

Brain Drain: Empirical Evidence of Emigration of Canadian Professionals to the United States

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ABSTRACT

This paper discusses the issue of brain drain as evidenced by the emigration of highly educated and skilled Canadians to the United States on both a permanent and a temporary basis. Emigration is measured by the number of visas issued. The paper reviews the controversy over emigration numbers and provides empirical evidence of factors that lead to brain drain. It also establishes quantitative links between economic factors and brain drain.

The author finds that brain drain is increasing—a result that is not surprising. All economic factors—higher income, better job opportunities, and lower taxes—have consistently been weighted in favour of the United States, and statistical analysis suggests that Canadian professionals respond to these factors in a strong way.

INTRODUCTION

There is a growing perception that while Canada is attracting skilled personnel from around the world, it is also losing many of its best and brightest to the United States (a phenomenon commonly known as “brain drain”). This emigration has become more prominent since the free trade agreement (FTA) in 1989, and especially after the implementation of the North American free trade agreement (NAFTA) in 1994. These agreements, which initially led to the freer flow

* Of the Conference Board of Canada. This paper is based on an earlier report by the author, *Are We Losing Our Minds? Trends, Determinants and the Role of Taxation in Brain Drain to the United States*, Detailed Findings 265-99 (Ottawa: Conference Board of Canada, August 1999). Since the completion of this paper, three important studies have appeared in the area of brain drain: John Zhao, Doug Drew, and T. Scott Murray, “Brain Drain and Brain Gain: The Migration of Knowledge Workers from and to Canada” (2000), vol. 6, no. 3 *Education Quarterly Review*, catalogue no. 81-003-XPB, 8-35; Daniel Schwanen, *Putting the Brain Drain in Context: Canada and the Global Competition for Scientists and Engineers*, Commentary no. 140 (Toronto: C.D. Howe Institute, April 2000); and Serge Nadeau, Lori Whewell, and Shane Williamson, “Beyond the Headlines on the ‘Brain Drain’” (Spring 2000), vol. 1, no. 1 *isuma* 154-57.

of goods and services among Canada, the United States, and Mexico, have now enabled the flow of human capital.

Most of the evidence to support the perception of brain drain is anecdotal: the data are based on small sample surveys and personal accounts that have little statistical significance.¹ These sources are not robust enough to warrant the development of effective policy measures. Information disseminated through a series of presentations on emigration by Statistics Canada also is incomplete.² Agency officials believe that emigration from Canada to the United States is more than offset by immigration to Canada from other countries. Their conclusion is not surprising since Statistics Canada focuses on “permanent” migration only. However, it is the “non-permanent” emigrants—those with temporary work permits—who account for the lion’s share of the current movement of highly educated and skilled Canadians to the United States, and their numbers are increasing. Even the temporary absence of these workers could have significant negative repercussions on the Canadian economy, especially if there is already a shortage of these professionals, as is often suggested by the business community.

This paper is a comprehensive examination of brain drain. It looks at the recent trend in emigration (both permanent and non-permanent) of highly educated and skilled Canadians to the United States and examines its significance in a broader economic context. Using national data, the paper also provides empirical evidence of factors responsible for brain drain and establishes a quantitative link between the trend and its determinants. Since the tax wedge between Canada and the United States is often identified as the main determinant of brain drain, details on differences in personal taxes of the two countries also are provided.

THE CONTROVERSY OVER NUMBERS

The main and historically consistent data source on emigration of Canadian professionals to the United States is the *Statistical Yearbook* published by the US Immigration and Naturalization Service (INS). According to this source,³ there are two main categories of Canadian professionals moving to the United States:

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- 1 One exception is a study by Don DeVoretz and Samuel A. Laryea, *Canadian Human Capital Transfers: The United States and Beyond*, Commentary no. 115 (Toronto: C.D. Howe Institute, October 1998).
 - 2 See Ivan Fellegi, Statistics Canada, “Brain Drain or Brain Gain,” presentation to the Association of University and Colleges of Canada, Quebec City, October 1997; a series of presentations, including presentations to Industry Canada and the Standing Committee on Finance by Ivan Fellegi and Scott Murray, under various titles; and a more recent presentation to a joint seminar of the Toronto Association for Business and Economics and the C.D. Howe Institute under the title, “‘Brain Drain’—What We Know and What We Don’t,” Toronto, September 23, 1999.
 - 3 US Immigration and Naturalization Service, *Statistical Yearbook of the Immigration and Naturalization Service, 1997* (Washington, DC: US Government Printing Office, 1999).

“permanent” and “non-permanent.” Permanent immigrants are those who move with the intention of holding permanent employment.⁴ Non-permanent immigrants are those who receive temporary visas to work in specific fields. In this study, they mainly include workers under NAFTA (for whom visas are issued for a year or more), intracompany transferees (for whom visas are issued for up to seven years), and persons in specialty occupations (for whom visas are issued for up to six years). Although business visitors, traders, and investors receive visas for one year, they are not included in the study because their visits are intermittent and each of their trips cannot exceed six months. The study also does not include spouses and dependants.

NAFTA workers account for the majority of temporary visas. Workers generally receive visas (TN-1) for one year, with the option of renewing them for an indefinite period or, after meeting certain legal requirements, converting them to permanent status. The NAFTA visa has generated a lot of confusion regarding the extent of brain drain or the actual number of Canadian professionals leaving for the United States. Many people confuse business visas and regular border crossing. They consider that the higher number of TN visas is primarily due to the problem of multiple counting of the same emigrant.

There are sound reasons for including NAFTA and other non-permanent immigrants in the study. First, they account for more than 90 percent of the total number of visas issued to Canadians working in the United States; therefore, their inclusion is critical to an understanding of the brain drain issue. Second, NAFTA visas offer advantages over the traditional method of emigrating to the United States on a permanent basis: they are convenient, more quickly obtained, and more flexible. Most Canadian professionals are choosing this relatively new option.

If the movement of professionals were analyzed purely on the traditional criterion of “permanent” emigration, the result would be inaccurate and misleading. Indeed, adopting such an approach would be like adding a new lane to a major highway, then not counting the cars and trucks that use the new lane in the statistics on highway use. The effect is the same for emigration. For example, permanent emigration in 1997 (the latest year for which data are available) was about 30 percent less than in 1996. This drop is likely the result of the new, more easily accessible visas. Indeed, given the convenience provided by NAFTA visas, opportunities for travel because of the open skies agreement, and better economic opportunities in the United States, it is not difficult to find some compelling economic arguments to support the notion that brain drain is increasing.

In 1999, a series of presentations by Statistics Canada on the issue of brain drain tended to exclude or minimize the significance of NAFTA workers. This exclusion was misleading for three reasons. First, as stated earlier, NAFTA

4 However, many Canadians who emigrate to the United States do not know beforehand whether they will stay there or not, given the ease of return.

workers account for the bulk of the total emigration of highly skilled Canadians to the United States. Second, although these professionals are leaving the country on a temporary basis, their absence could have serious negative repercussions during a period of shortage. Third, in a recent Canadian government study,⁵ based on a survey of 1995 graduates who moved to the United States on a temporary basis, it was found that 82 percent are still in the United States after four years and the majority do not intend to return in the foreseeable future.

From the perspective of a company or an economy, what is important is the output and the tax revenue contributed by a worker in a given period. The economic cost to the country, in terms of person-years lost, is the same whether one Canadian moves to the United States for two consecutive years or two Canadians move for one year each. Therefore, for a given time period, the absence of these professionals from the Canadian economy has the same implications whether the move is temporary or permanent.

It has often been claimed that Canada is a “net brain gainer.” For each professional that we lose to the United States, we receive four from the rest of the world. These numbers are valid only for “permanent” emigration. Once “temporary” numbers (which account for the bulk of Canadian professionals emigrating to the United States) are included in the calculation, the ratio is reversed. Moreover, the suggestion that a Canadian professional leaving for the United States is easily and perfectly replaced by a newly arriving professional immigrant is misleading. A large body of research shows that it takes years for new immigrants to assimilate with North American culture, language, and the labour market structure. There is a significant lapse of time before new immigrants find jobs closely related to their specialized disciplines, and secure salaries and responsibilities commensurate with their education and experience. Indeed, some estimates suggest that it may cost more than \$200,000 to replace a Canadian-born and -trained professional with a newly landed foreign professional.⁶

John Helliwell, an eminent Canadian economist, also believes that brain drain is not an issue.⁷ On the basis of the US current population survey (CPS), he concludes that the post-1990 average annual flow of skilled emigrants, including temporary emigrants, is only 10,000. (This figure is significantly lower than that estimated in this paper and quoted in other studies.) The CPS data, however, have their own limitations. For example, according to the census, the number of Canadian-born individuals living in the United States decreased from 660,000 in 1996 to 542,000 in 1997—down by about 120,000. Half of this decrease is

5 Human Resources Development Canada and Statistics Canada, *South of the Border: Graduates from the Class of '95 Who Moved to the United States*, catalogue no. 81-587-XIE.

6 *Supra* footnote 1, at 21.

7 John F. Helliwell, *Checking the Brain Drain: Evidence and Implications* (Vancouver: Department of Economics, University of British Columbia, May 1999).

attributed to statistical variation, whereas the other half (60,000) is assumed to be accounted for by individuals who either left the United States for Canada or a third country, or died. Since Canadians over the age of 65 in the United States account for less than 25 percent of the total, death would presumably account for only a small proportion. This implies that a large segment (around 40,000, even after accounting for those who left for a third country) should have returned to Canada. However, Statistics Canada accounts show that in 1997, some 22,000 Canadians returned from all over the world, and about half were from the United States. This disparity clearly illustrates the limitations of determining Canadian emigration through US CPS data. Also, given the rosy economic picture in the United States for at least the last decade, it would be extremely difficult to rationalize a decline in Canadian emigration.

Helliwell's study includes only "Canadian-born" emigrants in its analysis. Consequently, the study likely underestimates the outflow from Canada, since a significant proportion of Canadians were not born in Canada but have emigrated to Canada from other countries. Some studies have shown that it is the newly arriving immigrants into Canada who are more likely to move to the United States.⁸ Once a person leaves her/his home country, emotional attachment with the land is severed and the individual is likely to seek the highest economic opportunity, which by all economic measures is to be found in the United States.

Finally, it is interesting to note that according to the October 1996 INS estimate (published in October 1999),⁹ there are 120,000 Canadians (Canadian born and immigrant Canadians) living in the United States illegally, or as "undocumented immigrant population." About half of them "entered legally on [a] temporary basis and failed to depart."¹⁰ The Helliwell study and others (including this one) do not recognize their existence.

TREND OF EMIGRATION

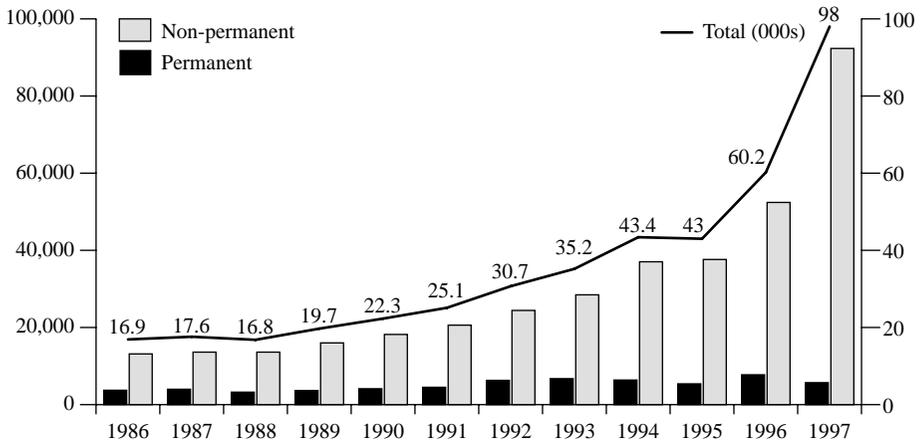
In this paper, emigration numbers for skilled workers are based on the number of visas granted. These emigrants include engineers, computer scientists, physicians, nurses, professors, teachers, managerial personnel, and social scientists. Between 1986 and 1997, there was little growth in the number of visas issued to "permanent" skilled emigrants to the United States (figure 1). However, when visas issued to non-permanent workers are included in the analysis, the picture changes dramatically, especially after the implementation of NAFTA. In 1997,

8 In the Canadian context, see Don J. DeVoretz, ed., *Diminishing Returns: The Economics of Canada's Recent Immigration Policy*, Policy Study no. 24 (Toronto: C.D. Howe Institute and the Laurier Institute, 1995). For a global perspective, the most notable earlier work is Walter Adams, ed., *The Brain Drain* (New York: Macmillan, 1968).

9 Supra footnote 3, at 199-200.

10 Ibid., at 199.

Figure 1 Total Emigration of Highly Skilled Canadians to the United States, 1986-1997^a (Based on Number of Visas Issued)



Note: Of those Canadians who go to the United States as students, some 5 percent change their status to permanent immigrants. They are included in these charts according to their proportions in different occupational categories.

^a The TN visa number for 1997, which is 75 percent of total highly skilled Canadian emigrants to the United States, is from the US Immigration and Naturalization Service (supplied by the Department of Foreign Affairs and International Trade, Ottawa). Numbers for permanent emigrants are also from the US Immigration and Naturalization Service. Other numbers are estimates.

Sources: Estimates by the author using the following: Statistics Canada (presentations by Ivan Fellegi and Scott Murray), "Brain Drain or Brain Gain?"; US Immigration and Naturalization Service, *INS Tapes and Statistical Yearbook of the Immigration and Naturalization Service* (various years); Don DeVoretz and Samuel A. Laryea, *Canadian Human Capital Transfers: The United States and Beyond*, Commentary no. 115 (Toronto: C.D. Howe Institute, October 1998); and Industry Canada, "Perspective on the 'Brain Drain'" (draft), December 1998.

non-permanent visas accounted for 94 percent of the total number of visas issued, a significant outflow of Canadian professionals to the United States, as compared to 77 percent in 1986. The numbers of permanent and non-permanent emigration (based on visas issued) jumped from 17,000 in 1988 to 98,000 in 1997. Again, this growth is largely attributable to the non-permanent category.

In order to eliminate the problem of multiple counting, particularly for those individuals who renew their non-permanent visa before it expires, the study attempts to convert the number of emigration visas into the actual number of Canadians who moved to the United States. Based on a series of conservative assumptions, the estimate shows that in 1997, about 35,000 Canadian professionals moved to the United States. This overall trend is the same as presented in figure 1 (based on the number of visas issued), and it is supported by other statistics, such as the number of Canadians leaving the tax base (discussed below). Interestingly, Statistics Canada, in its reporting of "reverse record check,"

also shows that the total number of emigrants to the United States during the period 1991-1996 was about 180,000 or an average of 36,000 per year.¹¹ About 73 percent of these emigrants expressed no intention of returning to Canada.

Further, Statistics Canada's presentation of data compiled by the Canada Customs and Revenue Agency (formerly Revenue Canada) shows that in 1997, 29,000 Canadians who were living and working in the United States ceased filing tax returns in Canada.¹² In compliance with Canadian tax law, any Canadian who is gainfully employed in the United States must continue to file income tax returns in Canada, unless the person ceases to be a "resident" of Canada. Qualification for "non-resident" status involves fulfilling certain requirements, which include relocation of family members outside Canada and disposal of all Canadian assets. By inference, the number of emigrant professionals in 1997 would likely include most of the 29,000 who ceased filing and others who worked in the United States and continued to file Canadian tax returns. Moreover, the 1997 figures support the growing emigration trend: approximately 29,000 Canadian workers ceased filing tax returns in Canada in 1997 as compared to 15,000 in 1991.

Figure 2 examines the impact of the FTA/NAFTA on emigration in key occupational categories (based on number of visas issued). For each occupational group, data are divided among three periods: 1986-1988 (pre-FTA), 1989-1993 (during the FTA), and 1994-1997 (post-NAFTA). Within each category, growth in emigration accelerated after the trade agreements were implemented. In fact, during the pre-FTA period, there was either negligible growth or even a decline in emigration. The FTA resulted in a significant overall increase in emigration, with various other factors such as the crisis in health care contributing in the case of physicians and nurses. NAFTA resulted in a sharp increase for all groups of emigrants in knowledge areas.

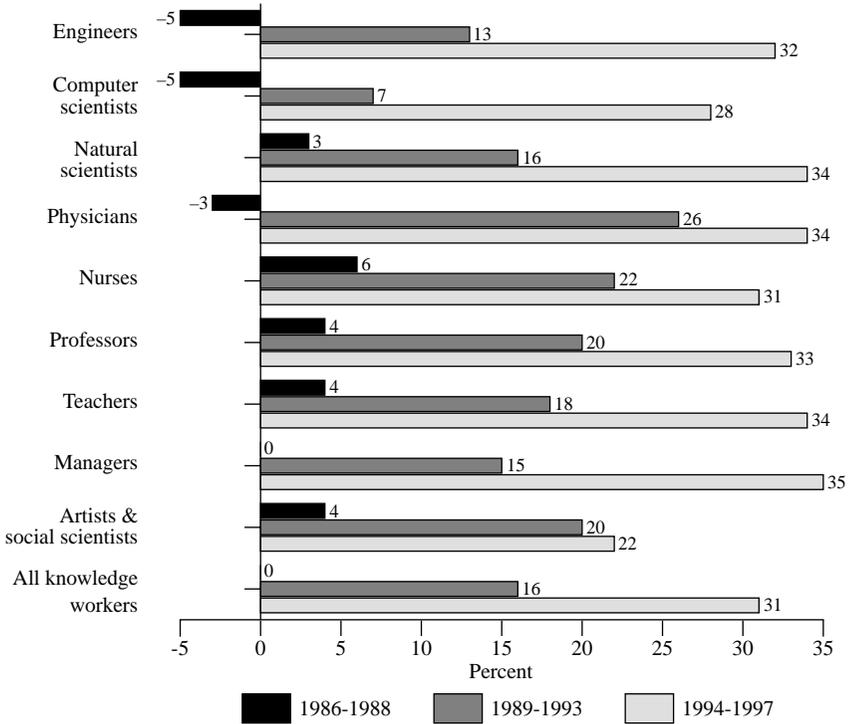
When this rapid growth in the emigration of highly skilled Canadians to the United States is viewed in the context of the overall Canadian labour force, the potential for significant negative economic repercussions becomes evident (see figure 3). In 1986, for example, less than 3 percent of Canada's natural scientists emigrated to the United States. By 1996, the proportion had increased to nearly 11 percent. The proportion of physicians, nurses, and engineers pursuing careers south of the border also recorded significant growth.¹³ Since professionals in these categories are leaving Canada at a rate higher than their rate of entry into the Canadian labour force, the country's pool of human capital is diminishing.

11 Supra footnote 2.

12 Ibid.

13 According to the HRDC/Statistics Canada study, *South of the Border*, supra footnote 5, at 6, masters and PhD graduates were overrepresented among those who emigrated. Graduates in health, engineering, and mathematics dominated the numbers who moved (ibid., at 8).

Figure 2 Average Annual Growth in Emigration of Highly Skilled Canadians^a to the United States, 1986-1997



^a Includes both permanent and non-permanent emigrants.

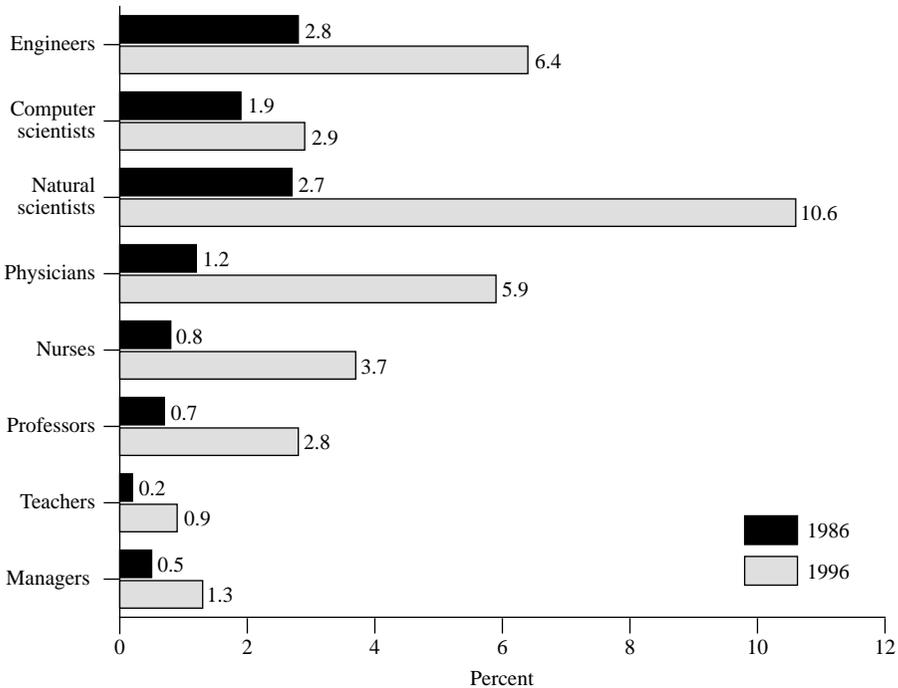
Sources: Estimates by the author using the following: Statistics Canada (presentations by Ivan Fellegi and Scott Murray), "Brain Drain or Brain Gain?"; US Immigration and Naturalization Service, *INS Tapes and Statistical Yearbook of the Immigration and Naturalization Service* (various years); and Don DeVoretz and Samuel A. Laryea, *Canadian Human Capital Transfers: The United States and Beyond*, Commentary no. 115 (Toronto: C.D. Howe Institute, October 1998).

CAUSES FOR EMIGRATION

Despite the attraction of better economic opportunities, migration in general is costly in both monetary and psychological terms. Relocation in a distant country with alien traditions, language, and culture presents the newcomer with the risk of being excluded from the mainstream. This difficulty is greatly diminished for migrants between Canada and the United States. Similarities between the two countries open an easier path to relocation.

In addition, with the advent of the Internet, people who are considering emigration can collect valuable information on the key factors associated with the decision to move—tax rates, salary range, cost of living, housing, education facilities, and quality of life. Information supplied by relatives and friends provides further support to the decision to move.

Figure 3 Total Emigration of Highly Skilled Canadians to the United States as a Percentage of Canada's Labour Force, 1986 and 1996



Sources: Estimates by the author using the following: Statistics Canada, catalogue no. 93-327; Statistics Canada (presentations by Ivan Fellegi and Scott Murray), "Brain Drain or Brain Gain?"; US Immigration and Naturalization Service, *INS Tapes and Statistical Yearbook of the Immigration and Naturalization Service* (various years); and Don DeVoretz and Samuel A. Laryea, *Canadian Human Capital Transfers: The United States and Beyond*, Commentary no. 115 (Toronto: C.D. Howe Institute, October 1998). Labour force data are estimates from Statistics Canada, catalogue no. 93-327.

Most emigrants are young.¹⁴ They are at a stage in their lives when they can move without the burden of many family responsibilities. Also, there has been an important attitude shift across generations. In this era of globalization and economic opportunism, many younger people are willing or even eager to relocate in another country.

Surveys by various research and business organizations invariably identify the same reasons for emigrating to the United States (though not necessarily in the same order): higher salary, paid in US dollars; more growth opportunities; expo-

¹⁴ See "The Lure of the US Hitech Job," *Inside*, prepared by Personal Systems (Ottawa, no. 1 April 1999).

sure to leading-edge technology; lower taxes; better management; and even a warmer climate. But surveys have limitations: questionnaire bias, restricted sample size, limited time frame, and questionable statistical validity. A more comprehensive study requires historically consistent national data on differences in earnings, employment opportunities, and taxes between the two countries, which are often considered to be the main factors responsible for brain drain. These data are presented in figures 4, 5, and 6.

Until the mid-1980s, earnings in Canada were close to those in the United States. In some cases (for example, for nurses and teachers), they were even higher. From 1990 onward, Canada has lagged in the growth of earnings, and the gap between the two countries has been widening (figure 4). In recent years, the discrepancy has been particularly apparent in the computer science, engineering, medicine, and university teaching professions. The difference in job opportunities in the two countries is best reflected by the gap in their respective unemployment rates (figure 5). After 1988, the gap in the unemployment rate narrowed between the two countries. Then it widened. In recent years, the gap has been stable, but there is still a significant difference in the unemployment rates of the two countries. The tax wedge, or difference in the level of tax burden, is often mentioned as the key reason for brain drain. The ratio of tax to gross domestic product (GDP) has been consistently higher in Canada than in the United States since the 1960s, but again the gap widened in the 1990s (figure 6).

Growth Opportunity

Compared to Canada, the United States has a GDP that is 11 times higher and a population that is 9 times larger. It accounts for 27 percent of world output, 16 percent of world trade, and 25 percent of world foreign direct investment.¹⁵ It is the hub of international financial activities and world technological breakthroughs. Therefore, by inference, the United States also offers a higher level of learning and growth opportunities. This superiority is particularly evident in the knowledge areas, as demonstrated by the level of research and development (R & D) (the ratio of R & D expenditure to GDP being 1.66 in Canada as against 2.62 in the United States) and the concentration of researchers (5.4 per thousand of labour force in Canada as against 7.4 per thousand in the United States).¹⁶

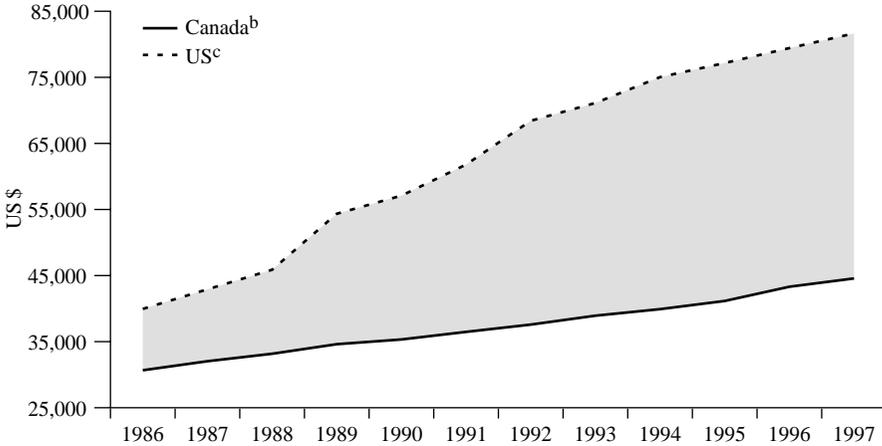
Gap in Personal Taxes

Since the gap in personal taxes between the two countries could be one of the main motivations for emigration, an in-depth examination is presented here. It

15 Organisation for Economic Co-operation and Development, *Main Economic Indicators* (Paris: OECD, April 1999).

16 Organisation for Economic Co-operation and Development, *OECD Science and Technology Indicators* (Paris: OECD, 1998).

Figure 4 Average Incomes for Professionals,^a Canada and the United States, 1986-1997



Note: Canadian earnings are converted into US \$ using purchasing power parity rate.

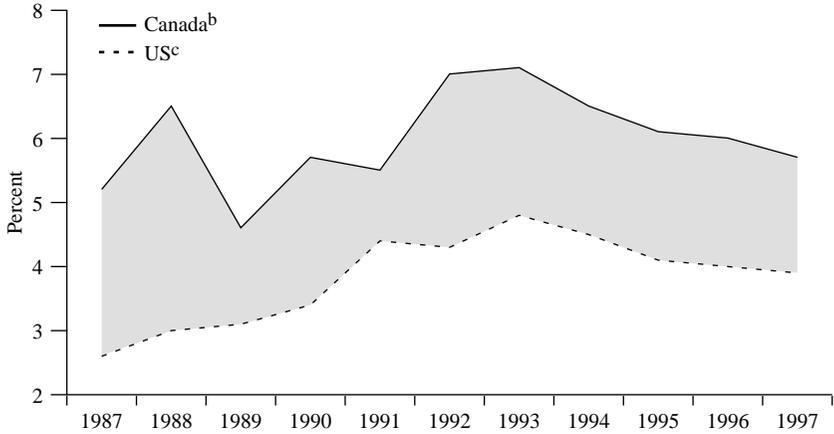
^a Average of average incomes of engineers, computer scientists, professors, teachers, physicians, nurses, and managers. ^b Canada: an average of average incomes of Alberta, Nova Scotia, Ontario, and Quebec. Average incomes for cities were not available. ^c United States: an average of average incomes of Chicago, Houston, Los Angeles, Miami, New York City, and San Jose. For San Jose, the average is only for the period from 1991 onward.

Sources: Estimates by the author using the following: Statistics Canada, 1996 Census, 93F0029XDB96004; Census, *Employment Income by Occupation (The Nation)*, catalogue no. 93-332; (1997), vol. 4, no. 1 *Education Quarterly Review*, catalogue no. 81-003-XPB; *Labour Force Update*, 1998, catalogue no. 71-005-XPB; Marie Lavoie and Ross Finnie, "Science and Technology Careers in Canada: Analysis of Recent University Graduates" (1997), vol. 4, no. 3 *Education Quarterly Review*, catalogue no. 81-003-XPB; US Department of Commerce, *1998 Statistical Abstract*; US Bureau of Labor Statistics, *Employment and Wages*; and US Bureau of the Census, *Current Population Reports*.

focuses 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, medicare), sales tax, property tax, and private health care cost in the United States. It examines the tax burden of households with three levels of income—\$50,000, \$100,000, and \$250,000—in six Canadian cities (Calgary, Halifax, Montreal, Ottawa, Toronto, and Vancouver) and six US cities (Charlotte, North Carolina; Chicago; Houston; Jacksonville, Florida; Los Angeles; and New York City), where many skilled emigrants reside. All income and tax calculations are based on national currencies (that is, in Canadian dollars for Canada and in US dollars for the United States).

It is clear (see figure 7) that, overall, taxes are higher in Canada than in the United States. For example, a person who earns \$50,000 pays 36.8 percent of gross income in various taxes in Canada compared with 31.7 percent in the

Figure 5 Unemployment Rates for Professionals,^a Canada and the United States, 1987-1997



^a Average of unemployment rates of engineers, computer and natural scientists, professors, teachers, physicians, nurses, managers, and social scientists. ^b Canada: an average of unemployment rates in Calgary, Halifax, Montreal, Ottawa-Hull, Toronto, and Vancouver. ^c United States: an average of unemployment rates in Chicago, Houston, Los Angeles, Miami, and New York City.

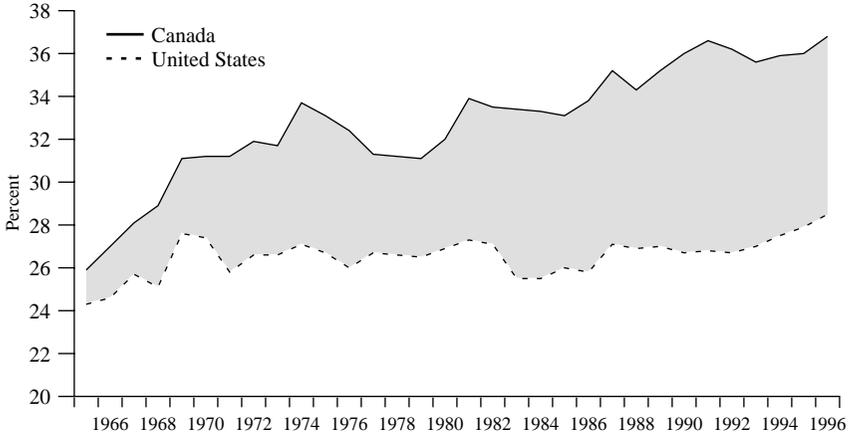
Sources: Estimates by the author using the following. For Canada: Statistics Canada, *Historical Labour Force Statistics*, 1997, catalogue no. 71-201-XPB; and Marie Lavoie and Ross Finnie, "Science and Technology Careers in Canada: Analysis of Recent University Graduates" (1997), vol. 4, no. 3 *Education Quarterly Review*, catalogue no. 81-003-XPB. For the United States: US Bureau of Labor Statistics, *Employment and Wages*; and US Department of Commerce, *1998 Statistical Abstract*.

United States (a gap of 5.1 percentage points). This suggests that, from a taxation viewpoint, even lower income earners can benefit from moving to the United States. As income increases, the gap widens. At the \$250,000 level, the total tax payment rises to 41.2 percent of gross income in Canada but amounts to only 29.7 percent in the United States (a gap of 11.5 percentage points). The major reason for this gap is the high income tax and surtax in Canada, especially at the provincial level. Although taxes related to social security are significantly higher in the United States, their weight in the overall tax burden is low. Property tax also is relatively higher in the United States. Sales tax, on the other hand, is high in Canada, largely because there is no US federal tax equivalent to the goods and services tax.

Econometric Analysis

The purpose of econometric analysis in this context is to establish a link between emigration and the factors responsible for it. The analysis indicates that economic factors like earnings, taxes, and job opportunities influence the decision of highly skilled Canadians to emigrate to the United States.

Figure 6 Total Tax Revenue as a Percentage of GDP, Canada and the United States, 1965-1996



Source: Organisation for Economic Co-operation and Development, *Revenue Statistics, 1965-97* (Paris: OECD, 1998).

$$\text{Emigration} = 0.46 * (\text{income gap}) + 2.09 * (\text{tax gap}) + 0.16 * (\text{unemployment gap})$$

t-value (5.12) (4.48) (1.41)

R-squared = 0.72 Durbin-Watson = 1.95 Pooled data, number of observations = 48

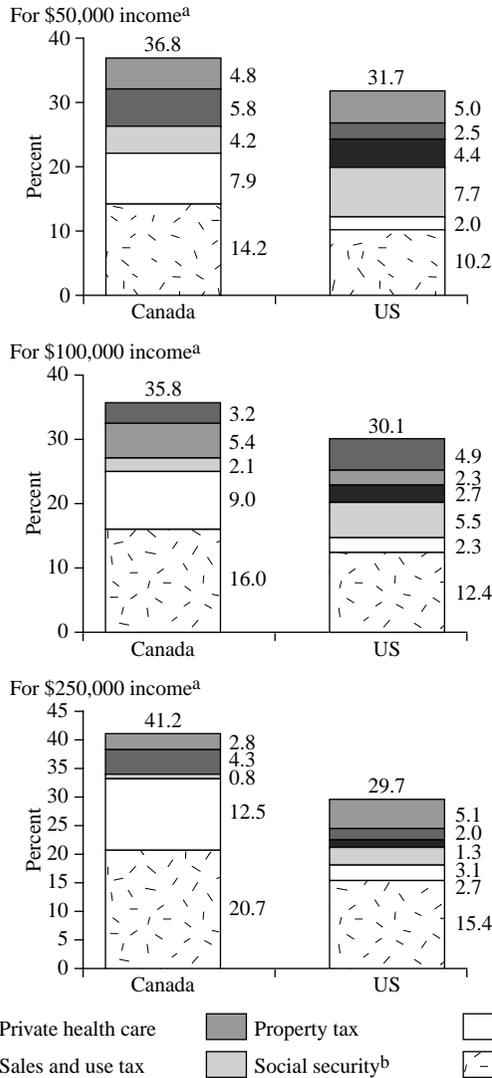
According to regression estimates (based on annual observations of a cross-section of data, 1986-1997), a \$2 increase in the gap between incomes in Canada and the United States, with the effects of all other variables held constant, will result in the emigration of one more highly skilled Canadian to the United States. Also, a 1 percent increase in the existing tax gap (measured by the ratio of total tax revenue to GDP) can push 2 percent more Canadians toward the United States.¹⁷

CONCLUSIONS

We can debate the actual numbers associated with brain drain and the methods used for their estimation. However, we cannot minimize the significance of the emerging trend: brain drain is rising and perhaps at an increasing rate. In a NAFTA environment, it would be shortsighted to exclude temporary emigration numbers. Given the convenience, flexibility, and opportunity, increasing numbers of Canadian professionals have been taking the temporary emigration route rather than relying on the costly and time-consuming traditional method of migrating on a permanent basis.

17 These results are meant to provide a guideline to the relationship between brain drain and the various factors that influence it. They should be interpreted with caution and not taken literally.

Figure 7 Total Taxes in Canada and the United States, 1998



Note: A household of two adults and two children, tax filed jointly for 1998 tax year. Canada: average of Calgary, Halifax, Montreal, Ottawa, Toronto, and Vancouver. United States: average of Charlotte, North Carolina; Chicago; Houston; Jacksonville, Florida; Los Angeles; and New York City (Queens).

^a Canada in Cdn.\$ and United States in US\$. ^b Includes Canada/Quebec Pension Plan and employment insurance in Canada; FICA (Federal Insurance Contribution Act) and OASDI (old age, survivors, and disability insurance), medicare, and private health care in the United States.

Sources: Estimates by the author using the following: Karin Treff and David B. Perry, *Finances of the Nation, 1998* (Toronto: Canadian Tax Foundation, 1999); *Canadian Master Tax Guide* (North York, Ont.: CCH Canadian, 1998); *US Master Tax Guide* (Chicago: CCH Inc., 1998); and US Department of Commerce, *Statistical Abstract of the United States*.

A significant increase in the number of Canadian professionals emigrating to the United States is not surprising. All economic factors, such as higher income, better employment opportunities, and lower taxes, have consistently been weighted in favour of the United States. The regression analysis performed in this study suggests that Canadian professionals respond to these economic factors in a strong way.

In addition, the emotional and psychological barriers that used to keep Canadians at home are now much less relevant. The health care and welfare systems, a hallmark of Canadian distinctiveness, similarly do not carry much weight. Indeed, the professionals who are moving to the United States can afford to buy the services they need with the new wealth they are acquiring. For many professionals, the cost of health care is covered by their US employer.