

Vancouver Centre of Excellence



Research on Immigration and Integration in the Metropolis

Working Paper Series

No. 02-11

**Immigrants' Earnings and Assimilation in Canada's Labour Market: The
Case of Overachievers**

Handy Gozalie

April 2002

RIIM

Research on Immigration and Integration in the Metropolis

The Vancouver Centre is funded by grants from the Social Sciences and Humanities Research Council of Canada, Citizenship & Immigration Canada, Simon Fraser University, the University of British Columbia and the University of Victoria. We also wish to acknowledge the financial support of the Metropolis partner agencies:

- Health Canada
- Human Resources Development Canada
- Department of Canadian Heritage
- Department of the Solicitor General of Canada
- Status of Women Canada
- Canada Mortgage and Housing Corporation
- Correctional Service of Canada
- Immigration & Refugee Board

Views expressed in this manuscript are those of the author(s) alone. For more information, contact the Co-directors of the Centre, Dr. Don DeVoretz, Department of Economics, SFU (e-mail: devoretz@sfu.ca) or Dr. David Ley, Department of Geography, UBC (e-mail: dley@geog.ubc.ca).

Immigrants' Earnings and Assimilation in Canada's Labour Market: The Case of Overachievers

by

Handy Gozalie

A Research Project Submitted in Partial Fulfillment of the Requirements of the Degree of Master of Arts in the Department of Economics, Simon Fraser University

April 2002

Abstract: This project used the 1996 Canadian census data to investigate the economic performance of immigrants from developed countries in Canada's labour market. Economic performance is measured by the income received from salaries, wages and self-employment income. Several hypotheses are tested, the purpose of which is to investigate the possibility that immigrants who come from traditional sending origins exhibit "overachiever" characteristics. The analysis was based on the human capital model augmented with several socio-demographic variables, and the estimation was carried using the *Feasible* GLS method. The results show that, contrary to the traditional hypothesis, immigrants from United States, the United Kingdom, German and Italy are subject to a positive premium upon entry. Moreover, their earnings rise at a slower rate, confirming the applicability of the human capital model in explaining their earnings equation. The impact on labour market experience and schooling prior to immigration is found to have a lesser effect on earnings than if these attributes are acquired in Canada. The study conforms to the findings of Akbari (1988), which show that immigrants from Western Europe are subject to a positive premium upon entry.

1. Introduction

Canadian Immigration policy has undergone significant changes since 1986. Over the past two decades, immigration policy has shifted, giving a greater emphasis toward humanitarian and family reunion concerns and reducing the emphasis on the economic or independent category more prominent in the 1960s. In fact, between 1968 until 1978 the independent category of immigrants made up approximately 48 percent of total admissions. By 1990, however, this independent class plummeted to about 22 percent of the total, although it rose again and was restored to 50-50 of the admission balance by 1994-1995. In addition, these changes in immigration regulations along with supply conditions alter immigrants by sending countries. In 1967, over 75 percent of immigrants originated from the United States and Western Europe. However, by the 1990s the majority of immigrants came from developing and less-developed countries.

This shift in immigration regulations in turn led to a new set of policy issues that can be thought of as assessing the successfulness of the change in the immigration regime. These issues can be broadly categorized into two different classes: one economic and one cultural.¹ Under the economic class, issues arising from immigration have been the subject of much research reflecting the importance of the contribution of immigrant earnings in the Canadian economy. Some of the most contentious economic issues in relation to the earnings of immigrants relative to Canadian-born workers are the failure of the assimilation process of the immigrants, and the impacts of the contribution to the public purse versus the consumption of public goods.

Under the points criterion, immigrants who enter Canada would be filtered by their skills and knowledge.² This method of immigrant filtering was intended to ensure successful integration into the Canadian labour market; thus, applicants are expected to contribute to the Canadian economy as their earnings grow. On the other hand, the entrance of immigrants under a non-economic admission, on humanitarian grounds for example, raises several economic concerns. Individuals admitted under the

¹ The argument under cultural class is not necessarily relevant since Canada is a country constituted on principles of tolerance and multiculturalism (Dean and DeVoretz 1996).

² Canadian Immigration and Citizenship (2002) provides the following self assessment for immigrants interested to enter under independent category:

| Age | Education | Occupation | Education/ training factor | Arranged employment | Work exp | Language | Demographic factor | Relative |
|-----|-----------|------------|----------------------------------|------------------------|-------------|----------|-----------------------|----------|
| 10 | 16 | 10 | 10 | 10 | 8 | 15 | 8 | 5 |

* The minimum score to pass the interview stage is 70. Unless applicants have at least 60 points on the above nine factors, the application will not merit further consideration and applicants will not be called for an interview.

latter categories, for example under family reunification and refugee, are expected to experience greater difficulties assimilating into the Canadian labour force than applicants under the points-assessed criterion. This initial difficulty in assimilation, if not overcome, could adversely affect the welfare of the existing working population since it would mean a greater dependency by immigrants on the welfare system (DeVoretz and Ozsomer 1999).

There have been numerous studies on the earnings of immigrants to Canada. Although these studies (e.g. Chiswick and Miller 1988; Bloom, Grenier and Gunderson 1995; Bloom and Gunderson 1991; De Silva 1992 and 1997; Dean and DeVoretz 1996) differ in certain dimensions, their overall conclusion suggests that immigrants exhibit underachiever status:

...there is indeed often an apparent disparity in earnings between immigrants and the native born. While some studies show that many immigrants have done well in the host country, other studies claim that this is not true of all immigrants. They argue that the earnings of certain immigrant groups have consistently lagged behind the earnings level of comparable Canadian born persons even after many years of stay in this country (De Silva 1992, 21).³

“Underachiever” here refers to the immigrant who is subject to some economic penalties upon entry, as reflected in the initially lower income earned relative to the Canadian-born cohort. However, over time immigrants’ earnings are found to increase with their length of stay reflecting a positive assimilation process until a catch-up point occurs.

It is important to note that these results and the estimated assimilation model preclude the possibility of an immigrant group earning a positive premium upon arrival and subsequently outperforming their Canadian-born cohort over their entire stay in Canada. Immigrants who exhibit this characteristic will be referred to as “overachievers” in this paper.

In line with the above issue, the purpose of this project is to analyze the earnings of immigrants from the traditional sending origins in relation to the Canadian born. By concentrating on this immigrant group, this project attempts to prove that the notion of immigrants being underachievers cannot universally be applied to all newcomers. The countries of choice here are the USA, United Kingdom, German and Italy. These four countries were chosen because, in addition to being Canada’s traditional sending countries in which the majority of immigrants entered under the points criterion, it was found from prior screening of the data, that the average earnings of immigrants originating from these countries exceeded those of the Canadian born circa 1996.⁴ Thus, it is possible

³ De Silva (1992) “Earnings of immigrants: A comparative analysis.” A study prepared for the Economic Council of Canada.

⁴ See Table 1 for more.

that there exists a structural difference in the earnings function of this putative elite group from developed countries.⁵

In this paper, *elite* immigrant (or *elite* foreign born) is defined as the sample of pooled immigrants originating from the USA, UK, German and Italy. *All* immigrant (or *all* foreign born) means pooled immigrants from all countries, including also the USA, UK, Germany and Italy. By analyzing the economic performance of this possibly *elite* immigrant, this project will attempt to isolate the unique features that led to this overachieving outcome in contrast to the traditional assimilation as a “catch-up” view.⁶

The framework of the analysis is based on the use of a unique human capital model augmented with several socio-demographic variables to explain the differential in the economic performance of the individual as measured by income from wages and self-employment. The use of a *feasible* GLS (WLS) estimator will be employed to estimate the parameters of interest and to plot the earnings profile since year of migration.

This project is divided into four sections. The literature review appears in section 2 where the hypotheses of interest are elaborated and related results discussed. In section 3, the empirical analysis including the database, equation specification and estimation results are reported. Section 4 summarizes the results and concludes the study.

2. Literature Review.

Chiswick’s (1978) seminal study is a foundation piece for this project. The hypothesis of interest for this study is related to the fact that incomes earned in the Canadian labour market are positively related to the productivity of the workers. In addition, basic economic theory also shows that workers are paid according to their productivity. For an individual, productivity can improve over time as experience is gained in different occupations, i.e. he or she consumes some form of schooling or labour market training.

This theoretical underpinning implies that possibly less productive immigrant enter the Canadian labour market with an earnings disadvantage since recent immigrants to Canada are likely

⁵ From 1980-1989, 43.2 percent of immigrants entered under the independent category. Family class and refugees made up 56.8 percent. From this 43.2 percent, approximately 61 percent originated from the USA and Western Europe (including the United Kingdom).

⁶ The issue of whether the earnings of pooled immigrants *excluding* US, UK, German and Italy would exhibit the underachiever income performance characteristic is an important issue as well, however this is not addressed in here.

to have fewer of the characteristics associated with higher earnings relative to Canadian-born citizens. For example, Non-elite immigrants are suspected of having less knowledge about the local labour market conditions and opportunities, having a less-developed proficiency in the official languages, or having less of the specific training demanded by Canadian firms. With this lack of relevant human capital characteristics to compete in the Canadian labour market, immigrant workers therefore are predicted to be subject to some earnings penalties in their early years in the labour market. In the literature, the initial lower earning for immigrants is referred to as a (negative) entry effect. We formalize this entry effect as follows, let *Foreign* represent a dummy variable taking the value of unity if the individual is foreign born and zero otherwise, the hypothesis of negative entry effect can be formalize as $\partial \text{Ln}Y / \partial \text{Foreign} < 0$, where Ln Y is the natural logarithm of income. For elite immigrants the opposite will hold.

The theory of human capital model is used to capture the nature of workers' productivity. Human capital accumulation can be defined as acquiring any income-enhancing characteristic through an act of investment. This investment has two cost components, a direct expenditure and foregone earnings. Two key examples of human capital acquisition are formal education and labour market training. For immigrants, some aspects of training and schooling are country-specific and thus are not perfectly transferable when they migrate to Canada; this is especially true for immigrants from developing (or less-developed) countries. However, for individuals who emigrate from sending countries that are similar to Canada, it is predicted that they will not experience a negative entry effect.

Given the hypothesis of the negative entry effect for immigrants, another important question arises with regard to the assimilation process. An assimilation process can be defined as the process whereby immigrants become more like Canadian-born people along some specified dimension, which, for the investigative purposes of this project, happens to be earnings assimilation. For immigrants originating from countries similar to Canada, the steepness of the increase in earnings as they continue to work should be flatter because of the lower negative entry effect. The interesting question here is whether immigrants' earnings will closely approach or possibly exceed those of Canadian-born individuals with similar income-enhancing characteristic over time. Certainly, the possibility exists that immigrants who acquire more experience in Canadian society will earn more even though they are subject to negative entry effect in the beginning.

The hypothesis also states that the earnings of immigrants' group may, but need not, equal or exceed the earnings of the native born as the immigrants make further human capital investments. In addition, it should also be the case that the largest adjustments occur in the first few years after arrival

and thus the increase in earning power is greatest in these years, this will be reflected in the shape of the earnings profile. Letting YSM and YSM^2 denote year since migration and its square, the hypothesis regarding the assimilation process can be formalized as, $\partial LnY / \partial YSM > 0$ and $\partial^2 LnY / \partial YSM^2 < 0$.

Underlying all the hypotheses above is one important and crucial assumption regarding the nature of the immigrants themselves. It is argued in this paper that individuals who enter under an economic admission are more highly motivated than other categories of immigrants, and have the innate ability to excel in competition with the Canadian born in the labour market. This assumption of self-selection is justified since, immigrating involves substantial costs — both direct monetary cost as well as an opportunity cost and only those who feel they can recoup some will move.

For socio-demographic characteristics, the argument is in favour of those who are married, with a spouse and children present. The individual that falls into these groups is argued to be more attached to the labour market, tend to invest more in human capital and are in better health; thus they are expected to perform better economically relative to the individual without these characteristics (Chiswick 1978).

The empirical result from the 1970 U.S. census supports all hypotheses above. Utilizing the basic human capital model augmented with several observable socio-demographic characteristics such as place of residents and marital status, Chiswick (1978) found that initially white male foreign-born immigrants earn less income (salary and self employment income) than comparable non-foreign-born counterparts in the United States. Over time, however, the earnings gap is narrowed at a decreasing rate and the earnings crossover occurs after 10-15 years in America. After approximately 20 years in the country, foreign-born white males were estimated to have 6 percent higher earnings.

The same author also found that foreign labour market experience is valued less relative to the U.S. labour market experience, suggesting the gain from being immigrants is greater the younger one is at the time of immigration. The country of origin is also found to play a significant role in determining the earnings of immigrants. Indeed, the impact of labour market experience and schooling in the United States has far less of an impact on immigrants that came from English-speaking countries than those who came from non-English-speaking countries. This finding could be taken as evidence that a different degree of transferability of country-specific training exists in the destination country.

Following Chiswick's (1978) pioneering study, many other researchers investigated similar issues by taking a slightly different approach and asking different questions. Relevant for the context of this paper, the literature review discussed below will concentrate on the Canadian case.

Chiswick and Miller (1988) tests the hypotheses described above for the Canadian case. Utilizing 1971 and 1981 Canadian census data they found that immigrants in Canada are underachiever; their earnings are subject to negative penalty upon entry and it increases over time.

Augmenting human capital model with several socio-demographic variables, the authors found that there exists a wage premium for bilingualism (French and English) for the Canadian born although the earnings difference between English speaking monolingual and French speaking monolingual has been diminishing over time. In addition Canadian born men of French ethnicity are found to have higher earnings than other Canadian born men.

From the comparison of Canadian born and foreign born, the authors found that years of schooling are significant in determining earnings of immigrants in Canada with a smaller partial effect for immigrants group. Effect of pre-immigration working experience is found to have lower partial effect however the effect of an additional year of post-immigration experience exceeds the partial effect of Canadian born experience. Looking at the results among foreign born, the authors found that comparing the impact of the length of stay on earnings among immigrants from developed English-speaking countries with immigrants from non-English speaking countries, length of stays has greater impact for the latter group. The coefficient estimate on schooling and pre-immigration experience is higher for immigrants originating from English-speaking developed countries confirming the greater transferability of schooling and immigration experience across countries with similar background.

Akbari (1988), using the 1981 Canadian census and the human capital model, investigated the earnings differential among immigrant in relation to public goods consumption. He divided the immigrants into two separate groups, those who came from Western Europe and those who originated from Asia, Africa and Central America. The plotted earnings differential between immigrants and the Canadian born shows that those with Western European origins are in a better position relative to all other immigrants in general. The author concluded that immigrants from Asia, Africa and Central America do experience an assimilation process whereas those with Western European origins exhibit an overachiever characteristic. For the latter group, their earnings are higher by about 10 percent relative to the Canadian born after the first year of landing.

Abbott and Beach (1992) investigated the role of age and cohort arrival effects on the earnings of immigrants. They were able to disentangle the own effect of age, work experience and year since migration given their unique data set.⁷ The authors found that Chiswick's (1978) hypotheses are confirmed for the Canadian case. The impacts of age and work experience play a significant role in the determination of the Canadian-born cohort and foreign-born earnings differential. Age is found to have a positive effect for the younger, less-experienced workers, but the same variable is found to have a negative effect for the older, more experienced workers. The concavity of the YSM-Earnings profile confirms the applicability of human capital model in capturing the diminishing return to earnings as one ages.

Studies by Bloom and Gunderson (1991) and Bloom, Grenier and Gunderson (1995) used pooled data from three different periods of the Canadian census — 1971, 1981 and 1986 — to incorporate the changes in the cohort effect in the assimilation process. The results from these studies are similar to others, confirming that the entry effect is negative, and over time the earnings differences are narrowed; however, the period of catching up is greater, around 13 to 22 years after entry to Canada. The negative entry effects are found to be much stronger for immigrants originating from Asia, Africa, and Latin America than for immigrants from traditional sending regions — Europe and the United States. In addition, through the use of pooled data, these studies have concluded that recent immigrant cohorts are more difficult to assimilate into the Canadian labour market than those who arrived earlier. Changes in Canadian immigration policy, the prolonged recession of the early 1980s and labour market discrimination are argued to be the sources of this slow down in the assimilation process.

Dean and DeVoretz (1996) investigated the economic performance of Jewish immigrants in Canada and concluded that Jewish people in Canada, both foreign born or Canadian born, on average exhibit an overachiever characteristic when compared to their non-Jewish cohort. They found that in large, Jewish populations in Canada on average possess a higher quality of human capital characteristic, such as a higher education level, are more likely to speak English, are more likely to be employed in professional occupations, and are more likely to work longer hours relative to the non-Jewish population. Jewish immigrants are found to earn as high an income as Canadian-born Jews regardless of the lower educational level of the former group, which implies that Jewish immigrants may not experience earnings penalties upon entry into Canada.

⁷The data set they used is called Job Mobility Survey or JMS for short. This data set report the actual labour market experience instead of having one to rely on Mincer's identity (age-school-5) to construct the artificial work experience which might lead to measurement error.

De Silva (1997) examines the earnings difference by entry class (assisted relative, convention refugees and independent or point assessed immigrants). The author found that although the earnings of independent (points-assessed) immigrants are relatively higher than the rest of the immigrant class, their earnings tend to grow the most slowly. Although immigrants that enter under humanitarian grounds initially experienced a substantial earnings disadvantage compared with the independents, the earnings gap has been narrowed to a significant extent over time. The author also acknowledged that there exist some unobserved or omitted factors that affect immigrants' earnings among various classes since the attributes they bring into Canada only count for a small portion of the earnings differences. Lastly, among those entering under the humanitarian entry category, Europeans outperform the majority from Third World countries

The studies of the differential in earnings are not limited to those subject to the assimilation of the catch-up phenomenon. For example, Pendakur and Pendakur (1996) investigated the earnings differential among visible minorities in Canadian's wage labour market. They concluded that visible minority workers in Canada, both Canadian born and foreign born, in general earn substantially less than their white workers counterparts after controlling for several important income-enhancing characteristics such as occupation, education and official language knowledge. For the Canadian-born visible minorities, the earnings differential is greater for men than for women relative to Canadian born whites. Earnings gaps also occur for aboriginal men and women in comparison to their white Canadian-born counterparts. In addition, the authors also found that there is substantial variation in the earnings penalties of the different ethnic groups.

To summarize, the foregoing reviews seem to conclude that in terms of entry effect and assimilation process, the majority of immigrants are found to exhibit an underachiever characteristic. Immigrants' earnings are found to be subject to negative effects but are predicted to increase over time as immigrants accumulate Canadian experience. The case of the overachiever holds somehow for the immigrants arriving from the traditional sending region. In addition their earnings are found to be subject to a smaller penalty relative to the other immigrants' group.

3. Empirical analysis

3.1 Earnings equation specification and variable definitions

The human capital model employed here is in the spirit of the model employed by Chiswick (1978), augmented with several socio-demographic variables. The earnings function is specified in a manner designed to test hypotheses described earlier.

In very general terms, the human capital model argues that differential lifetime earnings can be explained by different levels of human capital investment. Investments in human capital such as education or job-related skills are made in the early part of one's life and its benefits are reaped over time in terms of higher earnings. Over time an individual is predicted to invest less in human capital due to the fact that the costs are now higher (in terms of foregone earnings due to higher earnings from the accumulation of previous investment) and the time to recoup the benefits is shorter. Together with the natural depreciation of human capital as an individual ages, the experience-earnings profile is predicted to be concave reflecting the fact that earnings are declining as the stock of productive human capital diminishes.

The positive entry effect for the overachiever is reflected in a positive intercept of earnings profile relative to the Canadian-born cohort in the Earnings-Year Since-Migration framework. This positive premium implies that the quality of the income-enhancing characteristics these immigrants have acquired in their home country is higher relative to the Canadian-born cohort characteristics. It also reflects a high degree of transferability of skills across countries. In addition, a high probability of self-selection of immigrants who enter under economics criteria also would support the positive premium hypothesis.

The census data employed here do not report a direct measure of years of labour market experience and hence it needed to be constructed. Given the assumptions that individuals are in the labour force continuously after leaving school and make all of their human capital investment in Canada, the earnings function for Canadian-born workers can be written as:

$\ln Y = f(\text{Year of schooling, labour market experience (EX), and } EX^2, \text{ marital status, gender, Ln weeks})$, in linear form, equation 1 takes the following specification:

(Equation 1.1)

$$\ln Y = \beta_0 + \beta_1 S + \beta_2 EX + \beta_3 EX^2 + \beta_4 \text{Married} + \beta_5 \text{Gender} + \beta_6 \text{LnWeeks} + v$$

The dependent variable is the natural log of earnings of annual total income: salary income plus earnings due to self-employment. Labour market experience (EX) is calculated as age minus years of schooling minus 5.⁸ The natural log of weeks worked is included in the regression to capture

⁸ The construction of labour market experience may suffer from measurement error for two reasons. First, it assumes that at any point in time an individual is either employed or going to school. For immigrants, this assumption of continuous employment may not be valid as one would expect there are some employment interruptions just before and after immigration. Second, different countries have different education systems, thus there might be some differences in the years required to complete the same degree in Canada.

the elasticity of income earned with respect to weeks worked, the coefficient estimate would implies that a one percent increase in the weeks worked would increase income by $\hat{\beta}_6$ percentage, the usual interpretation of elasticity. As usual v is the residual capturing the other variables that would affect earnings.

Here, to capture the diminishing return on earnings as individuals accumulate labour market experience, EX and EX^2 are entered into the earnings equation. S is years of schooling, married (spouse present) and gender are dummy variables taking the value of unity if the individual characteristic corresponds to the variable and 0 otherwise. Ex-post we would predict the signs on EX and EX^2 to be positive and negative respectively, and the sign on years of schooling, married and \ln weeks to be positive.

For the foreign born, equation 1 must be modified to capture the entry effect and the assimilation process. Here I am proposing the earnings function for foreign born as follows:

$Y=f$ (Year of schooling, labour market experience (EX), and EX^2 , marital status, gender, \ln weeks, year since migration (YSM) and YSM^2)

(Equation 2.1)

$$\ln Y = \beta_0 + \beta_1 S + \beta_2 EX + \beta_3 EX^2 + \beta_4 Married + \beta_5 Gender + \beta_6 \ln Weeks + \beta_7 YSM + \beta_8 YSM^2 + v$$

The coefficients on YSM and YSM^2 are predicted to be positive and negative respectively; the other variables are expected to have the same signs as in the Canadian-born case. Here for foreign born, the estimate of EX and EX^2 represents the impact of labour market experience prior to immigration.

To capture the differences in the impact of schooling, pre- and post-immigration, equation 2.1 is modified slightly by separating total years of schooling into two components. Unfortunately, the Census does not report the breakdown of this schooling for immigrants; however, following Chiswick's (1978) suggestion, the pre- and post-immigration schooling can be constructed by subtracting total years of schooling from years of schooling attained prior to immigration.

(Equation 3.1)

$$\ln Y = \beta_0 + \beta_1 EX + \beta_2 EX^2 + \beta_3 Married + \beta_4 Gender + \beta_5 \ln Weeks + \beta_6 Foreign + \beta_7 YSM + \beta_8 YSM^2 + \beta_9 Educ_prior + \beta_{10} Educ_post + v$$

Here, the number of years of schooling received before immigration, EDUCPRIOR, is estimated by assuming that an immigrant was in school continuously from age 5 to the lesser of either the age at immigration *or* the age at which schooling was completed. Since total schooling is equal to the sum of prior to and post-immigration schooling, then $EDUC_POST = EDUC - EDUC_PRIOR$.⁹

The sign on the variables Educ_prior and Educ_post are expected to be positive with a greater value for the latter which implies education attainment in Canada is valued higher than country of origin education due to the importance of country specific training.

3.2 Data base

The unit of the analysis in this project is the economically active individual. This unit measurement is justified since we are interesting in measuring the relative economic performance of immigrants relative to Canadian born workers. To meet this criterion the data were taken from the *Public Use Micro File* of the 1996 Canadian census for individuals. The population of interest comprises individuals aged 24-65 who worked at least 30 weeks in 1995 for paid employment or self-employment income and are reported to have positive earnings. I have excluded individuals residing in the Atlantic provinces and the territories for the reason that the census response for Italian-born people does not distinguish between Italians and a wide variety of other European countries, reflecting a small population of Italian born in Canada's maritime provinces. I use all the available data for foreign born and a 10 percent sample for Canadian born. Note that the 1996 census contains information corresponding to the preceding year.¹⁰

⁹ As Chiswick notes, this method of calculating years of schooling prior to and post-immigration is subject to bias. It is likely to underestimate the number of years of schooling after immigration and overestimate schooling prior to immigration. However given the nature of the census, this is the best proximity for these variables.

¹⁰ For more on data explanation and construction of some artificial variables, please refer to Appendix 2.

3.3 Analysis of earnings of Foreign and Canadian born

3.3.1 Analysis of Aggregated Sample regression coefficients (“elite” immigrants and Canadian born)

At first the estimation is going to be carried using the OLS method; however, since we are dealing with large cross-section observations, the presence of heteroskedasticity in the model is highly suspected.¹¹

The White test is employed to test for the presence of heteroskedasticity. First, the equations were estimated using OLS procedure and the residuals as well as the fitted values were saved. After squaring the residuals, the squared residuals were regressed on the estimated values and its squares. In a linear form it can be described as:

$$(Equation 4.1) \quad \hat{u}_i^2 = \delta_0 + \delta_1 \hat{Y}_i + \delta_2 \hat{Y}_i^2$$

The results from White tests are reported in Tables 2.A and 2.B. In short, the test rejects the null of homoskedasticity of the error term for all equations. Armed with this information, all future estimations employ the GLS technique.¹²

Table 1 presents the descriptive statistics for the relevant variables in our analysis. The data set is divided into Canadian born, elite immigrants and all immigrants in general. *Elite* foreign-born individuals earned almost 11 percent more income than the Canadian born and about 16.5 percent relative to *all* foreign born in 1995, or \$38,200 for the *elite* foreign born versus \$34,450 for the Canadian born versus \$32,766 for *all* foreign born. Given approximately the same number of years of schooling (13 years), and the fact that *elite* foreign born are 6 years older, this implies in terms of labour market experience that the *elite* foreign born are substantially ahead of their Canadian-born counterparts. *Elite* immigrants in our sample on average were found to have stayed in Canada for

¹¹ Although the presence of non-constant variance of the error term does not cause bias of the parameter estimate, it causes the variance of the parameter estimate to be biased and thus the usual t statistics do not have the t distributions in the presence of heteroskedasticity. In addition, F statistics are no longer F distributed and the LM statistic no longer has an asymptotic chi-square distribution. (Wooldridge 2000, 248).

¹² LM statistic is formed for each regression case as follow; $N \cdot R_{u_i^2}^2 \approx \chi_2^2$ where N is the number of observations and $R_{u_i^2}^2$ is the R-squared from the regressions. The results from the OLS and GLS do not differ by much implying the results are robust.

about 27 years and immigrated when they were about 18 years old, whereas the *all* immigrants sample on average have stayed for about 20 years and immigrated at age 23. Given the elite's average length of stay, I infer they entered Canada around 1968, and thus the majority of the elite immigrants came from traditional sending regions (Western Europe, UK and USA). The difference in weeks worked is not substantial; both groups on average worked about 49 weeks, and a higher proportion of *elite* foreign born are married.

From the characteristics described above, the *elite* foreign born can be considered to possess an *equivalent* "quality" of income-enhancing characteristics than the Canadian born and therefore they are expected to perform relatively the same in the labour market if not poorer due to the disadvantages of being foreigners in Canada upon entry.

Table 3 presents the regression results of earnings for our analysis. Regression 1 reports the earnings equation for the Canadian-born. A pooled sample of Canadian and *elite* foreign-born individuals are used in regressions 2 to 4. *Elite* foreign-born earnings regression is reported in column 5. From regression 2, the coefficient on Foreign implies that, *ceteris paribus*, *elite* foreign-born individuals have -0.033 percent lower earnings than native-born men. This affect is substantially differs in magnitude than the 11 percent higher earnings reported in an uncontrolled result.¹³ However, given that the variable Foreign is statistically insignificant (t value of -0.038), I conclude that there is no systematic difference in earnings between these two groups.

Table 5 is the mirror image of the results contained in Table 3, however it uses the sample of *All* Foreign born. Here from regression 2.A, the coefficient on Foreign implies that, *ceteris paribus*, *all* foreign-born individuals, elite and non-elite, have -12.29 percent lower earnings than Canadian born cohort and it is statistically significant.

Regression 3 in Table 3 presents the result when the variable years since migration and its squares are included in the earnings equation. Now, with these two terms present, the significant coefficient on the foreign born keeps its signs but now it is statistically significant. This change in the significance of the coefficient on foreign born when YSM and its squares are included in the model is indicating that the model has not been properly specified previously.

An F-test is performed to test the null that the inclusion of YSM and its square has no effect on earnings. The F-statistic is obtained by the following formula:

¹³ If β_1 is the coefficient on dummy variable, say x_1 , when $\log(y)$ is the dependent variable, the exact percentage difference in the predicted y when $x_1 = 1$ versus when $x_1 = 0$ is $100 * [\exp(\beta_1) - 1]$.

$$(Equation 3.4) \quad F_{q,n-k-1} = \frac{(SSR_r - SSR_{ur}) / q}{SSR_{ur} / (n - k - 1)}$$

where SSR_r is the sum of squared residuals obtained from the restricted model (one without the period of year since migration variable and its squares) and SSR_{ur} is the sum of squared residual obtained from the unrestricted model, q is the number of restrictions, n is the number of observations, and k is the total number of parameters in the unrestricted model. The F statistic is distributed as F with q degrees of freedom and $(n-k-1)$ in the denominator.

The same weights are used here to estimate the restricted and the unrestricted models. The unrestricted model was estimated first then the weights were obtained, which were also used to estimate the restricted model. The calculated F statistic is 11.945, which exceeded the critical value at the 5 percent level, and thus the null hypothesis that YSM and YSM^2 variables have no impact on the earnings is rejected.¹⁴

The estimated coefficient implies that, *ceteris paribus*, *elite* foreign-born people are subject to an 11.87 percent negative entry effect. In addition, the coefficients estimate on YSM and YSM^2 are as expected and imply that *elite* foreign-born earnings rise over time in Canada at a decreasing rate. From regression 3.A (Table 5), however, the coefficient estimate on Foreign is greater in absolute value. *Ceteris paribus*, all foreign born are estimated to be subject to about 40 percent negative entry effect.

YSM and YSM^2 can be thought of as a measure of the change in the earnings as the individual acquires Canadian experience. Here the signs of these coefficients suggest that foreign-born immigrants have greater ability, motivation and a greater human capital investment, which overcome the earning disadvantages facing them upon entry. The result here is similar to Chiswick's (1978), in which he found that, not including the year since migration and its squares, the coefficient on the foreign born variable is insignificant. He noticed this result and states the importance of controlling the year since migration in earnings equations.¹⁵

¹⁴ This calculation is only for regression which used pooled *Elite* immigrants and Canadian born only. $SSR_R=240927$ $SSR_{UR}=240774$, $n=37606$ and $k = 10$.

¹⁵ Using the 1970 U.S census, Chiswick (1978) shows that Cuban immigrants have low earnings when compared with native-born men, but he also noticed that 80 percent of the Cubans had been in US less than 10 years prior to the Census date. For Cubans who have been in the country for 10 to 15 years, they have the same earnings as the native born. Another supporting case for inclusion of length in the country also can be found for Russian-born men. They are found to have higher earnings than the native born but 65 percent of the Russian have been in the country for more than 20 years.

Figure 1 plots the assimilation process of foreign born using the results from regression 3 and 3.A. *Ceteris paribus*, the earnings of the *elite* foreign born are predicted to be 11.87 percent lower than the equivalent Canadian born upon entry, equal after about 21 years, and reach the maximum after 42 years of staying in Canada.¹⁶ The earnings of *all* foreign born are predicted to be 40 percent lower than the equivalent Canadian born, equal after about 16 years, and reach the maximum after 35 years. The same figure also depicts that the earnings of *elite* immigrants are rising at a slower rate relative to *all* immigrants, as reflected by the steepness of the earnings profile.

From regression 3, it can be concluded that the hypothesis is valid for the immigrant sample studied. So far the estimation results are in support of the hypothesis and they suggest that this “*elite*” group of immigrants is just like any “ordinary” immigrant group that is subject to negative entry effects: their earnings rise over time and eventually surpass those of the Canadian born.

It is not correct to stop the analysis here as the current estimated equation is missing one important interaction variable that permits the possibility that the return on schooling is different between the two groups. It was argued earlier that the return on schooling for immigrant and Canadian born could be different since some aspects of schooling are country specific and not transferable. The degree of transferability of schooling by the country of origin into Canada will make the same years of schooling acquired abroad have a different impact in Canada. In addition, the language of instructors, curriculum or style of teaching may undermine (or enhance) the productivity of their educational attainment in Canada.

After adding the interaction variable (*foreign*) • (*schooling*) in Regression 4 (Table 3), a quite different pattern emerges in the earnings equation. In short, these estimation results contradict the hypothesis of a negative entry effect and the positive assimilation that were reported in regression 3. The estimation shows that the interaction term of the foreign born and years of schooling is negative and highly significant, reflecting that the return on schooling to education, regardless where the education was obtained, has a smaller impact on earnings for foreign born relative to the Canadian-born cohort.

For *elite* foreign born an extra year of schooling, *ceteris paribus*, raises earnings by 8.05 percent, whereas for Canadian born it raises by 10.18 percent (source: coefficients in Table 3,

¹⁶ From regression number 3, $\partial \ln Y / \partial For = -0.1264 + 0.0077YSM - 0.0000925YSM^2$ measures the rate of change in earnings for foreign born controlling for YSM. The negative intercept of -0.1264 implies that upon entry, Foreign born earnings are subject to $(e^{-12.64} - 1) * 100$ percent equal to 11.87 percent penalty relative to the Canadian born. Years since migration were plotted in the spread sheet and different values were inserted into the equation.

columns 4). More importantly, the inclusion of year of schooling now causes the coefficient of foreign variable to be positive and highly significant, suggesting that *elite* foreign-born immigrants are subject to *positive* entry effects, instead of negative effects, by about 17.8 percent.

For *all* foreign-born sample, the results from regression 4.A (Table 5) support the hypothesis of a negative entry effect coupled with a catch up period. Here, from the *all* immigrants sample the earning function yield a 15.25 percent *negative* entry effect.

Given the results reported in regressions 4 and 4.A, the differential in log earnings between Canadian born and foreign born both *elite* and aggregated can be plotted as in Figure 2. Taking into account the schooling interaction variable, the percentage difference in earnings between *elite* immigrant and non-immigrant controlled for other variables can be calculated as:

$$\partial \ln Y / \partial For = 0.1777 + 0.00707 YSM - 0.000087 YSM^2 - 0.02134 (for)(schooling)$$

For *all* immigrants' sample, the percentage difference in earnings controlled for other variables can be calculated as:

$$\partial \ln Y / \partial For = -0.1525 + 0.0327 YSM - 0.00047 YSM^2 - 0.02642 (for)(schooling)$$

Subtracting the coefficient estimate of the $(foreign) \bullet (schooling)$ from Schooling, the intercept now is 0.258 reflecting a *premium* upon entry of almost 29.5 percent for *elite* foreign born and -0.0779 for the *all* immigrant sample, reflecting a negative entry effect of approximately 7.5 percent.¹⁷

Figure 2 shows that upon arrival the *elite* foreign born enjoy a 29 percent premium in earnings relative to their Canadian-born cohort. The concavity of the differential earning curve implies that both foreign-born and Canadian-born earnings are rising with their lengths of stay in Canada, peaking after 42 years in Canada for the former group.¹⁸ To derive the rate of the increase for *elite* immigrants earnings as they increase their lengths of stay in Canada, for example, we evaluate

¹⁷ The exact percentage different is calculated by $100 * [\exp(\beta_i) - 1]$

¹⁸ From regression 4,

$$\partial \ln Y / \partial For = 0.1777 + 0.00707 YSM - 0.000087 YSM^2 - 0.02134 (for)(schooling)$$

Controlling for differences on schooling coefficients, 0.1018;

$\partial \ln Y / \partial For = 0.258 + 0.00707 YSM - 0.000087 YSM^2$, the same procedure is performed to create figure 2 as for figure 1. Here $[e^{0.258} - 1] * 100 = 29.43$

the effect of one more years in residency at 5 years of residency in Canada, (YSM=5). Here the effect of having one additional year in Canada for an *elite* immigrant, $\partial \ln Y / \partial YSM$, the percent increase is 0.62.¹⁹

Also plotted in the same figure is the assimilation process for the *all* foreign-born sample (elite and others). Here, the intercept indicate that upon entry immigrants, by and large, are subject to a 7.5 negative entry effect relative to their equivalent Canadian –born cohort. The earning’s profile for all foreign born is also concave with the maximum income reached after 36 years in Canada. Again if we evaluate the effect of one more year in Canada now for all immigrants (evaluated at YSM equal to 5), the percent increase is 2.807 (i.e. $0.03278 - 0.000942 \times 5 = 2.807$)

The coefficient on the log of weeks worked measures the elasticity of earnings with respect to the number of weeks worked during the year. Surprisingly this coefficient is found to be similar for both groups across all five regression equations with a smaller impact for *all* foreign born, implying that the effect of weeks worked is identical across the two groups. From regression 4, *ceteris paribus*, earnings rise by about 1.547 percent for a 1 percent increase in the weeks worked. The two-sided t-test was also employed to test the null, whether 1.547 significantly differs from 1, the t-statistic is 12.51, which reject the null at 5 percent level.²⁰

The coefficients on female and marital status confirm the hypothesis that married individuals, as predicted, have higher earnings, and females are subjected to a substantial earnings penalty in the labour market. For example, from the regression on *elite* immigrants, on average, females are subject to around 42 to 48 percent penalty relative to their male cohort.

In sum, there exists a substantial difference in the earnings equations between *elite* immigrants, Canadian born and *all* immigrants. Immigrants from developed countries do not experience an earnings penalty upon entry; rather, their earnings were found to be substantially higher after the variable $(foreign) \bullet (schooling)$ is included in the regression. On the other hand, in *all* immigrants sample, a negative entry effect was found. In addition, in both groups of immigrants earnings are found to increase at a decreasing rate over time, confirming the applicability of human capital theory in the estimation of earnings equation for immigrants in Canada. The earnings premium could be due to the unobserved characteristic that the majority of the immigrants in this study entered

¹⁹ Evaluated at YSM=5, the effect of one additional year in Canada for an elite immigrant can be calculated as: $\partial \ln Y / \partial YSM = 0.00707 - 0.000174 \times 5 = 0.0062$

²⁰ t-statistic was computed as follows: $t = \frac{(estimate - hypothesized)}{std.error}$, the estimate value is 1.547, the hypothesized value is 1 and the corresponding standard error is 0.0437

under a points-assessed criterion and were from developed countries in which the quality of the native born there are better if not, at least, equal to the Canadian born.

3.3.2 Analysis of foreign born and Canadian born regression coefficients

From Table 3, comparing regression 5 and 1 we see that the partial effect of schooling for the foreign born is smaller by about 2.07 percent, or 8.11 percent for the *elite* foreign born versus 10.18 percent for the Canadian born, holding other variables constant. The coefficients on experience and its squares are also smaller in absolute value for *elite* immigrants, reflecting a smaller effect of labour market experience prior to immigration. From regression 5, among immigrants, earnings rise at a decreasing rate, as the sign on YSM^2 shows, the longer the individual has been in the country. The earnings of *elite* immigrants are found at their maximum value just before 42 years in Canada.²¹

To capture the different impact of labour market experiences in the country of origin and in Canada, the percent increase in earnings for an additional year of experience is evaluated, say at 10 years ($EX=10$) with 5 years of residency in Canada ($YSM=5$). Here from Table 3 column 5, an additional increase in year of experience in their country of origin, $(\partial LnY / \partial EX)$, the percent increase is 2.063 for the immigrants and 2.966 for the Canadian born.²² To find the impact of an additional year in Canada, say 1 year earlier but with the same number of experience abroad, $\partial LnY / \partial YSM$, the percent increase is 0.678.²³ Combining these two effects, $[\partial LnY / \partial YSM + \partial LnY / \partial EX]$, the percent increase in earnings for foreign born is about 2.741; for the native born it is 2.966. The result shows that once in Canada, earnings rise *slower* with age for the *elite* foreign born than for the Canadian born by some trivial amount.

For the *all* foreign-born individual, the impact of an additional increase in year of experience in the country of origin, $(\partial LnY / \partial EX)$, the percent increase is 1.60 evaluated at EX equal to 10. The impact of an increase in years of residency in Canada evaluated at YSM equal to 5 is 2.8744. For all foreign born, the combination of these two effects, $[\partial LnY / \partial YSM + \partial LnY / \partial EX]$, the percent increase in earnings for All foreign born is about 4.47 percent.

This result supports the earlier hypothesis regarding the steepness of the rise in income over time. It was argued that the rise in income should be smaller for immigrants originating from a

²¹ Set the partial derivatives to zero, $\partial LnY / \partial YSM = 0.0077 - 0.000184YSM = 0$, and solve for YSM .

²² Evaluated at $EX=10$, $\partial LnY / \partial EX = 0.02937 - 0.000874EX$, equal to 2.063 percent.

For Canadian born experience in the country of origin is generated from regression 1,

$\partial LnY / \partial EX = 0.0442 - 0.001454EX$, equal to 2.966 percent.

²³ Evaluated at $YSM=5$, $\partial LnY / \partial YSM = 0.0077 - 0.000184YSM$, equal to 0.678 percent.

country similar to Canada. In the current context, this small percentage difference in the rate of the change in the earnings may be due to the fact that the immigrants we are dealing with here are all from developed countries; therefore, there may be some similarities in the labour market characteristics across these countries that will weaken the effect of the increase in the earning as the lengths of stay grow.

For the impact of schooling, it was argued earlier that the education and training skills acquired prior to immigration are not fully transferable across countries. More specifically, in the current context the hypothesis stated that the impact of schooling on earnings would be greater if the schooling and training were done in Canada rather than abroad.

Equation 3.1 is employed to test this transferability of education attainment prior to and post-immigration. After year of schooling was treated as the sum of two variables, regression 5 was re-estimated and the result is contained in Table 4 (for *all* foreign born, Table 6). Results of regression 5.1, which employ these two variables of schooling, are almost identical in every respect with regression 5.

The coefficients estimate on EDUC_PRE and EDUC_POST shows that the latter variable has a slightly greater impact on earnings although the difference is trivial, by about half a percentage, 0.086064 for EDUC_POST versus 0.08103 for EDUC_PRE. This weak measured effect of schooling, according to Chiswick (1978), can be explained by resorting to self-selection of immigrants. In this study, the elite immigrants predominantly entered under the economic admission class, which implies that there is a high probability of them being highly motivated and having greater innate ability. Thus, by excluding the variables that measure ability and motivation, the estimation of schooling impact could be biased downward.

From the analysis of the *elite* foreign born–Canadian born regression, two important findings arise regarding the nature of labour market experience and schooling for *elite* immigrants. First, earnings of elite immigrants rise at a slightly *lower* rate than that of their Canadian born counterparts over time in Canada, and the impacts of schooling as well as the impacts of labour market experience prior to immigration are smaller than if these characteristics were obtained in Canada.

4. Conclusion

The goal of this project is to investigate the performance of the overachievers among immigrants in the Canadian labour market. The use of *Feasible* GLS has been employed to estimate the earnings equation for “*elite*” immigrants and the Canadian born using the human capital framework augmented

with several demographic variables. The results are complex with only a limited number of hypotheses being supported. Nevertheless, two strong conclusions emerge. First, immigrants from the United States, the United Kingdom, Germany and Italy experience a positive entry effect on their earnings. In addition, both the immigrants as well as the Canadian born possess experience-earnings profiles, which are concave in shape, confirming an important assimilation phenomenon inherent in human capital theory.²⁴

Overall, the regressions results indicate a substantial earnings difference between *elite* foreign and Canadian born, accounting for year since migration in Canada. *Elite* foreign-born immigrants are subject to a 29.5 percent premium entry effect instead of the hypothesized negative entry effect. Their earnings rise at a decreasing rate with their lengths of stay in Canada, peaking after 42 years in Canada with the difference in log earnings by 0.401 relative to Canadian born controlling for all other variables.

The impact of schooling prior to immigration is found to have a smaller effect on earnings relative to the impact of schooling post-immigration. In addition, immigrant earnings are found to increase at approximately the same rate as that of the Canadian born. These two findings can be explained by taking into account the fact that the majority of elite immigrants in the analysis entered under the points-assessed criterion and came from the developed countries with similar labour market and education systems.

The impact of labour market experience prior to immigration is found to have a smaller impact than immigrant labour market experience while in Canada. However, upon entry, the earnings of foreign born rise at approximately the same rate as the “equivalent” Canadian born, given the accumulation of skills and knowledge about the local labour market by immigrants.

In short, the study is successful in testing the hypothesis and concluded that, contrary to the popular belief that immigrants are always subject to a negative entry effect in terms of lower earnings, some groups of immigrants are found to exhibit the opposite outcome. This overachiever characteristic owes much to two reasons; first, the elite immigrants originate from developed countries that share with Canada many similar features in their education and labour market systems. In addition, the majority of elite immigrants in this study entered Canada through the economy gate, which means that they are self-selected and represent those who are highly motivated to be

²⁴ Since this study only use a single cross section data, as a consequences cohort effect cannot be taken into the analysis. Cohort effect here means that the extent to which the observed patterns of such assimilation may be biased because they do not adequately control for unobserved quality differences across immigrants cohorts. Period effect on the other hand is nested implicitly in YSM variable.

economically successful. The results show that elite immigrants in this study are overachievers relative to the Canadian born. In fact, the results of this study conform to Akbari's (1988) findings for immigrants of Western European origin as well as those of Dean and DeVoretz (1996).

References

- Abbott, M.G., C. M. Beach. 1992. Immigrant earnings differential in Canada: A more general specification of age and experience effects. *Empirical Economics* 17: 221-238.
- Akbari, A.H. 1988. Some economic impacts of the immigrant population in Canada. Ph.D. diss., Department of Economics, Simon Fraser University, Burnaby, B.C.
- . 1995. The impact of immigrants on Canada's treasury, circa 1990. In *Diminishing Returns*, ed. D. DeVoretz, 113-127. Toronto: C.D. Howe Institute and Vancouver: The Laurier Institution.
- Bloom, D.E., and M. Gunderson. 1990. An analysis of the earnings of Canadian immigrants. In *Immigration, Trade, and the Labour market*, ed. R. Freeman and J. Abowd, 321-42. Chicago: University of Chicago Press.
- Bloom, D.E., G. Grenier and M. Gunderson. 1995. The changing labour market position of Canadian immigrants. *Canadian Journal of Economics* 27, no. 4b (November): 987-1005.
- Chiswick, B. 1978. The effect of Americanization on the earnings of foreign-born men. *Journal of Political Economy* 86: 897-921.
- Chiswick, B., and P.W. Miller. 1988. Earnings in Canada: The roles of immigrant generation, French ethnicity, and language. *Research in Population Economics* 6: 183-228.
- Dean, J., and D. J. DeVoretz. The economic performance of Jewish immigrants to Canada: A case of double jeopardy? RIIM working paper 96-01. Vancouver: Simon Fraser University, Centre for Excellence.
- De Silva, A. 1992. *Earnings of immigrants: A comparative analysis*. Ottawa: Economic Council of Canada.
- . 1997. Earnings of immigrant classes in the early 1980s in Canada: A re-examination. *Canadian Public Policy* 23 (2): 179-202.
- DeVoretz, D. J. 1995. New issues, new evidence, and new immigration policies for the twenty-first century. In *Diminishing Returns*, ed. D. J. DeVoretz, 1-30. Toronto: C.D. Howe Institute, and Vancouver: The Laurier Institution.
- DeVoretz, D.J., and Y. Ozsomer. 1998. Immigrants and public finance transfers: Vancouver, Toronto and Montreal. RIIM working paper 99-06. Vancouver: Simon Fraser University, Centre for Excellence.
- Fagnan, S. 1995. Canadian immigrant earnings, 1971-86. In *Diminishing Returns*, ed. D. J. DeVoretz, 166-208. Toronto: C.D. Howe Institute, and Vancouver: The Laurier Institution.
- Pendakur, K and R. Pendakur. 1996. The colour of money: Earnings differentials among ethnic groups in Canada. RIIM working paper 96-03. Vancouver: Simon Fraser University, Centre for Excellence.
- Statistics Canada. 1996. Public Use Micro File: Individual Data. Ottawa.
- Wooldridge, J.M. 2000. *Introductory Econometrics: A modern approach*. Mason, OH: South-Western College Publishing.

Appendix 1

Table 1
Means and Standard Deviation, Canadian and Foreign-Born, Age 24-65, in 1995

| | All Individuals | Canadian Born | Elite Foreign Born | All Foreign born |
|-------------------------------------|-----------------|---------------|--------------------|------------------|
| | Mean | Mean | Mean | Mean |
| Earnings | 33216.98 | 34452.17 | 38199.05 | 32766.56 |
| Natural Log of Earnings | 10.1018 | 10.1654 | 10.2383 | 10.0786 |
| Years of Schooling | 13.31 | 13.33 | 13.35 | 13.3 |
| Age | 42.48 | 40.23 | 45.95 | 43.3 |
| Experience (Age-education-5) | 24.17 | 21.9 | 27.6 | 25 |
| Weeks worked | 49.14 | 49.31 | 49.41 | 49.07 |
| Natural Log of weeks worked | 3.8872 | 3.8909 | 3.8934 | 3.8858 |
| Married, spouse present (%) | 70 | 60 | 74 | 73 |
| Foreign born (%) | 73 | 0 | 100 | 100 |
| Years since migration | * | 0 | 27.24 | 19.89 |
| Age at immigration | * | * | 18.72 | 23.41 |
| Number of observation | 77575 | 20729 | 16877 | 56846 |

Source: 1996 Canadian Census, Individual data

Note: * Variable is not applicable.

Table 2. White test based on OLS regression

| 2.A | Number of observations | R-square | White test statistic |
|-----------------|-------------------------------|-----------------|-----------------------------|
| Regression 1. | 20729 | 0.003 | 62.187 |
| Regression 2. | 37606 | 0.002 | 75.212 |
| Regression 3. | 37606 | 0.002 | 75.212 |
| Regression 4. | 37606 | 0.002 | 75.212 |
| Regression 5. | 16877 | 0.002 | 33.754 |
| Regression 5.1. | 16877 | 0.002 | 33.754 |

| 2.B | Number of observation | R-square | White test statistic |
|------------------|------------------------------|-----------------|-----------------------------|
| Regression 1.a | 20729 | 0.003 | 62.187 |
| Regression 2.a | 77575 | 0.002 | 155.15 |
| Regression 3.a | 77575 | 0.003 | 232.725 |
| Regression 4.a | 77575 | 0.003 | 232.725 |
| Regression 5.a | 56846 | 0.002 | 113.692 |
| Regression 5.1.a | 56846 | 0.002 | 113.692 |

Note:

Critical Values of the Chi-square distribution with two degrees of freedom, χ_2^2 , at 10, 5 and 1 percent are, 2.71, 3.84 and 6.63 respectively.

The white test statistic in Table A is for regression with *Elite* Foreign born and in B is for regression with *All* Foreign born.

Table 3
Regression Analysis of Earnings For Canadian and Foreign born, Age 24-65, 1995

| Regression # | Canadian born | Pooled Canadian and foreign | | Foreign born | |
|---|----------------------|-----------------------------|-----------------------|----------------------|-----------------------|
| | 1 | 2 | 3 | 4 | 5 |
| Constant | 2.642 (11.898) | 2.559 (14.933) | 2.568 (14.979) | 2.444 (14.142) | 2.366 (8.692) |
| Schooling | 0.1018 (40.137) | 0.0908 (50.961) | 0.0909 (51.154) | 0.1018 (40.763) | 0.0811 (31.944) |
| Experience | 0.0441 (18.97) | 0.0373 (21.652) | 0.0366 (21.19) | 0.0380 (21.790) | 0.0293 (10.350) |
| Experience² | -0.0007 (-14.816) | -0.0005 (-16.74) | -0.0005 (-16.70) | -0.0005 (-17.252) | -0.0004 (-8.428) |
| Ln Weeks worked | 1.479 (26.071) | 1.557 (35.571) | 1.557 (35.583) | 1.547 (35.42) | 1.638 (23.734) |
| Married (spouse present) | 0.1061 (9.072) | 0.0994 (10.612) | 0.1022 (10.911) | 0.10 (10.65) | 0.0872 (5.553) |
| Female | -0.4289 (-36.927) | -0.4524 (-50.897) | -0.4505 (-50.865) | -0.4513 (-50.939) | -0.4804 (-35.078) |
| Foreign birth status | * | -0.000333 (-0.038) | -0.1264 (-3.798) | 0.1777 (2.995) | * |
| Foreign (Year since migration) | * | * | 0.007698 (3.029) | 0.007073 (2.749) | 0.007743 (3.028) |
| Foreign (Year since migration²) | * | * | -0.000092 (-1.969) | -0.00008 (-1.810) | -0.000092 (-1.956) |
| Foreign (schooling) | * | * | * | -0.0213 (-6.335) | * |
| Observations | 20729 | 37606 | 37606 | 37606 | 16877 |
| R² | 0.1820 | 0.1813 | 0.1828 | 0.18167 | 0.1796 |
| Sum Square Residual | 132592 | 240323 | 240774 | 240516 | 107581 |
| Sum Square Regression | 29512 | 53242 | 53872 | 53394 | 23553 |

Source: 1996 Canadian Census, Individual Data

Note: t ratios in parentheses; dependent variable: natural logarithm of earnings in thousands of dollars.

*Indicating variable not entered.

Table 4
Regression analysis of earnings for *Elite* foreign born, segregating by
years of schooling, Age 24-65, Canada 1995.

| Regression # | 5 | 5.1 |
|---|-----------------------|-----------------------|
| Constant | 2.366 (8.692) | 2.339 (8.608) |
| Schooling | 0.0811 (31.944) | * * |
| Experience | 0.0293 (10.350) | 0.03275 (9.948) |
| Experience² | -0.0004 (-8.428) | -0.000455 (-8.622) |
| Ln Weeks worked | 1.638 (23.734) | 1.6333 (23.754) |
| Married (spouse present) | 0.0872 (5.553) | 0.08826 (5.621) |
| Female | -0.4804 (-35.078) | -0.4794 (-35.028) |
| Foreign birth status | * * | * * |
| Foreign (Year since migration) | 0.007743 (3.028) | 0.006415 (2.418) |
| Foreign (Year since migration²) | -0.000092 (-1.956) | -0.00011 (-2.284) |
| Foreign (schooling) | * * | * * |
| Educ_pre | * * | 0.0810 (31.852) |
| Educ_post | * * | 0.0860 (24.796) |
| Observations | 16877 | 16877 |
| R² | 0.1796 | 0.1798 |
| Sum Square Residual | 107581 | 107432 |
| Sum Square Regression | 23553 | 23565 |

Source: 1996 Canadian Census, Individual data.

Note: t ratios in parentheses; dependent variable: natural logarithm of earnings in thousands of dollars. *Variable not entered

Table 5.
Regression analysis of earnings for Canadian and All foreign born, Age 24-65, Canada 1995

| Regression | 1 ** | 2 | 3 | 4 | 5 |
|---|-------------|----------------------|-----------------------|------------------------|------------------------|
| Constant | | 2.5583 (21.675) | 3.0856 (26.296) | 2.7928 (22.962) | 2.8007 (20.32) |
| Schooling | | 0.084 (70.121) | 0.0798 (67.419) | 0.1009 (39.981) | 0.07398 (55.325) |
| Experience | | 0.03452 (27.564) | 0.02962 (23.872) | 0.03091 (24.914) | 0.02409 (16.144) |
| Experience² | | -0.0004 (-19.196) | -0.0004 (-19.749) | -0.000507 (-20.741) | -0.000401 (-13.992) |
| Ln Weeks worked | | 1.58 (52.516) | 1.4853 (49.745) | 1.4842 (49.554) | 1.4645 (41.577) |
| Married (spouse present) | | 0.0633 (9.037) | 0.0872 (12.521) | 0.0845 (12.116) | 0.07942 (9.185) |
| Female | | -0.3847 (-60.957) | -0.3894 (-62.608) | -0.3898 (-62.758) | -0.3728 (-50.544) |
| Foreign birth status | | -0.1312 (-19.316) | -0.5108 (-42.508) | -0.1524 (-3.806) | * * |
| Year since migration | | * * | 0.03279 (30.956) | 0.03278 (30.854) | 0.03351 (31.203) |
| Foreign (Year since migration²) | | * * | -0.00047 (-20.037) | -0.000471 (-20.041) | -0.000477 (-20.07) |
| For (schooling) | | * * | * * | -0.02642 (-9.522) | * * |
| Observations | | 77575 | 77575 | 77575 | 56846 |
| R² | | 0.15519 | 0.17615 | 0.17827 | 0.17466 |
| Sum Square Residual | | 483228 | 503173 | 505749 | 373512 |
| Sum Square regression | | 88770 | 107584 | 109716 | 79043 |

Source: 1996 Canadian Census, Individual data.

Note: t ratios in parentheses; dependent variable: natural logarithm of earnings in thousands of dollars.

*Variable not entered

** The result for Canadian born is identical to the results for Canadian born in Table 3.

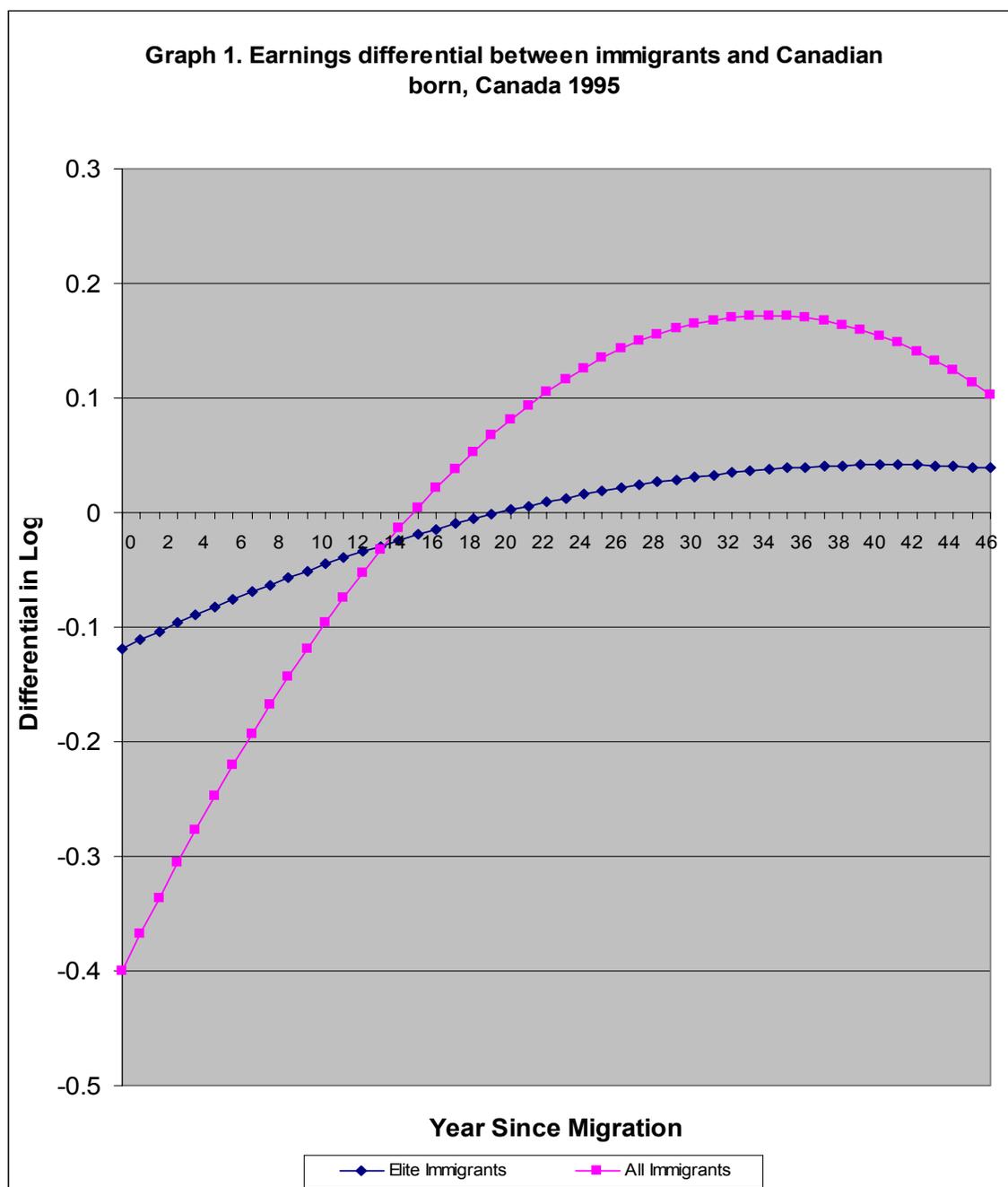
Table 6.
Regression Analysis of Earnings for All foreign born, segregating by
years of schooling, Age 24-65, Canada 1995

| Regression # | 5 | 5.1 |
|------------------------------|------------------------|------------------------|
| Constant | 2.8007 (20.32) | 2.8090 (20.344) |
| Schooling | 0.07398 (55.325) | * * |
| Experience | 0.02409 (16.144) | 0.02326 (14.519) |
| Experience sq | -0.000401 (-13.992) | -0.000398 (-13.831) |
| Ln Weeks worked | 1.4645 (41.577) | 1.4657 (41.633) |
| Married | 0.07942 (9.185) | 0.07933 (9.173) |
| Female | -0.3728 (-50.544) | -0.3727 (-50.540) |
| Foreign | * * | * * |
| YSM | 0.03351 (31.203) | 0.03387 (30.858) |
| YSM2 | -0.000477 (-20.07) | -0.000467 (-19.182) |
| For (schooling) | * * | * * |
| Educ_pre | * * | 0.07388 (55.236) |
| Educ_post | * * | 0.071831 (38.298) |
| Observations | 56846 | 56846 |
| R2 | 0.17466 | 0.1749 |
| Sum Square Residual | 373512 | 374402 |
| Sum Square Regression | 79043 | 79395 |

Source: 1996 Canadian Census, Individual data.

Note: t ratios in parentheses; dependent variable: natural logarithm of earnings in thousands of dollars.

*Variable not entered.



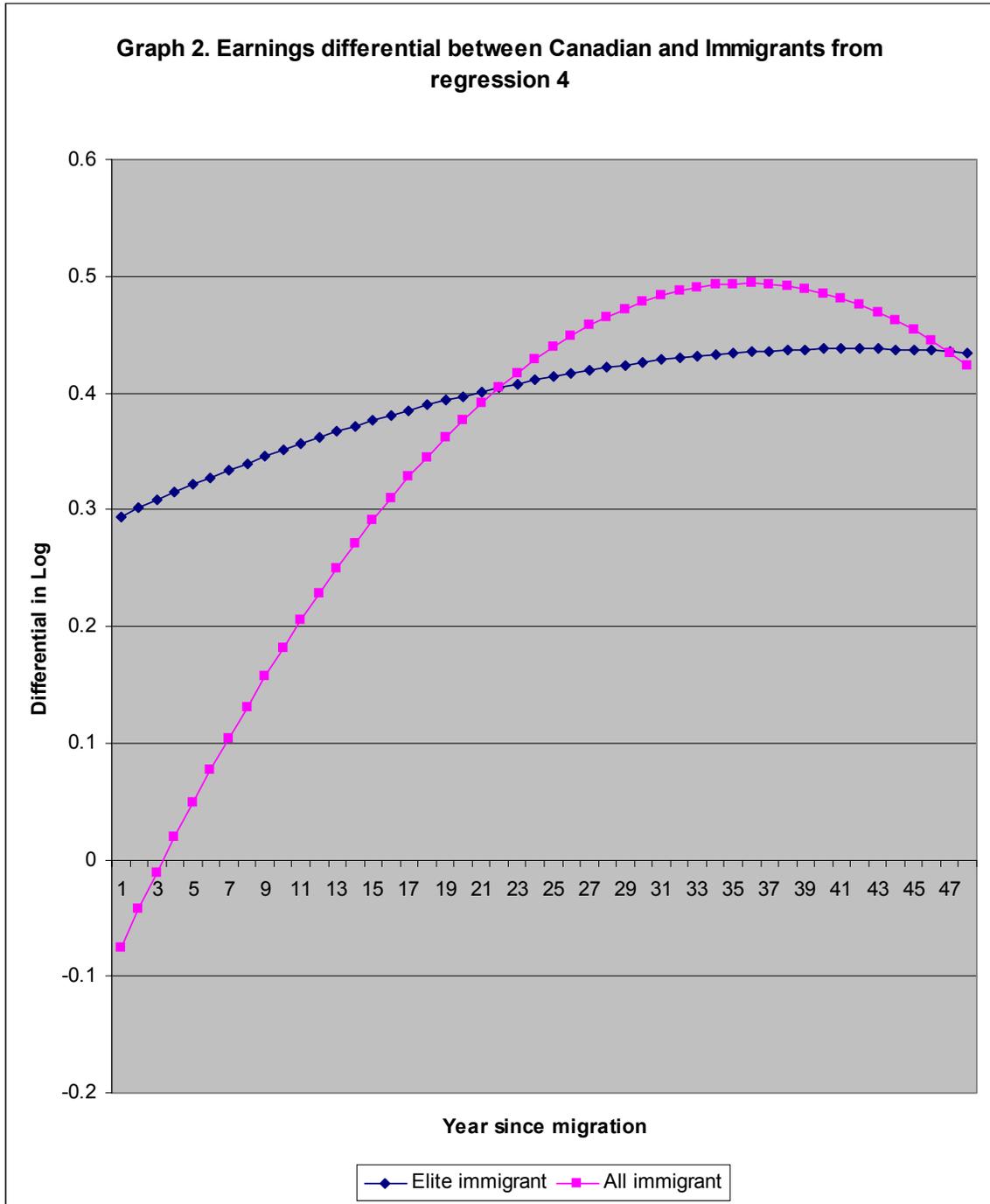
Source: From regression number 3 For Elite immigrants,

$$\partial \ln Y / \partial For = -0.1264 + 0.007698YSM - 0.00092YSM^2$$

From regression number 3.A For All immigrants,

$$\partial \ln Y / \partial For = -0.5109 + 0.03279YSM - 0.00047YSM^2$$

Note: the intercept value on the figure is differs from the intercept value from the regression because the latter is calculated in exact percentage form.



Source: From Regression number 4 for Elite immigrants

$$\frac{\partial \ln Y}{\partial For} = 0.1777 + 0.00707 YSM - 0.0000807 YSM^2 - 0.02134 (foreign) \cdot (schooling)$$

Controlling for differences on education coefficients:

$$\partial \ln Y / \partial For = 0.258 + 0.00707 YSM - 0.000087 YSM^2$$

From regression number 4.A for all immigrants

$$\partial \ln Y / \partial For = -0.1524 + 0.0327 YSM - 0.00047 YSM^2 - 0.02642 (for)(schooling)$$

Controlling for differences on education coefficients:

$$\partial \ln Y / \partial For = -0.0779 + 0.0327 YSM - 0.00047 YSM^2$$

Note: the intercept value on the figure is differs from the intercept value from the regression because the latter is calculated in exact percentage form.

Appendix 2

Data base construction and description.

The data for the analysis come from the public use micro file (PUMF) individual files of the 1996 Canadian Census. For the immigrants, I use all available data controlling for age, positive income and weeks worked. For Canadian born the random sampling was performed by SPSS 10.0 and it represents 10 percent of the sample from the Census.

The analysis is restricted to individual aged 24 to 65, who reported positive income (self-employment income + wages and salaries income) and worked at least 30 weeks in 1995. The study excludes those who reside in the Atlantic provinces and the territories.

Some of the data were directly obtained from the census whereas some of the variables need to be constructed first. Years of education were estimated using categorical information from the census. Labour market experience was constructed as follow, Age-schooling – 5. The number of year since migration was obtained from information on the calendar year during which a person is arrived in Canada. When the figure is reported as an interval, the middle point of the interval was assumed. For the open-ended interval, there are 6 different corresponding periods each with the length of 2 years, the latter year being assumed. Income was constructed by simply adding wages income with self-employment income.

Here is the categorical information from the census for education level and corresponding estimated years of schooling:

- | | |
|--|----------|
| 1. Less than grade 5 | 4 years |
| 2. Grade 5 to 8 | 7 years |
| 3. Grade 9 to 13 | 11 years |
| 4. High school graduation | 12 years |
| 5. Trade certificate | 12 years |
| 6. Non University education, without trade | 13 years |
| 7. Non University education, with trade | 14 years |
| 8. Non University education, with other | 14 years |

| | |
|--|----------|
| 9. University without certificate | 13 years |
| 10. University with diploma | 15 years |
| 11. University with bachelor degree | 16 years |
| 12. University with certificate above bachelor | 7 years |
| 13. Master | 18 years |
| 14. Doctorate | 21 years |

Working paper series from 2000

| No. | Author(s) | Title | Date |
|-------|---|--|-------|
| 00-01 | J. Atsu Amegashie | A Political Economy Model of the Permissible Number of Immigrants | 01/00 |
| 00-02 | David Ley | Seeking <i>Homo Economicus</i> : The Strange Story of Canada's Immigration Program | 05/00 |
| 00-03 | Chieko Tanimura | Immigration of Nikkeijin to Ease the Japanese Aging Crisis | 05/00 |
| 00-04 | Eden Nicole Thompson | Immigrant Occupational Skill Outcomes and the Role of Region-Specific Human Capital | 05/00 |
| 00-05 | Christiane Werner | A Taste of Canada: An Analysis of Food Expenditure Patterns for Canadian-born and Foreign-born Consumers | 05/00 |
| 00-06 | Don DeVoretz and Chona Iturralde | Probability of Staying in Canada | 08/00 |
| 00-07 | Ravi Pendakur, Fernanda Mata, Stan Lee and Natalie Dole | Job Mobility and Promotion in the Federal Public Service. A Joint Project with Strategic Research and Analysis, Multiculturalism Program, Canadian Heritage and Research Directorate. Public Service Commission. | 05/00 |
| 00-08 | Barry R. Chiswick and Paul W. Miller | The Complementarity of Language and Other Human Capital: Immigrant Earnings in Canada | 07/00 |
| 00-09 | John E. Hayfron | The Housing Market Outcomes of Immigrants in Norway | 08/00 |
| 00-10 | Greg Cunningham, Daniel Hiebert and Brian Klinkenberg | Immigration and Greater Vancouver: A 1996 Census Atlas http://www.geog.ubc.ca/metropolis/atlas | 09/00 |
| 00-11 | Barry R. Chiswick | The Economics of illegal Migration for the Host Economy | 09/00 |
| 00-12 | Daniel Hiebert | The Social Geography of Immigration and Urbanization in Canada: A Review and Interpretation | 09/00 |
| 00-13 | Barry R. Chiswick and Paul W. Miller | A Model of Destination Language Acquisition: Application to Male Immigrants in Canada | 09/00 |
| 00-14 | Jamie Winders | Immigration to Vancouver: An Analytical Review | 09/00 |
| 00-15 | Daniel Hiebert | Cosmopolitanism at the Local Level: Immigrant Settlement and the Development of Transnational Neighbourhoods | 09/00 |
| 00-16 | David Prescott, David Wilton, Canan Dadayli and Aaron Dickson | Visits to Canada: The Role of Canada's Immigrant Populations | 08/00 |
| 00-17 | J. Atsu Amegashie and John E. Hayfron | Perception and Labour Supply: A Theoretical Analysis with and Application to Immigrants | 10/00 |
| 00-18 | Geraldine Pratt | Studying Immigrants in Focus Groups | 12/00 |
| 00-19 | Allesandra Casarico and Carlo Devillanova | Social Security and Migration with Endogenous Skill Upgrading | 12/00 |
| 00-20 | Don DeVoretz, Holger Hinte, Christiane Werner | Some Immigrant Language Lessons from Canada to Germany | 10/00 |

| No. | Author(s) | Title | Date |
|------------|--|--|-------------|
| 00-21 | Don DeVoretz | An Analysis of Turn-of-the-Century Canadian Immigration: 1891-1914 | 12/00 |
| 01-01 | Shahrokh Shahabi-Azad | Immigrant Expenditure Patterns on Transportation | 01/01 |
| 01-02 | Johanna L. Waters | The Flexible Family? Recent Immigration and 'Astronaut' Households in Vancouver, British Columbia | 01/01 |
| 01-03 | David Ley, Peter Murphy, Kris Olds, Bill Randolph | Immigration and Housing in Gateway Cities: The Cases of Sydney and Vancouver | 01/01 |
| 01-04 | Gillian Creese, Robyn Dowling | Gendering Immigration: The Experience of Women in Sydney and Vancouver | 01/01 |
| 01-05 | David W. Edgington, Bronwyn Hanna, Thomas Hutton, Susan Thompson | Urban Governance, Multiculturalism and Citizenship in Sydney and Vancouver | 01/01 |
| 01-06 | Kevin Dunn, Minelle Mahtani | "Adjusting the Colour Bar": Media Representation of Ethnic Minorities under Australian and Canadian Multiculturalisms | 01/01 |
| 01-07 | Ian Burnley, Dan Hiebert | Emerging Patterns of Immigrant Settlement in Metropolitan Sydney and Vancouver: The Need for New Concepts and Models | 01/01 |
| 01-08 | Daniel Hiebert, David Ley | Assimilation, Cultural Pluralism and Social Exclusion Among Ethno-Cultural Groups in Vancouver | 02/01 |
| 01-09 | Harald Bauder | The Visible Minority Category and Urban Analysis | 01/01 |
| 01-10 | Johanna L. Waters | Migration Strategies and Transnational Families: Vancouver's Satellite Kids | 01/01 |
| 01-11 | Dominique M. Gross, Nicolas Schmitt | Do Birds of a Feather Flock Together? The Role of Cultural Clustering in Attracting New Immigrants | 01/01 |
| 01-12 | Diane Coulombe, William L. Roberts | The French-as-a-second-language Learning Experience of Anglophone and Allophone University Students | 03/01 |
| 01-13 | Galina Didukh | Health and Personal Care Consumption Patterns of Foreign-born and Canadian-born Consumers: 1984-1996 | 04/01 |
| 01-14 | Carl Mosk | Asian Immigrants to the Pacific Northwest: Canadian and American Experiences Compared | 05/01 |
| 01-15 | Margaret Walton-Roberts | Returning, Remitting, Reshaping: Non-Resident Indians and the Transformation of Society and Space in Punjab, India | 08/01 |
| 01-16 | Parin Dossa | Narrative Mediation of Conventional and New Paradigms of "Mental Health": Reading the Stories of Immigrant Iranian Women | 08/01 |
| 01-17 | Harald Bauder, Johanna Waters and Sin Yih Teo | Impacts of Immigration on British Columbia: Population, Labour Markets, Housing Markets and International Linkages | 09/01 |
| 01-18 | Lin Wang | Household Operations and Furnishings Consumption Patterns of Canadian and Foreign-born Consumers: 1984-1996 | 09/01 |

| No. | Author(s) | Title | Date |
|------------|---|--|-------------|
| 01-19 | Laura Beattie and David Ley | The German Immigrant Church in Vancouver: Service Provision and Identity Formation | 10/01 |
| 01-20 | David Ley, Judith Tutchener and Greg Cunningham | Immigration, Polarization, or Gentrification? Accounting for Changing Housing Prices and Dwelling Values in Gateway Cities | 08/01 |
| 01-21 | Shemina Hirji and June Beynon | Teachers of Punjabi Sikh Ancestry: Their Perceptions of their Roles in the British Columbia Education System | 11/01 |
| 01-22 | June Beynon, Roumiana Ileva and Marela Dichupa | Teachers of Chinese Ancestry: The Interaction of Identities and Professional Roles | 12/01 |
| 02-01 | Galina Didukh | Immigrants and the Demand for Shelter | 01/02 |
| 02-02 | Abdala Mansour, Nicolas Marceau and Steeve Mongrain | Gangs and Crime Deterrence | 02/02 |
| 02-03 | Harald Bauder and Emilie Cameron | Cultural Barriers to Labour Market Integration: Immigrants from South Asia and the former Yugoslavia | 02/02 |
| 02-04 | Brian Geiger | Clothing Demand for Canadian-born and Foreign-born Households | 01/02 |
| 02-05 | Dan Hiebert | Canadian Immigration and the Selection-settlement Services Trade-off: Exploring Immigrant Economic Participation in British Columbia | 02/02 |
| 02-06 | David W. Edgington and Thomas A. Hutton | Multicultural and Local Government in Greater Vancouver | 03/02 |
| 02-07 | Steven Vertovec | Religion in Migration, Diasporas and Transnationalism | 03/02 |
| 02-08 | Isabel Dyck | Becoming Canadian? Girls, Home and School and Renegotiating Feminine Identity | 03/02 |
| 02-09 | Parin Dossa | Modernization and Global Restructuring of Women's Work: Border-Crossing Stories of Iranian Women | 03/02 |
| 02-10 | Barry Edmonston | Interprovincial Migration of Canadian Immigrants | 03/02 |

For information on papers previous to 2000, please see our Website

<http://www.riim.metropolis.net/research/policy>

Back issues of working papers are available for \$5 from

Vancouver Centre of Excellence: Immigration, WMX4653, Simon Fraser University, 8888 University Drive, Burnaby, B.C, Canada V5A 1S6. Tel: (604) 291-4575 Fax: (604) 291-5336

E-mail: riim@sfu.ca

<http://www.riim.metropolis.net/>