

UNIVERSITY OF CALGARY

The Socioeconomic Attainment of Canadian Immigrants to the United States

by

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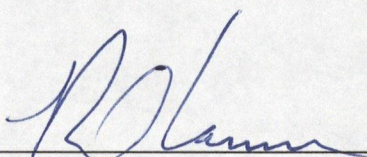
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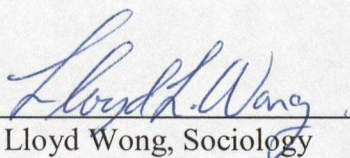
UNIVERSITY OF CALGARY

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "The Socioeconomic Attainment of Canadian Immigrants to the United States" submitted by Carmen Renée Tym in partial fulfillment of the requirements of the degree of Master of Arts.



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Abstract

Migration from one developed country to another is analyzed with data from the 1990 U.S. Census five percent Public Use Microdata Sample and the 1991 Census of Canada Public Use Microdata File. Evidence of a brain drain is that Canadian immigrants to the U.S. are more highly educated, as well as having higher percentages in professional and managers occupations, than *Canadians in Canada*. OLS regression of *Earnings* shows for men *Canadians in the U.S.* earn more than *Canadians in Canada*, *Americans in the U.S.*, and *Americans in Canada*. Results for women are *Canadians in the U.S.* earn more than Americans, both those in the U.S. and in Canada; however, there is no statistically significant difference in *Earnings* compared to *Canadians in Canada*. Men who are *Canadians in the U.S.* have higher *Occupational Status* than any other group. For women there is no statistically significant difference in *Occupational Status* by comparison.

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CHAPTER ONE: INTRODUCTION, THEORY, AND LITERATURE

Introduction

Most studies on immigration, as well as theories of migration, address movement from less developed countries to more developed countries. Migration from one developed country to another has been little studied, though it constitutes a considerable proportion of the total international flow of migrants. In view of the recent policy concern in Canada with the brain drain, this thesis examines Canadian immigrants to the U.S. Data are from the 1990 U.S. Census five percent Public Use Microdata Sample and the 1991 Census of Canada Public Use Microdata File, since the U.S. 2000 and Canadian 2001 census microdata files are not yet available. The number of cases analyzed is over 50 000. The research design is unique in that it compares Canadian immigrants not only to the native-born population in the host country (the United States), but also to those who remain in the country of origin. An additional comparison is made to U.S. immigrants to Canada. The thesis examines several research questions:

(1) Does the emigration of Canadians to the U.S. really constitute a brain drain, or do those leaving Canada for the U.S. mirror the Canadian labour force as a whole? To address this question I compare the educational levels and occupational categories of the Canadian born in the U.S. to both the Canadian born in Canada. (2) How do the *Earnings of Canadians in the U.S.* compare to those who remain in Canada? To the U.S. born who immigrate to Canada or remain in the U.S.? Using OLS regression methods, I predict *Earnings* from dummy variables for country of residence and country of birth, controlling for *Years of Schooling*, *Labour Force Experience*, *Weeks worked*, *Full-time*, and *Marital Status*. Separate models are run for men and women. The model for women

also includes a variable for *Number of Children*. *Earnings* are adjusted for exchange rate and inflation. (3) How does the *Occupational Status of Canadians in the U.S.* compare to that of the other groups? To address this question I estimate a model predicting the International Socio-Economic Index of Occupational Status (ISEI) from the country dummy variables and appropriate controls.

The definition of the brain drain¹ is the “loss of knowledge workers” from one country to another, and in this case, from Canada to the United States (Zhao, Drew, and Murray, 2000: 8). The brain drain is of interest to provincial and federal governments in Canada because of the financial impact of the loss of skilled workers. It is a concern to universities and other post-secondary institutions in terms of preparing students to meet requirements of the work force. Post-secondary graduates are also curious about the issue of the brain drain, as well as being concerned with how well jobs match their skills (Zhao et al., 2000: 4). In addition, employers of all types, both in the private and public sectors, have an interest in the brain drain.

Theory

Most of the theories available on immigration address movement from less developed countries to more developed countries. I have used ideas from each theory as they apply, but the only theory that is applicable in its entirety to migration from one developed country to another is neoclassical economics micro theory. Other theories of international migration that explain the initiation of movement are: the new economics of migration theory, dual labor market theory, and world systems theory. Although each of these other theories makes different assumptions, they are similar in that they attempt to explain migration from a less developed country to a more developed country.

The new economics of migration theory considers families or households as the unit of analysis. A family may diversify by having one of its members migrate to another country, in order to have another source of income and to lower certain risks. If local economic conditions turn worse, then the household can rely on the migrant for support. This is mainly a strategy of families in less developed countries, since in developed countries there are other ways of minimizing risk such as: crop insurance, futures markets, unemployment insurance, and loans. Even though the new economics of migration theory is about families, it is not the whole family that is migrating; rather a member of the family migrates while the rest of the family stays behind. This is not the same as saying that people migrate as families. Thus, the new economics of migration theory does not seem applicable to immigration from Canada to the U.S.

Dual labor market theory argues that “international migration is caused by a permanent demand for immigrant labor inherent to the economic structure of developed nations” (Massey et al., 1993: 440). Instead of raising entry wages to attract native workers, employers seek migrant workers who will accept low wages. According to dual labor market theory, differences in standards of living between countries make even low wages in developed countries appear generous to immigrants from less developed countries. Women and teenagers previously traditionally filled jobs with unpleasant conditions, low wages, instability, and little chance for advancement. However, for various reasons these sources have declined in advanced industrial societies, and this has increased the demand for immigrant workers. Dual labor market theory does not fit the research questions about migration from one developed country to another.

World systems theory views capitalist economic relations into peripheral, non-capitalist societies as creating “a mobile population that is prone to migrate abroad” (Massey et al., 1993: 444). Migration is viewed as a result of disruptions and dislocations that occur. Change in land use displaces people and creates a mobile labor force. The extraction of raw materials, and factory work lead to paid labor. New transportation and communication links between countries facilitate migration. As well, cultural connections between the developed and developing countries are reinforced by mass media and advertising. Thus, world systems theory states that international migration is a consequence of capitalist market formation in the developing world. Again, this theory is formulated on the relation between a developing and a developed country, and does not explain migration between developed countries.

Among theories that explain the perpetuation of international movement, both cumulative causation theory and network theory may also be applicable to research on migration from one developed country to another. Cumulative causation theory states migration changes the receiving country in ways that often increase the likelihood of additional migration. Network theory focuses on migrant networks. Interpersonal ties with relatives and friends increase the likelihood of international migration, because the network lowers the risks and raises the returns to moving. Connections are a form of social capital people can use to gain employment and receive assistance. As the network grows, more people migrate.

The theory that seems most applicable to migration from one developed country to another is neoclassical economics micro theory, which sees international migration as a form of investment in human capital. According to the theory, “the likelihood of

emigration is predicted to be reliably related to such standard human capital variables as age, experience, schooling, marital status and skill” (Massey, Arango, Hugo, Kouaouci, Pellegrino, and Taylor, 1993: 456). “A key empirical issue is where the effect of human capital is greater, at home or abroad” (Massey et al., 1993: 456). Individual actors are rational, and do a cost-benefit calculation about migrating. If a positive net return is expected, a person may decide to migrate. “People choose to move where they can be most productive, given their skills” (Massey et al., 1993: 434).

In weighing the issue, a person may take into account the investment of moving, including: “ (1) the material costs of traveling, (2) the costs of maintenance while moving and looking for work, (3) the effort involved in learning a new language and culture, (4) the difficulty experienced in adapting to a new labor market, (5) and the psychological costs of cutting old ties and forging new ones” (Massey et al., 1993: 434).

How the theory may apply to emigration from Canada to the U.S.

Some of these above costs might be minimized or eliminated in a move from Canada to the United States. For instance, if a person secures a job prior to emigrating, he or she would not be looking for work on arrival. Also, some companies cover moving expenses, for example Frank and Bélair (2000) found that half the Canadian graduates who went to the United States were offered incentives by their U.S. employers, and of those offered incentives 56% had payment for moving expenses. Thus having a job lined up, and moving expenses paid would negate the first two costs listed. Further, if the Canadian is English-speaking, there would not be a new language to learn, however this may be different for French Canadians. While there are cultural differences between Canada and the U.S., the extent of the differences is a subject of debate. Some argue that

the differences may be less than between some countries. “Similarities between the two countries open an easier path to relocation” (Iqbal, 2000: 681). According to world systems theory, mass communications and advertising campaigns reinforce ideological and cultural connections between countries (Massey et al, 1993: 446). Others maintain that the cultural differences are great (Adams et al., 2000). However, it may make a difference where in the U.S. the migrant is going. As far as the difficulty experienced in adapting to a new labor market, Borjas (1994) argues that there is a difference in the kinds of skills workers acquire in highly developed versus less developed countries. “It seems likely that skills acquired in advanced economies are more easily transferable to the U.S. labor market” (Borjas, 1994: 1687). He cites evidence that “there is a strong positive correlation between immigrant earnings in the United States and the level of economic development in the country of origin, as measured by the country’s per capita GNP” (Borjas, 1994: 1687). Finally, the psychological costs of cutting old ties and forging new ones, remains. However, with communication technology, such as e-mail and telephones, it is easier to stay in touch with friends and family at a distance than it was in the past. Thus, the costs that one would usually incur when moving to another country may be comparatively minimized in the case of moving from Canada to the U.S.

The role of earnings and employment

The micro theory of neoclassical economics allows for both earnings and the probability of employment to factor into a decision (whereas neoclassical economics macro theory assumes full employment). Theoretically, a person will migrate to where the expected net returns are the greatest. Having human capital such as education, experience, training, and language skills may increase the likelihood of international

movement. Further, the assumption is that “international movement does not occur in the absence of differences in earnings and/or employment rates between countries” (Massey et al., 1993: 435). The focus of the theory is on labor markets.

Status

While the primary benefit of a job may be wages, other factors such as satisfaction, responsibility, and opportunity for advancement may also be important. In terms of motivation, “people work not only for income, but also for the accumulation and maintenance of social status” (Massey et al., 1993: 441). Occupational status, along with earnings, will become a measure of success in the analysis.

Wage gap

An empirical prediction that follows from the theory is that the volume of international migration is affected by the size of the gap in wages between the countries. Refinements of the theory, however, suggest that it is the expected earnings, and not the actual wage difference that affects migration. Migration to another country “should not occur in the absence of an international gap either in observed or expected wages” (Massey et al., 1993: 455). In support of the theory, “whenever researchers have examined the empirical connection between wages in receiving countries and emigration from sending countries, they have found a significant positive correlation” (Massey, 1999: 304). Economic factors such as relative income levels, and employment opportunities may also affect international migration. Real personal disposable income, taxes, the job market, and unemployment rates are economic conditions that influence emigration (O’Neill, 1999).

Producing versus absorbing professionals

In an analysis of 104 countries, Cheng and Yang (1998) found that “the difference between the sending country and the United States in professional employment opportunities is statistically significant and positively associated with the level of professional migration” (648). The capacity of a country to absorb its professionals is thus important.

The role of education

Emigration of the highly educated means a loss for the sending country, not only in terms of future benefit, but also in the investment that was made in education. Wanner (1998) found that immigrants to Canada who have been educated in Anglophone and Francophone countries do better than the Canadian-born. Given this finding we might expect immigrants educated in Canada to do well in the U.S. since Canadian levels of education are comparable to those of the U.S. “Today no U.S.-Canadian difference gap exists in education for the youngest generation” (Reitz, 1998: 29). Borjas made a comparison of the education and wages of employed immigrants to the United States, men age 25-64, by country of birth, in 1990. He found that immigrants from Canada have an average of 13.8 years of schooling, compared to 13.2 years for native-born workers (1999: 43).

Trade

There are differences in immigration from less developed countries to more developed countries, and immigration from one developed country to another. “Developed countries will increasingly move to restrict in-migration from the developing world, even as they act to lower barriers to movement among themselves” (Massey,

1999: 310). The amount of trade between countries also affects migration. “Economic interaction between receiving and sending countries as reflected in the level of trade also contributes to the growth of professional migration to advanced countries” (Cheng and Yang, 1998: 631). Economic interaction was a measure of U.S. investment, import from the U.S., and export to the U.S. Results show that “the economic interaction factor has a significant positive effect (.221) on professional migration to the United States” (Cheng and Yang, 1998: 646).

What effect has free trade had on the movement of skilled workers between Canada and the U.S.? The North American Free Trade Agreement (NAFTA) passed in 1994 has affected temporary migration from Canada to the U.S. To gain entry, a Canadian worker needs proof of qualifications, and an offer of employment. While visas are issued for a maximum time of one year, there is no limit on the number of renewals (Zhao et al., 2000: 10). NAFTA has “enabled the flow of human capital” (Iqbal, 2000: 675). According to cumulative causation theory, “each act of migration alters the social context within which subsequent migration decisions are made, typically in ways that make additional movement more likely” (Massey et al., 1993: 451). Thus, “one might expect that a large increase in temporary migration... would eventually lead to a noticeable increase in permanent migration to the United States” (Zhao et al., 2000: 10).

Immigration policy and skilled immigrants

More developed countries that have made the transition from an industrial economy to a tertiary economy have an increased demand for highly trained workers. A tertiary economy has need for workers in administration, information and knowledge management, and services. This demand has led to the adoption of an immigration policy

by the United States that is favourable to the admission of the highly skilled (Cheng and Yang, 1998). “There is, in fact, international competition for the best educated immigrants because of their expected beneficial effects” (Reitz, 1998: 13).

The United States immigration policy has six preference categories, of which four categories are for immigrants related to U.S. citizens or permanent resident aliens, while two categories reflect labor components. The Third Preference category, of up to 10% of immigrants admitted, is for “members of professions or persons of exceptional ability in the arts and sciences and their spouses and children” (Reitz, 1998: 72). There is also a Sixth Preference category, comprising another 10%, for “workers in skilled or unskilled occupations in which laborers are in short supply in the United States and their spouse and children” (Reitz, 1998: 72).

Canada is a source country for skilled immigrants to the United States. For instance, immigrants from Canada made up 29.5% (11 191) in 1981 of those admitted in the Third and Sixth Preference categories, and 24.8% (11 039) in 1986, making it the second highest source country (Reitz, 1998: 89).

Innovation

In a study of natural and physical scientists, mathematicians, and engineers Schwanen argues that in looking at the causes of the brain drain we should pay “attention to the roots of growth and innovation in the business sector” (2000: 1). One reason for those in science and engineering to leave is that the amount of research and development (R&D) occurring in Canada is small relative to the size of the economy and to many other advanced countries. “It is this ability to use its knowledge productively – which depends, in turn, on such factors as good management and entrepreneurial activity – that

allows an economy to... both compete successfully and raise the average standard of living of its population” (Schwanen, 2000: 3).

Taxes

Iqbal (2000) discusses the emigration of skilled and highly educated Canadians to the U.S. Economic factors such as higher income, better job opportunities, and lower taxes attract professionals to the United States. An analysis “on the differences in all types of personal taxes: federal income tax, provincial/state income tax, social security related taxes (such as pension plans, employment insurance, and medicare), sales tax, property tax, and private health care cost” was conducted (Iqbal, 2000: 684). Three income levels – \$50 000, \$100 000, and \$250 000 – are examined in six Canadian cities and six U.S. cities. Canada has higher income tax and surtax. The U.S. has higher social security tax, though this is a small part of total taxes. Property tax is also higher in the U.S. The conclusion at each income level is that “overall, taxes are higher in Canada than in the United States” and that the gap widens as income increases (Iqbal, 2000: 684).

Brain drain versus brain gain

Articles on the brain drain from a wide range of countries indicate that it is a subject of international concern. Canadian immigration policy has put an emphasis on seeking skilled immigrants to Canada. Yet, at the same time, Canada is losing skilled workers through emigration. A recent report by Statistics Canada outlines issues and findings on the brain drain versus the brain gain in Canada. Findings indicate that “yes, there is a brain drain of skilled workers to the United States” but skilled immigration from worldwide sources to Canada counteracts this loss. However, we are not able to compensate for loss in health-related occupations (Zhao et al., 2000: 4). An analysis

performed by Human Resources Development Canada suggests, “it is clear that imbalances between supply of and demand for skill exist in particular industries and occupations in Canada” (Zhao et al., 2000: 9). In addition, there are “churning costs” of replacing those who have left Canada (DeVoretz and Laryea, 1998).

Although there are border crossings in both directions, since about 1980, U.S. emigration to Canada is lower than Canadian emigration to the U.S., resulting in a net loss for Canada (O’Neill, 1999).

Policy implications

Policies that would reduce emigration, from the sending country, based on neoclassical economic micro theory would be: to raise the likelihood of employment, or to lower the risk of underemployment, as well as to implement long-term development programs to raise income at the country of origin (Massey et al., 1993: 436). I think improving work conditions within occupations would also help. Additionally, the taxation structure directly affects a person's income by determining the amount of net income versus gross income. Any of these moves focus on changes the country of origin would make to improve conditions. Coercive, restrictive policies and measures are not recommended. These would include legislation against people leaving the country, exit tax, automatic loss of citizenship, and physical barriers such as walls or fences to keep people in.

Emigration from Canada 1960s to 1980s

Journal publications such as those by Kelly (1977) and St. John Jones (1979) indicate that the brain drain from Canada has been a long-standing issue. Table 1 shows Canadian immigrants to the U.S. from the 1960s to the 1980s as a percentage of the total number of immigrants to the U.S. (extracted from Reitz, 1998: 10 Table 1.1). As a percentage of all immigrants to the U.S., Canadian representation declined each decade up to 1990.

Table 1: Canadian Immigrants to the United States

	1961-1970		1971-1980		1981-1990	
Country of birth	Number	%	Number	%	Number	%
Canada	286 700	(8.6)	114 800	(2.6)	119 200	(1.6)

Emigration from Canada in the 1990s

Three different data sources have been used to assess emigration. First, the Current Population Survey conducted in the U.S. suggests that in the 1990s, an average of 20 000 Canadian-born, and another 8 000 non-Canadian-born persons immigrated to the U.S., for a total of 28 000 annually (Zhao et al., 2000, 11). Second, Reverse Record check indicates that from 1991 to 1996, about 24 500 people per year permanently emigrated from Canada to the U.S. (Zhao et al., 2000, 11). About half of the people who permanently leave Canada make the U.S. their destination (Zhao et al., 2000, 12). Finally, Canadian income tax data shows that between 1991 and 1997, the annual average emigration to the United States of tax filers and dependents is between 22 000 and 34 000 (Zhao et al., 2000, 13). “This is about 0.1% of the Canadian population – much smaller than what Canada has experienced historically” (Zhao et al., 2000: 13).

Substantive significance

Although the numbers of people emigrating from Canada to the U.S. over the last decade may be small, the long-term impact may still be great. Cumulative causation theory suggests that “over time, therefore, the accumulation of human capital reinforces economic growth in receiving areas while its simultaneous depletion in sending areas exacerbates their stagnation, thereby enhancing the conditions for migration” (Massey, et al., 1993: 453).

Further, it is important to consider the societal context of this migration. Migration systems theory predicts, “as political and economic conditions change, systems evolve, so that stability does not imply a fixed structure” (Massey et al., 1993: 454). Thus “social change, economic fluctuations, or political upheaval” may alter migration patterns (Massey et al., 1993: 454). An example of this would be government cutbacks to funding of health care and education in Alberta in the 90s, which was followed by emigration of some health workers and teachers.

Grant and Oertel (1997) examine the emigration of physicians, in light of restrictions on provincial health care spending in the 1990s. The rate of emigration increased as the economic conditions declined. Provinces across Canada did many things that affected physicians’ incomes such as imposing fee schedules (rather than working with the medical association to set fees), setting caps on budgets or total payments, limiting individual physician’s incomes, and non-linear compensation. Rural areas in Canada have had difficulty in recruiting physicians, especially specialists, thus provinces have also made attempts to regulate the location of physicians. As a result of these policies, real earnings fell substantially for Canadian physicians in the 1990s. The

expansion of Health Maintenance Organizations (HMOs) in the U.S., while changing the structure of medicine, has made the country more receptive to foreign-trained physicians. In addition to decreased income, Canadian physicians complained of involuntarily long hours, inadequate social infrastructure, research capacity, and social amenities. Grant and Oertel conclude that to make up for the shortage in physicians, Canada has to either increase medical school enrolment and allow practising physicians higher fees, or accept foreign-trained physicians to compensate for the emigration of Canadians.

A profile of Canadians emigrating to the U.S.

How does the profile of emigrants from Canada to the U.S. compare with characteristics of all Canadians? A report by Statistics Canada summarized descriptive statistics of emigrants' age, education, income, and industry in comparison to Canadian averages. Both tax filer data and Current Population Survey results show that Canadians who left for the U.S. during the 1990s were disproportionately in the 25-44 age group, and thus at entry and mid-career levels. Two-thirds of emigrants, compared to 44% of Canadians, were in the 25-44 age group (Zhao et al., 2000: 13). Further, recent migrants to the U.S. have high levels of education. Forty-nine percent of emigrants had a university degree, compared to 12% of Canadian born, and 21% of immigrants to Canada, in the 1990s (Current Population Survey data) (Zhao et al., 2000: 13). In addition, those who went to the U.S. were over-represented among higher incomes (Zhao et al., 2000: 14). Thus, "emigrants are overrepresented among the prime working age groups, the well educated, and high-income earners" (Zhao et al., 2000: 18-19).

Most of the top ten industries the emigrants worked in are classified as high-knowledge industries by Industry Canada (Zhao et al., 2000: 15). Physicians, natural scientists, nurses, engineers, teachers (both post-secondary and other), managerial workers, computer scientists, and mathematicians are among those in the Canadian work force that went to the United States (Zhao et al., 2000: 17). For physicians, in 1996-1997 one-quarter of new graduates left for the U.S. (Zhao et al., 2000: 17).

Recent study of Canadian graduates

A survey of 1995 graduates who moved to the United States showed that Texas was the most popular destination state (16%) followed by California (11%), New York (10%), and Florida (8%) (Frank and Bélair, 2000: 39). The graduates who left for the U.S. tended to have more advanced degrees (Ph.D.), to be in the top 10% of their graduating class, and to have received scholarships or awards (Zhao et al., 2000: 7). “After taking inflation and purchasing power into account”, the median earnings of those graduates who moved to the U.S. was \$47 400, as compared to \$38 400 earned by their counterparts in Canada (Zhao et al., 2000: 7). The reasons given by the graduates for moving to the United States were work (57%), education (23%), and marriage or relationship (17%) (Frank and Bélair, 2000: 40).

Research design

The research design is unique in that it compares Canadian immigrants not only to the native-born population in the host country (United States), but also to those who remain in the country of origin. An additional comparison is made to U.S. immigrants to Canada. This design will permit me to examine how differences in the structural and institutional characteristics of the U.S. and Canada affect opportunities and earnings.

This is similar to the approach of studies that compare immigrants from the same country of origin who reach different destinations. An example of this is the study of socioeconomic attainment of immigrants from the Former Soviet Union to Canada and Israel (Lewin-Epstein, Semyonov, Kogan, and Wanner, 2003).

Research questions

The broader questions my research addresses are: How do immigrants from one more developed country to another more developed country fare in terms of their *Earnings* and occupational attainment compared to those born in those countries, particularly when they share a common language? How do the returns to schooling and experience, in the form of *Earnings* and *Occupational Status*, compare between immigrants from a more developed country and the native-born?

The specific questions my research covers are:

1. How do the *Earnings* of *Canadians in the U.S.* compare to the *Earnings* of *Canadians in Canada*, *Americans in the U.S.*, and *Americans in Canada*?
2. Within the same occupation, how do the *Earnings* of *Canadians in the U.S.* compare to the *Earnings* of *Canadians in Canada*, *Americans in the U.S.*, and *Americans in Canada*?
3. How do *Canadians in the U.S.* compare on *Occupational Status* to *Canadians in Canada*, *Americans in the U.S.*, and *Americans in Canada*?

For each of these questions I see if there are differences for men and women. I also analyze the returns to education, and to *Earnings*.

The comparison on *Earnings* will test the assertion of neoclassical economic theory that international migration is affected by the wage gap between countries. This

theory would predict differences in *Earnings* to be found. Wages often reflect *Occupational Status*. I compare *Earnings* within occupations, as well as predicting *Occupational Status* as an outcome measure. Human capital measures include education (*Years of Schooling*), *Labor Force Experience*, and *Marital Status*. The returns to education and experience tested in the models will address the empirical issue raised by neoclassical economics theory of whether the effect of human capital is greater at home or abroad.

CHAPTER TWO: METHODS

Data

The analysis is of census data, the 1990 United States Census five percent Public Use Microdata Sample and the 1991 Census of Canada Public Use Microdata File.² I used the accompanying codebooks for these data sources to get definitions of, and information about, the variables.

Variables were recoded for a number purposes: to facilitate understanding in presentation, to match the coding between Canadian and U.S. data, to make possible selection criteria, and to create variables for analysis.

Descriptive variables

For presenting *Educational Attainment*, levels ‘12th grade no diploma’ and lower were collapsed into a single category.

Unlike the U.S. Census, the Canadian Census does not release detailed *Occupation* codes in the public use data, only category codes. First I recoded 500 detailed U.S. *Occupation* codes to match the detailed Canadian codes (National Occupational Classification). Then I recoded these assigned detailed codes into the 14 Canadian categories. This allowed me to run a descriptive comparison of occupational categories across groups as shown in Table 7. Since the U.S. list did not differentiate Senior managers from Middle and other managers in most cases, as the Canadian list does, I collapsed these into one category: Senior, Middle and other managers. The occupational categories are also subdivided into four skill levels, with Skill level IV being highest, and Skill level I lowest, as reflected in Table 7.

Selection

I applied selection criteria to these data. Respondent's *Place of Birth* had to be Canada or the United States. Canadian immigrants to the U.S. were identified as born in Canada, while U.S. immigrants to Canada were identified as born in the U.S. Respondents were selected for *Age* 20 to 64. *Labor* is a created variable for sample selection to identify those in the labor force as determined by the U.S. *Employment Status Recode* variable and the Canadian *Labour Force Activity* variable.³ Respondents had to have a valid response on all variables in the analysis to be selected.

Main variables in regression models

Log of Earnings – The definition of *Earnings* is wages and salaries. Other sources of income were not included.⁴ There were two conversions necessary. First, I have two different years of data on *Earnings*, 1989 for the U.S. (as reported in 1990) and 1990 in Canada (as reported in 1991). Therefore I adjusted for inflation and converted the U.S. data to a 1990 value.⁵ Secondly, I have two currencies, Canadian and U.S. dollars.⁶ After adjusting for exchange rate, I expressed the results in terms of 1990 U.S. dollars.⁷ As you might expect, the distribution for the variable *Earnings* is not normal. Thus, I took the natural log of *Earnings*. The main reason for this transformation was to produce regression estimates that reflect relative effects of the independent variables rather than absolute effects expressed in dollars. Taking the natural log of *Earnings* helped considerably to normalize the distribution. As a result the R^2 improved greatly.

Canadians in Canada, Americans in the U.S., and Americans in Canada – set of place variables. Each variable is a combination of place of birth and place of residence. These are a set of dummy variables where the reference category is *Canadians in the U.S.*

As a result of how the set is constructed, for each of these dummy variables 0 becomes equal to *Canadians in the U.S.* Thus, the comparison is always to *Canadians in the U.S.* Since the place dummy variables are a set, the coefficients may also be looked at comparatively to establish the relative ranking.⁸

Years of Schooling – There is only one education variable in the U.S. data and it is called *Educational Attainment*. I used several variables in combination from the Canadian data to construct a Canadian equivalent: *Highest Grade of Elementary/Secondary School*; *Highest Level of Schooling*; and *Highest Degree, Certificate or Diploma*. I then recoded the common variable *Educational Attainment* from levels into years to create a variable *Years of Schooling*.⁹

Labor Force Experience – Respondents were not asked how many years of labor force experience they had; therefore, I had to estimate this. A person is assumed to start school by age five. Therefore, *Labor Force Experience* equals *Age* minus *Years of Schooling* minus five. If *Age* minus number of *Years of Schooling* was less than five, this was adjusted so the value for *Labor Force Experience* would not be negative. If a respondent had less than nine *Years of Schooling* then *Labor Force Experience* equals *Age* minus 14.¹⁰ As most students work while in school, 0.35 of a year of *Labor Force Experience* was given for each year in school after age 14.¹¹ To take into account the possible affect of having a child for a woman on *Labor Force Experience* (and thus on *Earnings*), I included *Number of Children* in the model for women.

Weeks Worked – The actual number of weeks worked in the previous year between 1 and 52 weeks.

Full-time – Where full-time is 30 hours or more per week. I recoded the U.S. equivalent from *Usual Hours Worked Per Week Last Year*. This is a dummy variable where the reference category is part-time: 0 = part-time and 1 = full-time.

Married – Marital Status was recoded into two categories: divorced, separated, never married (single), and widowed are all considered to be not married, and married is its own category. This is a dummy variable where the reference category is not married: 0 = not married and 1 = married.

Sex – Was recoded into a dummy variable where the reference category is male: 0 = male and 1 = female.

Blacks – Were identified in the Canadian data as Black/Caribbean in *Ethnic Origin*. In the U.S. data they were identified as Black by *Race*. This is a dummy variable where the reference category is non-Black: 0 = non-Black and 1 = Black.

Aboriginal – In the Canadian data both *Aboriginal Ethnic Category* and *Registered Indian Indicator* were used to construct this variable. If a respondent had non-aboriginal origins and was not registered under the Indian Act s/he was coded as non-Aboriginal. Those with single or multiple Aboriginal ethnicities were considered Aboriginal, whether or not they were registered under the Indian Act. This is a dummy variable where the reference category is non-Aboriginal: 0 = non-Aboriginal and 1 = Aboriginal.

Number of Children – Is a recode of *Fertility* and reflects the actual number of children. *Fertility* census data is collected for women only.

*Occupational Status*¹² – International Socio-Economic Index (ISEI) of occupational status is a scale designed to be used in international comparative work

(Ganzeboom, De Graaf, and Treiman, 1992; Ganzeboom and Treiman, 1996). The ISEI occupational status scale has a minimum of 10 and a maximum of 90 points. For U.S. data the 500 detailed *Occupation* codes Ganzeboom and Treiman assigned International Standard Classification of Occupation 1988 (ISCO88) codes and then converted these to ISEI scores.¹³ For the Canadian data, Suzanne Model assigned the ISEI scores to each of the 14 Canadian census occupational categories (1998).¹⁴

Sampling

The number of *Canadians in the U.S.* who met the selection criteria – that is they were between the ages of 20 and 64, were in the labor force, and had valid responses on all variables of interest – became the limiting (maximum) number for two of the other groups who had far greater numbers, *Canadians in Canada*, and *Americans in the U.S.* As for the *Americans in Canada*, there were fewer cases than the number of *Canadians in the U.S.*, so all valid cases were used. In addition, while in the population there is a higher percentage of women than men, once the selection criteria were applied this led to a higher percentage of men than women. Due to this, and since I ended up running separate analyses for men and women, I did a separate random sample for an equal number of men and women within each data group. This way the number of cases for men and women are the same. After recoding the variables, and sampling within each data group, I merged the files into one file for the analysis.

Regression checks

I did the following checks for violation of assumptions. To check for normal distributions I ran histograms of all continuous variables. I especially checked for normalcy in the dependent variables *Log of Earnings* and *Occupational Status* and found

that both are normally distributed. To check for linearity I ran scatterplots of each continuous independent variable with each dependent variable. I also ran scatterplots of student residuals by the dependent variable. The scatterplots showed reasonably random patterns. In order to make sure there was not multicollinearity I ran tolerances for each independent variable as part of the regression. All tolerances were high (above 0.8), with two exceptions.¹⁵

The significance level was set at a “strong” evidence level for the number of cases, based on the work of Raftery (1995). Two levels were set, the first for the full number of cases, the second for half the cases when men and women are analyzed separately.

Models

There are three main models. In the first two, the dependent variable is *Log of Earnings*. The difference between them is the first does not include *Occupational Status* while the second includes it as an independent variable. The third model uses *Occupational Status* as the dependent variable and does not include *Log of Earnings*. Multiple regression analysis allows us to make comparisons of *Earnings* and *Occupational Status* that go beyond the measures of central tendency shown in Tables 5 and 6. We can then control for other relevant variables, as well as do significance tests for differences.

CHAPTER THREE: RESULTS

Descriptive statistics

Table 2 shows that the vast majority of *Canadians in the U.S.* came before 1970, after which immigration tapers off. From 1987 to 1990 there was then a small increase in the percentage of Canadians who entered the U.S. The numbers of Canadians immigrating to the U.S. is directly reflective of U.S. immigration policy. Until 1965, U.S. policy placed no limit on Canadian immigration to the U.S. Then in 1965, U.S. immigration policy reduced skilled entry classes and imposed an annual ceiling of 120 000 for Western Hemisphere countries (including Canada). The U.S. involvement in the Vietnam War, as well as military conscription in 1967, deterred some Canadians from going to the U.S. (while sending many Americans to Canada). When the war ended, this picture changed. However, in 1976 a country quota of 20 000 was imposed on Canadian immigrants further restricting numbers. Some new opportunities to emigrate were opened with the Free Trade Agreement (FTA) in 1989. An increased annual, global limit of employment based immigration was introduced in 1990 policy (O'Neill, 1999).

Table 2 indicates that 50% of *Canadians in the U.S.* are American citizens, either by being born of a U.S. parent or parents, or by becoming naturalized. Citizenship carries with it certain benefits, such as the right to remain in the country, and perhaps better chances of finding a job. Canadian born persons who have American citizenship through a parent may hold dual citizenship. 12% of *Canadians in the U.S.* speak French as their home language in comparison to 23% of *Canadians in Canada*. Since the percentage of French speaking *Canadians in the U.S.* is about half of that for *Canadians in Canada* this indicates there may be a language barrier for going to the United States.

In Table 2 approximately 10% of *Canadians in the U.S.*, age 20 to 64, are attending school. Some of the *Canadians in the U.S.* may have gone there as students.

Table 2: *Canadians in the U.S.*

	%	
<u>Year of entry</u>		
Before 1950	11.1	
1950 to 1959	24.0	
1960 to 1964	17.8	
1965 to 1969	14.2	1965 policy change
1970 to 1974	7.8	
1975 to 1979	7.9	1976 policy change
1980 or 1981	3.4	
1982 to 1984	4.1	
1985 to 1986	3.5	
1987 to 1990	6.2	1989 policy change
<u>Citizenship</u>		
Born abroad of U.S. parent(s)	12	
Naturalized citizen	38	
Not a US citizen	50	
<u>French as a Second Language spoken at Home</u>		
Canadians in the U.S.	12	
<i>Canadians in Canada</i>	23	
<u>School enrollment</u>		
Not attending school	90	
Yes, public school/college	7	
Yes, private school/college	3	

N = 16 266

Table 3 shows the top five occupations for *Canadians in the U.S.* Managers are in the top five occupations for both men and women. The top occupation for women *Canadians in the U.S.* is registered nurses.

Table 3: Top Five Occupations for *Canadians in the U.S.*

% Men
9.5 Managers and administrators, n.e.c.
4.1 Supervisors and Proprietors, Sales Occupations
3.1 Truck drivers
2.6 Carpenters
2.3 Sales representatives, mining, manufacturing, and wholesale
% Women
8.1 Registered nurses
7.8 Secretaries
4.5 Managers and administrators, n.e.c.
3.9 Bookkeepers, accounting, and auditing clerks
3.8 Teachers, elementary school

n.e.c. = not elsewhere classified

In Table 4 “Educational Attainment Comparison” twice as many *Americans in the U.S.* have a high school diploma or GED as their highest level of schooling (32.6%) as compared to *Canadians in Canada* (16.3%). While *Canadians in the U.S.* have high percentages in the Bachelors, Masters, Professional, and Doctorate degree categories, *Americans in Canada* have even higher percentages except for in the Professional category.

Table 4: Educational Attainment Comparison

Education Level	<i>Canadians in Canada</i>	<i>Canadians in the U.S.</i>	<i>Americans in the U.S.</i>	<i>Americans in Canada</i>
	%	%	%	%
12th grade no diploma and Less	23.8	12.8	12.7	10.5
High School graduate or GED	16.3	23.1	32.6	10.8
College, no degree	12.4	22.3	23.5	15.2
Associate degree, occupational program	13.5	5.0	4.4	8.5
Associate degree, academic program	19.2	4.9	3.6	14.4
Bachelors degree	12.0	18.7	15.0	24.4
Masters degree	2.2	7.5	5.5	11.0
Professional degree	0.2	3.2	1.8	0.6
Doctorate degree	0.3	2.2	0.8	4.6
Total	100	100	100	100
N	16 266	16 266	16 266	3 846
Pearson Chi-Square = 8 739				

Table 5 results indicate that for both men and women, *Canadians in the U.S.* have the highest mean and median *Earnings*. *Americans in Canada* have the second highest means and median *Earnings*. We also see in every category a gap in *Earnings* between men and women, although this is not taking into account other differences.

Table 5: *Earnings* Comparison

		<i>Canadians in Canada</i>	<i>Canadians in the U.S.</i>	<i>Americans in the U.S.</i>	<i>Americans in Canada</i>
Men	Mean	\$27 095	\$41 462	\$30 571	\$32 280
	Median	\$25 641	\$31 877	\$25 389	\$28 205
Women	Mean	\$16 684	\$20 863	\$17 622	\$18 809
	Median	\$15 290	\$17 850	\$14 700	\$16 239

A comparison of *Occupational Status* shown in Table 6 reveals that native-born in Canada and the U.S. are very similar, and the two immigrant groups are also highly similar. *Canadians in the U.S.* hold higher status occupations on average than *Canadians in Canada*. Similarly, *Americans in Canada* hold higher status occupations on average than *Americans in the U.S.*

Table 6: *Occupational Status* Comparison

		<i>Canadians in Canada</i>	<i>Canadians in the US</i>	<i>Americans in the US</i>	<i>Americans in Canada</i>
Male	Mean	42.0	48.3	43.3	48.4
	Median	39.0	50.0	40.0	50.5
Female	Mean	47.4	49.4	47.3	50.8
	Median	45.0	51.0	51.0	50.5
ISEI scores					

A look at the occupational categories in Table 7 (next page) reveals that *Canadians in the U.S.* have a higher percentage in the Manager and in the Professional categories, than do *Canadians in Canada*, and *Americans in the U.S.* However, *Americans in Canada* also have high percentages in these categories. The high percentage of Professionals for *Canadians in the U.S.* indicates those in Professional occupations may have an easier time getting into a country where immigration policies favor professionals. Policy changes such as cuts to healthcare budgets may also cause some professionals to move south.

Table 7: Occupational Categories Comparison

Occupation Category		<i>Canadians in Canada</i>	<i>Canadians in the U.S.</i>	<i>Americans in the U.S.</i>	<i>Americans in Canada</i>
		%	%	%	%
Skill level IV	Senior, Middle and other managers	10	13	9	13
	Professionals	15	24	17	29
Skill level III	Semi-professionals and technicians	6	6	5	7
	Supervisors	2	4	4	1
	Supervisors: crafts and trades	3	3	3	3
	Administrative and senior clerical personnel	8	7	7	7
	Skilled sales and service personnel	4	6	6	4
	Skilled crafts and trades workers	8	7	8	4
	Clerical personnel	13	8	10	9
Skill level II	Intermediate sales and service personnel	11	10	11	10
	Semi-skilled manual workers	11	8	13	6
Skill level I	Other sales and service personnel	7	2	3	5
	Other manual workers	4	2	3	3
Total		100	100	100	100
N		16 266	16 266	16 266	3 846
Pearson Chi-Square = 2 387					

Earnings model

The analysis is an Ordinary Least Squares (OLS) regression, which reports unstandardized coefficients (b). Since the dependent variable *Earnings* is logged, to interpret the unstandardized coefficients I take the exponent of the unstandardized coefficient (b) and then subtract one from that number ($e^b - 1$). This conversion is shown in the $e^b - 1$ column of the table, and may be interpreted as the percentage change in *Earnings* for every one-unit change in the variable for that coefficient, controlling for all other independent variables. In the case of dummy variables the interpretation involves a comparison to the reference category. When the sign of the coefficient for a dummy variable is negative this means that the other category has a lower value than the reference category.

First I analyzed all cases (see Appendix A Table 1). Since the coefficients for *Sex*, *Black*, and *Aboriginal* are all statistically significant, I must test for interaction effects for each of these to see if it is necessary to split the model (see Appendix A Tables 2, 3, and 4). Based on the results of the interaction effects, I split the model by *Sex* and ran separate analyses for men and women.

In Table 8 the under the column for men, we see that *Canadians in Canada* earn 11.9% less than *Canadians in the U.S.* *Americans in the U.S.* earn 13.8% less than *Canadians in the U.S.* *Americans in Canada* earn 16.1% less than *Canadians in the U.S.* For every one year of schooling *Earnings* increases by 7.5%. Each year of *Labor Force Experience* yields 1.4% higher *Earnings*. One *Week worked* corresponds to 3.7% more in *Earnings*. *Full-time* workers earn 114% more than part-time workers. *Married* men earn

26.7% more than non-married men. *Black* men earn 16.4% less than men who are not black. *Aboriginal* men make 14.7% less than non-Aboriginal men. Altogether, these variables explain 44.7% of the variation in *Earnings* for men (R^2).

Table 8 also has the results for women. There is no statistically significant difference between the *Earnings* of *Canadians in Canada* and *Canadians in the U.S.* *Americans in the U.S.* earn 8.4% less than *Canadians in the U.S.* *Americans in Canada* make 7.3% less than *Canadians in the U.S.* For every additional year of schooling, women's *Earnings* increase by 10.1%. *Earnings* go up by 1.1% for each year of *Labor Force Experience*. For *Weeks worked* each week increases *Earnings* by 4.0%. Women working *Full-time* have 115.1% higher *Earnings* than those working part-time. *Married* women earn 3.6% more than women who are not married. There is no statistically significant difference in *Earnings* for women who are *Black* as compared to those who are not. Also, there is no statistically significant difference in *Earnings* for women who are *Aboriginal* in comparison to non-Aboriginals. Each child a woman has decreases her *Earnings* by 4.0%. All told, these variables account for 51.2% of the variance in *Earnings* for women (R^2).

Table 8: OLS Regression of *Log of Earnings*

Independent Variables	Men $e^b - 1$	Women $e^b - 1$
<i>Canadians in Canada</i>	-11.9% *	-3.2%
<i>Americans in the U.S.</i>	-13.8% *	-8.4% *
<i>Americans in Canada</i>	-16.1% *	-7.3% *
<i>Years of Schooling</i>	7.5% *	10.1% *
<i>Labor Force Experience</i>	1.4% *	1.1% *
<i>Weeks worked</i>	3.7% *	4.0% *
<i>Full-time</i>	114.0% *	115.1% *
<i>Married</i>	26.7% *	3.9% *
<i>Black</i>	-16.4% *	-3.8%
<i>Aboriginal</i>	-14.7% *	-6.2%
<i>Number of Children</i>		-4.0% *
	$R^2 = 0.447$	$R^2 = 0.512$
	N = 26 322	N = 26 322

* $p \leq .0003$

$e^b - 1$ is the converted unstandardized coefficient

Next, I look to see if there are differences in returns for *Years of Schooling* and *Labor Force Experience* for the four groups. Before running this analysis, I must first test for interaction terms to see if I should continue to split the model for men and women (see Appendix A Table 5).

Table 9 shows the results for men. I notice that the main effect for *Americans in the U.S.* is still statistically significant, this means that *Americans in the U.S.* still have lower *Earnings* than *Canadians in the U.S.* despite taking into account differing returns on *Years of Schooling* and *Labor Force Experience*. Of the interaction terms, two are statistically significant. *Canadians in Canada* receive 1.7% less in *Earnings* for each year of schooling than *Canadians in the U.S.* In contrast, *Americans in the U.S.* get 1.5%

more in *Earnings* for each year of schooling than *Canadians in the U.S.* do. So there are differences in returns on education for men depending on which group they are in.

Table 9 reports results for women. *Americans in the U.S.* still earn less than *Canadians in the U.S.* Similar to men, women *Americans in the U.S.* get 2.3% higher returns on earnings per year of schooling than *Canadians in the U.S.* For women each year of *Labor Force Experience* increases *Earnings* by 0.5% more for *Canadians in Canada* than for *Canadians in the U.S.*

Table 9: OLS Regression of *Log of Earnings* – returns to education and experience

Independent Variables	Men $e^b - 1$	Women $e^b - 1$
<i>Canadians in Canada</i>	16.8%	-18.7%
<i>Americans in the U.S.</i>	-29.9% *	-37.8% *
<i>Americans in Canada</i>	-0.2%	-21.7%
<i>Years of Schooling</i>	7.6% *	9.2% *
<i>Labor Force Experience</i>	1.5% *	0.8% *
<i>Weeks worked</i>	3.7% *	3.9% *
<i>Full-time</i>	114.3% *	115.1% *
<i>Married</i>	26.5% *	3.6% *
<i>Black</i>	-14.9% *	-3.3%
<i>Aboriginal</i>	-15.3% *	-6.3%
<i>Number of Children</i>		-4.1% *
<i>Years of Sch X Cdn in Can</i>	-1.7% *	0.4%
<i>Years of Sch X Amer in the U.S.</i>	1.5% *	2.3% *
<i>Years of Sch X Amer in Can</i>	-0.8%	0.3%
<i>Labor Force Exp X Cdn in Can</i>	-0.3%	0.5% *
<i>Labor Force Exp X Amer in the U.S.</i>	0.0%	0.3%
<i>Labor Force Exp X Amer in Can</i>	-0.2%	0.6%

$R^2 = 0.449$ $R^2 = 0.513$

$N = 26\ 322$ $N = 26\ 322$

* $p \leq .0003$

$e^b - 1$ is the converted unstandardized coefficient

Earnings model – including Occupational Status as an independent variable

In the second regression model I see what the effect of *Occupational Status* is on *Earnings*, because I am interested in knowing whether or not the *Earnings* differences occur within occupations or only between occupations. (For the analysis of the full number of cases see Appendix A Table 6. For tests of interaction effects see Tables 7, 8, and 9 in Appendix A). I then ran separate analyses for men and women.

The results including *Occupational Status* for men are found in Table 10. *Canadians in Canada* earn 10.1% less than *Canadians in the U.S.* *Americans in the U.S.* earn 12.1% less than *Canadians in the U.S.* *Americans in Canada* make 14.9% less than *Canadians in the U.S.* These are all slightly smaller differences than when *Occupational Status* was not in the model (refer back to Table 8) so *Occupational Status* does modify the picture. For every one-point increase on *Occupational Status* there is a 0.9% increase in men's *Earnings*.

In Table 10 for women there is no statistically significant difference between the *Earnings* of *Canadians in Canada* and *Canadians in the U.S.* *Americans in the U.S.* earn 8.1% less than *Canadians in the U.S.* While *Americans in Canada* earn 7.1% less than *Canadians in the U.S.* As for men, for women I am seeing somewhat smaller differences in *Earnings* on these place variables than in the model without *Occupational Status*. Women earn 1.0% more for every point higher on *Occupational Status*.

Table 10: OLS Regression of *Log of Earnings* – including
Occupational Status

Independent Variables	Men $e^b - 1$	Women $e^b - 1$
<i>Canadians in Canada</i>	-10.1% *	-2.8%
<i>Americans in the U.S.</i>	-12.1% *	-8.1% *
<i>Americans in Canada</i>	-14.9% *	-7.1% *
<i>Years of Schooling</i>	4.9% *	7.4% *
<i>Labor Force Experience</i>	1.3% *	1.0% *
<i>Weeks worked</i>	3.6% *	3.9% *
<i>Full-time</i>	114.0% *	110.6% *
<i>Married</i>	25.6% *	2.4%
<i>Black</i>	-15.0% *	-0.7%
<i>Aboriginal</i>	-13.0% *	-5.6%
<i>Number of Children</i>		-3.5% *
<i>Occupational Status</i>	0.9% *	1.0% *
	$R^2 = 0.459$	$R^2 = 0.525$
	$N = 26\ 322$	$N = 26\ 322$

* $p \leq .0003$

$e^b - 1$ is the converted unstandardized coefficient

Only a small part of the inter-group differences in *Earnings* we observed in Tables 8 and 9 are due to *Canadians in the U.S.* holding higher *Occupational Status* (at most 3.1%). I have calculated the differences between Table 10 and Table 8 and reported them in Table 11.

Table 11: OLS Regression of *Log of Earnings* – difference

Where **Difference** is the portion of the effect on *Earnings* due to higher *Occupational Status*

Independent Variables	Men Difference	Women Difference
<i>Canadians in Canada</i>	2.1%	0.5%
<i>Americans in the US</i>	2.0%	0.4%
<i>Americans in Canada</i>	1.4%	0.2%
<i>Years of Schooling</i>	2.4%	2.5%
<i>Labor Force Experience</i>	0.1%	0.1%
<i>Weeks worked</i>	0.1%	0.1%
<i>Full-time</i>	0.0%	2.1%
<i>Married</i>	0.9%	1.4%
<i>Black</i>	1.7%	3.1%
<i>Aboriginal</i>	2.0%	0.6%
<i>Number of Children</i>		0.5%
<i>Occupational Status</i>	n/a	n/a

(For tests of interactions terms see Appendix A Table 10).

In Table 12 for men the statistical significance of *Years of Sch X Cnd in Can* and *Years of Sch X Amer* in the U.S. are both lost. This means that within similar occupational status there is no difference in returns on *Years of Schooling* among the four groups.

Table 12 for women shows that *Americans in the U.S.* receive 1.6% more in *Earnings* for every year of schooling as compared to *Canadians in the U.S.* This difference in returns on education still holds when taking *Occupational Status* into account. The difference in the interaction of *Labor Force Experience* for *Canadians in Canada* and *Canadians in the U.S.* disappears though. For both men and women the main effect of *Americans in the U.S.* remains statistically significant.

Table 12: OLS Regression of *Log of Earnings* –
including *Occupational Status* –
returns to education and experience

Independent Variables	Men $e^b - 1$	Women $e^b - 1$
<i>Canadians in Canada</i>	11.9%	-10.7%
<i>Americans in the U.S.</i>	-26.1% *	-30.7% *
<i>Americans in Canada</i>	-4.9%	-14.4%
<i>Years of Schooling</i>	4.9% *	6.8% *
<i>Labor Force Experience</i>	1.4% *	0.8% *
<i>Weeks worked</i>	3.6% *	3.9% *
<i>Full-time</i>	114.3% *	110.6% *
<i>Married</i>	25.5% *	2.2%
<i>Black</i>	-13.8% *	-0.4%
<i>Aboriginal</i>	-13.6% *	-5.7%
<i>Number of Children</i>		-3.5% *
<i>Occupational Status</i>	0.8% *	1.0% *
<i>Years of Sch X Cdn in Can</i>	-1.1%	0.0%
<i>Years of Sch X Amer in the U.S.</i>	1.3%	1.6% *
<i>Years of Sch X Amer in Can</i>	-0.4%	-0.1%
<i>Labor Force Exp X Cdn in Can</i>	-0.3%	0.3%
<i>Labor Force Exp X Amer in the U.S.</i>	0.0%	0.3%
<i>Labor Force Exp X Amer in Can</i>	-0.3%	0.4%
	$R^2 = 0.460$	$R^2 = 0.525$
	N = 26 322	N = 26 322

* $p \leq .0003$

$e^b - 1$ is the converted unstandardized coefficient

Occupational Status model

Now in the third model I move from trying to predict *Earnings* to trying to predict *Occupational Status* (see Table 11 in Appendix A; Tables 12, 13, and 14 for interaction effects). One of the problems immigrants often have is that their education and experience are not recognized in the host country and they are relegated to lower status

occupations than they would have held in their country of origin. We will see if this is the case for *Canadians in the U.S.* or *Americans in Canada*.

Table 13 contains the results for men. *Canadians in Canada* are 2.6 points lower on *Occupational Status* than *Canadians in the U.S.* *Americans in the U.S.* are 2.4 points lower on *Occupational Status* than *Canadians in the U.S.* *Americans in Canada* are 2.1 points lower than *Canadians in the U.S.* Every *Year of Schooling* for men increases their *Occupational Status* by 2.9 points. Each year of *Labor Force Experience* increases men's *Occupational Status* by 0.14 of a point. *Married* men are 1.4 points higher on *Occupational Status* than men who are not married. *Black* men are 2.2 points lower on *Occupational Status* than men who are not black. *Aboriginal* men are 2.8 points lower on *Occupational Status* than non-Aboriginal men. In total, these variables explain 35.7% of the variance in *Occupational Status* for men (R^2).

Table 13 reports the results for women. There is no statistically significant difference between any one of: *Canadians in Canada*, *Americans in the U.S.*, and *Americans in Canada* as compared to *Canadians in the U.S.* on *Occupational Status*. For each additional *Year of Schooling* women gain 2.6 points on *Occupational Status*. A year of *Labor Force Experience* for women gives 0.1 of a point increase on *Occupational Status*. *Married* women are 1.3 points higher on *Occupational Status* than women who are not married. *Black* women are 3 points lower on *Occupational Status* than non-black women. There is no statistically significant difference on *Occupational Status* between *Aboriginal* women and non-Aboriginal women. For each child a woman has, she is 0.7 of a point lower on *Occupational Status*. Altogether, these variables explain 23.6% of the variation in *Occupational Status* for women (R^2).

Table 13: OLS Regression of *Occupational Status*

Independent Variables	Men	Women
	b	b
<i>Canadians in Canada</i>	-2.641 *	-0.607
<i>Americans in the U.S.</i>	-2.356 *	-0.338
<i>Americans in Canada</i>	-2.057 *	-0.428
<i>Years of Schooling</i>	2.922 *	2.557 *
<i>Labor Force Experience</i>	0.144 *	0.110 *
<i>Married</i>	1.487 *	1.344 *
<i>Black</i>	-2.203 *	-2.992 *
<i>Aboriginal</i>	-2.807 *	-0.676
<i>Number of Children</i>		-0.711 *
	R ² = 0.357	R ² = 0.236
	N = 26 322	N = 26 322

* $p \leq .0003$

b is the unstandardized coefficient

(For tests of further interaction effects see Table 15 in Appendix A).

In Table 14 for men I find that *Canadians in Canada* benefit 0.6 of a point less on *Occupational Status* from each year of schooling than *Canadians in the U.S.* do. Whereas *Americans in the U.S.* get 0.3 of a point higher on *Occupational Status* for each additional year of schooling as compared to *Canadians in the U.S.* For each year of schooling *Americans in Canada* get 0.5 of a point less *Occupational Status* than *Canadians in the U.S.* do. *Canadians in Canada* increase their *Occupational Status* by 0.08 of a point for each year of *Labor Force Experience* in comparison to *Canadians in the U.S.*

Table 14 gives the results for women. Unlike men, *Canadians in Canada* actually move 0.4 of a point higher on *Occupational Status* for each year of schooling compared to *Canadians in the U.S.* *Americans in the U.S.* also do better than *Canadians in the U.S.*

on returns to schooling by 0.7 of a point per year. There is no statistically significant difference on the effect of *Years of Schooling* on *Occupational Status* between *Americans in Canada* and *Canadians in the U.S.* Both *Canadians in Canada* and *Americans in Canada* get slightly higher *Occupational Status* for *Labor Force Experience* than do *Canadians in the U.S.*

Table 14: OLS Regression of *Occupational Status* – returns to education and experience

Independent Variables	Men b	Women b
<i>Canadians in Canada</i>	3.521	-9.858 *
<i>Americans in the U.S.</i>	-6.488 *	-10.928 *
<i>Americans in Canada</i>	4.095	-9.423 *
<i>Years of Schooling</i>	3.045 *	2.218 *
<i>Labor Force Experience</i>	0.111 *	0.031
<i>Married</i>	1.435 *	1.264 *
<i>Black</i>	-1.837 *	-2.889 *
<i>Aboriginal</i>	-2.898 *	-0.611
<i>Number of Children</i>		-0.716 *
<i>Years of Sch X Cdn in Can</i>	-0.603 *	0.391 *
<i>Years of Sch X Amer in the U.S.</i>	0.292 *	0.682 *
<i>Years of Sch X Amer in Can</i>	-0.490 *	0.421
<i>Labor Force Exp X Cdn in Can</i>	0.081 *	0.180 *
<i>Labor Force Exp X Amer in the U.S.</i>	0.012	0.052
<i>Labor Force Exp X Amer in Can</i>	0.044	0.139 *
	R ² = 0.363	R ² = 0.242
	N = 26 322	N = 26 322

* p ≤ .0003

b is the unstandardized coefficient

CHAPTER FOUR: DISCUSSION

Summary

How do immigrants from one developed country to another fare in terms of *Earnings*? On measures of central tendency (Table 5) both immigrant groups *Canadians in the U.S.* and *Americans in Canada* have higher *Earnings* than native-born *Canadians in Canada* and *Americans in the U.S.* In particular, *Earnings* of *Canadians in the U.S.* for men are high. However, once I control for other variables, in the regression model (see Tables 8 and 10) for men while *Earnings* of the *Canadians in the U.S.* remain highest, the *Earnings* of *Americans in Canada* are comparatively less. In the regression results for women, the difference in *Earnings* between *Canadians in the U.S.* and *Canadians in Canada* is found to be statistically non-significant, and the *Earnings* of *Americans in Canada* are second highest in comparison.

Immigrants from one developed country to another fare well on *Occupational Status*. Results (in Table 13) are different for men and women. Results for men indicate that *Canadians in the U.S.* have the highest *Occupational Status*, with *Americans in the U.S.* 2.1 points lower. Among women there is no statistically significant difference on *Occupational Status*.

In answer to the research question of how *Earnings* of *Canadians in the U.S.* compare, a comparison of the *Earnings* of *Canadians in the U.S.* showed that for men *Canadians in the U.S.* earn more than any of the other groups. The results for women are *Canadians in the U.S.* earn more than Americans, both those in the U.S. and in Canada. However, for women there is no statistically significant difference in *Earnings* of *Canadians in the U.S.* compared to *Canadians in Canada*.

Another research question was how *Earnings* among groups compare within the same occupation. Within the same occupation, *Earnings* of *Canadians in the U.S.* compare favorably. Findings are the same as for the previous *Earnings* model, although *Occupational Status* modifies the *Earnings* differences somewhat.

Results also address the question of differences in *Occupational Status*. As far as *Occupational Status*, the findings are that men who are *Canadians in the U.S.* have higher *Occupational Status* than any other group. For women there is no statistically significant difference in *Occupational Status* for *Canadians in the U.S.* as compared to any other group. *Years of Schooling* has by far the largest effect (standardized coefficient, beta) of any of the variables on *Occupational Status*.

Throughout the results, the findings are different for men and women. For instance, differences in *Earnings* among women are not as great as among men. Although all women in this analysis were selected as being in the labor force, perhaps the primary reason for immigrating for some women is marriage or a relationship; with less of an emphasis on *Earnings*. Also, there is known to be less variation in women's *Earnings* compared to men's. This means that variation in women's *Earnings* is typically more readily explained (higher R^2). Other differences in the results for men and women include *Marital Status* affecting women's *Earnings* much less than men's. As well, there is no statistically significant effect of race found on women's *Earnings*. Differences between men and women also exist on results for *Occupational Status*. In this model, less of the variance in *Occupational Status* is explained for women than for men (see R^2 in Table 13). This may be due, in part, to the measure of *Occupational Status* itself being constructed only on men (see Endnote ¹²).

What are the returns on education and experience? First, I summarize the returns in *Earnings*. Surprisingly, for men *Canadians in the U.S.* have higher returns to *Years of Schooling* on *Earnings* than *Canadians in Canada*; this does not hold within the same occupation. For both men and women, *Canadians in the U.S.* have lower returns to education on *Earnings* compared to native-born in the U.S.; within the same occupation, this remains so for women. Few differences in returns on *Labor Force Experience* are found on *Earnings*. For women, *Canadians in Canada* get higher *Earnings* for their *Labor Force Experience* than *Canadians in the U.S.*; within the same occupation this effect disappears. Next, I highlight the returns in the form of status. Unexpectedly, for men *Canadians in the U.S.* have higher *Occupational Status* for each *Year of Schooling* than *Canadians in Canada*. However, for men *Canadians in the U.S.* get less return to *Labor Force Experience* on *Occupational Status* compared to *Canadians in Canada*. Women *Canadians in Canada* have better returns to education in *Occupational Status* than *Canadians in the U.S.* For both men and women, the native-born *Americans in the U.S.* have higher returns to *Years of Schooling* on *Occupational Status* than immigrant *Canadians in the U.S.* Also, results for men and women are similar in that *Canadians in Canada* receive slightly higher returns to *Labor Force Experience* on *Occupational Status* compared to *Canadians in the U.S.* In a comparison of immigrant groups, women who are *Americans in Canada* get more *Occupational Status* for their *Labor Force Experience* than *Canadians in the U.S.* For men, *Americans in Canada* have somewhat lower returns to schooling on *Occupational Status* compared to *Canadians in the U.S.*

Back to the theory

The results fit with the theory because those with higher human capital do move internationally. Education, experience, and marital status are all seen to affect *Earnings* significantly. Also, the theory predicts that migration will occur when a wage gap between countries exists. Even within occupations, men *Canadians in the U.S.* earn more than any other group, and women *Canadians in the U.S.* either earn more than or the same as the other groups, indicating a wage gap between the Canada and the United States. The higher *Occupational Status* of *Canadian in the U.S.* for men fits with the large numbers of professionals and managers in this group. It may also point to Canada not having a high absorptive capacity for its professionals, leading them to seek opportunities elsewhere. The large effect of *Years of Schooling* on *Occupational Status* tells us that the higher *Occupational Status* of male Canadian immigrants to the U.S. reflects higher levels of education.

Another tie in to the theory is that for men *Canadians in the U.S.* get better returns on *Earnings* for their education in the U.S. than *Canadians in Canada* do, a difference of 1.7%. Thus, this effect of human capital is greater abroad. This effect disappears, however, within the same occupations.

What about the brain drain?

Evidence that there is a brain drain from Canada to the U.S. is provided in Table 4 “Educational Attainment Comparison”, and in Table 7 “Occupational Categories Comparison”. *Canadians in the U.S.* have much higher percentages of Bachelors, Masters, Professional, and Doctorate degrees than *Canadians in Canada*. In addition, there are more Professionals and managers found in *Canadians in the U.S.* as compared

to *Canadians in Canada*. It seems that Canadian immigrants to the U.S. are highly educated and in high ranking occupations. Also, since *Canadians in the U.S.* have higher *Earnings*, we may conclude that they tend to be high-income earners.

Policy implications

Immigration policy directly affects migration from one developed country to another. The numbers and type of immigrants are regulated through policy. Since skilled workers from developed countries such as Canada do so well in the U.S. labor market, it is no wonder that U.S. immigration policy has Preference categories favoring them.

All aspects of the labor market strongly affect migration between developed countries. Thus, policies relating to all aspects of labor markets: unemployment, underemployment, the job market, working conditions, management, entrepreneurial activity, opportunity for advancement, and the amount of R&D will either inadvertently or intentionally determine migration patterns. Finally, tax policies are also highly relevant to international migration.

Is the glass half full or half empty?

Within social sciences for research that has the individual as the unit of analysis an R^2 of 0.5 is considered substantial. What this means, though, is that we can explain 50% or half of the variation in people's *Earnings* with what we are looking at. In reality, there is another half of the picture that remains unexplained. We may theorize about what those other factors that affect *Earnings* may be. It is also true that if and when we did have the other half of the picture, it would change the part we do see now. For instance, the effect of place of birth and place of residence (e.g. *Canadians in the U.S.*)

may change. These results are put forward with caution, and not as the last word, because the glass is both half full and half empty at this point.

Statistics and the individual

Whenever statistics are presented, we must remember to think about what they mean. In this research, while the results are from an analysis of individuals, the conclusions drawn are often expressed for groups of people. Comparing averages may conceal the extent of variation. Another direction the analysis might take is to study that variation directly (e.g. is there more *Earnings* inequality among *Canadians in the U.S.* than among *Canadians in Canada?*).

Further study

The broader understanding gained from this research will help Canadians assess emigration in the context of numerical information. The topic of the brain drain from Canada to the U.S. is an important issue that merits further research and exploration. I recommend that a cost of living adjustment be made on *Earnings*, if possible. In addition, the inclusion of hours worked per week would provide a more finely grained measure than the *Full-time* variable, and may add explanatory power to the *Earnings* model. The 2000 U.S. Census data is just now being released, and as soon as the 2001 Canadian Census data become available the analysis may be conducted on the more recent data. Although the census data contain information only on permanent migration, we could see if temporary migration under NAFTA has indirectly affected permanent migration of Canadians to the U.S. by comparing the results from a decade apart.

ENDNOTES

¹ Some authors take exception to the term brain drain, and prefer to conceptualize it instead as brain circulation or brain flow. Brain drain implies a loss and is more permanent, whereas brain circulation or brain flow is an exchange and may be relevant in describing temporary migration, return migration, and trans-national migration.

² The data are from three sources. The first source is Canadian Census data from the 1991 individual personal use microdata file. Both *Canadians in Canada* and *Americans in Canada* are from this data file. Data for the *Canadians in the U.S.* sample came from a second source, the Data Extraction System (DES) by the U.S. Census Bureau. DES accesses the U.S. 1990 public use microdata 5% sample and allows one to select cases with a specific value on some variable, for example *Place of Birth*. All Canadian born persons in the U.S. were selected in this manner, on a state-by-state basis, and saved as a single data file. <http://www.census.gov/DES/www/welcome.html>

Newer data are now available on Data Ferrett only.

The third source of data was the U.S. 1/1,000 Sample of the Census of Population and Housing 1990 United States Public Use Microdata, Study No. 6497. The *Americans in the U.S.* are taken from this data file. The 1/1,000 Sample came from the Inter-university Consortium for Political and Social Research (ICPSR) website at the University of Michigan. As 2 percent of the 5 percent Public Use Microdata Sample, it constitutes a one in one thousand sample. The necessary files were housed on Data Retrieval from Archived Tape (DRAT), and were also saved onto a CD for me.

<http://www.icpsr.umich.edu:8080/ICPSR-STUDY/06497.xml>

Bibliographic Citation:

U.S. Dept. of Commerce, Bureau of the Census, and Inter-university Consortium for Political and Social Research. CENSUS OF POPULATION AND HOUSING, 1990 [UNITED STATES]: PUBLIC USE MICRODATA SAMPLE: 1/1,000 SAMPLE [Computer file]. ICPSR version. Washington, DC: U.S. Dept. of Commerce, Bureau of the Census/Ann Arbor, MI: Inter-university Consortium for Political and Social Research [producers], 1995. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 1995.

³ To construct the variable *Labor*, for *Labour Force Activity* I coded all categories that were employed, and unemployed as “In the labor force”, and I coded all categories of not in labor force as “Not in labor force”; for *Employment Status Recode* I coded all categories of employed, unemployed, and armed forces as “In the labor force”, and the code not in labor force I kept as “Not in labor force”.

⁴ To reduce complications, other sources of income such as: self-employment income, interest, dividends, and net rental income, social security, public assistance, retirement income, family allowance, federal child tax credits, old age security pension, Canada pension, unemployment insurance benefits, investment income, and annuities were not included.

⁵ I did an Internet search, and found an Inflation Calculator for the U.S. at <http://www.bls.gov/cpi/home.htm>. From this I found that \$1.00 in 1989 had the same

buying power as \$1.05 in 1990. So I multiplied the U.S. data value by 1.05 to bring it up to a 1990 value.

⁶ To convert Canadian dollar to U.S. dollars, I took the average of the daily 1990 exchange rate from the Bank of Canada www.bank-banque-canada.ca/en/exchange.htm, which worked out to be 1.17. So I divided the Canadian value by 1.17 to get the U.S. value.

⁷ The wages and salaries variable for the Canadian data has a lower maximum than the U.S. one. The Canadian maximum is \$200 000. The U.S. codebook says that the top code is \$140 001 or more = state median of topcoded values. The data show a maximum earnings of \$197 869 U.S. Since I needed to adjust for the one year difference in data collection I multiplied the U.S. earnings (income1) by 1.05 for inflation (1989 to 1990). So the highest value becomes $\$197\,869 \times 1.05 = \$207\,762$ U.S. To have common currency I converted Canadian dollars to U.S. dollars by dividing the Canadian earnings (wagesp) by 1.17 the exchange rate for 1990 (year for earnings reported on in 1991 Census). This means the highest value becomes $\$200\,000 / 1.17 = \$170\,940$ U.S. As you can see, the maximum value for U.S. data is \$207 762 U.S. while the maximum for Canadian data is \$170 940 U.S. This equals a \$36 822 U.S. difference. There is a lower ceiling for earnings on the Canadian data than the U.S. data. I investigated to see how many cases actually fall into the top category in each group.

Those in the above \$140 000 U.S. categories for wages and salaries

Canadians in the U.S. 264 out of 15 928 cases

Americans in the U.S. 111 out of 15 928 cases

Those in the \$200 000+ Canadian category for wages and salaries

Canadians in Canada 3 out of 15 928 cases

Americans in Canada 3 out of 3 612 cases

Although the Canadian data have a lower maximum value for earnings than the U.S., since there are very few cases in the Canadian data that are \$200 000 or more this is not an issue. Notice how many *Canadians in the U.S.* are in the highest income category (values dependent on state median).

⁸ I credit Dr. Robert Marsa with this insight.

⁹ *Years of Schooling* values were assigned as follows

0 years = No school, Nursery, and Kindergarten

3 years = 1st to 4th grade

7 years = 5th to 8th grade

11.5 years = 12th grade no diploma, grade 13 no diploma, (No GED)

12 years = High School graduate or GED

13 years = College no degree

14 years = Associate degree occupational program, Associate degree academic program

16 years = Bachelors degree, certificate or diplomas above BA

18 years = Masters degree

20 years = Professional degree

22 years = Doctorate degree

I found the Canadian variable *Total Years of Schooling* unsatisfactory because it groups 14 to 17 years of schooling into one category.

¹⁰ In both Canada and the U.S. people can be legally employed as of age 14. In *Labor Force Activity* persons 15 and older are counted, and *Employment Status Recode* includes those 16 and older.

¹¹ I am missing the variable for school attendance in my Canadian data. However, results for the U.S. data respondents age 20 – 64 are:

Canadians in the U.S. 63% of those attending school are in the labor force

Americans in the U.S. 74% of those attending school are in the labor force

So I do not think it is valid to assume that students are not working while in school.

Granted, the work experience while in school may not be equivalent to that of after school. Still, I think it would count for something.

¹² Sociologists measure the stratification of occupations in three main ways: by prestige ratings, by derived class categories, and by socioeconomic status scores (SEI). Prestige and socioeconomic status scores are different. Prestige involves the evaluative judgment by members of society of the general desirability of occupations. In contrast, SEI scores “are constructed as a weighted sum of the average education and average income of occupational groups, sometimes corrected for the influence of age” (Ganzeboom et al., 1992: 7). SEI “measures the attributes of occupations that convert a person’s main resource (education) into a person’s main reward (income)” (Ganzeboom et al., 1992: 9).

¹³ “Please cite use of our conversion tools as:

Ganzeboom, Harry B.G.; Treiman, Donald J., International Stratification and Mobility File: Conversion Tools. Utrecht: Department of Sociology. Date of last revision: Summer 1996.”

<http://www.fss.uu.nl/soc/hg/ismf>

The ISEI was constructed on a sample of 73 901 men, age 21-61, working full-time. It did not include women. Women dominate certain occupations. “ISEI scores for these occupations are likely to be poorly estimated for the data on the few men in such occupations” (Ganzeboom et al., 1992: 14). This may explain the lower R^2 for women in my *Occupational Status* model.

In the U.S. data there were some nine occupational codes that had no corresponding ISCO88 code. In these instances I chose the nearest category.

¹⁴ Model’s codes in format (occup91 = isei): (1 = 68.000) (2 = 53.479) (3 = 65.850) (4 = 50.463) (5 = 49.939) (6 = 45.211) (7 = 53.828) (8 = 41.740) (9 = 34.121) (10 = 45.000) (11 = 38.976) (12 = 31.311) (13 = 30.504) (14 = 19.539).

¹⁵ *Occupational Status* for men has a tolerance of 0.63 in the *Log of Earnings* model. This may be because *Occupational Status* is correlated with *Years of Schooling*. *Number of Children* for women has a tolerance of 0.65. *Number of Children* is correlated with *Labor Force Experience*; however, I would expect this and it is not a problem.

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APPENDIX A: Additional Regression Tables

Table 1: OLS Regression of *Log of Earnings*

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-7.1% *
<i>Americans in the U.S.</i>	-11.2% *
<i>Americans in Canada</i>	-11.8% *
<i>Years of Schooling</i>	8.8% *
<i>Labor Force Experience</i>	1.1% *
<i>Weeks worked</i>	3.9% *
<i>Full-time</i>	122.1% *
<i>Married</i>	12.9% *
<i>Sex</i>	-31.2% *
<i>Black</i>	-9.5% *
<i>Aboriginal</i>	-11.0% *

 $R^2 = 0.517$

N = 52 644

* $p \leq .00009$ $e^b - 1$ is the converted unstantardized coefficient

Table 2 shows many, but not all, of the interaction terms for *Sex* are statistically significant. Differences could include: the coefficient of the variable being significant for one and not for the other, a difference in sign of the coefficients, a difference in magnitude of the coefficients, or different intercepts. What any of these differences tell us is that somehow each of these variables has a different effect on *Earnings* for men than for women.

Table 2: OLS Regression of *Log of Earnings* -
Sex Interaction

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-11.9% *
<i>Americans in the U.S.</i>	-13.8% *
<i>Americans in Canada</i>	-16.1% *
<i>Years of Schooling</i>	7.5% *
<i>Labor Force Experience</i>	1.4% *
<i>Weeks worked</i>	3.7% *
<i>Full-time</i>	114.0% *
<i>Married</i>	26.7% *
<i>Sex</i>	-48.5% *
<i>Black</i>	-16.4% *
<i>Aboriginal</i>	-14.7% *
<i>Canadians in Canada X Sex</i>	9.6% *
<i>Americans in the U.S. X Sex</i>	5.4%
<i>Americans in Canada X Sex</i>	10.0%
<i>Years of Sch X Sex</i>	2.6% *
<i>Labor Force Exp X Sex</i>	-0.7% *
<i>Weeks worked X Sex</i>	0.3% *
<i>Full-time X Sex</i>	1.7%
<i>Married X Sex</i>	-19.9% *
<i>Black X Sex</i>	13.5%
<i>Aboriginal X Sex</i>	7.4%

$R^2 = 0.524$

$N = 52\ 466$

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

Table 3 tests the interaction terms for *Black*. Only one of the interaction terms, *Sex X Black*, is statistically significant. This means I would expect being *Black* to have a different effect on *Earnings* for men than for women. However, since none of the other interaction terms with *Black* are statistically significant, there is no justification for splitting the model. The term *Black X Sex* will be included in the model split by *Sex*.

Table 3: OLS Regression of *Log of Earnings* - *Black* Interaction

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-7.2% *
<i>Americans in the U.S.</i>	-11.2% *
<i>Americans in Canada</i>	-11.8% *
<i>Years of Schooling</i>	8.7% *
<i>Labor Force Experience</i>	1.1% *
<i>Weeks worked</i>	3.8% *
<i>Full-time</i>	122.1% *
<i>Married</i>	13.0% *
<i>Sex</i>	-31.6% *
<i>Black</i>	-38.9%
<i>Aboriginal</i>	-11.1% *
<i>Canadians in Canada X Black</i>	9.4%
<i>Americans in the U.S. X Black</i>	-0.6%
<i>Americans in Canada X Black</i>	3.6%
<i>Years of Sch X Black</i>	0.9%
<i>Labor Force Exp X Black</i>	0.0%
<i>Weeks worked X Black</i>	0.5%
<i>Full-time X Black</i>	-1.2%
<i>Married X Black</i>	-3.3%
<i>Sex X Black</i>	14.9% *

$R^2 = 0.517$

$N = 52\ 644$

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

Table 4 contains results for the interaction terms with *Aboriginal*. The term *Canadians in Canada X Aboriginal* is statistically significant. Again, on the basis of only one significant term I would not split the model.

Table 4: OLS Regression of *Log of Earnings* – *Aboriginal* Interaction

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-7.6% *
<i>Americans in the U.S.</i>	-11.3% *
<i>Americans in Canada</i>	-11.7% *
<i>Years of Schooling</i>	8.8% *
<i>Labor Force Experience</i>	1.1% *
<i>Weeks worked</i>	3.9% *
<i>Full-time</i>	122.3% *
<i>Married</i>	12.7% *
<i>Sex</i>	-31.3% *
<i>Black</i>	-9.6% *
<i>Aboriginal</i>	-29.0%
<i>Canadians in Canada X Aboriginal</i>	28.7% *
<i>Americans in the U.S. X Aboriginal</i>	11.9%
<i>Americans in the U.S. X Aboriginal</i>	9.7%
<i>Years of Sch X Aboriginal</i>	-0.7%
<i>Labor Force Exp X Aboriginal</i>	0.7%
<i>Weeks worked X Aboriginal</i>	0.0%
<i>Full-time X Aboriginal</i>	-2.6%
<i>Married X Aboriginal</i>	2.4%
<i>Sex X Aboriginal</i>	9.2%

$R^2 = 0.517$

N = 52 644

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

Table 5: OLS Regression of *Log of Earnings* - Two-way and Three-way Interactions

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-11.0% *
<i>Americans in the U.S.</i>	-14.3% *
<i>Americans in Canada</i>	-15.5% *
<i>Years of Schooling</i>	7.6% *
<i>Labor Force Experience</i>	1.6% *
<i>Weeks worked</i>	3.9% *
<i>Full-time</i>	120.3% *
<i>Married</i>	11.5% *
<i>Sex</i>	-32.6% *
<i>Black</i>	-9.3% *
<i>Aboriginal</i>	-11.1% *
<i>Canadians in Canada X Sex</i>	-7.8%
<i>Americans in the U.S. X Sex</i>	-26.4% *
<i>Americans in Canada X Sex</i>	-9.1%
<i>Years of Sch X Sex</i>	1.6% *
<i>Labor Force Exp X Sex</i>	-1.1% *
<i>Years of Sch X Cdn in Can X Sex</i>	0.4%
<i>Years of Sch X Amer in the U.S. X Sex</i>	2.3% *
<i>Years of Sch X Amer in Can X Sex</i>	0.4%
<i>Labor Force Exp X Cdn in Can X Sex</i>	0.4% *
<i>Labor Force Exp X Amer in the U.S. X Sex</i>	0.3%
<i>Labor Force Exp X Amer in Can X Sex</i>	0.5%

$R^2 = 0.522$

N = 52 644

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

In Table 6 showing results for both men and women, the differences in *Earnings* remain between *Canadians in the U.S.* and any of the other groups, with *Canadians in the U.S.* still earning more, although not as much more as when *Occupational Status* not included. The variables *Sex*, *Black*, and *Aboriginal* are all statistically significant, so I again proceeded to test for interaction effects.

Table 6: OLS Regression of *Log of Earnings* –
with *Occupational Status*

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-5.8% *
<i>Americans in the U.S.</i>	-10.0% *
<i>Americans in Canada</i>	-11.0% *
<i>Years of Schooling</i>	6.0% *
<i>Labor Force Experience</i>	1.0% *
<i>Weeks worked</i>	3.8% *
<i>Full-time</i>	118.8% *
<i>Married</i>	11.5% *
<i>Sex</i>	-33.7% *
<i>Black</i>	-7.2% *
<i>Aboriginal</i>	-9.7% *
<i>Occupational Status</i>	0.9% *

$R^2 = 0.529$

$N = 52\,644$

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

Based on Table 7, I ran separate analyses for men and women.

Table 7: OLS Regression of *Log of Earnings* –
with *Occupational Status*

Sex Interaction

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-10.1% *
<i>Americans in the U.S.</i>	-12.1% *
<i>Americans in Canada</i>	-14.9% *
<i>Years of Schooling</i>	4.9% *
<i>Labor Force Experience</i>	1.3% *
<i>Weeks worked</i>	3.6% *
<i>Full-time</i>	114.0% *
<i>Married</i>	25.6% *
<i>Sex</i>	-52.8% *
<i>Black</i>	-15.0% *
<i>Aboriginal</i>	-13.0% *
<i>Occupational Status</i>	0.9% *
<i>Canadians in Canada X Sex</i>	8.0% *
<i>Americans in the U.S. X Sex</i>	3.9%
<i>Americans in Canada X Sex</i>	8.7%
<i>Years of Sch X Sex</i>	2.4% *
<i>Labor Force Exp X Sex</i>	-0.6% *
<i>Weeks X Sex</i>	0.4% *
<i>Full-time X Sex</i>	-0.6%
<i>Married X Sex</i>	-20.1% *
<i>Black X Sex</i>	15.5% *
<i>Aboriginal X Sex</i>	6.3%
<i>Occupational Status X Sex</i>	0.2%

$R^2 = 0.536$

$N = 52\ 644$

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

Table 8 shows that *Weeks worked X Black* as well as *Sex X Black* are both statistically significant. So I would expect to see differences in the effect of being *Black* on *Earnings* between men and women.

Table 8: OLS Regression of *Log of Earnings* –
with *Occupational Status*
Black Interaction

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-5.9% *
<i>Americans in the U.S.</i>	-10.1% *
<i>Americans in Canada</i>	-11.0% *
<i>Years of Schooling</i>	5.9% *
<i>Labor Force Experience</i>	1.0% *
<i>Weeks worked</i>	3.7% *
<i>Full-time</i>	118.8% *
<i>Married</i>	11.7% *
<i>Sex</i>	-34.1% *
<i>Black</i>	-42.4% *
<i>Aboriginal</i>	-9.9% *
<i>Occupational Status</i>	0.9% *
<i>Canadians in Canada X Black</i>	12.2%
<i>Americans in the U.S. X Black</i>	4.8%
<i>Americans in Canada X Black</i>	7.9%
<i>Years of Sch X Black</i>	0.9%
<i>Labor Force Exp X Black</i>	0.1%
<i>Weeks X Black</i>	0.6% *
<i>Full-time X Black</i>	-2.9%
<i>Married X Black</i>	-2.9%
<i>Sex X Black</i>	15.3% *
<i>Occupational Status X Black</i>	0.0%

$R^2 = 0.529$

$N = 52\ 644$

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

None of the interaction terms with *Aboriginal* is statistically significant in

Table 9.

Table 9: OLS Regression of *Log of Earnings* – with
Occupational Status
Aboriginal Interaction

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-6.2% *
<i>Americans in the U.S.</i>	-10.1% *
<i>Americans in Canada</i>	-10.7% *
<i>Years of Schooling</i>	6.0% *
<i>Labor Force Experience</i>	1.0% *
<i>Weeks worked</i>	3.8% *
<i>Full-time</i>	119.0% *
<i>Married</i>	11.4% *
<i>Sex</i>	-33.8% *
<i>Black</i>	-7.3% *
<i>Aboriginal</i>	-28.3%
<i>Occupational Status</i>	0.9% *
<i>Canadians in Canada X Aboriginal</i>	24.0%
<i>Americans in the U.S. X Aboriginal</i>	11.3%
<i>Americans in the U.S. X Aboriginal</i>	4.3%
<i>Years of Sch X Aboriginal</i>	-0.4%
<i>Labor Force Exp X Aboriginal</i>	0.6%
<i>Weeks X Aboriginal</i>	-0.1%
<i>Full-time X Aboriginal</i>	-1.8%
<i>Married X Aboriginal</i>	3.7%
<i>Sex X Aboriginal</i>	6.7%
<i>Occupational Status X Aboriginal</i>	0.0%

$R^2 = 0.529$

$N = 52\ 644$

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

Table 10: OLS Regression of *Log of Earnings* – with
Occupational Status

Two-way and Three-way Interactions

Independent Variables	$e^b - 1$
<i>Canadians in Canada</i>	-8.9% *
<i>Americans in the U.S.</i>	-12.5% *
<i>Americans in Canada</i>	-14.1% *
<i>Years of Schooling</i>	4.8% *
<i>Labor Force Experience</i>	1.5% *
<i>Weeks worked</i>	3.8% *
<i>Full-time</i>	117.1% *
<i>Married</i>	10.5% *
<i>Sex</i>	-41.4% *
<i>Black</i>	-7.1% *
<i>Aboriginal</i>	-9.9% *
<i>Occupational Status</i>	0.9% *
<i>Canadians in Canada X Sex</i>	-2.0%
<i>Americans in the U.S. X Sex</i>	-20.0%
<i>Americans in Canada X Sex</i>	-3.0%
<i>Years of Sch X Sex</i>	2.2% *
<i>Labor Force Exp X Sex</i>	-1.0% *
<i>Years of Sch X Cdn in Can X Sex</i>	0.1%
<i>Years of Sch X Amer in the U.S. X Sex</i>	1.6%
<i>Years of Sch X Amer in Can X Sex</i>	0.0%
<i>Labor Force Exp X Cdn in Can X Sex</i>	0.3%
<i>Labor Force Exp X Amer in the U.S. X Sex</i>	0.2%
<i>Labor Force Exp X Amer in Can X Sex</i>	0.4%

$R^2 = 0.533$

$N = 52\,644$

* $p \leq .00009$

$e^b - 1$ is the converted unstandardized coefficient

Table 11: OLS Regression of *Occupational Status*

Independent Variables	b
<i>Canadians in Canada</i>	-1.619 *
<i>Americans in the U.S.</i>	-1.394 *
<i>Americans in Canada</i>	-1.284 *
<i>Years of Schooling</i>	2.805 *
<i>Labor Force Experience</i>	0.105 *
<i>Married</i>	1.309 *
<i>Sex</i>	3.458 *
<i>Black</i>	-2.703 *
<i>Aboriginal</i>	-1.877 *

$R^2 = 0.310$

N = 52 644

* $p \leq .00009$

b is the unstandardized coefficient

Tests for *Sex* interaction effects in Table 12 show half of the interaction terms are statistically significant. I would expect to see differences for men and women on variables *Canadians in Canada*, *Americans in the U.S.*, *Years of Schooling*, and *Labor Force Experience*.

Table 12: OLS Regression of *Occupational Status* –
Sex Interaction

Independent Variables	b
<i>Canadians in Canada</i>	-2.641 *
<i>Americans in the U.S.</i>	-2.356 *
<i>Americans in Canada</i>	-2.057 *
<i>Years of Schooling</i>	2.922 *
<i>Labor Force Experience</i>	0.144 *
<i>Married</i>	1.487 *
<i>Sex</i>	8.632 *
<i>Black</i>	-2.203 *
<i>Aboriginal</i>	-2.807 *
<i>Canadians in Canada X Sex</i>	2.010 *
<i>Americans in the U.S. X Sex</i>	1.880 *
<i>Americans in Canada X Sex</i>	1.544
<i>Years of Sch X Sex</i>	-0.325 *
<i>Labor Force Exp X Sex</i>	-0.080 *
<i>Married X Sex</i>	-0.571
<i>Black X Sex</i>	-1.003
<i>Aboriginal X Sex</i>	1.719

$R^2 = 0.313$

N = 52 644

* $p \leq .00009$

b is the unstandardized coefficient

Table 13 shows that the interaction term *Americans in the U.S. X Black* is statistically significant.

Table 13: OLS Regression of *Occupational Status* – *Black* Interaction

Independent Variables	b
<i>Canadians in Canada</i>	-1.577 *
<i>Americans in the U.S.</i>	-1.305 *
<i>Americans in Canada</i>	-1.249 *
<i>Years of Schooling</i>	2.805 *
<i>Labor Force Experience</i>	0.109 *
<i>Married</i>	1.325 *
<i>Sex</i>	3.462 *
<i>Black</i>	4.785
<i>Aboriginal</i>	-1.863 *
<i>Canadians in Canada X Black</i>	-2.273
<i>Americans in the U.S. X Black</i>	-5.394 *
<i>Americans in Canada X Black</i>	-3.950
<i>Years of Sch X Black</i>	-0.031
<i>Labor Force Exp X Black</i>	-0.094
<i>Married X Black</i>	-0.444
<i>Sex X Black</i>	-0.018

$R^2 = 0.310$

$N = 52\,644$

* $p \leq .00009$

b is the unstandardized coefficient

In Table 14 *Canadians in Canada X Aboriginal* is the only statistically significant interaction term.

Table 14: OLS Regression of *Occupational Status* – *Aboriginal* Interaction

Independent Variables	b
<i>Canadians in Canada</i>	-1.681 *
<i>Americans in the U.S.</i>	-1.411 *
<i>Americans in Canada</i>	-1.414 *
<i>Years of Schooling</i>	2.808 *
<i>Labor Force Experience</i>	0.104 *
<i>Married</i>	1.327 *
<i>Sex</i>	3.407 *
<i>Black</i>	-2.710 *
<i>Aboriginal</i>	-3.581
<i>Canadians in Canada X Aboriginal</i>	4.014 *
<i>Americans in the U.S. X Aboriginal</i>	0.658
<i>Americans in Canada X Aboriginal</i>	5.130
<i>Years of Sch X Aboriginal</i>	-0.269
<i>Labor Force Exp X Aboriginal</i>	0.076
<i>Married X Aboriginal</i>	-1.261
<i>Sex X Aboriginal</i>	2.583

$R^2 = 0.310$

N = 52 644

* $p \leq .00009$

b is the unstandardized coefficient

Table 15: OLS Regression of *Occupational Status* –
Two-way and Three-way Interactions

Independent Variables	b
<i>Canadians in Canada</i>	-2.647 *
<i>Americans in the U.S.</i>	-2.307 *
<i>Americans in Canada</i>	-2.075 *
<i>Years of Schooling</i>	2.929 *
<i>Labor Force Experience</i>	0.149 *
<i>Married</i>	1.133 *
<i>Sex</i>	15.122 *
<i>Black</i>	-2.683 *
<i>Aboriginal</i>	-1.888 *
<i>Canadians in Canada X Sex</i>	-6.892 *
<i>Americans in the U.S. X Sex</i>	-8.987 *
<i>Americans in Canada X Sex</i>	-7.614
<i>Years of Sch X Sex</i>	-0.676 *
<i>Labor Force Exp X Sex</i>	-0.164 *
<i>Years of Sch X Cdn in Can X Sex</i>	0.377 *
<i>Years of Sch X Amer in the U.S. X Sex</i>	0.701 *
<i>Years of Sch X Amer in Can X Sex</i>	0.442
<i>Labor Force Exp X Cdn in Can X Sex</i>	0.173 *
<i>Labor Force Exp X Amer in the U.S. X Sex</i>	0.049
<i>Labor Force Exp X Amer in Can X Sex</i>	0.135 *

$R^2 = 0.315$

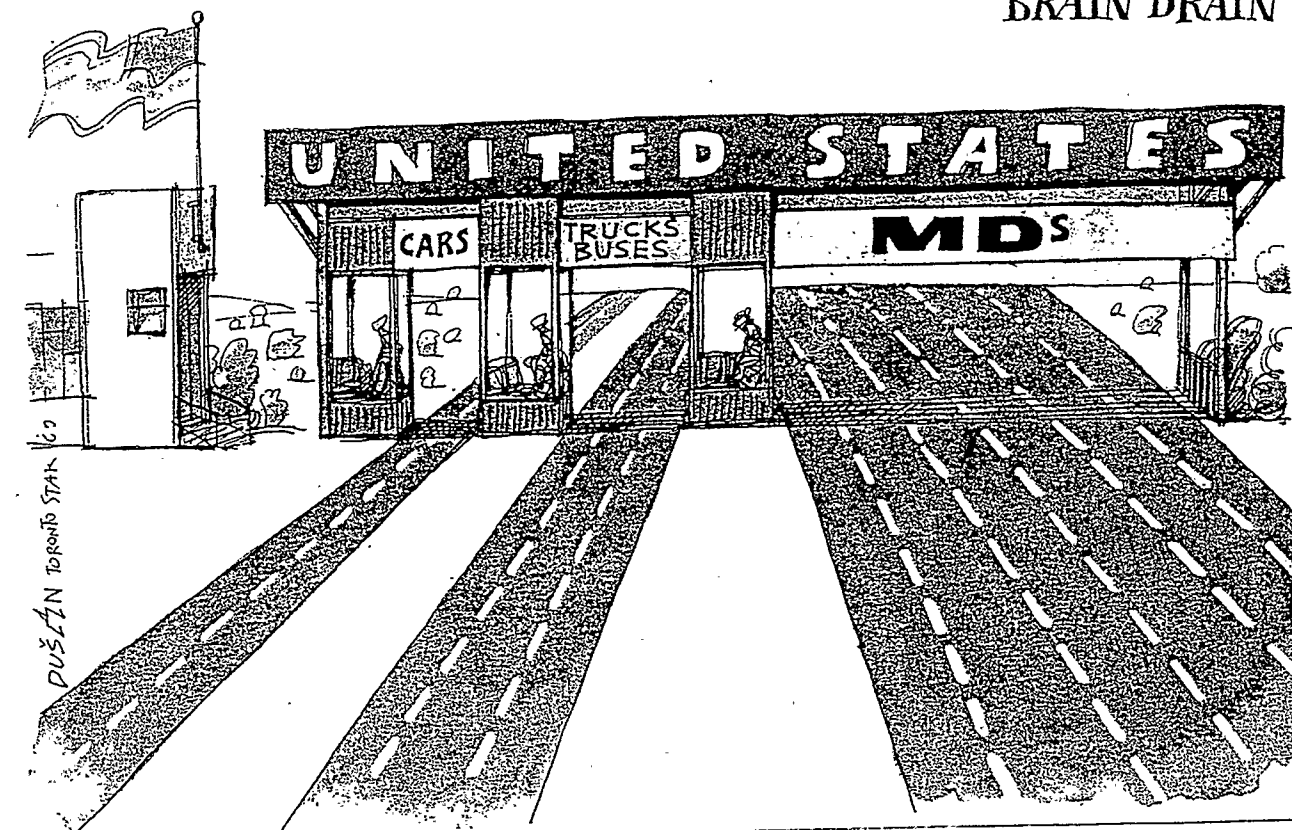
N = 52 644

* $p \leq .00009$

b is the unstandardized coefficient



BRAIN DRAIN





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