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# Education Quarterly Review

2000, Vol. 6, no. 3

- Brain drain and brain gain
- Pathways to the United States



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Statistics Canada  
Culture, Tourism and the Centre for Education Statistics

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2000, Vol. 6, no. 3

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## Symbols

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The following standard symbols are used in Statistics Canada publications:

- .. figures not available.
- ... figures not appropriate or not applicable.
- nil or zero.
- amount too small to be expressed.
- <sup>p</sup> preliminary figures.
- <sup>e</sup> estimate.
- <sup>r</sup> revised figures.
- x confidential to meet secrecy requirements of the Statistics Act.

From the

# Editor-in-Chief

## Mission

*Education Quarterly Review* analyses and reports on current issues and trends in education using information from a variety of statistical sources. It serves as a focal point for education statistics and provides a forum for communication with stakeholders and the public. Our goal is to present information and analysis that are relevant, authoritative, timely and accessible.

**F**ew topics addressed in past issues of *EQR* have raised more interest than the issue of the “brain drain or brain gain” of skilled Canadian workers. As with all research in the social sciences, the issues relating to the magnitude and nature of the emigration of knowledge workers from Canada to the United States and other countries are complex. What do we know about the reasons for which highly skilled workers leave Canada? Is suitable work not available to these workers? What is the impact of higher after-tax earnings south of the border? What effects have changes to U.S. immigration policy and freer trade had on the movement of skilled workers between these two countries? Answers to these questions are of great interest to all Canadians: Postsecondary graduates want to know where the jobs are, and as important, how well the available jobs match their skills. Universities and other postsecondary institutions are and will be impacted by the changing nature of the workforce, and course offerings must continue to meet the requirements of the public and private sector while maintaining a core curriculum that extends our knowledge in both the sciences and humanities. The financial impact of the loss of skilled workers is also of interest to provincial and federal governments as they struggle to balance their budgets and reduce debt.

We offer two analytical articles that tackle the complex issues and questions surrounding the loss of skilled workers to knowledge-based occupations in the United States, and the gain of knowledge workers from the United States and the rest of the world. What have we found? Yes, there is a brain drain of skilled workers to the United States, but we gain fourfold from worldwide sources. Is this overall gain similar for all occupations? No—health-related occupations suffer brain drain to the United States that is not overcome by gains from the rest of the world. What do we know about the size of the outflow of knowledge workers, and the permanency of their moves? This is an area that requires further study—the “brain drain–brain gain” issue is by no means settled. We will continue to study available empirical

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data in this area in order to expand our knowledge about the nature and impact of the movement of skilled workers to and from Canada.

In addition to these papers, please refer to the **Cumulative Index** at the back of the report, where we list nearly 90 articles that have appeared in *EQR* over its more than six years of production. These articles have been grouped under 11 categories, including funding, technology and learning, and accessibility. These categories

are based on education policy issues that were identified in the report *Strategic Plan (1997)*, released in November 1997, one year after the creation of the Centre for Education Statistics. The *Strategic Plan* reviews the Centre's statistical program and identifies objectives and priorities required to strengthen the program to better address information needs. *Strategic Plan (1997)* is available free of charge on the Internet at [www.statcan.ca/cgi-bin/downpub/freepub.cgi](http://www.statcan.ca/cgi-bin/downpub/freepub.cgi).



# Highlights

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## Brain drain and brain gain

- During the 1990s Canada suffered a net loss of skilled workers to the United States in several economically important occupations, although the numbers involved have remained small in an historical sense and small relative to the supply of workers in these occupations.
- Compared with the general population, emigrants are over-represented among better-educated, higher-income earners and individuals of prime working age. Further, there was an upward trend during the 1990s in the number of people leaving Canada for the United States and other countries.
- While losses of highly skilled workers to the United States accelerated during the 1990s, so too did the influx of highly skilled workers into Canada from the rest of the world. This is particularly true of high-technology industries where immigrant workers entering Canada outnumber the outflow to the United States by a wide margin.
- Emigrants to the United States are more than twice as likely to hold a university degree than are immigrants to Canada. However, because of the overall greater number of immigrants, there are four times as many university graduates entering Canada from the rest of the world as there are university degree holders of all levels leaving Canada for the United States.
- The number of master's and doctoral graduates alone entering Canada from the rest of the world is equal to the number of university graduates at all levels leaving Canada for the United States.

## Pathways to the United States

- The movement of graduates from the class of 1995 to the United States was relatively small. Only 1.5% of the more than 300,000 men and women who graduated from a Canadian postsecondary institution in 1995 moved to the United States between graduation and the summer of 1997.



- Master's and PhD graduates were overrepresented among the approximately 4,600 graduates who relocated to the United States, as were health, engineering and applied sciences graduates. Nearly one in five of the graduates who moved worked as a nurse upon arrival in the United States.
- About 360 (12%) of the 3,000 PhD graduates from the class of '95 moved to the United States. Most of the PhD graduates who moved (84%) were Canadian citizens (58% were Canadian by birth). The remainder were landed immigrants or foreign students.
- Those who relocated to the United States reported above-average grades. About 44% ranked themselves in the top 10% of their graduating class in their field of study. In addition, graduates who moved were somewhat more likely than their comparable counterparts who remained in Canada to have received scholarships or other academic awards. It would appear that those who moved tended to be high-quality graduates.
- In addition to economic forces, social factors played a compelling role in motivating some people to move. More than half of the 1995 graduates who relocated (57%) did so mainly for work, and another 23% for education purposes. But about 17% relocated for marriage or relationships—by far the majority of these were women.
- Compared with graduates who remained in Canada, those who moved to the United States tended to find work that was more closely related to their fields of study, required higher skill levels and were paid higher salaries. Much of this report analyses the graduates' work experiences in detail. For example:

After taking inflation and purchasing power parity into account, the median annual earnings of bachelor's graduates working in applied and natural sciences jobs upon arrival in the United States was \$47,400, considerably higher than the \$38,400 earned by their counterparts in Canada. The gap in salaries between bachelor's graduates in health occupations was similar.

EOR

# Articles

## Brain Drain and Brain Gain: The Migration of Knowledge Workers from and to Canada

### Abstract

This paper examines available empirical evidence about the ‘brain drain’—the loss of knowledge workers from Canada to the United States, and about the ‘brain gain’—the gain of knowledge workers in Canada from the rest of the world. This evidence leads to the general conclusion that during the 1990s Canada suffered a net loss of skilled workers to the United States in several economically important occupations, although the numbers involved have remained small in an historical sense and small relative to the supply of workers in these occupations. Compared with the general population, however, emigrants are overrepresented among better-educated, higher-income earners and individuals of prime working age. Further, there was an upward trend during the 1990s in the number of people leaving Canada for the United States and other countries.

While losses of highly skilled workers to the United States accelerated during the 1990s, so too did the influx of highly skilled workers into Canada from the rest of the world. This is particularly true of high-technology industries where immigrant workers entering Canada outnumber the outflow to the United States by a wide margin. Indeed, immigrant high-technology workers represented an important part of employment expansion in these industries in the 1990s. Evidence also suggests that the labour market does not discern a quality difference between immigrant and native-born high-technology workers, as estimated life-time earnings of immigrant versus Canadian-born computer scientists are nearly identical.

Emigrants to the United States are more than twice as likely to hold a university degree than are immigrants to Canada. However, because of the overall greater number of immigrants, there are four times as many university graduates entering Canada from the rest of the world as there are university degree holders of all levels leaving Canada for the United States. The number of master’s and doctoral graduates alone entering Canada from the rest of the world is equal to the number of university graduates at all levels leaving Canada for the United States.

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## 1. BACKGROUND

The Canadian economy experienced a rapid increase in the demand for skill and knowledge in the 1990s (HRDC and OECD 1998). Virtually all job creation occurred in knowledge-based occupations—professional, managerial and technical. The employment rate among highly educated individuals (that is, the percentage employed) is much higher than among less educated people, and this gap is widening. Between 1989 and 1998, knowledge-based occupations gained 780,000 workers, while employment in most non-knowledge-based occupations declined (Graph 1). The employment rate of people with Grade 8 education or less fell from 60% in 1989 to less than 50% by 1998. On the other hand, the employment rate of people with a university education held steady at about 87%, even during the recession of the early 1990s (see Graph 2).

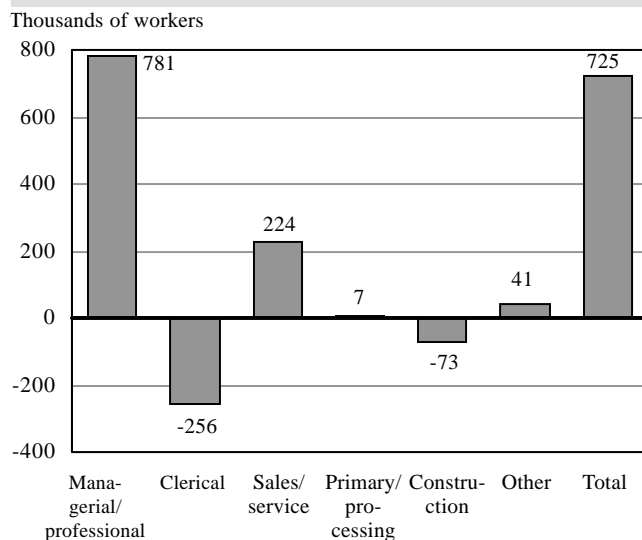
Partly in response to this increase in demand for higher levels of skill and education in the labour force, Canada has made huge additions to the stock of human capital. Both the incidence and average duration of initial education have increased to the point where Canada has

one of the most educated populations in the world (Graph 3). The students who flow out of the Canadian education systems and into the labour market are relatively highly qualified when compared with other countries' or with previous Canadian cohorts. Analysis performed by Human Resources Development Canada suggests that Canada does not suffer from any large-scale skill shortages at the aggregate level (Gingras and Roy 1998). However, this success comes at a cost—in 1995 Canada spent 7.0% of gross domestic product (GDP) on education, well above the mean of 5.6% for OECD countries.

Despite this positive picture at the aggregate level, it is clear that imbalances between the supply of and demand for skill exist in particular industries and occupations. For example, the Software Human Resources Council of Canada estimated a shortage of 20,000 computer programmers (Parsons 1996), paralleled by an estimate of 190,000 vacancies in the information technology sector in the United States (Miller 1997).

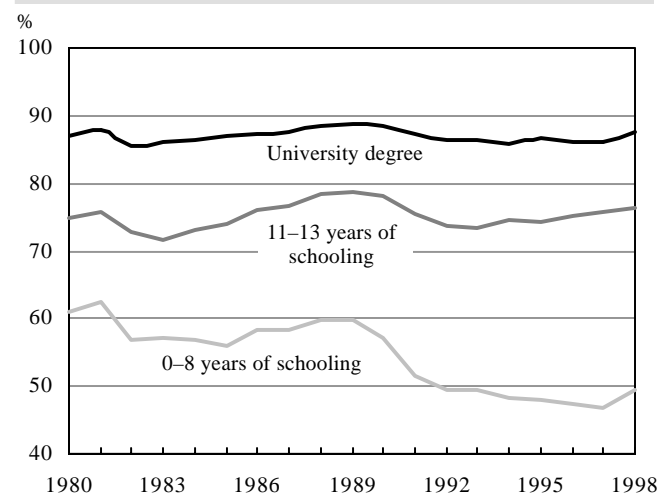
In this context we turn to the statistical evidence of the posited brain drain to the United States.

**Graph 1**  
**Change in full-time employment by occupation, 1989–1998**



**Source:** Statistics Canada, Labour Force Survey.

**Graph 2**  
**Employment rate<sup>1</sup> by level of education, 25–44 age group**



**Notes:**

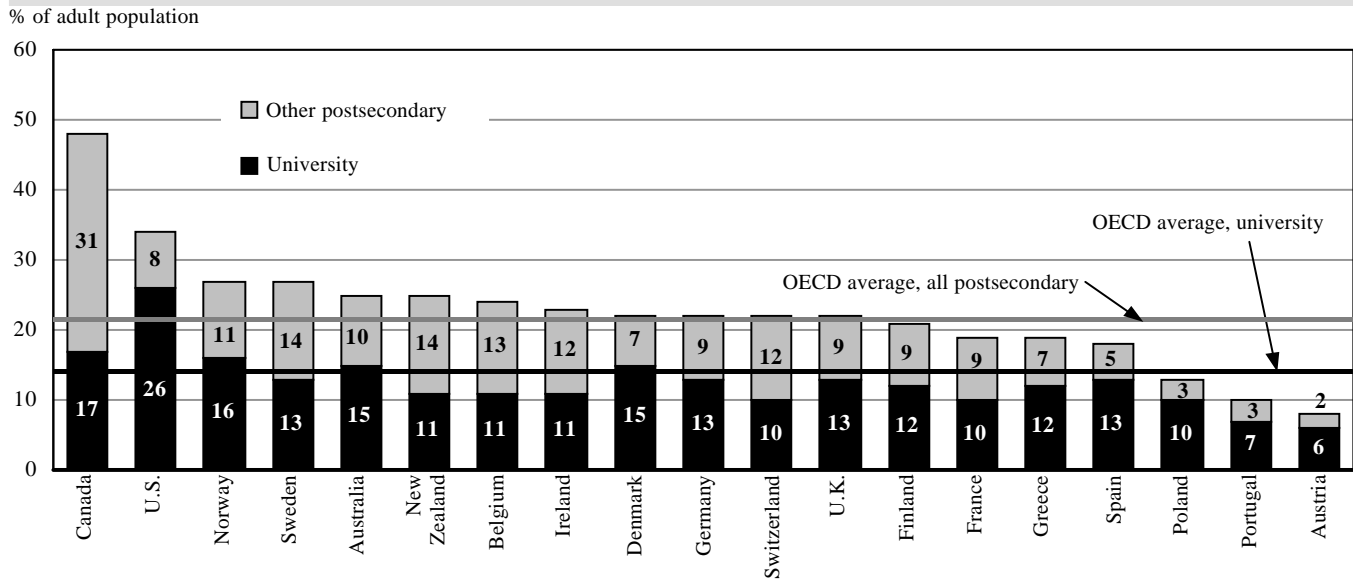
See Table 1.

1. Percentage who are employed.

**Source:** Statistics Canada, Labour Force Survey.



Graph 3  
**Percentage of population aged 25–64 who completed university or other postsecondary education, OECD countries, 1996**



Source: *Education at a Glance: OECD Indicators 1998*.

## 2 EMIGRATION FROM CANADA

### 2.1 Total emigration (permanent and temporary) to the United States

Traditionally, most people leaving Canada for the United States applied for permanent immigration. Temporary visas had limitations, such as restrictions on the number of renewals possible.

However, under the North American Free Trade Agreement (NAFTA), Canadian workers in qualifying professional occupations can readily gain entry into the United States, needing only to show proof of their qualifications and a job offer from an employer in the United States. Further, while the maximum validity for NAFTA visas is one year, there is no limit on the number of renewals. Hence, under NAFTA there may be more people remaining in the United States for an extended period of time without converting to permanent resident status. One might expect that a large increase in temporary migration (if it were a precursor to staying on in the United States) would eventually lead to a noticeable increase in permanent migration to the United States. The stability of the data on permanent emigration (1997 being the most recent year for which data are available) suggests we are not as yet witnessing such conversions on a large scale.

For these reasons, it is important to examine both permanent and temporary migration when estimating the magnitude and characteristics of outflow from Canada to the United States. The U.S. Immigration and Naturalization

Service (INS) provides reliable information on permanent migration from Canada to the United States. However, its data on temporary migration, while meeting the administrative purposes for which they were designed, do not provide a reliable count of people leaving Canada to live in the United States on a temporary basis. The limitations of these data are discussed in Section 2.1.3.

#### 2.1.1 The magnitude of total emigration to the United States—consistent estimates from three data sources

Three sources of information exist on total migration from Canada to the United States (See Box on page 11). All of these sources have limitations. The estimates of both the U.S. Current Population Survey and the Reverse Record Check are subject to relatively high levels of sampling error. The tax data results are based on all filers, but without identification of the destination of movers, whether to the United States or elsewhere. However, it is possible to derive upper and lower bounds for tax filers who moved to the United States. The methodologies of these estimates are detailed in this section.

To reduce the sampling error of the CPS estimates, an estimate of the average number of Canadian-born people entering the United States per year during the 1990s has been constructed using CPS results from 1994 to 1999. According to the survey, in March 1994, 104,000 Canadian-born people had been living in the United States

## Data Sources on Total Emigration

*Current Population Survey (CPS):* The CPS is a monthly survey of U.S. labour market conditions, carried out by the Bureau of the Census on behalf of the Bureau of Labour Statistics. Since 1994, a supplementary survey is conducted in March, profiling the characteristics of foreign-born people residing in the United States. This survey provides an estimate of the number of Canadian-born people who entered the United States during the 1990s and were still living there each year from 1994 to 1999. The CPS includes people whose usual place of residence for a period of six months or longer is the United States, and as such does not include people in the United States for shorter durations.

*Reverse Record Check (RRC):* The RRC is the means by which Statistics Canada estimates coverage in the Canadian Census of Population. The 1996 RRC included a sample of people residing in Canada at the time of the 1991 Census, as well as a sample of people entering Canada since the 1991 Census. Sampled individuals were contacted to establish where they had resided at the time of the 1996 Census. Those residing in Canada ought to have been included in the 1996 Census, hence among this group, those missed in the census provided an estimate of undercoverage in the census. A by-product of the RRC is an estimate of people who were living in Canada at the time of the 1991

Census or who entered Canada between 1991 and 1996, and who were residing in the United States at the time of the 1996 Census. The survey identifies (through a direct question) whether those who moved to the United States did so on a temporary or permanent basis.

Permanent movers are people who, at the time of the census, had left Canada with no intention of returning, as well as those who had resided outside Canada for at least two years but whose intentions about returning were unknown. Temporary movers are people who, at the time of the census, had resided outside Canada for at least six months with the intention of returning, or had resided outside Canada for no more than two years if their intentions were unknown.

*Canadian Personal Taxation Data:* All people receiving income from Canadian sources are required to file a Canadian tax return, including people leaving Canada during the tax year in question. For those moving from Canada, the date of departure but not the destination is captured on the tax form. For an income profile of movers in 1996 (the most recent year for which such data are available), we need to examine those who also filed tax returns in 1995 to capture a full year's income. About 96% of 1996 movers filed tax returns in 1995, hence this group is quite representative of 1996 movers.

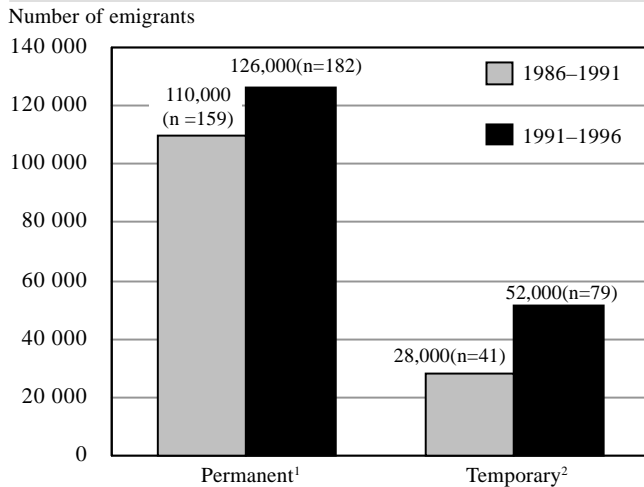
since January 1990. The implied annual outflow of people still residing in the United States over this period of four years and two months is 24,000. Similarly, the implied annual outflows of Canadian-born people still residing in the United States as derived from the 1995 to 1999 Current Population Surveys are 24,000, 17,000, 16,000, 18,000 and 20,000, respectively (see Table 2). Taking an average of the estimates from these annual surveys, the number of the Canadian-born who moved to the United States each year during the 1990s and who continue to reside in the United States is estimated at 20,000.

This estimate does not include non-Canadian-born people moving from Canada to the United States. Since the 1950s, the U.S. Immigration and Naturalization Service data on permanent migration from Canada as the country of last permanent residence have been consistently 40% higher than figures on migration of Canadian-born people. Hence, adjusting the CPS-based estimate of 20,000 Canadian-born upwards by 40% yields 28,000 as the estimate of the annual number of people (both Canadian and foreign-born) moving from Canada to the United States and continuing to reside in the United States during the 1990s.

The CPS data indicate a significant increase in the number of the Canadian-born who were living in the United States in 1998 and 1999 and who entered during the 1990s, but these estimates are based on very small samples and subject to a high degree of sampling error. However, the implied annual flow based on these two years of CPS data (see above) is virtually the same as that based on CPS data for the entire 1994 to 1999 period.

According to the Reverse Record Check, an estimated 178,000 people left Canada between 1991 and 1996 and were residing in the United States in 1996. Of these, 126,000 people expected to remain permanently in the United States, and an estimated 52,000 expected to return to Canada (see Graph 4). The implied annual average emigration of people continuing to reside in the United States from 1991 to 1996 may be estimated at around 35,000, of which 70% expected to be permanent. Emigration was 30% higher than in the period from 1986 to 1991 as estimated from the previous RRC. Between the periods, permanent migration increased by 15%, while temporary migration doubled.

**Graph 4**  
**Emigrants from Canada to the United States, 1986–1991 and 1991–1996**



**Notes:**

*n* = sample size

1. Permanent emigrants are persons who, at the time of the census, had left Canada with no intention of returning, and those who had resided outside Canada for at least two years but whose intentions about returning were unknown.
2. Temporary emigrants are persons who, at the time of the census, had resided outside Canada for at least six months with the intention of returning, or had resided outside Canada for no more than two years if their intentions were unknown.

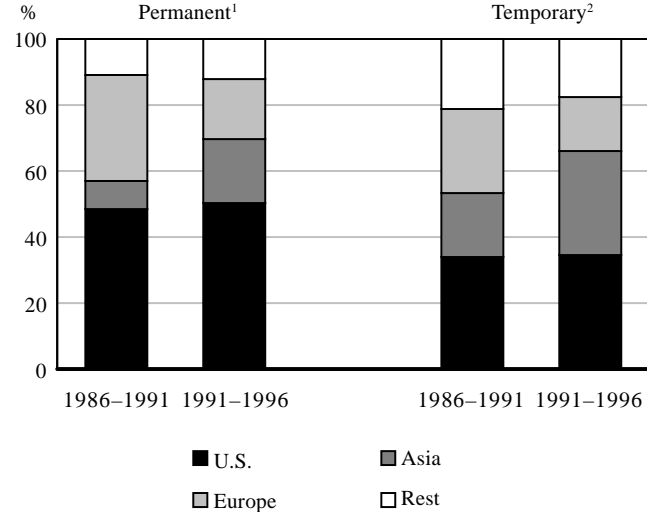
**Source:** Statistics Canada, Reverse Record Check Program, 1991 and 1996 Censuses.

The Reverse Record Check (RRC) reveals that between the two time periods, the share of emigrants to the United States remained constant, at half of all permanent emigrants and a third of all temporary emigrants. Over the same period, there was a noticeable shift from Europe to Asia in the destination of emigration. Among permanent emigrants, the Asian share increased from 9% to 19% while the European share dropped from 32% to 19% (see Graph 5). Among temporary emigrants, the Asian share increased from 20% to 31% and the European share dropped from 26% to 17%.

Canadian tax data provide estimates of the number of tax filers leaving Canada to all destinations during the 1990s. As these data are based on all tax filers and are therefore not subject to sampling errors, they provide a reliable trend over time in emigration of tax filers from Canada to all countries. It is worth noting, however, that tax filers need to identify themselves as movers, and there may be reasons (financial and otherwise) that could prompt filers not to make this declaration.

As shown in Graph 6, the data indicate that the number of tax filers who left Canada, whether permanently or temporarily, has increased steadily in recent years, from

**Graph 5**  
**Destinations of emigrants who left Canada, 1986–1991 and 1991–1996**



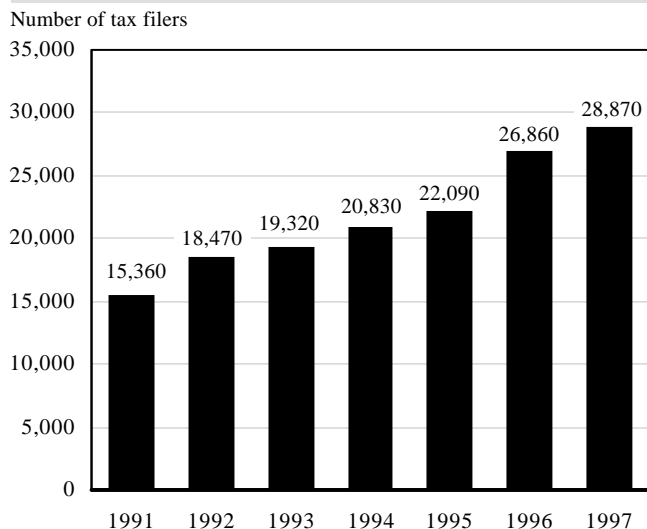
**Notes:**

See Table 3.

1. Permanent emigrants are persons who, at the time of the census, had left Canada with no intention of returning, and those who had resided outside Canada for at least two years but whose intentions about returning were unknown.
2. Temporary emigrants are persons who, at the time of the census, had resided outside Canada for at least six months with the intention of returning, or had resided outside Canada for no more than two years if their intentions were unknown.

**Source:** Statistics Canada, Reverse Record Check Program, 1991 and 1996 Censuses.

**Graph 6**  
**Tax filers who ceased to reside in Canada**




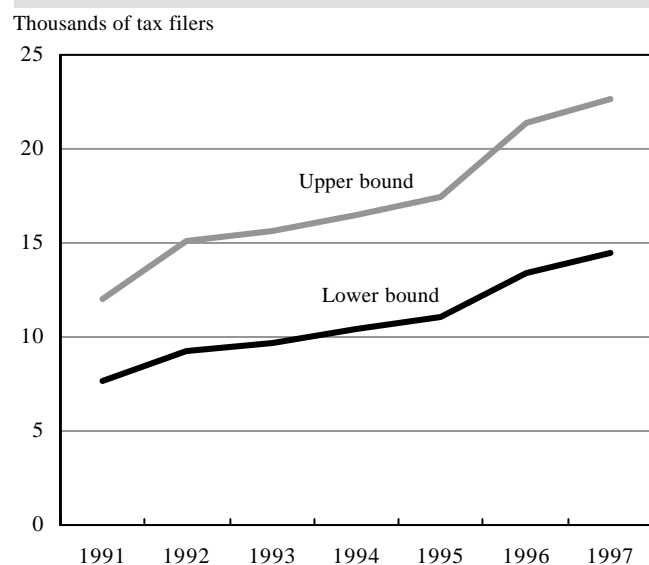
**Note:** Data based on Revenue Canada income tax files.

**Source:** Statistics Canada, Small Area and Administrative Data Division.

about 15,350 in 1991 to 28,900 in 1997, with an average of 21,700 per year. The only information available on the destinations of movers is the country from which the tax returns are filed, including a number filed from Canadian addresses. These filers may have used an accountant's or a relative's address in Canada to file their tax returns even though they are no longer residents of Canada, or they may have returned to Canada by the time of filing. Assuming that all tax filers who have filed from either a Canadian or U.S. address have moved to the United States yields an upper bound for tax filers who have moved to the United States. A lower bound on filers moving to the United States corresponds to half of tax filers leaving to all destinations; this is based on RRC estimates that between 1986 and 1996, half of all permanent migrants moved to the United States.

Graph 7 presents an estimate of the ranges of Canadian tax filers who may have moved to the United States between 1991 and 1997, under the above assumptions. The number of Canadian tax filers who moved to the United States can be estimated in the 8,000–12,000 range in 1991, increasing to the 14,000–23,000 range by 1997.

 **Graph 7**  
**Estimated number of tax filers who moved from Canada to the United States**



*Note:* Data based on Revenue Canada income tax files.

*Source:* Statistics Canada, Small Area and Administrative Data Division.

From the averages of the lower and upper bounds between 1991 and 1997, the average emigration of tax filers from Canada to the United States may be estimated

to lie between 11,000 and 17,000. Since the tax filer data on movers show a one-to-one ratio between filers and dependents, the average annual emigration to the United States may be estimated to lie between 22,000 and 34,000 over this period.

In summary, estimates from all three data sources are consistent, placing annual average emigration to the United States in the 1990s in the 22,000 to 35,000 range. This is about 0.1% of the Canadian population—much smaller than what Canada has experienced historically. Nevertheless, tax filer data do suggest that there is an upward trend in total emigration (both permanent and temporary) from Canada in the 1990s.

### 2.1.2 Profile of emigrants (age, education, income and industries)

#### Age profile

Tax filer data based on the 1995 income and age profile of tax filers who left in 1996 show movers to be disproportionately in the 25 to 44 age group—at entry and mid-career levels—when compared with all Canadian tax filers. Close to 10,000 of those who left in 1996 were aged 25 to 34, while another 7,000 were aged 35 to 44; together they accounted for about two-thirds of those who left Canada, compared with only 44% of all tax filers. Some 4,000 people aged 45 to 54 left, representing the same share of movers (12%) as of all tax filers.

The Current Population Survey provides a similar age profile of Canadian-born people residing in the United States and entering during the 1990s, as shown in Table 2. As with tax data, overall CPS results portray emigrants to the United States as disproportionately in the 25 to 44 age group, which comprises about two-thirds of all emigrants to the United States.

#### Education profile

Current Population Survey results show recent migrants to the United States possessed very high levels of education—higher than those of both the Canadian-born population and recent Canadian immigrants. Among migrants to the United States aged 16 and over, for the period 1994 to 1999, nearly half (49%) had a university degree. From the 1996 Census, comparable figures were 12% for Canadian-born people and 21% among Canadian immigrants during the 1990s.

The high proportion of well-educated Canadians entering the United States in recent years may be partly the result of NAFTA provisions. NAFTA has made it much easier for university-educated Canadians (and college graduates in a few computer-related occupations) to live and work in the United States on NAFTA temporary visas,

while not making entry into the United States any easier for less educated Canadians.

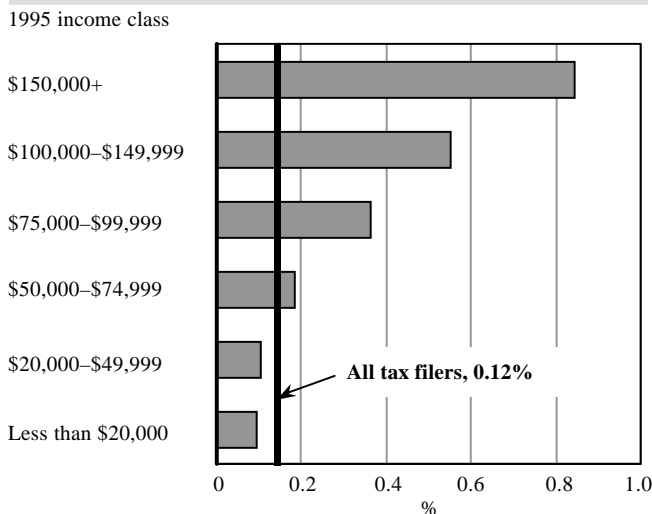
**Income profile**

Graph 8 gives the percentage of tax filers who left Canada in 1996 by 1995 income class. While movers represented only 0.1% of all tax filers, they were overrepresented among higher income earners. For example, tax filers who left Canada represented 0.9% of those reporting income of over \$150,000, and close to 0.6% of those with incomes between \$100,000 and \$149,999. Looking at this in

another way, movers were 7 times as likely as all tax filers to have incomes of over \$150,000 (4.0% of movers versus 0.6% of all tax filers). Similarly, movers were 5 times as likely to have incomes between \$100,000 and \$149,999 (4.0% of movers versus 0.9% of all filers).

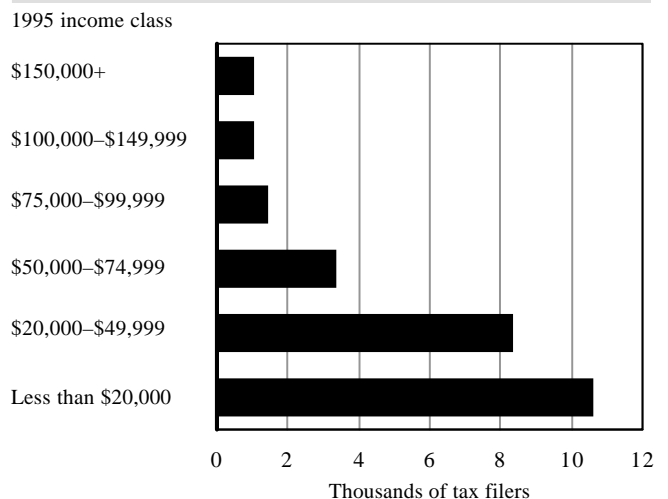
Graph 9 shows the number of tax filers who left Canada in 1996 by 1995 income class. Of the 25,700 who left, the majority, about 19,000, had incomes of less than \$50,000 in 1995, about 5,000 had incomes between \$50,000 and \$99,999, and a further 2,000 had incomes of \$100,000 or more.

**Graph 8**  
**Percentage of tax filers who ceased to reside in Canada in 1996**



**Notes:**  
See Table 4.  
Data based on Revenue Canada income tax files.  
**Source:** Statistics Canada, Small Area and Administrative Data Division.

**Graph 9**  
**Tax filers who ceased to reside in Canada in 1996**



**Notes:**  
See Table 4.  
Data based on Revenue Canada income tax files.  
**Source:** Statistics Canada, Small Area and Administrative Data Division.

**Data Sources on Industrial Sectors of Movers**

Data in this section are based on Revenue Canada T1 and T4 tax files and the Longitudinal Employment Analysis Program (LEAP) file, constructed by Business and Labour Market Analysis Division of Statistics Canada. The purpose of the LEAP file is to analyse the employment and income dynamics of employees in Canada, and the database includes a classification of employers by industry using the 1980 Standard Industrial Classification (SIC). The T1 file is built from individual tax returns to Revenue Canada, while the

T4 file is built from the T4 forms issued by employers concerning employees' income and deductions (CPP/QPP, EI, etc.). Linkage of these files has identified the SIC code of the employer of each individual. The SIC codes are associated with individuals' primary income in 1996. Two groups of tax filers were excluded in this linkage—individuals without any earned income and the self-employed who are not salaried employees.



Most of the analysis presented in this report examines brain drain and brain gain from the perspective of individuals. However, the issue can also be viewed from a business or industrial sector perspective. Such analysis is in its initial stages, using tax filer data (see Box on page 14). Industries (based on the 1980 Standard Industrial Classification codes) with the greatest number of movers in 1996 have been identified. Further analysis is planned to compare the industrial distribution of movers to that of all tax filers, in order to identify industries where movers are over-represented, and to examine trends over time.

The initial analysis (see Table 5) shows that, in 1996, 10 industries accounted for over one-fifth of the close to 27,000 movers. The industries with the most movers were Hospitals; University Education; and Elementary and Secondary Education. Also in the top 10 industries was a cluster of high-technology industries, including Architectural, Engineering and Other Scientific and Technical Services; Computer and Related Services; and Communication and Other Electronic Equipment. The other industries in the top 10 were Banks, Trust Companies and Credit Unions; Other Business Services; Federal Government Service; and Food Services.

In addition to the insights gained from an industrial perspective, this analysis also provides indirect information on the type of workers who are leaving. However the data need to be viewed cautiously. For example, not all movers employed by a university were necessarily full-time university professors; some may have been master's or doctoral students whose primary income was from teaching and/or research duties. Likewise, it would be wrong to assume all movers from high-technology industries are high-technology workers. Another limitation of the analyses undertaken thus far is the exclusion of the self-employed.

With these caveats in mind, this early work suggests that movers seem to be concentrated in knowledge-intensive industrial sectors. Most of the top 10 industries fall into high-knowledge industries as classified by Industry Canada (Lee and Has 1996).

### **2.1.3 U.S. Immigration and Naturalization Service data**

In its annual Statistical Yearbook, the U.S. Immigration and Naturalization Service (INS) publishes numbers of both permanent and temporary visas issued to migrants to the United States, by country of origin. The INS data on permanent migration provide not only a reliable count of permanent migration from Canada to the United States, but also information on the occupation of the migrants. They are the principal data source used in the analysis of permanent migration in Section 2.2.2.

The INS data on temporary visas, while meeting the administrative purposes for which they were designed, do not provide a reliable statistical picture of the number of people leaving Canada for the United States per year. Moreover, for a number of reasons, the INS temporary data are of limited use, even as an indicator of trends in the temporary entry of Canadians to the United States. These limitations of the INS temporary data are discussed in this section. Appendix 2 provides INS temporary data to help in the discussion and illustration of these data limitations.

As opposed to a count of people, the INS temporary data are based on visas issued. General I-94 forms, used to capture all categories of temporary visas, are completed on initial entry to the United States and on renewal of visas that are done at border points. However, the data reported by INS make no distinction between initial entries and renewals.

To further illustrate this, consider the case of the NAFTA temporary worker visa, the so-called TN visa, which is valid for a maximum of 12 months. There are two ways TN visas can be renewed within this period—either by sending a renewal request to one of four INS service centres within the United States, or by exiting and re-entering the United States and getting a renewal at the border upon re-entry. The former method may take up to three months, while renewals can generally be done quickly at the border.

For renewals done at the central sites, no I-94 forms are generated and no counts are produced of the number of renewals. For renewals at the border, a new I-94 form is generated, hence these renewals are included in the count of temporary visas reported by the INS.

The INS data on temporary visas include visas issued in other circumstances. Individuals on temporary working visas are required to fill out a new I-94 form when they re-enter the United States after an absence of 30 consecutive days or longer. It is also becoming increasingly common for Canadians receiving income from U.S. sources to obtain a NAFTA visa. For example, a Canadian professor making three visits to the United States to give one-hour lectures for fees might generate three INS entries—but not a single stay of significant duration in the United States.

In summary, the INS figures on temporary workers, NAFTA or otherwise, do not represent the number of Canadian temporary workers going to the United States each year. These figures may include multiple entries made by the same individuals in a given year, as well as renewals made by the same individuals year after year. They also include an unknown number of single or multiple entries, involving very short stays.

Problems also arise in use of the INS temporary counts to illustrate trends over time in temporary migration to the United States. Increasingly, NAFTA visas are replacing the other categories of temporary visas. Given that NAFTA visas require renewal annually versus every three years for other visas, part of the overall increase in the number of temporary entries reflects more renewal activity in the larger NAFTA category.

Additionally, changes in U.S. immigration regulations regarding temporary workers from Canada to the United States may be resulting in increases in the total number of temporary visas that have nothing to do with the actual number of Canadians leaving to work in the United States. For example, in April 1997, the INS introduced stricter measures to crack down on visa overstaying. Changes in unpublished data provided to Statistics Canada by INS reveal a significant surge across all categories of temporary visas issued at that time, which subsided after a few months but was repeated around April the following year.


In summary, the INS data are not a reliable source of information on either the magnitude of temporary movements from Canada to the United States, or of their trend over time because of the many difficulties discussed above.

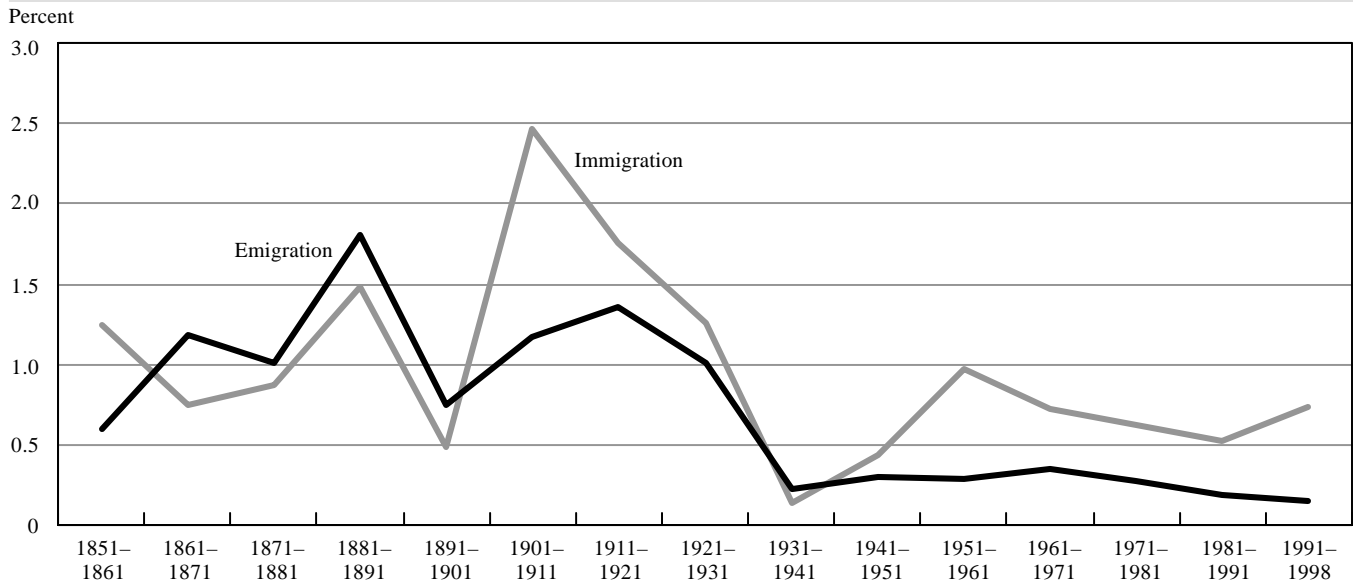
## 2.2 Permanent emigration

### 2.2.1 Magnitude of permanent emigration to all countries

Graph 10 clearly shows that as a share of the total Canadian population, permanent immigration (from all countries) and emigration (to all countries) have both decreased in recent years, compared with earlier in the 20th century. Permanent emigration per annum represented more than 1% of the Canadian population early in the century. By the 1930s it had dropped to about 0.35% of the population, holding steady at this percentage through the 1960s. By the 1990s permanent emigration had fallen to 0.15% of the population.

The only data available on total emigration (including both permanent and temporary) from Canada to all countries is that derived from the Reverse Record Check of the 1991 and 1996 Censuses. These data indicate that annual total emigration from Canada represented 0.22% of the population between 1986 and 1991, increasing to 0.27% between 1991 to 1996. Despite the small increase in the first half of the 1990s, emigration over this period was the lowest in Canadian history, and total emigration was a smaller percentage of the population than permanent emigration has been historically.

 **Graph 10**  
**Annualized permanent immigration to and emigration from Canada as a percentage of the population, 1851–1998**



**Note:**

See Table 6.

**Source:** Statistics Canada, Demography Division.

### 2.2.2 Occupations of permanent emigrants to the United States

In this section we examine occupational data of permanent emigrants to the United States and immigrants from the United States. Earlier data may be found in Boothby (1993). It is worth noting that occupational data are not available for either temporary emigrants to the United States or emigrants to countries other than the United States.

#### Data Sources on Permanent Migration

The U.S. Immigration and Naturalization Service (INS) produces counts by occupation of permanent migrants whose last permanent residence was Canada. These data are produced annually for the United States fiscal year (October 1 to September 30), and are made available by the INS to Statistics Canada and to the public upon request.

Demography Division at Statistics Canada produces historical data on Canadian immigration and emigration.

The 1991 and 1996 Canadian Censuses are also used in this study. The censuses include variables on immigration status, year of immigration, educational attainment, occupation and income.

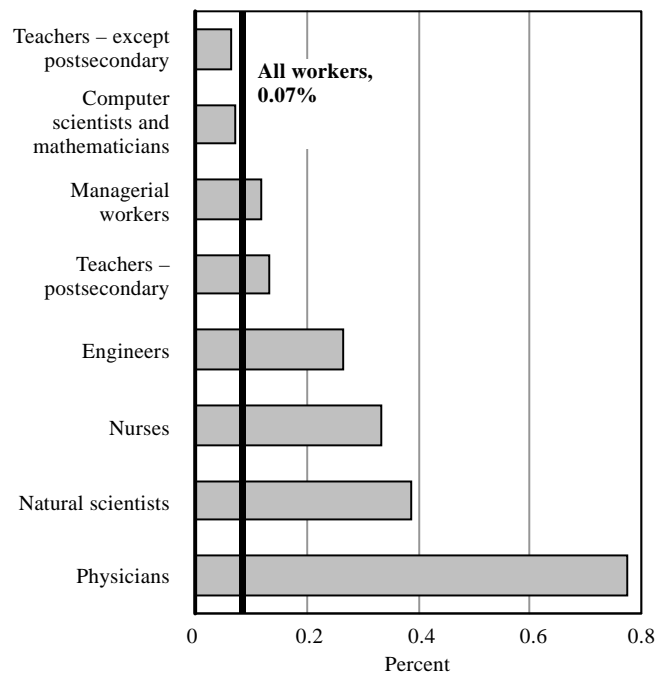
In 1996 and in 1997, total permanent emigration to the United States was equivalent to only 0.07% of the overall Canadian work force. Despite recent increases in knowledge-based occupations, permanent emigration remains small relative to the stock of workers in Canada. Physicians, nurses, engineers and scientists had the highest levels of emigration relative to the stock; however, these levels were less than 1% annually (Graph 11).

In the bilateral permanent migration of knowledge workers between Canada and the United States during the 1990s, Canada's largest losses were in the health professions, followed by engineering and managerial occupations (Graph 12). During the 1990s, there was a 19 to 1 ratio of physicians leaving versus entering Canada in the bilateral exchange with the United States, and similarly a 15 to 1 ratio of nurses, and 7 to 1 ratio of engineers and managerial workers.

Table 9 indicates an increasing trend in emigration in the 1990s among physicians and nurses. An average of about 150 physicians emigrated to the United States per year during the late 1980s, increasing to 450 per year in 1996 and 1997. Nurses leaving for the United States increased from 330 per year in the late 1980s, to about 750 in the early 1990s, and to 825 in 1996 and 1997. For



Graph 11  
Annual emigration to the United States as a percentage of the Canadian work force in selected knowledge-based occupations, 1996–1997<sup>1</sup>



#### Notes:

See Table 7.

1. 1996 to 1997 annual average for emigration; 1996 data for work force by occupation.

Sources: U.S. Immigration and Naturalization Service; and Statistics Canada, 1996 Census.

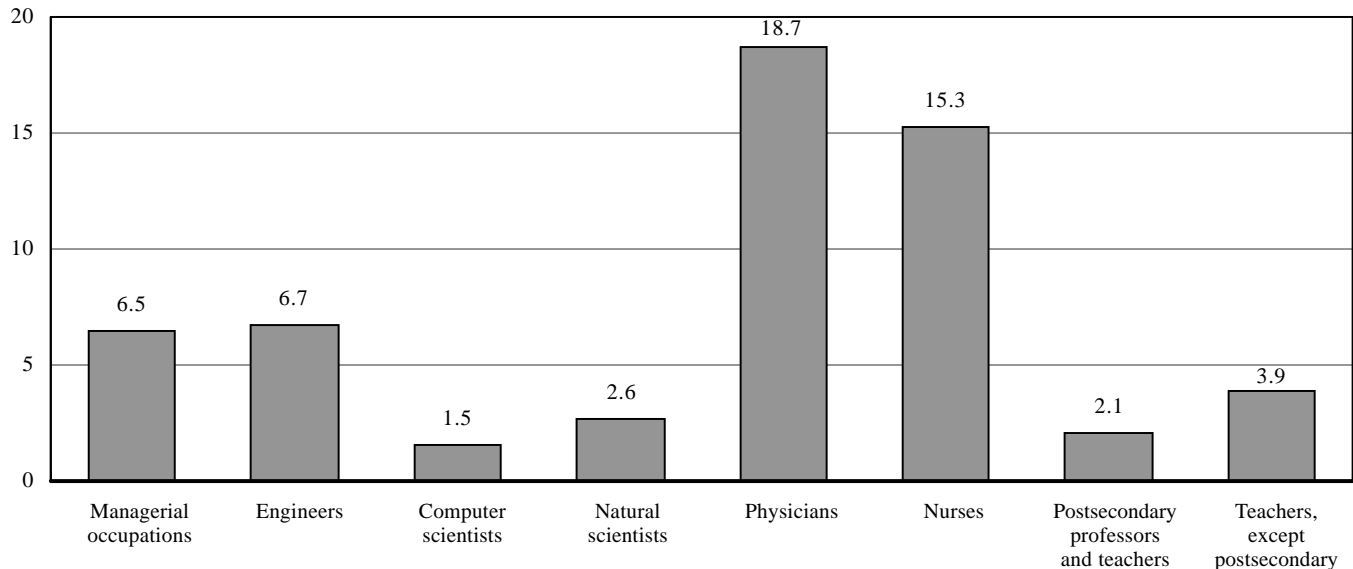
remaining knowledge occupations, the general pattern was for permanent emigration to increase from the late 1980s to the early 1990s, before decreasing somewhat in 1996 and 1997.

Relative to the supply of new graduates, the annual loss of physicians and nurses in recent years has been relatively large. Among physicians, the annual outflow was equivalent in magnitude to about one-quarter of the supply of new graduates, with about 450 leaving (1996–1997 average), compared with a 1995 graduating class of just over 1,700. Among nurses, the outflow was also equivalent to about a quarter of the new graduates, with losses of 800 compared with 3,000 graduates. The annual loss of engineers, computer scientists and natural scientists has been smaller relative to the new supply of university graduates in these fields. The annual average loss of engineers in 1996 and 1997 was equivalent to 4% of 1995 university graduates in engineering (12,300). The annual average loss of natural scientists in 1996 and 1997 was equivalent to 1% of 1995 university graduates in these disciplines (18,900).



Graph 12  
**Ratio of outflow to inflow from permanent migration between Canada and the United States, managerial and selected professional occupations, 1990–1997**

Ratio of outflow to inflow (inflow = 1)



**Note:**

See Table 8.

**Sources:** U.S. Immigration and Naturalization Service; and Citizenship and Immigration Canada, Landed Immigrant Data System.

The bilateral exchange of postsecondary faculty between Canada and the United States has been more balanced, although during the 1990s faculty emigrating to the United States outnumbered those moving to Canada by a 2 to 1 ratio. Additionally, data of the Association of Universities and Colleges of Canada (AUCC) indicate that among faculty who left their positions (other than for retirement) in 1996 and 1997, senior professors were more likely to leave Canada than to move within Canada (AUCC 1997). Among faculty leaving their position, 58% of senior professors left Canada, compared with 40% of mid-career and 47% of entry-level faculty.

### 2.3 Recent graduates who moved to the United States

Statistics Canada, in collaboration with Human Resources Development Canada, recently carried out a survey of 1995 graduates who moved to the United States. The findings of that survey can be found in *South of the Border: Graduates from the Class of '95 Who Moved to the United States* (Frank and Bélair 1999). The survey found that the overall percentage of 1995 postsecondary graduates living in the United States in 1997 remained small (1.5%). Graduates with more advanced degrees, however, were more likely to leave, with 12% of PhD graduates living in the United States in 1997. A dispro-

portionately high percentage (44%) of movers ranked themselves in the top 10% of their graduating class. Movers were also somewhat more likely than non-movers to have received scholarships or other academic awards. The survey also found that movers to the United States had significantly higher salaries than did non-movers. A possible contributing factor might be the high proportion of the movers who rated themselves near the top of their classes.

The survey found that 18% of movers to the United States had moved back to Canada by 1999. The salaries of those back in Canada at the time of the survey in 1999 were similar to those remaining in the United States, evidence that those returning may be bringing valuable work experience from the United States back to Canada.

Among those who moved to the United States for work-related reasons, the most common reasons cited included greater availability of jobs and higher pay. A very small percentage of graduates explicitly mentioned lower taxes as one of the reasons for their move.

### 2.4 Emigration to the United States—A summary

Overall, emigration to the United States remains small by historical standards and small relative to the stock of workers in the Canadian labour force. However, emigrants are overrepresented among the prime working

age groups, the well educated, and high-income earners. In the public sector, emigrant outflows are the greatest among people employed by hospitals, universities and other educational institutions and government. In the private sector, emigrant outflows are the greatest in high technology, finance and business services. When placed in the context of the bilateral exchange with the United States, Canada clearly suffers a net loss of highly educated workers.

### 3. CANADIAN IMMIGRATION

While the above analysis shows that Canada suffers from a brain drain to the United States, the following analysis presents data from a variety of sources to explore the extent to which this 'drain' is offset by a concomitant 'gain' of skilled workers from the rest of the world. We profile the age, education and occupation of recent immigrants and examine their contribution to the employment expansion of the high-technology sector.

#### 3.1. Intended occupations of recent immigrants

LIDS data on the intended occupation of immigrants (see Box below) show that knowledge-based occupations in high demand experienced large increases in permanent immigration from the mid-1980s until 1997, the most recent year for which data are available. Over this period, permanent immigration increased fifteen-fold among computer scientists, ten-fold among engineers, eight-fold among natural scientists, and four-fold among managerial workers (see Graph 13). In 1997, the combined immigration of computer scientists, engineers and natural scientists surpassed 20,000.

#### Data Sources on Canadian Immigrants

The Landed Immigrant Data System (LIDS) developed by Citizenship and Immigration Canada is a principal source of data on immigration to Canada. The LIDS files have been used as a source of information on the intended occupation of immigrants at the time of becoming landed immigrants based on their education and work experience.

The census is another important source of data on immigrants. The 1996 Census has been used to profile the educational level of immigrants and to examine the occupations of people immigrating between 1990 and 1994. The 1996 Census has also been the source of data used in estimating the lifetime annual earnings of immigrant and Canadian-born computer scientists.

On the other hand, permanent immigration has decreased in knowledge-based occupations for which the labour market demand was not as strong during the 1990s, namely physicians, nurses and teachers. Between 1990 and 1997, annual immigration fell 30% among post-secondary teachers, 50% among elementary and secondary teachers, 40% among physicians and 70% among nurses.

The 'points system' used in the selection of independent immigrants has been contributing to the recent increase in Canada's gain of individuals in high-demand occupations. The high points awarded to individuals in these occupations help them reach the necessary points to immigrate to Canada. Points are also awarded for factors such as level of education and abilities in an official language.

The Canadian Occupational Projections System (Roth 1998) forecasts that demand for high-technology workers will remain high, above the level of current domestic supply. It is worth noting in this context that Canada produces proportionately fewer graduates in the fields of mathematics, sciences and engineering than other G-7 countries, with the exception of Italy. In 1995, Canada produced 741 university graduates in science-related fields per 100,000 people aged 25 to 34 in the labour market, compared with 938 in the United States, and an average of 831 across OECD countries (OECD 1997).

#### 3.2 Aggregate fit between intended and actual occupations of immigrants

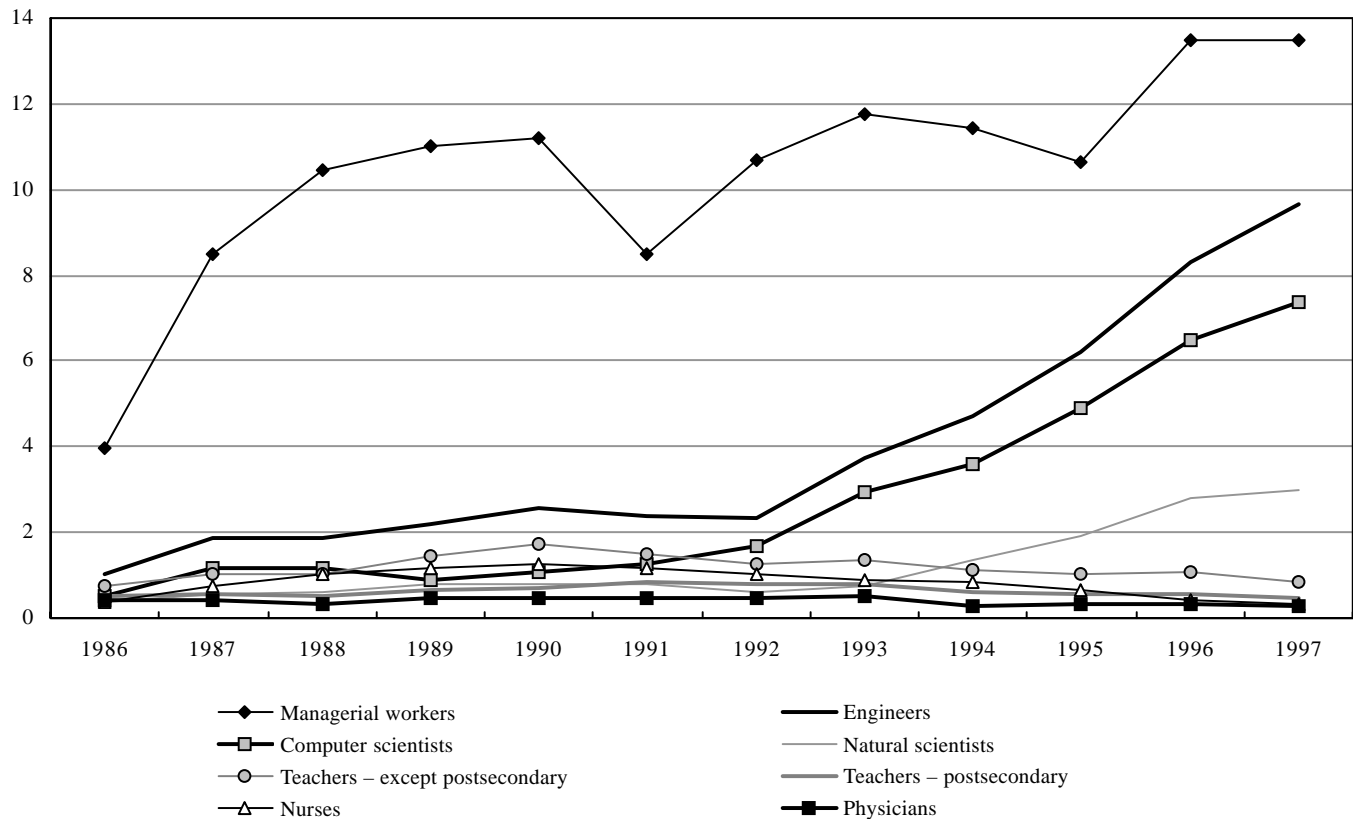
In this section we examine the aggregate fit between the intended occupation of immigrants when they became landed immigrants in Canada and their realized occupations. This aggregate fit helps shed light at an aggregate level on the adjustment and integration of immigrants into the Canadian labour market. Current data sources do not permit examination of the labour market adjustment at an individual level; however, new initiatives will permit such analysis (see Box on page 27).

The LIDS database of Citizenship and Immigration Canada (see Box on left) shows that between 1990 and 1994, 1.17 million people became landed immigrants in Canada. The 1996 Census found 0.98 million people who reported immigrating to Canada over the same period—83% of the Citizenship and Immigration Canada figure. There are several reasons for this difference, including deaths, return of immigrants to their country of origin, or emigration to another country. Additional reasons include undercounting of immigrants in the census, and possible reporting errors by immigrant respondents—for example, in reporting the year of landing in Canada.



Graph 13  
Canadian immigration<sup>1</sup> by selected occupation, 1986–1997

Thousands of immigrants



**Notes:**

See Table 10.

1. Refers to permanent migration into Canada from all countries.

Source: Citizenship and Immigration Canada, Landed Immigrant Data System.

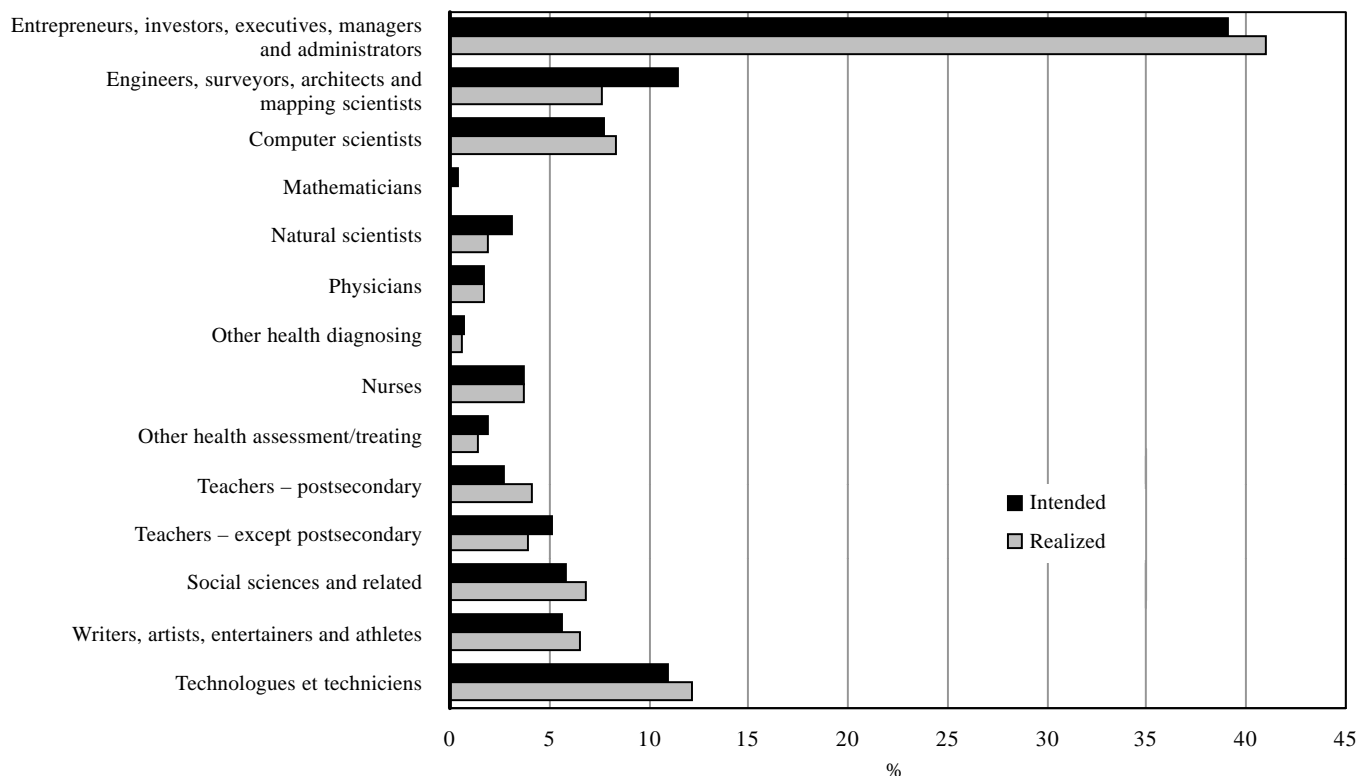
The aggregate fit has been examined by comparing the occupational distributions of the LIDS and census data sets (see Graph 14). The aggregate fit in knowledge-based occupations was very close, with the intended and actual percentage of recent immigrants (i.e., between 1990 and 1994) working in these occupations being equal, at 11.6%. Among recent immigrants intending to work in non-knowledge occupations, the aggregate match between intended and realized occupations was not as close. On becoming landed immigrants, 42% of recent immigrants planned to work in non-knowledge occupations, but in 1996 only 36% were working in these occupations. The closer aggregate fit in knowledge-based occupations is not surprising, given the differential demand in the Canadian labour market. Between 1990 and 1998, full-time employment of professional and managerial workers grew by 780,000, compared with growth of merely 55,000 for all other workers.

The fit between intended and realized occupations varied for individual knowledge-based occupations (see Graph 14). A higher percentage of recent immigrants reported working as computer scientists in 1996 (8.3% of those in knowledge-based occupations) than the intended percentage at the time of landing (7.7% of those intending to work in knowledge-based occupations). On the other hand, lower percentages of recent immigrants reported occupations in engineering and natural sciences in 1996 than the intended percentages at the time of landing. Between the 1991 and 1996 censuses, employment of computer scientists grew by 30%, while employment of engineers and natural scientists grew more slowly, by 5% and 11%. The high demand for computer scientists may have drawn some of the immigrants with training in engineering, mathematics and natural sciences into computer sciences.



Graph 14

### Percentage of immigrant knowledge workers who arrived in Canada between 1990 and 1994, by intended occupation at entry and realized occupation in 1996

**Note:**

See Table 11.

Sources: Citizenship and Immigration Canada, Landed Immigrant Data System; and Statistics Canada, 1996 Census.

The actual percentage of recent immigrants working in natural and applied science occupations combined (including computer sciences) was lower (18.1% of those in knowledge-based occupations) than the intended percentage at the time of landing (22.7% of those intending to work in knowledge-based occupations). One possible factor may be ‘flow-through’ immigration in these high-demand occupations; that is, a portion of the new immigrants may have emigrated to other countries, particularly the United States. Additionally, among the great number of immigrants Canada admitted each year in the 1990s in these high-technology fields, a portion may not have successfully integrated into the Canadian labour market and found employment in their field of training.

The intended and actual percentages of immigrants working as physicians and nurses matched quite closely. It seems, therefore, that despite licensing requirements for health professionals, immigrant health professionals had successfully integrated and were practising in their field of training in Canada. The health sector may have been better able to absorb immigrant physicians and nurses,

perhaps because of the relatively small number admitted each year.

The situation for educators at postsecondary levels was different from that of educators at the elementary and secondary levels. The actual percentage of immigrants working as postsecondary teachers (4.1%) exceeded the intended percentage (2.7%). It may be that some of the recent immigrants were graduate students at the time of landing but by 1996 were teaching at universities or colleges. The actual percentage of immigrants working as elementary and secondary teachers (3.9%) was below the intended percentage (5.1%). This may reflect more limited opportunities for new hiring of teachers because of factors such as declining school-age populations in some jurisdictions and reductions in public spending on education as part of the effort by governments to reduce or eliminate deficits.

The realized percentages in managerial, administrative and technical occupations were all close to or slightly higher than the intended percentages in these occupations.

### 3.3 Occupational distribution of recent immigrants compared with the native-born and immigrants of previous years

Another way to examine the impact of recent immigrants on the Canadian labour market is to compare their occupational distribution with those of the Canadian-born population and previous cohorts of immigrants. The objective is to learn whether recent immigrants tend to be over-represented in occupations where shortages have existed in recent years, such as high-technology occupations. Likewise, it will also identify occupations in which immigrants tend to be underrepresented. Comparing the occupational distributions of recent immigrants and earlier cohorts of immigrants will shed light on adjustment issues—in particular, whether the length of stay has a positive impact on occupational profiles.

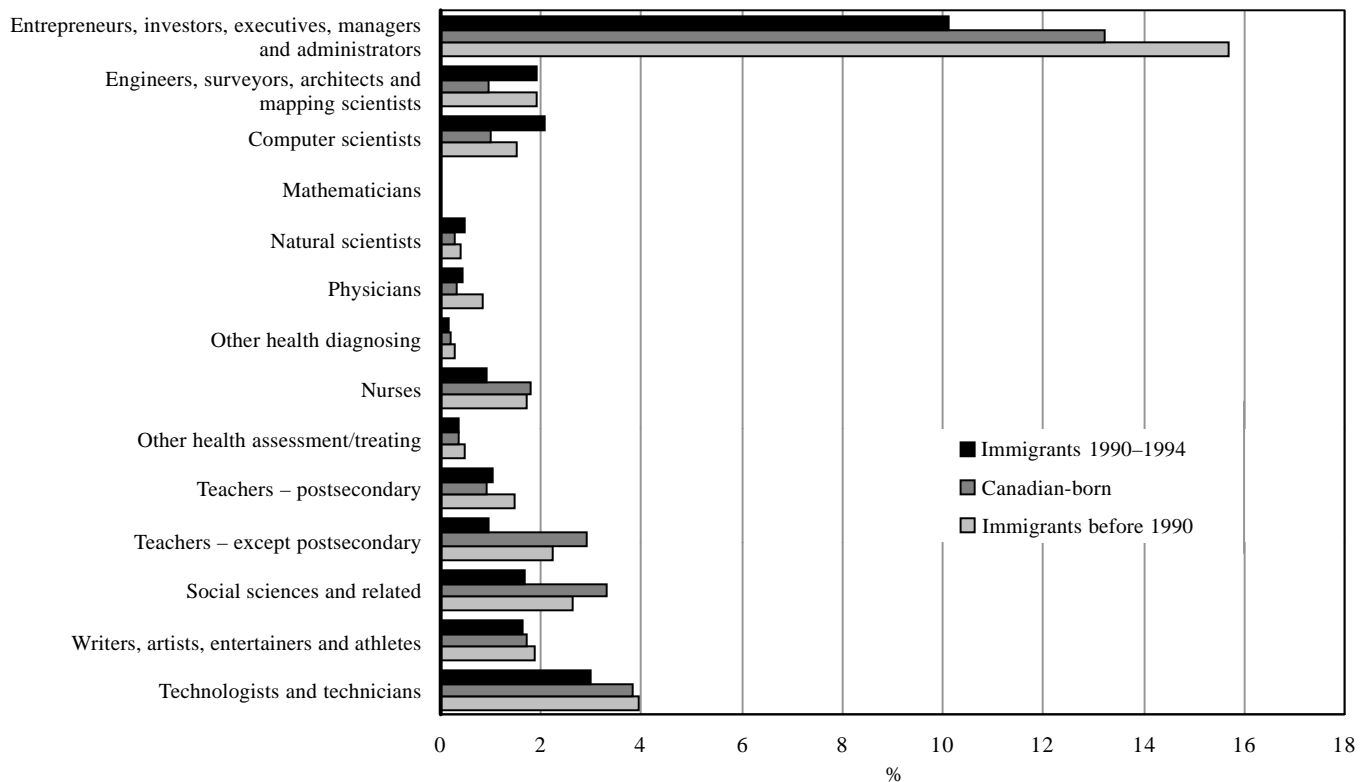
In the 1996 Census, among people aged 15 and over, 57% of recent immigrants (those who immigrated into Canada between 1990 and 1994) were in the labour force, compared with 65% of the Canadian-born and 59% of immigrants who came to Canada before 1990. The lower rate of labour force participation among recent immigrants

may reflect initial difficulties faced by newcomers in adapting to the Canadian labour market. On the other hand, the lower rate of labour force participation among immigrants who came to Canada before 1990 compared with the Canadian-born population can be mainly attributed to their older age. When viewed by age group, labour force participation rates of pre-1990 immigrants were comparable to or higher than rates of the Canadian-born population. Rates were identical for people aged 25 to 54; however, at ages 55 to 64, pre-1990 immigrants had a higher labour force participation rate than the Canadian-born.

If the experience of immigrants of previous cohorts is any indication, we can expect the labour force participation of recent immigrants to converge towards that of the Canadian-born.

Recent immigrants were twice as likely as the Canadian-born population to be working as computer scientists and engineers (2% versus 1%, respectively) and in natural sciences (2.5% versus 1.3%, respectively) (see Graph 15). These are precisely the occupations where employment has been expanding and where a shortage of workers has been reported.

**Graph 15**  
**Distribution of workers in individual knowledge-based occupations as a percentage of the work force in 1996, by immigration status**



**Note:**  
 See Table 12.  
**Source:** Statistics Canada, 1996 Census.



On the other hand, recent immigrants were underrepresented in managerial occupations, nursing, teaching at below-postsecondary levels, and social sciences and related occupations, compared with the Canadian-born. However, immigrants who came to Canada prior to 1990 were equally represented or overrepresented in the same occupations, with the exception of elementary and secondary teachers. The underrepresentation of recent immigrants may be a reflection of adjustment issues and/or lower labour market demand in these occupations.

### 3.4 Age and education profiles of recent immigrants

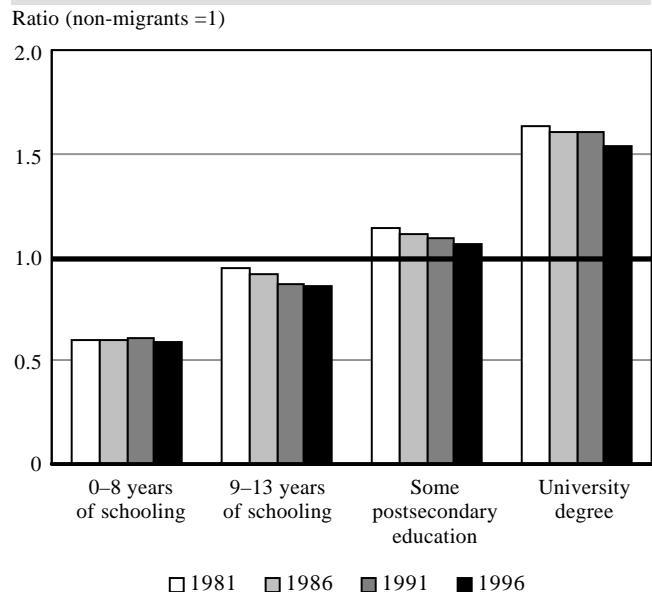
In general, international migrants tend to be younger and more highly educated than non-migrant populations. Why? Because immigration laws tend to favour migrants who are highly educated—this is true of immigration laws in both Canada and the United States. At the same time, the accompanying knowledge and skill levels of highly educated people are also likely to be in demand, not only in their native countries but also abroad, reducing a major element of uncertainty surrounding a life-altering decision. More highly educated people are also more likely to have the contacts and information needed to move to another country. Age is a factor inasmuch as younger people may, on balance, be less likely to be tied down by personal and financial commitments.

The propensity to be younger and better educated is also evident among interprovincial migrants, suggesting that a common economic incentive may be operating in both international and interprovincial migration.

Data from the last four Canadian censuses show interprovincial migrants to be about 1.5 times as likely to be 44 years of age or less, and about 1.5 times as likely as the non-migrant population to have a university education (see Graph 16). In comparison, recent immigrants were about 1.25 times as likely as the Canadian-born population to be 25 to 44 years of age. Adjusting for age, recent immigrants were close to 2 times as likely as native-born Canadians to have a university education. Recent immigrants were even more likely to hold advanced university degrees, between 2 and 3 times as likely to have a master's degree, and about 4 times as likely as the Canadian-born to have a doctorate (see Graph 17).

As we saw in section 2, migrants to the United States are even more highly educated than recent Canadian immigrants. However, because of the much larger number

Graph 16  
Ratio of distribution of interprovincial migrants to non-migrants,<sup>1,2</sup> by highest level of educational attainment



#### Notes:

See Table 13.

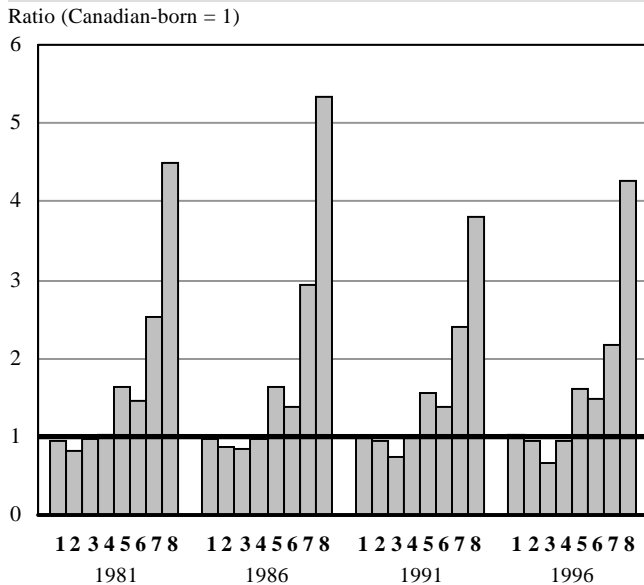
1. The above comparison is age-adjusted, using the entire 15+ Canadian population as the standard population.
2. To illustrate the interpretation of the ratio, the ratio of 1.5 for the category of 'university degree' means that interprovincial migrants were 1.5 times as likely as non-migrants to be university degree holders, adjusting for age differences in the two populations.

Sources: Statistics Canada, 1981, 1986, 1991 and 1996 Censuses.

of Canadian immigrants, university graduates migrating to Canada from all countries in the world outnumber graduates leaving for the United States (permanent and temporary) by a ratio of approximately 4 to 1. There are as many immigrants entering Canada with a master's or doctorate as the number of university graduates at all levels leaving for the United States.

Based on the 1996 Census, about 39,000 degree holders entered Canada per year (both permanently and temporarily) from 1990 to 1996, including 11,000 master's and PhD degree holders. This compares with an estimated 10,000 university graduates at all levels combined leaving Canada for the United States per year in the 1990s, based on the 1994 to 1999 U.S. Current Population Surveys. The latter estimate includes both permanent and temporary

**Graph 17**  
**Ratio of distribution of recent immigrants<sup>1</sup> to the Canadian-born, by highest level of educational attainment<sup>2, 3</sup>**



- 1 Less than high school
- 2 Secondary school graduate
- 3 Completed non-university
- 4 Some postsecondary
- 5 Bachelor's degree or higher
- 6 Bachelor's degree
- 7 Master's degree
- 8 Doctorate

**Notes:**

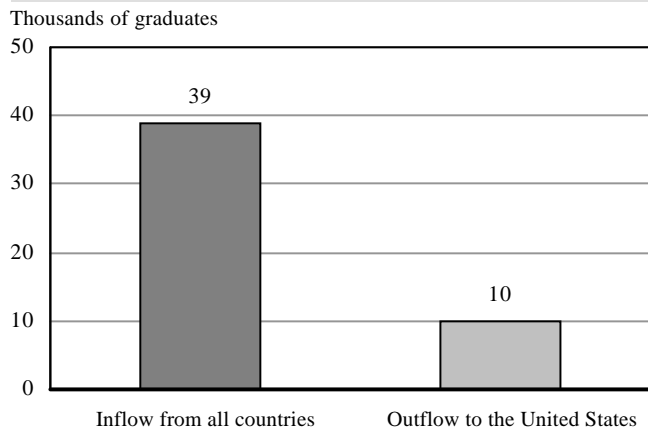
- See Table 14.
- 1. Recent immigrants are defined as those who arrived in Canada in the five-year period prior to each census.
- 2. The above comparison is age-adjusted, using the Canadian-born as the standard population.
- 3. To illustrate the interpretation of the ratio, the 1996 ratio of 4 for the category of 'doctorate' means that recent immigrants were four times as likely as the Canadian-born to hold a doctorate degree, after adjusting for age differences in the two populations.

**Sources:** Statistics Canada, 1981, 1986, 1991 and 1996 censuses.

migrants, and both the Canadian and foreign-born. It is important to point out that university graduates emigrating to countries other than the United States are not included because of lack of data.

Undoubtedly, a factor influencing the high educational qualifications of recent immigrants is the 'points system,' which, as previously mentioned, aims at selecting independent immigrants on the basis of their education, labour market experience and language abilities. Canada's immigration laws, however, are multifaceted. The goal is not only to promote Canada's economic interest (as

**Graph 18**  
**Annual average number of university graduates migrating to Canada from all countries (1990–1996)<sup>1</sup> and emigrating from Canada to the United States (1990–1999)<sup>1</sup>**



**Note:**

- 1. Includes both temporary and permanent migration.
- Sources:** U.S. Current Population Surveys, 1994–1999; and Statistics Canada, 1996 Census.

manifested by the 'points system' in selecting independent applicants), but also to reunite families and to assist refugees on humanitarian grounds. The two latter objectives are reflected in the other two main classes of immigrants—family class and refugees. Immigrants who are admitted in these two classes are not subject to the same screening as independent immigrants. However, when immigrants of all classes are grouped together, they still have significantly higher educational qualifications than the Canadian-born population, especially at the master's and PhD levels.

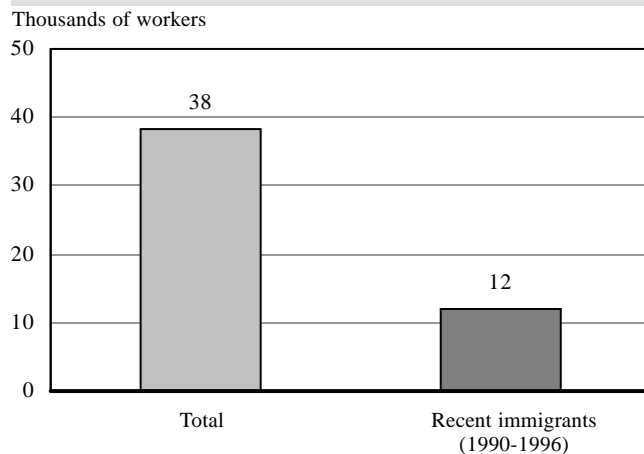
**3.5 Expected lifetime earnings of immigrant computer scientists**

Much of the debate on brain drain and brain gain has focussed on the shortage of skilled workers in the information technology sector. Because of the high demand for these workers, this sector is keenly aware of losses from migration to the United States. It is equally important, however, to consider the contribution of recent immigrants in this sector.

As shown in the previous section, recent immigrants are twice as likely as the Canadian-born population to be in high-technology occupations. In recent years, with the expansion of the high-technology sector, employment of high-technology professionals has grown rapidly, not only among immigrants, but also among the native-born. Between 1991 and 1996, employment of computer engineers, systems

analysts and computer programmers grew by 39,000, from 124,000 to 163,000. As shown in Graph 19, recent immigrants (since 1990) accounted for almost a third of this increase. It is clear that recent immigrants have become an important component of high-technology employment expansion and that they are contributing to meeting the high demand for workers in this sector.

**Graph 19**  
**Increase in employment among computer engineers, systems analysts and computer programmers between 1991 and 1996 for total population and recent immigrants**

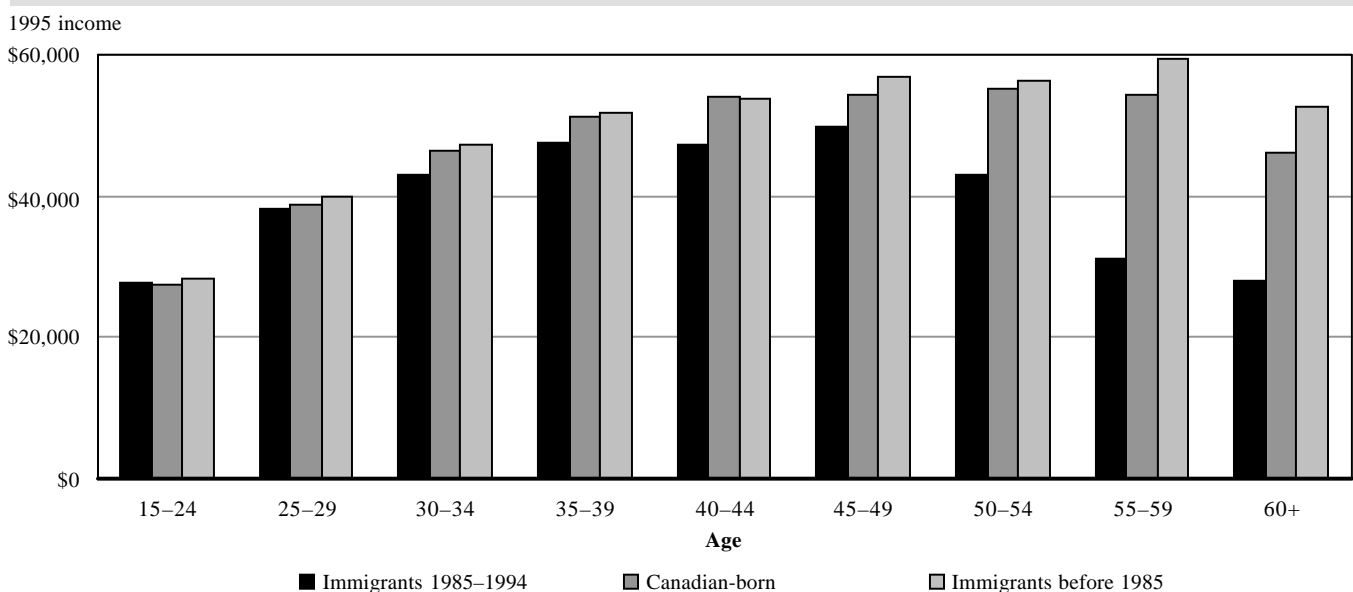


*Source: Statistics Canada, 1996 Census.*

We examine the issue of the quality of recent immigrant computer scientists by comparing their expected lifetime earnings with those of Canadian-born computer scientists. Earnings, inasmuch as they represent the value placed on a human resource by the marketplace, are an indicator of quality.

Results of the 1996 Census show that, among those aged 15 to 49, the annual income of immigrant computer scientists who had been in Canada for less than 10 years was slightly lower than their Canadian-born counterparts. Among those aged 50 and over, immigrants in Canada for less than 10 years earned significantly less than the Canadian-born. Compared to the Canadian-born, immigrants in Canada for more than 10 years had similar incomes up to the age of 44, and had higher incomes after age 45. Hence, it appears that those immigrating at relatively younger ages integrate well—and actually earn more—than the Canadian-born computer scientists after the age of 45. On the other hand, those immigrating at older ages appear to experience more difficulties. For the most part, immigrant computer scientists tend to be quite young (average age in the early 30s) when they immigrate into Canada. An analysis of expected lifetime earnings (see Box on page 26) showed that the projected lifetime earnings of young immigrant computer scientists were comparable with—only 1% below—those of their Canadian-born counterparts.

**Graph 20**  
**Income of computer scientists employed full time and year-round, by age and immigration status, 1995**



**Note:**

See Appendix 1.

*Source: Statistics Canada, 1996 Census.*

Hence, in high demand occupations, there is no evidence that the labour market discerns qualitative differences between immigrant and Canadian-born workers. In the absence of qualitative differences, given the sheer numbers involved, it is clear that immigrant computer scientists are making a significant contribution to Canada's high-technology industries.

### Lifetime Earnings of Computer Scientists

Appendix 1 provides detailed calculation of projected lifetime income of immigrant computer scientists and their Canadian-born counterparts. The first part of the table provides age-specific income of computer scientists in three categories—immigrants in Canada for less than 10 years, the Canadian-born population, and immigrants in Canada for 10 years or more. This part of the table also provides the standard population of computer scientists in Canada.

With this standard population, it is possible to calculate the age-adjusted income for the three groups of interest. In other words, we were able to obtain the average income of computer scientists in these three groups if they all had the same age profile as the entire computer scientist population.

As immigrant computer scientists to Canada, just like emigrant computer scientists to the United States, tend to be young (early 30s), it is reasonable to project their duration of employment to be 35 years—also the number of years customarily needed for full pension. Step 5 in the table calculates the cumulative difference in the income of immigrant computer scientists in their first 10 years of employment in Canada, compared to the Canadian-born. Step 6 calculates the cumulative difference in the income of immigrant computer scientists in the next 25 years of employment in Canada, compared with the Canadian-born. Step 7 calculates the annualized difference in the income of immigrant computer scientists in their entire 35 years of employment, compared with the Canadian-born. This analysis showed expected lifetime earnings of young immigrant computer scientists were comparable with—only 1% below—their Canadian-born counterparts.

#### 4. CONCLUSIONS AND FURTHER INITIATIVES

Is there a 'brain drain' to the United States? Yes—Canada suffers a net loss of workers in a variety of key knowledge-based occupations. The magnitude of these losses is relatively small—about 0.1% of all tax filers, and

less than 1% of the stock of workers in any specific knowledge occupation. The composition of emigrants, however, is weighted towards the better-educated, high-income earners and people of prime working age. Further, they are drawn from sectors that are thought to be important to Canada's economy and society. The recent survey of the 1995 graduates who moved to the United States indicated a disproportionately higher percentage (12%) of PhD graduates having moved there. Likewise, 0.9% of tax filers with annual incomes of \$150,000 or higher left Canada in 1996, a migration rate nine times as high as that of all tax filers. Tax filer data also indicate an upward trend in the number of people leaving Canada in the 1990s.

On the other hand, Canada receives more university graduates than it loses to the United States. For every university degree holder migrating from Canada to the United States, whether on a temporary or permanent basis, there are four university degree holders (including one master's or PhD) migrating from the rest of the world to Canada. Compared with the Canadian-born population, after adjusting for age differences, recent immigrants are overrepresented among university degree holders, especially advanced degree holders such as master's and PhD.

Recent immigrant high-technology workers are making an important contribution in helping to meet the high demand in the high-technology sector. Immigrants in the 1990s account for about a third of the increase in employment among computer engineers, systems analysts and computer programmers.

Clearly, the data suggest that the issue of the 'brain drain' is far more complex than first appears. Questions remain about the size of the flow of emigrants and the permanency of their moves, and the degree to which the best and the brightest may be overrepresented. Questions also remain about the extent to which Canadian immigrants—the so-called 'brain gain'—compensate for the 'drain.' This paper has presented data from a variety of sources germane to these questions in the hope that improved data can render the public debate more productive. Given that the most recent data to examine the issue are in many cases two or more years old, questions remain about how the situation may have evolved in more recent years and may still be evolving. Statistics Canada will continue to monitor and update existing sources of data, and will work with Human Resources and Development Canada, Industry Canada, and Citizenship and Immigration Canada to extend and improve what is known about the nature, extent and economic impact of the brain drain to the United States and the brain gain from the rest of the world.

## Further Initiatives

### Further Analysis of Tax Filer Data

As indicated in the paper, industrial sector analysis of movers using tax filer data is in its initial stages. Together with Industry Canada, Statistics Canada will be examining the number and income profiles of movers by industrial sector, in comparison with all tax filers as well as trends over time.

### National Graduates Surveys (NGS)

The National Graduates Survey (NGS), developed by Human Resources Development Canada and Statistics Canada, is being enhanced to provide estimates of the number of graduates of postsecondary institutions leaving Canada for the United States, by level and field of study, both two and five years after graduation. Previously it included only graduates remaining in Canada. The next survey will be conducted in 2000, a five-year follow-up of the graduating class of 1995. A survey of the class of 1999 is planned for the year 2001.

### Survey of Air and Land Travelers to Canada

The feasibility of conducting surveys on air and land travelers to profile Canadians returning from the United States to Canada and U.S. citizens coming to Canada is currently being explored. Such surveys have potential to generate information on the intent, experience, and duration of Canadians working

in the United States and the bilateral exchange of high-skilled workers between Canada and the United States.

### U.S. 2000 Census

The 2000 Census of the United States will provide in-depth information on the magnitude as well as the characteristics of Canadians who are living in the United States.

### Longitudinal Survey of Immigrants

The Longitudinal Survey of Immigrants is a new survey being developed by Statistics Canada in collaboration with Citizenship and Immigration Canada to provide information on the early experiences of recent immigrants to Canada. Immigrants will be interviewed six months, two years and four years after arriving in Canada.

### Longitudinal Immigrants Database (IMDB)

The IMDB is a longitudinal file linking immigration and taxation administrative records into a comprehensive database to allow analysis of the economic performance of the immigrant population in Canada. The data are updated annually and are currently available for the period of 1980 to 1995. Citizenship and Immigration Canada has performed preliminary analyses, and Statistics Canada has been involved in the development of the database.

## ACKNOWLEDGEMENTS

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**Table 1**  
**Employment rate by level of education, 25–44 age group, 1980–1998**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
0–8 years of schooling	61.1	62.4	56.8	57.1	56.8	56.0	58.4	58.3	59.7	59.8
11–13 years of schooling	74.8	75.9	72.8	71.7	73.1	73.9	75.9	76.6	78.4	78.8
University degree	87.0	87.9	85.6	86.2	86.5	87.1	87.3	87.7	88.5	88.8
	1990	1991	1992	1993	1994	1995	1996	1997	1998	
0–8 years of schooling	57.0	51.6	49.5	49.5	48.4	48.1	47.3	46.9	49.6	
11–13 years of schooling	78.0	75.4	73.6	73.4	74.6	74.4	75.1	75.8	76.4	
University degree	88.4	87.3	86.3	86.4	85.8	86.6	86.0	86.0	87.5	

**Notes:**

See Graph 2.

Employment rate is defined as the percentage of persons employed.

Source: Statistics Canada, Labour Force Survey.



**Table 2**  
**Canadian-born population living since January 1990 in the United States, 1994–1999**

	1994		1995		1996		1997		1998		1999		Average
	Estimates	Sample size (n)	Estimates	Sample size (n)	Estimates	Sample size (n)	Estimates	Sample size (n)	Estimates	Sample size (n)	Estimates	Sample size (n)	Estimates
number													
<b>Age group</b>													
All ages	104,000	(62)	126,000	(74)	105,000	(63)	116,000	(59)	152,000	(73)	185,000	(87)	131,000
25–44	53,000	(32)	46,000	(27)	54,000	(29)	68,000	(33)	101,000	(48)	101,000	(49)	71,000
16+	72,000	(44)	84,000	(47)	81,000	(50)	91,000	(49)	129,000	(63)	169,000	(77)	104,000
percent													
25–44 as percentage of population 16+	73.6		54.8		66.7		74.7		78.3		59.8		68.3
number													
<b>Gender</b>													
Male	45,000	(27)	66,000	(41)	51,000	(29)	68,000	(30)	83,000	(37)	101,000	(47)	69,000
Female	59,000	(35)	60,000	(33)	54,000	(34)	48,000	(29)	69,000	(36)	83,000	(40)	62,000
<b>Education</b>													
University	31,000	(22)	34,000	(24)	38,000	(22)	42,000	(28)	80,000	(37)	83,000	(36)	51,000
percent													
University as percentage of population 16+	43.1		40.5		46.9		46.2		62.0		49.1		49.0

**Notes:** 1994–1996 data were published by the U.S. Bureau of the Census; 1997 data are special tabulations by the U.S. Bureau of the Census for Statistics Canada; 1998 and 1999 data were retrieved by Statistics Canada using U.S. Federal Electronic Research and Review Extraction Tool (FERRET), <http://ferret.bls.census.gov>, with technical assistance from the U.S. Bureau of the Census.

**Source:** U.S. Bureau of the Census, Current Population Survey, March Supplement, 1994–1999.



Table 3  
Destinations of emigrants who left Canada, 1986–1991 and 1991–1996

	Permanent <sup>1</sup>				Temporary <sup>2</sup>			
	1986–1991		1991–1996		1986–1991		1991–1996	
	Distribution	Sample size	Distribution	Sample size	Distribution	Sample size	Distribution	Sample size
	%	number	%	number	%	number	%	number
U.S.	48	159	50	182	34	41	35	79
Asia	9	29	19	67	20	22	31	65
Europe	32	92	19	62	25	32	17	32
Rest	11	36	12	40	21	24	18	38

**Notes:**

See Graph 5.

1. Permanent emigrants are persons who, at the time of the census, had left Canada with no intention of returning, and those who had resided outside Canada for at least two years but whose intentions about returning were unknown.
2. Temporary emigrants are persons who, at the time of the census, had resided outside Canada for at least six months with the intention of returning, or had resided outside Canada for no more than two years if their intentions were unknown.

Source: Statistics Canada, Reverse Record Check Program, 1991 and 1996 Censuses.



Table 4  
Tax filers who ceased to reside in Canada in 1996 as a percentage of all tax filers in 1995, by 1995 income class

1995 income class	Movers in 1996	All tax filers in 1995	Movers as percentage of all tax filers
	number	number	%
Less than \$20,000	10,570	10,752,300	0.10
\$20,000–\$49,999	8,340	7,546,750	0.11
\$50,000–\$74,999	3,330	1,713,300	0.19
\$75,000–\$99,999	1,420	373,000	0.38
\$100,000–\$149,999	1,020	176,700	0.58
\$150,000+	1,020	115,000	0.89
Total	25,700	20,677,050	0.12

Notes: Data based on Revenue Canada income tax files.

See Graphs 8 and 9.

Number of movers in 1996 in this table is slightly smaller than that shown in Graph 6. The reason is that only movers who also filed a tax return in 1995 are shown here in order to capture 1995 full year income.

Source: Statistics Canada, Small Area and Administrative Data Division.



Table 5  
Tax filers leaving<sup>1</sup> Canada for all destinations, by industry of employer, for 10 industries with largest loss of employees, 1996

Industry (1980 SIC code)	Number of movers in 1996
Hospitals	1,060
University Education	910
Elementary and Secondary Education	690
Architectural, Engineering and Other Scientific and Technical Services	660
Computer and Related Services	580
Banks, Trust Companies and Credit Unions	520
Food Services	440
Federal Government Service <sup>2</sup>	420
Communication and Other Electronic Equipment	360
Other Business Services	290
All remaining industries	10,640

Notes: Data based on Revenue Canada income tax files.

1. These data exclude movers without earned income and self-employed who were not salaried employees. The industry is that of movers' principal employer (in terms of 1996 earnings).
2. Except Defence Services.

Source: Statistics Canada, Small Area and Administrative Data Division.





**Table 6**  
**Canadian immigration and emigration,**  
**annual averages by decade as a**  
**percentage of the population,**  
**1851–1861 to 1991–1998**

	Immigration as a percentage of population	Emigration as a percentage of population
1851–1861	1.24	0.60
1861–1871	0.75	1.19
1871–1881	0.87	1.01
1881–1891	1.48	1.80
1891–1901	0.49	0.74
1901–1911	2.46	1.18
1911–1921	1.75	1.36
1921–1931	1.25	1.01
1931–1941	0.14	0.22
1941–1951	0.44	0.30
1951–1961	0.97	0.29
1961–1971	0.72	0.35
1971–1981	0.62	0.27
1981–1991	0.52	0.19
1991–1998	0.73	0.15

*Notes:*

See Graph 10.

*Source:* Statistics Canada, Demography Division.



**Table 8**  
**Ratio of outflow to inflow from**  
**permanent migration between Canada**  
**and the United States, managerial**  
**and selected professional occupations,**  
**1990–1997**

Occupation	Annual average outflow <sup>1</sup>	Annual average inflow <sup>2</sup>	Ratio of outflow to inflow
Managerial occupations	2,470	381	6.5
Engineers	521	77	6.7
Computer scientists	135	88	1.5
Natural scientists	144	55	2.6
Physicians	320	17	18.7
Nurses	773	51	15.3
Teachers – postsecondary	231	112	2.1
Teachers – except postsecondary	296	76	3.9

*Notes:*

See Graph 12.

1. Outflow refers to permanent emigration from Canada to the United States.

2. Inflow refers to permanent migration from the United States to Canada.

*Sources:* U.S. Immigration and Naturalization Service; and Citizenship and Immigration Canada, Landed Immigrant Data System.



**Table 7**  
**Annual emigration to the United States**  
**as a percentage of the Canadian work**  
**force in selected knowledge-based**  
**occupations, 1996–1997<sup>1</sup>**

Knowledge-based occupations	Emigrants	Employed work force	Emigrants as a percentage of the work force
Teachers – except postsecondary	267	416,970	0.06
Computer scientists and mathematician	124	168,385	0.07
Managerial workers	2,263	1,927,760	0.12
Teachers – postsecondary	192	146,235	0.13
Engineers	458	172,415	0.27
Nurses	825	246,800	0.33
Natural scientists	174	44,630	0.39
Physicians	460	59,340	0.78

*Notes:*

See Graph 11.

1. 1996 – 1997 annual average for emigration; 1996 data for work force by occupation.

*Sources:* U.S. Immigration and Naturalization Service; and Statistics Canada, 1996 Census.



**Table 9**  
**Annual average permanent emigration**  
**from Canada to the United States,**  
**by occupation, 1986–1989, 1990–1995,**  
**and 1996–1997**

Occupation	1986–1989	1990–1995	1996–1997
Physicians	149	267	460
Nurses	331	756	825
Teachers – postsecondary	194	244	192
Teachers – except postsecondary	238	306	267
Computer scientists	99	139	124
Engineers	468	542	458
Natural Scientists	97	134	174
Managerial workers	1,653	2,539	2,263
All other occupations	6,637	6,048	3,850
All occupations	9,397	10,973	8,610

*Source:* U.S. Immigration and Naturalization Service.



**Table 10**  
**Canadian immigration<sup>1</sup> by selected occupation, 1986–1997**

	1986	1987	1988	1989	1990	1991
Managerial workers	3,984	8,514	10,453	11,027	11,193	8,494
Engineers	1,005	1,881	1,881	2,207	2,544	2,357
Computer scientists	493	1,184	1,151	895	1,094	1,272
Natural scientists	364	549	598	773	784	779
Teachers – except postsecondary	727	1,026	1,040	1,459	1,736	1,491
Teachers – postsecondary	503	576	502	667	719	829
Nurses	393	739	1,049	1,188	1,270	1,163
Physicians	419	427	339	460	450	489
	1992	1993	1994	1995	1996	1997
Managerial workers	10,710	11,740	11,452	10,630	13,467	13,500
Engineers	2,318	3,736	4,719	6,195	8,285	9,673
Computer scientists	1,698	2,921	3,610	4,887	6,480	7,355
Natural scientists	623	770	1,335	1,934	2,797	2,997
Teachers – except postsecondary	1,237	1,375	1,129	1,042	1,085	855
Teachers – postsecondary	771	799	586	553	540	488
Nurses	1,012	872	827	634	421	350
Physicians	464	529	258	305	341	270

**Notes:**

See Graph 13.

1. Refers to permanent migration into Canada from all countries.

Source: Citizenship and Immigration Canada, Landed Immigrant Data System.



**Table 11**  
**Percentage of immigrant knowledge workers who arrived in Canada between 1990 and 1994, by intended occupation at entry and realized occupation in 1996**

	Intended	Realized
	%	
Entrepreneurs, investors, executives, managers and administrators	39.1	41.0
Engineers, surveyors, architects and mapping scientists	11.4	7.7
Computer scientists	7.7	8.3
Mathematicians	0.4	0.1
Natural scientists	3.1	1.9
Physicians	1.7	1.7
Other health diagnosing	0.7	0.6
Nurses	3.8	3.7
Other health assessment/treating	1.9	1.4
Teachers – postsecondary	2.7	4.1
Teachers – except postsecondary	5.1	3.9
Social sciences and related	5.8	6.8
Writers, artists, entertainers and athletes	5.6	6.6
Technologists and technicians	11.0	12.1
Total knowledge workers	100.0	100.0

**Note:**

See Graph 14.

Sources: Citizenship and Immigration Canada, Landed Immigrant Data System; and Statistics Canada, 1996 Census.



**Table 12**  
**Distribution of workers in individual knowledge-based occupations as a percentage of the work force in 1996, by immigration status**

	Immigrants 1990–1994	Canadian-born	Immigrants before 1990
Entrepreneurs, investors, executives, managers and administrators	10.13	13.21	15.69
Engineers, surveyors, architects and mapping scientists	1.89	0.96	1.93
Computer scientists	2.06	1.01	1.53
Mathematicians	0.04	0.04	0.05
Natural scientists	0.48	0.28	0.40
Physicians	0.42	0.33	0.82
Other health diagnosing	0.15	0.20	0.26
Nurses	0.92	1.78	1.70
Other health assessment/treating	0.35	0.37	0.48
Teachers – postsecondary	1.02	0.92	1.48
Teachers – except postsecondary	0.96	2.89	2.23
Social sciences and related	1.69	3.32	2.63
Writers, artists, entertainers and athletes	1.62	1.71	1.88
Technologists and technicians	3.00	3.80	3.93

**Note:**

See Graph 15.

Source: Statistics Canada, 1996 Census.



**Table 13**  
**Ratio of distribution of interprovincial migrants to non-migrants,<sup>1,2</sup> by highest level of educational attainment**

	Distribution of migrants by education	Distribution of non-migrants by education	Ratio of distribution of migrants to non-migrants
	%	%	
<b>1981</b>			
0–8 years of schooling	12.0	20.1	0.6
9–13 years of schooling	36.2	38.2	0.9
Some postsecondary education	38.0	33.2	1.1
University degree	13.8	8.5	1.6
<b>1986</b>			
0–8 years of schooling	10.2	17.1	0.6
9–13 years of schooling	34.2	37.4	0.9
Some postsecondary education	39.4	35.4	1.1
University degree	16.2	10.1	1.6
<b>1991</b>			
0–8 years of schooling	8.4	13.9	0.6
9–13 years of schooling	32.8	37.5	0.9
Some postsecondary education	40.5	37.2	1.1
University degree	18.3	11.4	1.6
<b>1996</b>			
0–8 years of schooling	7.3	12.2	0.6
9–13 years of schooling	30.2	35.2	0.9
Some postsecondary education	40.5	38.2	1.1
University degree	22.1	14.4	1.5

**Notes:**

See Graph 16.

1. The above comparison is age-adjusted, using the entire 15+ Canadian population as the standard population.
2. To illustrate the interpretation of the ratio, the ratio of 1.5 for the category of 'university degree' means that interprovincial migrants were 1.5 times as likely as non-migrants to be university degree holders, adjusting for age differences in the two populations.

Sources: Statistics Canada, 1981, 1986, 1991 and 1996 Censuses.



**Table 14**  
**Ratio of distribution of recent immigrants to the Canadian-born,<sup>1</sup> by highest level of educational attainment<sup>2,3</sup>**

	Distribution of recent immigrants by education	Distribution of the Canadian-born by education	Ratio of distribution of recent immigrants to the Canadian-born
	%	%	
<b>1981</b>			
Less than high school	45.3	48.0	0.9
Secondary school graduate	11.3	13.9	0.8
Completed non-university	18.5	19.1	1.0
Some postsecondary	10.0	9.9	1.0
Bachelor's degree or higher	14.9	9.1	1.6
Bachelor's degree	11.6	7.9	1.5
Master's degree	2.5	1.0	2.5
Doctorate	0.8	0.2	4.5
<b>1986</b>			
Less than high school	42.7	44.4	1.0
Secondary school graduate	11.8	13.4	0.9
Completed non-university	17.0	20.2	0.8
Some postsecondary	10.7	11.1	1.0
Bachelor's degree or higher	17.7	10.8	1.6
Bachelor's degree	12.9	9.4	1.4
Master's degree	3.7	1.3	2.9
Doctorate	1.1	0.2	5.3
<b>1991</b>			
Less than high school	38.1	38.4	1.0
Secondary school graduate	14.4	15.3	0.9
Completed non-university	17.1	22.8	0.7
Some postsecondary	11.1	11.0	1.0
Bachelor's degree or higher	19.5	12.5	1.6
Bachelor's degree	14.8	10.7	1.4
Master's degree	3.7	1.5	2.4
Doctorate	0.9	0.2	3.8
<b>1996</b>			
Less than high school	35.8	35.0	1.0
Secondary school graduate	14.2	14.9	1.0
Completed non-university	16.6	24.8	0.7
Some postsecondary	10.4	11.0	0.9
Bachelor's degree or higher	23.2	14.3	1.6
Bachelor's degree	18.0	12.2	1.5
Master's degree	4.0	1.9	2.2
Doctorate	1.2	0.3	4.3

**Notes:**

See Graph 17.

1. Recent immigrants are defined as those who arrived in Canada in the five-year period prior to each census.
2. The above comparison is age-adjusted, using the Canadian-born as the standard population.
3. To illustrate the interpretation of the ratio, the 1996 ratio of 4 for the category of 'doctorate' means that recent immigrants were four times as likely as the Canadian-born to hold a doctorate degree, after adjusting for age differences in the two populations.

Sources: Statistics Canada, 1981, 1986, 1991 and 1996 Censuses.



## Appendix 1 Calculation of age-standardized employment income for computer scientists<sup>1</sup> employed full time, year-round, by age and immigration status, 1995

Age group	(Pi)	Age-specific employment income (Ei)			
		Standard population (All computer scientists employed full time, year- round in 1995 <sup>2</sup> )	Immigrants who entered Canada between 1985 and 1994	Immigrants who entered Canada before 1985	Canadian-born
15-24	3,490		\$27,675	\$28,281	\$27,488
25-29	21,225		\$38,209	\$39,908	\$38,805
30-34	32,890		\$43,024	\$47,149	\$46,406
35-39	28,755		\$47,415	\$51,696	\$51,298
40-44	20,990		\$47,254	\$53,909	\$53,958
45-49	12,815		\$49,932	\$56,831	\$54,479
50-54	6,135		\$42,942	\$56,251	\$55,152
55-59	2,065		\$31,251	\$59,433	\$54,323
60+	760		\$28,025	\$52,565	\$46,239
(1) Total standard population	129,125		(X)	(X)	(X)
(2) Total employment income = $\Sigma(P_i * E_i)$	(X)	\$5,667,070,985	\$6,350,614,662	\$6,237,339,844	
(3) Age-adjusted employment income = (2)/(1)	(X)	\$43,888	\$49,182	\$48,305	
(4) Income difference from the Canadian-born	(X)	(\$4,416)	\$877	(X)	
(5) Cumulative difference in income of immigrants in their first 10 years of employment in Canada from the Canadian-born	(X)	(\$44,164)	(X)	(X)	
(6) Cumulative difference in income of immigrants in the next 25 years of employment in Canada from the Canadian-born <sup>3</sup>	(X)	(X)	\$21,931	(X)	
(7) Annual average difference in income of Immigrants in 35 years of employment in Canada from the Canadian-born	(X)	-\$635	(X)		
(8) As percentage of age-adjusted average employment income of the Canadian-born	(X)	-1%	(X)		

**Notes:**

See Graph 20.

(X) Not applicable.

<sup>1</sup> Includes approximately 3% mathematicians, statisticians and actuaries in order to be comparable to the category of emigrants to the United States, set by U.S. Immigration and Naturalization Service.

<sup>2</sup> Excludes immigrants landed in Canada in 1995 and 1996 as they have, by and large, not worked year-round in Canada in 1995. Also excludes temporary residents.

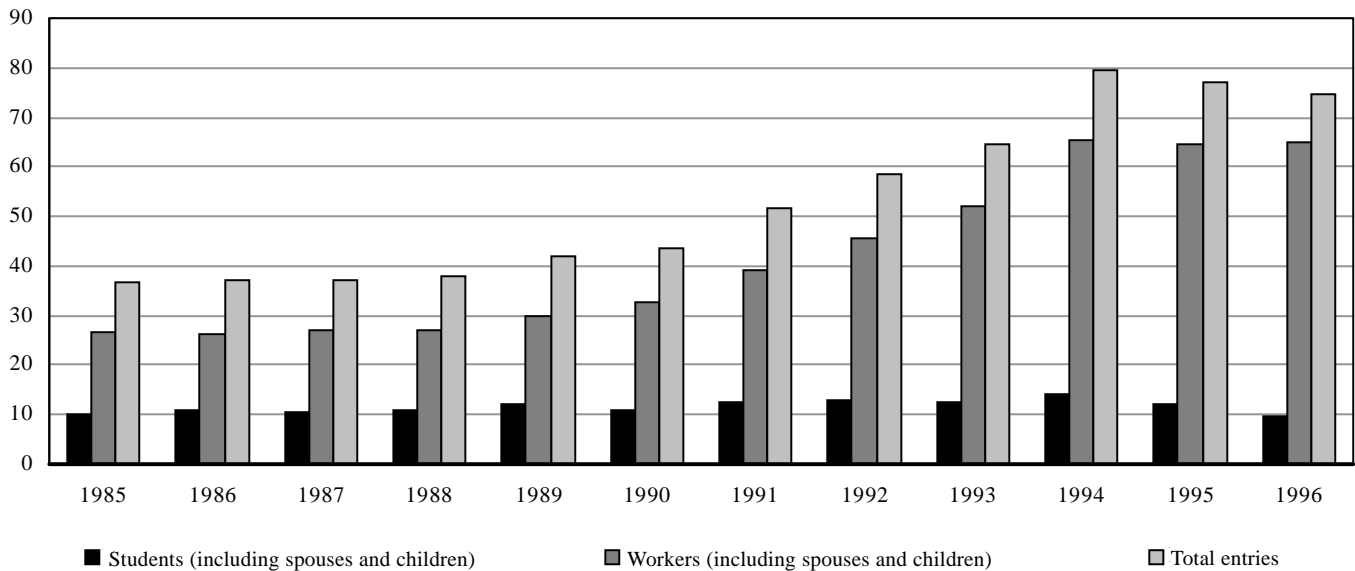
<sup>3</sup> 35 years are chosen as it is the usual number of years required for full pension. Further, the average age of both immigrant computer scientists to Canada and emigrant Canadian computer scientists to the United States is the early 30s; therefore, 35 years of employment is a reasonable estimate for them as well.

Source: Statistics Canada, 1996 Census.



## Appendix 2 Temporary entries by Canadian citizens to the United States to study or work<sup>1</sup>


Thousands of entries



**Note:**

1. Data based on new I-94 forms filled out by Canadian citizens when crossing the border to the U.S. to work or study. These data include initial entries, renewal of visas at border-crossings and multiple entries by same individuals in a given year. As such, they do not provide a reliable measure of the number of individuals going to the U.S. to work or study each year.

**Source:** U.S. Immigration and Naturalization Service.



## Pathways to the United States<sup>1</sup>: Graduates from the Class of '95

### Introduction

Statistics Canada, in partnership with Human Resources Development Canada, conducted the Survey of 1995 Graduates Who Moved to the United States (SGMUS) in March 1999. The survey covered postsecondary graduates from the class of '95 who moved to the United States between graduation and the summer of 1997. (It did not include American citizens returning to the United States after studying in Canada). These graduates were surveyed to obtain information on their characteristics, reasons for relocating to the United States, education and work experiences, and plans for the future. The movements of graduates to other countries, or of foreign students and graduates into Canada, were beyond the scope of the survey.

This article documents the activities of graduates who relocated to the United States. It examines the activities of these graduates before moving, describes the factors and processes surrounding their relocation to the United States, and looks at their activities upon arrival.

### Activities in Canada before moving

Graduates were asked about their main activity in Canada during the six months before they relocated to the United States. Depending on exactly when the person graduated, this period could have been anytime between the summers of 1994 and 1997.<sup>2</sup>

During the six months before relocating to the United States, half (51%) the graduates who moved were working and another 10%\*<sup>3</sup> were looking for work. Going to school was the main activity for 36% of the graduates (Graph 1). For some, relocation to the United States came right after graduation, thus explaining the seemingly high proportion who reported school as their main activity. Very few reported something else as their main activity, but this most often involved family responsibilities.

College graduates (67%) were most likely to have been working before their relocation to the United States, while about half of bachelor's and master's graduates (48% and 49%,\* respectively) were working during this time. In contrast, most PhD graduates (64%\*) reported school as their main activity during this period (Graph 2).

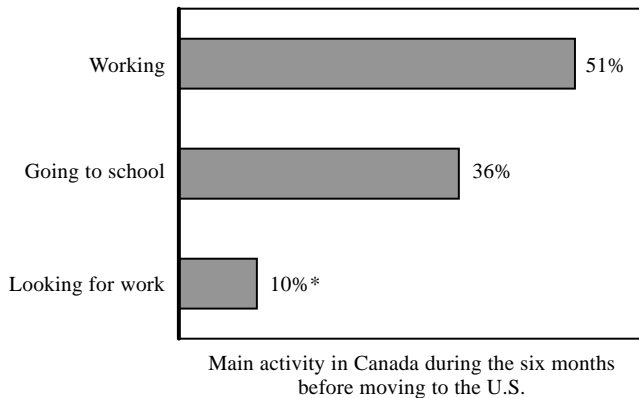
Jeffrey Frank, Statistics Canada  
Éric Bélair, Human Resources  
Development Canada

(Jeffrey Frank is no longer with Statistics  
Canada. Please direct all inquiries to  
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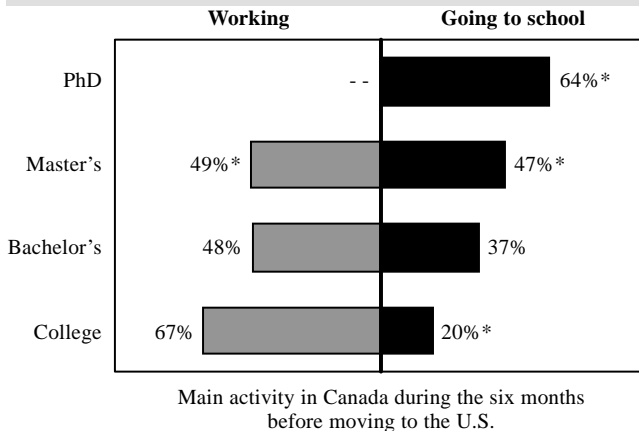
**Graph 1**  
**About half the graduates were working during the six months before moving to the United States**



\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

Source: Survey of 1995 Graduates Who Moved to the United States

**Graph 2**  
**Before relocating to the United States, PhDs were most likely to have been in school, while college graduates tended to be working**



-- estimate not reliable enough to report

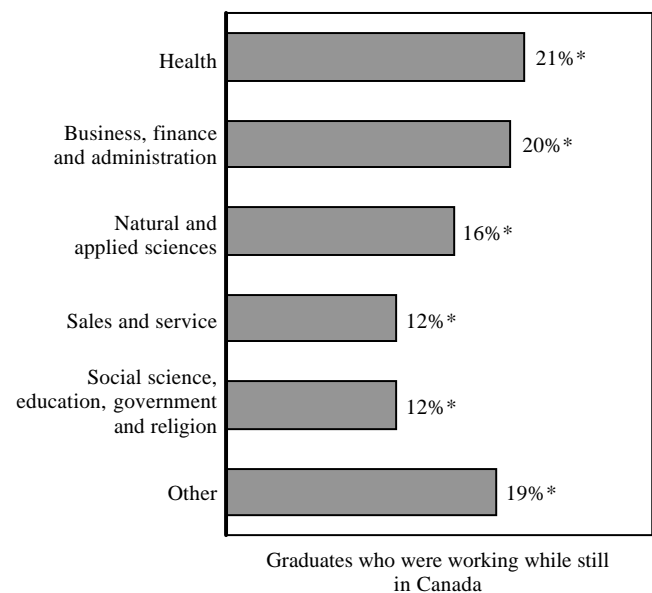
\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

Source: Survey of 1995 Graduates Who Moved to the United States.

Because of the small numbers involved, it is not possible to report any differences among subgroups in the proportions that were looking for work.

The most common jobs among those who were working in Canada during the six months before relocating to the United States were in the health field (21%\*) and in business, finance and administration occupations (20%\*) (Graph 3). Presumably, some of the jobs held by these recent graduates were transitional or student jobs, as many in this group were still in the midst of their school-to-work transitions. This was particularly true of those with business, finance and administration jobs which tended to require skills at the intermediate level only.

**Graph 3**  
**Most graduates were working in the health or business fields while still in Canada**



\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

Source: Survey of 1995 Graduates Who Moved to the United States

Graduates who were working while still in Canada reported earnings associated with the job they held during the six months before moving to the United States. Those who were earning less than \$20,000 (21%\*) and from \$20,000 to \$29,999 (35%) accounted for over half the group. Salaries over \$40,000 were relatively rare, with only 15%\* of those working earning this amount (Graph 4). As already noted, many of these recent graduates were still in the midst of their school-to-work transitions. These salary figures, therefore, include many transitional and student jobs.

## About the earnings data

All earnings data in this report relate to a specific job and are presented as annual amounts in 1999 Canadian dollars, before taxes and other deductions.

Respondents to the Survey of 1995 Graduates Who Moved to the United States provided earnings information for up to three jobs:

**Job 1** was the job graduates held during the six months before moving to the United States. Depending on when the graduate actually moved, this could have been as early as 1994 or as late as the first half of 1997.

**Job 2** was the job graduates had arranged to start upon arrival in the United States. Depending on when the graduate actually moved, this could have been as early as 1995 or as late as the summer of 1997.

**Job 3** was the job graduates held at the time of the survey (March 1999). This job could have been held in either the United States or in Canada (for those who had returned to Canada).

### Annual amounts

Respondents provided earnings information for each job on the basis (e.g., hourly, daily, weekly, monthly, yearly) that was easiest for them. All earnings data were then equated to a yearly amount, employing the same algorithm used by the 1997 National Survey of 1995 Graduates.

### Accounting for inflation

All earnings data presented in this report have been adjusted for inflation to represent 1999 dollars. Each of the graduates' jobs was adjusted individually, as jobs were held at different times depending on when the individual actually moved to the United States. Earnings data for Job 1 were adjusted using monthly figures from Statistics Canada's Consumer Price Index. Information for Job 2 was adjusted using U.S. monthly inflation figures. Earnings data for Job 3 did not require adjustment for inflation.

### Purchasing power parity

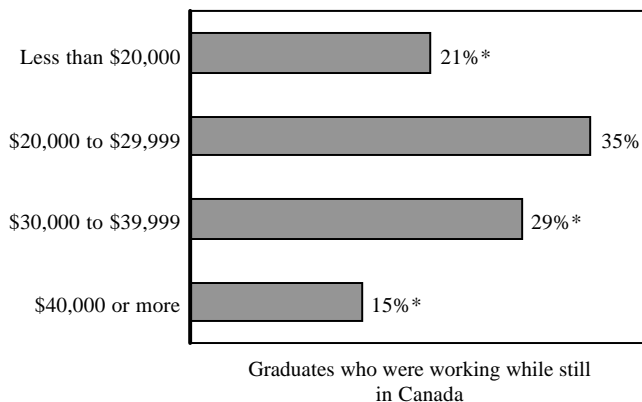
Earnings data reported in U.S. dollars were adjusted to reflect differences in purchasing power between Canada and the United States. The rate used to adjust earnings data (\$1US=\$1.25CAN) is the most recent estimate available from Statistics Canada and is based on the difference in the cost of private final consumption in 1995 between Canada and the United States.

### Factors not taken into account

Earnings and income data are often used or interpreted as indicators of well-being. International comparisons of earnings are complicated by the fact that earners live in different circumstances which can vary considerably between and within countries, provinces and states. Various forms of taxes, public services and other factors related to quality of life are not taken into account in the earnings data presented in this report.



Graph 4  
**Over half the graduates who were working while still in Canada were earning less than \$30,000 per year<sup>1</sup>**



<sup>1</sup> Annual earnings expressed in 1999 Canadian dollars.  
\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

**Source:** Survey of 1995 Graduates Who Moved to the United States.

## Making the move: Factors and processes

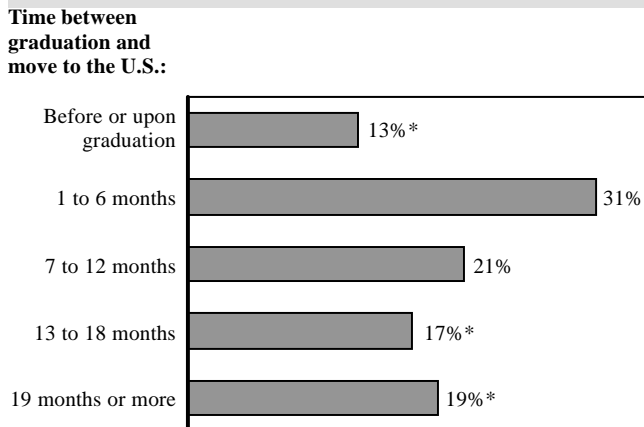
This section explores various aspects of the move, including the factors that attracted graduates to the United States and the process by which they got there.

### *Time between graduation and relocation to the United States*

Graduates from the class of '95 who moved to the United States tended to do so upon or shortly after graduation. In fact, 13%\* actually moved before or upon graduation (see note 2). Within one year of graduation, about two-thirds of the group under study had made their move to the United States (Graph 5). Generally, highly educated young people are highly mobile, and these data indicate that the period around graduation from a postsecondary institution was characterized by a high degree of mobility among recent graduates.



**Graph 5**  
**About two-thirds of graduates who moved to the United States did so within one year graduation**



\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

**Source:** Survey of 1995 Graduates Who Moved to the United States.

*Last province of residence*

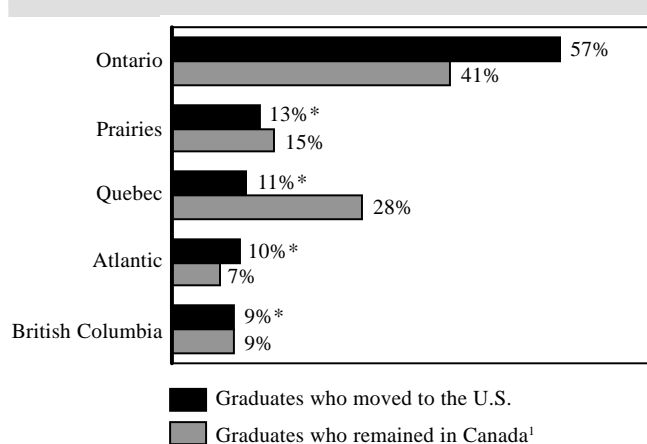
Graduates were asked in which province they were living before moving to the United States. For many, this would have been the province where they were studying, as more than one-third (36%) reported going to school as their main activity during the six months before relocating.<sup>4</sup> Others would have remained in their province of study to work or to look for work. Still others may have returned to their original home province before moving, or could have moved to a different province before relocating to the United States.

Although Ontario accounted for 41% of college and university graduates from the class of '95 who remained in Canada, Ontario was the last province of residence for over half (57%) of those who relocated to the United States. In contrast, 11%\* of the graduates who moved to the United States were last living in Quebec, a province that accounted for 28% of postsecondary graduates who remained in Canada<sup>5</sup> (Graph 6). Linguistic factors may have contributed to the proportionately small number of graduates who reported Quebec as their last province of residence.

*Destination in the United States*

Nearly half the graduates who moved to the United States ended up in a handful of states. Texas was the top destination, accounting for just under 16%\* of the graduates who relocated. Other common destination states included California (11%\*), New York (10%\*) and Florida (8%\*) (Graph 7).

**Graph 6**  
**Over half the graduates were living in Ontario just before moving to the U.S.**

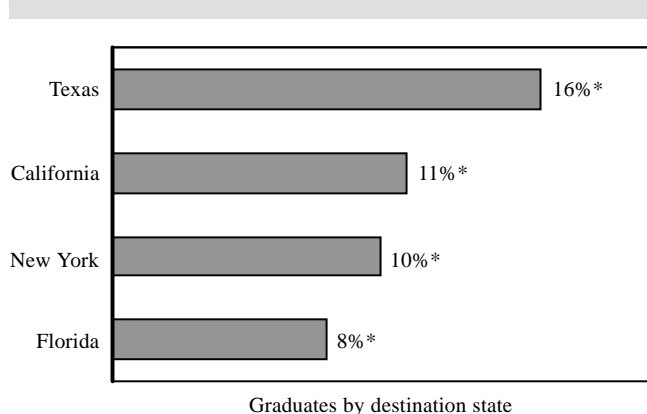


<sup>1</sup> Includes college and university graduates but not trade/vocational graduates

\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

**Source:** Survey of 1995 Graduates Who Moved to the United States.

**Graph 7**  
**Texas was the most common destination state**



\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

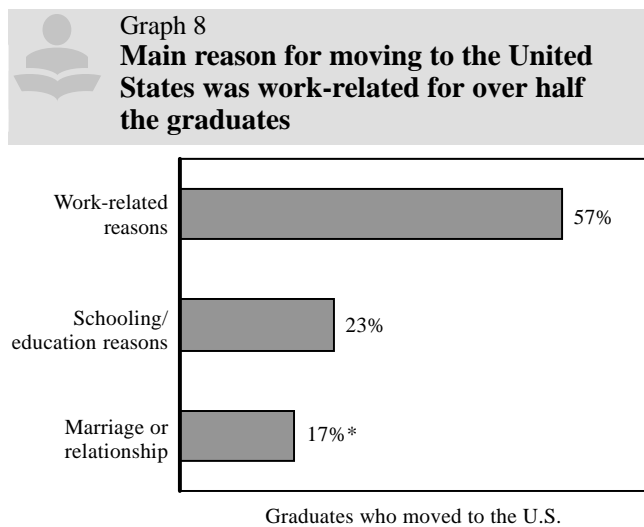
**Source:** Survey of 1995 Graduates Who Moved to the United States.

Among the approximately 360 PhD graduates who moved to the United States, about one-quarter (26%\*) made their way to California. Nearly 275 college graduates (24%\* of all college graduates who moved to the United States) went to Texas. In addition, disproportionate numbers of those who moved to Texas and Florida had

graduated from health-related fields. About half (51%\*) of the approximately 360 movers who had graduated from commerce, management and business administration programs relocated to New York State.

*Reasons for moving to the United States*

“Work” was the most common response graduates gave when asked for the single main reason for moving to the United States. Over half the graduates who moved south (57%) did so mainly for work. In addition, 23% moved for education, presumably to pursue graduate studies at an American institution. Another 17%\* moved mainly for marriage or relationship reasons (Graph 8).



\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.  
 Source: Survey of 1995 Graduates Who Moved to the United States.

Although those moving mainly for work-related reasons were equally likely to have been men or women, most of those who moved because of education were men (84%). In 1996-97, men accounted for 51% of enrolments in Canadian universities.<sup>6</sup> Pursuing graduate studies at an American institution, therefore, would appear to be a predominantly male phenomenon. Meanwhile, women accounted for the vast majority (86%) of those who reported moving to the United States for marriage or relationship reasons.

PhD and college graduates were most likely to have moved to the United States for work-related reasons, with about 4 out of 5 graduates in each of these categories moving because of work. In contrast, only about 4 in 10 of those with bachelor’s degrees (43%), the most numerous group among the members of the class of ’95 who went to

the United States, moved because of work. One-third of the bachelor’s graduates (33%) moved to the United States for education-related reasons. Another 22%\* moved for marriage or relationship reasons.

One notable pattern emerged among the data: college and university graduates in health-related fields were most likely to have moved because of work. In fact, 98% of college and 77% of university graduates whose field of study was health or the health sciences reported work as the main reason for having moved to the United States.

*Work-related factors that attracted graduates to the United States*

Graduates who reported work as their main reason for moving to the United States were asked a more detailed question about the work-related factors that attracted them. The results reported below, therefore, apply only to the 2,600 graduates (57% of the entire group) whose main reason for moving was work-related.

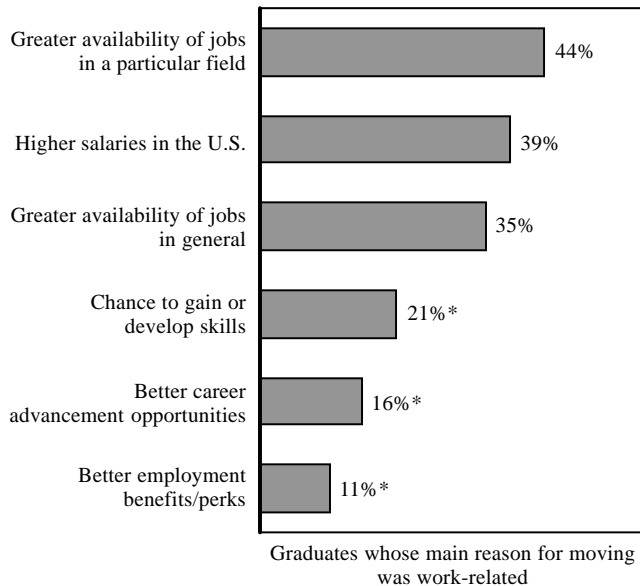
The question was open-ended so as not to influence respondents to mention factors that may not have otherwise occurred to them. Interviewers checked off up to five factors as they were reported by the respondent (most gave only two or three). The question was worded as follows: “What aspects of the job or other work-related factors attracted you to the United States after graduation? Please be as specific as possible.”

In general, the factors most commonly given shared the theme of *opportunity*. Greater availability of jobs in a particular field or industry was cited by 44% of those who moved to the United States for work-related reasons. In addition, 35% mentioned greater availability of jobs in general, 21%\* noted the chance to gain or develop skills, and 16%\* cited better career advancement opportunities (Graph 9).

*Better compensation* was also a common theme. Nearly 4 in 10 graduates (39%) mentioned higher salaries in the United States, making this the second-most commonly cited. Also, about one in ten (11%\*) noted that better employment benefits or perks attracted them to the United States.

Somewhat surprisingly, given the debate and media coverage of this issue, an insignificant proportion of graduates explicitly said that lower taxes in the United States were a factor that attracted them to work there. For some, however, lower taxes may have been implicit in mentioning higher salaries. Also, differences in Canadian and U.S. personal income tax rates tend to be smaller at lower income levels. At this early stage in their careers, many of these graduates may have been most concerned with finding an opportunity in their field.

Graph 9  
**Work-related factors<sup>1</sup> that attracted graduates to the United States**



<sup>1</sup> Multiple responses were allowed.

\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

**Source:** Survey of 1995 Graduates Who Moved to the United States.

### Education-related factors that attracted graduates to the United States

As already noted, 23% of the graduates from the class of '95 who moved to the United States (about 1,050 individuals) reported schooling or education as their main reason for moving. This group was asked an additional question about the education-related factors that attracted them to the United States. Once again, the question was open-ended so as not to unduly influence their answers. Multiple responses were also allowed.

By far the most commonly cited education-related factor attracting graduates to the United States was the *availability* of a program in a particular or specialized field. Among graduates who moved mainly for education, 62% mentioned this factor. The other most frequently cited factors related to notions of *quality* or *excellence*. For example, one in five (21%\*) noted the academic reputation of the program or institution. Very few graduates mentioned quality of research facilities, or scholarships or other forms of funding, as factors that attracted them to study in the United States.

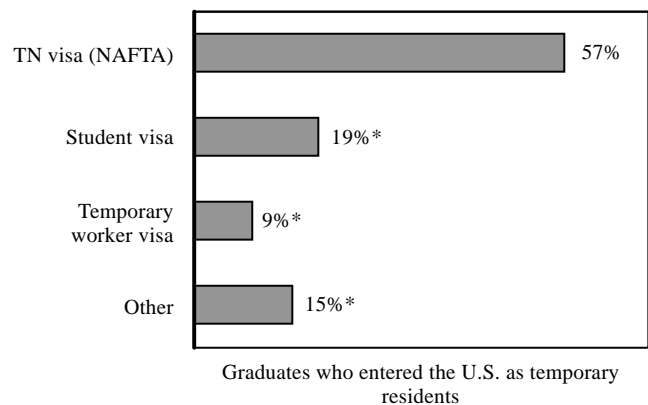
Since graduates who moved to the United States mainly for education represent a relatively small group, cross-tabulations by level of certification or by field of study did not yield meaningful results.

### Basis of admission to the United States

Four out of five graduates who moved south (80%) entered the United States as temporary residents. In addition, about 300 graduates (6%\*) were American citizens (with dual Canadian–U.S. citizenship<sup>7</sup>) and 13%\* had permanent residence status (e.g., a green card). Within this latter group, the vast majority (86%) obtained permanent residence/green card status through family sponsorship; employer sponsorship and other methods were far less common.

Graduates who entered the United States as temporary residents did so most often by obtaining a TN visa under the provisions of the North American Free Trade Agreement (NAFTA). Over half the graduates who entered the United States as temporary residents (57%) did so using a TN visa (Graph 10). Of those temporary residents whose main reason for moving to the United States was work-related, four out of five (80%) entered on a TN visa.

Graph 10  
**Over half of those who entered the United States as temporary residents did so under the North American Free Trade Agreement**



\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

**Source:** Survey of 1995 Graduates Who Moved to the United States.

Obtaining a TN visa is a relatively simple procedure compared with other more traditional temporary U.S. work visas. One must have an offer of a temporary job that falls under one of the professional occupations covered by NAFTA, appropriate qualifying credentials and a letter from the employer giving details of the work assignment, and one must pay a nominal fee. Moreover, a TN visa can be issued directly at the border whereas other temporary work visas typically take six to ten weeks to process.

A TN visa gives temporary residence status for up to one year and a TN visa holder is eligible to reapply after that year has ended. Other temporary worker visas require the employer to make a more formal application to the U.S. labour or immigration departments and involve higher fees. Also, an unlimited number of TN visas can be issued in a year, while the numbers of other types of temporary work visas issued to foreign workers each year are limited. Most of these other temporary work visas, however, are valid for up to three years.

TN visas were likely being used to gain entry to the United States in cases where other types of temporary work visas may have been used in the past, simply because a TN visa is much easier to obtain. To illustrate, a specialized temporary work visa (H1A) exists for registered nurses. However, 99% of graduates who entered the United States as temporary residents to work as registered nurses had a TN visa.

Only 9%\* of graduates who entered the United States as temporary residents did so using other types of temporary work visas. Examples include those for registered nurses (H1A), specialty occupations (H1B), temporary non-agricultural workers (H2A), temporary agricultural workers (H2B) and trainees (H3).

As this survey is a snapshot of a particular group during a specific period, this source alone cannot assess whether overall rates of recent graduates entering the United States as temporary workers have changed over time.

Student visas were the second-most commonly used type of temporary residence visa (19%\*). Among the 15%\* of graduates who entered the United States using other types of visas, those issued to exchange visitors or to fiancé(e)s of U.S. citizens were most common.

### Activities upon arrival in the United States

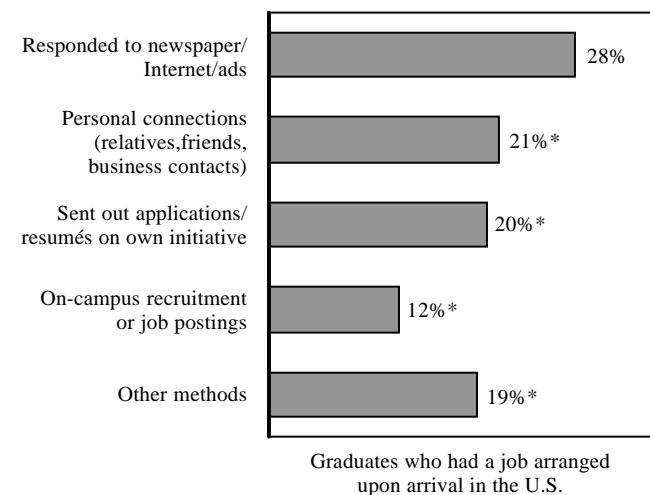
Nearly two-thirds (64%) of all the graduates who moved to the United States had arranged a job there before moving. Not surprisingly, this proportion was highest (89%) for those whose main reason for moving was work-related. In contrast, only about one-third (32%) of graduates whose main reason for moving was not work-related had a prearranged job. Students with jobs (including teaching and research assistants) accounted for about half of this latter group. Those who graduated from health-related programs were most likely to have had a prearranged job (83%).

### Finding employment in the United States

Regardless of their main reason for moving, graduates who had arranged to start a job when they arrived in the United

States were asked further questions about how they found their job. About 3,000 graduates had a job prearranged and most got their jobs through their own initiative: by responding to job advertisements (28%), through personal contacts (21%\*), or by sending out résumés or applications on their own (20%\*). Finding a job through on-campus recruitment programs or job postings was less common (12%\*). Very few graduates were contacted directly by a U.S. employer or head-hunter, were transferred to the United States, or found their jobs by registering with an employment agency (Graph 11).

Graph 11  
**Most found jobs in the United States through their own initiative**



\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

Source: Survey of 1995 Graduates Who Moved to the United States.

Thus, the popular notion that large numbers of recent graduates are being aggressively recruited by U.S. employers did not apply to the class of '95. While some active recruitment was certainly taking place, this was not how most of these graduates secured their U.S. jobs. Instead, most found employment in the United States using traditional job search methods. Further research using additional sources of data would be required to assess any changes in this pattern over time.

### Incentives offered<sup>8</sup>

Just under half the graduates who had a job arranged upon arrival in the United States (48%) were offered some type of incentive, in addition to employment, by their U.S. employer. Graduates who held master's degrees were most

likely to have received incentives (65%\*), compared with 52% of bachelor's and 38%\* of college graduates. Among occupational categories, 58% of graduates in health occupations and 55%\* of those in natural and applied sciences<sup>9</sup> jobs received incentives.

Among the approximately 1,400 graduates who were offered incentives by their U.S. employers, payment of moving expenses (56%) and signing bonuses (37%\*) were the most common types of incentive. In addition, 22%\* received education-related benefits that respondents perceived as incentives.

Over one-half (57%\*) of the graduates who were offered incentives and had jobs arranged in health occupations received signing bonuses from their U.S. employers. Among all graduates receiving incentives, 76% of those working in natural and applied sciences and 44%\* in health occupations had their moving expenses paid.

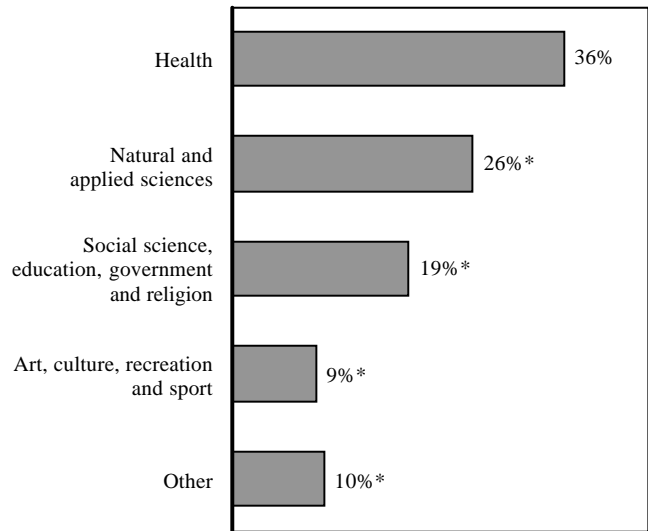
*Occupational profile and salaries earned*

Among graduates who moved to the United States and had a job arranged, there was a distinct shift in their occupational profile compared with their profile while still in Canada. Once in the United States, graduates were far less likely to be working in business, finance and administration occupations or in sales and services jobs than they had been in Canada, where these tended to be student or transitional jobs. Instead, graduates were even more concentrated by this time in occupations in the fields of health (36%), natural and applied sciences (26%\*), and social science, education, government and religion (19%\*) (Graph 12).

This progression was also reflected in the salaries earned by graduates who had prearranged jobs in the United States. A markedly smaller proportion were earning under \$30,000 (12%\*), compared with 56% of those who were working while still in Canada. At the higher end of the pay scale, nearly two-thirds (63%) were earning \$40,000 or more upon arrival in the United States, compared with just 15%\* of those who worked before moving. To some extent, this may reflect an expected shift out of transitional and student jobs and into more career-related positions (Graph 13). EOR



**Graph 12**  
**Most graduates with prearranged jobs in the United States worked in the health field**



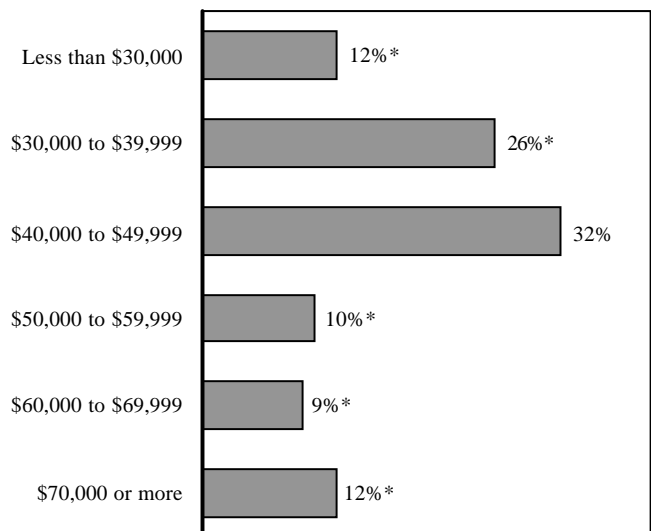
Graduates who had a job arranged upon arrival in the U.S.

\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

**Source:** Survey of 1995 Graduates Who Moved to the United States.



**Graph 13**  
**Nearly two thirds of working graduates were earning \$40,000 or more upon arrival in the United States<sup>1</sup>**



Graduates who had a job arranged upon arrival in the U.S.

<sup>1</sup> Annual earnings expressed in 1999 Canadian dollars.

\* Numbers marked with this symbol have a coefficient of variation between 16.6 percent and 33.3 percent and are less reliable than unmarked numbers.

**Source:** Survey of 1995 Graduates Who Moved to the United States.

## Notes

1. Adapted from the full report “*South of the Border: Graduates from the Class of '95 who moved to the United States*”. This report is available through the Internet free of charge at [www.hrdc-drhc.gc.ca/arb](http://www.hrdc-drhc.gc.ca/arb). For more information relating to this adapted article, contact the Editor, *Education Quarterly Review*: Telephone (613) 951-1500; E-mail: [jim.seidle@statcan.ca](mailto:jim.seidle@statcan.ca)
2. A small proportion of graduates actually moved to the United States before graduation in 1995. Some completed their program requirements in 1994 while not formally graduating until 1995, while others may have completed program requirements at a distance or returned temporarily to complete their requirements.
3. Numbers marked with this symbol (\*) have a coefficient of variation between 16.6% and 33.3% and are less reliable than unmarked numbers.
4. For many, the province of study would also have been the original home province of residence.
5. Excluding those completing CEGEP programs that lead to university enrolment.
6. Statistics Canada, Centre for Education Statistics.
7. Graduates who were exclusively American citizens who had been studying in Canada and subsequently returned home to the United States were not included in the survey.
8. The conceptual distinction between “incentives” and job “benefits” is difficult to make. Some of the responses that are normally thought of as regular benefits (such as paid vacation time) were not analysed. Still, some of the included responses could also be considered common practice (e.g., payment of moving expenses). Furthermore, no information source exists that offers a baseline comparison: one would ideally have information on the kinds of incentives Canadian employers are using, how often they are offered and to whom. Still, the SGMUS provides some information on the issue of incentives.
9. The natural and applied sciences occupational category includes scientists, engineers, architects and urban planners, mathematicians, systems analysts and computer programmers. Technical occupations related to natural and applied sciences are also included in this category.

# announcements

## Data releases

*For requests and extractions from CANSIM, contact Sharon-Anne Borde ([sharon-anne.borde@statcan.ca](mailto:sharon-anne.borde@statcan.ca)) at (613) 951-1503 or 1 800 307-3382, or the Centre for Education Statistics. For more information, or to enquire about the concepts, methods, and data quality of this release, contact Claudio Pagliarello ([claudio.pagliarello@statcan.ca](mailto:claudio.pagliarello@statcan.ca)) at (613) 951-1508, Centre for Education Statistics.*

### Education price index, 1997

- For the second consecutive year, prices for goods and services in elementary and secondary education increased less than overall inflation. In 1997, the Education Price Index (EPI) increased 0.7%, compared with 1.6% for the Consumer Price Index (CPI). From 1987 to 1991, growth in the EPI mirrored the CPI. Education prices subsequently rose more quickly than overall inflation until 1996 when this trend reversed.
- Teachers' salaries account for more than 70% of school boards' operating expenses and are the major component of the EPI. Budget constraints in most provinces have kept growth in teacher salaries under 1% since 1994. Other salaries in the education sector have seen little or no increases in recent years. For a fourth year in a row, the non-teaching salary component of the EPI remained unchanged.
- The prices of the non-salary items included in the EPI have fluctuated more than salaries in recent years, rising 1.5% in 1997. The non-salary component is made up of school facilities, instructional supplies, fees and contractual services. These have a relatively smaller influence on the overall EPI since they represent only 20% of the total operating budgets of school boards.

**Note:** The Education Price Index was established in the 1970s to determine whether increases in elementary and secondary education operating expenditures were attributable to inflation alone or to variations in the quantity and quality of goods purchased by schools (including teaching services). The EPI is used mainly to indicate price changes in elementary and secondary education and to express its expenditures in constant dollar amounts.

These data are now available of the years 1971 to 1997 on CANSIM:

**Available on CANSIM:** T00590304



**Table 1  
Level and Annual Growth Rate of the Consumer Price Index  
and the Education Price Index (EPI) and its Major Components, 1997**

	Relative importance to EPI %	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Consumer Price Index*		84.8	89.0	93.3	98.5	100.0	101.8	102.0	104.2	105.9	107.6
% change from previous year		4.0	5.0	4.8	5.6	1.5	1.8	0.2	2.2	1.6	1.6
Education Price Index*	100.0	83.1	87.1	91.8	96.7	100.0	101.9	102.8	105.3	105.8	106.5
% change from previous year		4.6	4.8	5.4	5.3	3.5	1.9	0.9	2.4	0.5	0.7
Salaries and wages*	80.0	83.0	86.9	91.7	96.4	100.0	101.8	102.2	102.0	102.3	102.8
% change from previous year		4.4	4.7	5.5	5.2	3.7	1.8	0.4	-0.2	0.3	0.5
Teachers' salaries*	71.9	82.3	86.2	91.0	96.2	100.0	101.8	102.3	102.0	102.4	102.9
% change from previous year		4.4	4.7	5.7	5.6	4.0	1.8	0.5	-0.3	0.4	0.5
Non-teaching salaries*	8.1	89.2	93.1	96.9	98.8	100.0	101.7	101.7	101.7	101.7	101.7
% change from previous year		4.9	4.4	4.1	2.0	1.3	1.7	0.0	0.0	0.0	0.0
Non-salary*	20.0	83.5	88.1	92.2	97.7	100.0	102.4	105.5	121.2	122.5	124.3
% change from previous year		5.3	5.5	4.7	5.9	2.4	2.4	3.1	14.9	1.0	1.5
Instructional supplies*	7.1	91.4	98.2	102.9	106.9	100.0	101.5	109.6	163.8	155.5	152.5
% change from previous year		8.3	7.5	4.7	3.8	-6.4	1.5	7.9	49.5	-5.1	-1.9
School facilities, supplies and services*	4.2	87.3	89.3	92.0	97.9	100.0	101.1	101.7	100.1	102.1	105.8
% change from previous year		0.9	2.4	3.0	6.4	2.2	1.1	0.6	-1.6	2.0	3.6
Fees and contractual service	8.7	76.9	81.5	86.1	92.1	100.0	103.6	105.2	107.8	114.3	118.0
% change from previous year		6.3	6.0	5.6	7.1	8.5	3.6	1.6	2.5	6.0	3.2

Note: Growth rates may differ slightly because of rounding.

\* 1992 = 100






**Table 2**  
**Education Price Index and its Two Major Components**

1992 = 100	1988	1989	1990*	1991	1992	1993	1994	1995	1996	1997
<b>Canada</b>										
Education Price Index	83.1	87.1	91.8	96.7	100.0	101.9	102.8	105.3	105.8	106.5
Salaries and wages	83.0	86.9	91.7	96.4	100.0	101.8	102.2	102.0	102.3	102.8
Non-salary	83.5	88.1	92.2	97.7	100.0	102.4	105.5	121.2	122.5	124.3
<b>Newfoundland</b>										
Education Price Index	87.5	91.0	94.9	99.2	100.0	100.3	100.6	102.1	102.4	102.9
Salaries and wages	88.2	91.6	95.3	99.5	100.0	100.1	100.1	100.0	100.0	100.0
Non-salary	83.2	86.9	91.9	97.7	100.0	101.2	103.9	115.7	117.2	121.3
<b>Prince Edward Island</b>										
Education Price Index	85.2	87.7	92.3	97.4	100.0	100.4	97.2	95.8	99.3 <sup>r</sup>	101.6
Salaries and wages	85.3	87.7	92.2	97.2	100.0	100.2	96.5	93.9	97.7 <sup>r</sup>	99.9
Non-salary	84.4	87.5	92.7	98.6	100.0	101.4	102.7	112.2	112.3	116.2
<b>Nova Scotia</b>										
Education Price Index	85.0	88.8	93.1	97.6	100.0	100.1	100.8	100.3	100.4	100.6
Salaries and wages	85.0	88.8	93.0	97.4	100.0	100.2	100.6	98.3	98.3	98.3
Non-salary	85.2	89.5	94.0	99.0	100.0	99.8	102.5	116.9	117.4	119.5
<b>New Brunswick</b>										
Education Price Index	87.6	90.6	94.7	98.9	100.0	101.4	102.8	104.9	106.6	108.2
Salaries and wages	88.6	91.6	95.6	99.3	100.0	101.4	102.6	103.0	104.5	105.6
Non-salary	82.7	86.0	90.5	97.0	100.0	101.7	104.1	113.6	116.7	120.6
<b>Quebec</b>										
Education Price Index	85.1	89.0	93.5	97.6	100.0	102.6	103.4	106.0	106.5	107.7
Salaries and wages	86.0	89.6	94.2	97.9	100.0	102.6	102.9	102.9	102.9	103.8
Non-salary	81.8	86.9	91.0	96.5	100.0	102.7	105.5	117.9	120.3	122.7
<b>Ontario</b>										
Education Price Index	81.4	85.4	90.4	95.7	100.0	101.8	102.8	105.8	106.2	106.5
Salaries and wages	81.0	85.0	90.1	95.3	100.0	101.6	102.2	102.2	102.4	102.5
Non-salary	83.2	87.7	91.9	97.5	100.0	102.6	105.9	122.9	124.0	125.5
<b>Manitoba</b>										
Education Price Index	86.6	89.8	94.2	98.5	100.0	101.8	104.1	107.6	107.5	108.3
Salaries and wages	86.4	89.5	93.9	98.1	100.0	101.8	103.8	103.8	103.8	104.7
Non-salary	87.4	91.9	95.6	100.7	100.0	101.4	105.4	128.1	126.9	127.6
<b>Saskatchewan</b>										
Education Price Index	86.5	91.7	95.4	99.6	100.0	100.6	103.1	106.6	107.2	109.3
Salaries and wages	86.7	92.1	95.8	99.9	100.0	100.2	102.4	102.4	102.9	105.3
Non-salary	85.8	90.3	94.0	98.4	100.0	102.4	105.9	122.9	123.7	125.1
<b>Alberta</b>										
Education Price Index	83.6	86.9	91.2	95.8	100.0	102.5	101.5	102.1	103.3	104.5
Salaries and wages	83.6	86.7	91.0	95.4	100.0	102.6	100.9	98.6	99.8	100.8
Non-salary	84.1	88.2	92.2	98.0	100.0	102.0	104.9	120.5	121.7	123.8
<b>British Columbia</b>										
Education Price Index	80.4	85.4	90.2	96.3	100.0	101.7	103.1	105.6	106.1	106.5
Salaries and wages	79.3	84.4	89.5	95.8	100.0	101.7	102.7	103.1	103.8	104.1
Non-salary	89.0	92.8	96.2	100.3	100.0	102.1	106.0	125.2	124.1	125.2

\*: Revised due to new methodology introduced in 1990.

r : Revised figures.

 <b>Table 3</b> <b>Annual Growth Rate of the Education Price Index and its Two Major Components</b>		1988	1989	1990*	1991	1992	1993	1994	1995	1996	1997
1992 = 100											
<b>Canada</b>											
Education Price Index		4.6	4.8	5.4	5.3	3.5	1.9	0.9	2.4	0.5	0.7
Salaries and wages		4.4	4.7	5.5	5.2	3.7	1.8	0.4	-0.2	0.3	0.5
Non-salary		5.3	5.5	4.7	5.9	2.4	2.4	3.1	14.9	1.0	1.5
<b>Newfoundland</b>											
Education Price Index		6.0	4.0	4.3	4.6	0.8	0.2	0.4	1.5	0.2	0.5
Salaries and wages		6.2	3.9	4.0	4.3	0.5	0.1	0.0	-0.1	0.0	0.0
Non-salary		4.8	4.4	5.8	6.3	2.4	1.2	2.7	11.3	1.3	3.4
<b>Prince Edward Island</b>											
Education Price Index		8.9	3.0	5.2	5.5	2.7	0.4	-3.1	-1.4	3.6 <sup>r</sup>	2.4
Salaries and wages		9.7	2.8	5.2	5.4	2.9	0.2	-3.7	-2.8	4.1 <sup>r</sup>	2.2
Non-salary		4.3	3.7	5.9	6.3	1.5	1.3	1.3	9.2	0.1	3.5
<b>Nova Scotia</b>											
Education Price Index		3.8	4.5	4.8	4.8	2.5	0.1	0.6	-0.5	0.1	0.2
Salaries and wages		3.7	4.4	4.7	4.8	2.7	0.2	0.4	-2.2	0.0	0.0
Non-salary		4.4	5.1	5.1	5.4	1.0	-0.2	2.6	14.1	0.5	1.8
<b>New Brunswick</b>											
Education Price Index		4.5	3.5	4.5	4.5	1.1	1.4	1.4	2.0	1.7	1.4
Salaries and wages		4.8	3.4	4.3	3.9	0.7	1.4	1.2	0.4	1.5	1.0
Non-salary		3.2	4.0	5.3	7.1	3.1	1.7	2.4	9.1	2.7	3.3
<b>Quebec</b>											
Education Price Index		4.9	4.6	5.1	4.3	2.5	2.6	0.7	2.5	0.5	1.2
Salaries and wages		4.7	4.2	5.2	3.9	2.2	2.6	0.2	0.0	0.0	0.9
Non-salary		5.7	6.2	4.8	6.0	3.6	2.6	2.8	11.8	2.1	2.0
<b>Ontario</b>											
Education Price Index		5.1	5.0	5.8	5.9	4.5	1.8	1.0	2.9	0.4	0.3
Salaries and wages		5.1	4.9	6.0	5.8	4.9	1.6	0.5	0.0	0.2	0.1
Non-salary		5.5	5.5	4.8	6.1	2.5	2.6	3.1	16.1	0.9	1.2
<b>Manitoba</b>											
Education Price Index		4.3	3.8	4.8	4.7	1.5	1.8	2.3	3.4	-0.2	0.8
Salaries and wages		4.1	3.5	5.0	4.5	1.9	1.8	2.0	0.0	0.0	0.8
Non-salary		5.4	5.2	4.0	5.4	-0.7	1.4	3.9	21.5	-0.9	0.6
<b>Saskatchewan</b>											
Education Price Index		2.5	6.0	4.1	4.3	0.4	0.6	2.5	3.4	0.5	2.0
Salaries and wages		1.5	6.2	4.1	4.2	0.1	0.2	2.3	0.0	0.5	2.3
Non-salary		5.7	5.2	4.1	4.7	1.6	2.4	3.4	16.1	0.6	1.2
<b>Alberta</b>											
Education Price Index		2.7	3.9	4.9	5.1	4.4	2.5	-0.9	0.6	1.2	1.2
Salaries and wages		2.3	3.7	5.0	4.8	4.8	2.6	-1.7	-2.3	1.2	1.0
Non-salary		4.9	4.9	4.5	6.3	2.0	2.0	2.9	14.9	1.0	1.8
<b>British Columbia</b>											
Education Price Index		4.5	6.2	5.7	6.7	3.8	1.7	1.4	2.4	0.5	0.3
Salaries and wages		4.5	6.5	6.0	7.1	4.4	1.6	1.1	0.4	0.7	0.3
Non-salary		4.3	4.2	3.7	4.3	-0.3	2.1	3.9	18.1	-0.8	0.9

\* : Revised due to new methodology introduced in 1990.

r : Revised figures.



## Data releases

*For more information, or to enquire about the concepts, methods and data quality of this release, contact Mongi Mouelhi (613) 951-1537, Centre for Education Statistics. To obtain tables on enrolments and graduations, contact Sharon-Anne Borde (613) 951-1503 or 1-800-307-3382, Centre for Education Statistics.*

### **University enrolment, 1998–1999**

Enrolment in undergraduate courses at Canadian universities increased marginally during the 1998–1999 academic year, halting five consecutive years of decline.

Universities enrolled 707,600 undergraduate students, 0.4% more than in the previous academic year. However, this level was still a substantial 8.3% below the record 771,300 in 1992–1993.

The small rise in enrolment in 1998–1999 was the result of an increase in full-time undergraduate students offsetting a small decline in part-time undergraduates. Universities enrolled 501,000 full-time undergraduates, 0.8% more than in 1997–1998; this was the second time full-time enrolment has surpassed the half-million mark (the first was in 1994–1995). At the same time, the number of part-time undergraduates declined 0.6% to 206,600.

The five-year decline in overall undergraduate enrolment was due entirely to a sharp drop in part-time undergraduates. Between 1992–1993 and 1998–1999, the number of part-time undergraduate students fell 24.6%, while enrolment in full-time undergraduate studies remained relatively steady. Although part-time enrolment fell between 1997–1998 and 1998–1999, the 0.6% decline was much smaller than in the previous years.

At the graduate level, enrolments have followed an upward trend since 1992–1993. Universities enrolled 79,400 full-time graduate students in 1998–1999, 10.0% more than six years earlier. Over the same period, the total number of part-time graduate students declined only 6.4% to 39,400.



Table 1  
University enrolment

	1992–1993	1997–1998	1998–1999	1992–1993 to 1998–1999	1997–1998 to 1998–1999
	% change				
Full-time undergraduate	497,200	497,100	501,000	0.75	0.78
18–24 year olds	412,100	418,500	423,800	2.83	1.26
men	188,900	182,300	183,100	-3.06	0.44
women	223,200	236,200	240,700	7.82	1.90
25–44 year olds	79,900	73,600	72,000	-9.91	-2.15
men	40,500	36,100	34,700	-14.35	-3.79
women	39,400	37,500	37,300	-5.40	-0.57
Part-time undergraduate	274,100	207,900	206,600	-24.62	-0.63
18–24 year olds	73,400	65,500	66,400	-9.56	1.26
men	32,100	28,300	28,800	-10.24	1.62
women	41,300	37,200	37,600	-9.04	1.00
25–44 year olds	165,700	115,400	113,300	-31.64	-1.85
men	59,700	42,600	41,700	-30.13	-2.08
women	106,000	72,800	71,600	-32.49	-1.72

Note: Data rounded to nearest 100, but percentages are calculated from non-rounded figures.  
Source: CANSIM, tables 00580701 and 00580702.

### Full-time undergraduates: More women aged 18 to 24

Among full-time undergraduate students, women aged 18 to 24 were the only group whose enrolment increased between 1992–1993 and 1998–1999. During this six-year period, enrolment in this group increased 7.8% to 240,700. On the other hand, the number of enrolments for male full-time undergraduates aged 18 to 24 declined 3.5% to 183,100 between 1992–1993 and 1997–1998, and then rose 0.4% to 183,100 in 1998–1999. In this age group, women represented 56.8% of full-time undergraduate enrolment in 1998–1999, up from 54.3% in 1992–1993.

These developments occurred during a period in which tuition fees increased, partially offsetting declines in government funding for each full-time student, a situation outlined in *The Daily* of August 25, 1999. In the 1992–1993 academic year, universities received \$9,200 (in 1997 constant dollars) in federal-provincial government operating grants for each full-time student.

Government grants had fallen to \$7,600 per full-time student in 1997–1998 (-17%). Over the same period, tuition fees rose 48%, from an average of \$2,000 (in 1997 constant dollars) to \$3,000.

### Enrolment in the provinces

Enrolment in full-time studies, both undergraduate and graduate, increased at universities in five provinces between 1992–1993 and 1998–1999.

The largest increase occurred in British Columbia, where the number of full-time students increased 18.4% to 54,000 during the six-year period. Full-time registrations also increased in Alberta, Saskatchewan, Nova Scotia and Manitoba.

However, enrolment in part-time undergraduate and graduate courses increased only in Alberta (+13%) and British Columbia (+10.7%) during the six-year period. Universities in the other eight provinces incurred double-digit declines in part-time enrolment.



Table 2  
Provincial enrolment – undergraduate and graduate

	1992–1993	1997–1998	1998–1999	1992–1993 to 1998–1999	1997–1998 to 1998–1999
	% change				
<b>Full-time</b>					
Newfoundland	13,200	13,100	13,100	-0.74	0.00
Prince Edward Island	2,700	2,400	2,500	-9.32	0.73
Nova Scotia	29,400	30,100	30,000	2.04	-0.17
New Brunswick	19,100	18,500	18,500	-3.04	0.14
Quebec	135,000	131,100	134,200	-0.64	2.36
Ontario	230,600	227,200	230,000	-0.25	1.25
Manitoba	20,600	21,000	20,900	1.50	-0.67
Saskatchewan	22,900	23,900	23,700	3.54	-0.87
Alberta	50,300	52,800	53,500	6.29	1.30
British Columbia	45,700	53,000	54,000	18.38	1.94
Canada	569,500	573,100	580,400	1.91	1.27
<b>Part-time</b>					
Newfoundland	4,600	2,700	2,600	-44.10	-3.28
Prince Edward Island	900	500	400	-54.38	-13.49
Nova Scotia	8,500	7,000	7,200	-14.66	2.97
New Brunswick	5,700	4,100	4,200	-25.82	1.34
Quebec	122,500	101,000	98,100	-19.87	-2.88
Ontario	108,500	76,300	73,000	-32.74	-4.32
Manitoba	17,000	9,800	9,900	-42.09	0.57
Saskatchewan	10,100	7,400	7,600	-24.15	3.50
Alberta	17,900	18,600	20,300	13.02	8.98
British Columbia	20,500	22,300	22,700	10.66	1.88
Canada	316,200	249,700	246,000	-22.20	-1.48
<b>Total enrolment</b>	<b>885,700</b>	<b>822,800</b>	<b>826,400</b>	<b>6.69</b>	<b>0.44</b>

Note: Data rounded to nearest 100, but percentages are calculated from non-rounded figures.

Source: CANSIM, tables 00580701 and 00580702.



## Current data

Data series	Most recent data	
	Final <sup>1</sup>	Preliminary or estimate <sup>2</sup>
<b>A. Elementary/secondary</b>		
Enrolment in public schools	1996–1997	1997–1998 <sup>e</sup> 1998–1999 <sup>e</sup>
Enrolment in private schools	1996–1997	1997–1998 <sup>e</sup> 1998–1999 <sup>e</sup>
Enrolment in minority and second language education programs	1995–1996	
Secondary school graduation	1995–1996	
Educators in public schools	1996–1997	1997–1998 <sup>e</sup> 1998–1999 <sup>e</sup>
Educators in private schools	1996–1997	1997–1998 <sup>e</sup> 1998–1999 <sup>e</sup>
Elementary/secondary school characteristics	1996–1997	1997–1998 <sup>e</sup> 1998–1999 <sup>e</sup>
Financial statistics of school boards	1996	
Financial statistics of private academic schools	1995–1996	1996–1997 <sup>p</sup>
Federal government expenditures on elementary/secondary education	1995–1996	1996–1997 <sup>e</sup> 1997–1998 <sup>e</sup>
Consolidated expenditures on elementary/secondary education	1995–1996	1996–1997 <sup>e</sup> 1997–1998 <sup>e</sup> 1998–1999 <sup>e</sup>
Education price index	1997	
<b>B. Postsecondary</b>		
University: enrolments	1998–1999	discontinued
University degrees granted	1998	discontinued
University continuing education enrolment (discontinued)	1996–1997	...
Educators in universities	1997–1998	1998–1999
Salaries and salary scales of full-time teaching staff at Canadian universities	1997–1998	1998–1999
Tuition and living accommodation costs at Canadian universities	1999–2000	
University finance	1997–1998	1998–1999 <sup>e</sup>
College finance	1996–1997	1998–1999 <sup>e</sup>
Federal government expenditures on postsecondary education	1996–1997	1997–1998 <sup>e</sup> 1998–1999 <sup>e</sup>
Consolidated expenditures on postsecondary education	1996–1997	1997–1998 <sup>e</sup> 1998–1999 <sup>e</sup>



## Current data (Concluded)

Data series	Most recent data	
	Final <sup>1</sup>	Preliminary or estimate <sup>2</sup>
Community colleges and related institutions: postsecondary enrolment and graduates	1997–1998	1998–1999 <sup>p</sup>
Trade/vocational enrolment	1996–1997	1997–1998 <sup>e</sup>
College/trade teaching staff	1996–1997	1997–1998 <sup>e</sup>
International student participation in Canadian universities	1998–1999	

### C. Publications<sup>4</sup>

Education in Canada, 1999

South of the Border: Graduates from the class of '95 who moved to the United States (1999)

*Leaving school (1993)*

*After High School, the First Years (1996)*

*Adult education and training survey (1995)*

*International student participation in Canadian education (1993-1995)*

*Education price index – methodological report*

*Handbook of education terminology: elementary and secondary level (1994)*

*Guide to data on elementary secondary education in Canada (1995)*

*A Guide to Statistics Canada Information and Data Sources on Adult Education and Training (1996)*

*A Statistical Portrait of Elementary and Secondary Education in Canada – Third edition (1996)*

*A Statistical Portrait of Education at the University Level in Canada – First edition (1996)*

*The Class of '86 Revisited*

The Class of 90: A compendium of findings (1996)

*The Class of '90 Revisited (1997)*

Education indicators in Canada: Report of the Pan-Canadian Indicators Program (1999)

Education at a Glance: OECD Indicators (2000)

Literacy, Economy and Society (1995)

*Growing Up in Canada: National Longitudinal Survey of Children and Youth (1996)*

1. Indicates the most recent calendar year (e.g., 1993) or academic/fiscal year (e.g., 1993–1994) for which final data are available for all provinces and territories.
2. Indicates the most recent calendar year (e.g., 1995) or academic/fiscal year (e.g., 1996–1997) for which any data are available. The data may be preliminary (e.g., 1995<sup>p</sup>), estimated (e.g., 1995<sup>e</sup>) or partial (e.g., data not available for all provinces and territories).
3. Available for some provinces.
4. The year indicated in parenthesis denotes the year of publication. Some of these publications are prepared in cooperation with other departments or organizations. For information on acquiring copies of these reports, please contact the Planning and Client Services Section of the Centre for Education Statistics at Statistics Canada. Telephone: (613) 951-1503; fax: (613) 951-9040 or Internet: perrdan@statcan.ca.



## Advance Statistics

*This section summarizes data on institutions, teachers, enrolment, degrees and finance at all levels of education in Canada. Unless otherwise indicated, actual figures are given for 1997–1998, preliminary figures for 1998–1999 and estimates for 1999–2000. Financial statistics are shown in current dollars for 1996–1997 to 1999–2000. For further information, please contact Analysis and Dissemination Section, Centre for Education Statistics, at (613) 951-1503, 1 800 307-3382 or by fax at (613) 951-9040.*

### **Enrolment**

- In the fall of 1999, an estimated 508,500 children enrolled in the pre-elementary level, up 2,900 from 1998–1999. Enrolment in Grades 1 to 12 was expected to be 5,016,400, up by 0.8% from the previous year.
- Full-time postsecondary Community College enrolment was estimated to decrease slightly in 1999–2000 by 0.1% from the previous year, to reach 409,400.

### **Teachers**

- The number of full-time elementary and secondary teachers remained unchanged in 1999–2000, at 295,900.

### **Degrees**

- In the 1998 calendar year, an estimated 124,900 bachelor's and first professional degrees, 22,000 master's degrees and about 4,000 doctorates were conferred.

### **Finance**

- In 1999–2000, total education expenditures are expected to reach \$61.9 billion, an increase of 1.7% over 1998–1999.
- In 1999–2000, about 88% of the education bill will be paid by the three levels of government; the remainder through fees and other private sources.
- The elementary and secondary level is expected to account for approximately 61% of total education spending in 1999–2000. The postsecondary and vocational training levels will make up about 29% and 10%, respectively.

**EQR**





Table 1  
Institutions, enrolments and teachers, 1997–1998 to 1999–2000

	Institutions			Enrolments					Full-time teachers		
	Elementary/secondary <sup>1</sup>	Community colleges <sup>2</sup>	Universities	Pre-elementary <sup>1</sup>	Elementary/secondary <sup>1</sup>	Full-time post-secondary community college <sup>3</sup>	Full-time university <sup>4</sup>	Part-time university	Elementary/secondary <sup>1</sup>	Post-secondary community colleges <sup>5</sup>	Universities <sup>6</sup>
<b>Canada</b>											
1997–1998	16,057 <sup>P</sup>	196	75	502,068 <sup>P</sup>	4,937,478 <sup>P</sup>	398,643	573,099	249,673	296,775 <sup>P</sup>	31,727 <sup>P</sup>	33,702
1998–1999	16,123 <sup>e</sup>	190	75	505,578 <sup>e</sup>	4,978,284 <sup>e</sup>	409,848 <sup>P</sup>	580,376	245,985	295,902 <sup>e</sup>	..	33,667 <sup>e</sup>
1999–2000 <sup>e,7</sup>	16,198	191	..	508,483	5,016,446	409,395	..	..	295,907	..	..
<b>Newfoundland</b>											
1997–1998	397 <sup>P</sup>	5	1	6,526 <sup>P</sup>	95,548 <sup>P</sup>	5,974	13,115	2,683	6,627 <sup>P</sup>	652 <sup>P</sup>	865
1998–1999	381 <sup>e</sup>	1	1	6,290 <sup>e</sup>	92,324 <sup>e</sup>	6,377 <sup>P</sup>	13,115	2,595	6,423 <sup>e</sup>	..	854
1999–2000 <sup>e</sup>	372	1	..	6,064	88,144	6,440	..	..	6,196	..	..
<b>Prince Edward Island</b>											
1997–1998	71 <sup>P</sup>	1	1	43 <sup>P</sup>	24,645 <sup>P</sup>	1,620	2,452	482	1,364 <sup>P</sup>	81 <sup>P</sup>	180
1998–1999	71 <sup>e</sup>	1	1	44 <sup>e</sup>	24,662 <sup>e</sup>	1,940 <sup>P</sup>	2,470	417	1,364 <sup>e</sup>	..	179
1999–2000 <sup>e</sup>	72	1	..	46	24,710	1,958	..	..	1,366	..	..
<b>Nova Scotia</b>											
1997–1998	501 <sup>P</sup>	6	12	12,053 <sup>P</sup>	152,662 <sup>P</sup>	7,307	30,077	7,006	8,998 <sup>P</sup>	708 <sup>P</sup>	1,910
1998–1999	497 <sup>e</sup>	5	12	11,923 <sup>e</sup>	152,575 <sup>e</sup>	7,291 <sup>P</sup>	30,027	7,214	8,853 <sup>e</sup>	..	1,914
1999–2000 <sup>e</sup>	491	5	..	11,792	151,920	7,362	..	..	8,680	..	..
<b>New Brunswick</b>											
1997–1998	381 <sup>P</sup>	6	5	9,302 <sup>P</sup>	123,477 <sup>P</sup>	5,152	18,503	4,181	7,371 <sup>P</sup>	887 <sup>P</sup>	1,146
1998–1999	370 <sup>e</sup>	6	5	9,246 <sup>e</sup>	121,916 <sup>e</sup>	5,206 <sup>P</sup>	18,529	4,237	7,229 <sup>e</sup>	..	1,145
1999–2000 <sup>e</sup>	360	6	..	9,178	119,887	5,258	..	..	7,086	..	..
<b>Quebec</b>											
1997–1998	3,055 <sup>P</sup>	88	7	98,784 <sup>P</sup>	1,031,253 <sup>P</sup>	163,550	131,074	101,021	65,514 <sup>P</sup>	12,674 <sup>P</sup>	8,144
1998–1999	3,056 <sup>e</sup>	88	7	100,131 <sup>e</sup>	1,027,931 <sup>e</sup>	168,852 <sup>P</sup>	134,162	98,116	65,624 <sup>e</sup>	..	8,046 <sup>e</sup>
1999–2000 <sup>e</sup>	3,058	88	..	101,782	1,023,176	168,079	..	..	65,876	..	..
<b>Ontario</b>											
1997–1998	5,820 <sup>P</sup>	40	21	248,243 <sup>P</sup>	1,939,372 <sup>P</sup>	142,353	227,153	76,255	119,688 <sup>P</sup>	7,010 <sup>P</sup>	12,346
1998–1999	5,858 <sup>e</sup>	40	21	250,216 <sup>e</sup>	1,961,669 <sup>e</sup>	141,822 <sup>P</sup>	229,985	72,958	118,698 <sup>e</sup>	..	12,412 <sup>e</sup>
1999–2000 <sup>e</sup>	5,894	40	..	251,470	1,984,410	141,153	..	..	118,409	..	..
<b>Manitoba</b>											
1997–1998	844 <sup>P</sup>	5	6	17,868 <sup>P</sup>	204,177 <sup>P</sup>	3,802	21,024	9,796	11,951 <sup>P</sup>	697 <sup>P</sup>	1,506
1998–1999	858 <sup>e</sup>	5	6	17,370 <sup>e</sup>	204,875 <sup>e</sup>	3,920 <sup>P</sup>	20,883	9,852	11,815 <sup>e</sup>	..	1,501
1999–2000 <sup>e</sup>	862	5	..	16,782	205,812	3,957	..	..	11,645	..	..
<b>Saskatchewan</b>											
1997–1998	907 <sup>P</sup>	4	4	16,391 <sup>P</sup>	194,637 <sup>P</sup>	3,195	23,864	7,364	10,919 <sup>P</sup>	850 <sup>P</sup>	1,372
1998–1999	896 <sup>e</sup>	4	4	16,244 <sup>e</sup>	195,051 <sup>e</sup>	3,113 <sup>P</sup>	23,656	7,622	10,949 <sup>e</sup>	..	1,390
1999–2000 <sup>e</sup>	884	4	..	16,117	195,059	3,145	..	..	10,959	..	..
<b>Alberta</b>											
1997–1998	1,901 <sup>P</sup>	16	10	40,326 <sup>P</sup>	522,844 <sup>P</sup>	29,595	52,824	18,594	29,594 <sup>P</sup>	3,090 <sup>P</sup>	2,940
1998–1999	1,932 <sup>e</sup>	16	10	40,833 <sup>e</sup>	531,180 <sup>e</sup>	32,594 <sup>P</sup>	53,510	20,263	29,870 <sup>e</sup>	..	3,009 <sup>e</sup>
1999–2000 <sup>e</sup>	1,973	16	..	41,326	538,898	32,918	..	..	30,223	..	..
<b>British Columbia</b>											
1997–1998	2,064 <sup>P</sup>	22	8	50,365 <sup>P</sup>	626,905 <sup>P</sup>	35,599	53,013	22,291	33,039 <sup>P</sup>	4,852 <sup>P</sup>	3,293
1998–1999	2,086 <sup>e</sup>	22	8	51,073 <sup>e</sup>	643,466 <sup>e</sup>	38,212 <sup>P</sup>	54,039	22,711	33,340 <sup>e</sup>	..	3,217
1999–2000 <sup>e</sup>	2,112	22	..	51,641	661,123	38,594	..	..	33,727	..	..
<b>Yukon</b>											
1997–1998	28 <sup>P</sup>	1	–	465 <sup>P</sup>	5,905 <sup>P</sup>	318	–	–	424 <sup>P</sup>	101 <sup>P</sup>	–
1998–1999	28 <sup>e</sup>	1	–	459 <sup>e</sup>	6,081 <sup>e</sup>	268 <sup>P</sup>	–	–	426 <sup>e</sup>	..	–
1999–2000 <sup>e</sup>	28	1	–	448	6,289	273	–	–	426	..	–
<b>Northwest Territories</b>											
1997–1998	86 <sup>P</sup>	1	–	1,675 <sup>P</sup>	15,859 <sup>P</sup>	178	–	–	1,269 <sup>P</sup>	125 <sup>P</sup>	–
1998–1999	88 <sup>e</sup>	1	–	1,722 <sup>e</sup>	16,337 <sup>e</sup>	253 <sup>P</sup>	–	–	1,294 <sup>e</sup>	..	–
1999–2000 <sup>e</sup>	90	1	–	1,810	16,789	127	–	–	1,297	..	–
<b>Department of National Defence, Overseas</b>											
1997–1998	2 <sup>P</sup>	–	–	27 <sup>P</sup>	194 <sup>P</sup>	–	–	–	17 <sup>P</sup>	–	–
1998–1999	2 <sup>e</sup>	–	–	27 <sup>e</sup>	217 <sup>e</sup>	–	–	–	17 <sup>e</sup>	–	–
1999–2000 <sup>e</sup>	2	–	–	27	229	–	–	–	17	–	–

See notes at end of tables.



Table 2  
Degrees, by level and sex of recipient, 1996 to 1998

	Bachelor's and first professional degrees			Master's degrees			Earned doctorates		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Canada</b>									
1996	53,043	74,946	127,989	10,578	10,980	21,558	2,593	1,335	3,928
1997	51,782	74,014	125,796	10,461	10,858	21,319	2,543	1,423	3,966
1998	51,268	73,593	124,861	10,514	11,512	22,026	2,540	1,436	3,976
<b>Newfoundland</b>									
1996	932	1,276	2,208	124	119	243	22	8	30
1997	935	1,239	2,174	130	142	272	28	4	32
1998	926	1,281	2,207	134	155	289	21	8	29
<b>Prince Edward Island</b>									
1996	168	291	459	3	7	10	–	–	–
1997	179	335	514	5	1	6	–	–	–
1998	122	263	385	1	2	3	–	–	–
<b>Nova Scotia</b>									
1996	2,386	3,537	5,923	420	559	979	50	31	81
1997	2,465	3,517	5,982	431	558	989	55	26	81
1998	2,440	3,639	6,079	398	496	894	54	33	87
<b>New Brunswick</b>									
1996	1,433	2,109	3,542	211	205	416	39	10	49
1997	1,458	2,060	3,518	202	206	408	31	7	38
1998	1,380	1,930	3,310	166	200	366	19	8	27
<b>Quebec</b>									
1996	11,904	17,908	29,812	3,279	3,389	6,668	736	357	1,093
1997	11,484	17,299	28,783	3,241	3,335	6,576	752	391	1,143
1998	11,409	16,021	27,430	3,256	3,513	6,769	759	413	1,172
<b>Ontario</b>									
1996	23,366	32,304	55,670	4,382	4,418	8,800	1,018	588	1,606
1997	22,265	31,722	53,987	4,254	4,204	8,458	1,006	573	1,579
1998	21,859	32,171	54,030	4,277	4,568	8,845	981	566	1,547
<b>Manitoba</b>									
1996	2,231	2,853	5,084	303	259	562	67	35	102
1997	2,117	2,883	5,000	279	277	556	73	40	113
1998	2,021	2,752	4,773	241	286	527	72	35	107
<b>Saskatchewan</b>									
1996	1,816	2,429	4,245	259	221	480	81	22	103
1997	1,674	2,252	3,926	262	210	472	83	20	103
1998	1,667	2,316	3,983	266	241	507	64	25	89
<b>Alberta</b>									
1996	4,239	5,949	10,188	639	700	1,339	253	135	388
1997	4,446	6,165	10,611	649	858	1,507	227	173	400
1998	4,495	6,276	10,771	704	874	1,578	254	165	419
<b>British Columbia</b>									
1996	4,568	6,290	10,858	958	1,103	2,061	327	149	476
1997	4,759	6,542	11,301	1,008	1,067	2,075	288	189	477
1998	4,949	6,944	11,893	1,071	1,177	2,248	316	183	499



Table 3  
Expenditures on education, by direct source of funds, 1996–1997 to 1999–2000

	Total	Local governments	Provincial and territorial governments	Federal government <sup>9</sup>	Non-governmental (private) sources
	\$'000				
<b>Canada</b>					
1996–1997	58,125,149	12,954,806	31,445,826	6,006,460	7,718,057
1997–1998 <sup>P</sup>	59,767,443	12,829,910	32,126,952	6,669,978	8,140,603
1998–1999 <sup>e</sup>	60,826,588	9,829,531	36,989,599	5,743,570	8,263,888
1999–2000 <sup>e</sup>	61,865,140	9,925,937	37,794,193	5,788,211	8,356,799
<b>Newfoundland</b>					
1996–1997	1,274,781	–	745,889	420,449	108,443
1997–1998 <sup>P</sup>	1,261,065	–	724,279	429,351	107,435
1998–1999 <sup>e</sup>	1,091,667	–	762,562	225,943	103,162
1999–2000 <sup>e</sup>	1,081,452	–	738,752	230,369	112,331
<b>Prince Edward Island</b>					
1996–1997	218,035	–	152,970	41,820	23,245
1997–1998 <sup>P</sup>	239,967	–	160,722	52,920	26,325
1998–1999 <sup>e</sup>	233,109	–	174,302	30,517	28,290
1999–2000 <sup>e</sup>	230,015	–	169,623	31,399	28,993
<b>Nova Scotia</b>					
1996–1997	1,636,583	138,274	1,010,414	245,926	241,969
1997–1998 <sup>P</sup>	1,632,931	139,305	970,668	269,008	253,950
1998–1999 <sup>e</sup>	1,696,230	144,127	1,104,974	212,803	234,326
1999–2000 <sup>e</sup>	1,700,512	150,006	1,095,753	216,362	238,391
<b>New Brunswick</b>					
1996–1997	1,374,177	29	1,056,757	186,643	130,748
1997–1998 <sup>P</sup>	1,449,567	–	1,091,675	226,025	131,867
1998–1999 <sup>e</sup>	1,390,849	–	1,098,926	167,130	124,793
1999–2000 <sup>e</sup>	1,438,802	–	1,141,087	171,473	126,242
<b>Quebec</b>					
1996–1997	13,891,347	813,838	10,294,922	1,128,235	1,654,352
1997–1998 <sup>P</sup>	13,696,123	926,508	9,715,570	1,335,662	1,718,383
1998–1999 <sup>e</sup>	14,546,191	952,265	10,577,864	1,283,157	1,732,905
1999–2000 <sup>e</sup>	14,533,290	962,266	10,537,628	1,280,149	1,753,247
<b>Ontario</b>					
1996–1997	21,710,738	8,384,723	8,641,285	1,622,068	3,062,662
1997–1998 <sup>P</sup>	22,689,074	8,065,788	9,586,286	1,863,493	3,173,507
1998–1999 <sup>e</sup>	22,556,838	4,981,698	12,759,783	1,589,628	3,225,729
1999–2000 <sup>e</sup>	22,899,301	5,022,743	13,011,090	1,609,708	3,255,760
<b>Manitoba</b>					
1996–1997	2,272,394	546,406	1,079,735	381,466	264,787
1997–1998 <sup>P</sup>	2,351,408	561,904	1,102,968	417,704	268,832
1998–1999 <sup>e</sup>	2,409,097	580,672	1,206,453	364,967	257,005
1999–2000 <sup>e</sup>	2,481,353	592,645	1,256,344	368,741	263,623
<b>Saskatchewan</b>					
1996–1997	2,099,595	522,213	940,983	417,556	218,843
1997–1998 <sup>P</sup>	2,191,872	552,997	976,536	455,564	206,775
1998–1999 <sup>e</sup>	2,275,051	560,411	1,036,282	444,545	233,813
1999–2000 <sup>e</sup>	2,315,046	565,148	1,062,346	445,459	242,093
<b>Alberta</b>					
1996–1997	5,287,103	1,340,266	2,636,168	525,799	784,870
1997–1998 <sup>P</sup>	5,604,814	1,365,368	2,774,732	559,869	904,845
1998–1999 <sup>e</sup>	5,895,334	1,382,224	3,088,717	512,726	911,667
1999–2000 <sup>e</sup>	6,261,950	1,399,300	3,442,900	520,108	899,642
<b>British Columbia</b>					
1996–1997	7,588,838	1,198,325	4,535,222	683,750	1,171,541
1997–1998 <sup>P</sup>	7,955,144	1,207,245	4,644,853	812,687	1,290,359
1998–1999 <sup>e</sup>	8,104,566	1,217,307	4,810,917	722,739	1,353,603
1999–2000 <sup>e</sup>	8,272,651	1,222,338	4,946,135	728,797	1,375,381

See notes at end of tables.



Table 3  
Expenditures on education, by direct source of funds, 1996–1997 to 1999–2000 (Concluded)

	Total	Local governments	Provincial and territorial governments	Federal government <sup>9</sup>	Non-governmental (private) sources
	\$'000				
<b>Yukon</b>					
1996–1997	101,895	227	92,442	5,880	3,346
1997–1998 <sup>P</sup>	108,256	227	97,847	6,013	4,169
1998–1999 <sup>e</sup>	104,845	227	95,406	6,030	3,182
1999–2000 <sup>e</sup>	103,904	227	94,438	5,950	3,289
<b>Northwest Territories</b>					
1996–1997	278,083	10,505	259,039	2,312	6,227
1997–1998 <sup>P</sup>	300,172	10,568	280,816	2,094	6,694
1998–1999 <sup>e</sup>	294,636	10,600	273,413	3,154	7,469
1999–2000 <sup>e</sup>	194,683	5,850	179,131	3,088	6,614
<b>Nunavut</b>					
1996–1997	–	–	–	–	–
1997–1998 <sup>P</sup>	–	–	–	–	–
1998–1999 <sup>e</sup>	–	–	–	–	–
1999–2000 <sup>e</sup>	127,424	5,414	118,966	281	2,763
<b>Other<sup>8</sup></b>					
1996–1997	391,580	–	–	344,556	47,024
1997–1998 <sup>P</sup>	287,050	–	–	239,588	47,462
1998–1999 <sup>e</sup>	228,175	–	–	180,231	47,944
1999–2000 <sup>e</sup>	224,757	–	–	176,327	48,430

See notes at end of tables.



Table 4  
Expenditures on education, by level, 1996–1997 to 1999–2000

	Total	Elementary– secondary <sup>10</sup>	Postsecondary <sup>11</sup>			Trade level <sup>12</sup>
			Community college	University	Subtotal	
\$'000						
<b>Canada</b>						
1996–1997	58,125,149	36,744,729	4,477,942	11,600,697	16,078,639	5,301,781
1997–1998 <sup>P</sup>	59,767,443	36,973,134	4,641,993	12,255,382	16,897,375	5,896,934
1998–1999 <sup>e</sup>	60,826,588	37,453,842	4,808,833	12,660,539	17,469,372	5,903,374
1999–2000 <sup>e</sup>	61,865,140	37,498,917	5,261,701	12,874,894	18,136,595	6,229,628
<b>Newfoundland</b>						
1996–1997	1,274,781	595,363	37,771	225,630	263,401	416,017
1997–1998 <sup>P</sup>	1,261,065	561,794	36,751	242,262	279,013	420,258
1998–1999 <sup>e</sup>	1,091,667	581,757	39,685	240,322	280,007	229,903
1999–2000 <sup>e</sup>	1,081,452	549,649	42,865	254,125	296,990	234,813
<b>Prince Edward Island</b>						
1996–1997	218,035	118,452	12,995	45,980	58,975	40,608
1997–1998 <sup>P</sup>	239,967	127,042	12,540	44,565	57,105	55,820
1998–1999 <sup>e</sup>	233,109	141,908	13,278	43,333	56,611	34,590
1999–2000 <sup>e</sup>	230,015	137,365	13,538	44,503	58,041	34,609
<b>Nova Scotia</b>						
1996–1997	1,636,583	932,349	56,312	457,284	513,596	190,638
1997–1998 <sup>P</sup>	1,632,931	912,793	54,450	460,150	514,600	205,538
1998–1999 <sup>e</sup>	1,696,230	1,002,376	58,678	480,758	539,436	154,418
1999–2000 <sup>e</sup>	1,700,512	993,830	58,882	490,776	549,658	157,024
<b>New Brunswick</b>						
1996–1997	1,374,177	837,117	55,510	320,579	376,089	160,971
1997–1998 <sup>P</sup>	1,449,567	845,460	60,833	327,562	388,395	215,712
1998–1999 <sup>e</sup>	1,390,849	847,189	59,588	320,371	379,959	163,701
1999–2000 <sup>e</sup>	1,438,802	880,757	61,063	332,456	393,519	164,526
<b>Quebec</b>						
1996–1997	13,891,347	8,063,747	1,855,226	3,023,313	4,878,539	949,061
1997–1998 <sup>P</sup>	13,696,123	7,611,537	1,895,793	3,122,268	5,018,061	1,066,525
1998–1999 <sup>e</sup>	14,546,191	7,778,541	1,858,025	3,202,049	5,060,074	1,707,576
1999–2000 <sup>e</sup>	14,533,290	7,931,507	1,871,951	2,997,721	4,869,672	1,732,111
<b>Ontario</b>						
1996–1997	21,710,738	15,054,001	1,237,136	4,112,635	5,349,771	1,306,966
1997–1998 <sup>P</sup>	22,689,074	15,438,788	1,323,376	4,378,615	5,701,991	1,548,295
1998–1999 <sup>e</sup>	22,556,838	15,210,014	1,416,735	4,558,527	5,975,262	1,371,562
1999–2000 <sup>e</sup>	22,899,301	14,825,274	1,725,924	4,838,527	6,564,451	1,509,576
<b>Manitoba</b>						
1996–1997	2,272,394	1,574,272	76,432	453,088	529,520	168,602
1997–1998 <sup>P</sup>	2,351,408	1,612,581	85,540	449,979	535,519	203,308
1998–1999 <sup>e</sup>	2,409,097	1,645,452	87,719	462,048	549,767	213,878
1999–2000 <sup>e</sup>	2,481,353	1,691,832	92,559	475,504	568,063	221,458
<b>Saskatchewan</b>						
1996–1997	2,099,595	1,286,132	55,456	493,348	548,804	264,659
1997–1998 <sup>P</sup>	2,191,872	1,323,670	61,985	509,316	571,301	296,901
1998–1999 <sup>e</sup>	2,275,051	1,376,667	62,326	531,253	593,579	304,805
1999–2000 <sup>e</sup>	2,315,046	1,372,959	65,108	542,657	607,765	334,322
<b>Alberta</b>						
1996–1997	5,287,103	3,293,915	367,354	1,007,651	1,375,005	618,183
1997–1998 <sup>P</sup>	5,604,814	3,489,953	386,490	1,065,187	1,451,677	663,184
1998–1999 <sup>e</sup>	5,895,334	3,710,753	462,717	1,111,311	1,574,028	610,553
1999–2000 <sup>e</sup>	6,261,950	3,881,402	543,098	1,148,045	1,691,143	689,405

See notes at end of tables.



Table 4  
Expenditures on education, by level, 1996–1997 to 1999–2000 (Concluded)

	Total	Elementary– secondary <sup>10</sup>	Postsecondary <sup>11</sup>			Trade level <sup>12</sup>
			Community college	University	Subtotal	
\$'000						
<b>British Columbia</b>						
1996–1997	7,588,838	4,680,412	675,953	1,381,298	2,057,251	851,175
1997–1998 <sup>p</sup>	7,955,144	4,729,985	671,068	1,574,906	2,245,974	979,185
1998–1999 <sup>e</sup>	8,104,566	4,852,771	697,918	1,626,939	2,324,857	926,938
1999–2000 <sup>e</sup>	8,272,651	4,932,931	721,570	1,666,270	2,387,840	951,880
<b>Yukon</b>						
1996–1997	101,895	77,158	5,856	3,935	9,791	14,946
1997–1998 <sup>p</sup>	108,256	83,854	6,339	3,494	9,833	14,569
1998–1999 <sup>e</sup>	104,845	79,515	6,447	3,613	10,060	15,270
1999–2000 <sup>e</sup>	103,904	78,160	6,547	3,595	10,142	15,602
<b>Northwest Territories</b>						
1996–1997	278,083	208,782	39,303	3,783	43,086	26,215
1997–1998 <sup>p</sup>	300,172	211,900	44,301	3,947	48,248	40,024
1998–1999 <sup>e</sup>	294,636	206,536	42,784	4,614	47,398	40,702
1999–2000 <sup>e</sup>	194,683	108,804	42,617	4,473	47,090	38,789
<b>Nunavut</b>						
1996–1997	–	–	–	–	–	–
1997–1998 <sup>p</sup>	–	–	–	–	–	–
1998–1999 <sup>e</sup>	–	–	–	–	–	–
1999–2000 <sup>e</sup>	127,424	94,037	14,629	841	15,470	17,917
<b>Other<sup>8</sup></b>						
1996–1997	391,580	23,029	2,638	72,173	74,811	293,740
1997–1998 <sup>p</sup>	287,050	23,777	2,527	73,131	75,658	187,615
1998–1999 <sup>e</sup>	228,175	20,363	2,933	75,401	78,334	129,478
1999–2000 <sup>e</sup>	224,757	20,410	1,350	75,401	76,751	127,596

**Notes:**

- These data are estimates and include public, private, federal and overseas schools.
- The number of institutions does not include campuses, which previously had been reported in Education Quarterly Review for some of the provinces.
- Includes postsecondary enrolments in community colleges, CEGEPS, nursing and hospital schools and other related institutions.
- Regular winter session only.
- Includes community college teachers at the trade level.
- Includes only those with 12-month terms of appointment.
- Includes one community college in Nunavut with an estimated 131 students. Other information for Nunavut was not available at the time that this issue of EQR was released.
- Includes Canada's spending on education in foreign countries and undistributed expenditures.
- Excludes federal contributions to provincial governments for Official Languages in Education programs and for postsecondary education under Established Program Financing.
- Includes public and private schools. Public includes: (i) federal schools and schools for the blind and deaf; (ii) provincial and federal department spending on elementary-secondary education; (iii) academic education in federal penitentiaries and provincial reform schools; and (iv) departmental administration.
- Expenditures on postsecondary education include: (i) operating and capital expenditures of universities, community colleges and similar institutions, and postsecondary programs in nursing schools; (ii) student aid, scholarships and bursaries; and (iii) direct expenditures by federal and provincial governments.
- Expenditures on vocational training include: (i) training sponsored by Human Resources Development Canada; (ii) federal expenditures on language courses; (iii) vocational training in federal penitentiaries and provincial reformatory schools; (iv) various training courses set by federal and provincial authorities; and (v) private trade schools, art schools, music schools, etc.

# Education at a glance

*This section provides a series of social, economic and education indicators for Canada, the provinces/territories and the G-7 countries. Included are key statistics on the characteristics of the student and staff populations, educational attainment, public expenditures on education, labour force employed in education, and educational outcomes.*

Table 1 Education indicators, Canada, 1981 to 1999												
Indicator <sup>1</sup>		1981	1986	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>Social context</b>												
Population aged 0-3	('000)	1,448.7	1,475.0	1,573.4	1,601.7	1,610.6	1,596.1	1,595.1	1,578.6	1,560.7	1,550.7	..
Population aged 4-17	('000)	5,480.3	5,204.7	5,395.4	5,437.7	5,484.7	5,536.4	5,620.7	5,691.4	5,754.0	5,795.7	..
Population aged 18-24	('000)	3,493.1	3,286.3	2,886.1	2,869.2	2,869.6	2,852.0	2,823.4	2,816.8	2,833.0	2,865.4	..
Total population	('000)	24,900.0	26,203.8	28,120.1	28,542.2	28,940.6	29,248.1	29,562.5	29,963.7	30,358.5	30,747.0	..
Youth immigration <sup>f</sup>		42,826	25,861	61,239	61,178	73,098	68,257	65,878	66,339	70,355	61,214	..
Lone-parent families	(%)	16.6	18.8	15.3	14.4	14.8	14.9	15.1	..	..	..	..
<b>Economic context</b>												
GDP: Real annual percentage change		4.0	3.1	-1.8	-0.6	2.2	4.1	2.3	1.5	..	..	..
CPI: Annual percentage change		12.4	4.2	5.6	1.5	1.8	0.2	2.1	1.6	..	..	..
Employment-population ratio	(%)	60.4	59.9 <sup>2</sup>	59.8 <sup>2</sup>	58.4 <sup>2</sup>	58.2 <sup>2</sup>	58.5 <sup>2</sup>	58.6	58.6	59.2 <sup>3</sup>	..	..
Unemployment rate	(%)	7.5	9.5 <sup>4</sup>	10.4 <sup>4</sup>	11.3 <sup>5</sup>	11.2 <sup>5</sup>	10.4 <sup>5</sup>	9.5	9.7	9.2	8.3	..
Student employment rate	(%)	..	34.4	38.0	35.1	34.0	34.2	33.3	34.8	32.5 <sup>6</sup>	..	..
Mothers' participation rate	(%)	54.7	63.8	70.4	69.8	70.1	70.2	70.7	71.6	..	..	..
Families below low income cut-offs:												
Two-parent families		10.2	10.9	10.8	10.6	12.2	11.5	12.8	..	..	..	..
Lone-parent families	(%)	48.4	52.5	55.4	52.3	55.0	53.0	53.0	..	..	..	..
<b>Enrolments</b> ('000)												
Elementary/secondary schools		5,024.2	4,938.0	5,218.2	5,284.1	5,327.8	5,362.8	5,441.4 <sup>r</sup>	5,414.6 <sup>r</sup>	5,459.5 <sup>tr,e</sup>	5,497.0 <sup>tr,e</sup>	..
Percentage in private schools		4.3	4.6	4.7	4.9	5.0	5.1	5.1 <sup>r</sup>	5.2 <sup>r</sup>	5.3 <sup>tr,e</sup>	5.3 <sup>tr,e</sup>	..
Public college/trade/vocational, full-time <sup>7</sup>		..	238.1	275.9	266.7	306.5	298.5	269.1	266.4 <sup>e</sup>	264.5 <sup>e</sup>	..	..
College/postsecondary, full-time		273.4	321.5	349.1	364.6	369.1	377.9	389.5	395.3	398.8 <sup>r</sup>	409.8 <sup>p</sup>	..
College/postsecondary, part-time <sup>8</sup>		..	96.4 <sup>tr,e</sup>	125.7 <sup>tr,e</sup>	106.6 <sup>tr,e</sup>	103.9 <sup>tr,e</sup>	95.1 <sup>tr,e</sup>	91.9 <sup>tr,e</sup>	89.1 <sup>tr,e</sup>	91.1	..	..
Full-time university		401.9	475.4	554.0	569.5	574.3	575.7	573.2	573.6	573.0	..	..
Part-time university		251.9	287.5	313.3	316.2	300.3	283.3	273.2	256.1	249.7	..	..

See notes at end of this table.


**Table 1**  
**Education indicators, Canada, 1981 to 1999 (Concluded)**

Indicator <sup>1</sup>	1981	1986	1991	1992	1993	1994	1995	1996	1997	1998	1999
Adult education and training	..	..	5,504	..	5,842	..	..	..	6,069	..	..
— Participation rate (%)	..	..	27	..	28	..	..	..	26	..	..
<b>Graduates</b> ('000)											
Secondary schools <sup>9</sup>	..	..	260.7	272.9	281.4	280.4	295.3	295.9 <sup>r</sup>	295.9	300.8 <sup>e</sup>	..
Public college/trade/vocational <sup>10</sup>	..	145.0	159.7	158.8	163.9	151.1	144.2	141.5 <sup>e</sup>	138.7 <sup>e</sup>	..	..
College/postsecondary	71.8	82.4	85.9	92.5	95.2	97.2	100.9	105.0 <sup>r</sup>	105.9 <sup>re</sup>	..	..
University/Bachelor's	84.9	101.7	114.8	120.7	123.2	126.5	127.3	128.0	125.8 <sup>r</sup>	124.9	..
University/Master's	12.9	15.9	18.0	19.4	20.8	21.3	21.4	21.6	21.3 <sup>r</sup>	22.0	..
University/Doctorate	1.8	2.2	2.9	3.1	3.4 <sup>e</sup>	3.6	3.7	3.9	4.0 <sup>r</sup>	4.0	..
<b>Full-time educators</b> ('000)											
Elementary/secondary schools	274.6	269.9	302.6	301.8	295.4	295.7 <sup>e,r</sup>	298.7 <sup>e,r</sup>	294.4 <sup>e</sup>	294.3 <sup>re</sup>	292.8 <sup>re</sup>	295.9 <sup>e</sup>
College/postsecondary/trade/vocational	24.1	25.0	30.9	32.7	28.1 <sup>r</sup>	28.0 <sup>r</sup>	24.4 <sup>e</sup>	31.2	29.5 <sup>r</sup>	..	..
University	33.6	35.4	36.8	37.3	36.9	36.4	36.0	34.6	33.7	33.6 <sup>r</sup>	..
Elementary/secondary pupil-educator ratio	17.0	16.5	15.5	15.7 <sup>e</sup>	16.1 <sup>e</sup>	16.1 <sup>e</sup>	16.1 <sup>e,r</sup>	16.3 <sup>e,r</sup>	16.3 <sup>e,r</sup>	16.5 <sup>e</sup>	16.6 <sup>e</sup>
<b>Education expenditures</b> (\$ millions)											
Elementary/secondary	16,703.2	22,968.0	33,444.9	34,774.5 <sup>r</sup>	35,582.3 <sup>r</sup>	35,936.0	36,424.7	36,744.7	36,973.1 <sup>p</sup>	37,453.8 <sup>e</sup>	37,498.9 <sup>e</sup>
Vocational	1,601.2	3,275.1	4,573.8	5,380.9	5,631.2	6,559.0	6,185.2	5,301.8 <sup>r</sup>	5,896.9 <sup>p</sup>	5,903.4 <sup>e</sup>	6,229.6 <sup>e</sup>
College	2,088.1	2,999.0	3,870.7	4,075.3	4,105.9	4,207.1	4,531.8	4,477.9 <sup>r</sup>	4,642.0 <sup>p</sup>	4,808.9 <sup>e</sup>	5,261.7 <sup>e</sup>
University	4,980.7	7,368.7	11,254.8	11,569.8	11,736.8	11,857.9	11,802.0	11,600.7 <sup>r</sup>	12,255.4 <sup>p</sup>	12,660.5 <sup>r</sup>	12,874.9 <sup>e</sup>
Total education expenditures	25,373.2	36,610.8	53,144.2	55,800.5	57,056.2	58,560.0	58,943.7 <sup>r</sup>	58,125.1 <sup>r</sup>	59,767.4 <sup>p</sup>	60,826.6 <sup>r</sup>	61,865.1 <sup>r</sup>
— as a percentage of GDP	7.1	7.3	7.9	8.1	8.0	7.8	7.6	7.1	6.9	..	..

**Notes:**

1. See "Definitions" following Table 3.
2. Standard deviation 0.0% – 0.5%.
3. The figure is for May 1997.
4. Standard deviation 1.1% – 2.5%.
5. Standard deviation 0.6% – 1.0%.
6. The figure is for April 1997.
7. The enrolments have all been reported as full-time based on a "full-day" program, even though the duration of the programs varies from 1 to 48 weeks.
8. Excludes enrolments in continuing education courses, which had previously been included.
9. Source: Canadian Education Statistics Council. (Excludes adults for Quebec and Ontario and Alberta equivalencies.)
10. The majority of trade and vocational programs, unlike graduate diploma programs which are generally two or three years' duration, are short programs or single courses that may require only several weeks. A person successfully completing these short-duration programs or courses is considered a completer, not a graduate. These completers do not include persons in part-time programs.





**Table 2**  
**Education indicators, provinces and territories**

Indicator <sup>1</sup>	Canada	Newfound- land	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario
<b>Social and economic context</b>							
Educational attainment, <sup>2</sup> 1998: (%)							
— Less than secondary	27.5	39.4	36.0	31.4	33.0	33.7	25.4
— Graduated from high school	19.0	13.7	14.0	13.7	21.0	15.4	20.7
— Some postsecondary	7.0	5.0	6.4	5.8	5.4	5.5	7.3
— Postsecondary certificate, diploma or university degree	46.4	41.9	43.6	49.1	40.6	45.4	46.5
Labour force participation rates by educational attainment, 1998: (%)							
— Total	65.8	56.3	65.9	60.5	61.1	63.1	67.0
— Less than secondary	40.0	32.8	47.3	37.8	36.3	37.9	40.8
— Graduated from high school	68.9	60.6	73.7	64.0	68.9	68.6	68.6
— Some postsecondary	72.3	62.1	69.2	66.8	67.6	69.5	73.6
— Postsecondary certificate, diploma or university degree	78.8	76.2	78.2	73.4	76.3	79.2	79.5
Unemployment rate, 1998 (%)	7.0	16.1	13.2	8.9	10.8	9.2	5.9
<b>Costs and school processes</b>							
Public and private expenditures on education as a percentage of GDP, 1994-95	7.0	9.9	7.6	7.6	7.4	7.6	6.8
Public expenditures on education as a percentage of total public expenditures, 1994-95	13.6	16.9	10.8	9.7	11.2	13.8	14.2
Elementary/secondary pupil-educator ratio, 1997-98 <sup>e</sup>	16.3	14.6	17.2	17.5 <sup>f</sup>	17.6	15.2	16.3
<b>Educational outcomes</b>							
Secondary school graduation rates, 1996-97 (%)	73.4	80.2	85.6	80.7	86.0	75.9 <sup>5,6</sup>	72.0
University graduation rate, 1994-95 (%)	37.0	23.5	28.1	48.8	29.8	52.0	36.2
Unemployment rate by level of educational attainment, 1995 (%)							
— Less than secondary	12.8	27.2	23.1	14.5	15.6	15.2	11.4
— Graduated from high school	8.5	15.0	13.2	10.7	9.9	11.1	8.3
— Some postsecondary	8.8	15.0	9.7	9.3	12.7	10.7	8.1
— Postsecondary certificate, diploma or university degree	6.5	11.1	8.3	9.0	7.4	7.7	5.6

See notes at end of this table.



Table 2  
Education indicators, provinces and territories (Concluded)

Indicator <sup>1</sup>	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories
<b>Social and economic context</b>						
Educational attainment, <sup>2</sup> 1998: (%)						
— Less than secondary	30.9	31.5	21.2	20.7	..	..
— Graduated from high school	18.9	18.6	19.9	22.3	..	..
— Some postsecondary	6.8	8.0	8.1	8.8	..	..
— Postsecondary certificate, diploma or university degree	43.4	41.8	50.9	48.1	..	..
Labour force participation rates by educational attainment, 1998: (%)						
— Total	66.6	67.1	72.8	65.5	..	..
— Less than secondary	43.9	43.2	49.5	38.3	..	..
— Graduated from high school	73.5	78.2	75.5	64.4	..	..
— Some postsecondary	73.4	76.0	78.0	70.2	..	..
— Postsecondary certificate, diploma or university degree	78.7	78.5	80.6	76.9	..	..
Unemployment rate, 1998 (%)	4.6	4.8	4.6	7.4	..	..
<b>Costs and school processes</b>						
Public and private expenditures on education as a percentage of GDP, 1994-95	7.8	7.4	5.4	6.5	11.3	16.6
Public expenditures on education as a percentage of total public expenditures, 1994-95	12.9	13.8	13.2	12.2	10.4	12.0
Elementary/secondary pupil-educator ratio, 1997-98 <sup>e</sup>	16.3	17.3 <sup>f</sup>	17.6 <sup>f</sup>	17.5 <sup>f</sup>	13.2	13.1
<b>Educational outcomes</b>						
Secondary school graduation rates, 1996-97 (%)	78.1	78.8	64.7	70.5	37.3	24.6
University graduation rate, 1994-95 (%)	34.4	36.0	26.1	23.9	..	..
Unemployment rate by level of educational attainment, 1995 (%)						
— Less than secondary	8.8	7.5	9.4	13.2	..	..
— Graduated from high school	5.3	5.1	6.6	7.3	..	..
— Some postsecondary	8.6	6.4	8.1	8.4	..	..
— Postsecondary certificate, diploma or university degree	5.0	4.9	5.8	6.4	..	..

**Notes:**

1. See "Definitions" following Table 3.
2. Parts may not sum to 100% due to rounding.
3. Data are based on the Finance Surveys of the Centre for Education Statistics and the System of National Accounts.
4. Data are based on the Finance Surveys of the Centre for Education Statistics.
5. Starting in 1995, Quebec graduate data for regular day programs include individuals over the age of 20 that graduated from regular day programs.
6. Graduates for Quebec excludes "Formation professionnelle".



Table 3  
Education indicators, G-7 countries, 1996

Indicator <sup>1</sup>		Canada	United States	France	United Kingdom	Germany	Italy	Japan
<b>Social and economic context</b>								
Educational attainment:	(%)							
lower secondary or less		24	14	40	24	19	62	..
tertiary		48	34	19	22	22	8	..
Labour force participation by educational attainment:	(%)							
— upper secondary education		89	88	90	89	85	80	..
Men		72	72	76	74	69	61	..
Women		92	93	92	94	93	92	..
— university education		85	82	83	86	83	81	..
Men								
Women								
<b>Costs and school processes</b>								
Public expenditure on education as a percentage of total public expenditures		13.6	14.4	11.1	..	9.5	9.0	9.8
Public expenditure on education as a percentage of GDP		5.8	5.0	5.8	4.6	4.5	4.5	3.6
Participation rate in formal education	(%)	68.2	68.8	64.5	66.8	61.8	53.8	57.0
Net tertiary non-university enrolment rate	(%)	17.3	12.9	..	4.7	2.9	..	..
Net university enrolment rate	(%)	23.1	21.7	..	22.2	7.9	..	..
<b>Educational outcomes</b>								
Ratio of upper secondary graduates to population	(%)	73	72	85	..	86	79	99
Ratio of first university degree to population	(%)	32	35	..	34	..	1	23
Unemployment rate by level of educational attainment:	(%)							
— upper secondary education								
Men		9	6	8	8	8	6	..
Women		9	4	12	6	10	11	..
— university education								
Men		5	2	6	4	5	5	..
Women		6	2	9	3	5	10	..

**Note:**

1. See "Definitions" following Table 3.

Source: Education at a Glance: OECD Indicators, OECD, Paris, 1998.

## Definitions

### Education indicators, Canada

**Table 1.**

Year refers to the following: (1) population refers to July of given year; (2) enrolment and staff refers to the academic year beginning in September of the given year; (3) graduates refers to number of persons graduating in the spring or summer of the given year; (4) expenditures refers to the fiscal year beginning in April of the given year.

#### 1. Youth immigration

The number of persons aged 0 to 19 who are, or have been, landed immigrants in Canada. A landed immigrant is a person who is not a Canadian citizen by birth, but who has been granted the right to live in Canada permanently by Canadian immigration authorities.

#### 2. Lone-parent families

The number of lone-parent families expressed as a percentage of the total number of families with children. A lone parent refers to a mother or a father, with no spouse or common-law partner present, living in a dwelling with one or more never-married sons and/or daughters. Sources: 1971 to 1986: Statistics Canada, *Lone-parent families in Canada*, Catalogue no. 89-522E; 1991 to present: Small Area and Administrative Data Division.

#### 3. Gross Domestic Product

The unduplicated value of production originating within the boundaries of Canada, regardless of the ownership of the factors of production. GDP can be calculated three ways, as total incomes earned in current production, as total final sales of current production, or as total net values added in current production, and it can be valued either at factor cost or at market prices. Source: Statistics Canada, Industry, Measures and Analysis Division.

#### 4. Consumer Price Index

The consumer price index (CPI) is an indicator of changes in consumer prices. It is defined as a measure of price change obtained by comparing, over time, the cost of a specific basket of commodities. Figures are annual averages.

#### 5. Employment-population ratio

The number of persons employed expressed as a percentage of the population 15 years of age and over, excluding institutional residents. Figures are annual averages.

#### 6. Unemployment rate

The number of unemployed persons expressed as a percentage of the labour force.

#### 7. Student employment rate

The number of persons aged 15 to 24 attending school on a full-time basis who were employed during the calendar year, (excluding May through August) expressed as a percentage of the total number of full-time students 15 to 24 years of age.

#### 8. Mothers' participation rate

The number of mothers who were in the labour force during the reference period and who live in a dwelling with one or more never-married sons and/or daughters, expressed as a percentage of the total number of mothers living in dwellings with one or more never-married sons and/or daughters. Source: Statistics Canada, *Women in the Workplace*, Catalogue no. 71-534.

#### 9. Families below low income cut-offs

Low income cut-offs are a relative measure of the income adequacy of families. A family that earns less than one-half of the median adjusted family unit income is considered to be in difficult circumstances. The set of low income cut-offs is adjusted for the size of the area of residence and for family size. Source: Statistics Canada, *Low Income Persons, 1980 to 1995*, December 1996, Catalogue no. 13-569.

#### 10. Adult education participation rate

The number of persons 17 years of age or over participating in adult education or training activities, expressed as a percentage of the total population 17 years of age or over. Excludes regular full-time students who are completing their initial schooling.

#### 11. Elementary/secondary pupil-educator ratio

Full-time equivalent enrolment (enrolment in Grades 1 to 12 [including Ontario Academic Credits] and ungraded programs, pre-elementary enrolment in provinces where attendance is full time, and half of the pre-elementary enrolment in other provinces) divided by the full-time equivalent number of educators.

**12. Education expenditures**

Includes expenditures of governments and of all institutions providing elementary/secondary and postsecondary education, and vocational training programs offered by public and private trade/vocational schools and community colleges.

**Education indicators, provinces and territories****Table 2.**

The methodologies used to derive the indicators in Table 2 may differ from those used in other statistical tables of this section.

**13. Educational attainment and labour force participation rates**

Refers to the population aged 25 and over. Source: Statistics Canada, *Labour Force Annual Averages*, 1995, Catalogue no. 71-220E.

**14. Graduation rate**

This measure is the sum of age-specific ratios of the number of graduates to population for an academic year. The ratios are calculated using the population as of June 1 of the school year and the number of graduates by age as of the same date. "Late graduates" are included in the calculations. Graduation rates are based on "youth" only. The term "youth only" may include individuals over the age of 20, enrolled in "regular" day school programs. However, graduates from up-grading programs for out-of-school adults, sometimes leading to "equivalency" certification but in other cases leading to regular high school graduation certification, are not included. If adult graduates were included, the graduation rates would be higher in all jurisdictions.

**15. University graduation rate**

Number of degrees awarded at the undergraduate level, as a percentage of the population aged 22.

**16. Unemployment rate by level of educational attainment**

The number unemployed with a given level of education is expressed as a percentage of the labour force with the same education; population aged 25 and over. Upper secondary includes the final grade of secondary school.

**17. University/secondary school earnings ratio**

The average annual earnings of those with university education are expressed as a percentage of the average annual earnings of those with upper secondary education; population aged 45 to 64.

**Education indicators, G-7 countries****Table 3.****18. Educational attainment**

Percentage of the adult population aged 25 to 64 that has completed a certain level of education.

**19. Participation rate in formal education**

The total number of students age 5 and older enrolled in formal education expressed as a percentage of the population aged 5 to 29.

**20. Net tertiary non-university enrolment rate**

Total number of full-time students aged 18 to 21 who are enrolled in non-university tertiary education, expressed as a percentage of the population aged 18 to 21.

**21. Net university enrolment rate**

Total number of full-time and part-time students aged 18 to 21 who are enrolled in university education, expressed as a percentage of the population aged 18 to 21.

EQR



In upcoming  
**ISSUES**

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*The following articles are scheduled to appear in upcoming issues of Education Quarterly Review:*

**Postsecondary graduates and the labour market: Job requirements relative to education level**

An analysis of the fields of study at specific levels of education that are associated with jobs that have requirements below education.

**Holding their own: Employment and earnings of postsecondary graduates**

An examination of the fortunes of younger workers based on the results of a longitudinal analysis of the early labour market outcomes of Canadian postsecondary graduates.

**Graduates' earnings and the job-education match**

An examination of the two important issues relating to transition from school to the labour market – earnings and the education-job skills match.

**University education: Recent trends in participation, accessibility and returns**

An analysis of important trends associated with participation in university education, including participation rates, tuition fees, prospects of finding a job and earnings.

**University and community college leavers**

An examination of how social demographic and high school related variables impact the odds of postsecondary leaving.

## **Factors influencing bachelors graduates pursuing further postsecondary education**

An analysis, using data from the National Graduates Surveys, of the patterns associated with the pursuit of further education.

## **Indicators of success for effective and efficient schools**

An examination of how new initiatives from Statistics Canada's Centre for Education Statistics can be utilized to explore the efficiency and effectiveness of elementary and secondary schools.

## **"Who are the disappearing youth?"**

This article examines the characteristics of young people who responded to the 1991 School Leavers Survey, but who subsequently failed to respond to the 1995 School Leavers Follow-up Survey. EQR

*This index lists all analytical articles published in Education Quarterly Review. Included are descriptions of education and education-related surveys conducted by Statistics Canada, provincial governments and institutions. The categories under which the articles appear are based on policy issues identified in the report Strategic Plan (1997), released by the Centre for Education Statistics in November 1997 and available on the Internet at address <http://www.statcan.ca/cgi-bin/downpub/freepub.cgi>.*

## **Education funding**

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School transportation costs

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Federal participation in Canadian education

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Funding public school systems: A 25-year review

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## **Student flows, student mobility and transitions**

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The search for education indicators

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Intergenerational change in the education of Canadians

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Participation in pre-elementary and elementary and secondary education in Canada: A look at the indicators

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Educational outcome measures of knowledge, skills and values

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Interprovincial university student flow patterns

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After high school ... Initial results of the School Leavers Follow-up Survey, 1995

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Varied pathways: The undergraduate experience in Ontario

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Education: The treasure within

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Brain drain and brain gain: The migration of knowledge workers from and to Canada

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Pathways to the United States: Graduates from the class of '95

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Trends in education employment

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Male-female earnings gap among postsecondary graduates

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Earnings and labour force status of 1990 graduates

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Worker bees: Education and employment benefits of co-op programs

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Youth combining school and work

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Employment prospects for high school graduates

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Relationship between postsecondary graduates' education and employment

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Labour market dynamics in the teaching profession

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Educational attainment — a key to autonomy and authority in the workplace

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Youth employment: A lesson on its decline

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## Technology and learning

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Computer literacy — a growing requirement

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The National Longitudinal Survey of Children and Youth, 1994-95: Initial results from the school component

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Third International Mathematics and Science Study: Canada report, Grade 8

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