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International students as a source of labour supply: Engagement in the labour market during the period of study



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International students as a source of labour supply: Engagement in the labour market during the period of study

by *Eden Crossman, Youjin Choi and Feng Hou*

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Abstract

While international students are in Canada primarily for study purposes, they may also participate in the labour market. Increases over the past two decades in the number of international students, along with regulations designed to facilitate their employment while studying, suggest a growing role played by this population in the Canadian labour market. This article assesses the extent to which international students who intended to study at the postsecondary level were engaged in the labour market. Findings of the analysis indicate that the share of international students in the employed population of Canada has grown over time. The share of international students with paid employment income, among total paid workers, grew from 0.1% in 2000 to 1.4% in 2018, and the number of international students with paid employment increased from 21,800 to 277,400. The share of total earnings attributed to international students has also expanded from 0.03% in 2000 to 0.36% in 2018. The share of international students in the working population was larger in some provinces than in others (notably Prince Edward Island, British Columbia, Manitoba and Ontario), but the share increased in all provinces over the 2000-to-2018 period. Notably, the labour market share of international students in the accommodation and food services sector was considerably higher than in other sectors, though all sectors experienced gains in the share of their workforce made up of international students. Taken altogether, international students are growing in importance when it comes to the Canadian labour market, and in some particular sectors more markedly.

Authors

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Introduction

While international students are in Canada primarily for study purposes, they may also participate in the labour market. Increases over the past two decades in the number of international students, combined with regulations that facilitate their employment while studying, have potentially led to growth in this population's role in the Canadian labour market.¹ International students who meet program requirements are eligible to work in Canada during their studies. Regulatory changes that took effect on June 1, 2014, improved opportunities for international students to work in Canada while studying. Under the amended regulations, all international students with a Canadian study permit are automatically authorized to work off campus for up to 20 hours per week during the academic session, and full time during scheduled breaks, without the need to apply for a separate work permit. The study permit holder must be pursuing academic, vocational or professional training of six months or more that leads to a degree, diploma or certificate at a designated institution. Previously, study permit holders pursuing studies at publicly funded and certain privately funded postsecondary institutions, while allowed to work on campus, had to apply for an off-campus work permit to be able to work (up to 20 hours per week off campus during the academic session and full time during scheduled breaks).

There are many reasons an international student may work while studying—for example, wanting to earn money to cover living costs and tuition fees, seeking opportunities to apply skills and knowledge, or gaining experiences that contribute positively to a future permanent migration trajectory. In particular, the growing importance of Canadian work experience in the selection of economic immigrants since the early 2000s may motivate some international students to find work while studying (Hou, Crossman and Picot 2020). The labour market experiences of international students can influence the nature of subsequent economic activities for those who go on to hold post-graduation work permits or to become permanent residents. Existing research identifies a clear earnings advantage for former international students whose previous stay in Canada combined work and school (e.g., Choi, Hou and Chan 2021; Hou and Bonikowska 2018; Hou and Lu 2017).

As part of a series² that provides a broad overview of international students as a source of labour, this article assesses the extent to which international students at the postsecondary level are engaged in the labour market while holding a study permit. This article examines the distribution of international students with paid employment and the contribution made by international students by province and industry of employment, as a share of the population of tax-filing earners and as a share of total earnings. The analysis is based on unique study permit holders who held study permits in a calendar year from 2000 to 2018.³ Regardless of education program length, individuals who held a study permit for at least some time during the calendar year are included.⁴ Individuals who became a permanent resident in the first four months of the tax year are excluded from the population of international students in that year. This study relies on integrated data from the Longitudinal Immigration Database and T4 tax files.

1. This article uses the terms “international students” and “study permit holders” interchangeably, and the numbers reported in the article refer specifically to the latter.
2. Three articles in this series that have been released examine trends in the size and characteristics of international students, the transition of international students to permanent residency and their retention in the province of study after graduation (Choi, Crossman and Hou 2021a, 2021b; Crossman, Choi and Hou 2021). Other forthcoming articles in this series will examine international students' labour market engagement after graduation (yet before becoming permanent residents) and after becoming permanent residents.
3. The sample includes unique postsecondary study permit holders present in Canada in a calendar year. The term “unique study permit holder” refers to those individuals holding study permits, regardless of whether they first arrived as a study permit holder or not. If an individual has multiple study permits in a calendar year, they are counted only once in this study. Study permit holders for primary or secondary education and study permit holders with missing information on study levels are excluded from the analysis. In 2014 and 2015, there were unusually large shares of students who had level of study information missing, compared with other years (see Crossman, Choi and Hou 2021).
4. In the case of multiple study permits held in a year, the study permit issued first is used to record information on characteristics (e.g., intended province of study, level of study).

The share of international students reporting earnings has increased, with the largest gains occurring among those studying at the college level

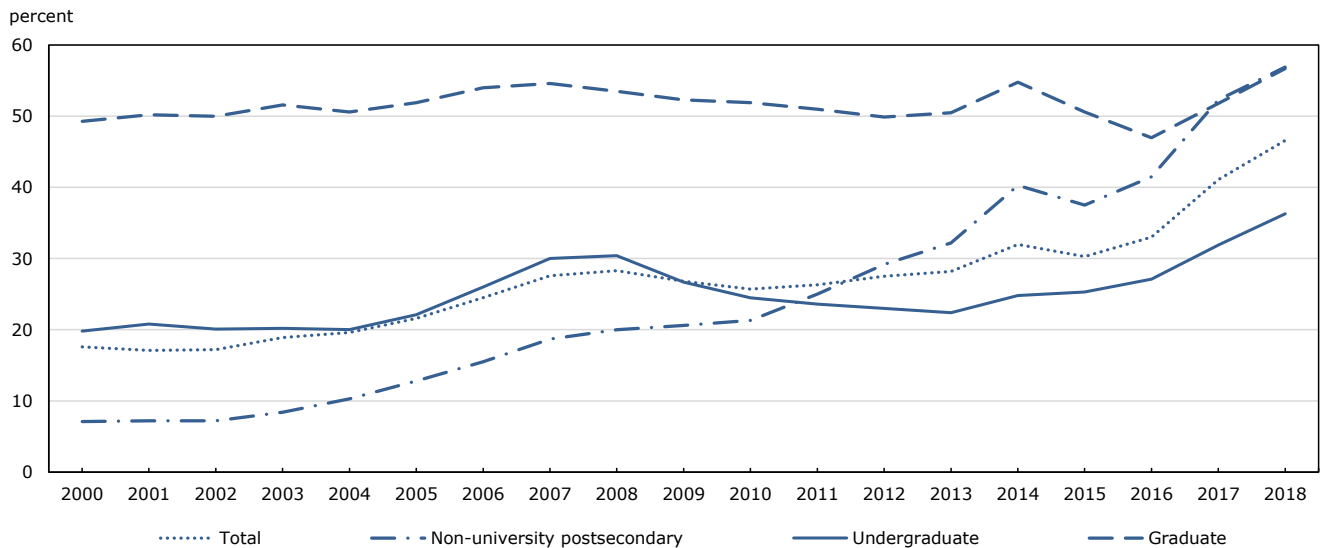
The share of international students at the postsecondary level with positive T4 earnings rose from nearly 2 in 10 in the early 2000s to nearly 5 in 10 by 2018, with a relatively large component of this increase occurring after 2016 (Chart 1 and Table 1). The share of international students reporting earnings provides a measure of their participation in the labour market.

The proportions of male and female international students reporting employment earnings were roughly equal over most of the past two decades. The exception is that a slightly smaller share of females than males reported employment earnings in the first half of the 2000s.

By age group, in 2018, international students aged 25 to 34 had the highest share reporting earnings (55%)—a share more than double that in 2000 (25%). In the early 2000s, the share of international students aged 35 and older reporting earnings was roughly on par with that of those aged 25 to 34. Since this time, however, the share of this older group has grown at a slower rate and was 13 percentage points lower by 2018. International students aged 18 to 24 had the second-largest share reporting earnings in 2018 (44%), nearly a three-fold increase over the early 2000s.

There have been changes over time in the share of international students reporting earnings by level of study (Chart 1). At the non-university postsecondary level (also referred to as the college level), the share of international students reporting earnings increased from 7% in 2000 to 57% in 2018. There was marked growth after 2016, when the number of international students at the college level also started to increase rapidly (Crossman, Choi and Hou 2021). The share of those studying at the bachelor's degree level who reported earnings also increased, but to a lesser extent, from about 20% in the early 2000s to about 25% from the mid-2000s to early 2010s, and eventually reaching 36% by 2018. International students studying at the graduate level (master's and doctoral degrees) consistently had a larger share reporting earnings (the exception was in 2018, when it was on par with that of those studying at the college level). In contrast to the trends observed for other education levels, this share was somewhat stable throughout the period, with roughly half reporting earnings. Employment opportunities for graduate students often consist of university employment, such as research or teaching assistantships. It is likely that these employment opportunities have remained largely stable.

Chart 1
Percentage of international students at the postsecondary education level with T4 earnings by level of education



Sources: Statistics Canada, Longitudinal Immigration Database and T4 file.

The share of international students who did not hold a separate work permit and had earnings ranged from 10% to 15% between 2000 and 2014. In the four following years, the share more than doubled, reaching 37% by 2018. This later period corresponds to the regulatory changes in 2014. Among those holding a work permit, the share reporting earnings fluctuated somewhat over the 2000-to-2018 tax year period, from a low of 56% in 2000 to a high of 68% in 2007.

Nigeria was the source country with the highest share of international students reporting earnings in 2018 (68%), followed by India (61%), Iran (54%) and Brazil (52%). The major source country associated with the lowest share of international students reporting earnings in this same year was Japan (26%), followed by China (27%), South Korea (34%) and the United States (37%). These group differences may partially reflect international students' needs to financially support their studies and motivations to seek permanent residency after studying.

By province, the highest share of international students reporting earnings in 2018 was for those intending to study in Newfoundland and Labrador (57%), followed by those intending to study in New Brunswick (48%), Ontario (48%) and Alberta (47%). The intended provinces of study with the lowest shares of international students reporting earnings in 2018 were Nova Scotia (36%), Prince Edward Island (42%), Quebec (44%) and Manitoba (46%). The largest increase in the proportion of international students reporting earnings between 2000 and 2018 was for British Columbia, with a share that rose more than five times in size. That increase was followed by Ontario and Quebec, where the shares more than doubled.

Table 1
Percentage of international students at the postsecondary education level with T4 earnings, tax years 2000 to 2018

	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
	percent									
All	17.6	17.2	19.6	24.5	28.3	25.7	27.5	32.0	33.0	46.6
Sex										
Male	19.4	18.4	20.2	24.7	27.8	25.1	27.5	32.4	33.2	47.6
Female	15.6	15.9	18.8	24.4	28.8	26.6	27.6	31.5	32.8	45.4
Age on study permit										
18 to 24	13.6	13.6	15.4	20.9	24.9	21.4	23.3	28.0	30.1	44.3
25 to 34	24.9	25.4	29.8	34.2	38.0	37.9	40.5	46.0	43.5	55.4
35 and older	26.5	26.6	30.4	31.3	32.8	33.7	34.0	33.0	32.3	42.4
Level of study on study permit										
Non-university postsecondary	7.1	7.2	10.3	15.5	20.1	21.3	29.2	40.3	41.5	56.9
University—bachelor's	19.8	20.1	20.0	26.0	30.4	24.5	23.0	24.8	27.1	36.3
University—master's and doctorate	49.3	50.0	50.6	54.0	53.5	51.9	49.9	54.8	47.0	56.7
Other ¹	12.4	11.9	12.6	13.1	16.5	15.1	15.8	17.6	18.7	31.5
Work permit										
Without a work permit	13.0	13.1	14.3	15.0	13.5	11.2	9.9	15.4	28.2	37.1
With a work permit	56.3	56.5	59.0	64.5	66.4	58.9	59.1	64.1	55.1	66.8
Top source country (2019 ranking²)										
India	41.6	34.0	35.4	38.2	41.5	31.3	42.8	61.1	49.3	61.1
China	18.9	11.4	14.3	24.2	26.3	19.2	19.2	22.2	20.6	26.5
France	19.2	21.0	20.3	21.9	26.1	25.7	23.8	26.9	30.1	39.3
South Korea	4.4	3.9	4.6	7.1	11.9	16.5	19.5	21.0	21.7	33.7
Vietnam	13.3	12.2	10.8	21.9	29.5	19.5	22.2	29.4	30.8	40.8
United States	19.3	19.7	21.3	25.4	31.6	31.4	32.7	32.8	32.8	36.8
Brazil	12.2	15.5	24.4	23.7	34.1	31.6	28.0	24.9	34.8	52.2
Iran	47.3	46.9	41.2	53.2	62.0	60.5	61.2	63.2	54.0	53.7
Nigeria	56.5	57.5	49.7	53.8	48.8	37.6	40.5	48.7	60.5	68.2
Japan	5.3	5.6	6.4	10.8	16.5	19.2	16.2	16.4	15.0	25.5
Other countries	21.5	23.7	26.7	29.3	31.9	28.3	27.7	31.2	34.5	47.4
Province of destination on study permit										
Newfoundland and Labrador	43.1	39.7	41.4	41.5	39.7	42.6	43.8	52.4	47.8	57.0
Prince Edward Island	20.0	18.5	24.2	31.7	30.4	28.4	24.7	26.7	27.0	41.8
Nova Scotia	24.1	23.6	25.9	29.1	28.9	24.7	23.0	25.7	24.8	36.0
New Brunswick	25.4	22.0	25.5	33.3	37.0	33.1	32.1	37.4	36.9	48.2
Quebec	20.1	20.6	20.9	23.6	27.8	27.9	27.8	32.2	33.4	44.4
Ontario	20.1	19.9	21.3	25.0	27.1	23.4	26.9	32.3	31.8	47.8
Manitoba	22.1	19.5	23.3	30.8	35.9	31.1	28.2	33.5	32.2	45.7
Saskatchewan	25.5	25.1	28.7	35.7	39.8	36.7	41.3	48.1	41.3	46.0
Alberta	24.0	25.4	32.5	42.0	49.1	44.5	46.3	47.9	42.3	47.2
British Columbia	8.9	8.0	10.4	16.8	22.2	21.2	23.1	26.7	32.0	46.0
	number									
Total observations	124,300	164,400	180,600	187,700	200,300	240,900	294,600	314,200	357,600	595,600

1. Includes university—other studies; residents and interns (unique to medical profession); English and French as second language courses, including at colleges and universities; Prework Training Certificate, Training Certificate for a Semiskilled Trade, Diploma of Vocational Studies or Attestation of Vocational Specialization; and other remaining studies not otherwise captured.

2. The listed source countries are the top 10 countries based on the number of current postsecondary study permit holders in 2019.

Sources: Statistics Canada, Longitudinal Immigration Database and T4 file.

Median earnings of international students have almost doubled over the past two decades

While Table 1 quantifies the percentage of international students who have paid employment income in a given year, Table 2 shows the median annual earnings of those who have such paid employment income. The numbers are shown for the 2000-to-2018 period for international students who held a study permit at the postsecondary education level. Changes in earnings levels over time can provide an indication of changes in the amount of labour input supplied by international students with paid employment income. Over the past two decades, the median earnings received by international students with paid employment income almost doubled, from \$5,500 (in 2018 dollars) in 2000 to \$9,500 in 2018. The 2017 and 2018 tax years were characterized by relatively strong increases in median earnings.

The earnings of male international students were consistently higher than those of their female counterparts. While females generally earned about 80% of male earnings, their earnings grew at a faster rate (notably after 2014), reaching 90% in the years following 2016. Not unexpectedly, earnings of international students were highest at the older end of the age spectrum throughout the period.

By program level, earnings throughout 2000 to 2018 were generally highest among those with a study permit at the college level, followed by those at the graduate (master's and doctoral degree) level. Earnings of those with a study permit at the bachelor's degree level ranked lowest in almost every year throughout the period, but growth in earnings for this group was the highest. After trending upwards to 2014, earnings of those studying at all levels fell slightly in subsequent years, but by 2018 had returned to, or surpassed, the earlier levels.

Annual earnings of international students with a work permit were consistently more than twice as high as those of their counterparts without a work permit throughout 2000 to 2018. In 2018, international students with a work permit had earnings of \$14,700, compared with \$6,200 for those without a work permit. However, the growth in annual earnings over the period was higher among those without a work permit, with a marked increase occurring after 2014, when international students were allowed to work off campus without a work permit.

In 2018, international students from Nigeria had the highest earnings, followed by those from India and Brazil. In contrast, median earnings were lowest for those from the United States, followed by France and China. There is a notable pattern of stronger earnings growth for international students from major source countries prior to 2014; subsequently, most source countries were associated with a general levelling off or decline in earnings levels.

In 2018, the highest earnings levels were reported by international students with Alberta, Ontario and British Columbia as the destination provinces on their study permits. The lowest earnings amounts were reported by those headed to Quebec, Nova Scotia and New Brunswick.⁵ Over the period from 2000 to 2018, earnings growth was highest among international students intending to study in New Brunswick (where median earnings more than tripled), followed by Newfoundland and Labrador, Manitoba, and Nova Scotia. Growth was lowest for those planning to study in Prince Edward Island, Saskatchewan, Ontario and Quebec.

5. In 2017 and 2018, Alberta had the highest median earnings among the provinces (but lower than the Northwest Territories and Yukon), followed by Saskatchewan and Ontario. The Atlantic provinces had the lowest median earnings (Statistics Canada 2021).

Table 2
Median T4 earnings among international students at the postsecondary education level with T4 earnings, tax years 2000 to 2018

	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
	2018 dollars									
All	5,500	5,200	5,900	6,400	7,500	6,900	8,000	8,000	5,600	9,500
Sex										
Male	6,200	5,600	6,400	7,100	8,300	7,600	9,000	8,900	6,000	9,900
Female	4,700	4,700	5,300	5,700	6,600	6,300	6,900	6,900	5,200	9,000
Age on study permit										
18 to 24	3,700	3,500	4,300	4,900	6,300	5,800	7,000	7,100	4,800	9,000
25 to 34	7,400	7,200	8,200	9,100	9,800	8,700	9,600	9,900	7,500	10,600
35 and older	7,800	9,200	10,300	10,900	10,400	10,700	11,300	10,200	8,400	10,900
Level of study on study permit										
Non-university postsecondary	6,100	5,100	6,200	7,700	8,900	7,700	10,000	10,100	5,500	10,900
University—bachelor's	3,000	2,900	3,600	4,700	6,500	6,000	6,700	6,100	5,000	7,000
University—master's and doctorate	6,800	6,400	7,200	7,900	8,000	7,400	7,800	8,500	6,600	8,800
Other ¹	6,000	6,300	7,600	6,400	6,900	7,000	6,800	6,700	5,300	8,800
Work permit										
Without a work permit	3,700	3,600	4,200	4,300	4,400	4,500	4,300	3,400	4,400	6,200
With a work permit	11,800	11,300	11,300	10,100	10,200	8,900	9,900	11,800	11,000	14,700
Top source country (2019 ranking²)										
India	5,700	5,100	6,900	9,300	10,600	7,900	11,100	11,900	5,200	11,300
China	6,500	5,200	5,600	6,600	8,100	6,600	6,700	6,800	5,300	6,500
France	3,700	3,500	3,500	3,500	4,700	4,700	5,500	4,900	3,800	5,800
South Korea	5,600	5,900	7,200	7,800	7,400	7,200	7,800	7,800	5,400	8,100
Vietnam	6,900	4,000	4,500	5,500	8,800	8,400	8,100	7,400	6,700	7,900
United States	3,400	3,100	3,500	4,400	4,900	5,300	5,600	5,500	4,800	5,500
Brazil	4,300	4,800	6,000	6,100	6,500	5,000	4,200	5,800	5,500	10,600
Iran	7,500	7,600	6,900	7,200	7,500	6,500	7,300	8,600	7,000	6,800
Nigeria	8,800	6,700	7,100	7,200	9,800	7,600	8,600	7,900	6,900	11,400
Japan	5,700	4,800	5,300	5,500	6,700	6,600	6,800	6,600	4,700	7,100
Other countries	5,700	5,600	6,700	6,800	7,900	7,800	8,300	7,500	6,400	9,000
Province of destination on study permit										
Newfoundland and Labrador	2,700	2,600	3,000	3,400	4,600	5,300	6,700	7,000	5,600	7,700
Prince Edward Island	7,500	5,500	3,900	4,300	6,400	6,000	6,000	6,900	5,300	8,400
Nova Scotia	3,300	3,000	4,000	5,400	6,000	6,000	6,400	7,100	5,300	7,000
New Brunswick	2,500	2,700	3,800	5,600	6,600	6,400	6,600	6,200	6,100	7,600
Quebec	4,400	3,800	4,300	4,000	4,800	5,000	5,700	5,200	4,400	6,500
Ontario	6,900	6,200	7,200	7,700	8,700	8,000	9,100	9,300	5,300	10,100
Manitoba	3,400	3,500	4,400	5,600	8,500	7,900	8,200	7,100	5,900	8,400
Saskatchewan	5,700	5,500	7,100	7,300	9,900	8,000	9,900	11,700	8,000	8,100
Alberta	5,500	5,900	7,400	7,900	10,700	9,800	11,600	11,600	9,100	10,700
British Columbia	5,900	4,900	5,200	6,500	6,800	6,200	6,800	7,300	5,700	10,000

1. Includes university—other studies; residents and interns (unique to medical profession); English and French as second language courses, including at colleges and universities; Prework Training Certificate, Training Certificate for a Semiskilled Trade, Diploma of Vocational Studies or Attestation of Vocational Specialization; and other remaining studies not otherwise captured.

2. The listed source countries are the top 10 countries based on the number of current postsecondary study permit holders in 2019.

Note: Dollar amounts are rounded to the nearest \$100.

Sources: Statistics Canada, Longitudinal Immigration Database and T4 file.

Large shifts occurred across industrial sectors among international students with paid employment income

Over the 2000-to-2018 period, the majority (85% to 91%) of international students with paid employment were concentrated in four provinces: Ontario, British Columbia, Quebec and Alberta (Table 3). Among those four provinces, Ontario and British Columbia gained in their relative shares of international students with T4 earnings, while Quebec and Alberta saw their relative shares decline.

The distribution of international students with paid employment across industrial sectors also changed considerably (Table 3). In the early 2000s, close to 60% of international students with T4 earnings worked in educational services. This share decreased to 12.6% in 2018. Meanwhile, accommodation and food services became the largest sector where international students found work (25.9% in 2018), followed by wholesale and retail trade (19.1%) and business, building and other support services (16.1%). As a result of these changes, international students have spread to a much broader spectrum of economic activities, and became a more visible component of Canada’s labour force.

Table 3
Distribution of international students with T4 earnings across provinces and industries, tax years 2000 to 2018

	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
Total international student T4 earners	21,800	28,300	35,300	46,100	56,600	62,000	81,100	100,500	118,000	277,400
	number									
	percent									
Province of employment at taxation										
New foundland and Labrador	1.0	1.0	1.0	1.0	1.1	1.3	1.3	1.3	1.3	0.8
Prince Edward Island	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5
Nova Scotia	3.3	3.6	4.0	3.4	2.8	2.9	2.7	2.4	2.1	1.8
New Brunswick	2.1	2.3	2.5	2.5	2.2	2.0	1.6	1.4	1.1	0.9
Quebec	23.7	22.1	19.0	17.0	17.2	18.3	16.2	16.4	16.5	14.0
Ontario	39.8	42.6	42.2	39.1	35.6	35.1	36.7	37.8	41.4	48.5
Manitoba	2.5	2.4	3.0	3.5	3.3	3.0	3.3	3.4	3.4	3.5
Saskatchewan	2.8	2.6	2.7	2.6	2.5	3.3	5.4	3.1	2.3	1.7
Alberta	10.6	10.8	11.9	13.9	15.0	13.4	13.4	13.9	8.5	6.0
British Columbia	13.6	12.2	13.3	16.6	19.9	20.3	18.9	19.8	22.8	22.1
Industry of employment at taxation										
Agriculture	0.4	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3
Forestry, fishing, mining, quarrying, oil and gas	0.2	0.2	0.3	0.6	0.8	0.5	0.8	0.7	0.2	0.2
Utilities	0.2	0.2	0.1	0.3	0.4	0.3	0.3	0.3	0.1	0.1
Construction	0.7	0.8	0.6	0.6	1.1	1.0	1.4	1.8	1.7	1.8
Manufacturing	5.7	3.9	3.5	3.5	3.6	2.8	3.9	4.2	3.1	4.0
Wholesale and retail trade	5.4	5.4	6.6	8.3	11.0	11.2	13.3	15.3	17.7	19.1
Transportation and warehousing	0.6	0.6	0.6	0.7	0.9	0.8	1.6	1.6	1.2	2.4
Finance, insurance, real estate, rental and leasing	1.7	1.6	1.8	2.6	3.5	3.0	3.1	3.6	2.6	2.8
Professional, scientific and technical services	3.8	3.4	3.7	5.8	6.5	4.9	5.8	6.3	4.4	4.8
Business, building and other support services	6.1	5.7	5.7	6.1	6.6	7.2	7.7	9.3	14.0	16.1
Educational services	58.3	59.6	57.1	48.9	38.1	38.8	32.6	27.1	21.1	12.6
Health care and social assistance	2.5	2.5	2.5	2.3	2.7	3.0	3.0	3.0	2.1	2.6
Information, culture and recreation	1.8	1.6	1.8	2.3	3.2	2.7	2.8	2.7	2.2	2.6
Accommodation and food services	7.1	8.2	9.3	12.0	15.7	16.9	18.9	19.3	25.2	25.9
Other services (except public administration)	4.2	4.9	4.7	4.1	3.5	3.1	2.8	2.7	2.4	2.4
Public administration	1.0	1.1	0.9	1.1	1.4	1.4	1.1	1.1	0.6	0.8

Sources: Statistics Canada, Longitudinal Immigration Database and T4 file.

The share of international students among paid workers has grown over time

The share of international students among paid workers (individuals with T4 earnings) has grown from 0.1% in 2000 to 1.4% in 2018 (Table 4). This measure provides an indication of the role of international students in the employed population of Canada.

By province of employment, in 2018, this share was highest in British Columbia (2.3%), Ontario (1.8%) and Prince Edward Island (1.5%), and lowest in New Brunswick (0.6%), Alberta (0.7%) and Saskatchewan (0.8%). In comparison, the share of international students among paid workers was similar across provinces in the early 2000s. While the share of international students in the employed population expanded in all provinces from 2000 to 2018, growth was strongest in Prince Edward Island, British Columbia and Manitoba, and was lowest in Alberta, New Brunswick and Saskatchewan.

What role do international students play in the working populations in various sectors? Based on industry of employment at taxation, there was a much expanded role for international students as workers in accommodation and food services (with the share rising from 0.1% in 2000 to 4.6% in 2018), as well as business, building and other support services (from 0.2% to 3.9%). The educational services sector consistently employed a relatively high share of international students (from 1.2% in 2000 to 2.4% in 2018). Over the entire period, the shares were lowest in public administration (0.1% or less); forestry, fishing, mining, quarrying, oil and gas (0.2% or less); utilities (also 0.2% or less); and agriculture (0.3% or less).

Table 4
Share of international students with T4 earnings among total T4 earners and distribution of international student T4 earners across provinces and industries, tax years 2000 to 2018

	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
	percent									
All	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	1.4
Province of employment at taxation										
Newfoundland and Labrador	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.9
Prince Edward Island	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	1.5
Nova Scotia	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.5	1.0
New Brunswick	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.6
Quebec	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.9
Ontario	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.6	0.7	1.8
Manitoba	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.5	0.6	1.4
Saskatchewan	0.1	0.2	0.2	0.3	0.3	0.4	0.8	0.5	0.5	0.8
Alberta	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.4	0.7
British Columbia	0.2	0.2	0.2	0.4	0.5	0.6	0.7	0.8	1.1	2.3
Industry of employment at taxation										
Agriculture	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3
Forestry, fishing, mining, quarrying, oil and gas	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.2
Utilities	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.1	0.2
Construction	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.4
Manufacturing	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.6
Wholesale and retail trade	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.7	1.7
Transportation and warehousing	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.8
Finance, insurance, real estate, rental and leasing	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.7
Professional, scientific and technical services	0.1	0.1	0.2	0.3	0.4	0.3	0.5	0.6	0.5	1.2
Business, building and other support services	0.2	0.2	0.2	0.3	0.4	0.4	0.6	0.9	1.6	3.9
Educational services	1.2	1.5	1.7	1.9	1.7	1.8	2.0	2.0	1.8	2.4
Health care and social assistance	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.4
Information, culture and recreation	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4	1.0
Accommodation and food services	0.1	0.2	0.3	0.4	0.7	0.8	1.1	1.4	2.0	4.6
Other services (except public administration)	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.9
Public administration	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1

Sources: Statistics Canada, Longitudinal Immigration Database and T4 file.

The share of total earnings of international students is largest in British Columbia and in accommodation and food services

The share of total T4 earnings received by international students rose from 0.03% in 2000 to 0.36% in 2018 (Table 5). The measure is used in this analysis to provide an indication of the scope of economic activity attributable to international students. In 2018, the share of total earnings attributable to international students was largest in British Columbia (0.63%), followed by Prince Edward Island (0.46%) and Ontario (0.43%). The share of employment earnings ascribed to international students grew from 2000 to 2018 in all provinces, and most rapidly in Manitoba, British Columbia, Prince Edward Island and Ontario.

The share of total earnings accrued by international students among T4 earners in 2018 was highest in accommodation and food services (2.5% of all earnings in this industry) where the share of international students among T4 earners was highest. This was followed by business, building and other support services (1.09%); wholesale and retail trade (0.49%); and educational services (0.39%). From 2000 to 2018, growth in international students' share of total earnings was highest in accommodation and food

services (with a marked increase after 2016), followed by transportation and warehousing; wholesale and retail trade; and business, building and other support services. With relatively high employment of international students over the period, the educational services sector exhibited the smallest growth in the share of earnings attributable to international students.

Table 5

Share of total T4 earnings of international students in total T4 earnings of all T4 earners, tax years 2000 to 2018

	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018
	percent									
All	0.03	0.04	0.05	0.06	0.08	0.08	0.12	0.14	0.12	0.36
Province of employment at taxation										
Newfoundland and Labrador	0.02	0.02	0.04	0.04	0.05	0.07	0.10	0.11	0.11	0.21
Prince Edward Island	0.03	0.02	0.03	0.05	0.06	0.07	0.09	0.09	0.14	0.46
Nova Scotia	0.02	0.03	0.05	0.07	0.07	0.08	0.11	0.13	0.11	0.24
New Brunswick	0.02	0.03	0.04	0.07	0.08	0.07	0.08	0.10	0.07	0.18
Quebec	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.08	0.08	0.21
Ontario	0.03	0.04	0.06	0.07	0.08	0.08	0.11	0.14	0.12	0.43
Manitoba	0.02	0.02	0.04	0.07	0.09	0.08	0.12	0.14	0.14	0.39
Saskatchewan	0.03	0.04	0.06	0.07	0.09	0.10	0.30	0.18	0.12	0.22
Alberta	0.03	0.04	0.05	0.07	0.10	0.10	0.13	0.16	0.10	0.19
British Columbia	0.04	0.04	0.05	0.08	0.13	0.12	0.16	0.21	0.22	0.63
Industry of employment at taxation										
Agriculture	0.02	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.05	0.13
Forestry, fishing, mining, quarrying, oil and gas	0.01	0.02	0.01	0.03	0.05	0.04	0.07	0.07	0.03	0.06
Utilities	0.01	0.01	0.01	0.03	0.06	0.05	0.06	0.07	0.03	0.06
Construction	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.05	0.04	0.13
Manufacturing	0.02	0.02	0.02	0.03	0.04	0.03	0.06	0.08	0.06	0.20
Wholesale and retail trade	0.02	0.02	0.03	0.04	0.07	0.07	0.12	0.15	0.16	0.49
Transportation and warehousing	0.01	0.01	0.01	0.02	0.03	0.03	0.07	0.08	0.05	0.26
Finance, insurance, real estate, rental and leasing	0.01	0.02	0.02	0.04	0.07	0.06	0.08	0.10	0.07	0.20
Professional, scientific and technical services	0.04	0.04	0.05	0.11	0.14	0.11	0.18	0.21	0.14	0.37
Business, building and other support services	0.05	0.06	0.08	0.10	0.13	0.15	0.20	0.25	0.32	1.09
Educational services	0.18	0.23	0.29	0.31	0.29	0.29	0.31	0.32	0.26	0.39
Health care and social assistance	0.02	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.05	0.14
Information, culture and recreation	0.02	0.02	0.03	0.07	0.10	0.10	0.13	0.15	0.11	0.35
Accommodation and food services	0.06	0.08	0.11	0.17	0.29	0.37	0.57	0.66	0.78	2.50
Other services (except public administration)	0.05	0.08	0.08	0.08	0.10	0.09	0.10	0.12	0.11	0.31
Public administration	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.01	0.05

Sources: Statistics Canada, Longitudinal Immigration Database and T4 file.

Conclusion

This study examined the extent to which international students holding a postsecondary level study permit were involved in the labour market. Findings showed that the labour market participation of international students has increased markedly. The share of these students reporting earnings rose from nearly 2 in 10 in the early 2000s to nearly 5 in 10 by 2018.

The study also shows that the share of international students in the population of paid workers has grown over time in Canada, from 0.1% in 2000 to 1.4% in 2018. The share of total T4 earnings attributable to international students has also expanded, from 0.03% in 2000 to 0.36% in 2018. The relative importance of international students in the labour market, however measured, was larger in some provinces than in

others (notably Prince Edward Island, British Columbia, Manitoba and Ontario). However, all provinces witnessed a growing role of international students over the 2000-to-2018 period. The exception was Alberta and, to a lesser extent, Saskatchewan, where international students' share in the provincial labour market stagnated somewhat in the post-2014 period. This is likely a response to a falling overall labour demand in those provinces because of decreased oil prices (Chen and Morissette 2020).

While all sectors experienced gains in the share of their workforce made up of international students, the gains were particularly large in accommodation and food services; business, building and other support services; wholesale and retail trade; and professional, scientific and technical services. In the early 2000s, international students with T4 earnings were highly concentrated in the educational services sector. By 2018, they had spread to a much broader spectrum of economic activities. Taken altogether, international students are growing in importance when it comes to the Canadian labour market, and in some particular sectors more markedly. In particular, as a source of labour supply, international students can help mitigate labour shortage during the period of recovery from the COVID-19 pandemic.

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