Return and Onward Migration of Canadian Immigrants From 1996 to 2001[1]

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Major Paper presented to the

Department of Economics of the University of Ottawa

In Partial fulfillment of the requirements of the M.A. Degree

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December 2006

[1] I thank Dr. Gilles Grenier of University of Ottawa for supervision and assistance through the whole writing. Also, I should send my thanks to Dr. Kit-Chun Lam, of Hong Kong Baptist University, for trying to recall her work in the 1990s and for her generous help with patient explanations of the methodology she used for similar research.

Abstract

Using Canadian Census Data, this paper studies the out-migration of immigrants between 1996 and 2001. It is found that there was obvious out-migration in Canada, as about 6% of immigrants who arrived between 1980 and 1994 moved from Canada to other countries during that five-year period. The data are categorized into different synthetic cohorts based on various characteristics. The effects of each characteristic on out-migration are studied, first by looking at descriptive statistics, and then by doing regression analysis. Because variables on education are potentially endogenous in the model, specifications are presented with and without education. Males are found to be more mobile than females, and older immigrants are less likely to out-migrate. The group from the US is found to be most likely to out-migrate by analysis of the descriptive statistics, while the Asian group is found to have the highest propensity to return through regression without education. Also, education is found to be negatively affecting the out-migration rates. Year of immigration does not seem to have a clear effect on out-migration, because it is related to both length of stay and the economic cycle. However, to get more reliable results, we still need more information because some of the estimates are found not to be statistically significant.

1. Introduction

Migration is an ongoing process rather than an end in itself. A rational Canadian immigrant may decide to return to his or her motherland, or go to a third country for a better education, career, or higher welfare. In the same way, a rational emigrant may return to Canada for similar reasons. The intuition for why return or subsequent international migration takes place is that any in- and out-migration decision is made by comparing the economic and social costs and benefits of the possible movements, such as staying in Canada, returning to home countries, or moving to a new country.

There are very few studies on this area that have been carried out in Canada, and even fewer studies that focus on recent populations. This is because it is difficult to find longitudinal data which can directly show the return and onward migration moves, and it is even harder to get data directly showing the personal characteristics of the individuals who out-migrated. Typical studies were done by Lam (1994) and Aydemir and Robinson (2006). Lam used the Canadian Censuses of 1971 and 1981 with a synthetic cohort approach to study the partial effects of several characteristics on out-migration of "Foreign-Born Members in Canada", including sex, year of immigration, place of birth, age, schooling, language skills, and employment

status. Lam found that the older male immigrants with high school education or less have a higher propensity to out-migrate, while a command of official languages reduces this propensity. Aydemir and Robinson (2006) used the Landings Records (LIDS) and the Longitudinal Immigration Data Base (IMDB) to study the numbers of immigrants staying in Canada. They concluded that a large fraction of working age males, especially skilled workers and entrepreneurs, are highly internationally mobile.

From the perspective of personal characteristics, out-migration behaviour, like internal migration choices, depends on important personal factors, such as mother tongue, level of education, family type, and age. Influential geographical attributes include economic variables (income level, employment growth, and unemployment), distance, and cultural similarity. Not only onward migrants, but also return migrants, are sensitive to the geographical variation in economic opportunities. Following Lam's choices, I assume that the out-migration rate is affected by sex, age, place of birth, year of immigration, and education.

This paper uses recent population census data to find how many immigrants leave Canada, and for what reasons. This research may help the Canadian government to carry out more practical policies in order to prevent

this new kind of "brain drain" and try to keep those immigrants in the Canadian labour market.

The main body of this paper is organized in five sections. In section 2, the data, the chosen sample, the categorization of variables, and the economic model to find the partial effects are briefly introduced. In section 3, a descriptive analysis of the sample by each characteristic is done. In this section, the problem that the potential endogeneity of education variables is also briefly discussed. In section 4, regressions based on the methodology given in section 2 are done, and the results are analyzed. In section 5, an alternative way to solve the problem of the endogenous education variables is discussed. The conclusion is drawn and the recommendations for immigration policies are given in section 6.

2. Framework

2.1 Methodology

The methodology in this paper is developed from Lam's work in 1994, "Out-migration of Foreign-Born Members in Canada". Lam categorized the whole set of Canadian immigrants from Canadian Census data of 1971 and 1981 into different synthetic cohorts, the members of each cohort having common personal characteristics, such as age, sex, place of birth, year of immigration, schooling, official languages ability, and employment status. Then she traced those synthetic cohorts of immigrants over the 10 years between 1971 and 1981, and regressed the differences between the sizes in 1981 and 1971 of each cohort on the personal characteristics to find the partial effect of those characteristics.

Following this method, I categorize the selected dataset from Canadian Censuses of 1996 and 2001 into cohorts identified by different personal characteristics, including age, sex, place of birth, the years since immigration, and the highest degree of education. The size or the number of members in each cohort decreases over the five years because some immigrants will return to their home countries or migrate to another country.

Then the task is to trace the relative change in the size of a cohort between 2001 and 1996.

2.2 Analysis based on Individuals in the Public Use Microdata File (PUMF) of the Canadian Census

This paper uses the Public Use Microdata files (PUMF) on Individuals of the Canadian Censuses of 1996 and 2001, in which each individual is identified by his or her personal characteristics. Those two data sets provide information on the demographic, social, and the economic characteristics of the Canadian population, and allow us to group the population and define each synthetic cohort by different characteristics, which include age, sex, year of immigration, place of birth, and highest degree of education.

The Public Use Microdata files, which are products of the Census of Canada for each year, provide a random sample of actual census records with identifying geographic information removed. The 2001 Census and the 1996 Census PUMF on Individuals contain, respectively, data based on a 2.7027% sample and a 2.7777% sample of the population enumerated in the census.

The people under study in this paper are those between 20 and 55 years old in 1996 who were born outside Canada, and immigrated to Canada between 1980 and 1994. The whole set of those immigrants is categorized into different cohorts in the following way, as shown in Table 2.1.

Table 2.1 Categorization of Selected Canadian Immigrants

Characteristics	**Groups**
Sex (2 groups)	Female
	Male (reference group)
Age in 1996 (7 groups)	22 (average age for people between 20-24)
	27 (average age for people between 25-29)
	32 (average age for people between 30-34)
	37 (average age for people between 35-39)
	42 (average age for people between 40-44)
	47 (average age for people between 45-49)
	52 (average age for people between 50-54)
Year of Immigration [1] (13 groups)	1980
	1981
	1982-1983
	1984-1985
	1986
	1987
	1988
	1989
	1990
	1991
	1992
	1993
	1994
Place of Birth (5 groups)	US (reference group)
	Europe
	Asia
	Africa
	Others
Highest Degree of Education (3 groups)	Secondary/High school graduation certificate or below (reference group)
	Above high school and below university
	Bachelor degree(s) and above

[1] We did not define a reference group in terms of the variable "Year of Immigration" because the immigrants are categorized by different periods of immigration rather than different single year when we do regression with the cohorts. This will be discussed in section 4.

Therefore, the total number of cohorts is the number of all the combinations of these characteristics. For reasons to be explained later, the analysis is done with and without the education variables, with the following numbers of cohorts:

Without the education variable, $2 \times 7 \times 13 \times 5 = 910$;

With the education variable, $2 \times 7 \times 13 \times 5 \times 3 = 2730$.

2.3 Econometric model

I start with the relationship between the numbers of immigrants in 2001 as a function of those in 1996.

$$N_{2i} = V_i \cdot N_{1i} \cdot (1 - R_i) + u_i \qquad (1)$$

Each cohort i is defined with respect to a series of characteristics, where N_{2i} stands for the number of members in cohort i in 2001, and N_{1i} is the number for the same cohort in 1996; V_i is age-specific survival rate, which is the probation of people who do not die in a given age group, R_i is the out-migration rate over the five years between 1996 and 2001; and u_i is the residual due to sampling and measurement errors. For example, some

people may not remember clearly the date when they immigrated into Canada and may have written down different answers in the Census of 1996 and 2001.

In order to find the partial effects of the personal characteristics I selected, I assume that the out-migration rate R_i is a linear function of those personal characteristics denoted by X_{ij}, where j means the j^{th} personal characteristic for the i^{th} cohort. B_j is the parameter or the partial effect of the j^{th} personal characteristic, and v_i is a residual.

$$R_j = \sum_j X_{ij} \cdot B_j + v_i \tag{2}$$

From (1) and (2), I will get,

$$N_{2i} = V_i \cdot N_{1i}\left(1 - \sum_j X_{ij} \cdot B_j - v_i\right) + u_i \tag{3}$$

or $$N_{2i} = V_i \cdot N_{1i} - V_i \cdot N_{1i} \cdot \sum_j X_{ij} \cdot B_i + e_i \tag{4}$$

where $e_i = u_i - V_i \cdot N_{1i} \cdot v_i$

I define the retention rate as $\frac{N_{2i}}{V_i \cdot N_{1i}} = 1 - \sum_j X_{ij} \cdot B_j + e_i^*$ (5)

This retention rate is assumed to be connected with the characteristics of the immigrants.

In terms of the out-migration rate, we have

$$R_i^* = \sum_j X_{ij} \cdot B_j + e_i^* \qquad (6)$$

where R_i^* is the adjusted out-migration rate by taking into account the mortality rates;

The residual is $e_i^* = \frac{u_i}{V_i N_{1i}} - v_i$, and is distributed as $e_i^* \sim (0, \frac{\sigma_u^2}{V_i^2 N_{1i}^2} + \sigma_v^2)$, if it is assumed that $\text{cov}(u_i, v_i) = 0$. This finding suggests that the residual term in (6) is heteroskedastic as $V_i^2 N_{1i}^2$ is changing over i. I estimate the following model by the weighted least squares method.

The procedure takes the following steps[2]:

First, regress model (6) with OLS and save the estimated residual $\hat{e}_i$;

Second, regress the following model $\frac{\hat{e}_i^2}{N-K} = a_0 + a_1 \cdot \frac{1}{V_i^2 N_{1i}^2}$.

[2] This procedure follows closely the logic used by Park (1966) and Glejser (1969);

Third, re-regress the model (6) weighted by $\frac{1}{\left(\frac{\hat{e}_i^2}{N-K}\right)}$. It means that the final regression model to be estimated will be

$$\frac{y}{\left(\frac{\hat{e}_i^2}{N-K}\right)} = \sum_j \frac{X_{ij}}{\left(\frac{\hat{e}_i^2}{N-K}\right)} \cdot B_j + e_i^{**} \qquad (7)$$

3. Descriptive analysis of the data

3.1 Adjustment of the cohort sizes for comparison

Before beginning the regression analysis, I will look at the data first to check the straightforward feature of the declining number of immigrants staying in Canada in each marginal cohort.

I will first adjust the observed number of each synthetic cohort of immigrants who were staying in Canada in 1996 to be comparable to the number of the same cohort of immigrants who were still in Canada in 2001. First, the 1996 and 2001 datasets of PUMF on Individuals I used are samples with different ratios to the target universe. The sample ratios for the 1996 data and the 2001 data are 2.7777% and 2.7027% respectively.

Second, I take into account the age-specific survival rates because some of the people in each cohort can be expected to die at a certain rate (see life Table in Appendix A) over the five-year interval between the censuses. I adjust N_{1i}, the observed size of the i^{th} cohort in 1996, and N_{2i}, the observed size of i^{th} cohort in 2001, to the comparable adjusted numbers N_{1i}^{*} and N_{2i}^{*} for regression in equation (6) in the following way:

$$N_{1i}^{*} = \frac{V_i \cdot N_{1i}}{sample\ ratio\ of\ 1996\ data} = \frac{V_i \cdot N_{1i}}{0.027777} \tag{8}$$

$$N_{2i}^{*} = \frac{N_{2i}}{sample\ ratio\ of\ 2001\ data} = \frac{N_{2i}}{0.027027} \tag{9}$$

3.2 Descriptive analysis results

A first look at the overall movement suggests that adjusted total number of immigrants is 35740 in 1996, and in 2001 this number declined to only 33568. Therefore, the overall out-migration rate is 6.08% (see Table 3.1). I begin the detailed descriptive analysis with the basic demographic characteristics of an individual – sex, age, and place of birth.

Table 3.1 Adjusted Numbers of Immigrants in 1996 (N_1^*) and 2001 (N_2^*) by Sex

Sex	Variable	Sum	Out-Migration Rate
female	N_1^*	18758	0.0598
	N_2^*	17637	
male	N_1^*	16981	0.0618
	N_2^*	15931	
Total	N_1^*	35740	0.0608
	N_2^*	33568	

Table 3.1 shows that generally males seem to be slightly more mobile than females with a higher out-migration rate between 1996 and 2001.

Table 3.2 Adjusted Numbers of Immigrants in 1996 (N_1^*) and 2001 (N_2^*) by Age

Age	Variable	Sum	Out-Migration Rate
20-24	N_1^*	4306	0.0930
	N_2^*	3906	
25-29	N_1^*	5501	0.0409
	N_2^*	5276	
30-34	N_1^*	7110	0.0394
	N_2^*	6830	
35-39	N_1^*	7179	0.0638
	N_2^*	6721	
40-44	N_1^*	5755	0.0784
	N_2^*	5304	
45-49	N_1^*	3806	0.0726
	N_2^*	3530	
50-54	N_1^*	2083	0.0387
	N_2^*	2002	
Total	N_1^*	35740	0.0608
	N_2^*	33568	

Table 3.2 indicates that the oldest group has the lowest out-migration rate; this could be attributable to higher moving costs. Table 3.2 also shows that the closer to the ages between 40 and 44 the immigrants are, the higher the propensity to out-migrate. However, the youngest group has the highest

out-migration rate. One main reason for this can be their flexibility of decision for future career path, because most of the immigrants of age 20 to 24 were beginning their career and had recently entered the labour.

Table 3.3 Adjusted Numbers of Immigrants in 1996 (N_1^*) and 2001 (N_2^*) by Place of Birth

From	Variable	Sum	Out-Migration Rate
Africa	N_1^*	2318	0.0681
	N_2^*	2160	
Asia	N_1^*	18375	0.0661
	N_2^*	17160	
Europe	N_1^*	8212	0.0539
	N_2^*	7769	
US	N_1^*	1075	0.0977
	N_2^*	970	
Other (Central and South America, Caribbean, Bermuda, Oceania, and others)	N_1^*	5760	0.0436
	N_2^*	5509	
Total	N_1^*	35740	0.0608
	N_2^*	33568	

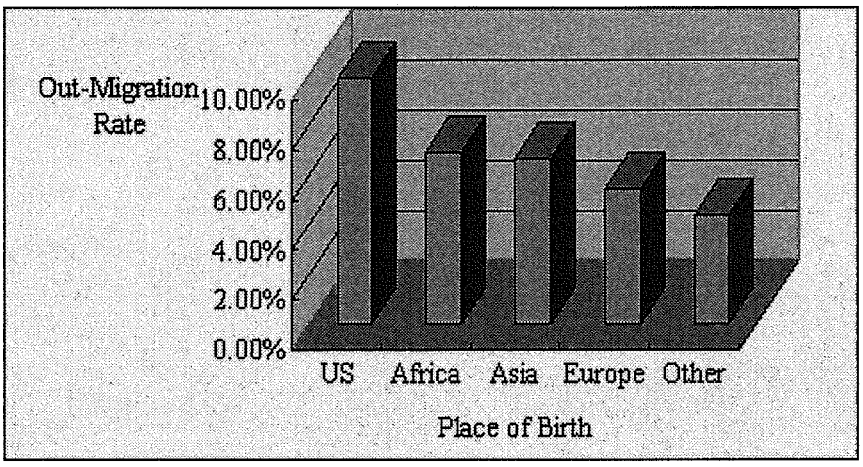

Figure 3.1 Out-Migration Rates by Places of Birth

From Table 3.3 and Figure 3.1, it appears that among all the immigrants, the group from the U.S. has the highest out-migration rate. The out-migration rate for African and Asian immigrants is higher than the out-migration rate of immigrants from Europe and other countries (Central and South America, Caribbean, Bermuda, Oceania and other places).

Table 3.4 Adjusted Numbers of Immigrants in 1996 (N_1^*) and 2001 (N_2^*)

By Year of Immigration

Year of Immigration	Variable	Sum	Out-Migration Rate
1980	N_1^*	2321	0.0217
	N_2^*	2271	
1981	N_1^*	1839	0.0605
	N_2^*	1728	
1982-1983	N_1^*	2947	0.0019
	N_2^*	2942	
1984-1985	N_1^*	2719	0.0254
	N_2^*	2650	
1986	N_1^*	1746	0.0671
	N_2^*	1629	
1987	N_1^*	2176	0.0249
	N_2^*	2122	
1988	N_1^*	2462	0.1205
	N_2^*	2165	
1989	N_1^*	2965	0.0176
	N_2^*	2913	
1990	N_1^*	3299	0.0227
	N_2^*	3224	
1991	N_1^*	3103	0.0904
	N_2^*	2823	
1992	N_1^*	3600	0.1527
	N_2^*	3051	
1993	N_1^*	3537	0.1129
	N_2^*	3138	
1994	N_1^*	3025	0.0366
	N_2^*	2914	
Total	N_1^*	35740	0.0608
	N_2^*	33568	

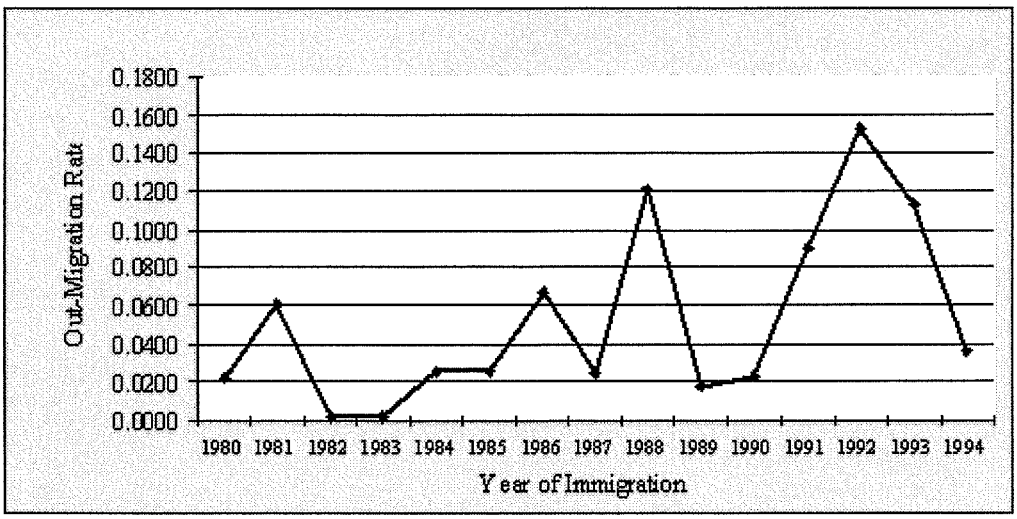

Figure 3.2 Out-Migration Rates of Those Who Immigrated between 1980 and 1994

Table 3.4 and Figure 3.2 show that out-migration rate was increasing and falling dramatically and had no obvious trend with length of stay in Canada for those who arrived between the years of 1980 and 1994. During the early 80s and the early 90s, the Canadian economy experienced recessions. Out-migration rates of those who immigrated at that time or 2 – 3 years earlier may have been affected. However, the out-migration rates during the period 1996 to 2001 of immigrants who arrived during the recession in the early 80s were not as high as those of immigrants who arrived during the recession in the early 90s. This may be due to the fact that the numbers of immigrants moving into Canada during the recession of the

early 80s were much lower than those who entered during the recession of the early 90s (See Appendix B), and thus the immigrants who arrived during the early 80s were affected less in labour market than those who came during the early 90s. The analysis and explanation will be discussed further in section 4 when more variables are included in the empirical analysis.

Table 3.5 Adjusted Numbers of Immigrants in 1996 (N_1^*) and 2001 (N_2^*) by Highest Degree of Education

Highest Degree of Education	Variable	Sum	Out-Migration Rate
high school or less	N_1^*	17603	0.1458
	N_2^*	15036	
above high school, below bachelor degree(s)	N_1^*	10172	-0.0202
	N_2^*	10378	
bachelor degree(s) or above	N_1^*	7964	-0.0238
	N_2^*	8154	
total	N_1^*	35740	0.0608
	N_2^*	33568	

In Table 3.5, one would expect that the number in each education group would decline over the period between the years 1996 and 2001 due to out-migration, as I found in Table 3.1 to Table 3.4. In fact, Table 3.5 shows that the number of immigrants in the group "high school or less" declined, while the numbers of immigrants in the groups of "above high school, below bachelor degree(s)" and "bachelor degree(s) or above" increased. Those

results mean that some of the immigrants whose highest degrees of education in 1996 were less than high school entered into high school and even university level programs or above between 1996 and 2001; similarly, immigrants who were below a university level degree in 1996 got their degree of bachelor degree(s) or above before or in 2001. Therefore, the number of immigrants in the group "high school or less" declined not only due to the out-migration, but also because a part of the immigrants who were in group "high school or less" in 1996 became more educated and earned higher diplomas, certificates or degrees between the years 1996 and 2001. Similarly, the reason why the numbers in the groups of "above high school, below bachelor degree(s)" and "bachelor degree(s) or above" increased is that there were more immigrants who earned those diploma, certificates or degrees in the two education groups during the years 1996 and 2001 and stayed in Canada in 2001 than those who had those educational degrees but out-migrated during the same period. The generation of these variables of education is thus somewhat endogenous and may cause biased parameter estimates within a regression framework. This problem will be addressed further in the section 5.

4. Regression results and analysis

4.1 Re-categorization of immigrants in terms of year of immigration

As shown in Figure 3.2, the trend overtime of the out-migration rate is not obvious, and could be confounded with the economic cycle and other particular events that could have more direct effects on the behaviour of out-migration than simply the years since immigration, so I re-categorize the immigrants by different periods of immigration instead of by single year of immigration.

Table 4.1 Re-categorization of the Immigrants by Different Period of Immigration

Groups	Period of Immigration
Group 1	Years between 1980-1983 (reference group)
Group 2	Years between 1984-1986
Group 3	Years between 1987-1990
Group 4	Years between 1991-1994

In Table 4.1, the whole data set is divided into several cohorts denoted by "1980 – 1983", "1984-1986", "1987-1990", and "1991-1994", based on the period of immigration into Canada.

4.2 Regression results

I use the methodology described in section 2 in order to estimate these out-migration rates within a multivariate regression framework. Two models are presented, with and without the inclusion of the education variables. Our reference category is male immigrants who immigrated to Canada between 1980 and 1985 from the United States, with high school education or below.

Table 4.2 Cell-based regression Results for Out-Migration Rate

variable	DF	Without Education Variables			With Education Variables		
		parameter estimate	t value	Pr > |t|	Parameter estimate	t value	Pr > |t|
Intercept	1	-0.24046	-1.53	0.1259	-0.51591	-4.2	<.0001
Age	1	-0.00247	-0.75	0.4564	0.02159	8.66	<.0001
immigrated between 1984-1986	1	-0.07679	-0.66	0.508	-0.04121	-0.49	0.6261
immigrated between 1987-1990	1	0.01358	0.14	0.8904	-0.1184	-1.67	0.0949
immigrated between 1991-1994	1	0.03337	0.34	0.7347	0.05043	0.71	0.4771
Female	1	-0.08976	-1.28	0.2008	-0.13315	-2.58	0.0098
Europe	1	0.36835	3.34	0.0009	-0.41883	-5.15	<.0001
Asia	1	0.42443	3.79	0.0002	-0.06705	-0.79	0.4317
Africa	1	-0.18842	-1.97	0.0486	-0.37041	-5.12	<.0001
Other Places	1	0.35144	3.24	0.0012	-0.58484	-7.5	<.0001
High School to University	1	N/A	N/A	N/A	-0.22382	-3.48	0.0005
University or Higher	1	N/A	N/A	N/A	-0.42598	-6.74	<.0001
Sample Size[3]		905			2495		
R-Square		0.0529			0.0797		

[3] The sample size in each specification is expected to be the same with the number of cohorts without and with the education variables as calculated in section 2.2, that is 910 without the education variables or 2730 with the education variables; in fact, those numbers are 905 and 2495 respectively. The reason for the differences is that there were some missing variables of out-migration rates due to the zero denominator problems as some of the adjusted numbers of immigrants in 2001 (N^*_{2i}) for some cohort i may be zero or missing.

In Table 4.2, by regressing with and without the education variables, I have opposite signs for some estimated parameters. Intuitively, compared with the descriptive statistics discussed in section 3, the results from the specification with the education variables seem more reasonable, because it has more statistically significant estimated parameters, and because it is expected that the group from the US will have higher out-migration rate than any of the other groups during 1996 to 2001.

However, as discussed earlier, with no problem of endogenous variables, the results without the education variables may be more reliable than those with the education variables, and I am interested mainly in discussing the results of the specification without the education variables in this section.

4.2 Partial effects of each characteristic: expected and observed impact

4.2.1 Sex

Males are expected to exhibit higher geographic mobility than females, and the descriptive analysis in section 3 supports this intuitive expectation.

Also, the parameter estimates for the variable of sex is negative in both specifications. This means the females are less likely to out-migrate than males, all other factors held constant. However, the estimated parameter for the variable "female" in the specification without the education variable is not statistically significant, while it is significant in the specification that includes the education variables.

First, female immigrants who were single when they immigrated to Canada need to study and get information more than males in advance in order to reduce the risk of information asymmetry. For example, the discrimination toward sex if any in the labour market will push females to think more carefully to make up their mind before they move to this new land. And they will analyze more cautiously than males the costs and benefits of moving. Thus, the possibility of an over-optimistic expectation can be reduced by females' careful analysis. Second, a large fraction of the female immigrants were "followers" to their husbands. Those females are even less likely to out-migrate alone.

4.2.2 Age

Generally, the older the immigrations are, usually the longer they have been in Canada, the more social and economic networks they may have built,

the higher costs they may have for out-migration, the harder it may be to get assimilated by a new environment, and the more pessimistic they will be when they have to face the new challenges. Because they have invested in social capital that are specific to their correct situation, the immigrants will not give up the existing social networks they have built in Canada and move to a new country unless they have confirmed that the movement has a positive net benefit, by learning thoroughly all the information they need.

On the other hand, age may have a positive impact to the out-migration rate also as older people can usually get higher pension in their home countries (Lam, 1994), provided that they are of retirement age.

My result for age suggests that older immigrants usually have a lower propensity to out-migrate than the younger immigrants in the specification that excludes the education variable. However, the result is not statistically significant. On the other hand, the small p-value in the specification with the education variables suggests that the positive parameter is statistically significant.

4.2.3 Period of immigration

Usually, abstracting from the effects of the economic cycle and other particular events, an immigrant who has been in Canada longer is expected to have built more economic and social networks, and thus there should be a higher cost for him/her to out-migrate. Also, the longer the immigrants have been staying, the more self-selected they are, and the less necessary it is to correct the information that they had before they moved to Canada, and thus there is a lower possibility to have problems of information asymmetry and to make an irrational decision to stay. Therefore, an immigrant who immigrated in Canada earlier is expected to be less likely to out-migrate. However, this pattern is not that obvious, and thus I re-divide the whole sample into 4 groups by different periods of immigration, as shown in Table 4.1.

The cohort "1980 - 1983" is used as the reference group. In the specification without the education variables, there is a negative parameter estimate for cohort "1984 - 1986", and positive parameter estimates for cohort "1987-1990" and cohort "1991-1994". This suggests that the group who immigrated during 1984 to 1986 is less likely to out-migrate, and the group who immigrated during 1987 to 1994 is more likely to out-migrate

than those immigrated during 1980 to 1986. Note that the initial economic conditions could potentially have a permanent effect on the immigrants, as the immigrants who came to Canada during recessionary times might still stay poor in labour market and thus out-migrate eventually. When the economy recovered in the late 80s from a steep recession along with a small flow of new immigrants into Canada (see Appendix B) during early 80s, who immigrated 2 – 3 years earlier (1984 - 1986), those immigrants were more willing to stay rather than out-migrate.

During the more recent recession in the early 90s, however, a large part of those who immigrated during late 1980s or even earlier, combined with the large cohort (see Appendix B), had to out-migrate due to unfavourable labour market conditions.

Since the early 1990s, the government of Canada changed its immigration policy, making it easier to immigrate to Canada, and this was followed by a larger growth in the number of new immigrants. This phenomenon influenced negatively the situation the immigrants had in Canada, and the out-migration rates of those who immigrated during 1987 to 1994 became larger as a result. Besides, during the late 80s and early 90s, a large fraction of immigrants were from Hong Kong in the advent of the

impending handover between the United Kingdom and China. A significant fraction of these landings may have been stimulated by the attractiveness of establishing citizenship to evade the expected "hazard", though later it was proved to be an unnecessary worry. Therefore, many immigrants returned to Hong Kong after establishment of citizenship in Canada.

However, all of the p-values for the estimated parameters of cohorts in both specifications are quite large, which suggests that those estimated parameters to the cohorts are not statistically significant. To support those explanations advanced in this section, I still need more information.

4.2.4 Place of birth

Conventionally, one would expect migration decisions to be strongly affected by economic conditions in the source country. Immigrants tend to out-migrate to rich countries, not to poor countries. Also, an immigrant is more likely to out-migrate to a nearby country than to a distant one (Borjas and Bratsberg, 1996). The presence of a communist regime in the source country may have a strong negative impact on the out-migration rate. Further, the source country's per-captia GNP probably has a negative

(though sometimes statistically insignificant) impact on the in-migration rate, but a positive impact on the out-migration rate.

Therefore, I would expect immigrants from the U.S. to have a larger propensity to return than those from Asia, Europe, Africa, and other places (Central and South America, Caribbean, Bermuda, and Oceania). However, the results from the regression analysis without the education variables (the preferred specification) are different from what we expected. The estimated coefficients for Europe, Asia and others (Central and South America, Caribbean, Bermuda, and Oceania) are positive, and all of those estimates are statistically significant with small p-vales (0.0009, 0.0002, and 0.0012 respectively), while the estimated parameter for Africa is negative and statistically significant with small p-value ($pr=0.0486<0.05$). Actually, the regression results may not be so surprising. During the late 1990s, the phenomenon of globalization intensified. From most foreigners' point of view, Canada is still a powerful and peaceful developed country, but it is losing its attractiveness, for at least among certain immigrants to stay for a long period. First, immigration from the U.S. is to a large extent driven by professionals and managers due to corporate interlock between Canada and America (Boyd, 1981). This group is expected to return to their home country after finishing their managerial or professional appointment in

Canada, which usually takes 3 to 5 years. Second, following the formation of European Union which was implemented in 1992, Europe became more economically integrated, which would tend to encourage immigrants to stay for longer periods than what would otherwise be the case. The new European immigrants may prefer, more than what was previously the case, moving back to their home to staying in Canada for a long period.

Third, short-term staying of Asian immigrants is a special case due to special underlying reasons. In Canada, there are over 50% of immigrants from Asia and the Pacific during the late 90s, and there are 8 Asian countries among the top ten source countries of immigrants to Canada (see Appendix C). In Asia and the Pacific during the decade of globalization, there were a lot of emerging economies, such as India and China, and many newly industrialized economies, such as Hong Kong, Taiwan, Korea, Malaysia, and Indonesia. In order to attract more international trade and FDI, those economies were competing with each other by implementing a lot of preferential policies for trade and investment for foreign traders and investors. Developing a business relationship with those economies became as attractive as a "Gold Rush" for foreign businessmen. Accordingly, being an emigrant became an advantage for doing business in those countries, and Canada is one of the best choices for those people who want to establish

another citizenship through economic immigration through the business class. Therefore, staying for a short period (2 to 3 years) rather than a long period is more practical for those "emigrant businessmen" to realize their dreams in this new "Gold Rush".

As shown in Table 3.3, the numbers of immigrants from Africa is relatively smaller than those from Europe and Asia, due to the lower development status of those countries, most of which still being undeveloped and therefore harder to "export" professional and skilled workers. This may be why the out-migration rates of African immigrants are estimated to be lower than others. African immigrants are seeking a long term stay, and are working in Canada for a more promising economic future, rather than establishing citizenship in order to eventually return to their home countries.

4.2.5 Highest degree of education

Education is expected to influence the out-migration rates, because it has a key role in immigrants' position in labour market. In Table 4.1, the estimated parameters for "Above high school, below bachelor degree(s)" and "Bachelor degree(s) or above" are -0.22382 and -0.42598 respectively,

with quite small p-values for both. Therefore, disregarding the endogeneity problem, those estimates are reliable. It follows that the more educated immigrants will be less likely to out-migrate. The main reason may be that it is much easier for the more educated immigrants to find jobs in Canada, and thus to stay for a long period. However, as discussed earlier, the education variables are endogenous to the out-migration choices, and thus the estimate parameters will include the impact of changing between education categories. In the next section, I will discuss an alternative way to find out the partial effects of education.

5. An alternative regression specification with education variables

As defined in Table 5.1, I create the variables of "Average Years of Schooling for Members in 1996" for each synthetic cohort. This variable is static, and I use it as a substitute for the variable that combined the education variables in 1996 and 2001 together.

Table 5.1 Categories for Immigrants

by Average Years of Schooling for Members in 1996

Education Group *m*	**Years of Education in 1996 (6 groups)**
$m = 1$	0 No degree, certificate or diploma
$m = 2$	12 Secondary/high school graduation certificate or equivalent
$m = 3$	14 Trades certificate or diploma; Other non-university certificate or diploma; University certificate or diploma below bachelor level
$m = 4$	16 Bachelor's degree(s)
$m = 5$	17 University certificate or diploma above bachelor level; Degree in medicine, dentistry, veterinary medicine or optometry
$m = 6$	18 Master's degree(s) Earned doctorate

The value of the new variable of "Average Years of Schooling for Members in 1996" for cohort *i*, which is denoted by $Avyrsch_i$, is expected as:

$$Avyrsch_i = \frac{\sum_{m=1}^{6} Obs_{im} \cdot Yr_m}{\sum_{m=1}^{6} Obs_{im}}, \qquad (10)$$

Where

$Avyrsch_i$ is average years of schooling of the members in cohort *i*;

Obs_{im} is the observed number of members in cohort *i* and who had earned highest degree of education *m* in 1996 as defined in Table 5.1;

Yr_m is the average years of schooling to earn degree *m* in 1996.

The following example provides an illustration (see table 5.2),

Table 5.2

Average Years of Schooling for the Members in 1996 for the 1st Cohort

Highest Degree of Education in 1996	**Years of Schooling to Get this Degree** (Yr_m)	**Number of Members** (Obs_{im})
No degree, certificate or diploma ($m = 1$)	0	13
Secondary/high school graduation certificate or equivalent ($m = 2$)	12	10
Trades certificate or diploma; Other non-university certificate or diploma; University certificate or diploma below bachelor level ($m = 3$)	14	1
Bachelor's degree(s) ($m = 4$)	16	0
University certificate or diploma above bachelor level; Degree in medicine, dentistry, veterinary medicine or optometry ($m = 5$)	17	1
Master's degree(s) Earned doctorate ($m = 6$)	18	0
Total Number of the Members		**25**

This cohort is identified by (sex, age, cohort, origin) = (female, 22, "1980", Africa), which means that the members in this cohort are 22 years old females who immigrated into Canada from Africa during 1980 to 1983.

In this particular case,

$$Avyrsch_1 = \frac{0\times13+10\times12+1\times14+0\times16+1\times17+0\times18}{25} = 6.04\,.$$

In the same way, one would get the average years of schooling in 1996 for each cohort i accordingly.

Table 5.3

Regression Results with Alternative Education Variables

Variable	DF	Parameter Estimate	t value	Pr > |t|
Intercept	1	-0.05273	-0.54	0.5874
Age	1	-0.00091098	-0.45	0.6539
immigrated between 1984-1986	1	-0.02938	-0.44	0.6589
immigrated between 1987-1990	1	0.01130	0.20	0.8395
immigrated between 1991-1994	1	0.04787	0.86	0.3907
Female	1	-0.03308	-0.82	0.4147
Europe	1	0.10330	1.61	0.1084
Asia	1	0.14029	2.18	0.0293
Africa	1	-0.02549	-0.40	0.6922
Other Places	1	0.08462	1.32	0.1884
Years of Schooling in 1996	1	-0.05273	-0.54	0.5874
Sample Size[4]		905		
R-Square		0.0134		

Compared with the regression results in Table 4.1, it is found that the sign for each coefficient estimate is consistent with what I found from the specification without the education variables in section 4. However, except for the estimated parameter for group from Asia, all of the estimates are not

[4] The sample size is expected to be the same with the number of cohorts without and with the education variables as calculated in section 2.2, that is 910 without the education; in fact, the number is 905. The reason for the difference is that there were some missing variables of out-migration rates due to the zero denominator problems as some of the adjusted numbers of immigrants in 2001 (N_{2i}^{*}) for some cohort i may be zero or missing.

statistically significant. The sign for the parameter of "Average Years of Schooling in 1996" is negative, and therefore, the higher educated immigrants will have a lower propensity to out-migrate. This result matches our result in section 4; however, the p-value for this estimate indicates that it is not statistically significant.

6. Conclusion

This study consisted of an analysis of the out-migration rates of immigrants between the period 1996 and 2001. During the years 1996 and 2001, about 6% of all Canadian immigrants out-migrated from Canada to other countries. Three specifications are used, two including education variables, and the other excluding education variables. In the specification without education variables, I compared each cohort with the reference group – male immigrants from the U.S. who arrived between the years 1980 and 1985. With the other two specifications, the partial effects of education were also discussed. Among those out-migrants, the group of the less educated older males from Asia who immigrated into Canada during the early 1990s is the most likely to out-migrate. Also, a fraction of immigrants are found to increase their education during the period 1996 to 2001.

Immigrants who arrived during the years between 1984 and 1986 seem to be more willing to stay than any other cohorts I studied. However, the estimates for each period of immigration are not statistically significant. In fact, the partial effects by those variables may be more complicated, and this issues merits further investigation.

All other factors held constant, Asian, European and American immigrants are more likely to out-migrate, while the immigrants from Africa were less likely to out-migrate. The case of immigrants from Hong Kong is special because of the impending handover between the UK and China.

Education is undoubtedly influencing out-migration choices, but technically it is difficult to estimate its partial effect. In this paper, I used both the methodology of Lam (1994) and an alternative method in which I used the average years of education in 1996 for each cohort. Through both approaches, I obtained the same conclusion that the more educated immigrants would be less likely to out-migrate; however, the estimate from the latter model is not statistically significant.

In order to obtain more reliable results for all of those three specifications, I still need more information, such as additional explanatory variables because some of the estimates are found to be not statistically significant.

In any event, to retain the immigrants in the Canadian labour market, we need to break barrier, such as discrimination based on sex and race. Further, we need try to attract mainly the more highly educated immigrants, and have a better system to help the existing immigrants to continue their

education after landing in Canada. Furthermore, immigration policies that are compatible to the cycle of the Canadian economy should be carried out; when the economy is about to enter into a recession, the new potential immigrants must be cautious in their decision to move into Canada.

Appendix A

Table a. Life Table for the first year of life, Canada, 2000 to 2002

	female		male	
Age	survival numbers	Average Survival Rates	survival numbers	Average Survival Rates
20	99197		98866	
21	99163		98785	
22	99130		98700	
23	99097		98615	
24	99064	N/A	98529	N/A
25	99031		98444	
26	98999		98363	
27	98966		98284	
28	98933		98205	
29	98899	0.998339557	98124	0.995795297
30	98863		98042	
31	98824		97956	
32	98782		97866	
33	98737		97772	
34	98687	0.998110455	97675	0.995708355
35	98633		97573	
36	98573		97465	
37	98507		97352	
38	98435		97232	
39	98357	0.997189675	97104	0.994717061
40	98274		96967	
41	98183		96820	
42	98086		96661	
43	97979		96488	
44	97862	0.995693445	96301	0.992831696
45	97733		96096	
46	97591		95872	
47	97435		95628	
48	97264		95361	
49	97077	0.993303207	95071	0.98922061
50	96873		94757	
51	96651		94416	
52	96408		94044	
53	96142		93636	
54	95849	0.989371792	93186	0.98328759
55	95526		92689	
56	95171		92142	
57	94781		91539	
58	94354		90874	
59	93888	0.982978609	90143	0.973083085

Source: "Life Tables, Canada, Provinces and Territories 2000 to 2002" (revised), Statistics Canada.

Appendix B

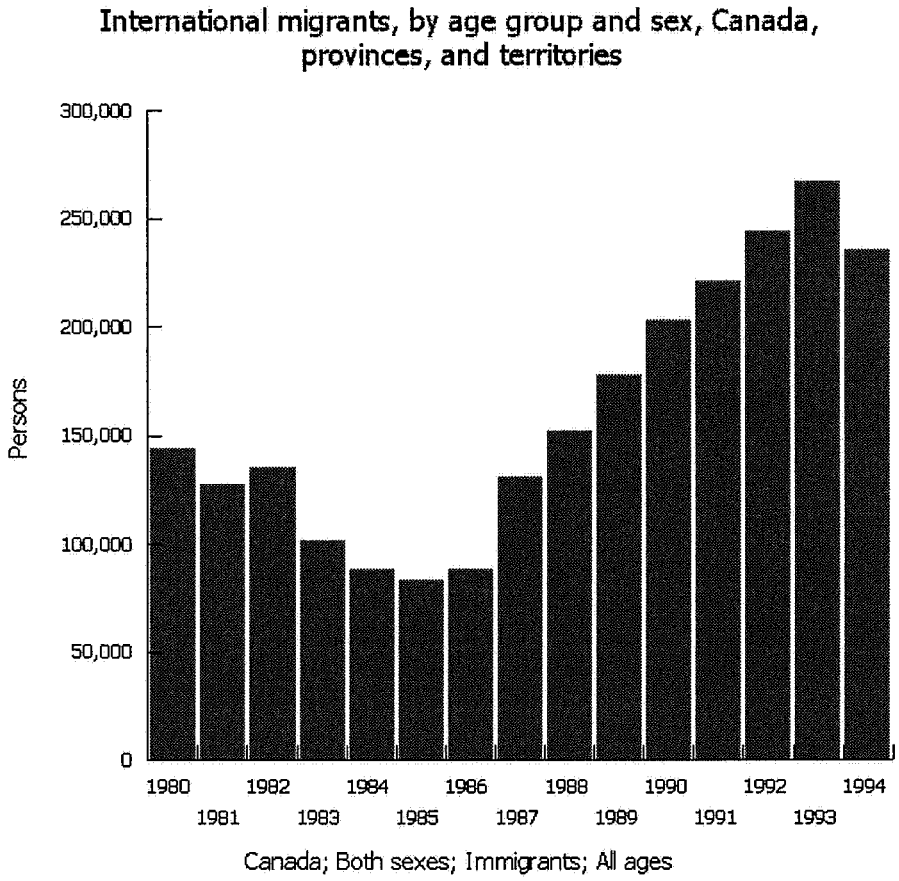

Figure b. Number of Immigrants to Canada by Year

Source: Statistics Canada, CANSIM Table 051-0011.

Appendix C

Figure c.1 IMMIGRATION BY SOURCE AREA

	1999		2000		2001	
REGION	#	%	#	%	#	%
Africa and the Middle East	33,490	17.63	40,815	17.96	48,078	19.20
Asia and Pacific	96,437	50.78	120,539	53.03	132,711	53.01
South and Central America	15,221	8.01	16,944	7.45	20,129	8.04
United States	5,528	2.91	5,814	2.56	5,894	2.35
Europe and the United Kingdom	38,930	20.50	42,885	18.87	43,204	17.26
Not stated	316	0.17	316	0.14	330	0.13
Total	**189,922**	**100**	**227,313**	**100**	**250,346**	**100**

Figure c.2`IMMIGRATION BY TOP TEN SOURCE COUNTRIES

	1999			2000			2001		
COUNTRY	#	%	**Rank**	#	%	**Rank**	#	%	**Rank**
China, People's Republic of	29,112	15.33	1	36,715	16.15	1	40,296	16.10	1
India	17,429	9.18	2	26,086	11.48	2	27,812	11.11	2
Pakistan	9,295	4.89	3	14,182	6.24	3	15,339	6.13	3
Philippines	9,170	4.83	4	10,086	4.44	4	12,903	5.15	4
Korea, Republic of	7,216	3.80	5	7,626	3.35	5	9,604	3.84	5
United States	5,528	2.91	7	5,814	2.56	7	5,894	2.35	6
Iran	5,907	3.11	6	5,608	2.47	8	5,736	2.29	7
Romania	3,461	1.82	14	4,425	1.95	11	5,585	2.23	8
Sri Lanka	4,723	2.49	9	5,841	2.57	6	5,514	2.20	9
United Kingdom	4,478	2.36	10	4,647	2.04	10	5,345	2.14	10
Taiwan	5,464	2.88	8	3,511	1.54	14	3,111	1.24	19
Yugoslavia	1,490	0.78	29	4,723	2.08	9	2,786	1.11	22
Total for Top Ten Only	**98,322**	**51.78**		**121,328**	**53.38**		**134,028**	**53.54**	
Total Other Countries	**91,600**	**48.22**		**105,985**	**46.62**		**116,318**	**46.46**	
Total	**189,922**	**100**		**227,313**	**100**		**250,346**	**100**	

Source: "Immigration - Historical Perspective (1860-2001)", Citizenship and Immigration Canada.

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