to an additional year declines from 1.3 percent to less than 0.1 percent between the 1965-1969 and 1995-1999 cohorts. In contrast, for immigrant women the comparable marginal return at 10 years of experience declines from 0.8 to 0.2 percent between these two cohorts. In some sense, the decline for women must be of less importance since the return to foreign experience for all cohorts of immigrant women have been very close to 0. The decline among immigrant men has served to make their returns look more like those of immigrant women. We should however be careful in making inferences based on these differences in our male and female samples since the results are also consistent with greater attenuation bias in estimated female returns resulting from greater measurement error in labour market experience for women. Interestingly though, our estimated immigrant returns to Canadian experience are, if anything, slightly larger for women than men, suggesting that measurement error is not driving our results.

We find no evidence to support the popular perception that the returns to foreign education have been declining for more recent immigrant cohorts. In an earlier draft of this paper we also interacted indicators of educational credentials with cohort, similar to the approach of Ferrer and Riddell (2003), and continued to find no evidence that the foreign education of more recent arrivals is valued less. In both our male and female samples, all the estimated coefficients on the cohort interaction terms in table 4 are small and statistically insignificant. So immigrants who arrived in the period 1995-1999 appear to have received returns to their foreign school years of roughly 6 percent, just as their counterparts of 30 years

before did. Consistent with the results from table 3, we continue to find, in both our male and female samples, that this return is only slightly less than the return immigrants receive for school years completed in Canada, but substantially less than the returns to Canadian schooling received by native-born Canadians.

Most importantly, given our focus, when we allow the returns to foreign experience and years of schooling to vary between cohorts, the unexplained gap in entry earnings between immigrants from the 1960s and 1990s becomes even smaller. For men the 1990-1994 cohort effect drops from 23 percent and significant to 13 percent and insignificant and the 1995-1999 cohort effect from 15 percent and significant to 11 percent and insignificant. For women the 1990-1994 cohort effect decreases from 24 to 17 percent, although the 1995-1999 effect actually rises slightly in absolute value. The 1990s cohort effect estimates for women are now also both statistically insignificant. In both the male and female samples, we continue to estimate relatively large 1995-1999 cohort effects because the point estimates on the interactions of the 1995-1999 cohort dummy and foreign schooling are slightly positive. Although statistically insignificant, these point estimates have considerable influence on the estimated cohort effects. If we restrict the foreign schooling interaction effects to be zero, the 1995-1999 cohort effect in the female sample drops to 11 percent and in the male sample to only 4 percent.<sup>14</sup> Together these results suggest that somewhere between one-quarter and one-half of the overall deterioration in entry earnings of immigrant men and women can be explained by declining returns to foreign experience.

What explains the declining returns to foreign experience? Although we include fixed effects for region of birth, broad compositional shifts, such as the shift from European to Asian immigrants, can account for the declining returns to foreign experience if foreign experience from the growing immigrant source regions of the world is, and always has been, valued less. The deterioration is however also consistent with declining returns within given regions or compositional shifts within regions, such as a shift away from economic class immigrants to refugees. In table 5 we take a step forward in addressing this issue by estimating the same specification as in table 4 for two different samples of immigrants: (i) those born in the West, which we define as including North America, Northern Europe, Western Europe



and Southern Europe; and (ii) those born in the East, which we define as including Eastern Europe, Africa and Asia. In our sample of immigrant men the proportion of new arrivals born in the West steadily drops from 70 to 16 percent between the late 1960s and late 1990s. Over the same period, the proportion born in the East rises from 22 to 73 percent. This dramatic shift in source regions is very similar in our sample of immigrant women. Given this shift and the popular perception that immigrants from non-traditional source countries face challenges in having their foreign experience and education recognized by Canadian employers, we might expect to find no deterioration across cohorts if we condition the sample on traditional and non-traditional source regions.<sup>15</sup>

The results in table 5 contrast with the hypothesis that declining returns to foreign experience simply reflect the broad shift from Western to Eastern source regions. In the male sample, the interactions of foreign experience (and its square) and cohort reveal a significant deterioration in the return to foreign experience even among immigrants born in Eastern regions. The estimated return to an additional year of foreign experience for men from the East who already have 10 years of foreign experience declines from 0.8 percent to something slightly negative between the 1965-1969 and 1995-1999 immigrant cohorts. Among men from the West there is also a decline, although it is much weaker. So whereas the foreign experience of immigrant men from the East is worthless by 1995-1999, recent arrivals from the West continue to receive substantial returns to their experience obtained abroad.

For women, on the other hand, the returns to foreign experience are virtually identical for immigrants born in the West and East and have been since at least the 1960s. The results in table 5 indicate that the deterioration in the sample of all immigrant women reflects declining returns to foreign experience within the Eastern *and* Western samples. For women with 10 years of foreign experience, the marginal return to an additional year drops from 1.1 to 0.4 percent between the 1965-1969 and 1995-1999 cohorts for women born in the West and from 0.9 to 0.3 percent among those born in the East. Although we are unable to identify precisely what the cause of these declining returns to foreign experience are or why the West/East distinction is less relevant for women, we can rule out the possibility that the declining returns identified in table 4 are being entirely driven by the broad compositional shift away from Canada's

traditional source countries. The results in table 5 show clearly that the returns are declining *within* regions suggesting either unobserved compositional shifts within regions or changes in the quality of or value to Canadian employers of experience from given regions. We leave these difficult, but important, questions to future research.

Although unable to explain the deterioration in entry earnings across immigrant cohorts, the foreign schooling and cohort interactions in table 5 are noteworthy. The results, in both the male and female samples, suggest that schooling returns for the 1965-1969 immigrant cohort were, if anything, slightly higher among immigrants from Eastern regions. For the most recent immigrant cohort the pattern is starkly different as the value of education from the West appears to have increased by roughly 50 percent for both men and women. However, there is no obvious trend over the five immigrant cohorts who arrived between these two periods. In fact, the return to Western schooling appears either to have been stable or slightly declining between the early 1980s and early 1990s. Nonetheless, the result does raise an interesting question of whether the perception of declining returns to foreign education among recent arrivals is based on a decline that is not absolute, but rather relative to immigrants from Canada's traditional source countries.

### *3.6. Effect of labour market entry conditions*

Despite the importance of declining returns to foreign experience, our point estimates in table 4 continue to suggest substantial unexplained gaps in entry earnings between Canada's most recent arrivals and their counterparts of the late 1960s. In this section we consider to what extent the macro labour market conditions at the time of arrival can explain these remaining differentials. The early 1990s recession in Canada was particularly severe with unemployment rates for men peaking at 12 percent in 1992 and 1993. This recession was then followed by a recovery in which the employment gains were concentrated in the self-employed sector. In this harsh macro environment immigrants from non-traditional source countries may be especially vulnerable because they have had less time to become familiar with local labour markets and to establish social networks to improve the likelihood of making successful job transitions. Indeed,

there is evidence that entering labour markets during poor macro conditions may have permanent scarring effects on the future labour market prospects of immigrants (see Aydemir, 2003 for evidence using Canadian data; Chiswick, Cohen and Zach, 1997, offer evidence for the U.S.). In addition to these business cycle effects, Beaudry and Green (2000) show in a sample of both immigrant and native-born men that successive labour market entry cohorts have experienced a gradual deterioration in their entry earnings. Motivated by this observation, Green and Worswick (2003) introduce native cohort effects into their analysis of immigrant earnings in an attempt to control for an economy wide decline which is assumed to have affected natives and immigrants identically.

In table 6 we add the entry year national unemployment rate to our previous specification and allow it to affect natives and immigrants differently. In the same specification we also follow Green and Worswick (2003) and add a full set of cohort effects for the native-born. We define the year of labour market entry for the native born as the year following the final year of school. We introduce these two effects simultaneously because we are unable to disentangle the effects of an upward trend in the unemployment rate between 1965 and 1980 and the concomitant downward trend in native cohort effects. By including both we allow the native cohort effects to capture the long-term secular decline in the entry earnings of all men, while our entry unemployment rate is left to identify changing macro conditions within entry cohorts.

Consistent with the findings of Green and Worswick (2003) the coefficients on the cohort dummies not interacted with immigrant status (i.e. the first 6 rows of table 6) in the male sample suggest a clear pattern of deteriorating earnings across native-born labour market entry cohorts. We also find a remarkably similar deterioration among native-born women. Specifically our estimates suggest that the earnings of native-born men who entered the Canadian labour market in the period between 1995 and 1999 were 28 percent lower than their counterparts who entered the Canadian labour market between 1965 and 1969. For women the comparable differential is slightly higher at 31 percent. In addition, the results from both our samples imply significant negative effects of the entry unemployment rate on the earnings of both natives and immigrants. We do not however find any clear evidence that immigrants' earnings are more

sensitive to entry macro conditions – in none of the samples is the interaction of our immigrant dummy and the entry unemployment rate statistically different from zero. When we assume that our immigrant entry cohorts experienced identical entry earnings effects as natives and we allow for entry macro conditions to influence earnings, particularly those of the 1990-1994 cohort, all our immigrant cohort effect point estimates become positive. In fact, the 1995-1999 cohort effect estimate for immigrant men is statistically significant at the 10 percent level. This suggests that were it not for the decrease in returns to foreign experience and the broader economy-wide deterioration in entry earnings, the earnings of Canada's most recent male immigrant cohort would have been higher than the entry earnings of observationally equivalent immigrant men from the 1960s. The important question is whether or not it is reasonable to assume that immigrants experienced identical entry challenges to those faced by native-born labour market entrants of the 1980s and 1990s. Given that the literature remains unsure of what caused the broader deterioration in entry earnings, one must arguably exercise caution in interpreting the resulting differentials between immigrant cohorts. To the extent that immigrants have not experienced an identical deterioration in entry earnings, our positive cohort effects will tend to overstate or understate the earnings potential of Canada's most recent immigrant cohorts.

#### **4. Predicted Earnings Profiles**

To this point we have not discussed the implications of our estimates for differences in earnings growth between immigrant cohorts. In figures 1 to 4 we plot, separately for men and women, relative earnings profiles based on our estimates from the standard "years since migration" specification (specification 1 in table 1) and from our complete specification which distinguishes the Canadian and foreign components of immigrants' experience and education, and recognizes changing entry macro conditions (table 6). Both figures plot the difference in mean predicted log earnings in the immigrant and native-born samples under various assumptions about the experience and schooling of individuals. Specifically, we assume that all immigrants arrive in Canada with 6.6 years of foreign experience and 11.9 years of foreign schooling – the means of these variables in the pooled sample of immigrant men and

women – and compare their mean predicted log earnings as they accumulate Canadian experience to native-born workers who we assume have already accumulated 6.6 years of Canadian experience and 11.9 years of Canadian schooling. So for example, at 5 years of Canadian experience on the horizontal axis we are comparing mean log earnings of immigrants if they are all assumed to have 6.6 years of foreign experience, 11.9 years of foreign schooling and 5 years of Canadian experience to mean log earnings of natives if they all have 11.6 years of Canadian experience and 11.9 years of Canadian schooling. In the simpler *YSM* model of equation 1 the accumulation of Canadian experience means adjusting both *YSM* and *EXP* for immigrants, but only *EXP* for natives. By giving observations their actual values of all the remaining variables we avoid having to make arbitrary decisions about predicted immigrant types, which are not always comparable between specifications since they contain different covariates.

Figures 1 (men) and 2 (women) illustrate earnings growth profiles based on estimates from the *YSM* specification of equation 1. The profiles show entry earnings differentials that are increasing with each immigrant entry cohort. The exception in both the male and female sample is the most recent immigrant cohort, who have relative entry earnings that fall between the 1985-1989 and 1990-1994 cohorts. Both figures also suggest relatively high assimilation rates for the 1990s cohorts, but given their large entry effects they still face substantial gaps 20 years after arrival. The exception is the 1990-1994 female immigrant cohort whose earnings appear to essentially match those of natives after 20 years of working in Canada.

Figures 3 (men) and 4 (women) plot relative mean predicted log earnings based on the estimates from table 6. Again, with the exception of the most recent cohort, we continue to find entry earnings differentials for both immigrant men and women that are increasing with each successive immigrant cohort. However, the entry effects are clearly less dispersed in these figures, particularly for immigrant women. Moreover, our model which distinguishes Canadian from foreign, experience and schooling, suggests much less of a contrast in earnings growth between immigrants who arrived in the 1990s and earlier cohorts. Figures 3 and 4 both suggest substantial growth in earnings for all cohorts as immigrants accumulate experience in Canadian labour markets. In fact, with the exception of the 1985-1989 cohort, all

immigrant women appear to have matched the earnings of native-born women with similar amounts of experience and schooling after 20 years of working in Canada. For men the earliest four cohorts have matched the earnings of similar native-born men after 20 years. The earnings growth of the 1990s male cohorts is much less pronounced so that after 20 years of working in Canada they continue to face substantial gaps on their earnings. The important point from figure 2 is that the estimates from our most flexible specification that distinguishes foreign from Canadian, experience and schooling, and allows the returns to the foreign components to vary between cohorts, produces earnings profiles that are much more consistent with our prior beliefs.

## **5. Summary**

The major finding from our analysis is that somewhere between one-quarter and one-half of the overall deterioration in the entry earnings of Canada's immigrant men and women can be explained by declining wage returns to foreign labour market experience. Moreover, this decline appears to have been experienced most strongly among immigrant men from non-traditional source countries. In contrast to popular perceptions, we find little or no evidence that declining returns to foreign education are responsible for the deterioration.

Our results suggest that another one-third of the deterioration can be explained by the shift away from traditional European source countries to non-traditional Asian sources and the resulting shift in the knowledge of an official language and mother tongue of new immigrants. We emphasize that these broad compositional shifts are not responsible for the declining returns to foreign experience, since we observe these declines within samples of immigrants from Western and Eastern source regions. Whether they are due to compositional shifts within these regions, say from economic class immigrants to refugees, or to actual declines in the value that Canadian markets put on the value of labour market experience from these regions remains unclear. We leave these important questions to future research.

Finally, we find that any cohort effects that remain after controlling for the knowledge of an official language, mother tongue and region of birth and allowing the returns to foreign experience to vary

between cohorts can be explained with reference to the broader deterioration in entry earnings experienced by native-born labour market entrants. In fact, when we follow Green and Worswick (2003) and assume that immigrant cohorts experienced identical decline in entry earnings to their native-born counterparts, our estimates suggest that Canada's immigrant men who arrived in the 1995-1999 period would otherwise have experienced entry earnings that are significantly *higher* than the entry earnings of immigrants arriving between 1965 and 1969. However, given that the literature remains unclear about the cause of this broader economy wide trend in entry earnings, we are hesitant to interpret this estimate as an indication of improved "quality" of more recent immigrant arrivals.

Table 1: OLS regression of log weekly earnings on total experience and years since migration.

	Men		Women	
	(1)	(2)	(1)	(2)
Total experience	0.0442*** (0.0006)	0.0515*** (0.0011)	0.0361*** (0.0012)	0.0449*** (0.0015)
Total experience*immigrant		-0.0282*** (0.0021)		-0.0312*** (0.0021)
Total experience <sup>2</sup> /100	-0.0845*** (0.0036)	-0.1058*** (0.0017)	-0.0652*** (0.0034)	-0.0909*** (0.0029)
Total experience <sup>2</sup> /100*immigrant		0.0673*** (0.0031)		0.0709*** (0.0041)
Total years of schooling	0.0726*** (0.0020)	0.0773*** (0.0026)	0.0925*** (0.0024)	0.1022*** (0.0022)
Total years of schooling*immigrant		-0.0163*** (0.0041)		-0.0342*** (0.0033)
Unemployment rate	-0.0126*** (0.0025)	-0.0135*** (0.0028)	0.0043 (0.0029)	0.0045 (0.0027)
Unemployment rate*immigrant		-0.0020 (0.0045)		-0.0055* (0.0029)
Immigrant dummy	0.0035 (0.0997)	0.4173*** (0.0365)	0.0292 (0.1377)	0.6838*** (0.0785)
1970-74 cohort*immigrant	-0.0802** (0.0325)	-0.0622* (0.0331)	-0.1274** (0.0429)	-0.0984** (0.0376)
1975-79 cohort*immigrant	-0.1424* (0.0661)	-0.1132 (0.0726)	-0.2255** (0.0795)	-0.1792** (0.0768)
1980-84 cohort*immigrant	-0.2793** (0.0941)	-0.2404** (0.1024)	-0.3601** (0.1277)	-0.2956** (0.1232)
1985-89 cohort*immigrant	-0.4010*** (0.1221)	-0.3500** (0.1352)	-0.4015** (0.1571)	-0.3099* (0.1545)
1990-94 cohort*immigrant	-0.6102*** (0.1255)	-0.5501*** (0.1419)	-0.6307*** (0.1586)	-0.5205*** (0.1588)
1995-99 cohort*immigrant	-0.5070*** (0.1232)	-0.4433** (0.1401)	-0.5135*** (0.1374)	-0.3933** (0.1421)
Years since migration (ysm)	-0.0014 (0.0072)	0.0051 (0.0087)	-0.0097 (0.0099)	0.0007 (0.0094)
ysm*1970-74 cohort	-0.0009 (0.0012)	-0.0016 (0.0013)	0.0032* (0.0017)	0.0024 (0.0013)
ysm*1975-79 cohort	0.0003 (0.0028)	-0.0010 (0.0032)	0.0068* (0.0034)	0.0054 (0.0030)
ysm*1980-84 cohort	0.0035 (0.0037)	0.0015 (0.0043)	0.0130* (0.0060)	0.0104* (0.0053)
ysm*1985-89 cohort	0.0066 (0.0059)	0.0037 (0.0069)	0.0141 (0.0082)	0.0105 (0.0073)
ysm*1990-94 cohort	0.0227** (0.0072)	0.0190* (0.0089)	0.0348** (0.0113)	0.0300** (0.0108)
ysm*1995-99 cohort	0.0153 (0.0103)	0.0117 (0.0117)	0.0221** (0.0090)	0.0160 (0.0091)
ysm <sup>2</sup> /100	0.0009 (0.0124)	-0.0123 (0.0154)	0.0249 (0.0180)	0.0069 (0.0157)
R <sup>2</sup>	0.1668	0.1688	0.1656	0.1705
Native sample		404,033		278,272
Immigrant sample		413,901		285,123

Note: Model also includes a constant and indicators of marital status, province, Montreal, Vancouver and rural status. The excluded category is a non-married individual living in urban Toronto. Robust standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels respectively. The dependent variable is log weekly earnings which includes wages and salaries and net income from self-employment. The samples are restricted to individuals aged 18 to 54 with positive earnings who reported working mostly full-time for 52 weeks in the income reference year. Immigrants who migrated before 1965 and natives who entered the Canadian labour market before 1965 are dropped from the sample. Non-permanent residents, institutional residents and those living in the territories are also excluded.



Table 2: OLS regression of log weekly earnings on Canadian and foreign, experience and schooling.

	Men		Women	
	(1)	(2)	(1)	(2)
Canadian experience	0.0515*** (0.0011)	0.0516*** (0.0011)	0.0449*** (0.0015)	0.0449*** (0.0015)
Canadian experience*immigrant	-0.0184*** (0.0009)	-0.0089** (0.0032)	-0.0109*** (0.0012)	-0.0107*** (0.0020)
Canadian experience*1970-74 cohort*immigrant		-0.0048*** (0.0006)		-0.0006 (0.0004)
Canadian experience*1975-79 cohort*immigrant		-0.0070*** (0.0011)		-0.0017 (0.0010)
Canadian experience*1980-84 cohort*immigrant		-0.0086*** (0.0019)		0.0007 (0.0017)
Canadian experience*1985-89 cohort*immigrant		-0.0107** (0.0041)		-0.0032 (0.0035)
Canadian experience*1990-94 cohort*immigrant		-0.0014 (0.0060)		0.0096 (0.0061)
Canadian experience*1995-99 cohort*immigrant		-0.0034 (0.0078)		0.0051 (0.0069)
Canadian experience <sup>2</sup> /100	-0.1059*** (0.0017)	-0.1060*** (0.0017)	-0.0911*** (0.0028)	-0.0911*** (0.0029)
(Canadian experience <sup>2</sup> /100)*immigrant	0.0318*** (0.0033)	0.0140*** (0.0061)	0.0221** (0.0078)	0.0232*** (0.0042)
Canadian school years	0.0774*** (0.0026)	0.0774*** (0.0026)	0.1021*** (0.0022)	0.1021*** (0.0022)
Canadian school years*immigrant	-0.0206*** (0.0020)	-0.0197*** (0.0018)	-0.0296*** (0.0016)	-0.0295*** (0.0016)
Unemployment rate	-0.0138*** (0.0027)	-0.0139*** (0.0028)	0.0042 (0.0026)	0.0042 (0.0027)
Unemployment rate*immigrant	-0.0040 (0.0037)	-0.0047 (0.0040)	-0.0091** (0.0028)	-0.0083** (0.0028)
Foreign experience	0.0128*** (0.0017)	0.0122*** (0.0019)	0.0013 (0.0010)	0.0012 (0.0010)
Foreign experience <sup>2</sup> /100	-0.0235*** (0.0061)	-0.0228*** (0.0064)	0.0151*** (0.0034)	0.0152*** (0.0033)
Foreign school years	0.0608*** (0.0025)	0.0610*** (0.0025)	0.0681*** (0.0019)	0.0681*** (0.0019)
Canadian*foreign experience	-0.0003*** (0.0001)	-0.0002** (0.0001)	-0.0001** (0.0000)	-0.0001* (0.0000)
Immigrant dummy	0.4508*** (0.0403)	0.3458*** (0.0212)	0.5723*** (0.0235)	0.5592*** (0.0338)
1970-74 cohort*immigrant	-0.0926*** (0.0082)	-0.0107 (0.0187)	-0.0488*** (0.0109)	-0.0378** (0.0149)
1975-79 cohort*immigrant	-0.1257*** (0.0219)	-0.0168 (0.0355)	-0.0799*** (0.0218)	-0.0556 (0.0360)
1980-84 cohort*immigrant	-0.2224*** (0.0410)	-0.1010 (0.0636)	-0.1395*** (0.0432)	-0.1420* (0.0641)
1985-89 cohort*immigrant	-0.3071*** (0.0564)	-0.1764* (0.0927)	-0.1564** (0.0639)	-0.1262 (0.0974)
1990-94 cohort*immigrant	-0.4122*** (0.0580)	-0.3413*** (0.1019)	-0.2478*** (0.0542)	-0.2957** (0.0990)
1995-99 cohort*immigrant	-0.3596*** (0.0602)	-0.2656** (0.0951)	-0.2096*** (0.0595)	-0.2171** (0.0959)
R <sup>2</sup>	0.1690	0.1691	0.1707	0.1707
Native sample		404,033		278,272
Immigrant sample		413,901		285,123

Note: Model also includes a constant and indicators of marital status, province, Montreal, Vancouver and rural status. The excluded category is a non-married individual living in urban Toronto. Robust standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels respectively. The dependent variable is log weekly earnings which includes wages and salaries and net income from self-employment. The samples are restricted to individuals aged 18 to 54 with positive earnings who reported working mostly full-time for 52 weeks in the income reference year. Immigrants who migrated before 1965 and natives who entered the Canadian labour market before 1965 are dropped from the sample. Non-permanent residents, institutional residents and those living in the territories are also excluded.

Table 3: Cohort entry effects controlling for language abilities and region of birth.

	Men		Women	
	(1)	(2)	(1)	(2)
Immigrant dummy	0.4016*** (0.0231)	0.4035*** (0.0317)	0.5894*** (0.0352)	0.6943*** (0.0243)
1970-74 cohort*immigrant	-0.0077 (0.0185)	0.0296 (0.0241)	-0.0340** (0.0148)	-0.0153 (0.0166)
1975-79 cohort*immigrant	-0.0105 (0.0332)	0.0351 (0.0403)	-0.0509 (0.0346)	-0.0274 (0.0357)
1980-84 cohort*immigrant	-0.0828 (0.0596)	-0.0270 (0.0687)	-0.1286* (0.0616)	-0.0995 (0.0627)
1985-89 cohort*immigrant	-0.1459 (0.0879)	-0.0720 (0.0980)	-0.1090 (0.0964)	-0.0742 (0.0965)
1990-94 cohort*immigrant	-0.3045** (0.0980)	-0.2276* (0.1111)	-0.2738** (0.0985)	-0.2359** (0.1004)
1995-99 cohort*immigrant	-0.2256** (0.0913)	-0.1517 (0.1065)	-0.1959* (0.0954)	-0.1581 (0.0952)
<u>Other controls</u>				
Mother tongue*knowledge of official languages	YES	YES	YES	YES
Region of birth	NO	YES	NO	YES
R <sup>2</sup>	0.1714	0.1738	0.1728	0.1739
Native sample		403,466		277,856
Immigrant sample		413,308		284,721

Note: All specifications include the full set of covariates in the baseline model (i.e. specification (2) in Table 2). The excluded category is a non-married person living in urban Toronto with English as mother tongue and no knowledge of French. Robust standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels respectively. The dependent variable is log earnings, which includes wages and salaries and net income from self-employment. Samples are restricted to individuals aged 18 to 54 with positive earnings who reported working mostly full-time for 52 weeks in the income reference year. Immigrants who migrated before 1965 and natives who entered the Canadian labour market before 1965 are dropped from the sample. Non-permanent residents, institutional residents and those living in the territories are also excluded. 1,160 men and 818 women have implausible language variable codes (e.g. mother tongue is French and no current knowledge of French) and are dropped from the sample.

Table 4: Foreign experience and years of schooling interacted with entry cohort.

	Men	Women
Immigrant dummy	0.3660*** (0.0326)	0.6644*** (0.0277)
1970-74 cohort*immigrant	0.0217 (0.0255)	-0.0135 (0.0202)
1975-79 cohort*immigrant	0.0058 (0.0338)	-0.0214 (0.0421)
1980-84 cohort*immigrant	-0.0568 (0.0631)	-0.0771 (0.0501)
1985-89 cohort*immigrant	-0.0323 (0.1013)	-0.0680 (0.0807)
1990-94 cohort*immigrant	-0.1254 (0.1378)	-0.1689 (0.0958)
1995-99 cohort*immigrant	-0.1059 (0.1302)	-0.1755 (0.1151)
Foreign experience	0.0155*** (0.0019)	0.0061*** (0.0018)
Foreign experience*1970-74 cohort	-0.0006 (0.0006)	-0.0023*** (0.0004)
Foreign experience*1975-79 cohort	-0.0004 (0.0007)	-0.0017*** (0.0005)
Foreign experience*1980-84 cohort	-0.0026*** (0.0003)	-0.0030* (0.0015)
Foreign experience*1985-89 cohort	-0.0046*** (0.0006)	-0.0036* (0.0017)
Foreign experience*1990-94 cohort	-0.0101*** (0.0011)	-0.0071** (0.0023)
Foreign experience*1995-99 cohort	-0.0132*** (0.0014)	-0.0072*** (0.0009)
Foreign experience <sup>2</sup> /100	-0.0104** (0.0045)	0.0172*** (0.0021)
Foreign school years	0.0582*** (0.0027)	0.0658*** (0.0019)
Foreign school years*1970-74 cohort	0.0005 (0.0005)	-0.0001 (0.0007)
Foreign school years*1975-79 cohort	0.0012 (0.0009)	-0.0018 (0.0011)
Foreign school years*1980-84 cohort	0.0023 (0.0019)	-0.0027* (0.0013)
Foreign school years*1985-89 cohort	-0.0022 (0.0014)	-0.0010 (0.0017)
Foreign school years*1990-94 cohort	-0.0022 (0.0042)	-0.0029 (0.0025)
Foreign school years*1995-99 cohort	0.0043 (0.0031)	0.0031 (0.0033)
<u>Other controls</u>		
Mother tongue*knowledge of official languages	YES	YES
Region of birth	YES	YES
R <sup>2</sup>	0.1740	0.1739
Native sample	403,466	277,856
Immigrant sample	413,308	284,721

Note: Both regressions include the full set of covariates in the baseline model (i.e. specification (2) in Table 2). The excluded category is a non-married person living in urban Toronto with English as mother tongue and no knowledge of French. Robust standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels respectively. The dependent variable is log earnings, which includes wages and salaries and net income from self-employment. Samples are restricted to individuals aged 18 to 54 with positive earnings who reported working mostly full-time for 52 weeks in the income reference year. Immigrants who migrated before 1965 and natives who entered the Canadian labour market before 1965 are dropped from the sample. Non-permanent residents, institutional residents and those living in the territories are also excluded.

Table 5: Foreign experience and years of schooling interacted with entry cohort for Western and Eastern samples.

	Men		Women	
	Western	Eastern	Western	Eastern
Immigrant dummy	0.3694*** (0.0587)	0.4309*** (0.0694)	0.6149*** (0.0326)	0.6917*** (0.0600)
1970-74 cohort*immigrant	0.0037 (0.0186)	-0.0381 (0.0436)	-0.0249* (0.0134)	-0.0345 (0.0307)
1975-79 cohort*immigrant	-0.0292 (0.0289)	-0.0742* (0.0377)	-0.0353 (0.0368)	-0.0722 (0.0545)
1980-84 cohort*immigrant	-0.1284* (0.0583)	-0.1360* (0.0733)	-0.1435*** (0.0242)	-0.1419* (0.0743)
1985-89 cohort*immigrant	-0.1617** (0.0639)	-0.1147 (0.1149)	-0.1500*** (0.0417)	-0.1405 (0.1216)
1990-94 cohort*immigrant	-0.2333** (0.1009)	-0.2357 (0.1673)	-0.1925 (0.1692)	-0.2707** (0.1096)
1995-99 cohort*immigrant	-0.5062*** (0.1280)	-0.1562 (0.1498)	-0.3137** (0.1063)	-0.3328* (0.1576)
Foreign experience	0.0250*** (0.0027)	0.0084*** (0.0018)	0.0078** (0.0029)	0.0052*** (0.0014)
Foreign experience*1970-74 cohort	0.0012 (0.0007)	0.0000 (0.0011)	-0.0011 (0.0006)	-0.0031** (0.0011)
Foreign experience*1975-79 cohort	0.0025 (0.0019)	0.0009 (0.0009)	-0.0020 (0.0014)	-0.0009 (0.0013)
Foreign experience*1980-84 cohort	-0.0003 (0.0011)	0.0005 (0.0008)	-0.0039 (0.0022)	-0.0010 (0.0014)
Foreign experience*1985-89 cohort	0.0023 (0.0023)	-0.0025*** (0.0007)	-0.0015 (0.0032)	-0.0032* (0.0015)
Foreign experience*1990-94 cohort	-0.0031 (0.0021)	-0.0078*** (0.0013)	-0.0077*** (0.0017)	-0.0062** (0.0022)
Foreign experience*1995-99 cohort	-0.0036*** (0.0011)	-0.0110*** (0.0012)	-0.0068*** (0.0027)	-0.0052*** (0.0010)
Foreign experience <sup>2</sup> /100	-0.0400*** (0.0052)	-0.0007 (0.0029)	0.0144** (0.0046)	0.0166*** (0.0048)
Foreign school years	0.0519*** (0.0031)	0.0607*** (0.0037)	0.0618*** (0.0024)	0.0653*** (0.0038)
Foreign school years*1970-74 cohort	0.0031*** (0.0005)	-0.0015 (0.0011)	0.0046*** (0.0008)	-0.0055** (0.0023)
Foreign school years*1975-79 cohort	0.0053*** (0.0010)	-0.0010 (0.0008)	0.0049*** (0.0007)	-0.0072* (0.0035)
Foreign school years*1980-84 cohort	0.0134*** (0.0014)	-0.0032 (0.0024)	0.0116*** (0.0028)	-0.0086** (0.0037)
Foreign school years*1985-89 cohort	0.0083*** (0.0015)	-0.0050 (0.0029)	0.0127*** (0.0010)	-0.0052 (0.0045)
Foreign school years*1990-94 cohort	0.0095*** (0.0025)	-0.0049 (0.0057)	0.0101* (0.0052)	-0.0069 (0.0050)
Foreign school years*1995-99 cohort	0.0285*** (0.0040)	0.0002 (0.0045)	0.0312*** (0.0042)	0.0005 (0.0066)
<u>Other controls</u>				
Mother tongue*knowledge of official languages	YES	YES	YES	YES
Region of birth	YES	YES	YES	YES
R <sup>2</sup>	0.1766	0.1763	0.1789	0.1782
Native sample	403,466	403,466	277,856	277,856
Immigrant sample	171,741	184,306	106,979	128,744

Note: All regressions include the full set of covariates in the baseline model (i.e. specification (2) in Table 2). The excluded category is a non-married person living in urban Toronto with English as mother tongue and no knowledge of French. Western regions are North America, and Northern, Western, and Southern Europe. The Eastern regions are Eastern Europe, Africa, and Asia. Robust standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels respectively. The dependent variable is log earnings, which includes wages and salaries and net income from self-employment. Samples are restricted to individuals aged 18 to 54 with positive earnings who reported working mostly full-time for 52 weeks in the income reference year. Immigrants who migrated before 1965 and natives who entered the Canadian labour market before 1965 are dropped from the sample. Non-permanent residents, institutional residents and those living in the territories are also excluded.

Table 6: OLS regression of weekly earnings on entry unemployment rate and native cohort effects.

	Men	Women
1970-74 cohort	-0.0332** (0.0106)	-0.0240** (0.0106)
1975-79 cohort	-0.0720*** (0.0216)	-0.0602** (0.0237)
1980-84 cohort	-0.1183*** (0.0367)	-0.1201*** (0.0370)
1985-89 cohort	-0.1645*** (0.0447)	-0.1712** (0.0620)
1990-94 cohort	-0.2289*** (0.0480)	-0.2474*** (0.0608)
1995-99 cohort	-0.2797*** (0.0460)	-0.3061*** (0.0679)
Entry unemployment rate	-0.0040*** (0.0010)	-0.0035* (0.0016)
Entry unemployment rate*immigrant	-0.0018 (0.0037)	0.0004 (0.0026)
Immigrant dummy	0.1938*** (0.0495)	0.4472*** (0.0614)
1970-74 cohort*immigrant	0.0652*** (0.0189)	0.0156 (0.0132)
1975-79 cohort*immigrant	0.0980*** (0.0278)	0.0485 (0.0303)
1980-84 cohort*immigrant	0.0924 (0.0519)	0.0604* (0.0326)
1985-89 cohort*immigrant	0.1568** (0.0655)	0.1124* (0.0524)
1990-94 cohort*immigrant	0.1416 (0.1088)	0.0977 (0.0690)
1995-99 cohort*immigrant	0.1908* (0.0963)	0.1229 (0.0995)
<u>Other controls</u>		
Mother tongue*knowledge of official languages	YES	YES
Region of birth	YES	YES
Foreign experience*cohort*immigrant	YES	YES
Foreign schooling*cohort*immigrant	YES	YES
R <sup>2</sup>	0.1790	0.1791
Native sample	403,466	277,856
Immigrant sample	413,308	284,721

Note: All regressions include the full set of covariates in the baseline model (i.e. specification (2) in Table 2). The excluded category is a non-married person living in urban Toronto with English as mother tongue and no knowledge of French. Robust standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at the 1, 5, and 10 percent levels respectively. The dependent variable is log earnings, which includes wages and salaries and net income from self-employment. Samples are restricted to individuals aged 18 to 54 with positive earnings who reported working mostly full-time for 52 weeks in the income reference year. Immigrants who migrated before 1965 and natives who entered the Canadian labour market before 1965 are dropped from the sample. Non-permanent residents, institutional residents and those living in the territories are also excluded.

Figure 1 – Male predicted earnings profiles based on specification 1 of table 1

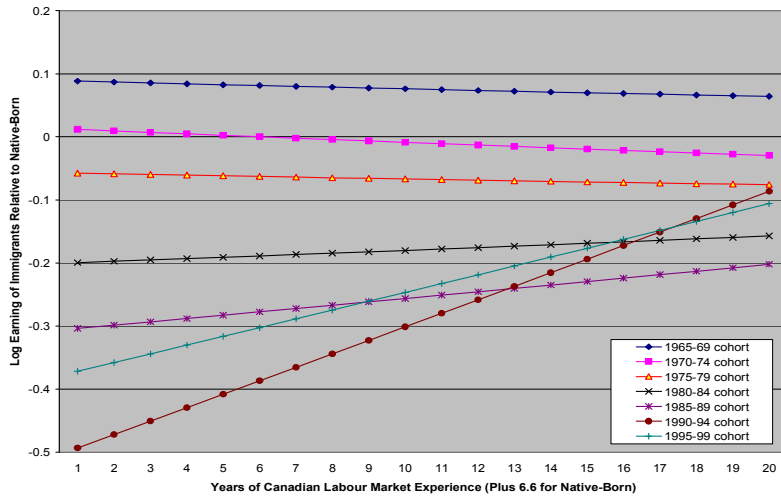


Figure 2 – Female predicted earnings profiles based on specification 1 of table 1

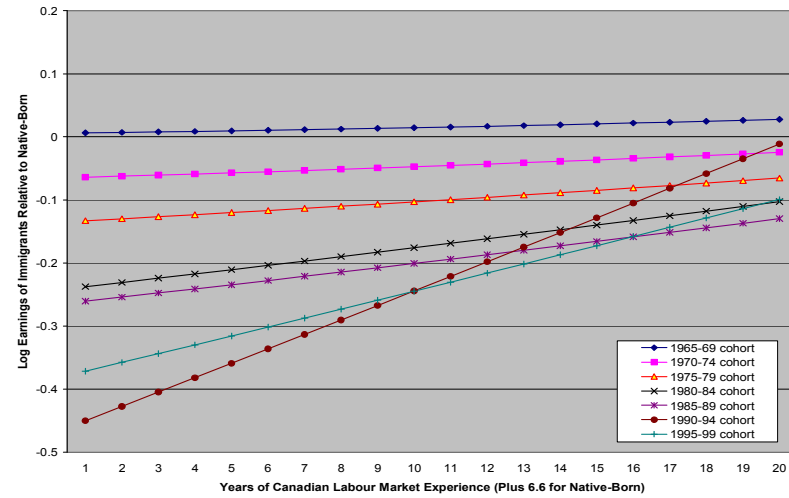


Figure 3 – Male predicted earnings profiles based on table 6 specification

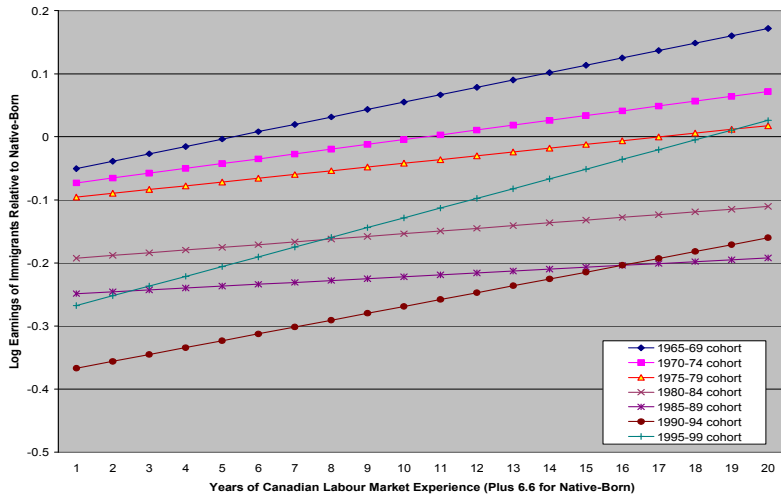
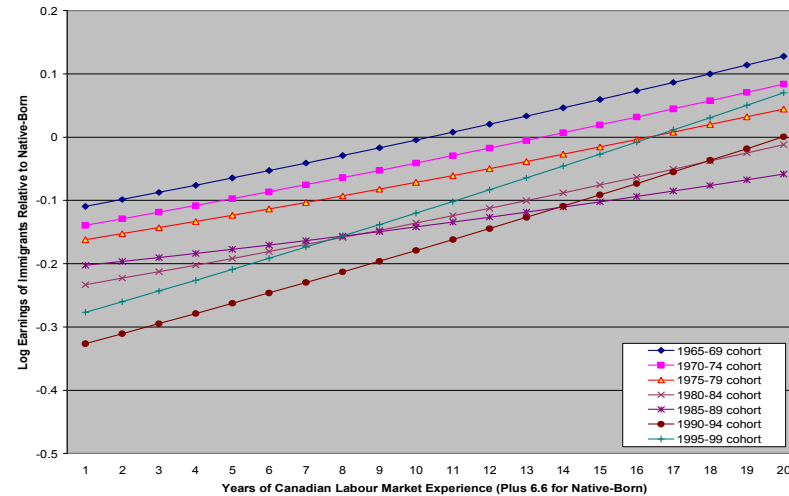


Figure 4 – Female predicted earnings profiles based on table 6 specification



Note: All profiles represent the mean predicted log earnings in the immigrant sample if all immigrants assumed to arrive in Canada with 6.6 years of experience and 11.9 years of schooling – the means years of foreign experience and schooling in the data. This is compared to the mean predicted log earnings of native-born Canadians when they are assumed to have the same total years of experience and schooling (i.e. they begin their careers with 6.6 years of labour market experience and 11.9 years of Canadian schooling).

## Appendix

## Sample means by immigrant status.

	Men		Women	
	Immigrants	Native-born	Immigrants	Native-born
Log weekly earnings (\$2000)	6.563	6.606	6.217	6.305
Entry cohort				
1965-1969	0.222	0.178	0.207	0.156
1970-1974	0.224	0.235	0.227	0.216
1975-1979	0.178	0.231	0.181	0.237
1980-1984	0.126	0.166	0.127	0.173
1985-1989	0.112	0.105	0.118	0.117
1990-1994	0.095	0.058	0.099	0.065
1995-1999	0.043	0.027	0.041	0.036
Years since migration	14.157	-	14.625	-
Canadian experience	12.012	14.763	12.279	14.422
Canadian years of schooling	2.039	13.949	2.223	14.007
Foreign experience	6.703	-	6.505	-
Foreign years of schooling	12.172	-	11.479	-
Current unemployment rate	6.348	7.113	6.277	7.146
Entry unemployment rate	6.988	7.201	7.063	7.379
Married	0.800	0.722	0.721	0.655
Newfoundland	0.003	0.016	0.002	0.018
Prince Edward Island	0.001	0.004	0.001	0.005
Nova Scotia	0.009	0.034	0.007	0.035
New Brunswick	0.005	0.026	0.004	0.027
Montreal	0.106	0.114	0.095	0.125
Rest of Quebec	0.015	0.142	0.011	0.136
Toronto	0.400	0.115	0.442	0.130
Rest of Ontario	0.174	0.245	0.155	0.236
Manitoba	0.031	0.044	0.033	0.043
Saskatchewan	0.009	0.041	0.009	0.037
Alberta	0.094	0.112	0.087	0.105
Vancouver	0.114	0.052	0.121	0.054
Rest of British Columbia	0.039	0.055	0.033	0.049
Rural	0.069	0.217	0.056	0.187
English mother tongue and unilingual	0.341	0.633	0.366	0.610
English mother tongue and bilingual	0.033	0.063	0.036	0.073
French mother tongue and unilingual	0.010	0.111	0.010	0.127
French mother tongue and bilingual	0.025	0.155	0.023	0.146
Foreign mother tongue and speaks English	0.482	0.031	0.461	0.033
Foreign mother tongue and speaks French	0.014	0.000	0.015	0.000
Foreign mother tongue and bilingual	0.074	0.007	0.060	0.011
Foreign mother tongue and no French or English	0.021	0.000	0.029	0.000
Region of birth				
North America	0.050	1.000	0.060	1.000
Central America	0.015	-	0.012	-
Caribbean	0.065	-	0.097	-
South America	0.047	-	0.051	-
Northern Europe	0.160	-	0.143	-
Western Europe	0.057	-	0.048	-
Southern Europe	0.143	-	0.122	-
Eastern Europe	0.061	-	0.062	-
Africa	0.058	-	0.050	-
South Asia	0.094	-	0.073	-
Southeast Asia	0.093	-	0.128	-
East Asia	0.102	-	0.117	-
West Asia	0.042	-	0.024	-
Oceania and other	0.013	-	0.013	-

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<sup>1</sup> Frenette and Morrisette (2003) also consider women and use the complete 20 percent 2001 Census data, but their analysis is focused on documenting changes in assimilation profiles between immigrant cohorts and not on explaining deteriorating entry earnings across these cohorts.

<sup>2</sup> A more flexible specification might also interact the cohort dummies with the quadratic *YSM* term. The difficulty is that mean *YSM* for the most recent cohort is only 2.5 so that the quadratic term is poorly identified. In order to obtain reasonable out-of-sample predictions in the figures of section 4 we follow Beaudry and Green (2000) and Green and Worswick (2003) and assume constant curvature of all our estimated earnings growth profiles across cohorts.

<sup>3</sup> Specifically, we use the male and female provincial unemployment rates for individuals aged 25 to 54.

<sup>4</sup> We would like to thank an anonymous referee for pointing out the “Moulton problem” and suggesting Stata’s cluster option as a solution.

<sup>5</sup> Access to these files is restricted to Statistics Canada’s premises in Ottawa.

<sup>6</sup> Full-year is defined as working 52 weeks in the income reference year. Full-time is defined as usually working more than 30 hours per week.

<sup>7</sup> All of the results from the larger samples of all workers are available from the authors upon request.

<sup>8</sup> In particular, unlike survey data, the IMDB data is sensitive to tax filing incentives. This has, for example, led to sample selection issues as filing rates increased among low income individuals with the introduction of the Canada Child Tax Benefit (CCTB) in early 1990s.

<sup>9</sup> Schaafsma and Sweetman (2001) and Ferrer and Riddell (2003) similarly distinguish Canadian and foreign experience and years of schooling, but due to the public-use Census file limitations they are left with a residual “unknown” category.

<sup>10</sup> Borjas (1999) has shown that the negative correlation between entry earnings and earnings growth is, in fact, conditional on a given level of education. When not conditioning on education it might be the case that immigrants who arrive with relatively more human capital (and therefore have higher entry earnings) are also the immigrants who invest relatively more in additional human capital (and thereby experience greater earnings growth).

<sup>11</sup> To the extent that immigrants arrive in Canada with foreign experience and return to school in Canada, our measures will overstate years of foreign schooling and Canadian experience by the number of years spent in Canadian school and understate years of Canadian schooling and foreign experience by the exactly same amount. This introduces a very special form of non-classical measurement error, the consequences of which, it turns out, depend on the relative magnitudes of the true returns to Canadian and foreign, experience and schooling. From some simple Monte Carlo simulations of the problem,

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we find that if the sum of the returns to the over measured variables (foreign schooling and Canadian experience) exceed the sum of the returns to the under measured variables (Canadian schooling and foreign experience), then the returns to the over measured variables will be downward biased and the returns to the under measured variables will be upward biased. If the sum of the returns to the over measured variables are less than the sum of the returns to the under measured, then the opposite is true. Since there is no way of determining the relative magnitude of these sums, the direction of the bias is ambiguous. To the extent that they are equal, our estimates will be unbiased.

<sup>12</sup> We leave the issue of earnings growth upon arrival to the final section of the paper.

<sup>13</sup> The exception is individuals with a French mother tongue and no knowledge of English. In both our male and female samples their earnings appear much closer to the earnings of individuals with a foreign mother tongue.

<sup>14</sup> In both the male and female sample we are able to reject the null that all the foreign schooling interaction terms are zero at the 1 percent level.

<sup>15</sup> Green and Worswick (2004) make a similar comparison between immigrants from traditional and non-traditional source countries and obtain a similar result.