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International Students from Ontario's Publicly Assisted Postsecondary Institutions: Labour Market and Immigration Outcomes

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Between 2013-14 and 2022-23, international student enrollment at Canadian postsecondary institutions more than doubled, from 200,000 students to 460,000 (Statistics Canada, 2024a). Growth in Ontario was especially striking; as a major hub for international students, enrollment in the province more than tripled[1] over this period (Williams et al., 2015; Statistics Canada, 2024b). These increases coincided with the implementation of Canada's 2014 international education strategy, which set ambitious targets for attracting new international learners (Government of Canada, 2014; 2019). The strategy emphasized the economic impact of international students in Canada through tuition and discretionary spending, and it highlighted the benefits of attracting newcomers to Canada who are young, proficient in at least one official language and educated through Canadian postsecondary programs (Government of Canada, 2019). International graduates could help develop Canada's highly skilled workforce,[2] particularly in sectors with demonstrated labour market gaps, and reinforce Canada's workforce long term through immigration.

International enrollment increases raised concerns across the country around housing and other services and led to a series of Immigration, Refugees and Citizenship Canada (IRCC) policy shifts starting in early 2024 (IRCC, 2024a). These new policies, including limits on international student study permits and Post-Graduation Work Permits (PGWPs), reshaped Canada's international education strategy and impacted international student recruitment and enrollment. By fall 2024, Canadian postsecondary institutions anticipated more than a 50% decrease in international enrollment (Amad, 2024; Previl, 2024). Ontario colleges and universities saw significant enrollment decreases between September 2023 and 2024. Some colleges reported 40–50% fewer international students, alongside a 30% drop in new study permit submissions between January and April 2025 compared to the same months in 2024 (Hurley, 2025; Apply Board, 2025). The full impacts of IRCC's 2024 policy changes in Ontario will not be clear for several years. At the same time, Ontario and Canada still need to address

[1] Ontario international enrollments grew from 86,000 in 2013-14 to more than 256,000 in 2022-23. International enrollments at publicly assisted colleges increased four-fold while international enrollments at publicly assisted universities doubled.
[2] In Canadian immigration, high-skilled jobs fall into specific categories of the Training, Education, Experience and Responsibilities (TEER) system. Jobs captured in TEERs 0, 1, 2 and 3 are considered high-skilled jobs, requiring significant training and education. TEER 0 are management occupations; TEER 1 are occupations that usually require a university degree; TEER 2 usually require a college diploma or at least two years of apprenticeship training; TEER 3 usually require a college diploma, apprenticeship training or at least six months of on-the-job training (Government of Canada, 2025d).

labour market shortages and ensure a robust workforce. This review of Ontario international graduate outcomes under the previous federal framework provides relevant details to support ongoing policy discussions.

The Higher Education Quality Council of Ontario (HEQCO) partnered with the Social Research and Demonstration Corporation (SRDC) to explore the labour market outcomes and pathways to immigration for international students enrolled in Ontario's publicly assisted colleges and universities.[3] Microdata from Statistics Canada's Education and Labour Market Longitudinal Platform (ELMLP) revealed key findings on the labour market entry, post-graduation earnings and transition to permanent residency (PR) of international students enrolled in publicly funded Ontario institutions between 2010 and 2020. In this report, we highlight differences in international students' labour market and immigration outcomes by field of study and credential. Graduates from Ontario certificate and diploma programs were more likely to file taxes[4] in Canada than graduates with other credentials, and they transitioned to PR at high rates. But those who entered graduate degree programs tended to have higher PR transition rates within eight years of entry. Graduates in high-demand fields such as math and computer science, health and engineering earned more than those in other fields and were more likely to transition to PR. These findings shed light on Canada's success in developing a highly skilled workforce through its international strategy.

Background

Priorities of the federal government's 2014–2019 international education strategy included attracting more international students to study in Canada, growing the national workforce — particularly in sectors with labour shortages — and increasing the number of international students who choose to remain in Canada as permanent residents after graduation (Government of Canada, 2014; 2019). The Post-Graduation Work Permit

[3] The technical report can be found on SRDC's website.
[4] Filing taxes was used to help identify individuals who were living in Canada and provided insights into students' labour market outcomes, including their earnings. While tax data is a proxy for students' labour market participation, some international students file taxes even without an income. Multiple institutions recommend filing and claiming education deductions, as this can reduce future tax liability when students begin working through co-ops, placements or other employment. Some students also work and do not file taxes.

(PGWP), introduced in 2003,[5] was an important initiative supporting these goals (Williams et al., 2015). Prior to 2024, the PGWP was an open permit that allowed international students to work immediately after graduation[6] from a postsecondary institution with Designated Learning Institution (DLI)[7] status — a status that all publicly assisted postsecondary institutions in Ontario have. PGWP duration generally coincided with program length, with up to three years of eligibility: graduates from one-year programs could receive a one-year permit; graduates from longer programs could be eligible for two- or three-year permits. Some international students enrolled in sequential programs to accumulate more years of study for longer PGWPs.

The promise of a work permit served as a recruiting tool to attract international students to study in Canada, and it supported graduates' post-graduation plans. Canadian work experience established through the PGWP assisted international students who sought PR status through points in IRCC's Comprehensive Ranking System (CRS) (ICEF Monitor, 2014). The CRS is used to evaluate PR candidates[8] for three immigration streams: the Federal Skilled Worker Program, the Canadian Experience Class and the Federal Skilled Trades Program. Applicants can accumulate a maximum of 1,200 points based on several key factors, including age, highest level of education (additional points for Canadian education) and paid work experience (additional points for Canadian work experience outside of academic programs), with an additional 600 points if nominated through a provincial nominee program (PNP)[9] (Government of Canada, 2025a; Government of Ontario, 2025).

Through the PGWP program, the number of international students who settled in Canada after graduation surged. Between 2008 and 2018, PGWP holders increased more than six times from 10,300 to 135,100 (Crossman, Lu & Hou, 2022). Data from 2008 to 2012 confirmed that nearly three-quarters of PGWP holders successfully

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[5] The PGWP started as a pilot program in selected provinces in 2003. It expanded nationwide in 2005.
[6] From programs of study at least eight months in duration.
[7] DLIs are institutions approved by a provincial or territorial government to host international students.
[8] PR applicants use the Canadian Express Entry System, an online system used to manage immigration applications, to create a profile and submit materials.
[9] The PNP allows provinces and territories to nominate individuals who meet their specific labour market needs. Candidates must qualify for one of the three express entry programs — Federal Skilled Worker Program, Federal Skilled Trades Program or Canadian Experience Class — and meet the criteria of the province or territory's PNP. Each province and territory has its own streams targeting specific groups, such as skilled workers, students or business owners. Quebec and Nunavut do not participate in the PNP but have their own immigration programs.

transitioned to PR status within five years of obtaining their permits (Crossman, Lu & Hou, 2022).

Prior to IRCC's 2024 policy changes, graduates from all full-time academic programs at public colleges and universities were eligible for a PGWP. New PGWP eligibility requirements distinguish between program types: all graduates from bachelor's, master's or PhD programs are eligible for three-year PGWPs; graduates from certificate or diploma programs must meet specific field-of-study requirements, and permit lengths generally correspond to program length, up to three years.[10] Eligible fields announced in November 2024 were linked to critical labour shortages in the Canadian economy and fell into five broad categories: agriculture and agri-food; healthcare; science, technology, engineering and mathematics (STEM); trade; and transportation.[11] In June 2025, IRCC expanded the list of eligible fields to include education, veterinary science, pharmacy, social work and skilled trades such as culinary arts and construction management (IRCC, 2025d). Currently, more than 900 fields of study are eligible for PGWPs (IRCC, 2025d).[12] Eligible fields of study are expected to be updated early in 2026.

Recent changes to PGWP eligibility do not affect the data discussed in this study, but they will influence the labour market and immigration outcomes of current and future international students. New policies will alter who chooses to study in Ontario, the credentials they pursue and the fields of study they select. Findings from this study offer context and benchmarks for understanding how these policies shift international graduates' pathways and outcomes.

[10] New PGWP requirements also include meeting a minimum language proficiency. Graduates from programs under one year and up to two years are eligible for PGWPs corresponding to program length (for example, a graduate from a nine-month program may be eligible for a nine-month PGWP). Graduates from two-year programs may be eligible for a three-year PGWP.
[11] These fields are also prioritized under IRCC's Express Entry system.
[12] Eligible fields of study are linked to academic programs using Classification of Instructional Programs (CIP) codes.

Research Questions and Methodology

SRDC analyzed labour market outcomes and immigration pathways for international students enrolled at Ontario colleges and universities between 2010 and 2020. The following research questions were explored:

1. How do labour market entry and earnings levels, one and five years[13] after graduation, vary for international students by credential level and field of study?

2. How do international students' transition rates from study permits to PR vary by credential level and field of study, up to eight years after receiving their initial study permit?[14]

The investigation relied on SRDC's descriptive and regression analyses of microdata from Statistics Canada's Education and Labour Market Longitudinal Platform (ELMLP).[15] SRDC linked three datasets in the ELMLP: Postsecondary Student Information System (PSIS), income tax from the T1 Family File (T1FF) and the Longitudinal Immigration Database (IMDB), which captures every person issued an Ontario study permit since 1980. The sample for this report includes international students who were issued Ontario study permits between 2010 and 2020 and enrolled in publicly assisted Ontario institutions.

Outcome Variable

This report shares descriptive results for a subset of variables analyzed: annual tax filing in Canada, annual earnings and transition rate to PR. Tax filing was derived by

[13] Examining labour market outcomes for international graduates one and five years post-graduation provides detail regarding students' immediate transitions into employment and captures information for graduates who chose to remain in Canada longer term.
[14] PR transition rates were explored eight years after students received their first study permit to allow enough time for international graduates to be eligible to apply for PR status. The analysis does not control for graduation.
[15] Descriptive findings are provided in this report. Where regression analyses resulted in refined outcomes, further detail is reported. SRDC's full methodology and regression outcomes can be found in the technical report here.

examining international students who filed taxes in Canada one and five years following graduation (i.e., the first graduation flag in a student's record). Annual earnings post-graduation was captured among students who filed tax returns and had positive earnings. To allow for group comparison, earnings data were logarithmically transformed and adjusted for inflation across the first five years after graduation. Data from the IMDB was used to track which students became permanent residents up to eight years after they were issued their initial Ontario study permit.

Explanatory Variables

Descriptive results on post-graduation labour market and immigration outcomes were analyzed using two explanatory variables: students' credential type and field of study. Credential type captured the level of education attained from a postsecondary institution and included certificate, diploma, bachelor's degree, graduate or professional degrees and other credentials.[16] The field of study variable, which comprises twelve areas of academic focus, included: science; math and computer science; engineering; business; humanities; health;[17] arts; social sciences; education; agriculture and resources; services;[18] and other fields.[19] In the labour market outcomes analyses, these variables are captured at graduation (i.e., credential obtained and in which field), but in the migration analysis, these variables are captured at entry (i.e., credential and field first entered).[20]

[16] Examples of other credentials include qualifying programs and residencies.
[17] Programs under the health field of study include healthcare programs (e.g., health professions, medical residency and fellowship programs) as well as general health programs (e.g., kinesiology, leisure studies and design for human health).
[18] Programs under the services field of study include personal, security and transport services.
[19] Other fields include unclassified, missing or multiple.
[20] As the migration analysis does not control for graduation, these explanatory variables could not be captured at graduation, which is why they are anchored at entry. It is possible that some students changed their credential level or field of study over the course of their stay, which again would not be accounted for here.

Findings

Labour Market Outcomes

One year after graduation, most Ontario international students who received a study permit between 2010 and 2020 filed taxes in Canada. Nearly 80% of international students filed a tax return one year after graduation.[21] The high percentage of tax-filing graduates could reflect the broad PGWP eligibility in place prior to 2024. All international graduates from academic programs longer than eight months could have secured a PGWP for up to three years,[22,23] depending on length of study. By year five, the proportion of graduates with tax data reduced slightly to 72%, which could be due to the proportion of graduates leaving Canada (either by choice or because their arrangements expired).[24]

International students' pre-graduation work experiences may have helped support their transitions into the labour market following program completion. In 2018, 50% of enrolled international students in Canada reported positive T4 earnings, up from 20% in the early 2000s (Crossman et al., 2021). In Ontario, 48% of enrolled international students reported earnings in 2018 (Crossman et al., 2021).

International students may also have benefited from co-op placements. Between the 2014 and 2018 cohorts, the rate at which international students held co-op work permits[25] increased from 25% to 37%. This difference increased to 16 percentage points in SRDC's regression analysis. Co-op permits are compulsory for international students enrolled in programs that require work experience as part of their program's

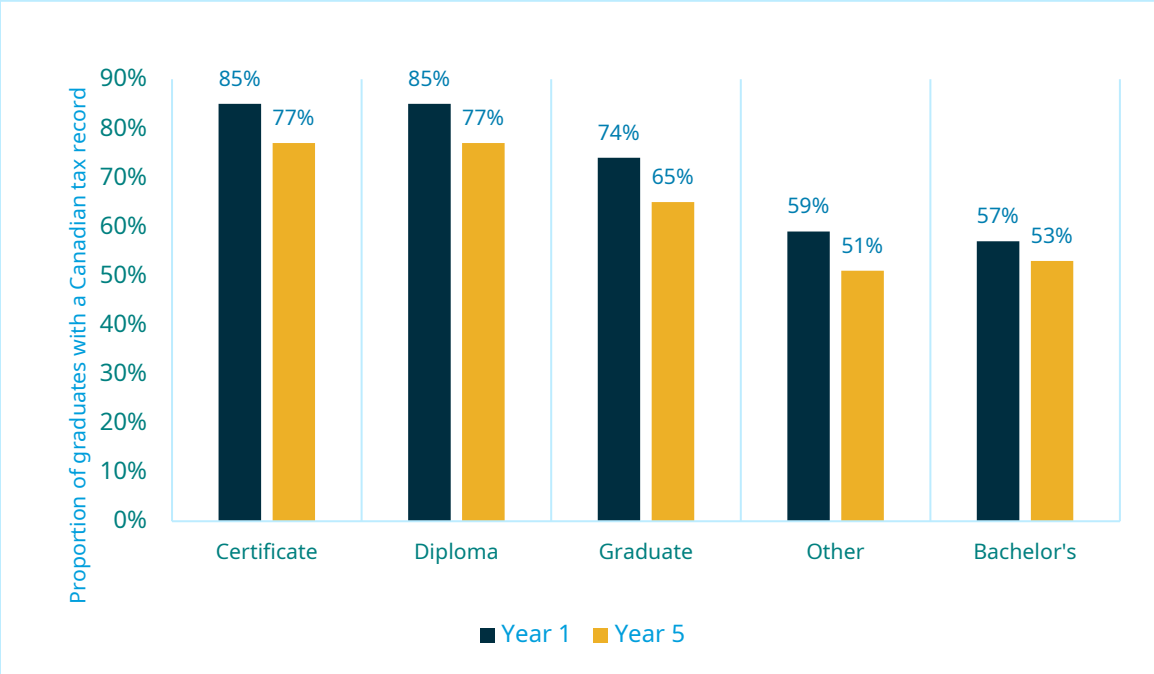
[21] Not all tax filers report positive earnings. One year after graduation, 338,880 international students filed taxes and 251,140 reported positive earnings.
[22] PGWPs are one-time, non-renewable permits, but IRCC offered different PGWP extension opportunities. In April 2023, expired PWGP holders (or those with PGWP set to expire in 2023) could apply for 18-month extensions. In August 2024, IRCC offered eligible graduates with expired or nearly expired PGWP an opportunity to apply for an Open Work Permit, which extended work eligibility up to three years.
[23] Not all tax-filers required a PGWP in order to work. Some graduates may have gone back to school part time and worked on or off their campus; others may have already transitioned to PR.
[24] International students leaving Canada could lead to changes in the underlying graduating cohorts used between the year one and five analyses. Differences in the cohorts could result in lower tax filing rates.
[25] International students apply for co-op permits separately from study permits.

curriculum, and they can provide opportunities for students to gain experience in Canadian workplaces, develop professional skills and expand their networks (Wyonch, 2020).

SRDC's analyses show that bachelor's degree graduates were less likely to file taxes one and five years after graduation compared to those who graduated from certificate, diploma or graduate degree programs. Figure 1 below shows tax-filing rates for international graduates by credential type.

Figure 1

Tax-filing Rate One and Five Years After Graduation, by Credential (2010–2020 Cohorts)



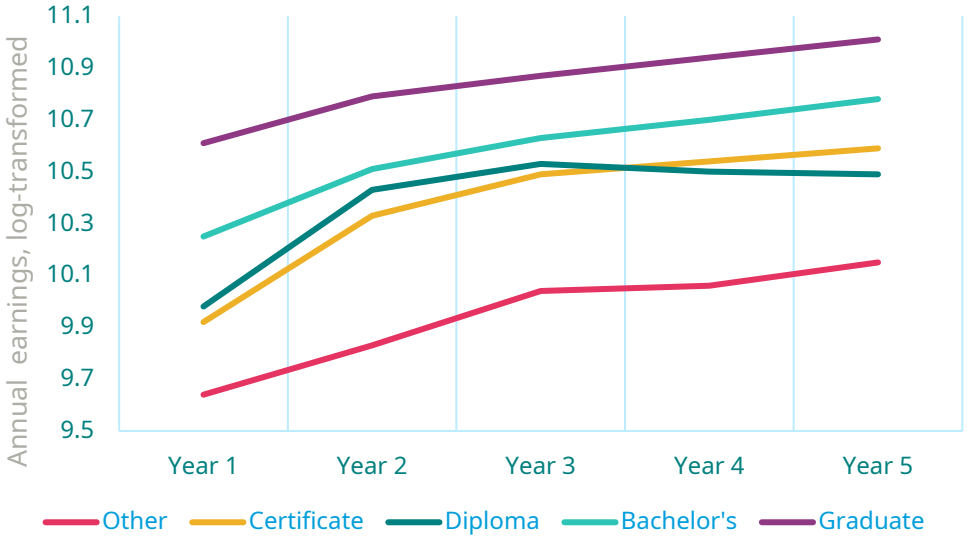
Sources: PSIS and T1FF data.

Note: This figure illustrates differences in tax-filing rates, by credential, of international students enrolled in public institutions for all cohorts from 2010 to 2020, one and five years after graduation. For the one-year post-graduation rates, all 11 cohorts are used, but the five-year post-graduation rates use the 2010-2016 cohorts.

Although fewer international students with bachelor's degrees filed taxes following graduation, Figure 2 shows that they earned more than students with a certificate or diploma, but slightly less than those with a graduate degree.

Figure 2

Annual Log Earnings for Five Years After Graduation, by Credential (2010–2020 Cohorts)



Sources: PSIS and T1FF data.

Note: This figure shows annual log-transformed earnings differences by credential for international students enrolled in public institutions for all cohorts from 2010 to 2020, one to five years after graduation.

Ontario certificate and diploma graduates consistently earned less than bachelor's degree graduates over the five years observed after graduation. In year one, certificate and diploma holders earned $20,300 and $21,600 (respectively) compared to $40,500 for bachelor's degree holders. In year five, certificate and diploma holders earned $39,700 and $36,000 (respectively) compared to $48,100 for bachelor's degree holders[26] (see appendix for full table of anti-log earnings). Both one and five years after graduation, graduate degree holders earned more than all other credential holders ($40,500 in year one and $60,500 in year five). This aligns with literature on the earnings premium associated with advanced credentials and is similar to earnings differences among domestic students. On average, bachelor's degree holders earn more than those with certificates or diplomas, while graduate degree holders earn more

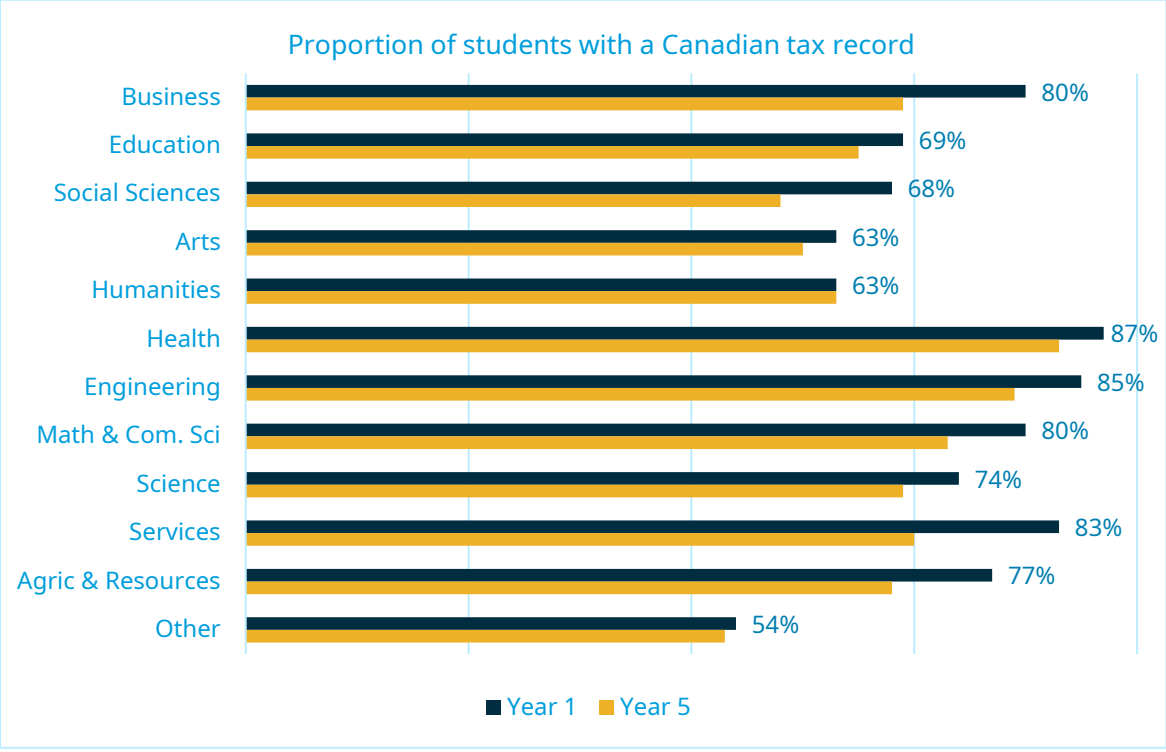
[26] Annual earnings reported here are converted from log earnings and are offered for context. These are geometric means rather than arithmetic means and should be interpreted carefully.

than bachelor's degree holders (Colyar et al., 2022; Finnie et al., 2019; Ostrovsky & Frenette, 2014).

Figure 3 shows differences in tax-filing rates one and five years after graduation by field of study. Students who completed a credential in health (87%), engineering (85%), services (83%), math and computer science (80%) and business (80%) were the most likely to file taxes in Canada one year after graduating. These outcomes align with some high-need sectors of the labour market (health and engineering) prioritized in IRCC's new field of study priorities but also include fields that are not considered a high priority (business and services). There has been a consistently high demand for workers in science, technology, engineering and mathematics (STEM) and healthcare jobs in Canada (Statistics Canada, 2023). Jobs in these high-demand sectors include a range of roles that require different skills specialization and credential levels, from certificates to advanced degrees.

Figure 3

Tax-filing Rates One and Five Years After Graduation, by Field of Study (2010–2020 Cohorts)



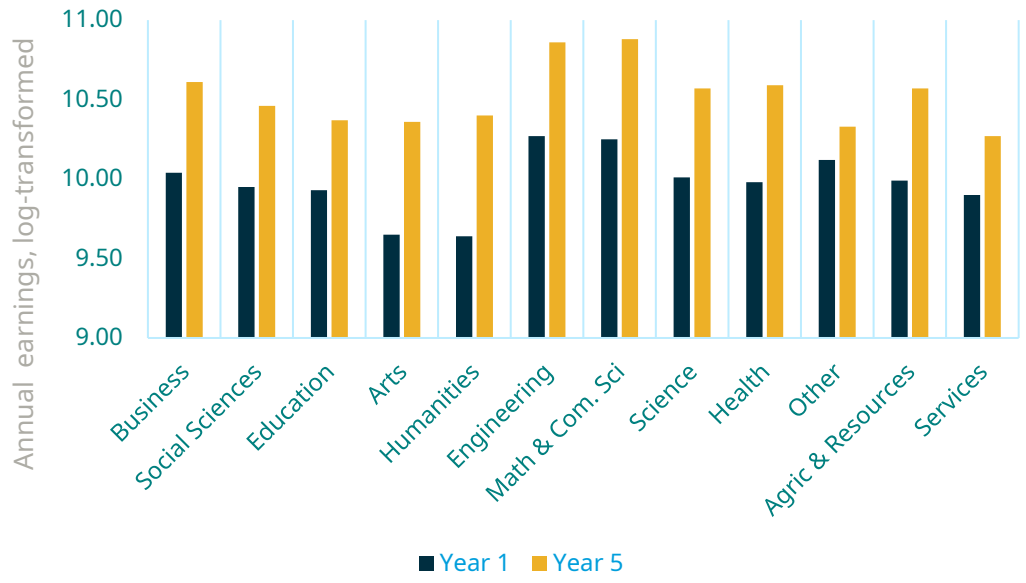
Sources: PSIS and T1FF data.

Note: This figure illustrates differences in tax-filing rates by field of study for international students enrolled in public institutions for all cohorts from 2010 to 2020, one and five years after graduation.

A similar trend can be observed in Figure 4, which shows variations in earnings by field of study.[27] In years one and five, graduates of engineering, math and computer science fields had the highest earnings, while graduates of arts programs had the lowest. Engineering and tech-sector workers typically earn more than their counterparts in other fields (Frenette & Handler, 2020). This earnings difference is also observed among domestic graduates (Choi, Hou & Chan, 2021).

Figure 4

Annual Earnings One and Five Years After Graduation, by Field of Study (2010–2020 Cohorts)



Sources: PSIS and T1FF data.

Note: This figure shows annual log-transformed earnings differences by field of study, of international students enrolled in public institutions for all cohorts from 2010 to 2020, one to five years after graduation.

Data available for this study did not include details about international graduates' occupational field or if their work aligned with their fields of study. In 2018, 26% of

[27] Anti-log annual earnings by field are provided in the Appendix, Table 5.

international students in Canada were working in accommodation and food service, and 19% worked in wholesale retail trade during their studies (Crossman et al., 2021).

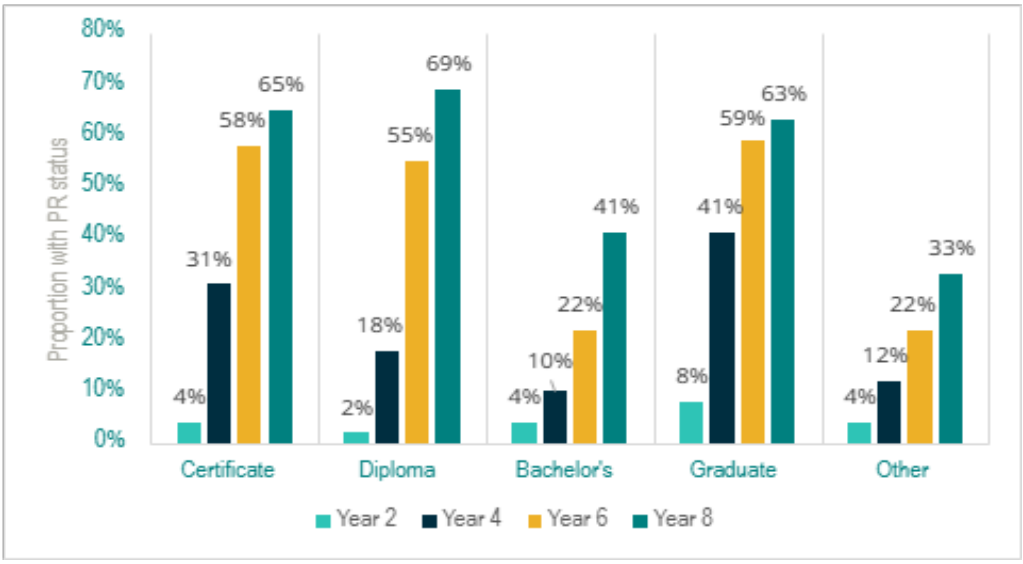
Immigration Outcomes

Among those who received their first Ontario study permit between 2010 and 2016, 21% of Ontario international students became permanent residents as early as four years after receiving their first study permit.[28] By year eight, the overall rate of transition for those who were still in the country more than doubled to 54%. Transition rates varied by institution type and credential level. Results showed that international students who attended Ontario universities were less likely to transition to PR than those who attended college. The difference after eight years was 13 adjusted percentage points. Figure 5 shows credential differences in transition rates to PR status after the initial study permit was issued. Two years after receiving their first Ontario study permit, transition rates to PR were consistently low across all credential holders. Students, particularly those enrolled in bachelor's or diploma programs, were still completing their studies and, as a result, may not have qualified or accumulated enough points for most express entry pathways.[29] The small proportion that transitioned may have qualified for specialized pathways, such as through family sponsorship or caregiver status. The rate of transition to PR increased across all credentials over the eight-year period. Students who started in a certificate or diploma program transitioned to PR at high rates: 65% and 69%.

[28] The underlying cohorts included in each yearly analysis differ (e.g., only people who were issued a study permit between 2010 and 2012 are included in the eight-year outcome model), and therefore longer-term migration outcomes will likely differ for more recent cohorts that do not yet have available information in the IMDB data. International students included in this analysis may not have held a PGWP.
[29] Work during studies cannot be counted towards CRS scores in the Canadian Experience Class or Federal Skilled Trades Program. Some work experience can count toward minimum requirements for the Federal Skilled Worker Program.

Figure 5

Transition Rates to Permanent Resident Status After Initial Study Permit Issued, by Credential (2010–2018 Cohorts)



Sources: PSIS and IMDB data.

Note: This figure illustrates the rate of transition to PR by credential for international students enrolled in public institutions up to eight years after their initial study permit issued for all cohorts from 2010 to 2018.

SRDC's regression analysis added nuance to the descriptive results. The regression showed that bachelor's students were more likely than certificate or diploma students to transition to PR when individuals with similar characteristics (including country of origin, age and field of study) were compared.[30] In both the descriptive and regression analyses, students from Ontario graduate programs were more likely to become permanent residents four, six and eight years after being issued a study permit compared to those who entered bachelor's degree programs. The regression results may reflect the additional points allotted to bachelor's and graduate students in the CRS system, which improve their chances of receiving an invitation to apply for PR. Some graduate students captured in this study may have also benefited from short-term federal[31] and provincial programs like the Ontario Immigrant Nominee Program

[30] SRDC's regression analysis of PR transition rates by credential revealed that certificate and diploma students in the eight-year outcome model were 8 and 5 adjusted percentage points less likely to transition to PR compared to students who entered bachelor's programs.

[31] The PhD Eligibility Stream, which was introduced in 2011 and ended in 2014, provided PR for a maximum of 1,000 PhD students per year who had completed at least two years of study, as well as

master's and PhD graduate streams. Graduate degree holders also had higher earnings than graduates with other credentials. Their advantages in the labour market may have positively influenced their decisions to pursue PR as well as their success in obtaining it.

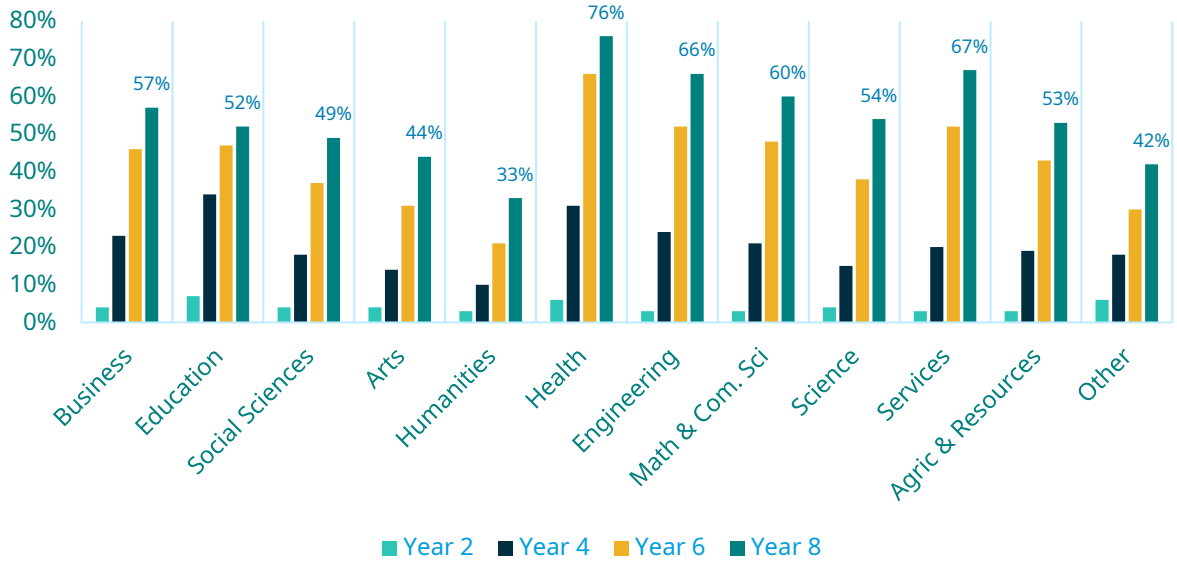
While factors such as Canadian education and work experience play a role in students qualifying for PR, a key variable our analysis cannot account for is students' motivation for pursuing Canadian education. Previous research reported that "rates of transition to permanent residency reflect not only the characteristics of a given credential, but the goals of the students completing it" (Wall, 2022). Employment, family and social conditions in their home countries may influence students' decision making. For students who wished to settle in Canada, college and graduate programs requiring one or two years of study offered an efficient pathway and quicker entry into the labour market. On the other hand, immigration may not be the primary motivator for some international students, as they may be interested in graduate studies or planning to return home to pursue a career (Colyar et al., 2023). International graduates that return to their home countries can still contribute positively to Canada's global reputation as ambassadors for Canadian education in their countries.

Figure 6 shows differences by field of study in transition rates to PR status after the initial study permit was issued. Ontario international students who entered health programs (76%), services (67%), engineering (66%) and math and computer science (60%) were the most likely to become permanent residents by year eight, while students who entered arts (44%) and humanities (33%) programs were the least likely.

students who had recently graduated.

Figure 6

Transition Rates to PR After Initial Study Permit Issued, by Field of Study (2010–2018 Cohort)



Sources: PSIS and IMDB data.

Note: This figure shows the transition rates to PR by field of study for international students enrolled in public institutions up to eight years after their initial study permit issued for all cohorts from 2010 to 2018.

These findings align with labour market outcomes by field of study. Graduates from health, services and engineering programs were more likely to file taxes one year after graduation, potentially pointing to active labour market participation. These graduates could have earned points that would contribute to gaining PR status earlier than graduates in other fields. Graduates in health and engineering may be more likely to seek PR status because their programs of study meet professional standards for Ontario and/or Canada. They may require additional or different training in their home countries in order to meet local standards needed for employment in their chosen fields.

Discussion and Conclusion

Increases in international student enrollments in Ontario have been reported for many years, but little has been known about international students' labour market and immigration outcomes. Multi-year, longitudinal data used in this study illuminate the

efficacy of Canada's 2014–2019 international strategy in Ontario and offer evidence that can inform ongoing policy discussions.

Many of the goals outlined in Canada's 2014–2019 international strategy were met in Ontario. Between 2010 and 2020, publicly assisted colleges and universities recruited high numbers of international students. These students contributed to local economies through discretionary spending and by working during their studies. With broad access to PGWPs, many international students entered the labour market following graduation. Graduates transitioned to PR status at high rates.

Detailed outcomes data for Ontario's international students suggest that Canada's 2014–2019 strategy also supported the goal of recruiting and retaining highly skilled workers. These findings show that international students graduated with credentials in fields with labour market gaps and transitioned to PR as highly skilled workers: tax filing and PR transition rates were high for graduates in engineering and health; and master's and PhD graduates reported higher earnings than other credential holders and transitioned to PR at high rates. At the same time, the findings show high rates of employment and PR transition in lower-priority credentials such as certificates[32] and in lower-demand fields such as business and services. Canada's strategy cast a wide net, and it brought graduates and newcomers across a range of high-priority and lower-priority credentials and academic programs.

Future research will be needed to understand how Canada's new international education strategy supports Canada's immigration and economic goals. Narrow PGWP eligibility for certificate and diploma holders may help fill important skills and labour market gaps (for example, with more international students in personal support worker programs), but these credential holders are offered fewer points in Canada's CRS system and may have lower PR rates. Research could examine how different credential levels are represented in groups of new PRs who studied in specific high-priority fields at Ontario institutions. Research could also focus on how graduates' fields of study align with their post-graduate work, as well as how previously completed credentials and educational and work experiences shape their pathways into the labour market. International students in certificate programs may arrive to study in Canada holding a bachelor's or advanced degree; they may arrive with skills and experience in high-

[32] The NOC and TEER system is used to identify high-priority credentials for Canadian immigration (Government of Canada, 2025b).

priority fields. These graduates may have very different learning and labour market pathways. An adaptable and robust Canadian workforce needs individuals with a variety of skills, experience and credential levels working in fields that align with their PSE studies.

Before international graduates access and enter the labour market or seek PR status, however, they are learners at postsecondary institutions. Researchers, institutions and policy makers can work to understand student motivations for studying in Canada and Ontario and their ambitions for seeking pathways to PR. These understandings can further support government planning for Ontario and Canada's economic and social vitality into the future.

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Appendix

International Students from Ontario's Publicly Assisted Postsecondary Institutions: Labour Market and Immigration Outcomes

Appendix

Table 1

Descriptive Analysis: Tax-filing Rate After Graduation

Observations	Year 1 % with tax data	Year 2 % with tax data	Year 3 % with tax data	Year 4 % with tax data	Year 5 % with tax data
N=	*338,880*	*257,480*	*214,470*	*158,820*	*122,460*
PSIS Program of graduation					
Certificate	0.85	0.85	0.83	0.79	0.77
Diploma	0.85	0.86	0.83	0.80	0.77
Graduate	0.74	0.72	0.69	0.67	0.65
Other	0.59	0.59	0.56	0.52	0.51
Bachelor's	0.57	0.58	0.56	0.54	0.53
Field of Study at graduation					
Business	0.80	0.80	0.77	0.71	0.69
Education	0.69	0.68	0.67	0.65	0.65
Social Sciences	0.68	0.68	0.65	0.61	0.58
Arts	0.63	0.65	0.64	0.62	0.60
Humanities	0.63	0.66	0.66	0.63	0.63
Health	0.87	0.87	0.86	0.85	0.83
Engineering	0.85	0.85	0.83	0.80	0.79

Math and Computer Science	0.80	0.80	0.78	0.75	0.73
Science	0.74	0.74	0.72	0.71	0.69
Services	0.83	0.82	0.79	0.73	0.70
Agriculture and Resources	0.77	0.77	0.74	0.70	0.68
Other	0.54	0.56	0.55	0.53	0.53

Sources: PSIS and T1FF data.

Note: This table shows differences in tax filing rates, by credential, of international students enrolled in public institutions for all cohorts from 2010 to 2020, one and five years after graduation. For the one-year post graduation rates, all 11 cohorts are used, but the 5-year post graduation rates use the 2010-2016 cohorts.

Table 2

Regression Analysis: Tax Filing After Graduation (tax return=1)

Observations	Year 1	Year 2	Year 3	Year 4	Year 5
N=	*338,880*	*275,480*	*214,470*	*158,820*	*122,460*
PSIS program of graduation (Bachelor's)					
Certificate	0.054*** (0.0031)	0.061** (0.0033)	0.076*** (0.0037)	0.075** (0.0042)	0.071*** (0.0047)
Diploma	0.11*** (0.0027)	0.12*** (0.0029)	0.14*** (0.0033)	0.13*** (0.0037)	0.11*** (0.0042)
Graduate	0.031*** (0.0032)	0.022*** (0.0035)	0.032*** (0.0040)	0.035*** (0.0044)	0.028*** (0.0050)
Other	-0.056*** (0.015)	-0.037* (0.016)	-0.024 (0.018)	-0.024 (0.020)	-0.019 (0.021)
Field of study at graduation (Business)					
Education	-0.0020 (0.0091)	0.0062 (0.010)	0.027* (0.011)	0.042** (0.013)	0.069*** (0.015)

Social Sciences	-0.037***(0.0027)	-0.032*** (0.0030)	-0.026*** (0.0035)	-0.019*** (0.0042)	-0.018*** (0.0049)
Arts	-0.070***(0.0054)	-0.048*** (0.0059)	-0.029*** (0.0067)	-0.011 (0.0077)	-0.0050 (0.0088)
Humanities	-0.086***(0.0039)	-0.060*** (0.0041)	-0.035*** (0.0045)	-0.020*** (0.0051)	-0.0100 (0.0056)
Health	0.018***(0.0027)	0.027*** (0.0029)	0.045*** (0.0034)	0.073*** (0.0042)	0.079*** (0.0050)
Engineering	0.048***(0.0018)	0.053*** (0.0020)	0.061*** (0.0024)	0.081*** (0.0029)	0.090*** (0.0035)
Math and Computer Science	0.021***(0.0023)	0.028*** (0.0026)	0.037*** (0.0032)	0.051*** (0.0039)	0.054*** (0.0047)
Science	-0.016***(0.0036)	-0.011** (0.0040)	-0.0037 (0.0045)	0.020*** (0.0052)	0.018** (0.0059)
Services	0.031***(0.0042)	0.025*** (0.0049)	0.031*** (0.0060)	0.026*** (0.0077)	0.025** (0.0090)
Agriculture and Resources	-0.013 (0.0066)	-0.0059 (0.0071)	-0.0073 (0.0084)	0.0035 (0.010)	0.020 (0.012)
Other	-0.12***(0.011)	-0.096*** (0.012)	-0.076*** (0.013)	-0.055*** (0.014)	-0.039* (0.016)

Sources: PSIS and T1FF data.

Notes: This table shows differences in tax filing rates, by credential, of international students enrolled in public institutions for all cohorts from 2010 to 2020, one and five years after graduation. For the one-year post graduation rates, all 11 cohorts are used, but the 5-year post graduation rates use the 2010-2016 cohorts. The table presents the results of separate linear probability models examining if a student had a tax return and declared employment earnings (1=yes) one to five years after a student graduated from a PSE program. The explanatory variables included in the model are categorical and the reference group for each variable is in parentheses next to the bolded variable title. Robust standard errors are in parentheses under each coefficient. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3

Descriptive Analysis: Log Earnings After Graduation

Observations	Year 1 mean earnings	Year 2 mean earnings	Year 3 mean earnings	Year 4 mean earnings	Year 5 mean earnings
N=	251,140	207,110	155,380	107,410	79,070
PSIS program of graduation					
Other	9.64	9.83	10.04	10.06	10.15
Certificate	9.92	10.33	10.49	10.54	10.59
Diploma	9.98	10.43	10.53	10.50	10.49
Bachelor's	10.25	10.51	10.63	10.70	10.78
Graduate	10.61	10.79	10.87	10.94	11.01
Field of study at graduation					
Business	10.04	10.44	10.57	10.59	10.61
Social Sciences	9.95	10.32	10.42	10.42	10.46
Education	9.93	10.15	10.26	0.34	10.37
Arts	9.65	10.14	10.28	10.31	10.36
Humanities	9.64	9.98	10.17	10.29	10.40
Engineering	10.27	10.65	10.77	10.80	10.86
Math and Computer Science	10.25	10.63	10.77	10.81	10.88
Science	10.01	10.33	10.45	10.47	10.57
Health	9.98	10.37	10.49	10.54	10.59
Other	10.12	10.16	10.27	10.29	10.33
Agriculture and Resources	9.99	10.42	10.54	10.57	10.57

Services	9.90	10.24	10.33	10.57	10.27

Sources: PSIS and T1FF data.

Notes: This table shows annual log-transformed earnings differences by credential for international students enrolled in public institutions for all cohorts from 2010 to 2020, one to five years after graduation.

Table 4

Regression Analysis: Log Earnings After Graduation

Observations	Year 1	Year 2	Year 3	Year 4	Year 5
N=	251,140	207,110	155,380	107,410	79,070
PSIS program of graduation (Bachelor's)					
Other	-0.80*** (0.049)	-0.77*** (0.048)	-0.64*** (0.055)	-0.68*** (0.066)	-0.62*** (0.072)
Certificate	-0.59*** (0.0084)	-0.47*** (0.0082)	-0.44*** (0.0093)	-0.43*** (0.011)	-0.42*** (0.013)
Diploma	-0.45*** (0.0073)	-0.38*** (0.0070)	-0.37*** (0.0081)	-0.45*** (0.010)	-0.50*** (0.012)
Graduate	0.042*** (0.0085)	0.021* (0.0087)	0.040*** (0.010)	0.049*** (0.012)	0.043** (0.014)
Field of study at graduation (Business)					
Social Sciences	-0.15*** (0.0068)	-0.14*** (0.0069)	-0.15*** (0.0082)	-0.17*** (0.012)	-0.17*** (0.015)
Education	-0.35*** (0.023)	-0.37*** (0.025)	-0.34*** (0.030)	-0.30*** (0.035)	-0.31*** (0.046)
Arts	-0.32*** (0.015)	-0.25*** (0.014)	-0.24*** (0.017)	-0.22*** (0.022)	-0.21*** (0.026)
Humanities	-0.34*** (0.012)	-0.30*** (0.011)	-0.24*** (0.012)	-0.19*** (0.014)	-0.13*** (0.016)

Engineering	0.066*** (0.0044)	0.075*** (0.0043)	0.085*** (0.0052)	0.12*** (0.0069)	0.14*** (0.0089)
Math and Computer Science	0.093*** (0.0058)	0.12*** (0.0057)	0.14*** (0.0069)	0.17*** (0.0095)	0.21*** (0.012)
Science	-0.12*** (0.0091)	-0.16*** (0.0095)	-0.15*** (0.011)	-0.13*** (0.014)	-0.067*** (0.017)
Health	0.026*** (0.0072)	0.0024 (0.0076)	-0.011 (0.0090)	0.014 (0.012)	0.050*** (0.015)
Other	-0.12*** (0.033)	-0.18*** (0.036)	-0.14*** (0.036)	-0.11** (0.039)	-0.13** (0.042)
Agriculture and Resources	-0.051** (0.017)	-0.055*** (0.015)	-0.065*** (0.019)	-0.042 (0.025)	-0.075* (0.034)
Services	0.012 (0.0097)	-0.13*** (0.0100)	-0.16*** (0.012)	-0.21*** (0.018)	-0.21*** (0.022)

Sources: PSIS and T1FF data.

Notes: This table shows annual log-transformed earnings differences by credential for international students enrolled in public institutions for all cohorts from 2010 to 2020, one to five years after graduation. The table presents the results of separate OLS models examining CIP adjusted log earnings (excluding those who earned $0) one to five years after a student graduated from a PSE program. The explanatory variables included in the model are categorical and the reference group for each variable is in parentheses next to the bolded variable title. Robust standard errors are in parentheses under each coefficient. * p < 0.05, ** p < 0.01, *** p < 0.001.

Table 5

Descriptive Analysis: Anti-log Annual Earnings After Graduation ($)

Observations	Year 1	Year 2	Year 3	Year 4	Year 5
N=	251,140	207,110	155,380	107,410	79,070
PSIS Program of graduation					
Other	15,400	18,600	22,900	23,400	25,600
Certificate	20,300	30,600	36,000	37,800	39,700
Diploma	21,600	33,900	37,400	36,300	36,000

BA	28,300	36,700	41,400	44,400	48,100
Grad	40,500	48,500	52,600	56,400	60,500
Field of study at graduation					
Education	20,500	25,600	28,600	30,900	31,900
Arts	15,500	25,300	29,100	30,000	31,600
Humanities	15,400	21,600	26,100	29,400	32,900
Social Sciences	21,000	30,300	33,500	33,500	34,900
Business	22,900	34,200	38,900	39,700	40,500
Science	22,200	30,600	34,500	35,200	38,900
Math and Computer Science	28,300	41,400	47,600	49,500	53,100
Engineering	28,900	42,200	47,600	49,000	52,100
Agriculture and Resources	21,800	33,500	37,800	38,900	38,900
Health	21,600	31,900	36,000	37,800	39,700
Services	19,900	28,000	30,600	28,900	28,900
Other	24,800	25,800	28,900	29,400	30,600

Sources: PSIS and T1FF data.

Notes: This table shows differences in annual anti-log earnings by credential for international students enrolled in public institutions for all cohorts from 2010 to 2020, one to five years after graduation. Annual earnings reported here are converted from log-earnings and are offered for context. These are geometric means rather than arithmetic means and should be interpreted carefully.

Table 6

Descriptive Analysis: Migration Outcomes After Receiving Initial Ontario Study Permit

Observations	Year 1 % transition to PR	Year 2 % transition to PR	Year 3 % transition to PR	Year 4 % transition to PR	Year 5 % transition to PR	Year 6 % transition to PR	Year 7 % transition to PR	Year 8 % transition to PR
N=	509,530	419,690	338,930	266,660	210,090	169,800	138,610	102,450
PSIS program of graduation								
Certificate	0.01	0.04	0.13	0.31	0.49	0.58	0.62	0.65
Diploma	0.01	0.02	0.06	0.18	0.38	0.55	0.65	0.69
Graduate	0.03	0.08	0.21	0.41	0.53	0.59	0.62	0.63
Bachelor's	0.02	0.04	0.06	0.10	0.14	0.22	0.32	0.41
Other	0.02	0.04	0.07	0.12	0.17	0.22	0.28	0.33
Field of study at graduation								
Business	0.01	0.04	0.10	0.23	0.36	0.46	0.53	0.57
Education	0.03	0.07	0.20	0.34	0.43	0.47	0.50	0.52
Social Sciences	0.02	0.04	0.09	0.18	0.28	0.37	0.43	0.49
Arts	0.02	0.04	0.08	0.14	0.22	0.31	0.39	0.44

Humanities	0.02	0.03	0.06	0.10	0.15	0.21	0.28	0.33
Health	0.02	0.06	0.14	0.31	0.53	0.66	0.72	0.76
Engineering	0.01	0.03	0.09	0.24	0.41	0.52	0.60	0.66
Math & Com. Sci	0.01	0.03	0.08	0.21	0.37	0.48	0.55	0.60
Science	0.02	0.04	0.07	0.15	0.26	0.38	0.47	0.54
Services	0.01	0.03	0.09	0.20	0.38	0.52	0.62	0.67
Agriculture and Resources	0.01	0.03	0.08	0.19	0.33	0.43	0.49	0.53
Other	0.03	0.06	0.11	0.18	0.24	0.30	0.36	0.42

Sources: PSIS and IMDB data.

Notes: This table shows the rate of transition to PR by credential for international students enrolled in public institutions up to eight years after their initial study permit issued for all cohorts from 2010 to 2018.

Table 7

Regression Analysis: Migration Outcomes After Receiving Initial Ontario Study Permit

Observations	Year 1 Transition to PR	Year 2 Transition to PR	Year 3 Transition to PR	Year 4 Transition to PR	Year 5 Transition to PR	Year 6 Transition to PR	Year 7 Transition to PR	Year 8 Transition to PR
PSIS program of graduation (Bachelor's)								
Certificate	-0.015*** (0.0012)	-0.014*** (0.0021)	-0.0054 (0.0035)	-0.0059 (0.0053)	0.033*** (0.0062)	0.015* (0.0068)	-0.056*** (0.0072)	-0.078*** (0.0086)
Diploma	-0.015*** (0.00012)	-0.024*** (0.0019)	-0.047*** (0.0031)	-0.054*** (0.0051)	0.015* (0.0062)	0.019* (0.0068)	-0.036*** (0.0072)	-0.051*** (0.0085)
Graduate	-0.0056*** (0.00086)	-0.0059*** (0.0013)	0.027*** (0.0024)	0.093*** (0.0036)	0.15*** (0.0039)	0.015*** (0.0042)	0.094*** (0.0045)	0.070*** (0.0051)
Other	-0.013*** (0.0012)	-0.014*** (0.0020)	-0.019*** (0.0033)	-0.028*** (0.0050)	-0.012* (0.0056)	-0.051*** (0.0060)	-0.12*** (0.0063)	-0.15*** (0.0074)
Field of study at graduation (Business)								
Education	-0.00081 (0.0015)	0.00010 (0.0029)	0.018*** (0.0053)	0.28*** (0.0080)	0.044** (0.0098)	0.050*** (0.011)	0.062** (0.012)	0.065*** (0.013)
Social Sciences	-0.0022*** (0.00059)	-0.0075*** (0.0011)	-0.020*** (0.0019)	-0.032*** (0.0031)	-0.022** (0.0039)	-0.0088** (0.0044)	-0.0012* (0.0049)	-0.0081 (0.0056)

Arts	0.00040 (0.0011)	-0.0043* (0.0020)	-0.022*** (0.0034)	-0.056*** (0.0050)	-0.068*** (0.0065)	-0.062*** (0.0076)	-0.043*** (0.0086)	-0.026** (0.010)
Humanities	-0.0013* (0.00063)	-0.0094*** (0.0011)	-0.033*** (0.0019)	-0.069*** (0.0029)	-0.086*** (0.0036)	-0.078*** (0.0040)	-0.064*** (0.0044)	-0.054*** (0.0052)
Health	0.0049*** (0.00092)	0.0044** (0.0014)	0.00091 (0.0023)	0.0066 (0.0036)	0.036*** (0.0048)	0.056*** (0.0059)	0.067*** (0.0069)	0.92*** (0.0081)
Engineering	-0.0030*** (0.00062)	-0.0078*** (0.00092)	-0.011*** (0.0015)	0.0064* (0.0022)	0.034*** (0.0028)	0.049*** (0.0032)	0.071*** (0.0037)	0.091*** (0.0045)
Math & Com. Sci	-0.0038*** (0.00062)	-0.0093*** (0.0011)	-0.020*** (0.0018)	-0.015*** (0.0028)	0.0058 (0.0037)	0.026*** (0.0044)	0.041*** (0.0051)	0.051*** (0.0060)
Science	0.000030 (0.00071)	-0.0025 (0.0014)	-0.011*** (0.0024)	-0.016*** (0.0036)	-0.019*** (0.0043)	-0.0090 (0.0048)	0.0044 (0.0053)	0.021*** (0.0062)
Services	0.0012 (0.0016)	-0.0020 (0.0026)	-0.0045 (0.0044)	-0.0054 (0.0065)	0.012 (0.0082)	0.026** (0.0095)	0.051*** (0.011)	0.063*** (0.014)
Agriculture and Resources	-0.0055*** (0.0013)	-0.016*** (0.0024)	-0.035*** (0.0044)	-0.44*** (0.0073)	-0.031* (0.0093)	-0.0077 (0.011)	-0.0033 (0.013)	-0.0018 (0.015)
Other	0.0044*** (0.00098)	0.00088 (0.0015)	-0.0077** (0.0026)	-0.026*** (0.0039)	-0.041*** (0.0049)	-0.039*** (0.0055)	-0.022*** (0.0064)	0.42

Sources: PSIS and IMDB data.

Notes: This table shows the rate of transition to PR by credential for international students enrolled in public institutions up to eight years after their initial study permit issued for all cohorts from 2010 to 2018. The table shows the average marginal effects produced through a multinomial logistic regression model that measures migration outcomes after a student's initial Ontario study permit was issued. Each column represents the five categorical outcomes that are

possible in this model. The explanatory variables included in the model are categorical and the reference group for each variable is in parentheses next to the bolded variable title. Robust standard errors are in parentheses under each coefficient. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.