Retention, Attraction, and Labour Market Outcomes of Post-Secondary Graduates in New Brunswick

Eton Boco, MA
Philip Leonard, PhD
Ted McDonald, PhD

PROJECT TITLE
Retention, attraction, and labour market outcomes of post-secondary graduates in New Brunswick

PRINCIPAL INVESTIGATORS
Ted McDonald, Director, NB-IRDT
Philip Leonard, Research Associate, NB-IRDT

RESEARCH TEAM
Eton Boco, Data Analyst, NB-IRDT

PUBLICATION DATE

ACKNOWLEDGEMENTS

HOW TO CITE THIS PRODUCT

Table of Contents

List of Tables

Abbreviations

CCNB	Collège Communautaire de Nouveau Brunswick
MCFT / **CTFM**	Maritime College of Forest Technology / Collège de Technologie Forestière des Maritimes
MTA	Mount Allison University
NBCC	New Brunswick Community College
NBCCD	New Brunswick College of Craft and Design
STU	St. Thomas University
UdeM	Université de Moncton
UNB	University of New Brunswick

Executive Summary

This report examines the retention/attraction rates and labour market outcomes of graduates from New Brunswick's public post-secondary educational institutions. It uses Post-Secondary Information System (PSIS) data and tax data, linked through the Canadian Research Data Centre Network's Education and Labour Market Longitudinal Platform. Graduate counts, retention rates, and annual incomes are presented according to sex, province of permanent residence, immigration status, level of study, field of study, and institution for the 2009-2016 study period.

Counts

About 7,000 to 8,000 students graduate from NB public post-secondary institutions each year – a number that has slowly been decreasing.

- o Around 3,000 students graduate from college programs.
- o Between 3,000 to 4,000 students graduate from undergraduate university programs.
- o About 600 to 700 students graduate from graduate-level university programs.

Retention Rates

On average, 78% of graduates remain in NB by the December of their graduation year, and 72% remain two years later.

- o College graduates have the highest retention rates (92% in the year of graduation and 87% two years later). Retention is slightly lower for graduate students (70% and 64%) and undergraduate students (69% and 61%).
- o Students residing in NB prior to admission have the highest retention (92% in graduation year; 84% two years later). The similarity in retention rates for college graduates and students living in NB prior to admission could be due to the attraction that community colleges have for students from surrounding communities.
- o Domestic students have higher retention (77% in graduation year and 73% two years later) than international students (60% file taxes in NB at the end of their graduation year, and 38% do so two years after).

Graduate Income

On average, graduates have a mean taxable income of around $36,000 in their first full year and $40,000 in their second full year after graduation (nominal dollars).

- o Differences in taxable graduate incomes are primarily driven by differences in level and field of study, with undergraduate degree holders having more taxable income than college graduates, and graduate degree holders having the most.

Following the presentation and discussion of results, this report compares its findings to those of a similar NB-IRDT report[1] that utilized different data and demonstrates the impact of varying data sources and methodologies on study outcomes.

---

[1] Bhuiyan, E.M., Daigle, B., McDonald, T., & Miah, P (2021). College & university graduate retention in New Brunswick: 2010 - 2018. Fredericton, NB: New Brunswick Institute for Research, Data and Training.

Introduction

This report presents statistics describing labour market outcomes and proportions of graduates from New Brunswick's public post-secondary institutions[2] who reside in New Brunswick (NB) after graduation for the period 2009-2016. Retaining post-secondary graduates in the province plays a vital role in remedying the demographic challenges in the province and the fiscal challenges that arise as a result. Student labour market and retention research helps inform targeted policies that aim to encourage graduates to remain in NB while examining whether students' decisions to stay or leave are tied to economic outcomes.

Our results are based on data from the Education and Labour Market Longitudinal Platform (ELMLP), which consists of three administrative datasets:

- The Post-Secondary Information System (PSIS)
- The Registered Apprentice Information System (RAIS)
- The T1 Family File (tax records)

When linked, these three datasets provide detailed information on enrollment, graduation, labour market participation (post-graduation), tax filing, and taxable income of graduates of public post-secondary institutions and apprenticeship programs in Canada. More information is provided in the "Methodology" section below.

As part of a research agreement between the Government of New Brunswick's Department of Post-Secondary Education, Training and Labour (PETL) and the New Brunswick Institute for Research, Data and Training (NB-IRDT), this report makes use of information provided in the PSIS and T1 Family File to identify income and retention rates for post-secondary education (PSE) graduates in NB. It also includes a supplementary comparison of retention rates calculated from tax data and results from Medicare data.[3]

Literature Review

In the past, Statistics Canada has used the ELMLP datasets, individually and linked, to study the distribution, educational pathways, and labour market outcomes of post-secondary students in Canada. Their studies centre around enrollment, persistence, regional retention rates (e.g., retention in the Maritime provinces), and income for graduates, and are usually stratified by different demographic/background identifiers.

A 2017 study on labour outcomes and retention rates for graduates from universities in the Maritime provinces revealed that between 2006 and 2011, at least 95% of graduates had a paid full-time or part-time job within a year of graduating (Galarneau, Hinchley, and Ntwari, 2017). This was true for both graduate and undergraduate levels of education.

---

[2] These institutions include the University of New Brunswick (UNB), Université de Moncton (UdeM), St. Thomas University (STU), Mount Allison University (MTA), New Brunswick Community College (NBCC), Collège Communautaire de Nouveau Brunswick (CCNB), Maritime College of Forest Technology (MCFT)/ Collège de Technologie Forestière des Maritimes (CTFM), and New Brunswick College of Craft and Design (NBCCD).

[3] The results with which this study's findings are compared in Appendix D are taken from Bhuiyan, E.M., Daigle, B., McDonald, T., & Miah, P (2021). College & university graduate retention in New Brunswick: 2010 - 2018. Fredericton, NB: New Brunswick Institute for Research, Data and Training.

Between 2009 and 2011, the median annual earnings[4] for bachelor's degree holders remained relatively constant at around $32,000, and $52,000 for master's or doctorate holders (2012 constant dollars).

Of the sample, one-third of students who graduated from a university in the Maritimes reported a different region of residence (i.e., Western provinces/territories, Ontario, or Quebec) on their tax return a year after graduating. While this indicates an outflow of labour from the region, it is also important to note that some of the 'leavers' originated from outside the Maritimes, and they may have been returning to their respective home provinces.

Classified by gender, retention rates were higher among female undergraduates (70%) compared to males (64%). Numbers were even higher for those who reported a Maritime province as their residence at admission (83% for women and 77% for men). For those from other Canadian regions, that number dropped to 15% for both men and women. Among international students that remained in Canada, over 56% of men and 51% of women remained in the region. Similar patterns were reported for graduate students as well.

'Leavers' in general were reported to have earned more within the first year of graduation than those that remained in the region. For male bachelor's degree holders, the median earning disparities (in 2012 constant dollars) from 2006 to 2011 for 'stayers' versus 'leavers' averaged close to $7,000. For women, the difference was about $4,000. This is despite the income decline both leavers and stayers experienced between 2008 and 2011.

Our report follows a similar direction as Galarneau et al. (2017) but focuses specifically on graduates from PSE institutions in NB, rather than across the Maritimes. Labour market outcomes and retention rates[5] are a topic of interest for NB, as efforts continue to be directed at creating incentives for graduates to remain in the province after graduation, and a focused analysis of graduate retention and labour market outcomes in NB can help inform the development and maintenance of such policies and incentives.

Data and Methodology

Data

The ELMLP, accessed via the Research Data Centre (RDC) at the University of New Brunswick, was used for analysis in this report. As mentioned above, the ELMLP contains three administrative datasets: the Post-Secondary Information System (PSIS), the Registered Apprentice Information Systems (RAIS), and the T1 Family File (tax records). This report makes use of PSIS data linked with the T1 Family File tax records to examine the labour outcomes and retention rates of graduates from post-secondary institutions in NB.

The PSIS dataset provides information annually on enrollments in and graduations from Canadian post-secondary institutions. This information can be stratified by demographic and background variables provided within the dataset.

---

[4] This includes graduates with zero taxable income. Negative income reporters were excluded.

[5] Retention rates (especially for students not from NB, whether international or from a different province), can also be referred to as the attraction rate of the province.

The T1 Family File provides income information for Census families, working-age individuals, and seniors, derived from income tax returns. It covers all those who completed a T1 tax return in the reference year or received federal child benefits, as well as their non-filing spouses, their non-filing children, and filing children who reported the same address as their parent.

This study reports on the cohort of NB graduates who graduated from public post-secondary institutions between 2009 and 2016[6],[7]. It excludes overseas students without visas who take classes (e.g., via internet) and graduates who received degrees from NB institutions but never actually resided in NB (for example, students from the UNB – Humber College nursing program). Graduates of all degree types are included in the sample, including graduates from short programs, those with credentials and attestations, and graduates who received high school and general equivalency diplomas from post-secondary institutions.

It should be noted that some graduates in this sample have multiple credentials. To eliminate the risk of determining an individual's identity from confidential data, information outside of income for terminal graduates[8] could not be published in this report.

Methodology

The purpose of this project is to calculate the retention rates and labour market outcomes (specifically income outcomes) of graduates from public PSE institutions in NB. Unlike the referenced 2017 report by Galarneau et al., this report includes retention rates for college graduates along with university graduates.

We use two retention measures:

- The percentage of graduates still in NB as of Dec. 31 of the graduation year
- The percentage of graduates still in NB as of Dec. 31 two years later

Students can graduate throughout the year, but tax data on residency are based on December 31 of the tax year. For example, for a student who graduated in June 2014, we would measure where they reported living in their tax returns on December 31, 2014 and on December 31, 2016. Therefore, retention is based on the proportion of graduates from NB institutions still residing in NB in a given tax year.

Retention is calculated as the number of graduates from NB post-secondary institutions who declared NB as their province of residence on December 31st of a given tax year divided by the total number of tax filers who are part of the graduation year cohort.

Naturally, this means the dataset has two limitations: Students who do not file taxes in a given year are left out of retention calculations, as they are not in the T1FF dataset; and students who

---

[6] While graduate data was available prior to 2009, some of it was imputed and is therefore unreliable for use in analysis.

[7] While college data was available for all years in this study, institution-level data for NB colleges could only be released for the 2015 and 2016 graduate cohorts due to institutional regulations. It should also be noted that some colleges did not have complete graduate information for 2009 and 2010. This results in large differences between those years and subsequent years for larger categories in which college students are counted (e.g., gender, immigration status). For this reason, written analysis for those categories excludes these years, though they are included in the tables in the Appendices.

[8] Terminal graduates are those who did not return to school for another degree over the study period.

remain in NB but declare another province of residence on their tax return are not counted in the numerator of retention calculations.

It is perhaps better to use the term "attraction," rather than "retention" in reference to international students who remain in the province. This is an important distinction to make because, of the total population of international students who come to NB to study, some will remain in NB for some time after graduation (numerator/group of interest), some will remain in Canada but leave the province (denominator), and some will leave Canada altogether. Therefore, because these students are not from NB or Canada, referring to their decision to stay in NB or Canada as "retention" is not entirely accurate.

We use the Canadian Revenue Agency's (CRA) definition of taxable income (i.e., total income less deductions)[9] for graduates in the first two full years after graduation. For instance, regarding graduates from June 2014, we observe taxable income in 2015 and taxable income in 2016 (i.e., year 1 and year 2 income). We report on average taxable income for each cohort. For average income, we report on only those graduates who did not continue on with more education, although we do not know for certain when they entered the labour market. Income is available for all NB graduates and is not restricted to those who have NB as their province of taxation.

Analysis is based on graduates who completed an income tax return (only about 5-10% of graduates do not file a return in a given year). NB graduates are identified by a variable defining graduation using graduation dates and program end status and a variable showing the graduate's province of study.

Income is based on the graduate tax filer's total taxable income as stated on their tax return. General tax filer counts are based on the number of NB graduates who filed taxes in the tax year, given their graduation dates. Provincial tax filer counts are based on the same characteristics as general tax filer counts except that the graduate's taxation province is considered. Retention rates are obtained by dividing provincial counts by the general counts.

New Brunswick Graduates by the Numbers

This analysis is based on a population of about 62,000 individuals who graduated from an NB post-secondary institution between 2009 and 2016.[10] The entire sample comes to a total of about 7,000 to 8,000 graduates per year (Table 3) – a number that has been decreasing over time. Of these, around 4,000 are female, about 3,000 are college graduates, and roughly 7,000 are domestic graduates.[11]

Declining trends over time are reflected in the number of domestic graduates and college graduates. The rising number of international students has not been enough to offset the decline

---

[9] This includes graduates with zero income. Taxable income includes self-employment income and is, on average, higher than employment income from T4 slips but lower than gross income. This measure of Total Income as defined by the CRA represents "taxable income" and not gross Income. Employment income (T4E) excludes self-employment income. See the user guide here: https://crdcn.org/datasets/elmlp-education-and-labour-market-longitudinal-linkage-platform.

[10] 2009 and 2010 counts do not include college-level graduates in the dataset.

[11] "Domestic" refers to Canadian citizens or permanent residents.

in the number of domestic graduates. The number of graduates from undergraduate and graduate-level university programs remained steady over the study period.

70-80% of graduates from NB post-secondary institutions resided in NB prior to enrolment (Table 3). Of the roughly 1,500 to 1,800 of graduates each year that did not reside in NB prior to admission, just under half are from Nova Scotia (NS) or Ontario (ON).

Only 5-10% of all NB graduates do not file a Canadian tax return in a given year (Tables 8 and 9). About 4-8% of female NB graduates do not file taxes in a given year, compared to 7-13% of male graduates.[12] This is consistent with a study by Robson and Schwartz (2020) which revealed men were less likely than women to file a tax return.

Over 90% of college graduates and undergraduates submit a tax return in a given year, compared to just over 80% of graduate-level students.

While the percentage of domestic tax filers is usually higher than the percentage of international tax filers, the difference for domestic and international students is more pronounced two years after graduation. Over 40% of international NB graduates do not file a tax return two years after graduation, compared to 3-6% of domestic graduates. It should be noted that one of the reasons some international students do not file is because they are no longer in the country.

Tables 3-7 show the number of graduates as measured in the PSIS data from 2009 to 2016. UNB produces the highest number of university graduates in the province while Mount Allison University (MTA) produces the lowest number of university graduates. More than 30% of university graduates in the province are from UNB, which represents about 2,300 students each year. Between 300 and 500 students graduate from MTA each year; about 1,000 students graduate from the Université de Moncton (UdeM); and between 400 and 600 students graduate from Saint Thomas University (STU).

Just over 3,000 students graduate from NB colleges each year. Looking only at the years for which college-level data can be stratified by institution (2015 and 2016), we see that the majority of graduates in the province are from the New Brunswick Community College[13] (NBCC). This institution produces close to 2,000 graduates per cohort. Close behind is Collège Communautaire du Nouveau-Brunswick (CCNB), which produces slightly over 1,000 graduates per cohort. Just under 200 students graduate from the New Brunswick College of Craft and Design (NBCCD) and the Maritime College of Forest Technology (MCFT)/Collège de Technologie Forestière des Maritimes (CTFM) combined.

The majority of credentials awarded in NB are in the fields of

  1) Business Management and Public Administration or
  2) Architecture, Engineering and Related Technologies (Table 5).

Over 1,500 students graduate with degrees in each of these two fields within a calendar year.

---

[12] This includes international graduates who are no longer in Canada to file taxes.

[13] The New Brunswick College of Craft and Design and the Maritime College of Forest Technology/Collège de Technologie Forestière des Maritimes are combined here due to small sample sizes.

Closely following are the fields of

> 1) Law and Social Sciences and
> 2) Health and Related Fields,

which graduate over 1,000 students each calendar year. The fewest credentials are awarded in the field of Agriculture, Natural Resources and Conservation, which produces around 150 graduates in a calendar year. The field with the next lowest number of graduates each year is Math, Computer and Information Sciences, which has slightly over 200 graduates in a calendar year.

Graduate Retention in New Brunswick

Graduate retention rates in NB have remained steady over time. Close to 80% of NB graduates file taxes in the province in their year of graduation (Table 8). This rate falls to about 70% two years after. In general, for all categories in this report, two-year retention rates are lower than graduation-year retention rates.[14]

Provincially, the number of domestic student tax filers is more than ten times greater than the number of international student tax filers each year (Table 13). This is despite the overall decline in the former and the overall increase in the latter over the study period. Unsurprisingly, domestic students are still far more likely to choose to stay in NB than international students.

Retention in NB is highest among students residing in NB prior to admission, with a 92% retention rate in the year of graduation (Table 9). The rate drops to 84% two years after graduation.

Students residing in NS prior to admission have an average retention of 18% (Table 10), whereas Ontarians average a 10% retention rate (Table 11). Two years after graduation, retention for the NS cohort remains the same while retention for the ON cohort drops to 7%. However, it should be noted that retention in the graduation year for graduates who reside in NS and ON has increased by over 3 percentage points (p.p.) since 2013. Improvements are also seen in their two-year retention rates, albeit between just the 2013 and 2014 cohort of graduates. As more recent data become available, we will be able to ascertain whether this is a continuing trend.

Retention rates have generally remained steady over time for both sexes. Retention, both in the year of graduation and two years after, varies among men and women (Table 12). In some years, men have a higher retention rate, and in other years women have a higher retention rate. On average, however, men have a slightly higher retention rate in the year of graduation, while women have a slightly higher average retention rate two years after.

By level of study, college graduates have the highest retention rates in the province in both the year of graduation and two years after, averaging 92% and 87%, respectively (Table 14). Undergraduate students have the lowest retention rates on average (69% in the graduation year; 61% two years after). While retention for college and undergraduate-level graduates has remained steady over the study period, graduate-level retention rates have declined. This is similar to the findings of the Maritime Province Higher Education Commission's (MPHEC) survey, showing two-year retention rates between 55% and 60% for university students.

---

[14] This is with the exception of students residing in NS prior to admission, who have the same retention rates in the year of graduation and two years after.

Community colleges often have a local reputation, attracting students primarily from their surrounding local communities. This is likely the reason behind the similarity of retention rates for post-secondary students residing in NB prior to admission and college students in the province (for both groups, retention is around 90% in the year of graduation and around 85% two years after). Therefore, for college graduates, it is likely that retention has less to do with their post-secondary institution and more to do with their province of residence prior to admission.

Among universities within the province, retention is highest among UdeM graduates (77%-84%) and lowest among MTA graduates (28%-45%) – both in the year of graduation and two years later (Table 15).

Because UdeM is a French-language institution, its graduates are French-speaking students, and previous research on language and mobility in NB has indicated higher retention rates among French-speaking graduates (Emery et al., 2019).

Low retention rates among MTA graduates are likely due to the large proportion of graduating students who reside in NS at the time of admission. It is therefore probable that some of these students are simply returning to their province of permanent residence after graduation. Regarding provincial tax filer counts, (i.e. the number of graduates who have NB as their province of taxation), UdeM and UNB usually have the highest numbers – both in the year of graduation and two years after. MTA has the lowest counts in the year of graduation and two years after.[15]

For the years institution-level data could be released for college graduates (2015 and 2016), CCNB graduates have the highest graduation-year retention rates (between 93% and 95%). NBCC graduates follow closely behind with a 93% retention rate for the cohort years available. MCFT/CTFM and NBCCD graduates have the lowest college-level retention, with a combined retention of 76% and 70%, respectively, for the first and second years following graduation.

The fields of Architecture, Engineering and Related Technologies and Business Management and Public Administration typically have the highest number of provincial tax filers in the year of graduation and two years after (Table 16).

The highest retention rates both in the year of graduation and two years after vary between the fields of Architecture, Engineering and Related Technologies; Business Management and Public Administration; and Math, Computer and Information Sciences. These rates are between 78% and 87% for each cohort of graduates.

The lowest retention rates both in the year of graduation and two years after are among Physical, Life Sciences and Technologies graduates. These graduates average a 66% retention rate in the year of graduation and a 58% retention rate two years after.

Despite having a relatively high retention rate, the field of Math, Computer and Information Sciences has the lowest number of provincial tax filers in the year of graduation, signaling low enrollment numbers in the field. This is the same two years after graduation – except in 2014, when the field of Physical, Life Sciences and Technologies has the same number of provincial tax filers (Table 16).

---

[15] The sample of graduates in this report includes both students who have NB as their permanent province of residence and those who do not. Higher retention rates are expected among graduates who are already living in NB at the time of their admission, given the ties they likely have to the province.

Attraction of International Students

The term "attraction" is better used than "retention" to describe international students who remain in the province. It is extremely relevant for policy makers to know the post-graduation mobility decisions of the total population of international students who come to NB to study. Since international students have Canadian education credentials and substantial exposure to English or French, they are seen as excellent candidates for retention in their province of study. Specifically, some will remain in NB after graduation for a certain number of years (numerator / group of interest); some will remain in Canada but leave the province (denominator); and some will leave Canada altogether. Therefore, while international students are included in the denominator of the retention calculations, the term "attraction" is best used for international students, as they are attracted to the province more-so than retained.

The international student attraction rate for NB is 60% in the year of graduation and 38% two years after – each lower than the corresponding retention rate for domestic students. This is despite increases in international graduate retention in recent years.

Graduate Income in New Brunswick

Overall, NB graduates have a taxable income of around $36,000[16] in their full first year after graduation. In their second full year, that number increases to $40,000[17] ([Table 17]).

In 2016 constant dollars, this taxable income ranges between $36,000 and $41,000 in the first full year and $40,000 to $43,000 in the second full year. This two-year income is comparable to the median earnings of 2012 NB graduates as reported by the MPHEC, which also fell between $40,000 and $43,000[18] two years after graduation (MPHEC, 2016).[19]

Results from our report show differences in income levels across many categories of graduates (e.g., immigration status, institution attended, gender, etc.). These differences are likely primarily driven by differences in level and field of study; because these characteristics are not controlled for in this report, causal inferences should not be drawn.

Students residing in NB prior to admission have a taxable income slightly lower than the overall average for both time periods following graduation. In their first full year since graduation, they have a taxable income of about $35,000 in the first full year and about $39,000 two years after ([Table 18], nominal dollars). Students residing in NS prior to admission have slightly less, at about $33,000 in the first full year since graduation and $37,000 two years after ([Table 18], nominal dollars). Students from Ontario have the highest average taxable income, with about $45,000 in the first full year since graduating and $51,000 a year after that ([Table 18], nominal dollars).

---

[16] Nominal dollars

[17] Nominal dollars

[18] 2016 constant dollars

[19] MPHEC income estimates are based on the self-reported data of respondents completing graduate outcomes surveys, compared to the administrative data on income from tax records. Their analysis is limited to graduates from Maritime bachelor's programs only.

The above results for graduates residing in Ontario prior to admission indicates that those who return to Ontario earn more than their counterparts who stay in NB.

Earnings differences may reflect differences in employment opportunities across provinces but may also be due to differences in the cost of living (especially housing costs), as well as differences in the composition (field, level of qualification, personal characteristics) of stayers and movers.

Male NB graduates have a taxable income ranging between $35,000 and $46,000 in their first full year after graduation (Table 19, nominal dollars). Two full years after, this range increases to between $41,000 and $47,000. Female taxable incomes are lower, between $33,000 and $35,000 in their first full year and $36,000 to $38,000 in their second full year (Table 19, nominal dollars).

In addition, the gap between male and female taxable incomes widens two years after graduation for NB graduates. Male NB graduates experience an average taxable income growth of 8% between their income a full year after graduation and their income two full years after. Female NB graduates, on the other hand, experience 10% average taxable income growth within the same time. There is a near neutral relationship between taxable incomes and retention rates by sex.

Domestic graduates have a taxable income of about $36,000 in their first full year post-graduation and $41,000 in their second full year (Table 20, nominal dollars). International graduates have slightly less, at about $30,000 in their first full year and $34,000 in the second full year (Table 20, nominal dollars). Average taxable income growth is higher among international students; however, domestic graduates average an 8% taxable income growth, whereas international students average 10%.

This income gap between domestic and international graduates is not unique to NB. A 2020 study by the Labour Market Information Council (LMIC) reveals that international graduates in Canada earn less than their Canadian counterparts, and although earning differences narrow, they don't necessarily catch up over time (LMIC, 2020).

Students with a graduate degree from an NB institution have a higher taxable income than their undergraduate and college-level counterparts (Table 1, nominal dollars), while college-level students have the lowest. While average taxable incomes have generally remained stable over time in real terms for college and undergraduate-level students, the two-year post-graduation income for graduate-level students has steadily risen by cohort.

Low taxable incomes but high retention rates among college students signals either a labour market that favors undergraduate and graduate credentials or a higher taxable income potential for undergraduates and graduate-level students who leave – or both.

Table 1: Income One and Two Full Years After Graduation by Level of Education

	2009	2010	2011	2012	2013	2014	2015	2016
College								
One Year	$30,200	-	$30,300	$30,200	$30,600	$30,600	$30,500	-
Two Years	$35,400	-	$33,900	$34,400	$33,700	$33,500	-	-
Undergraduate								
One Year	$34,800	-	$44,200	$37,000	$37,100	$36,200	$35,700	-
Two Years	$39,500	-	$40,100	$41,800	$41,700	$39,800	-	-
Graduate								
One Year	$50,900	-	$55,500	$61,200	$62,500	$61,000	$58,900	-
Two Years	$56,400	-	$61,200	$66,000	$67,500	$68,600	-	-
Other								
One Year	$32,700	-	$45,200	$43,000	$39,100	$42,400	$43,100	-
Two Years	$40,200	-	$59,700	$53,900	$47,400	$48,900	-	-

Note: Income is not adjusted for inflation. Due to concerns about confidential data being estimated from results, retention rates and income by level of study are omitted for the 2010 cohort. 'Other' refers to graduates of undergraduate qualifying programs, post-baccalaureate non-graduate programs, and non-programs (i.e., students not registered in a program). 2009 numbers do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 100.

UNB graduates typically have the highest taxable income (Table 2, nominal dollars). Earning slightly less are UdeM graduates, while STU and MTA graduates earn even less than UNB and UdeM graduates. MTA graduates have the lowest taxable income (between $19,000 and $22,000 in the first full year and $24,000 to $27,000 in the second full year) (Table 32, nominal dollars).

This likely reflects the different compositions of graduates across universities, both in terms of field of study (discussed below) and level of degree. For example, MTA and STU are both primarily undergraduate liberal arts universities. As college institution-level data could only be released for the 2015 and 2016 cohort of graduates, taxable income is only available for the 2015 cohort, one year after graduation.

Along with having one of the highest retention rates, NBCC graduates had the highest taxable income among the colleges in 2015 in their first full year after graduation. CCNB and MCFT/CTFM graduates earned slightly lower on average in their first full year (Table 2, nominal dollars). Graduates from NBCCD had the least amount in average taxable income in 2015 among all graduates (university and college) (Table 2, nominal dollars).

Table 2: Income One and Two Full Years After Graduation by Institution

	2009	2010	2011	2012	2013	2014	2015	2016
University of New Brunswick								
One Year	$39,900	$42,300	$42,700	$45,500	$47,300	$46,900	$43,100	-
Two Years	$44,900	$47,500	$47,900	$51,200	$52,400	$50,900	-	-
Mount Allison								
One Year	$19,500	$20,500	$20,100	$22,500	$21,500	$22,400	$26,000	-
Two Years	$25,000	$25,000	$24,500	$27,200	$26,300	$26,400	-	-
Université de Moncton								
One Year	$40,300	$41,770	$71,000	$44,000	$42,200	$38,400	$39,800	-
Two Years	$44,700	$44,500	$45,500	$47,600	$46,500	$43,400	-	-
St. Thomas University								
One Year	$25,000	$30,100	$27,900	$30,300	$26,600	$29,500	$30,900	-
Two Years	$29,800	$34,100	$33,000	$34,200	$31,200	$33,600	-	-
New Brunswick Community College								
One Year	-	-	-	-	-	-	$31,200	-
Two Years	-	-	-	-	-	-	-	-
Collège Communautaire du Nouveau-Brunswick								
One Year	-	-	-	-	-	-	$30,300	-
Two Years	-	-	-	-	-	-	-	-
Maritime College of Forestry and Technology/ Collège de Technologie Forestière des Maritimes								
One Year	-	-	-	-	-	-	$30,900	-
Two Years	-	-	-	-	-	-	-	-
New Brunswick College of Craft and Design								
One Year	-	-	-	-	-	-	$13,600	-
Two Years	-	-	-	-	-	-	-	-

Note: Income is not adjusted for inflation. 2009 and 2010 numbers do not include college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 1000.

Overall, taxable incomes have remained relatively stable for NB graduates. It bears repeating that these income differences are primarily caused by the differences in programs and fields of study across the universities and should not be used to infer superior performance by one institution over another.

Education graduates have the highest average taxable income of all fields of study, totaling up to $53,200 in the first full year and $56,400 in the second full year (Table 34, nominal dollars). Arts, Humanities and Communications graduates, on the other hand, have the lowest taxable incomes at around $21,000 in the first full year and $25,000 in the second full year (Table 34, nominal dollars).[20]

The relatively high income levels of education graduates may reflect the strength of unions and existence of collective agreements for teachers in the public education system. It should also be noted that an education degree is a post-graduate degree that requires an undergraduate degree for entry into the program.

The retention rates between the highest and lowest taxable income fields are about the same, with Arts, Humanities and Communications graduates having a slightly lower retention rate two years after graduation.

Taxable incomes have remained steady in most fields over time. Though taxable incomes are highest among education graduates throughout the study period, these graduates experience the smallest taxable income growth (average of 7%) between the first full year and second full year. Arts, Communication and Humanities graduates, on the other hand, experience the highest average taxable income growth at 18% between the first full year of graduation and two years after. Differential field-specific unemployment rates and delays in moving into "career" jobs are two potential explanations for this pattern.

Conclusion

Overall, NB public post-secondary institutions graduate about 7,000 to 8,000 individuals a year, but this number has slowly decreased over time. Of these graduates, the majority are female rather than male students, domestic rather than international students, and undergraduate rather than graduate or college-level students,[21] and most resided in NB prior to admission.

The majority of university graduates in the province graduate from UNB. For the years college institution-level data could be released, the majority of college graduates were from NBCC. Most graduates also hold degrees in the fields of Architecture, Engineering and Related Technologies or Business Management and Public Administration.

Graduate Retention

While overall retention in the province ranges from 70-80% in the year of graduation and two years after, there is considerable variation across categories.

- o Although international graduates are generally less likely to remain in the province after graduation, differences in attraction/retention rates between domestic and international

---

[20] The earnings reported here are close to the Canadian average reported in Statistics Canada's report using results from the 2016 Survey on Teacher's Salaries and Working Time (https://www150.statcan.gc.ca/n1/pub/81-604-x/2017001/t/tbld2.1-eng.htm).

[21] This references the overall count for each cohort by level of education, regardless of institution attended.

students are much more pronounced two years after graduation, sometimes by as much as 40 p.p.[22]

o College graduates have the highest retention in the province in the year of graduation and two years after, averaging 92% in the former and 87% in the latter (Table 14). Graduate student retention is lower, at 70% and 64% for the first and second years after graduation, while undergraduate retention is lowest, at 69% and 61%.

o Community colleges often have a local reputation, attracting students mainly from their surrounding local communities. This is likely the reason behind the similar retention rates for students residing in NB prior to admission and college students in the province. Thus, for college graduates, it is likely that retention has less to do with their post-secondary institution and more to do with their province of residence prior to admission.

o Retention is lowest among MTA graduates in the year of graduation and two years after (average rates of 40% and 31%, respectively) and highest among UdeM graduates (average of 84% and 79%).

o In the year of graduation, retention is usually highest among graduates from one of these three fields:

  o Architecture, Engineering and Related Technologies (average of 84%)
  o Business Management and Public Administration (average of 83%)
  o Math, Computer and Information Sciences (average of 81%).

This is the case two years after as well.

Graduate Income

For NB graduates, average post-graduation taxable income falls between $35,000 and $41,000, depending on the amount of time that has passed since graduation. As mentioned earlier, the two-year taxable income reported for all graduates is within the range of median incomes reported by the MPHEC at the same time (i.e., two years after graduation), suggesting the robustness of our results. There is some variation between categories:

o Men generally have a higher taxable income than women in the first full year and two years after graduation. Women, however, average higher taxable income growth at 10%, compared to 8% for men.

o Taxable income differences between domestic students and international students increase two years after graduation for some cohorts, with domestic students having an even higher taxable income than their international counterparts. The higher average growth in taxable income among international students – if continued – could eventually close the earnings gap between domestic and international students.

o Taxable incomes vary by level of study, with graduate students totaling more than undergraduate and college students on average.

o On average, UNB graduates have the highest taxable income, followed closely by UdeM graduates. MTA graduates have the lowest, both in their first full year since graduation and two years after.

---

[22] See the two-year retention rates of the 2012 cohort of terminal graduates in Table 13.

- o   Education graduates have the highest taxable income of all the fields of study, totaling up to $52,100 in the first full year and $56,400 in the second full year after graduation. Arts, Humanities and Communications graduates, on the other hand, have the lowest taxable incomes at around $21,000 in the first full year and $26,000 in the second full year.

- o   Taxable incomes generally increase between the first and second full year since graduation in all categories, over time. Differences in taxable incomes are primarily driven by differences in level and field of study, which are not controlled for in this report. We report on raw differences, and causal inferences should not be drawn from our results. Future work should involve a regression analysis controlling for demographic and background differences among NB graduates.

Future Research and Policy Implications

Further study should include a regression analysis, which would help us understand the impact of student characteristics on the likelihood of staying or leaving the province. A regression controlling for demographic and background characteristics could account for confounding factors and indicate the role that various factors each play in the mobility decisions.

Similarly, regression analysis of income levels and trajectories would generate insights into the roles that immigration status, field of study, location of study, level of study, and other factors play in accounting for earnings differences highlighted in this report. More generally, additional years of data post-graduation would allow for a richer longitudinal analysis of earnings trajectories of graduates in the longer term.

One of the most noteworthy results shown in this report is the difference in the counts and retention rates among domestic students (NB and other provinces) and international students. While NB is able to attract a notable percentage of international students to its post-secondary institutions, substantially fewer of these students remain in NB in the two years after graduation. While counts of international provincial tax filers have risen, this is not enough to offset the decline in the number of domestic provincial tax filers (Table 20).

Incentive programs should aim at convincing these students to remain in Canada and choose NB for their province of residence. The following factors could contribute to the attraction and eventual retention of international students:

- •   Retaining the relatively low tuition fees for NB institutions to attract students to the province.

- •   Providing increased and diversified job opportunities and easier immigration pathways for when they graduate.

Future research should compare retention rates to measures of sector labour force demand. This would reveal if the low retention among graduates is a demand issue.

References

Bhuiyan, E.M., Daigle, B., McDonald, T., & Miah, P (2021). College & university graduate retention in New Brunswick: 2010 - 2018. Fredericton, NB: New Brunswick Institute for Research, Data and Training.

Emery, J. C. H., Wang, L., & Daigle, B. (2019). The impact of official bilingualism on the geographic mobility of New Brunswickers: Evidence from 2001 to 2016. Fredericton, NB: New Brunswick Institute for Research, Data and Training.

Galarneau, D., Hinchley, C., & Ntwari, A. (2017, April). Labour market outcomes of graduates from universities in the Maritime provinces. *Insights on Canadian Society.* Statistics Canada Catalogue no. 75-006-X.

Labour Market Information Council. (2020, August 20). Post-secondary graduate earnings - LMIC-CIMT. Retrieved September 30, 2020, from https://lmic-cimt.ca/projects/studentoutcomes/

Maritime Province of Higher Education Commission (2016). Presentations and publications. Retrieved November 04, 2020, from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjh mqXJ0qPwAhXuMlkFHWAgCFEQFjACegQIAxAD&url=http%3A%2F%2Fwww.mphec.ca%2Fm edia%2F181587%2FClass-of-2012-in-2018_Employment-Profile_Report.pdf&usg=AOvVaw2BmUFVfoHG2m_--lryOXi0

Maritime Province Higher Education Commission. (2017, April 24). Fifteen-year trend shows steady retention rate of Maritime university graduates. Retrieved September 22, 2020, from http://www.mphec.ca/media/163344/Migration-Trend_Media-Release.pdf

Robson, J., & Schwartz, S. (2020). Who doesn't file a tax return? A portrait of non-filers. Retrieved September 23, 2020, from https://www.utpjournals.press/doi/abs/10.3138/cpp.2019-063

Appendix A: Tables – NB Graduate Numbers

Table 3: NB Graduates by Demography

Year of Graduation		2009	2010	2011	2012	2013	2014	2015	2016
All graduates		7,260	6,710	8,070	8,050	8,420	8,110	7,940	7,860
Graduates residing in NB prior to admission		3,420	3,390	6,480	6,410	6,610	6,280	6,090	5,950
Graduates residing in NS prior to admission		410	360	350	430	430	430	360	400
Graduates residing in ON prior to admission		340	310	350	330	390	400	430	380
Sex	**Male* graduates**	3,040	2,820	3,500	3,540	3,670	3,630	3,620	3,620
	Female graduates	4,220	3,880	4,570	4,510	4,740	4,480	4,320	4,240
Immigration status	**Domestic* graduates**	6,790	6,290	7,680	7,600	7,880	7,440	7,240	7,080
	International graduates	470	420	400	450	540	670	700	780
Level of education	**Undergraduate**	4,130	4,030	3,930	3,760	3,950	3,680	3,780	3,720
	Graduate	630	600	600	760	720	760	700	650
	College	2,320	2,060	3,450	3,430	3,550	3,450	3,240	3,260
	Other/Not Applicable	200	20	90	100	200	220	210	230

* contains graduates in the 'not stated' or 'other' categories.

Notes: Under 'Level of Education,' 'Other' refers to graduates of undergraduate qualifying programs, post-baccalaureate non-graduate programs, and non-programs (i.e., students not registered in a program). Please note that this report includes graduates from NB institution campuses not located in NB; for example, students in the UNB-Humber College Nursing program. The Maritime Province Higher Education Commission (MPHEC) excludes such students. It should also be noted that some colleges did not release graduate information for 2009 and 2010, which results in large differences between those years and consequent years. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 4: NB Graduates by Institution

Institution	2009	2011	2010	2012	2013	2014	2015	2016
University of New Brunswick	2,840	2,600	2,510	2,470	2,580	2,600	2,580	2,540
Mount Allison University	370	390	450	440	540	530	460	490
Université de Moncton	1,100	1,090	1,090	1,130	1,150	1,010	1,080	1,050
St. Thomas University	630	560	570	570	590	520	570	510
New Brunswick Community College							1,960	1,920
Collège Communautaire du Nouveau-Brunswick							1,110	1,180
Maritime College of Forestry and Technology/ Collège de Technologie Forestière des Maritimes/ New Brunswick College of Craft and Design							180	180

Please note that this report includes graduates from NB institution campuses not located in NB: for example, students in the UNB-Humber College Nursing program. The Maritime Province Higher Education Commission (MPHEC) excludes such students. In addition, regulations on the release of NB college data by institution prevented any graduate information prior to 2015 from being published. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 5: NB Graduates by Field of Study

Field of Study	2009	2010	2011	2012	2013	2014	2015	2016
Education	870	780	770	620	610	570	560	570
Arts, Humanities and Communication	790	590	640	780	750	640	620	600
Law and Social Sciences	1,020	970	1,060	1,020	1,160	1,030	1,140	1,120
Business, Management, and Public Administration	1,490	1,270	1,530	1,600	1,580	1,660	1,560	1,610
Physical, Life Sciences and Technologies	300	300	290	310	340	330	330	330
Math, Computer Science and Information Sciences	180	170	220	220	260	250	240	270
Architecture, Engineering, and Related Technologies	1,120	1,090	1,550	1,490	1,600	1,650	1,610	1,590
Agriculture, Natural Resources, Conservation and Other*	170	160	160	150	190	180	140	160
Health and Related fields	1,200	1,230	1,480	1,480	1,620	1,500	1,440	1,320
Other	120	140	380	380	310	310	300	300

Notes: * contains graduates in the 'Not Stated' or 'Other' categories. 'Other' includes pre-technology education/pre-industrial arts programs and multidisciplinary/interdisciplinary studies. It should be noted that some colleges did not release graduate information for 2009 and 2010, which results in large differences between those years and consequent years. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 6: Percentage of Graduates who File Taxes by December of Graduation

Year of Graduation		2009*	2010*	2011	2012	2013	2014	2015	2016
All graduates		63%	67%	95%	94%	94%	93%	93%	90%
Graduates residing in NB prior to admission		96%	97%	97%	96%	96%	97%	96%	95%
Graduates residing in NS prior to admission		98%	94%	94%	95%	95%	93%	97%	98%
Graduates residing in ON prior to admission		91%	90%	91%	94%	97%	95%	95%	63%
Sex	Male* graduates	58%	58%	74%	75%	75%	79%	80%	58%
	Female graduates	69%	73%	96%	96%	95%	94%	95%	69%
Immigration status	Domestic* graduates	64%	68%	97%	96%	96%	97%	97%	94%
	International graduates	47%	48%	45%	44%	41%	43%	40%	47%
Level of education	Undergraduate	92%	-	94%	94%	93%	92%	92%	87%
	Graduate	86%	-	90%	87%	86%	82%	89%	83%
	College	-	-	97%	95%	96%	96%	96%	94%
	Other	90%	-	100%	90%	95%	95%	95%	96%

Notes: * contains graduates in the 'Not Stated' or 'Other' categories. It should be noted that some colleges did not release graduate information for 2009 and 2010, which results in large differences between those years and consequent years. Under 'Level of Education,' 'Other' refers to graduates of undergraduate qualifying programs, post-baccalaureate non-graduate programs, and non-programs (i.e., students not registered in a program). Due to concerns about confidential data being estimated from results, retention and income by level of study are omitted for the 2010 cohort.

Table 7: Percentage of Graduates who File taxes 2 Years after Graduation

Year of Graduation		2009	2010	2011	2012	2013	2014
All graduates		63%	67%	93%	93%	91%	90%
Graduates residing in NB prior to admission		95%	96%	95%	95%	95%	95%
Graduates residing in NS prior to admission		95%	97%	91%	93%	93%	93%
Graduates residing in ON prior to admission		91%	94%	91%	94%	95%	93%
Sex	**Male* graduates**	55%	58%	91%	90%	89%	87%
	Female graduates	68%	73%	95%	95%	93%	92%
Immigration status	**Domestic* graduates**	63%	68%	95%	95%	95%	95%
	International graduates	49%	48%	43%	47%	59%	66%
Level of education	**Undergraduate**	91%	-	92%	93%	91%	89%
	Graduate	86%	-	88%	83%	81%	72%
	College	-	-	95%	95%	94%	94%
	Other	90%	-	89%	90%	90%	91%

Notes: * contains graduates in the 'Not Stated' or 'Other' categories. It should also be noted that some colleges did not release graduate information for 2009 and 2010, which results in large differences between those years and consequent years. Under 'Level of Education,' 'Other' refers to graduates of undergraduate qualifying programs, post-baccalaureate non-graduate programs, and non-programs (i.e., students not registered in a program). Due to concerns about confidential data being estimated from results, retention and income by level of study are omitted for the 2010 cohort.

Appendix B: Tables – NB Graduate Retention Rates

Table 8: Graduates Retention Rates, All Graduates

	2009	2010	2011	2012	2013	2014	2015	2016
Number of tax filers	4,590	4,510	7,640	7,550	7,890	7,560	7,410	7,050
Filed taxes in NB	3,140	3,210	6,150	5,890	6,040	5,820	5,780	5,620
Retention rate in graduation year	**68.14%**	**71.18%**	**80.50%**	**78.01%**	**76.55%**	**76.98%**	**78.00%**	**79.92%**
Number of tax filers 2 years post-graduation	4,540	4,470	7,520	7,460	7,700	7,300		
Filed taxes in B 2 years post-graduation	2,840	2,840	5,530	5,350	5,430	5,250		
2-year retention rate	**62.56%**	**63.53%**	**73.54%**	**71.72%**	**70.52%**	**71.92%**		

Note: 2009 and 2010 do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 9: Graduates Retention Rates, Graduates Residing in NB Prior to Admission

	2009	2010	2011	2012	2013	2014	2015	2016
Number of tax filers	3,270	3,290	6,290	6,150	6,360	6,070	5,870	5,670
Filed taxes in NB	2,870	2,930	5,820	5,570	5,720	5,520	5,410	5,270
Retention rate in graduation year	**87.77%**	**89.06%**	**92.53%**	**90.57%**	**89.94%**	**90.94%**	**92.16%**	**92.95%**
Number of tax filers 2 years post-graduation	3,240	3,240	6,180	6,110	6,280	5,960		
Filed taxes in B 2 years post-graduation	2,620	2,620	5,270	5,120	5,230	5,030		
2-year retention rate	**80.86%**	**80.86%**	**85.28%**	**83.80%**	**83.28%**	**84.40%**		

Note: 2009 and 2010 do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 10: Graduates Retention Rates, Graduates Residing in NS Prior to Admission

	2009	2010	2011	2012	2013	2014	2015	2016
Number of tax filers	400	340	330	410	410	400	350	390
Filed taxes in NB	60	60	60	70	70	70	70	80
Retention rate in graduation year	**15.00%**	**17.65%**	**18.18%**	**17.07%**	**17.07%**	**17.50%**	**20.00%**	**20.51%**
Number of tax filers, 2 years post-graduation	390	350	320	400	400	400		
Filed taxes in NB, 2 years post-graduation	60	60	60	70	70	80		
2-year retention rate	**15.38%**	**17.14%**	**18.75%**	**17.50%**	**17.50%**	**20.00%**		

Note: 2009 and 2010 do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 11: Graduates Retention Rates, Graduates Residing in ON Prior to Admission

	2009	2010	2011	2012	2013	2014	2015	2016
Number of tax filers	310	280	320	310	380	380	410	240
Filed taxes in NB	30	30	30	30	30	30	40	30
Retention rate in graduation year	**9.68%**	**10.71%**	**9.38%**	**9.68%**	**7.89%**	**7.89%**	**9.76%**	**12.50%**
Number of tax filers, 2 years post-graduation	310	290	320	310	370	370		
Filed taxes in NB, 2 years post-graduation	20	20	20	20	20	30		
2-year retention rate	**6.45%**	**6.90%**	**6.25%**	**6.45%**	**5.41%**	**8.11%**		

Note: 2009 and 2010 do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 12: Graduate Retention Rates by Sex

	2009	2010	2011	2012	2013	2014	2015	2016
MALE								
Number of tax filers	1,690	1,660	3,240	3,240	3,380	3,340	3,300	3,180
Filed taxes in NB	1,100	1,140	2,620	2,490	2,590	2,620	2,630	2,520
Retention rate in graduation year	**65.09%**	**68.67%**	**80.86%**	**76.85%**	**76.63%**	**78.44%**	**79.70%**	**79.25%**
Number of tax filers, 2 years post-graduation	1,660	1,640	3,180	3,190	3,280	3,170		
Filed taxes in NB, 2 years post-graduation	970	980	2,300	2,210	2,340	2,300		
2-year retention rate	**58.43%**	**59.76%**	**72.33%**	**69.28%**	**71.34%**	**72.56%**		
FEMALE								
Number of tax filers	2,900	2,850	4,400	4,310	4,510	4,220	4,110	3,880
Filed taxes in NB	2,040	2,070	3,530	3,400	3,440	3,200	3,160	3,100
Retention rate in graduation year	**70.34%**	**72.63%**	**80.23%**	**78.89%**	**76.27%**	**75.83%**	**76.89%**	**79.90%**
Number of tax filers, 2 years post-graduation	2,890	2,830	4,340	4,270	4,420	4,130		
Filed taxes in NB, 2 years post-graduation	1,870	1,860	3,220	3,150	3,090	2,940		
2-year retention rate	**64.71%**	**65.72%**	**74.19%**	**73.77%**	**69.91%**	**71.19%**		

Note: 2009 and 2010 do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 13: Retention/Attraction Rates by Immigration Status

	2009	2010	2011	2012	2013	2014	2015	2016
DOMESTIC STUDENTS								
Number of tax filers	4,340	4,290	7,420	7,300	7,570	7,180	6,990	6,640
Filed taxes in NB	3,030	3,090	6,000	5,750	5,870	5,610	5,530	5,360
Retention rate in graduation year	**69.82%**	**72.03%**	**80.86%**	**78.77%**	**77.54%**	**78.13%**	**79.11%**	**80.72%**
Number of tax filers, 2 years post-graduation	4,300	4,250	7,290	7,220	7,480	7,070		
Filed taxes in NB, 2 years post-graduation	2,770	2,770	5,430	5,270	5,360	5,150		
2-year retention rate	**64.42%**	**65.18%**	**74.49%**	**72.99%**	**71.66%**	**72.84%**		
INTERNATIONAL STUDENTS								
Number of tax filers	250	220	220	250	320	380	420	410
Filed taxes in NB	110	120	150	140	170	210	260	260
Retention rate in graduation year	**44.00%**	**54.55%**	**68.18%**	**56.00%**	**53.13%**	**55.26%**	**61.90%**	**63.41%**
Number of tax filers, 2 years post-graduation	240	220	230	240	220	230		
Filed taxes in NB, 2 years post-graduation	70	70	100	80	80	90		
2-year retention rate	**29.17%**	**31.82%**	**43.48%**	**33.33%**	**36.36%**	**39.13%**		

Note: 2009 and 2010 do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 14: Retention Rates by Level of Study, 2010 to 2016

	2009	2010	2011	2012	2013	2014	2015	2016
COLLEGE								
Number of tax filers	60	-	3,330	3,260	3,410	3,320	3,100	3,060
Filed taxes in NB	40	-	3,100	2,960	3,070	3,040	2,860	2,840
Retention rate in graduation year	**66.67%**	-	**93.09%**	**90.80%**	**90.03%**	**91.57%**	**92.26%**	**92.81%**
Number of tax filers, 2 years post-graduation	50	-	3,290	3,250	3,350	3,260		
Filed taxes in NB, 2 years post-graduation	30	-	2,880	2,790	2,880	2,850		
2-year retention rate	**60.00%**	-	**87.54%**	**85.85%**	**85.97%**	**87.42%**		
UNDERGRADUATE								
Number of tax filers	3,820	-	3,680	3,540	3,680	3,400	3,490	3,240
Filed taxes in NB	2,610	-	2,620	2,420	2,430	2,240	2,390	2,330
Retention rate in graduation year	**68.32%**	-	**71.20%**	**68.36%**	**66.03%**	**65.88%**	**68.48%**	**71.91%**
Number of tax filers, 2 years post-graduation	3,770	-	3,620	3,490	3,590	3,290		
Filed taxes in NB, 2 years post-graduation	2,350	-	2,280	2,140	2,100	1,950		
2-year retention rate	**62.33%**	-	**62.98%**	**61.32%**	**58.50%**	**59.27%**		
GRADUATE								
Number of tax filers	540	-	540	660	620	620	620	540
Filed taxes in NB	380	-	390	470	440	420	430	350
Retention rate in graduation year	**70.37%**	-	**72.22%**	**71.21%**	**70.97%**	**67.74%**	**69.35%**	**64.81%**
Number of tax filers, 2 years post-graduation	540	-	530	630	580	550		

Filed taxes in NB, 2 years post-graduation	350	-	350	400	370	350		
2-year retention rate	**64.81%**	-	**66.04%**	**63.49%**	**63.79%**	**63.64%**		
OTHER/NOT APPLICABLE								
Number of tax filers	180	-	90	90	190	210	200	220
Filed taxes in NB	120	-	30	40	100	120	100	100
Retention rate in graduation year	**66.67%**	-	**33.33%**	**44.44%**	**52.63%**	**57.14%**	**50.00%**	**45.45%**
Number of tax filers, 2 years post-graduation	180	-	80	90	180	200		
Filed taxes in NB, 2 years post-graduation	110	-	20	30	90	110		
2-year retention rate	**61.11%**	-	**25.00%**	**33.33%**	**50.00%**	**55.00%**		

'Other' refers to graduates of undergraduate qualifying programs, post-baccalaureate non-graduate programs, and non-programs (i.e., students not registered in a program). Due to concerns about confidential data being estimated from results, retention and income by level of study is omitted for the 2010 cohort. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 15: Retention Rates by Institution, 2010 to 2016

	2009	2010	2011	2012	2013	2014	2015	2016
University of New Brunswick								
Number of tax filers	2,590	2,390	2,330	2,270	2,360	2,320	2,350	2,100
Filed taxes in NB	1,720	1,660	1,580	1,470	1,480	1,470	1,510	1,440
Retention rate in graduation year	**66.41%**	**69.46%**	**67.81%**	**64.76%**	**62.71%**	**63.36%**	**64.26%**	**68.57%**
Number of tax filers, 2 years post-graduation	2,570	2,370	2,270	2,220	2,280	2,180		
Filed taxes in NB, 2 years post-graduation	1,550	1,440	1,350	1,260	1,270	1,250		
2-year retention rate	**60.31%**	**60.76%**	**59.47%**	**56.76%**	**55.70%**	**57.34%**		
Mount Allison University								
Number of tax filers	330	350	400	420	460	460	400	430
Filed taxes in NB	130	130	180	170	180	160	160	170
Retention rate in graduation year	**39.39%**	**37.14%**	**45.00%**	**40.48%**	**39.13%**	**34.78%**	**40.00%**	**39.53%**
Number of tax filers, 2 years post-graduation	320	350	390	410	460	450		
Filed taxes in NB, 2 years post-graduation	110	110	140	120	130	140		
2-year retention rate	**34.38%**	**31.43%**	**35.90%**	**29.27%**	**28.26%**	**31.11%**		
Université de Moncton								
Number of tax filers	1,070	1,040	1,050	1,060	1,100	970	1,040	980
Filed taxes in NB	900	880	900	900	920	800	860	810
Retention rate in graduation year	**84.11%**	**84.62%**	**85.71%**	**84.91%**	**83.64%**	**82.47%**	**82.69%**	**82.65%**
Number of tax filers, 2 years post-graduation	1,060	1,040	1,060	1,060	1,070	940		

Filed taxes in NB, 2 years post-graduation	840	810	840	850	840	740		
2-year retention rate	**79.25%**	**77.88%**	**79.25%**	**80.19%**	**78.50%**	**78.72%**		

St. Thomas University								
Number of tax filers	550	530	530	540	550	480	530	480
Filed taxes in NB	360	370	370	380	390	340	390	360
Retention rate in graduation year	**65.45%**	**69.81%**	**69.81%**	**70.37%**	**70.91%**	**70.83%**	**73.58%**	**75.00%**
Number of tax filers, 2 years post-graduation	530	510	510	520	540	470		
Filed taxes in NB, 2 years post-graduation	310	320	320	330	320	270		
2-year retention rate	**58.49%**	**62.75%**	**62.75%**	**63.46%**	**59.26%**	**57.45%**		

New Brunswick Community College								
Number of tax filers	-	-	-	-	-	-	1860	1790
Filed taxes in NB	-	-	-	-	-	-	1730	1670
Retention rate in graduation year	-	-	-	-	-	-	**93.01%**	**93.30%**
Number of tax filers, 2 years post-graduation	-	-	-	-	-	-		
Filed taxes in NB, 2 years post-graduation	-	-	-	-	-	-	-	-
2-year retention rate	-	-	-	-	-	-	-	-

Collège Communautaire du Nouveau-Brunswick								
Number of tax filers	-	-	-	-	-	-	1070	1110
Filed taxes in NB	-	-	-	-	-	-	1000	1050
Retention rate in graduation year	-	-	-	-	-	-	**93.46%**	**94.59%**
Number of tax filers, 2 years	-	-	-	-	-	-		

post-graduation							
Filed taxes in NB, 2 years post-graduation	-	-	-	-	-	-	-	-
2-year retention rate	-	-	-	-	-	-	-	-
Maritime College of Forestry and Technology / Collège de Technologie Forestière des Maritimes / New Brunswick College of Craft and Design							
Number of tax filers	-	-	-	-	-	-	170	170
Filed taxes in NB	-	-	-	-	-	-	130	120
Retention rate in graduation year	-	-	-	-	-	-	**76.47%**	**70.59%**
Number of tax filers, 2 years post-graduation	-	-	-	-	-	-		
Filed taxes in NB, 2 years post-graduation	-	-	-	-	-	-	-	-
2-year retention rate	-	-	-	-	-	-	-	-

Note: Regulations on the release of NB college data by institution prevented any graduate information outside of income prior to 2015 from being published. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Table 16: Retention Rates by Field of Study, 2010 to 2016

	2009	2010	2011	2012	2013	2014	2015	2016
Education								
Number of tax filers	830	750	730	600	580	530	530	540
Filed taxes in NB	650	610	560	470	460	400	410	400
Retention rate in graduation year	**78.31%**	**81.33%**	**76.71%**	**78.33%**	**79.31%**	**75.47%**	**77.36%**	**74.07%**
Number of tax filers, 2 years post-graduation	830	740	720	590	580	530		
Filed taxes in NB, 2 years post-graduation	610	560	530	440	430	370		
2-year retention rate	**73.49%**	**75.68%**	**73.61%**	**74.58%**	**74.14%**	**69.81%**		
Arts, Humanities and Communication								
Number of tax filers	590	500	600	720	680	590	580	540
Filed taxes in NB	400	330	430	520	490	410	420	420
Retention rate in graduation year	**67.80%**	**66.00%**	**71.67%**	**72.22%**	**72.06%**	**69.49%**	**72.41%**	**77.78%**
Number of tax filers, 2 years post-graduation	580	490	580	720	670	580		
Filed taxes in NB, 2 years post-graduation	350	290	380	470	410	360		
2-year retention rate	**60.34%**	**59.18%**	**65.52%**	**65.28%**	**61.19%**	**62.07%**		
Law and Social Sciences								
Number of tax filers	840	810	1,010	950	1,080	950	1,060	1,030
Filed taxes in NB	530	520	750	650	740	680	760	770
Retention rate in graduation year	**63.10%**	**64.20%**	**74.26%**	**68.42%**	**68.52%**	**71.58%**	**71.70%**	**74.76%**
Number of tax filers, 2 years	830	800	990	950	1,060	940		

post-graduation								
Filed taxes in NB, 2 years post-graduation	450	450	650	570	640	600		
2-year retention rate	**54.22%**	**56.25%**	**65.66%**	**60.00%**	**60.38%**	**63.83%**		

Business, Management and Public Administration								
Number of tax filers	800	730	1,420	1,450	1,440	1,490	1,400	1,380
Filed taxes in NB	600	550	1,220	1,230	1,190	1,210	1,160	1,150
Retention rate in graduation year	**75.00%**	**75.34%**	**85.92%**	**84.83%**	**82.64%**	**81.21%**	**82.86%**	**83.33%**
Number of tax filers, 2 years post-graduation	800	740	1,390	1,430	1,400	1,390		
Filed taxes in NB, 2 years post-graduation	550	480	1,100	1,130	1,070	1,060		
2-year retention rate	**68.75%**	**64.86%**	**79.14%**	**79.02%**	**76.43%**	**76.26%**		

Physical, Life Sciences and Technologies								
Number of tax filers	270	270	270	290	310	300	310	300
Filed taxes in NB	170	200	190	190	200	210	210	180
Retention rate in graduation year	**62.96%**	**74.07%**	**70.37%**	**65.52%**	**64.52%**	**70.00%**	**67.74%**	**60.00%**
Number of tax filers, 2 years post-graduation	260	270	270	280	300	290		
Filed taxes in NB, 2 years post-graduation	160	170	160	160	170	170		
2-year retention rate	**61.54%**	**62.96%**	**59.26%**	**57.14%**	**56.67%**	**58.62%**		

Math, Computer and Information Sciences								
Number of tax filers	90	100	190	200	220	220	210	240
Filed taxes in NB	60	80	150	160	190	190	170	180

Retention rate in graduation year	**66.67%**	**80.00%**	**78.95%**	**80.00%**	**86.36%**	**86.36%**	**80.95%**	**75.00%**
Number of tax filers, 2 years post-graduation	90	100	190	190	200	200		
Filed taxes in NB, 2 years post-graduation	50	70	140	140	160	170		
2-year retention rate	**55.56%**	**70.00%**	**73.68%**	**73.68%**	**80.00%**	**85.00%**		

Architecture, Engineering and Related Technologies

Number of tax filers	300	360	1,460	1,380	1,520	1,550	1,500	1,470
Filed taxes in NB	160	230	1,270	1,130	1,230	1,290	1,300	1,270
Retention rate in graduation year	**53.33%**	**63.89%**	**86.99%**	**81.88%**	**80.92%**	**83.23%**	**86.67%**	**86.39%**
Number of tax filers, 2 years post-graduation	300	340	1,430	1,360	1,470	1,480		
Filed taxes in NB, 2 years post-graduation	140	180	1,110	1,010	1,170	1,170		
2-year retention rate	**46.67%**	**52.94%**	**77.62%**	**74.26%**	**79.59%**	**79.05%**		

Agriculture, Natural Resources and Conservation

Number of tax filers	140	170	510	510	470	460	420	420
Filed taxes in NB	90	100	420	400	360	360	330	320
Retention rate in graduation year	**64.29%**	**58.82%**	**82.35%**	**78.43%**	**76.60%**	**78.26%**	**78.57%**	**76.19%**
Number of tax filers, 2 years post-graduation	140	170	500	500	460	460		
Filed taxes in NB, 2 years post-graduation	70	100	380	360	330	340		
2-year retention rate	**50.00%**	**58.82%**	**76.00%**	**72.00%**	**71.74%**	**73.91%**		

Health and Related Fields								
Number of tax filers	720	820	1,450	1,440	1,580	1,460	1,400	1,150
Filed taxes in NB	490	590	1,160	1,130	1,180	1,080	1,020	940
Retention rate in graduation year	**68.06%**	**71.95%**	**80.00%**	**78.47%**	**74.68%**	**73.97%**	**72.86%**	**81.74%**
Number of tax filers, 2 years post-graduation	720	830	1,450	1,440	1,560	1,440		
Filed taxes in NB, 2 years post-graduation	460	550	1,090	1,070	1,110	1,020		
2-year retention rate	**63.89%**	**66.27%**	**75.17%**	**74.31%**	**71.15%**	**70.83%**		

Note: 2009 and 2010 do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 10.

Appendix C: Tables – NB Graduate Income

Table 17: Average Income One and Two Full Years After Graduation, Overall

	2009	2010	2011	2012	2013	2014	2015	2016
Overall								
One Year	$36,800	$38,700	$38,900	$36,400	$36,500	$36,100	$35,600	-
Two Years	$41,700	$43,100	$39,200	$41,000	$40,500	$39,600	-	-

Note: Income is not adjusted for inflation. 2009 and 2010 numbers do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 100.

Table 18: Average Income One and Two Full Years After Graduation by Province of Permanent Residence

	2009	2010	2011	2012	2013	2014	2015	2016
New Brunswick								
One Year	$37,500	$39,200	$34,300	$36,100	$36,200	$35,600	$35,100	-
Two Years	$42,000	$43,400	$38,300	$40,500	$39,800	$39,000	-	-
Nova Scotia								
One Year	$31,100	$31,800	$31,600	$32,800	$33,400	$34,500	$33,800	-
Two Years	$36,100	$36,200	$36,500	$38,300	$37,400	$38,400	-	-
Ontario								
One Year	$42,700	$44,300	$44,800	$44,200	$45,400	$49,000	$44,000	-
Two Years	$47,800	$49,800	$50,600	$51,500	$53,700	$51,600	-	-

Note: Income is not adjusted for inflation. 2009 and 2010 numbers do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 100.

Table 19: Average Income One and Two Full Years After Graduation by Gender

	2009	2010	2011	2012	2013	2014	2015	2016
Men								
One Year	$36,800	$38,900	$46,200	$38,000	$ 38,900	$ 37,300	$ 35,900	-
Two Years	$43,100	$44,700	$42,600	$44,200	$ 43,700	$ 41,200	-	-
Women								
One Year	$36,990	$38,600	$33,300	$35,100	$34,600	$35,100	$35,400	-
Two Years	$41,000	$42,200	36,600	$38,500	$38,100	$38,300	-	-

Note: Income is not adjusted for inflation. 2009 and 2010 numbers do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 100.

Table 20: Average Income One and Two Full Years After Graduation by Immigration Status

	2009	2010	2011	2012	2013	2014	2015	2016
Domestic								
One Year	$37,500	$39,100	$39,200	$36,500	$36,700	$36,500	$35,900	-
Two Years	$42,100	$43,600	$39,300	$41,200	$40,700	$39,800	-	-
International								
One Year	$26,100	$32,900	$29,600	$33,200	$32,000	$28,800	$29,200	-
Two Years	$35,000	$36,800	$34,600	$34,900	$34,400	$ 31,700	-	-

Note: Income is not adjusted for inflation. 2009 and 2010 numbers do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 100.

Table 21: Income One and Two Full Years After Graduation by Field of Study

	2009	2010	2011	2012	2013	2014	2015	2016
Education								
One Year	$40,500	$43,300	$43,800	$48,900	$49,100	$53,200	$52,100	-
Two Years	$46,000	$48,000	$47,900	$52,400	$52,700	$56,400	-	-
Arts, Humanities and Communication								
One Year	$20,900	$21,600	$22,300	$22,600	$22,900	$21,200	$23,300	-
Two Years	$24,700	$25,500	$26,600	$25,700	$27,600	$25,300	-	-
Law and Social Sciences								
One Year	$26,600	$27,700	$ 26,700	$28,200	$26,600	$27,600	$28,400	-
Two Years	$32,500	$32,700	$31,500	$33,500	$31,200	$31,400	-	-
Business Management and Public Administration								
One Year	$38,100	$40,600	$54,500	$38,200	$37,700	$37,900	$35,700	-
Two Years	$44,600	$44,600	$38,000	$42,100	$41,600	$41,900	-	-
Math, Computer and Information Sciences								
One Year	$37,000	$36,400	$33,800	$35,800	$27,900	$34,600	$38,000	-
Two Years	$45,300	$42,600	$36,500	$39,900	$30,900	$37,100	-	-
Architecture, Engineering and Related Technologies								
One Year	$49,500	$49,600	$38,100	$38,300	$41,800	$36,500	$34,900	-
Two Years	$58,300	$59,800	$44,800	$45,400	$46,100	$40,700	-	-
Health, Physical and Life Sciences and Related Fields								
One Year	$51,300	$51,500	$40,900	$42,000	$42,700	$42,400	$42,800	-
Two Years	$52,700	$ 54,300	$43,300	$46,000	$46,300	$44,800	-	-
Agriculture, Natural Resources, Conservation								
One Year	$34,400	$32,100	$32,100	$35,900	$36,000	$33,600	$32,600	-
Two Years	$37,000	$34,800	$36,100	$41,000	$38,300	$38,100	-	-
Other								
One Year	$35,600	$33,200	$30,500	$32,000	$28,400	$29,000	$30,000	-
Two Years	$35,600	$33,200	$30,500	$32,000	$28,400	$29,000	-	-

Note: Income is not adjusted for inflation. 'Other' includes pre-technology education/pre-industrial arts programs and multidisciplinary/interdisciplinary studies. 2009 and 2010 numbers do not include the college-level cohort of graduates. Per Statistics Canada disclosure requirements, figures are rounded to the nearest 100.

Appendix D: A Comparison of Medicare and Tax Data Results

In spite of a rich culture and vast natural resources, the province of New Brunswick (NB) is faced with demographic challenges, including an aging population and the out-migration of many younger, working-age individuals.

To help boost both the population and economy of NB, the Government of New Brunswick has invested substantially in post-secondary education (PSE) in the province. Improving PSE is likely to attract more individuals to NB and help produce a more highly skilled labour force; however, there is always the potential that some of that investment could be lost as qualified graduates leave the province, taking their human capital and potential earnings with them.

Retaining post-secondary graduates in the province plays a vital role in remedying demographic challenges and the fiscal challenges that arise as a result – making it a salient research topic in NB. Student labour market and retention research in particular helps inform targeted policies that aim to encourage graduates to remain in NB while examining whether students' decisions to stay or leave are tied to economic outcomes.

In 2021, the New Brunswick Institute for Research, Data and Training (NB-IRDT) released two reports analyzing post-secondary graduate retention in the province:

- College & university graduate retention in New Brunswick: 2010 – 2018
  (Bhuiyan et al., 2021)[23]

- Retention, attraction, and labour market outcomes of post-secondary education recipients in New Brunswick
  (Boco et al., 2021)[24]

While both reports attempt to answer the same overarching question (*How many graduates from NB PSE institutions are staying in NB?*), they examine different study periods, utilize administrative data from different sources, and employ different methodologies to address this question. Most notably, Bhuiyan et al. (2021) use Medicare data in their calculations, while Boco et al. (2021) employ tax data.

This appendix compares NB graduate retention rates as estimated in these two NB-IRDT reports, explaining the methodologies behind both sets of calculations and the similarities and differences between the data sources. Since different estimates from different data sources and methodologies could lead to uncertainty in policy recommendations and questions about data integrity, it is important to compare such estimates systematically. Results show that estimates of retention in both studies are similar, suggesting that retention results are robust to alternative data sources.

---

[23] Bhuiyan, E.M., Daigle, B., McDonald, T., & Miah, P (2021). College & university graduate retention in New Brunswick: 2010 - 2018. Fredericton, NB: New Brunswick Institute for Research, Data and Training.

[24] Boco, E., Leonard, P., & McDonald, T. (2021). Retention, attraction, and labour market outcomes of post-secondary graduates in New Brunswick. Fredericton, NB: New Brunswick Institute for Research, Data and Training.

Tax Records	Medicare Records

• The Post-Secondary Information System (PSIS) linked with tax records provided in the T1 Family File is used.
 	
• Tax records are used to determine residence in NB after graduation.
 	
• Two retention/attraction measures are used:
   ○ **Grad-year retention** - the percentage of graduates still in NB as of December 31st of the graduation year (e.g., graduating in 2014 and province of taxation in Dec. 2014).
   ○ **2-year retention rate** - the percentage of graduates still in NB as of Dec. 31st two years later (e.g., graduating in 2014 and province of taxation in Dec. 2016.)
   ○ Retention is calculated as the number of NB PSE institution graduates who declared NB as their province of taxation on Dec. 31st of a given tax year divided by the total number of tax filers who are part of the graduation-year cohort.
	• Data from the University and Community College Registrar Databases and the Citizen Database (Medicare Registry) are linked.
	
	• **"Matched"** individuals (i.e., individuals with Medicare information) are considered retained if they have an Active Medicare Registration in NB 1 year or 3 years after the date of graduation – otherwise, they are considered to have left the province on or prior to the date of termination of an active Medicare status.
	
	• **"Unmatched"** individuals (i.e., individuals with no Medicare information) are also assumed to have left the province. Individuals can be "Unmatched" for various reasons:
	   ○ A graduating student does not have an Active Medicare status because he/she does not remain in NB after graduation.
	   ○ Individuals may be unmatched because of missing information or information that is not reported consistently across both datasets.
	
	• The number of students who graduated each year is based on calendar year and not academic year.

Table 22: Comparison Between Tax and Medicare Records

Tax Data	Medicare Records
Similarities	
Excludes international students without visas/permits who study at NB institutions (e.g., via internet)	
Includes students who study in joint university programs (e.g., UNB joint nursing program with Humber College) but may or may not be physically in NB	
Differences	
Retention is based on students filing Canadian taxes in a given tax year. Non-filers in a specific tax year are excluded from retention estimations for that year. This includes students who do not file taxes at all in a given year and students who remain in NB but declare another province of residence on their tax returns.	Retention is based on Medicare status 1 and 3 years after graduation.
MTA and STU data available throughout study period.	MTA and STU data available from 2014 onwards.
Once students with no visa were excluded from the sample, each graduate had an assigned gender. None were missing or in the 'Not Stated' category.	Some graduates from UNB (mainly students studying overseas/online) have 'Unknown' gender. These students are excluded from analysis by gender.
Due to the year-round nature of academic graduation, 'x'-year retention is not always the full year. This varies depending on the month the student graduates. Whatever value 'x' is equals the longest amount of time that can pass since graduation.	Retention for each year is based on the full year after the graduation of a student.

Over the period of this comparison, about 90% of university graduates filed taxes in Canada in the year of graduation and two years after, while 70-77% of university graduates were matched in Medicare records. College graduates are excluded from this comparison due to differences in the years of data availability from the data sources.

Table 23: Percentage of University Graduates who File Taxes

Year of Graduation	2010	2011	2012	2013	2014	2015	2016
In year of Graduation	93%	93%	93%	92%	91%	92%	87%
2 years after graduation	92%	92%	91%	90%	87%		

Table 24: Annual Distribution of Matched University Graduates in NB from 2010 to 2016

Year of Graduation	2010	2011	2012	2013	2014	2015	2016
Matching Ratio	75%	76%	77%	77%	70%	71%	70%

STU and MTA data begin in 2014.

Graduate Counts by Data Source

Given the similarities and differences between the data sources, the tables below show the number of graduates reported based on administrative records made available by both datasets.

- The overall number of graduates each year for both data sources is very close in range – off by only a few students each year (Table 4).

- Differences between data sources in graduate counts by level of education are driven chiefly by undergraduates in larger institutions (Table 5).

- The larger the institution in terms of student population and programs offered, the more pronounced the differences in graduate counts. In other words, graduate counts by data source for smaller universities like MTA and STU are nearly identical, whereas larger universities like UNB and UdeM show larger differences (Table 6).

- These differences between the data sources likely occur because separate agencies compile the datasets.

Table 25: Total Number of University Graduates in NB

Graduation Year	2014	2015	2016
Post-Secondary Information System (PSIS)	4,660	4,690	4,600
University and Community College Registrar Databases	4,681	4,672	4,554

*STU and MTA data begin in 2014 in the University and Community College Registrar Databases.

Table 26: Total Number of University Graduates in NB by Level of Education

Graduation Year	2014	2015	2016
Post-Secondary Information System (PSIS)			
Undergraduate	3,900	3,990	3,950
Graduate	760	700	650
University and Community College Registrar Databases			
Undergraduate	3,924	3,970	3,891
Graduate	757	702	663

Table 27: Total Number of University Graduates in NB by Institution

Graduation Year	2010	2011	2012	2013	2014	2015	2016
Post-Secondary Information System (PSIS)							
University of New Brunswick	2,600	2,510	2,470	2,580	2,600	2,580	2,540
Université de Moncton	1,090	1,090	1,130	1,150	1,010	1,080	1,050
Mount Allison University	390	450	440	540	530	460	490
St. Thomas University	560	570	570	590	520	570	510
University and Community College Registrar Databases							
University of New Brunswick	2,573	2,600	2,446	2,471	2,624	2,579	2,521
Université de Moncton	1,073	1,082	1,109	1,141	1,010	1,077	1,035
Mount Allison University*	-	-	-	-	526	449	487
St. Thomas University*	-	-	-	-	521	567	511

*STU and MTA data begin in 2014 in the University and Community College Registrar Databases.

Does NB Student Retention Vary by Data Source?

Despite the use of different data sources and methodologies, the retention rates for university graduates produced using PSIS and Medicare data are within close range and follow the expected retention trends: that is, they decline as more time passes since graduation. The calculated declines are also of similar magnitudes.

- With both data sources, UdeM graduates are the most likely to still be in NB after graduation, while MTA graduates are the least likely.

- Retention rates calculated using Medicare data show stable retention rates over the study period. Graduation-year retention rates from tax data are stable, but two-year rates show a slight decline, specifically for UNB and STU graduates. However, they are still close in range.

Table 28: Retention Rates for University Graduates by Data Source

Graduation Year	2014	2015	2016
Grad-year retention *(Tax records)*	66%	68%	70%
1-year retention *(Medicare Records)*	65%	67%	67%
2-year retention *(Tax records)*	60%		
3-year retention *(Medicare Records)*	58%	61%	61%

Note: The study period for the student retention report using tax records goes from 2009 to 2016, whereas the study period for Medicare records goes from 2010 to 2019.

Table 29: Retention Rates for NB Institutions by Data Source

Graduation Year	2010	2011	2012	2013	2014	2015	2016
University of New Brunswick							
Grad-year retention *(Tax records)*	69%	68%	65%	63%	63%	64%	69%
1-year retention rate *(Medicare Records)*	64%	64%	64%	64%	61%	62%	63%
2-year retention rate *(Tax records)*	61%	59%	57%	56%	57%		
3-year retention rate *(Medicare Records)*	56%	56%	56%	56%	56%	57%	58%
Université de Moncton							
Grad-year retention *(Tax records)*	85%	86%	85%	84%	82%	83%	83%
1-year retention rate *(Medicare Records)*	84%	86%	84%	83%	82%	82%	81%
2-year retention rate *(Tax records)*	78%	79%	80%	79%	79%		
3-year retention rate *(Medicare Records)*	76%	80%	78%	76%	75%	77%	77%

Mount Allison University							
Grad-year retention *(Tax records)*	37%	45%	40%	39%	35%	40%	40%
1-year retention rate* *(Medicare Records)*					40%	43%	43%
2-year retention rate *(Tax records)*	31%	36%	29%	28%	31%		
3-year retention rate* *(Medicare Records)*					36%	37%	38%
St. Thomas University							
Grad-year retention *(Tax records)*	70%	70%	70%	71%	71%	74%	75%
1-year retention rate* *(Medicare Records)*					72%	74%	76%
2-year retention rate *(Tax records)*	63%	63%	63%	59%	57%		
3-year retention rate* *(Medicare Records)*					61%	65%	70%

*STU and MTA data begin in 2014 in the University and Community College Registrar Databases.

Summary and Conclusion

This appendix compares post-secondary graduate counts and retention rates in NB as estimated by two NB-IRDT reports. The first study (Bhuiyan et al., 2021) uses provincial Medicare records to investigate retention of post-secondary graduates in the province, while the second (Boco et al., 2021) uses graduates' tax records to investigate residence after graduation.

Except for a decline in two-year retention rates for UNB and STU graduates in the tax data, this comparison shows similar numbers and trends in graduate counts as well as retention rates. Both data sources reveal that university graduates in NB have a retention rate of about 60% over the comparison period, and UdeM graduates are the most likely to remain in the province while MTA graduates are the least likely to remain. For the purpose of informing policy, this comparison shows that Medicare data is a useful complement to other data sources that can be used in analysis.