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by Marc Frenette and Tomasz Handler

Release date: April 24, 2024

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Retention and recruitment of young skilled workers: Results by province and territory

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DOI: <https://doi.org/10.25318/36280001202400400003-eng>

Abstract

A young skilled labour force can make important contributions to the economic, health, cultural and civic vitality of any community. Since Canada is a vast country with diverse job opportunities available in various locations, some provinces and territories may face challenges and opportunities in retaining and attracting young skilled talent. This article is the first to inform the issue by determining the share of youth who grew up in a certain province or territory and eventually obtained a postsecondary education but left to work in another province or territory (termed “skill loss”). Likewise, the article also looks at young skilled workers who entered a province or territory to work, as a share of that province or territory’s initial population of homegrown young skilled labour (termed “skill gain”). The findings suggest that net skill gains were highest (by far) in Nunavut, followed by the Northwest Territories and Yukon. Among the provinces, two were net skill “gainers” (Alberta and British Columbia). Net skill losses were particularly large in Prince Edward Island, New Brunswick, and Newfoundland and Labrador, while smaller losses were registered in Nova Scotia, Manitoba and Saskatchewan. Quebec and Ontario registered very small net skill losses. In addition to being the only two provinces to benefit from the migration patterns of young skilled talent, Alberta and British Columbia were also less likely to provide a postsecondary education to their “leavers,” compared with the share of entrants who had already completed their postsecondary education elsewhere. British Columbia was, by far, the largest net gainer of medical degree graduates among the provinces, while British Columbia and Alberta were the largest net gainers of PhD graduates. These findings provide a starting point for discussions by provinces and territories around the issue of skill retention and recruitment among their youth populations.

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Introduction

Skilled labour is critical for the economic development of any community. Young highly skilled workers are often at the forefront of innovation, which fosters productivity and can help firms remain competitive in a global market. Skilled workers may also have positive spillover effects by transferring their knowledge to co-workers, clients and other members of the local economy. Having access to skilled talent that is young is also important for demographic reasons, especially when the local population is aging and faces a decline in working-age residents. Such demographic adjustments can yield benefits for the long-term economic sustainability of the community. Of course, the benefits of young skilled talent may reach beyond those in the economic realm. Any community needs skilled labour to meet the health care needs of its population. Communities also benefit from graduates in diverse fields for cultural, civic or other reasons.

However, communities may face challenges in retaining and attracting young skilled talent. This is because the demand for skilled labour may be increasing, based on recent evidence on the changing nature of work (Frenette, 2023). Canadian jobs have become increasingly non-routine and cognitive in nature—a long-term trend that has only accelerated during the COVID-19 pandemic. Large firms in big cities may have an advantage in recruiting top talent.

The issue is particularly important for the provinces and territories because education is within their jurisdiction. Indeed, provinces and territories invest in their homegrown residents through publicly funded childcare, elementary and secondary school, and often postsecondary education. Understanding how many young skilled people are lost or gained because of migration patterns between high school and the beginning of work can inform policy discussions on retaining and recruiting skilled labour. This is the objective of this article.¹

Specifically, the article begins by identifying the base population of high school-aged youth (based on the province or territory where they lived at age 16²) from the T1 Family File (T1FF). Among this sample, only those who eventually obtained a postsecondary qualification from 2010 to 2017 in the Postsecondary Student Information System (PSIS) and did not appear in the PSIS two years after graduation were selected. Next, the province of work two years after postsecondary graduation was identified in the Longitudinal Worker File (LWF) and the T1FF.³ Comparing the province of work with the initial province of residence enables the calculation of skill losses and gains at the provincial and territorial level.⁴

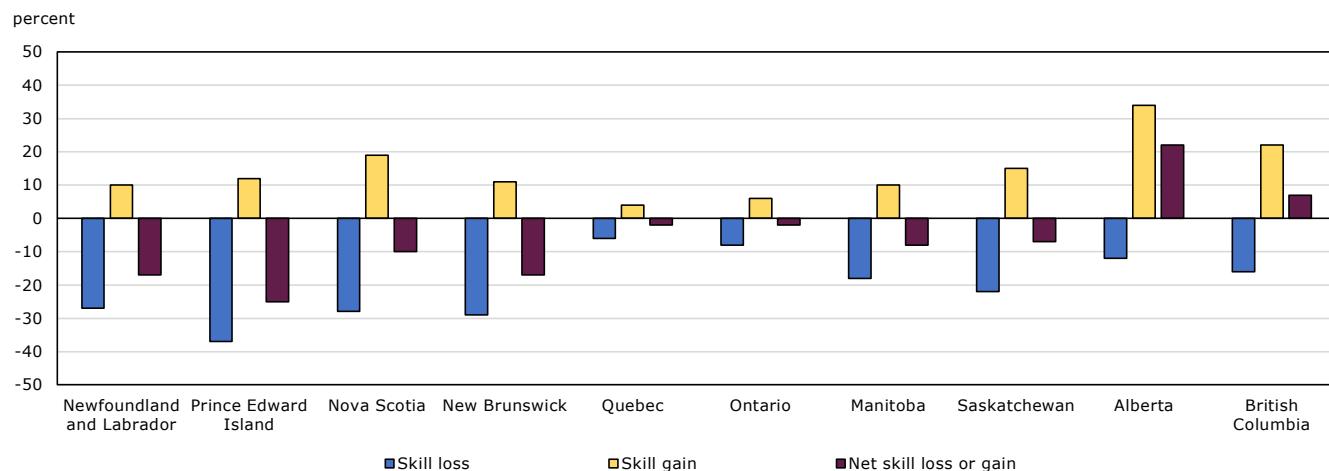
1. There is no recent Canadian evidence on this topic. A recent paper by Narh and Buzzelli (2022) looks at outflows and inflows between province of origin and province of study using the Postsecondary Student Information System (PSIS) for the 2016/2017 academic year. In a blog post, Usher (2021) uses a more recent version of the data (corresponding to the 2018/2019 academic year) to conduct similar analyses. In both cases, the authors relied entirely on the PSIS to define the province of origin; however, this is not comprehensively reported in the data for colleges, so the analyses were limited to universities. Furthermore, these analyses do not follow individuals in the post-graduation period, when they are working. In a much older paper, Burbidge and Finnie (2000) look at inflows and outflows between province of origin, province of study and province of work five years after graduation. However, the data are very old (the authors use the 1982, 1986 and 1990 graduation cohorts of the National Graduates Surveys).
2. In some cases, youth could not be located in tax data at age 16 (either because they did not file, were not listed as a dependant by their parent filer or did not receive federal child benefits). In these cases, their province or territory of residence at age 15, and then 17, was examined. Ages 16 and 15 were preferred over 17 because some Quebec students may have moved away from the parental home to attend CEGEP at age 17.
3. To identify the province of work, the individual's main job two years after graduation was determined. For individuals with no self-employment income in the T1FF, the main job was simply that with the highest T4 wages and salaries in the LWF. In these instances, the province of work was the province of the main employer, based again on the T4 information in the LWF. For individuals with self-employment income, the province of work was the province of residence in the T1FF if net self-employment income was greater than the T4 wages and salaries from the main paid job (otherwise, the province of work was again the main employer's province).
4. Another group of skilled workers is registered apprentices. However, determining an end date to their training is more complex for them because many remain registered but do not complete. In fact, Laporte and Mueller (2011) used the 2007 National Apprenticeship Survey to show that the number of completions in that year amounted to only 7% of registrations. Consequently, it might be best to study this group in a separate analysis distinct from postsecondary graduates.

It is important to note that this article focuses on the propensity of provinces and territories to retain or recruit young skilled workers who were in Canada in their teen years and educated in Canada at the postsecondary level. Remaining shortages can potentially be bridged by foreign talent through the immigration system. However, understanding the migration patterns of young skilled domestic talent could form the basis for policy discussions about the reliance on foreign talent to fill labour shortages in provinces and territories.

The three territories and two provinces (Alberta and British Columbia) were the only net gainers of young skilled workers

Chart 1 suggests that, among the provinces, Alberta stood out as the largest net beneficiary of the migration of young skilled workers. The net gains in skilled talent registered by Alberta represented 22% of its initial population of young skilled individuals. British Columbia was also a net skill gainer (7%), while all other provinces were net skill losers. The losses were particularly large in Prince Edward Island (-25%), New Brunswick (-17%), and Newfoundland and Labrador (-17%), while smaller losses were registered in Nova Scotia (-10%), Manitoba (-8%) and Saskatchewan (-7%). Quebec and Ontario registered very small net skill losses (-2%).

Chart 1
Skill loss and gain by province

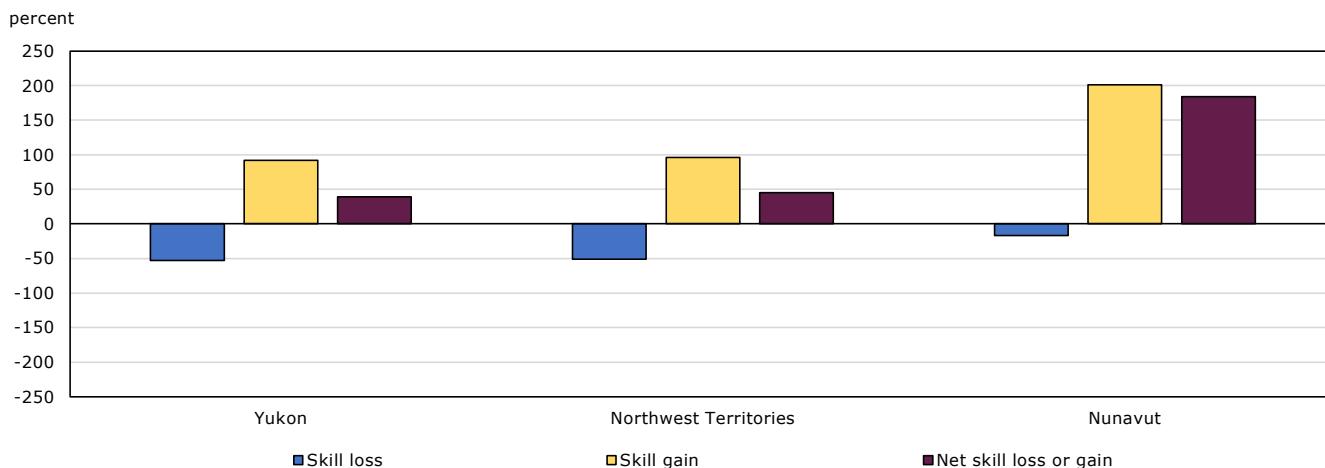


Notes: The denominator for all estimates is the population of future postsecondary graduates (skilled labour) residing in the province during high school. The numerator is either the skilled labour leavers (loss) or entrants (gain) based on their province or territory of work two years after graduation. The sample includes the 2010 to 2017 cohorts of postsecondary graduates.

Sources: Statistics Canada, Postsecondary Student Information System, T1 Family File and Longitudinal Worker File.

Although these are substantial losses and gains on the provincial front, the migration of young skilled talent affected the territories to a much greater extent. In fact, the results for the territories are so different that they warrant their own separate chart. While the three territories lost a substantial share of their young skilled talent, they also attracted an even larger share (Chart 2). The losses were larger in Yukon (-53%) and the Northwest Territories (-51%), compared with Nunavut (-17%); however, in all three cases, the gains far outweighed the losses. In the Northwest Territories and Yukon, the gains represented 96% and 92% of the original population of young skilled talent, respectively. As large as these gains were, they were less than half of what was registered in Nunavut (201%). Overall, the net gains in young skilled talent were highest in Nunavut (184%), followed by the Northwest Territories (45%) and Yukon (39%).

Chart 2
Skill loss and gain by territory



Notes: The denominator for all estimates is the population of future postsecondary graduates (skilled labour) residing in the territory during high school. The numerator is either the skilled labour leavers (loss) or entrants (gain) based on their province or territory of work two years after graduation. The sample includes the 2010 to 2017 cohorts of postsecondary graduates.

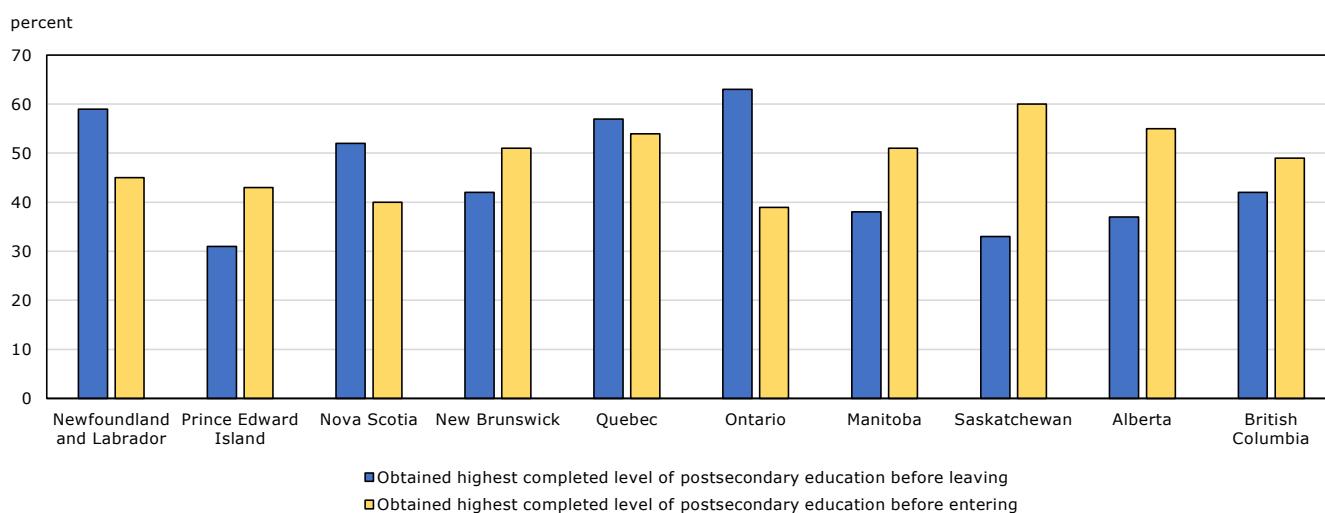
Sources: Statistics Canada, Postsecondary Student Information System, T1 Family File and Longitudinal Worker File.

Of course, not all skill losses and gains are equal from a fiscal point of view. Postsecondary education is partially funded by the provinces.⁵ As a result, and all else equal, homegrown talent who leave the province to work elsewhere will be less costly to their home province if they obtained their postsecondary education elsewhere. Conversely, young skilled talent who end up working in a different province than their home province will be costlier to their home province if they obtained their postsecondary education in that province.

Chart 3 shows the percentage of leavers and entrants who completed postsecondary education before leaving or entering the province. A higher orange bar (indicating the percentage who obtained their postsecondary education prior to entering), compared with the blue bar (indicating the percentage who obtained their postsecondary education prior to leaving), will be less costly from a provincial perspective, all else equal.

In addition to being the only net skill gainer, Alberta and British Columbia were also less likely to provide a postsecondary education to their leavers, compared with the share of entrants who had already completed their postsecondary education elsewhere. However, Saskatchewan led the provinces on this front, with 60% of entrants having already completed their postsecondary education, while 33% of leavers graduated from postsecondary education prior to leaving. By contrast, Ontario was almost the mirror image of Saskatchewan: 63% of its leavers completed postsecondary education in Ontario prior to their departure, while 39% of entrants obtained their postsecondary education outside Ontario. Newfoundland and Labrador and Nova Scotia also had a substantially higher share of leavers who completed their postsecondary education in their home province, compared with the share of entrants who obtained their qualifications outside their host province.

5. Due to low sample sizes, the remainder of the article will focus exclusively on the provinces.

Chart 3**Percentage of leavers and entrants who completed postsecondary education before leaving or entering**

Notes: The denominator for all estimates is the population of future postsecondary graduates (skilled labour) residing in the province during high school who either left (blue bars) or entered (orange bars) the province based on their province or territory of work two years after graduation. The numerator is either the skilled labour leavers or entrants who obtained their highest completed level of postsecondary education before leaving or entering based on their province or territory of work two years after graduation. The sample includes the 2010 to 2017 cohorts of postsecondary graduates.

Sources: Statistics Canada, Postsecondary Student Information System, T1 Family File and Longitudinal Worker File.

British Columbia was the largest net gainer of medical degree graduates

Medical degree graduates are fairly mobile because of the competitive nature of medical school entrance and residency placement. As a result, all provinces except Quebec and Ontario lost a significant share of their homegrown future medical school graduates (Table 1). Quebec lost few of these individuals (-7%), perhaps owing to linguistic preferences (Quebec has the largest French-speaking population in the country by far). Ontario also fared relatively well on this front, registering the second-smallest percentage loss (-16%). Skill losses were more substantial in other provinces (from -32% in British Columbia to -63% in Prince Edward Island).^{6,7}

6. Medical degree graduates must complete a medical residency program before becoming licensed to practise medicine. Thus, the ideal approach would be to look at the province of work two years after completing a medical residency program. While the PSIS does not have comprehensive information on residency completion, it does have comprehensive information on residency enrolment. To approximate medical residency completion, the approach adopted here consists of looking at the final year of medical residency enrolment and identifying the province of work two years later (ensuring that the graduates are not in the PSIS at this point). Although this could include some medical degree graduates who did not complete their residency (and did not become a practising doctor), data from the 2016 Census of Population indicate that 87.2% of medical degree graduates aged 35 to 54 years who were educated in Canada worked as medical doctors (implying that they did complete a medical residency program). The remaining 12.8% may have also completed their residency, but they did not work as practicing doctors (18.7% did not work, while the rest worked in a variety of jobs in the public and private sectors).
7. Many professional degree holders incorporate and, thus, do not have a strict obligation to file a T1 personal income tax return unless they pay themselves a salary or have another reason to file a T1 (e.g., they file a T2 corporate income tax return). However, the T1FF captures approximately 95% of the Canadian population through various means (filing spouses, dependants, federal child benefits, etc.) Indeed, the vast majority of medical doctors (95.2%), dentists (96.8%), optometrists (96.6%), veterinarians (98.0%) and lawyers (94.9%) in the 2016 Census of Population could be found in the T1FF.

Table 1**Skill loss and gain by province and highest level of completed postsecondary education**

Province	Certificate or diploma												Professional degree											
	Bachelor's degree						Master's degree						PhD						in dentistry, optometry or veterinary medicine			Professional degree in law		
	Skill loss	Skill gain	Net skill	Skill loss	Skill gain	Net skill	Skill loss	Skill gain	Net skill	Skill loss	Skill gain	Net skill	Skill loss	Skill gain	Net skill	Skill loss	Skill gain	Net skill	Skill loss	Skill gain	Net skill	Skill loss	Skill gain	Net skill
percent																								
Newfoundland and Labrador	-25	6	-19	-28	13	-15	-31	13	-18	-68	55	-13	-37	14	-23	-53	79	26	-38	23	-15			
Prince Edward Island	-25	11	-14	-42	11	-30	-53	14	-39	-73	37	-37	-63	41	-22	x	x	x	-55	17	-38			
Nova Scotia	-20	11	-9	-32	23	-9	-41	31	-10	-66	67	1	-55	48	-7	-52	25	-26	-46	29	-17			
New Brunswick	-20	8	-12	-31	13	-18	-46	14	-32	-72	33	-38	-46	19	-27	-49	20	-29	-42	12	-30			
Quebec	-5	2	-3	-6	4	-2	-9	7	-2	-17	14	-3	-7	5	-2	x	x	x	-9	3	-6			
Ontario	-6	3	-3	-8	6	-2	-13	12	-1	-23	19	-3	-16	18	2	-12	11	-1	-10	15	5			
Manitoba	-15	9	-6	-16	9	-6	-35	15	-19	-56	27	-29	-39	21	-18	-32	16	-15	-37	14	-24			
Saskatchewan	-19	15	-5	-21	14	-7	-34	19	-15	-65	40	-26	-54	36	-19	-29	45	15	-36	25	-11			
Alberta	-9	38	29	-11	28	17	-25	50	25	-44	74	30	-36	36	0	-18	37	18	-26	32	6			
British Columbia	-12	16	4	-16	22	6	-25	40	15	-45	87	41	-32	62	30	-37	44	7	-28	37	9			

x suppressed to meet the confidentiality requirements of the *Statistics Act*

Notes: The denominator for all estimates is the population of future postsecondary graduates (skilled labour) residing in the province during high school. The numerator is either the skilled labour leavers (loss) or entrants (gain) based on their province or territory of work two years after graduation. The sample includes the 2010 to 2017 cohorts of postsecondary graduates.

Sources: Statistics Canada, Postsecondary Student Information System, T1 Family File and Longitudinal Worker File.

Some provinces tended to recruit relatively more medical degree graduates. This was especially the case in British Columbia, having gained 62% of medical degree graduates. Thus, British Columbia registered a net gain of 30% of medical degree graduates, far surpassing any other province. Ontario stood in second place (a net gain of 2%), followed by Alberta (no net gain or loss). Small to moderate net skill losses were registered in Quebec (-2%) and Nova Scotia (-7%), while net skill losses were more substantial in other provinces (from -18% in Manitoba to -27% in New Brunswick).

Other professional degrees in health care included dentistry, optometry and veterinary medicine, which had to be grouped together to produce large enough sample sizes. Newfoundland and Labrador was the biggest net gainer for this group (26%), followed by Alberta (18%) and Saskatchewan (15%). New Brunswick (-29%) and Nova Scotia (-26%) registered the largest net losses.

Another professional degree that was examined is law. In this case, moderate net gains were registered by British Columbia (9%), Alberta (6%) and Ontario (5%), while the largest net losses were registered in New Brunswick (-38%) and Prince Edward Island (-30%).

British Columbia and Alberta also fared well with regard to PhD holders. In fact, they were the only two provinces to register substantial net gains among these graduates (41% in British Columbia and 30% in Alberta). Nova Scotia was next, with a 1% net gain. This was followed by small net losses in Quebec and Ontario (-3% in both cases); moderate net losses in Nova Scotia (-7%) and Newfoundland and Labrador (-13%); and more substantial net losses in Saskatchewan (-26%), Manitoba (-29%), Prince Edward Island (-37%) and New Brunswick (-38%).

Most provinces registered small to moderate net losses in certificate and diploma holders. However, Alberta was a clear outlier, having registered a net gain of 29%. This could reflect the fact that the oil-producing province has a high demand for technologists and technicians to work in the oil fields. Alberta also registered the largest net skill gains among bachelor's degree (17%) and master's degree (25%) graduates, which could reflect a high demand for other types of graduates (e.g., engineering).

However, the results in Table 2 suggest that Alberta registered net skill gains across all five groups of fields of study examined here: STEM (science, technology, engineering and mathematics) mathematics intensive, STEM other, Bbase (business, humanities, health, arts, social sciences and education) business, Bbase health, and Bbase other. British Columbia was a net gainer in all five fields, but especially in STEM other (which largely includes fields related to biology).

Table 2**Skill loss and gain by province and field of study associated with the highest level of completed**

Province	STEM mathematics			STEM other			BHASe business			BHASe health			BHASe other		
	Net skill			Net skill			Net skill			Net skill			Net skill		
	Skill loss	Skill gain	loss or gain	Skill loss	Skill gain	loss or gain	Skill loss	Skill gain	loss or gain	Skill loss	Skill gain	loss or gain	Skill loss	Skill gain	loss or gain
percent															
Newfoundland and Labrador	-34	10	-24	-34	24	-10	-22	8	-14	-24	10	-13	-27	10	-17
Prince Edward Island	-48	14	-34	-37	25	-13	-31	7	-24	-32	12	-19	-38	12	-26
Nova Scotia	-38	22	-16	-37	30	-8	-26	15	-11	-19	17	-2	-30	19	-11
New Brunswick	-37	13	-24	-41	22	-19	-25	9	-17	-24	9	-15	-28	12	-16
Quebec	-7	5	-2	-10	6	-4	-6	3	-3	-4	2	-1	-7	4	-2
Ontario	-10	8	-2	-12	6	-6	-6	7	1	-8	4	-3	-8	6	-3
Manitoba	-21	10	-11	-19	12	-6	-17	7	-11	-16	9	-7	-18	11	-7
Saskatchewan	-26	14	-12	-23	19	-4	-22	11	-11	-18	13	-5	-23	18	-5
Alberta	-12	34	22	-14	38	24	-10	27	17	-9	28	19	-14	39	25
British Columbia	-20	30	9	-17	36	19	-16	17	1	-15	18	3	-15	23	8

Notes: STEM stands for science, technology, engineering and mathematics. STEM mathematics intensive includes engineering, mathematics, computer sciences, physics and chemistry programs. BHASe stands for business, humanities, health, arts, social sciences and education. The denominator for all estimates is the population of future postsecondary graduates (skilled labour) residing in the province during high school. The numerator is either the skilled labour leavers (loss) or entrants (gain) based on their province or territory of work two years after graduation. The sample includes the 2010 to 2017 cohorts of postsecondary graduates.

Sources: Statistics Canada, Postsecondary Student Information System, T1 Family File and Longitudinal Worker File.

Conclusion

Retaining and recruiting young skilled talent are critical to any community for economic, health, cultural and civic reasons. The issue is particularly important to the provinces and territories because education is within their jurisdiction. However, a competitive labour market means that certain provinces or territories may be more likely than others to lose or gain young skilled workers.

This article found that net skill gains were highest (by far) in Nunavut, followed by the Northwest Territories and Yukon. Among the provinces, two were net skill gainers (Alberta and British Columbia). Net skill losses were particularly large in Prince Edward Island, New Brunswick, and Newfoundland and Labrador, while smaller losses were registered in Nova Scotia, Manitoba and Saskatchewan. Quebec and Ontario registered very small net skill losses. In addition to being the only two provinces to benefit from the migration patterns of young skilled talent, Alberta and British Columbia were also less likely to provide a postsecondary education to their leavers, compared with the share of entrants who had already completed their postsecondary education elsewhere. British Columbia was, by far, the largest net gainer of medical degree graduates among the provinces, while British Columbia and Alberta were the largest net gainers of PhD graduates.

Note that migration may be highly influenced by economic conditions in different parts of the country. The patterns shown here were observed in a period when Alberta and British Columbia were the only net gainers of overall interprovincial migration (Chastko 2021).⁸ The pattern for youth may change if the overall interprovincial migration pattern changes—indeed, Alberta has begun to lose population because of provincial migration in recent years, following declining oil prices during the 2010s.

It is also important to note that these data predate the COVID-19 pandemic and the recent increase in telework. It may now be easier for certain workers to remain in their home province or territory while they work (remotely) in a different part of the country. While this could accentuate skill losses in certain provinces or territories, the fact that workers can continue to live (and spend) where they grew up (rather than move away) could mitigate the losses for jurisdictions of origin (i.e., the resource may be gone, but the dollars are still spent locally). Future research with more recent data could examine this dynamic.

Future work could also focus on skill losses and gains in minority official language communities (e.g., Franco-Ontarians, Acadians, Anglo-Quebecers). Maintaining a critical mass of young skilled talent in these communities may be challenging, especially given that many speak both official languages and could compete for jobs anywhere across Canada.

8. See Table 1 in Chastko (2021), which covers the period from 2008/2009 to 2018/2019.

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