

**An Assessment of the Economic Impact of
International Education in British Columbia:
An Update in 2017**

Final Report

Presented to:

British Columbia Council for International Education

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Executive Summary

This report provides the assessment of the economic impact of international students studying in British Columbia (B.C.) during 2017. It also provides an assessment of the economic impacts of international students studying in the province during 2015 in comparison to 2017. This report is an update on the report titled “An Assessment of the Economic Impact of International Education in British Columbia in 2010 and 2015,” which was released in 2017.

The highlights of our current study of the impact of international education services include the following:

- B.C.’s post-secondary institutions and K-12 schools were home to 152,390 international students during 2017. This represents an 18% increase in the number of international students in B.C. in 2015.
- Between 2015 and 2017, the number of international students studying in public post-secondary institutions grew significantly more (31%) compared to private post-secondary institutions (9%). During the same timeframe, the number of international students in the K-12 sector increased by 21%.
- During 2017, international students spent almost \$4.7 billion in B.C. on tuition and fees and day-to-day living expenses. The expenditure in turn increased industrial output, generated jobs, and, tax revenue for governments.
- The economic impacts of such an annual expenditure are equivalent to a \$2.7 billion *direct* contribution to the provincial GDP in 2017, and *directly* supporting 35,500 jobs. Governments raised almost \$246 million in personal income tax revenue.
- When indirect impact is taken into account, namely, the increased economic activities of those businesses supplying goods and services to the ones directly impacted, the overall impact is even more substantial. Combined direct and indirect economic impact of international student spending was equivalent to \$3.3 billion contribution to provincial GDP, 43,400 jobs supported, and \$622 million government tax revenue raised.
- As the funds supporting these international students come from sources outside the country, international education is an export of services. When compared with B.C.’s export of goods in 2017, B.C.’s export of international education service ranked 3rd, behind our export of commodity groups such as mineral fuels, mineral oils, bituminous substances and mineral waxes (all combined in one group); and wood and articles of wood (incl. wood charcoal) (all in one group).
- B.C.’s export in international education services was equivalent to 10.5% of its total value of exports of goods.

- The role of international education services is even more important when comparing the value of export of international education services with the value of export in goods to some of the top ten international student source countries. For example, the value of international education services was equivalent to 86.2% of the total value of export in goods from B.C. to India in 2017. Similarly, the value of international education service provided to students from Brazil was equivalent to 61.6% of the value of all goods exported from B.C. to Brazil.

Summary tables of the number of international students and the economic impacts of international education in B.C. are shown as follows.

Summary Table I Total Number of International Students in B.C., 2017

	2017
Public Post-Secondary	59,985
Private Post-Secondary	71,967
K-12	20,438
Total	152,390

*Source: Immigration, Refugees and Citizenship Canada (IRCC), Ministry of Advanced Education, Skills and Training, Ministry of Education.
See notes in the main part of the report.*

Summary Table II Total Annual Spending of International Students in B.C., 2017

	2017
Public Post-Secondary	\$2.05 billion
Private Post-Secondary	\$2.10 billion
K-12	\$542.0 million
Total	\$4.7 billion

Source: RKA.

Summary Table III Direct Economic Impacts of International Students in B.C., 2017

	2017
GDP	\$2.7 billion
Jobs	35,500
Government Revenue	\$246 million

Source: RKA, based on customized Statistics Canada Expenditure Model.

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Summary Table IV Combined Direct and Indirect Economic Impacts of International Students in B.C., 2017

	Total Impact
GDP	\$3.3 billion
Jobs	43,400
Government Revenue	\$622 million

Source: RKA, based on customized Statistics Canada Expenditure Model.

Summary Table V Total Value of International Education Services in B.C. by Top Ten Source Markets, 2017

	2017
China	\$1,474,337,000
India	\$915,132,000
South Korea	\$391,166,000
Japan	\$210,510,000
Brazil	\$178,810,000
United States	\$164,038,000
Mexico	\$134,338,000
Vietnam	\$113,872,000
Taiwan	\$75,864,000
Saudi Arabia	\$75,402,000
Top Ten Source Markets	\$3,733,469,000
All Markets	\$4,689,996,000

Source: RKA.

1. Introduction

B.C. has developed a strong international reputation as a high quality study destination. This has translated into continuous growth in the number of international students studying in the province over the last decade.

International students provide opportunities for B.C. students to have more global education experiences and bring social and cultural benefits to communities, schools, and institutions throughout the province.

International students also support growth of a strong economy through their spending on tuition, accommodation and living expenses, arts, culture and recreation.

Roslyn Kunin and Associates, Inc. (RKA) was commissioned by the British Columbia Council for International Education to estimate the economic impact of international students studying in B.C. with a study permit in 2017, based on data reported by the Department of Immigration, Refugees and Citizenship Canada (IRCC). This report is an update on the report titled “An Assessment of the Economic Impact of International Education in British Columbia in 2010 and 2015,” which was released in 2017.

The report presents our assessment of the impact values. Notes on data sources and methodology have been described in Appendix 1.

2. Economic Impact of International Students in B.C.

In this section, we report our assessment of the contribution to B.C.'s economy attributed to international students studying in B.C. during 2017.

Economic impact analysis of this kind studies and measures the effect of a new project, program or policy on the economic activities in a given area. In our study of the impact of international students studying in schools, and post-secondary institutions in B.C., we view their annual spending in B.C. as expenditure to purchase goods and services in our businesses, and therefore will affect the economic activities in the province.

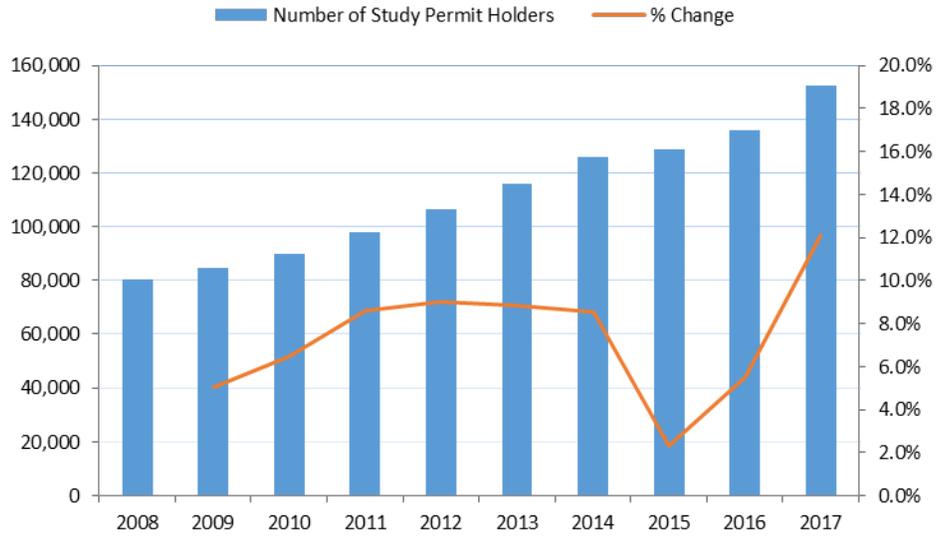
The impacts we measure are direct impacts, which accounts for the change in local (in this case, provincial) business activity occurring as a result of spending of international students, as well as indirect impacts, which accounts for business growth resulting from changes in sales for suppliers to the directly-affected businesses (including trade and services at the retail, wholesale and producer levels). The combined direct and indirect impact provides a more complete picture of the effects of international student spending.

A more detailed explanation of the analytical framework can be found in Appendix 1.

2.1. Number of International Students

In this report, the number of international students in the province is represented using data from IRCC indicating the number of study permit holders in the province during the calendar year of 2017. As shown in Figure 1 below, the number of international students has been increasing steadily over the past decade.

Figure 1: Number of International Students in B.C. and Annual Growth Rates, 2008 to 2017



Source: Immigration, Refugees and Citizenship Canada (IRCC)

During the earlier part of this ten-year period, annual growth rate (as shown in the right axis) peaked in 2012 at 9% and then the rate of growth slowed. Then from 2016 to 2017, the number of international students grew substantially by over 12%, due to the large number of students from India.

Table 1 shows the total number of international students in B.C. in 2017, with a breakdown by sector: students in public post-secondary institutions, private post-secondary institutions, and the K-12 system. For comparison purposes, we have also shown values in 2015.

Table 1 Number of International Students in B.C., by Sector, 2015 and 2017

	2015	2017	Percentage Change
Public Post-Secondary	45,690	59,985	31.3%
Private Post-Secondary	66,197	71,967	8.7%
K-12	16,958	20,438	20.5%
Total¹	128,845	152,390	18.3%

Source: Immigration, Refugees and Citizenship Canada (IRCC), Ministry of Advanced Education, Skills and Training and Ministry of Education.

2.2. Annual Spending by International Students

Table 2 shows the estimated sums of spending by international students in B.C. in 2017, with a breakdown by sector. Again we have shown the comparative value in 2015. The spending includes cost of education, as well as day-to-day living expenses.

Table 2 Estimated Annual Spending of International Students in B.C., by Sector, 2017 with comparable in 2015

	2015	2017	Percentage Change
Public Post-Secondary	\$1.36 billion	\$2.05 billion	51%
Private Post-Secondary	\$1.76 million	\$2.10 billion	19%
K-12	\$387.8 million	\$542.0 million	40%
Total	\$3.5 billion	\$4.7 billion	34%

Source: RKA.

Finally, in the last column of Table 2, we have shown the percentage increase in total annual spending of international students between 2015 and 2017.

¹ Sector breakdowns have been provided by the Ministry of Advanced Education, Skills and Training. Specifically, K-12 students, registered in the province’s public and independent schools in 2016/17 academic year, are from Ministry of Education’s Student Statistics Report; public post-secondary students, registered in the province’s publicly funded post-secondary institutions in the 2016/17 academic year, are from Ministry of Advanced Education, Skills and Training’s Student Transitions Project, Fall 2017 submission. Private post-secondary students are derived by deducting the number of K-12 students and public post-secondary students from the total number of study permit holders. It is also noted that the total number of students in 2015 has been revised as per IRCC data, as well as those in public post-secondary institutions. As such, the number of private post-secondary students has also been revised, since the 2016 Economic Impact Report.

2.3. Direct Economic Impact

Tables 3 to 5 present the estimated economic impact of international students in B.C. in 2017 in terms of direct contribution to provincial GDP and jobs supported, with a breakdown by sector. As in Tables 1 and 2, we also present comparable values in 2015. The impact also includes the values of government revenue due to student spending. It should be noted that direct tax revenue being assessed refers to personal income tax only.²

² In general, government revenues come from personal income taxes, indirect taxes less subsidies, corporate income taxes and natural resource royalties. In this study, we were able to estimate personal income taxes and indirect taxes.

Indirect taxes incurred in the process of producing outputs and services include both indirect taxes on production (such as property taxes) and indirect taxes on products (such as federal and provincial sales taxes).

Statistics Canada's expenditure model is capable of calculating the amount of indirect taxes incurred in the process of producing an industry's outputs and services. It should be noted that the model estimates tax revenue impacts for the combined direct and indirect impacts, and total (direct, indirect and induced impacts) scenarios only.

Statistics Canada's model does not automatically estimate personal income taxes. Instead, we derived the values by applying the average personal income tax rates in B.C. to labour income, which is generated in Statistics Canada's model.

Table 3 Direct GDP Impact of International Student Spending, B.C., 2017 with comparable in 2015

	2015	2017	Percentage Change
Public Post-Secondary	\$768.7 million	\$1,170.2 million	52%
Private Post-Secondary	\$999.5 million	\$1,196.6 million	20%
K-12	\$219.9 million	\$309.3 million	41%
Total	\$2.0 billion	\$2.7 billion	35%

Source: RKA, based on customized Statistics Canada Expenditure Model

Table 4 Direct Job Impact of International Student Spending, B.C., 2017 with comparable in 2015

	2015	2017	Percentage Change
Public Post-Secondary	11,328	15,541	37%
Private Post-Secondary	14,731	15,891	8%
K-12	3,241	4,107	27%
Total	29,301	35,538	21%

Source: RKA, based on customized Statistics Canada Expenditure Model

Table 5 Direct Tax Revenue Impact³ of International Student Spending, B.C., 2017 with comparable in 2015

	2015	2017	Percentage Change
Public Post-Secondary	\$76.7 million	\$107.6 million	40%
Private Post-Secondary	\$99.7 million	\$110.0 million	10%
K-12	\$21.9 million	\$28.4 million	30%
Total	\$198.4 million	\$246.0 million	24%

Source: RKA, based on customized Statistics Canada Expenditure Model

2.3.1. Regional Impact Analysis

In this sub-section, we provide estimates of economic impact by international students studying in different regions of the province in terms of their contribution to the provincial GDP, employment, and government revenue.

³ Impact refers to the estimated tax revenue generated from personal income taxes associated with labour income only.

For the purposes of this analysis, we have used the boundaries of eight Development Regions in the province. We have one region for Southern Interior which combines Thompson/Okanagan and Kootenay Development Regions, and another region for Northern B.C. which combines Cariboo, Nechako, Northcoast, and Northeast Development Regions. It is noted that allocation of international students by Development Region is based on study permit data produced by IRCC, and as such is different from the way students were allocated in prior studies. Therefore, the regional impact estimate for international students in this update cannot be directly compared with impact values in prior studies.

In the table below, we have shown the regional shares of student population, the estimated number of international students in each region, and their aggregate expenditure. The number of international students in each region is based on IRCC’s calculation of the number of study permit holders by destination. Summing up the number of study permit holders in each destination across the province resulted in a total headcount of international students of 155,585 in 2017. However, total number of international students in the province (152,390 as reported in this study) is based on IRCC’s count of “total unique persons,” which means some study permit holders held more than one permit during the year as he/she studied in a different region in the province. The “regional share” reported in Table 6 is calculated by dividing the number of study permit holders in each region by the “total unique persons” in the province. Therefore, the total of “regional shares” is 102.1%. However, the allocation of total annual international student expenditure to regions is based on “unduplicated” regional shares of the international student population.

Table 6 Estimated Number of International Students in B.C. and Annual Spending, by Region, 2017

	Regional Share	Number of Students ⁴	Annual Spending
Mainland/Southwest	75.3%	114,760	\$3,459 million
Vancouver Island/Coast	11.2%	17,110	\$515.8 million
Southern Interior	7.3%	11,075	\$333.8 million
Northern B.C.	2.1%	3,155	\$95.1 million
Total *	102.1%	152,390	\$4.7 billion

Source: RKA based on IRCC study permit holder data in 2017 calendar year by province of destination.

** Regions’ subtotal does not add up to Total as Total includes “regions unknown.”*

⁴ The number of international students in each region is based on IRCC’s data on the number of study permit holders by destination. However, “total” of all regions is a count of “total unique persons.”

**Table 7 Direct Economic Impact of International Student Spending in B.C.,
by Region, 2017**

	GDP	Jobs	Tax Revenue
Mainland/Southwest	\$1,973.9 million	26,213	\$181.5 million
Vancouver Island/Coast	\$294.3 million	3,908	\$27.1 million
Southern Interior	\$190.5 million	2,530	\$17.5 million
Northern B.C.	\$54.3 million	721	\$5.0 million
Total *	\$2.7 billion	35,538	\$246.0 million

Source: RKA, based on customized Statistics Canada Expenditure Model

** Regions' subtotal does not add up to Total as Total includes "regions not stated"*

2.4. Comparison of International Education Services in B.C. with Other Export Trade

We start this sub-section by presenting the number of international students in B.C. by top source markets, followed by the estimated values of their annual spending. We will compare the value of annual spending by international students with the values of B.C.'s exports of goods to these markets. We will also compare the value of total expenditure in international education services in the province with the total export of goods from B.C.

The table that follows details the number of international students by top ten source markets. We have also shown comparable values in 2015.

Table 8 Number of International Students in B.C. by Top Source Markets, 2015 and 2017

	2015	2017	Percentage Change
China	50,395	47,905	-4.9%
India	12,040	29,735	147.0%
South Korea	12,660	12,710	0.4%
Japan	6,545	6,840	4.5%
Brazil	4,520	5,810	28.5%
United States of America	4,725	5,330	12.8%
Mexico	3,335	4,365	30.9%
Vietnam	1,925	3,700	92.2%
Taiwan	2,440	2,465	1.0%
Saudi Arabia	4,300	2,450	-43.0%
Top Ten Source Markets	102,885	121,310	17.9%
All Markets	128,845	152,390	18.3%

Source: IRCC

In general, international students from the top 10 source markets account for more than three-quarters of all international students coming to study in B.C.

By multiplying an average total expenditure per student in 2017 (approximately \$30,780) by the total number of international students in each of the top ten source markets, we have calculated the total amount of export of international education services from B.C. to each of these markets. This is summarized in Table 9.

Table 9 Total Value of International Education Services by Top Source Markets, 2017

	2017
China	\$1,474,337,000
India	\$915,132,000
South Korea	\$391,166,000
Japan	\$210,510,000
Brazil	\$178,810,000
United States of America	\$164,038,000
Mexico	\$134,338,000
Vietnam	\$113,872,000
Taiwan	\$75,864,000
Saudi Arabia	\$75,402,000
Top Ten Source Markets	\$3,733,469,000
All Markets	\$4,689,996,000

Source: RKA

It should be noted that we do not have detailed information regarding the distribution of students by source market in different levels of study. As such we have calculated the value of international student spending for students in each market by applying an average total spending value for all students.

Note that the amounts generated as shown here in Table 9 are underestimates of the “true” amount of B.C.’s exports of educational services as we are only accounting for the number of students who stay in the province to study with a study permit. We have not accounted for the province’s export of educational services in the form of setting up programs on campuses outside of Canada. In addition, because we use data from IRCC to represent the number of international students in the province during the year, we may not have captured the impact of short-term students who study for fewer than six months without a study permit.

We have further compared B.C.’s export of international education services with other export of goods from B.C.⁵ They are shown in Table 10.

⁵ The data on export of goods is available at: <http://www.ic.gc.ca/tdo>. The time period is 2017. Product Search is “Top 25 Product Groups – HS2”.

Table 10 Comparison of International Education Services with Top Exports in Goods from B.C., 2017

	Value of Export (in thousands of dollars)
27 - Mineral Fuels, Mineral Oils, Bituminous Substances and Mineral Waxes	\$10,932,821
44 - Wood and Articles of Wood (Incl. Wood Charcoal)	\$9,578,690
International Education Services	\$4,689,996
47 - Pulp of Wood and The Like; Waste and Scrap of Paper or Paperboard	\$3,587,847
26 - Ores, Slag and Ash	\$2,844,531
84 - Nuclear Reactors, Boilers, Machinery and Mechanical Appliances	\$2,097,840
76 - Aluminum and Articles Thereof	\$1,428,155
03 - Fish, Crustaceans, Molluscs and Other Aquatic Invertebrates	\$1,271,337
85 - Electrical or Electronic Machinery and Equipment	\$1,068,871
79 - Zinc and Articles Thereof	\$1,059,413
87 - Motor Vehicles, Trailers, Bicycles, Motorcycles and Other Similar Vehicles	\$924,075
Total (All Products) – Excluding International Education Services	\$44,497,297

Source: Trade Data Online; RKA

In Table 11, we present the comparison of the value of annual spending of international students in B.C. in a year by top source markets with the value of export of goods from B.C. to these markets.

In 2017, the value of international education services in B.C. amounted to the equivalent of 10.5% of the total value of B.C.'s export in goods. By comparison, in 2015 in which we presented the similar metric, the value of international education services in B.C. amounted to the equivalent of 9.5% of the province's total value of export in goods.

Table 11 Comparison of International Education Services in Top Source Markets with Exports in Goods to these Markets from B.C., 2017

	Export of International Education Services	Export in Goods	International Education Services as % of Export in Goods
China	\$1,474,337,000	\$6,887,487,000	21.4%
India	\$915,132,000	\$1,062,091,000	86.2%
South Korea	\$391,166,000	\$2,888,221,000	13.5%
Japan	\$210,510,000	\$4,531,563,000	4.6%
Brazil	\$178,810,000	\$290,097,000	61.6%
United States of America	\$164,038,000	\$22,205,297,000	0.7%
Mexico	\$134,338,000	\$261,751,000	51.3%
Vietnam	\$113,872,000	\$217,957,000	52.2%
Taiwan	\$75,864,000	\$722,774,000	10.5%
Saudi Arabia	\$75,402,000	\$43,702,000	172.5%
Top Ten Source Markets	\$3,733,469,000	\$39,111,270,000	9.5%
All Markets	\$4,689,996,000	\$44,497,297,030	10.5%

Source: RKA; Statistics Canada.

2.5. Combined Direct and Indirect Economic Impact

As described at the beginning of this section, the combined direct and indirect impact of spending of international students on the provincial economy can be viewed as a more complete picture of the extent of such impact. The combined direct and indirect impact will measure not only the increased economic activities of those industries due to such spending, but also how the initial demand for a product creates a chain effect down the production process.

Tables 12 to 14 present the values of combined direct and indirect impacts of international student spending on provincial GDP, jobs, and government tax revenue. It is noted that the type of taxes captured in the Statistics Canada economic simulation model for combined direct and indirect impacts are indirect taxes. In the following three tables, we have calculated the tax impact from both personal income taxes and indirect taxes incurred during the process of production.⁶

⁶ In general, government revenues come from personal income taxes, indirect taxes less subsidies, corporate income taxes and natural resource royalties. In this section on combined direct and indirect impacts, we were able to estimate personal income taxes and indirect taxes.

Table 12 Combined Direct and Indirect GDP Impact of International Student Spending, B.C., 2017

	2017
Public Post-Secondary	\$1,462.1 million
Private Post-Secondary	\$1,495.0 million
K-12	\$386.4 million
Total	\$3.4 billion

Source: RKA, based on customized Statistics Canada Expenditure Model

Table 13 Combined Direct and Indirect Job Impact of International Student Spending, B.C., 2017

	2017
Public Post-Secondary	18,962
Private Post-Secondary	19,388
K-12	5,011
Total	43,361

Source: RKA, based on customized Statistics Canada Expenditure Model

Table 14 Combined Direct and Indirect Tax Revenue Impact of International Student Spending, B.C., 2017

	2017
Public Post-Secondary	\$272.1 million
Private Post-Secondary	\$278.2 million
K-12	\$71.9 million
Total	\$622.2 million

Source: RKA, based on customized Statistics Canada Expenditure Model

Indirect taxes incurred in the process of producing outputs and services include both indirect taxes on production (such as property taxes) and indirect taxes on products (such as federal and provincial sales taxes).

3. Conclusions

During the year 2017, B.C. was home to approximately 152,390 international students. This represents an 18% increase in the number of international students studying in the province over 2015. Almost 39% of these students were studying in public post-secondary institutions, while just under half of these students were studying in private post-secondary sector. The province's K-12 system hosted about 13% of all international students.

The economic contribution of international student spending is substantial to our provincial economy. The total spending of these students was estimated to be almost \$4.7 billion during 2017. This directly translates to approximately \$2.7 billion contribution to the provincial GDP, 35,500 jobs, and \$246 million of personal tax revenue to governments.

When we account for both the direct and indirect impact of international student spending, the contribution is even more substantial. The combined direct and indirect impact is valued to be \$3.3 billion worth in contribution to the provincial GDP, 43,400 jobs, and \$622 million tax revenue to all levels of government.

Most people think of traditional sectors like logging and forestry, or oil and gas, or mining, when asked what supports the B.C. economy. It is important to point out that international student spending in our province is also an export of our services, and the contribution of this sector is at least as great and in some cases, greater than the export of some goods. When we compare the value of international education services with our merchandise export, we can clearly see the importance of its value.

For example, the value of international education services exceeded the value of B.C.'s export of pulp and paper products, or fishery products, among many others. In fact, the value of international education services in B.C. amounted to the equivalent of 10.5% of the total value of B.C.'s export of goods during 2017.

Appendix 1 Notes on Data Sources and Methodology

International Student Number

In this report, we use the number of “*study permit holders*” as a proxy to represent international students in B.C.

The Department of Immigration, Refugees and Citizenship Canada (IRCC) defines international students as “Temporary residents who entered Canada mainly to study and have been issued a study permit (with or without other types of permits). A study permit is an official document issued by an officer that allows someone who is not a Canadian citizen or a permanent resident to study in Canada. In general, a study permit is not needed for any program of study that is six months or less. For statistical purposes, a temporary resident is designated as an international student on the basis of IRCC’s determination of his or her “yearly status” – the main reason for which the person has been authorized to enter and stay temporarily in Canada during the year of observation. International students exclude temporary residents who have been issued a study permit but who entered Canada mainly for reasons other than study.”

The IRCC data therefore allows us to use the number of study permit holders as a proxy for the number of international students during a year.

For the purposes of this study, the IRCC data “reports the number of permit holders with valid study permit(s) in the calendar year. This is a unique count of all persons who held one or more valid permits on one or more dates between January 1st and December 31st.”

One limitation of using the IRCC data set to represent the number of international students is that the actual number of permit holders registering in a Canadian institution may be smaller than the number of permits issued, due to the fact that some permit holders may not be able to, or have chosen not to, continue to study in an education program.

Another limitation of the current IRCC data is the inability to break down the study permits holders by level of study in an accurate and reliable manner. In the absence of this data, B.C.’s Ministry of Advanced Education, Skills and Training has provided an estimate of the breakdown of study permits in three categories: public post-secondary, private post-secondary, and K-12, using available data sources.

One of the adjustments we have made for the students in the K-12 category was to further allocate them in the public or independent K-12 system based on shares derived from Ministry of Education data.

The allocation of student permit holders in the post-secondary system into finer categories of trade, college, undergraduate, master’s, Ph.D., and other types of programs is based on IRCC information.

Further allocation of registration status by full-time and part-time study for each type of student has been based on Statistics Canada’s CANSIM data series (Table 477-0019).

Student Expenditure

Tuition and Fees

For tuition and other fees at the K-12 level, we have relied upon information published in the CAPS-I report,⁷ as well as an annual inflation of 2% per year. Note these are based on tuition and fees in a school year (10 months). Tuition and fees in independent schools can be substantially higher. In this regard we have also used information available from the CAPS-I report to calculate average annual tuition and fees for independent school international students.

Detailed tuition and fees for full-time university level international students for each province are available from Statistics Canada's annual Tuition and Living Accommodation Costs (TLAC) survey.

In deriving student tuition and fees in the four levels of study other than "secondary or less" (i.e., post-secondary, which is further divided into trade/college, university (which is further separated to those in undergraduate and graduate programs), other post-secondary), we make the following assumptions:

- **University:** We have applied separate undergraduate and graduate tuition values from the TLAC to full-time undergraduate students and students in master's/Ph.D. programs.

Part-time students are assumed to take a 50% course load for the purposes of calculation.

In addition to tuition, we have included "additional fees" which represent compulsory fees universities imposed on both domestic and international students, such as facility fees, society fees, health and dental (for international students only) fees, student pass fees in some cases, and others. We also make an allowance of \$1,200 per academic year for books/tools/materials.

Tuition and fees are for an academic year (i.e., eight months).

- **Trade/College:** For full-time tuition, we apply a factor of 75% to the average university undergraduate tuition in each province. The factor of 75% is an approximation, and based on Web research conducted for selected college programs in each province to see how they compare to full-time tuition of an undergraduate program.

For part-time students, we have assumed a 50% course load.

We also assume that international students in "Trade" and "College" levels of study pay on average the same percentage (75%) of "Additional Fees" as university level

⁷ Canadian Association of Public Schools – International (CAPSI) (2015). "A Comparative Market Assessment of International K-12 Students in Canada."

international students. We also make the same allowance for books/equipment requirement (\$1,200) in a year.

- Other Post-Secondary: we have assumed that students in this category are mostly students in language training programs. We have used estimates of tuition and fees on a weekly basis derived from information provided by Languages Canada. We have also assumed that students in this category study for six months in the year in language training programs.

Living Expenses

For students in 2017, we have made the following assumptions:

- K-12: we have assumed that a student in the public school system pays an average homestay cost of \$867 per month for a 10-month period. Essentially we are assuming that students return to their home countries for summer vacation. For those in the private independent school system, we have assumed that three-quarters of these students pay an average homestay cost of \$867 per month, and one-quarter of these students are on full board with the school they attend.
- University: for full-time students, we use Statistics Canada's annual Tuition and Living Accommodation Costs (TLAC) survey data (to calculate the average costs of on-campus room and meal expenses for an eight-month period for students in the undergraduate, master's and Ph.D. programs). Then, values have been scaled up to full year (12 months) values. That is, we assume that international students in the university category stay in the country for 12 months, even though they may only take two semesters of courses.

For part-time students, we have assumed a monthly home-stay cost of \$867, for 12 months in a year.

We also make allowances for transportation costs for students staying in the province. We have applied data from Statistics Canada's Survey of Household Spending (SHS), detailing household spending on public transportation, by province and territory, in 2016. The values we use refer to the average expenditure per household using public transportation (households with or without using public transit).

- For students in other levels of study (trade/college), we have assumed that they spend the equivalent of what university students have to pay in an academic year (average room and meal and transportation costs).
- Other Post-Secondary: we have used information provided by Languages Canada pertaining to language training school students to estimate cost of room, food, and transportation.

In addition to basic living costs as presented above, we make an allowance of \$2,500 per student per year (\$1,500 for K-12 students) for discretionary expenses (such as eating out, recreational activities, and entertaining).

For students in each level of study, the formula to calculate gross expenditure is as follows:

Estimated number of students in that level of study x sum of (average tuition and additional fees, books, average room and meals, average transportation cost, average discretionary spending) per year = Gross Expenditure in one year for International Students in the level of study.

Analytical Framework

To capture the overall impact of international educational services on the provincial economy, expenditures of international students are applied to the Statistics Canada interprovincial impact simulation model.⁸ The model provides estimates of the overall impact on output, gross domestic products (GDP), and employment in each provincial/territorial economy.

A short description of the input-output model is provided below.

An Input-Output Structure of the Economy

When a person spends on a product (goods and/or services), that amount of expense creates a direct requirement for the production of that product. The economic impact, however, does not end there. The increased production of this product leads to increased production of all the intermediate goods and services that are used to make this product, and the increased production of intermediate goods and services will in turn generate more demand for other goods and services that are used to produce these intermediate products. As demand rises, workers are able to earn a higher wage, and they sometimes decide to spend a portion of their extra earnings to purchase more goods and services.

As such, an initial demand for a product creates a chain effect down the production process.

An economic impact analysis is designed to study such inter-linkage between industries in order to evaluate how a change in an initial demand for goods or services contributes to changes in other industries' levels of production and overall economic activity level within a region.

The input-output model is based on the input-output structure of the Canadian economy,⁹ which is essentially a set of tables describing the flows of goods and services among the various sectors of the economy. Such a model is useful in determining how much additional production is generated by a change in the demand for one or more products or by a change in the output of an industry.

Beyond the direct expenditures, input-output models can be utilized to analyze additional benefits to the economy. This includes businesses providing goods and

⁸ Statistics Canada catalogue product 15F0009X – Input-Output Model Simulations (Interprovincial Model).

⁹ Statistics Canada catalogue product 15F0042X – Provincial Input-Output Tables.

services to entities where direct expenditures occur. In addition, as a result of increased local household income, there may be further increases in overall expenditure. The latter is considered as a spun-off (or induced) impact, which is sometimes shown in economic impact studies.

Currently, Statistics Canada uses the 2014 interprovincial supply and use tables to estimate the economic impact, and the results are used for comparative analysis purposes. It should be noted that employment impact estimates from this model are based on the 2014 total compensation per job.¹⁰ As such, it was necessary to deflate the net student expenditures incurred in 2017 dollars to get a more accurate estimate of the employment impact.

It should be noted that even though we describe the impact assessment as that related to international students studying in B.C., direct economic impact is not attributed exclusively to educational services. In fact, in the expenditure model, total expenditures have been allocated to most industries, with the majority in universities and government education services; retail trade; transit and ground passenger transportation; finance, insurance, real estate and rental and leasing; food and beverage services; and arts, entertainment, and recreation.

In this study, we used exogenous shock values on final consumption expenditures from Statistics Canada's Input-Out economic impact simulation model. This is in recognition of the fact that expenditures are measured at purchaser's prices (meaning they include margins such as transportation, wholesale, retail, and taxes), whereas output is measured at basic prices. Also, expenditures may be supplied through imports. As such, all expenditures for goods and services must remove all taxes on products before an output multiplier can be applied.

Statistics Canada's current input-output economic impact simulation model does not estimate indirect tax revenue derived from products and production in its direct impact assessment. In this report, we have estimated tax revenue generated from personal income taxes associated with labour income.¹¹

¹⁰ Data is derived from Statistics Canada CANSIM table 383-0030 – labour statistics by business sector industry and by non-commercial activities consistent with the industry accounts, provinces and territories.

¹¹ Personal income tax values have been derived by applying average personal income tax rates in each province/territory by labour income. Average personal tax rates have been derived based on data available from Statistics Canada's CANSIM table 384-0040 - Current accounts - Households, provincial and territorial, annual.