



The Economic Impact of International Students Enrolled in Nova Scotia Universities: An Expenditure Analysis

Minister's Post-Secondary Education
Research Advisory Panel

Report Number 1, December 2009



DEC 15 2009

Honourable Marilyn More
Minister of Education
PO Box 578
2021 Brunswick Street
Halifax, NS B3J 2S9

Dear Minister More:

I am very pleased to transmit to you a study recently completed by the Post-Secondary Education Research Advisory Panel, entitled "The Economic Impact of International Students Enrolled in Nova Scotia Universities: An Expenditure Analysis".

This expenditure analysis employed a survey of international students studying at Nova Scotia universities, combined with other data, to measure how much international students spend while studying in Nova Scotia, and how much the province spends on those students, in order to ascertain the full economic impact of this group of students.

The study will be made publicly available on the Department's website and will serve as a valuable resource to the Province and our universities regarding international students.

Yours truly,



Wayne Doggett
Chair, Post-Secondary Education Research Advisory Panel

The Economic Impact of International Students Enrolled in Nova Scotia Universities: An Expenditure Analysis

Fazley Siddiq, Principal Investigator
Brandon Holterman, Warren Nethercote, Alasdair Sinclair, Allan White

Dalhousie University
School of Public Administration
6100 University Avenue
Halifax, NS B3H 3J5

Project Manager: Warren Nethercote

Prepared for
The Minister's Post-secondary Education Research Advisory Panel
Department of Education, Province of Nova Scotia

August 2009

ISBN 978-1-55457-329-5

This research project was carried out by the Dalhousie University School of Public Administration under contract from the Government of Nova Scotia and jointly funded by the Government of Nova Scotia and the Canadian Council on Learning. The opinions expressed herein are those of the authors and do not necessarily represent the views of the Government of Nova Scotia or the Canadian Council on Learning.

Abstract

The School of Public Administration, Dalhousie University, carried out a study of international students in Nova Scotia universities to analyze the economic impact of international students, conduct a cross-jurisdictional review of policies related to international students, and determine international students' intentions after graduation. The study used a survey of international students and a combination of the literature, government and university information. The initial economic impact of international students was found to be \$154 million per year, including an initial injection of \$91 million of new money to Nova Scotia. The total economic impact of international students was \$231 million after application of the spending multiplier. Generally, international students had positive impressions of Nova Scotia, suggesting that this group was a good candidate source of future immigrants who could help to address the Province's demographic challenges. The cross-jurisdictional review pointed to many examples of innovative policy instruments for international students such as coordinated cross-jurisdictional educational policies in the European Union or coordinated education and immigration policies in Australia. Key findings of the current study begin with the conclusion that it is in Nova Scotia's long-term and demographic interest to invest in attracting more international students. Since international students provide significant economic benefit to Nova Scotia, spending over three dollars for every one spent by Government, current limits on funding of universities for international students through the university funding formula seem to be incongruous. Registration targets for international students might be more appropriate. Similarly, the current policy with respect to differential fees may be at cross purposes with Nova Scotia's Immigration Strategy.

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Executive Summary

Background

Nova Scotia faces a demographic challenge. Over the next 25 years, Nova Scotia's population is forecast to grow negligibly, compared to a forecast of over 20 percent growth for all of Canada. Immigration offers a solution to this challenge, but Nova Scotia's performance in this regard has not been good. Across the last four Canadian censuses, the proportion of foreign-born residents of Nova Scotia was approximately one-quarter of the proportion for Canada at large. Sustained long-term economic growth requires a growing, well-educated workforce to support future knowledge-based activities. Unfortunately, Nova Scotia's population is aging, and the university-age population, the very engine of a knowledge-based economy, is expected to fall 30 percent in the next 20 years (McNiven, 2008).

The study used an expenditure-based approach to determine the economic impact of international students in Nova Scotia. A survey was used to estimate expenditure *by* international students, as well as providing information on demographics and student intentions. Government and university data, primarily from published university accounts, were used to estimate expenditure *for* international students. The sum of expenditures by and expenditures for international students provided the initial economic impact. The literature provided guidance on spending multipliers used to determine the total economic impact of international students.

Results

A cross-jurisdictional review revealed a competitive international market for international students, in which Canada attracts only a five percent share of students. Across the globe, international students are valued, both as economic assets and as potential future immigrants who will be well-prepared to contribute to knowledge-based economies. Australia, Belgium, Canada, and the United Kingdom are the only nations charging differential tuition fees to international students. All others treat international and native students equally, in recognition of their benefit culturally and economically, and to maximize opportunities to attract future immigrants. Immigrants augment and maximize the stock of human capital which is diminishing in some jurisdictions due to demographic trends.

The initial economic impact of international students was found to be \$154 million in 2008-09, including an initial injection of \$91 million of new money to Nova Scotia. The total economic impact of international students was \$231 million in 2008-09 after application of the spending multiplier. The direct spending by international students averaged \$28,500 during the same period. International students spent nearly double the amount spent for their benefit by government, university and private sources. International students spend over \$3.40 of new money in Nova Scotia for every dollar spent by the Government of Nova Scotia on their education and health care.

International students in Nova Scotia are generally satisfied with Nova Scotia and with Nova Scotia universities and fully half of the survey respondents expressed interest in applying for

permanent residence in Canada. Whether so many international students do indeed apply for permanent residence is not known.

Significance

International students think highly of Nova Scotia and its universities; therefore, they are ideal candidates for immigration, particularly when approximately half express interest in applying for permanent residence in Canada. International students can help offset Nova Scotia's demographic challenge. Furthermore, international students represent an economic benefit to Nova Scotia, so that policy-based incentives to encourage greater numbers of international students are feasible. But Nova Scotia's retention of immigrants is poor, and so applying for permanent residence in Canada does not necessarily imply that graduates will remain in Nova Scotia.

Summary and Conclusions

The results and significance of the study produced a number of key findings:

- International students are a qualified target group for increasing immigration to Nova Scotia; among other things, they demonstrate adaptability and skills valued by Canada's immigration policies.
- A university 'portal,' rather like the one available in the United Kingdom, would promote and simplify the application process for those international students applying to Nova Scotia universities.
- The economic benefit of international students to Nova Scotia makes current limits on funding of universities for international students through the university funding formula seem to be incongruous. Registration targets for international students might be more appropriate.
- Universities collected nearly \$19 million in differential fees from international students in 2008-09. Such fees may be at cross purposes with Nova Scotia's Immigration Strategy. Absence of such fees might be a powerful differentiator for Nova Scotia Universities.
- Medical Services Insurance for eligible international students costs Nova Scotia less than \$90 per student per year. It would be an attractive and inexpensive differentiator to offer MSI at no cost to all international students immediately upon their arrival.
- The international competitiveness of Nova Scotia universities would be strengthened if their programs were aligned with those in higher education areas such as the European Union.

Acting on findings such as these would bring multiple benefits. It would address the decline of the university-age population in Nova Scotia, thus supporting a more knowledge-based economy. It would increase the number of international students in Nova Scotia, and bring increased direct benefit to the economy. Last but not least, it would increase satisfaction levels of already-satisfied international students, encouraging them to stay in Nova Scotia, addressing the Province's demographic challenge.

Fazley Siddiq, Brandon Holterman, Warren Nethercote, Alasdair Sinclair, Allan White. 2009. *The Economic Impact of International Students Enrolled in Nova Scotia Universities: An Expenditure Analysis*. School of Public Administration, Dalhousie University.

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Acknowledgements

The authors appreciate the input provided by the Nova Scotia Department of Education's Steering Committee for the project, and particularly the direct support of Ms. Xiaodan Pang, the Project Authority, who provided information held by, or available only through the Government of Nova Scotia. The support and involvement of the International Student Coordinators at the 11 Nova Scotia universities was critical to the execution of the survey of international students. Fernando Cartwright of the Canadian Council on Learning (CCL) provided technical support on use of the CCL's ECHO survey tool for the on-line survey and Terri Thompson of CCL provided scans of literature databases as the first stage of literature review. Ms. Judy Baroni, of the Dalhousie University School of Public Administration, provided considerable SPSS support and performed the 'horizontal' analysis of expenditures by students in Appendix B4.

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1. Introduction

The Nova Scotia Department of Education, in collaboration with the Canadian Council on Learning, contracted the School of Public Administration at Dalhousie University to study international students in Nova Scotia universities. The study had three objectives:

- understanding the economic impact of international students in Nova Scotia;
- reviewing policies relating to international students in different jurisdictions; and,
- determining international students' intentions after graduation.

1.1 Motivation

In the modern era of knowledge-based economies, the sustainability of long-run economic growth has become extremely dependent on the availability of high quality human capital (Van Leeuwen & Foldvari, 2008, p. 7). Industrialized countries such as Canada are facing demographic declines and looming labour shortages. For example, it is estimated that the province of Nova Scotia will have fewer workers than the number of jobs potentially available for them over the next decade (McNiven, 2008).

Immigration is one way of dealing with the impending shortage of human capital. Individuals from foreign countries can come to Canada under a variety of immigration classes, or as international students who may subsequently apply for permanent residence. Governments in regions such as Nova Scotia are currently reviewing their immigration and education policies in order to ensure that they are properly designed to meet the challenge.

This study investigates the international higher education industry – which is a substantial and growing export business – and measures the impact international students can have on a region's economy and on the sustainability of long-run economic growth. Recent studies have argued that universities in Nova Scotia should adopt an increasingly international outlook (Gardner Pinfold, 2006). This study aims to provide some background information about the international education industry, to provide insight into global trends and government initiatives taking place abroad, and to demonstrate the overall economic benefits associated with international students. Finally, the report aims to communicate this information in a clear, coherent and comprehensive manner so that the policy makers within Nova Scotia can develop the best policies for attracting, integrating and retaining international students in the region.

1.2 Scope of the Study

This study examines international students registered at Nova Scotia Universities during the fall term of 2008-09.

The study captures demographic data and students' intentions using an on-line survey addressed to all international students, and most importantly, expenditures by those students while in Nova Scotia. These expenditure data are used, together with data from Government and university sources, to estimate the economic impact of international students in Nova Scotia. The survey and expenditure analysis are supported by literature and cross-jurisdictional reviews of international students and government policies relating to them.

The study concludes by drawing attention to a number of key considerations about international students that will inform policy makers in Nova Scotia.

1.3 Organization of the Report

This report is organized in six sections, three annexes and a reference list. Following the Introduction, Section 2 provides a review of the literature and presents necessary background information for the study. This includes a review of the demographic challenges in developed nations, the growth of numbers of international students internationally, a cross-jurisdictional review of education and immigration policies, and a review of the economic benefits of international students.

Section 3 describes the methodology and study design for the analysis of expenditures by and for students. The section also includes a discussion of the spending multiplier and of the design of the survey. This section provides the basis for determining the economic impact of international students in Nova Scotia.

Section 4 describes the data sources and characteristics for the study. It begins with a description of the sample for the survey of international students, and concludes with a description of secondary data sources. In both cases, the discussion includes consideration of challenges arising from the information.

Section 5 describes the analysis of primary and secondary sources, together with the findings of that analysis. Survey responses are analyzed and presented in five ways: as demographic profiles, as university profiles, as student intentions, as categories of student comments, and as expenditures by students. Expenditures for students are derived from secondary sources, either university or Government. Section 5 closes by determining the economic impact of international students by combining expenditures by and for international students, and by applying the spending multiplier.

Finally, Section 6 presents a summary and conclusions arising from the study, to inform policy makers in Nova Scotia of significant considerations concerning international students.

Detailed descriptions of the survey of international students and of the expenditure analyses are provided in Annexes. Secondary sources are identified in a Reference List.

The Literature Review provides a broad foundation for this expenditure analysis in the following section.

2. Literature Review

International students represent a growing component of higher education, world wide. This section will review the literature on international students, specifically, important demographic challenges, the market for international students, government policies related to international students, and the economic benefits of international students.

2.1 Demographic Challenges

Many industrialized countries are forecasting declines in population growth rates due to low birthrates and aging populations. These declines will result in serious labour shortages in the coming years (Verbik & Lasanowski, 2007). For example, it is estimated that sometime towards the middle of the next decade, “the number of people willing and available to work in Canada will be smaller than the number of jobs potentially available for them” (McNiven, 2008, p. 1). McNiven (2008, p.5) also referred to reports that suggest the provinces of Ontario and Quebec are likely to experience a shortfall of 325,000 and 292,000 workers by 2025, respectively (“Ontario’s Impending Labour Crunch,” 2007; Conference Board of Canada, 2007).

In Atlantic Canada, population growth rates have declined continuously since 1945, and at the provincial level have largely stagnated, or even turned negative, in the early years of the 21st century (Metropolis, 2008, p. 8). The stagnation of Atlantic Canada’s population is largely due to declining fertility rates, the aging of the resident population and out-migration, especially of young people. These factors, combined with a looming skills shortage have made immigration one of the top public policy issues in Atlantic Canada over the last five to ten years (Murphy & deFinney, 2008, p. 3).

Although the Atlantic Provinces’ population remained relatively stable between 2001 and 2006, having dropped trivially (0.04 percent), the national average population increased by 5.4 percent during the same period (Statistics Canada, 2007). During the previous Census period (1996 to 2001), the Atlantic Provinces’ population decreased by 2.1 percent (48,000 inhabitants) while the national average population increased by 4.0 percent (Statistics Canada, 2001). In fact, the Atlantic Region’s percentage of the Canadian population has declined continuously during the past half century (Denton, Feaver & Spencer, 1998). Statistics Canada projects that the Atlantic Provinces’ population will only grow 2.5 percent between 2005 and 2031, a small fraction of the 20.9 percent growth that is projected for the overall Canadian population during the same period (Munro, 2007, p. 5). It is projected that the labour force in Nova Scotia, New Brunswick and Newfoundland and Labrador will fall between 2006 and 2031 (Martel et al., 2007, table 2; Evernden, 2008, p. 13). McNiven (2008, p.7) offers a more pessimistic projection than Statistics Canada, that Nova Scotia’s population will decline by 4.6 percent, or 43,000 people by 2026, dropping from 938,000 in 2004 to 895,000 in 2026. McNiven’s projection assumes no net migration, so that the effects of death rate exceeding birth rate are directly reflected in population decreases; this assumption of no net migration is considered unnecessarily conservative.

The aging of the population in Atlantic Canada is a major factor behind the stagnation of population growth. Like the rest of Canada, the Atlantic Provinces have an aging population due to the postwar baby boom, and the subsequent baby bust. In addition, certain provinces such as Nova Scotia feature a population that is older than the Canadian average. Recent reports have estimated that the number of people age 65 years or older in Nova Scotia will increase by over 70 percent by 2026 – growing from 128,000 in 2001 to 218,000 in 2026 – and that the university-age population (18 to 22 years of age for undergraduates) will decline by nearly 30 percent – falling

from 73,000 in 2001 to 51,000 in 2026 (McNiven, 2008, p. 8; McNiven et al., 2006). Nova Scotia's natural increase in population (births minus deaths) has been declining significantly since the start of the 1990s. This is mainly due to a low fertility rate (1.4 in 2004), which is well below the replacement rate of 2.1 (McNiven et al., 2006, p.2).

The stagnation of Atlantic Canada's population is also due to the region's disproportionately small share of immigrants to Canada (Evernden, 2008). Between 2004 and 2006, Atlantic Canada accounted for 7.2 percent of the total Canadian population (Statistics Canada, 2007a) yet its share of national immigration was only 1.7 percent (CIC, 2006). Overall, immigrants make up about 3.4 percent of the population in Atlantic Canada, compared with about 20 percent for Canada as a whole (Metropolis, 2008, p. 8).

Immigrants help lower the average age of the population and increase the number of people in Atlantic Canada's labour force. For example, more than 75 percent of immigrants coming to Atlantic Canada between 2001 and 2006 were less than 45 years of age, while only about 55 percent of the total population in 2006 was in that age group (Metropolis, 2008, p. 8). Recent immigrants have accounted for nearly 45 percent of the growth in Atlantic Canada's labour force (Metropolis, 2008, p. 8).

Between 2001 and 2005, the Atlantic Provinces welcomed over 15,000 immigrants (CIC, 2006a). About half of the immigrants to the Atlantic Provinces settle in Nova Scotia (Metropolis, 2008). Citizenship and Immigration Canada has recently stated that "were it not for immigration, populations in all four provinces would be static or in decline" (CIC, 2008). Similarly, Metropolis (2008, p. 8) estimates that in absence of immigration, the Atlantic region's population would be 25,000 lower than it currently is. Demographic trends for Nova Scotia suggest that immigration is needed to sustain population growth.

2.2 The Growth of International Student Numbers

To understand the importance of international students regionally or locally, it is first necessary to examine global trends in international student mobility, and global trends in international student enrolment. Such a global examination provides a strong foundation upon which to assess the performance of Nova Scotia.

The literature defines international students as those students studying outside their home countries. The number of international students is the subject of much debate; however, there is general agreement that the number of international students has increased dramatically over the course of the past decades and will continue to rise significantly in the foreseeable future. Verbik and Lasanowski (2007, p.1) find that there were 2.7 million international students in 2005, which represents a 61 percent increase since 1999 and a more than fourfold increase from 1975. Moreover, the total number of worldwide tertiary enrolments was 40 percent higher in 2007 than it was in 2000 (Verbik & Lasanowski, 2007, p. 1). Other studies arrive at similar estimates and projections. For example, UNESCO estimates that there were two million international students in 2005 with an expectation of growth to five million by 2020 (Adrian Kershaw Consulting, 2005, p. 9). Similarly, an Australian study projects that the demand for higher education would triple between 2000 and 2025 to an estimated 7.2 million students (Verbik & Lasanowski, 2007, p.1).

The number of international students in Canada has grown considerably over the past few decades. Canada had 37,000 international students in 1980, 57,000 in 1990, and nearly 145,000 in 2002 (IPSEA, 2005, p.2).

Atlantic Canada’s 17 universities have become increasingly outward looking with regards to their student populations. This has resulted in the growth rate of the number of students from other regions of Canada and from other countries outpacing the growth rate of students from within Atlantic Canada at most institutions. This increasingly outward-looking focus has been largely driven by a projected decline of the university age population in the region (Gardner Pinfold, 2006). Between 1996 and 2005, the annual inflows of international students coming to the Atlantic Provinces doubled, from 1,500 to 3,000 (Metropolis, 2008, p. 10). As illustrated by Figure 1, enrolment of international students in Nova Scotia increased by 113 percent (from 1,839 to 3,915 students) between 1991 and 2007.¹

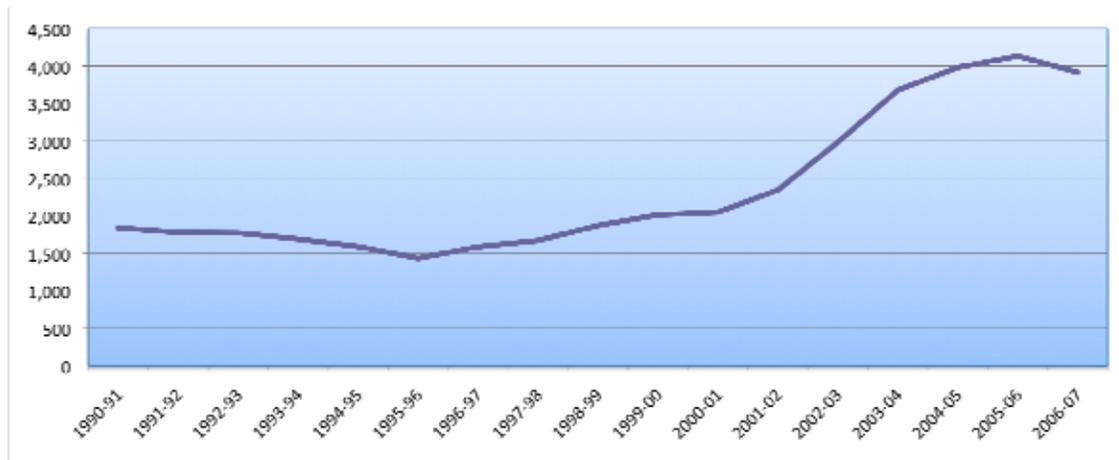


Figure 1: Number of International Students in Nova Scotia Universities, 1991-2007 (from NS Department of Education, 2008)

2.2.1 Increased Mobility and the Convergence of Knowledge

The growth of international student numbers is part of a larger global phenomenon of increased mobility and the convergence of knowledge. In the past, human capital was fairly immobile. People tended to remain in their country of birth for the majority of their lives; alternatively, if they left their country of origin, they generally stayed in their adoptive country (Tung, 2008). In recent years, there has been a global trend towards increased mobility due to the globalization of the world economy and reduced barriers to the movement of people between most countries of the world (Tung, 2008). Nowadays, people routinely leave their home country to study and/or work abroad, and then bring their increased human capital back to their country of origin. This global trend leads to a phenomenon of “brain circulation” as described by Tung (2008, p. 469):

¹ Information taken from Data Tables provided by NS Department of Education (Fall 2008).

Thus, the concepts of ‘brain drain’ and ‘brain gain’ – whereby one nation’s gain becomes another country’s loss – appear to become less relevant as they are replaced by that of ‘brain circulation’ or ‘triangular human talent flow’.

The increasing adoption of advanced technology together with rising levels of education (Conrad, 2007) in developing countries is contributing to a global convergence of knowledge. As this knowledge base continues to grow in developing countries, so does competition for skilled labour, and by extension, international students. Knowledge has become perhaps the most important determinant of economic success, further intensifying the need for skilled labour. As stated in a World Bank Report (1999):

For countries in the vanguard of the world economy, the balance between knowledge and resources has shifted so far towards the former that knowledge has become perhaps the most important factor determining the standard of living – more than land, than tools, than labour. Today’s most technologically advanced economies are truly knowledge-based (World Bank, 1999, p. 16; Australian Government, 2008, p. 88).

To maximize the economic potential of the international education industry, it is important to understand the geographic areas to which international students are going, as well as from where they are coming. Currently, the majority of foreign students enrolled in higher education choose to study in certain well established countries. In 2004, G-8 countries hosted approximately two-thirds of all international students, with 52 percent enrolled in four countries: the United States (22 percent), the United Kingdom (11 percent), Germany (10 percent), and France (9 percent) (National Center for Educational Statistics, 2007, p. 12). The same NCES publication reported that Canada hosted five percent of all international students in the world, but used data from 2002 (p. 13). Within Canada, the top three provinces of destination for international students have always been Ontario, British Columbia and Quebec (IPSEA, 2005). This is consistent with immigration trends in general (CIC, 2006).

Among the top six receiving countries, the United States experienced the lowest growth in international student enrolment between 1999 and 2005 with 17 percent. During this same period, enrolment grew by 29 percent in the United Kingdom, 42 percent in Australia, 46 percent in Germany, 81 percent in France and 108 percent in Japan (American Council on Education, 2006, p. 1).

Asia is the leading source for international students coming to Canada with nearly half in 2001 originating from Asian countries (IPSEA, 2005, p. 7). This proportion will likely rise in the future, based on the notion that post-secondary participation rates are anticipated to increase dramatically in developing nations over the next 20 years. For example, China is expected to increase participation rates from 4 percent in 2005 to 19 percent in 2020 (Adrian Kershaw Consulting, 2005, p. 9). Moreover, Asia is widely considered to have by far the top growth potential of all regions of the world and is expected to account for approximately 70 percent of global demand in 2025 (Verbik & Lasanowski, 2007, p. 1).

In 2004-05, universities in Atlantic Canada welcomed over 6,100 international students from about 160 different countries. In 2005, the top five source countries for international students studying in Atlantic Canada were China, the United States, Bermuda, Korea, and Japan (Metropolis, 2008; Metropolis, 2008a, p. 172). According to the Nova Scotia Department of Education, in 2006-07, the top five source countries for international students in Nova Scotia were China, the United States, Bermuda, Bahamas, and Germany. The top three source regions

for Nova Scotia were Asia (48.3 percent), the Caribbean (16 percent), and North America (9 percent).²

2.2.2 The Market for International Students

As noted earlier, the number of international students has risen dramatically in recent decades. This rise can be explained by higher participation rates from developing countries and by the fact that most jobs in the global knowledge economy require educational qualifications at the tertiary level. Yet, as the number of international students has increased, so has the market for their enrolment become increasingly competitive.

Developing countries such as China and India, once thought of as “sending countries”, are building their indigenous higher education capacity and are encouraging students to stay home for their education so as not to lose them to the United States (NAFSA, 2006). China invested heavily in higher education beginning in the late 1990s with the goal of making nine top Chinese universities world-class. This investment appears to be having the desired effect as Chinese students are citing the improvement of Chinese higher education as an important factor in their decision to stay home for advanced study (Gribble, 2008). New competitors in Asia and the Middle East have also entered the market with declared ambitions to become regional education centres “by attracting as many as several hundred thousand international students” to their countries (Verbik & Lasanowski, 2007, p. 2). Furthermore, these newly emerging education centres – such as Singapore and Dubai – have the resources necessary to recruit high quality faculty members from universities around the world.

New competitors in the international student market are starting to set recruitment targets: Malaysia wants to attract 100,000 international students by 2010 (up from 45,000 in 2005); Jordan plans to have 100,000 by 2020; Singapore would like 150,000 by 2015; China seeks to host 300,000 by 2020; and Japan has set the ambitious goal of hosting one million foreign students by 2025 (up from the current 120,000) (Obst, 2007, ¶ 12). Furthermore, many countries that are recruiting foreign students are providing them with incentives to join the workforce of the host country, an approach that Guruz (2008, p. 142) has called “human resources development through *brain power*”.

This has negatively affected enrolments in the traditional receiving countries (American Council on Education, 2006). A 2007 study from the United Kingdom states that:

Developments over the past 5 to 6 years demonstrate both that overall predicted student numbers have not been as high as expected and that international student demand might not continue to focus on what have been the main destinations in the past. The United States, the United Kingdom and Australia have all experienced either a decline in enrolments or a “slump” in the growth experienced in previous years (Verbik & Lasanowski, 2007, p. 2).

In the modern era of knowledge-based economies, the sustainability of long-run economic growth has become extremely dependent on the availability of high quality human capital (Van Leeuwen & Foldvari, 2008). International students offer a source of human capital and many countries around the world depend on them for economic development. Verbik & Lasanowski (2007, p.2) state that Canada – with one of the lowest birth rates in the OECD – is expected to become

² Information taken from Data Tables provided by Nova Scotia Department of Education (Fall 2008).

increasingly reliant on international students and skilled immigration to the country in order to boost the labour force.

2.3 Education Policies

In response to the increased competitiveness of the international student market, governments around the world are developing new and innovative policies to help attract and retain international students. Some of these policies are clearly within the educational regime, but others address immigration issues that are just as important. The following cross-jurisdictional review examines the leading international education policies, such as the European Higher Education area created by the Bologna Process and the efforts in Australia to align education and immigration policies to attract more international students. National policies that aim to create coordinated whole-of-government approaches towards the recruitment of international students, such as those established in France and the United Kingdom, are also discussed. In addition, this literature review examines university funding across Canada and other factors that influence a student's decision to study in a particular country, such as differential tuition fees.

2.3.1 Multi-national Policies (Higher Education Areas)

Various countries are collaborating on coordinated education policies in order to make certain geographic regions more attractive destinations for international students. The most influential and innovative example of such initiatives is found in Europe. The Bologna Process was established in 1999 to facilitate the convergence of higher education across the European Union (EU) by 2010. The Bologna Process seeks to make the EU “the most competitive and dynamic knowledge-based economy in the world by 2010” (The Europe Unit, 2005, p.9). It has significant political support within Europe and applies to around 4,000 institutions hosting 16 million students (Australian Government, 2006; Adelman, 2008).

The Bologna Process is a commitment by 45 countries across Europe to harmonize their systems and structures of higher education in order to create an integrated European higher education area (EHEA). The EHEA is not intended as a unitary European system of higher education. Rather, it is a “space” in which national systems possess common key features, in which qualifications offered by institutions in the EHEA are easily recognized and assessed by institutions and employers. This offers a high level of mobility to students and staff seeking education or employment (Australian Government, 2006, p. 4).

Since the initiative is still unfolding, the impact of the Bologna Process is still unknown; however, the aggregate total of current international student enrolment in 36 of the 45 member countries, for which data are available, is 1.1 million, nearly half of all international students worldwide (American Council on Education, 2006, p. 12). The Bologna Process is claimed to have “made Europe, overnight, a major competitor in the international student market” (NAFSA, June 2006, p. 4).

The Bologna Process seems likely to have a profound effect on the development of higher education globally, as observers from other continents are taking a close interest in the reform process and are beginning to consider how their own systems can be more closely aligned with “Bologna” thinking (Australian Government, 2006, p. 3). While still a work in progress, parts of the Bologna Process have already been imitated in Latin America, North Africa, and Australia (Adelman, 2008, p. 5). Efforts are also underway among Asia-Pacific countries to create a regional higher education space like that in Europe (American Council on Education, 2006, p.

12). New competitors, such as Singapore and the Middle East, have also entered the market and are in the process of creating regional education hubs (American Council on Education, 2006, p. 14).

The Australian Government (2006) has been keeping a close eye on the success of the Bologna Process and recently stated that:

If Australia is not able to maintain alignment with the [Bologna Process] developments, a significant proportion of the current 32,000 European enrolments in Australian institutions may find other destinations more attractive. Similarly should Asian countries or institutions choose to align with the Bologna Process, Europe may become a more attractive destination for those students (p. 2).

The United States and Canada do not currently have any initiatives similar to the Bologna Process. Roberston & Keeling (2007) argued that adopting such a process may encourage more mobile students to remain in the region.

2.3.2 National Policies

As the benefits associated with international education become more apparent, national governments (along with state and provincial authorities) have been launching coordinated policies and whole-of-government approaches to attracting international students (Obst, 2007). For example:

- France established a national agency in 1998 (renamed CampusFrance in 2007) with ninety-eight offices abroad that promotes French higher education and provides a comprehensive web site to help prospective students search for programs and institutions, apply online, and receive information on visas, insurance, residency, and employment (Obst, 2007, ¶ 7; American Council on Education, 2006, p. 13).
- The United Kingdom established the Universities & Colleges Admissions Service (UCAS), a consortium of universities which helps students find a school, simultaneously apply online to 180 universities and colleges (and list preferences for up to six universities), check their visa status online and assess their qualifications for admission. Globally, the British Council promotes the UK's higher education system through its offices in 110 countries (American Council on Education, 2006, p. 13).

Other countries such as Germany³ and Singapore⁴ have also established specific organizations to promote their higher education sector abroad (American Council on Education, 2006, p. 14; Obst, 2007, ¶ 8). In August 2007, the New Zealand Government announced a new International Education Agenda that features an integrated, long-term, whole-of-government strategy (Obst, 2007, ¶ 9). Furthermore, the Review of Australian Higher Education concluded in December 2008 that an independent organization be established to market and develop international student activity with a whole-of-government approach (Australian Government, 2008).

³ The German Academic Exchange Service (DAAD) promotes German higher education abroad and provides cooperation and assistance in its regional offices.

⁴ Education Singapore was created in 1998 and charged with promoting and marketing Singapore abroad.

In contrast, the United States has neither a national policy on international students nor a national strategy for recruiting them. Institutions are largely acting individually in their recruitment efforts (American Council on Education, 2006, p. 11).

In Canada, responsibility for education is constitutionally assigned to the provinces and territories. As a result, although there are comparable structures and similar terminology across provinces, in practice each province has adopted different arrangements regarding higher education access, curricula, student mobility, the granting of degrees and planning. As a result, there is virtually no articulation across provincial boundaries and credits are not fully portable (Hatt & Harley, 2005). The Canadian Association of University Teachers (2008) argues that the Government of Canada and the provincial governments should cooperate to establish and implement policy and programs for international students at all public post-secondary institutions. A small step forward was taken in September 2008, when provincial education ministers announced the launch of a national brand – a stylized red maple leaf with a bilingual slogan that says “Imagine Education in Canada” – in a bid to attract more foreign students to study and possibly stay in Canada (Canadian Press, 2008). The rationale behind the launch of the brand was that “in a country like China, it doesn’t make sense to try to pitch individual provinces” (Canadian Press, 2008).

2.3.3 Funding of Universities in Canada

Government approaches for funding universities in Canada tend to vary widely from province to province. There are generally three categories of funding approaches: (1) enrolment-based formulas that automatically adjust funding based on changes in enrolment (either through simple enrolment or weighted enrolment formulas), (2) base funding models whereby institutions receive an ongoing base operating grant along with “across the board” adjustments, and (3) targeted funding to achieve specific system objectives (Alberta Advanced Education, 2005, p. 2). According to a cross-jurisdictional study prepared by Alberta Advanced Education (2005), the Canadian provinces use the following funding approaches: British Columbia and Manitoba employ a combination of base-funding and targeted funding; Saskatchewan and Nova Scotia employ a mix of a weighted enrolment-based model and targeted funding; Ontario employs a complex mix of a weighted enrolment-based model and a simple enrolment-based model along with a targeted funding component; Quebec employs a weighted enrolment-based model; New Brunswick employs a mix of enrolment-based, base funding and targeted funding; and Prince Edward Island and Newfoundland and Labrador employ a base funding model.

The Nova Scotia funding model makes specific reference to international students, setting enrolment limits for international students at the institutional level of 10 percent of undergraduate enrolment, and 30 percent of graduate enrolment, above which international student enrolments will not be supported by public funding (Nova Scotia Council on Higher Education (NSCHE), 1998, p. 7). Two policy considerations support the limits: the need to prevent recruitment of international students to the exclusion of domestic students in order to exploit market-based differential fees; and, the importance of international students to many graduate programs (p. 7). An often forgotten third policy consideration provides Government with the option to review individual graduate programs on a public interest basis should international student enrolments in them exceed 50 percent (p. 8).

No literature was located with regards to the funding mechanisms specific to international students in provinces outside Nova Scotia.

2.3.4 Tuition and Differential Fees

Cost of education is one of the factors affecting an international student's choice of study venue. There are only four countries in the world that charge differential tuition fees to international students. Britain was the first country to do so in 1967, followed by Belgium in 1972 and Australia in 1980 (Woodhall, 1987, p. 120). In Canada, some provinces introduced differential fees in the 1970s and increased them sharply during the 1980s. By 1982, all provinces except British Columbia, Saskatchewan, Manitoba and Newfoundland were charging differential tuition fees (Canadian Federation of Students, 2008). Quebec is unique in the sense that although its total fees are 5 to 6 times higher than those charged to domestic students, nearly 50 percent of the international students in the province are exempt from those fees under the province's policy of encouraging francophone students from other parts of the world to attend university in Quebec (Eastman, 2003). In Nova Scotia, Université Sainte-Anne offers an automatic scholarship to francophone international students which offsets the cost of their differential fee, although it still charges differential fees to students enrolled in its French immersion program. Université Sainte-Anne's policy regarding the scholarship may be a response to the exemptions offered in Quebec.

Historically, differential fees were introduced because several host countries' concern about the rising cost of subsidizing students from abroad (Woodhall, 1987, p. 119). The Canadian Federation of Students (2008, p. 1) contests this reasoning, arguing that the root cause of differential fees is government under funding and contending that high differential fees are an unfair burden and a barrier to post-secondary education for international students. Ultimately, these fees could threaten Canada's ability to attract and retain foreign students (2008, p. 1). Along the same lines, in November 2008, the Canadian Association of University Teachers (2008, ¶ 3) reiterated their stance that "no differential fees should be applied to international students."

In contrast to those nations who charge differential fees, tuition in Germany and France is free, both for domestic and foreign students. Moreover, the French Government has declared a policy of equality of access and treatment for all students, regardless of nationality (Woodhall, 1987, p. 121). (Woodhall wrote of the former Federal Republic of Germany, but tuition in Germany remains free to this day.)

Prior to adoption of the current university funding formula in Nova Scotia, international student fees included a Government-mandated \$1,700 per FTE differential fee for international students, which was remitted to the Maritime Provinces Higher Education Council for redistribution among universities as part of their operating grants. Upon introduction of the current funding formula, this mandatory fee was deleted and universities were allowed "to charge whatever fees the international student market will bear" (NSCHE, 1998, p. 7). Using MPHEC enrolment data and published differential fees, the total value of differential fees to Nova Scotia Universities in 2008-09 is \$18.8 million.

According to data provided by the Department of Education, Nova Scotia has had the highest tuition fees in the country for at least the past 13 years; these fees have increased by 90 percent during that period.⁵ For example, in 2008-09, Nova Scotia had the highest tuition fee of all the provinces at \$5,932 (for undergraduate programs) – which was 25 percent higher than the Canadian average of \$4,724.⁶ Tuition fees for international students in Nova Scotia are also

⁵ Taken from data tables provided by Nova Scotia Department of Education, based on Statistics Canada Tuition Survey (March 3, 2009).

⁶ *Ibid.*

amongst the highest in the country. For example, in 2008-09, Nova Scotia had the fourth highest tuition fees in Canada for international students at \$11,771 – which was 11 percent higher than the Canadian average of \$10,616. Prior to increases in 2000-01 and for much of the 1990s, Nova Scotia’s tuition rate for international students was essentially the same as the national average.⁷

A more positive view of these tuition statistics is shown in Figure 2. Although Nova Scotia tuition fees are the highest in Canada for Canadian students, tuition fees for international students in Nova Scotia are competitive with those of British Columbia, Ontario and Quebec, the leading receivers of international students in Canada. The tuition fees for international students in all four of these provinces are above the national average.

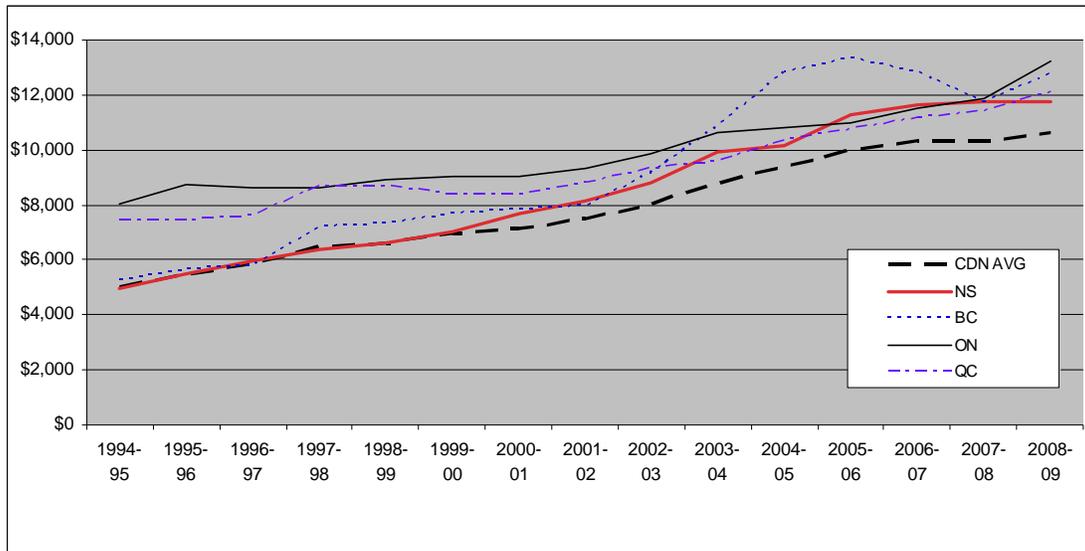


Figure 2: Tuition Fees for International Students in Canada

Finally, since differential fees are established by individual universities in Nova Scotia, caution is warranted with respect to Figure 2. For the 2008-09 academic year the authors examined published differential fees across Nova Scotia, finding wide variation. The highest differential fee, at Dalhousie University and at the University of King’s College, was 36 percent above the weighted average of Nova Scotia differential fees of \$5,343, whereas Université Sainte-Anne offered an automatic scholarship to any francophone international student to offset its \$2,592 differential fee, which is already only 49 percent of the Nova Scotia weighted average. The Atlantic School of Theology charged no differential fee. Thus, competitiveness with respect to universities in British Columbia, Ontario or Quebec will vary from one institution to another.

2.3.5 The Role of Atlantic Canada’s Universities

Various studies have recently been published about the university system in Atlantic Canada and the need to embrace immigration. For example, a 2006 study by Gardner Pinfold states that overall enrolment in Atlantic Canada universities has increased by about 75 percent since 1980, rising to nearly 92,000 in 2005 (p. 1). Despite this growth, the study found that Atlantic universities would face an enrolment challenge in the future due to unfavourable demographic trends. The study therefore concluded that Atlantic Canada universities must adopt “an increasingly international outlook” (p. 2).

⁷ *Ibid.*

Along the same lines, a 2006 ACOA study (Lebrun & Rebelo, 2006) states that immigration is emerging as the new economic role for Atlantic Canada's universities; "The region's universities can play a central role in helping the region deal with its demographic challenges and its growing need for qualified workers by attracting, integrating and retaining more international students in the region" (p. 27). Lebrun and Rebelo further argue that Atlantic Canada's disproportionately large number of universities could become more involved in converting international students to new immigrants to the region.

2.4 Immigration Policies

Immigration policies targeting skilled workers are closely related to international education policies. Demographic challenges in various countries, coupled with skill shortages in certain labour categories are forcing many developed countries to tailor their immigration policies to facilitate student migration (Gribble, 2008, p. 25). In the Canadian context, Murphy and deFinney (2008) state the following about international students:

The fact that they are already living in and are familiar with the region, that they will earn well-recognized Canadian credentials, and that they may already have gained some Canadian work experience makes them an obvious and highly desirable group from which to recruit new permanent residents (p. 4).

This principle is reflected directly in Canada's 'Canadian Experience Class' for prospective permanent residents (CIC, 2009).

2.4.1 Points Systems

Various countries have shifted their immigration policies in order to focus on high-skilled workers. Australia, Canada and the UK have used point systems to achieve this goal. Draft immigration legislation in Germany also includes the possibility of a points test (McLaughlan & Salt, 2002, p. 6).

Canada introduced its points-based system in 1967 to limit the discretionary power of immigration officials. Under the points system, immigrants are given points (or scores) for factors such as education, adaptability, work experience, language ability, age, and a job offer in Canada (August & Leo, 2006, p. 9). Thresholds are set for total points, as well as for individual factors. Applicants with scores below set thresholds cannot be considered for immigration.

Some countries, such as Australia and Canada, have strategically aligned immigration policies with other policies to attract international students. Immigration policies that are used to target a high-skill labour force may also encourage the best and the brightest students to apply for graduate and postgraduate studies with the further prospect of obtaining permanent residency and long-term employment in the host country. Canada, for example, expects that recent immigration policy changes will increase enrolments from abroad by as much as 20,000 (American Council on Education, 2006, p. 14). In 1998, Australia amended its points-based immigration system, with additional points for graduates of Australian universities; by the start of 2002, such international students represented nearly 50 percent of all skilled applicants. At the same time, Australia experienced a 30 percent rise in demand for its tertiary courses (Hawthorne, 2005, p. 688). It is also interesting to note that since 2003, Australia has been awarding an extra five points to skilled applicants who have studied and resided in one or more areas in regional Australia or low population growth metropolitan areas for at least two years (Ziguras & Law, 2006, p. 64).

These strategies have been successful for the labour market as well. Australia introduced ‘transformed skilled migration selection procedures’ in the mid 1990s, which by 2000 had contributed to a halving of unemployment among recently arrived migrants (12.4 percent of 1999 arrivals unemployed by November 2000 compared to 23.4 percent of 1995 arrivals by November 1996). By June of the following year, the 1999 cohort’s unemployment rate had dropped to below 10 percent, even before the full force of the recent shift to international student recruitment had been felt (Hawthorne, 2005, p. 688).

2.4.2 Ability to Work during Studies

International students, like any other, can benefit from employment to help offset costs of education. A cross-jurisdictional review of policies related to student employment during studies reveals that certain countries impose greater limitations on work by international students than others. For example, Australia imposes few limitations and allows foreign students to work both on and off campus while studying for their degrees (Peykov, 2004, p. 17). Similarly, the UK Government allows them to work up to 20 hours per week during their studies and unlimited hours while on vacation (Peykov, 2004, p. 16).

On the other hand, the United States has more restrictive policies. For example, foreign students in the US are generally barred from off-campus employment (although exceptions are made for extreme financial hardship and employment with an international organization) and may only engage in on-campus employment if it does not displace a US resident (Haddal, 2006, p. 2).

In Canada, federal legislation allows foreign students to work on campus without an employment authorization. In April 2007, Citizenship and Immigration Canada (CIC) implemented the Off-Campus Work Permit program that allows foreign students to work while completing studies. All provinces have signed agreements with CIC that allow international students to work part-time off-campus while studying and to work full-time during breaks or during the summer. In turn, provinces have signed agreements with eligible post-secondary institutions so their students can participate in this program (CIC, 2009a). The CIC recently changed their Post-Graduation Work Permit Program to allow eligible international graduates to apply for an open work permit (no job-offer required, no geographic restrictions) valid for up to three years (CIC, 2009b). Both of these programs are designed to provide international students with work experience in Canada which may lead to more students applying for permanent residence, either through a provincial nominee program stream or the Canadian Experience Class.

2.4.3 Retention after Graduation

Many international students now consider overseas study as a stepping-stone to permanent residency in a country offering a higher standard of living than their home countries along with better employment and research opportunities (Gribble, 2008, p. 25). A 2006 UNESCO study found that of the total number of students studying overseas, 40 percent of students coming from East Asia and the Pacific remain in the regions in which they study after graduation (American Council on Education, 2006, p. 12). In the United States recent data show that only 50 percent of overseas students return home after completing their qualification. Similarly, close to half the migrants who come to Australia on the skilled migration program are former students and, according to a recent OECD report (2006), student migration has increased in a number of OECD countries, including Denmark, Sweden and Japan (OECD, 2006; Gribble, 2008, p. 27). For many students, the choice to study abroad is often part of a deliberate immigration strategy that is often facilitated by the immigration policies of the host country (Gribble, 2008, p. 27).

Atlantic Canada has struggled to retain immigrants as they often move on to other areas in the country with established communities of immigrants from the same parts of the world. With regards to the small proportion of immigrants that do come to the region, Metropolis (2008, p. 9) reports that in the first half of the 1980s, the immigrant retention rate was 75 percent; however, this dropped considerably over the next ten years to less than 50 percent. Since the mid-1990s, retention rates have improved and in 2006 about 64 percent of the immigrants who first settled in Atlantic Canada remained there (Akbari, 2008; Metropolis, 2008, p. 9).

In similar fashion, the Province of Nova Scotia experienced a continuous decrease in its retention rate of immigrants between 1981 and 2001 (Jollymore & Poirier, 2008, p. 27). Although Nova Scotia led the Atlantic Provinces in the relative improvement of retention rates (Murphy & deFinney, 2008, p. 5) it must not be forgotten that Nova Scotia's proportion of immigrants relative to Canada at large continues to speak to the need for improvement. According to data from the Atlantic Metropolis Centre, 63 percent of immigrants who settled in Nova Scotia from 2001 to 2006 remained in the province (Jollymore & Poirier, 2008, p. 28; Akbari, 2008). Nova Scotia's 2005 immigration strategy set a target retention rate of 70 percent in the 2006 – 2011 census period, and a target of 3,600 for annual immigrant arrivals within 4 years of full strategy implementation (Nova Scotia, 2005, p. 7). Citizenship and Immigration Canada landings data for Nova Scotia do not suggest that the arrivals target will be achieved.⁸ Assuming that some proportion of international students do become immigrants, increased international student enrolment could address the landing shortfall; however, the current market-based differential fee practices in Nova Scotia may be at cross purposes with the goals of Nova Scotia's Immigration Strategy.

Studies have shown that immigrants are attracted to destinations that offer proximity to friends and family and strong economic conditions (Evernden, 2008, p. 12). This offers certain challenges to Atlantic Canada as it does not have large established immigrant communities, has higher unemployment rates than the rest of the country and lacks diversity in employment activities compared to the major Canadian cities (Bruce, 2007).

Nevertheless, a recent ACOA study (Lebrun & Rebelo, 2006, p. 5) found that 51 percent of the international students currently studying in Atlantic Canada chose the region as their first choice of study destination. Sixty-seven percent were interested in applying for permanent residency in Canada and residing in Atlantic Canada (p. 47).

2.5 Economic Benefits of International Students

In addition to supplying the human capital that is needed to offset labour shortages and sustain long-term economic growth, international students bring a great deal of economic benefit to a region. Indeed, the international education sector is a substantial and growing export business (Adrian Kershaw Consulting, 2005) that has been estimated by Merrill Lynch to be valued at \$2.2 trillion worldwide (IPSEA, 2005, p. 2). Many studies have been published over recent years concerning the international education sector and its impact on the various economies of the world. For example, in 2005 the OECD estimated that the higher education market in its member states was conservatively worth some \$40USD billion annually with the United States, the United Kingdom and Australia leading the way in the provision of international education (Gribble, 2008, p. 26; UNESCOPRESS, 2005; Hatakenaka, 2004). A 2007 study found that the total net injection into the United Kingdom economy by international students – combining the figures for

⁸ Nova Scotia Office of Immigration data tables reported immigrant landings of 1929, 2586, 2520, and 2653 for 2005 through 2008 respectively. Achieving landings of 3,600 in 2009 appears unlikely.

tuition fees and other expenditures – was around £3.74 billion in 2004-05 (Vickers & Bekhradnia, 2007, p. 11). Moreover, when adding the multiplier of 1.5, the total impact of spending by international students was estimated to be more than £5.5 billion (Vickers & Bekhradnia, 2007, p. 11).

In Canada, export earnings from foreign students have increased from \$530 million in 1989 to \$595 million in 1997 and \$727 million in 2001 (Guruz, 2008, p. 143). During the same time period, the export earnings in the United States increased at a much faster rate, rising from \$4.6 billion in 1989 to \$8.3 billion in 1996 and \$11.5 billion in 2001 (Guruz, 2008, p. 143). Furthermore, NAFSA (2008, p. 2) estimated the net contribution to the U.S. economy by foreign students and their families to be \$15.5 billion during the 2007-08 academic year – or nearly \$25,000 USD per international student.

In 2003 the Business Council of British Columbia identified international education as a “sizable and growing export business” and estimated the economic benefits at \$229 million for the province, or approximately \$32,000 per student⁹ (IPSEA, 2005, p. 32). A 2005 study for the BC Progress Board concluded that international students spend, on average, \$31,000 per year on study and leisure related activities – this amount includes \$12,000 in average tuition costs, \$9,000 in annual housing and food costs and \$10,000 on study and leisure related activities (Adrian Kershaw Consulting, 2005, p. 17). In 2006, another British Columbia study found that the 28,100 international students in that province spent close to \$511 million for direct purchases of goods and services, which translated to an overall contribution of \$485 million in provincial GDP, 9,100 jobs, and \$67 million in Government revenue (Roslyn Kunin & Associates, Inc., 2006, p. 16).

Newfoundland and Labrador published an immigration strategy in 2007 that estimated that international students spend between \$18,000 and \$25,000 per year in the province (Newfoundland and Labrador, 2007, p. 17). These estimates are lower than those for studies of other provinces, but Newfoundland and Labrador has the second lowest tuition fees for international students in Canada.

Many studies have attempted to quantify the economic benefits associated with post-secondary education in Atlantic Canada. For example, an Atlantic Provinces Economic Council (APEC) study in 2000 found that universities in Atlantic Canada generated an estimated \$1.63 billion in direct and indirect spending (APEC & Association of Atlantic Universities, 2000, p. 13). This APEC estimate is for the overall student population and is not limited to international students. APEC estimates the Nova Scotia portion of this figure to be \$779 million in direct and induced spending (p. A9). The study found that direct university expenditures in 1997-98 totaled over \$1.04 billion, equivalent to 2.2 percent of regional GDP (p. 11). In comparison, university expenditures across Canada were equivalent to 1.4 percent of GDP, over 35 percent less than in the Atlantic Provinces (p. 11). Student spending injected \$315 million into the region’s economy in 1998-99¹⁰ and visitor spending related to university activities was \$41 million in 1998-99 (p. 12). In addition to spending, the APEC study went on to say that Atlantic Canada universities contributed to the economy through job creation, including the nearly 15,000 Atlantic Canadians directly employed by the region’s universities (about 1.5 percent of the total employed labour force compared to 1.1 percent nationally) (p. 11). Student and visitor spending also indirectly contributed to job creation, with over 7,000 jobs arising from student spending and another 921

⁹ It is unclear how they arrived at the “\$32,000 per student” figure.

¹⁰ The study used the residence costs as a proxy for average student spending. For example, full-time enrolment in Nova Scotia of 29,804 and an average residence fee of \$5,197 results in a total expenditure of \$155 million.

jobs arising from visitor spending (APEC & Association of Atlantic Universities, 2000, p. 13). The APEC study referred to its estimates as “conservative” and based on methodology¹¹ used in previous studies, adjusted for current enrolment levels and costs of services.

Another study conducted by Gardner Pinfold in 2006 arrived at higher figures than the 2000 APEC study. Again, this study focused on the overall student population and was not limited to international students. The Gardner Pinfold (2006, p. 20) study found that direct spending attributable to Atlantic Canada universities was approximately \$2.15 billion. This figure includes spending by the universities on operations (including payroll) and capital projects, as well as incremental spending by students and visitors. Gardner Pinfold (2006, p. 20) estimated the Nova Scotia portion of this figure to be nearly \$1.1 billion of direct university spending. Students were estimated to have spent \$980 million in 2004, of which approximately 60 percent flowed to the universities to pay for tuition, residence fees and books and the remaining 40 percent – about \$400 million – flowed to the wider economy to cover costs of rental accommodations, food, transportation and entertainment (Gardner Pinfold, 2006, p. 18).

Gardner Pinfold (2006, p. 21) estimated that Atlantic Canada universities were responsible for \$2.0 billion of the region’s GDP, over 27,000 jobs (of which over 16,000 are directly employed by universities and the rest are created elsewhere in the regional economy as a result of spending) and \$467 million in tax revenue collected by the federal and provincial governments. Using the multiplier effect Gardner Pinfold (2006, p. 21) estimated the overall economic output related to Atlantic Canada universities to be about \$4.39 billion.

With regard to Nova Scotia, Gardner Pinfold (2006, p. 21) found that the overall economic output related to universities in the province using the multiplier effect was about \$2.15 billion, that universities were responsible for \$968 million of provincial GDP and 7,616 direct jobs (with university payroll in Nova Scotia totaling about \$420 million) and the creation of another 6,185 positions in indirect and induced employment. Finally, Gardner Pinfold (2006, p. 21) estimated that \$227 million in tax revenue related to universities was collected in Nova Scotia (of which \$81 million was direct, \$19 million was indirect and \$127 million was induced).

With regards to the portion of economic spinoffs attributable to international students, the Gardner Pinfold (2006, p. 25) study states that the five to six thousand international students studying in Atlantic Canada, generate over \$100 million in export earnings per year. The Gardner Pinfold study does not detail the methodology used to obtain the final figures. It lists the sources of the data as “Statistics Canada and Atlantic Universities.”

Similarly, with respect to international students, the recent ACOA study (Lebrun & Rebelo, 2006, p. 29) estimated that international students contributed \$153 million annually to Atlantic Canada’s economy (or \$25,000 of spending per student). Like the earlier Gardner Pinfold study, the ACOA study did not explicitly define how the \$25,000 figure was obtained.

¹¹ The Appendix to the APEC study explains the methodology utilized in great detail. For example, to calculate the total spending (direct + indirect) by universities, they took the total expenditures (wages/salaries & other) and multiplied them by 80 percent (as it was estimated that 80 percent stayed in the region). They then multiplied that amount by an “income-generated multiplier” of 0.43 to determine induced spending. They then added the two amounts (the 80 percent amount and the [80% x 0.43] amount) to determine total spending.

2.5.1 Other Benefits of International Students

Finally, the benefits related to having international students living and studying in a region are not limited to the financial flows they generate. There exist many other less tangible benefits that have no readily measurable economic value. International students enrich a region's cultural diversity, helping to increase understanding of other societies including cultural aspects such as music and the arts, helping to expose different perspectives on international affairs, etc. (Gardner Pinfold, 2006, p. 25). Having people abroad who have lived in Nova Scotia and are familiar with its products and services can also help strengthen the Province's economic and political ties with other countries. Moreover, many university departments – such as those in engineering and the sciences – depend strongly on international students to remain viable (Vickers & Bekhradnia, 2007, p. 4). Ziguras & Law (2006, p. 61) even argue that “in the long term, the aging of the population in developed countries may mean that the labour force advantages of international education will outweigh the direct economic benefits from tuition fees and living costs of international students.”

3. Methodology and Study Design

The study used an expenditure-based approach to determine the economic impact of international students in Nova Scotia. This section of the report first describes the framework used for the expenditure-based study, including a discussion of the spending multiplier. The section also describes the methods used to collect primary and secondary information, including the design of the survey of international students.

3.1 Conceptual Framework

Economic activity can be measured using two essentially equivalent methods: the expenditure approach and the income approach. The former measures all expenditure and the latter all income. It is important to note that every expenditure results in the receipt of income at the other end while income can only be generated if *and only if* an expenditure is incurred.

The *expenditure approach* is a widely used method for measuring economic activity. At the national level, it measures gross domestic product (GDP) as total spending on all final goods and services produced in the economy (Williamson, 2007). It ignores spending on intermediate goods (money spent on goods used as inputs in the production of other goods and services) (Ragan and Lipsey, 2009) to avoid “double counting.” Most conventional definitions of national income accounting express total expenditure as follows:

$$\begin{aligned} \text{Total expenditure} &= C \text{ (consumption expenditure)} + I \text{ (investment expenditure)} \\ &+ G \text{ (government expenditure)} + NX \text{ (total exports – total imports)}. \end{aligned}$$

The expenditure approach measures the total spending on final goods and services. It avoids double counting by ensuring that spending on intermediate goods is excluded. The expenditure approach illustrates spending by a country on domestic goods and services over a specified period.

The second approach measures economic activity from the income side. The income approach sums all incomes received by economic agents (Williamson (2007). Incomes include compensation of employees, corporate profits, net interest, government and business enterprise profits before tax, inventory valuation adjustment and depreciation (Williamson, 2007). The summation of these factors, non-factor payments and depreciation represents national income.

The income approach and expenditure approach yield the same measure, within measurement error (Williamson, 2007). The sale or purchase of goods and services in an economy shows up on the expenditure side. Spending on output is recorded on the income side because what is spent on all output is income for someone in the economy, in some form or another (Williamson, 2007). It is thus essential that these two measures are not confused, or used simultaneously, to avoid counting each dollar more than once. Using variables from both the income and expenditure approaches would lead to an inaccurate representation of national income and must therefore be avoided.

3.2 Empirical Methodology

The methodology used in this study is based on the theoretical underpinnings of the expenditure approach. It measures actual spending in a given year for and by international students in Nova

Scotia. The expenditure approach was chosen because it measures: (i) spending on goods and services *within* Nova Scotia *by* international students; and (ii) spending by government, universities and other entities *for* international students in Nova Scotia quite comprehensively. There is no equivalent method that captures this economic activity as effectively using the income approach.

The empirical methodology of the study will focus on the actual money flows by and for international students. Money flows will be analyzed through *direct expenditure* by and for international students as outlined in Table 1 and *indirect expenditure* arising out of this initial direct expenditure.

Table 1: Expenditure Variables

Area	Measure (Expenditures)
Direct Spending by International Students	Communication Services (home, cell, internet and cable) Groceries (food & other general household supplies) Rent or Mortgage Utilities Residence Fees Residence Meal Plan Transportation Costs (public transportation, car insurance/payments, maintenance, gas) Tuition/University Fees Textbooks and Supplies Clothing and other goods and services (including un-insured medical or dental expenditures) Entertainment Travel Other expenditures
Government Spending for International Students through University	Provincial Grants Other Government Grants
Other Government Spending for International Students	Medical Services Insurance
University Spending for International Students	Endowment
	Research Grants, Projects and Contracts

The key assumptions underlying this study are as follows:

- (1) The study is concerned with students enrolled in programs paying fees and universities receiving public funding due to the presence of these students. It does not include post-doctoral students/fellows that do not pay fees and for whom universities do not receive public funding.
- (2) International students do not displace domestic students.
- (3) All universities in Nova Scotia are operating under a balanced budget, where annual revenues equal annual expenditure.

- (4) Scholarships, stipends, bursaries and assistantships are distributed in direct proportion to the ratio of international students to all students. Thus, if 14 percent of a particular university's students are international, 14 percent of expenditure on scholarships, stipends, bursaries and assistantships are assumed to be dedicated for international students.
- (5) The sample is representative of the underlying population, which is homogeneous.

Data will be obtained from primary and secondary sources. Student expenditure data will be gathered primarily from the survey while other expenditure data will be collected from secondary sources consisting mainly of university and Government of Nova Scotia documents.

One important challenge for this study is to ensure that all relevant expenditure is captured and included in the estimates, but that the same expenditure is not counted more than once. As a result, direct payment to students through government grants, endowment expenditure, research grants, projects and contracts are not included since they are income for students, which one would assume is spent for tuition, books and supplies, room and board, and other expenditures. Thus, the direct payment to students is captured when that money is spent (under *direct spending by international students*), which is precisely what the expenditure approach seeks to achieve. Expenditure in support of international students for research, in kind, and in forms other than direct payment shall be captured from government grants and university spending after deducting the direct payment to students. These two expenditures are tabulated in Table 1 under *government spending for international students through university* and *university spending for international students* respectively. This will ensure that no expenditure is missed, but double counting of the same expenditure is also avoided.

The research methodology will also estimate the indirect expenditure arising out of the direct expenditure on an annualized basis. These economic spinoffs due to the presence of international students in Nova Scotia will be estimated using alternative measures of the spending multiplier. It is expected that the sum of direct and indirect expenditure will provide a more comprehensive estimate of the contribution of international students to the economy of Nova Scotia.

The rationale behind using alternative estimates for the multiplier is to ensure that the study identifies a range within which lies the true contribution of international students to economic activity in the province.

An additional focus of this study will be to distinguish between expenditure that can be characterized as a net injection of resources into Nova Scotia as opposed to money that is spent from sources that originate in Nova Scotia. This is an important consideration since it allows policy makers to determine the amount of resources that become available to the provincial economy solely on account of hosting international students. It also means, by extension, that the greater the number of international students the more money would be spent and therefore the greater would be the contribution to the provincial economy. Moreover, the resources that are spent from provincial sources serve as a complement to the money that comes from abroad and together constitute a significant investment in enhancing the human capital base within the province in addition to expanding the provincial economy.

3.3 The Multiplier

This section examines the “spending multiplier” for the initial increase in expenditures in Nova Scotia by foreign students over a one-year period. Some discussion of the background to the multiplier used in economic studies is necessary because of the variability across studies in methodology and output to determine which approach is most relevant in the case of international students.

The original multiplier was designed for use at the national level to estimate the ultimate impact of a change in government spending or taxation. In its simplest form, this multiplier equals $1/\text{the marginal propensity to save (MPS)}$, in an economy without taxes and imports. An MPS equaling 0.2 means that when individuals receive additional income, they save 20 cents of every dollar received. Thus the multiplier in this case is $1/0.2$, or 5. If government spending is increased by \$5 billion, the eventual impact on the economy will be \$25 billion. This \$25 billion is the accumulation of a series of expenditure increases over time, as the expenditure of \$5 billion becomes income for consumers who spend 80 percent, or \$4 billion, on consumer goods, and this \$4 billion then initiates additional spending of \$3.2 billion, and so on until consumer expenditures have increased by a total of \$20 billion.¹²

Two important lessons are suggested by this simple example. One is that taxes and imports are neglected, and that portion of the \$5 billion injection spent on them does not necessarily contribute to a subsequent increase in income. This effect can be very large. For example, if the marginal propensity to pay taxes is 0.2, so that consumers pay out 20 percent of their income on taxes, and the marginal propensity to import is 0.4, so that 40 percent of consumer expenditures are for imported goods, then the resulting multiplier is reduced from 5 to 1.32. With this reduced multiplier of 1.32, after all the spending cycles are complete, the increase in national income will be \$6.6 billion rather than \$25 billion as consumer expenditures increase by only \$1.6 billion rather than \$20 billion.¹³

The second lesson from the simple example is that the multiplier process takes time, as the impact comes from a virtual series of infinite rounds of expenditures of ever decreasing amounts.

In the real world, the multiplier impact of a government stimulus packages is hotly debated, as recent experience in the United States testifies. There is no consensus, but Paul Krugman, the most recent Nobel Prize winner in Economics, suggests the multiplier in the US for both government expenditures and tax reductions is 1.5 (Stirton, 2009).

When economists approach the problem of estimating a state, provincial or local multiplier, they tend to use a simpler model than the government expenditure model outlined above. This model has different versions, but the most convincing one places the focus on three components to calculate the “spending multiplier”. The three components are the initial impact, the backward linkages and the forward linkages (Miller, undated). Using the value added approach for a province or state, consider a firm that earns \$1 million from an export, \$600K of which represents value added to the firm and \$400K of which was paid to buy raw materials. The initial impact or direct effect in this case is \$600K. The “indirect effect” in this case, the backward linkage, is the

¹² Without government and foreign trade, the marginal propensity to spend, $z = MPC$, where MPC is the marginal propensity to consume. The simple multiplier $k = 1/(1 - z) = 1/(1 - MPC)$.

¹³ With government and foreign trade, $z = MPC(1 - t) - m$, where t is the marginal propensity to pay taxes and m is the marginal propensity to import. The simple multiplier is then $k = 1/(1 - z) = 1/[1 - \{MPC(1 - t) - m\}]$.

portion of the raw materials purchased from firms within the province, say 50 per cent or \$200K. The “induced effect” or forward linkage is in two parts. The first is the increase in expenditures in the province by households which received part of the \$600K value added as wages, say \$450K, of which they saved some, spent some outside the province, paid taxes, and spent the rest, \$350K in the province. The second part is the value added in the province by the subsequent spending of the \$200K spent locally on raw materials, say \$150K. In this case, the so-called Type I multiplier is calculated as \$600K plus \$200K divided by \$600K or 1.33. The Type III multiplier is calculated as \$600K plus \$200K plus \$350K plus \$150K divided by \$600K, or 2.2.¹⁴

While informative, these multiplier calculations have to be used carefully. On the one hand, they underestimate the multiplier because they neglect the cascade effect of many rounds of expenditure. On the other hand, they overestimate the multiplier because they do not take account of the import content of expenditures within the province of the workers who earn wages and spend a portion locally.

The procedure adopted in this expenditure analysis study in calculating spending multipliers is to obtain a sense of the order of magnitude of the likely multiplier associated with spending by foreign students.

The most directly relevant study is by Gardner Pinfold (2006) entitled “The Economic Impact of Universities in the Atlantic Provinces”. The document covers a wide range of relevant topics, but the focus here is on the calculation of the spending multiplier for Nova Scotia. (The study also calculates other multipliers, including the “Direct Employment Multiplier” and the “Tax Revenue Multiplier”, the former calculated at 1.8 and the latter at 1.6 for the Type III version.)

The Direct Spending by students in the province is calculated at \$539 million, the Indirect Spending at \$89 million and the Induced Spending at \$341 million, for a total impact of \$969 million. The Type III multiplier equals \$969 million divided by \$539 million, or 1.8. The study notes that the Indirect Spending by universities is low because spending on goods and services, other than direct wages, is low, and the import content of what spending there is on goods and services is high.

A second estimate of a spending multiplier for Nova Scotia universities is given in the January 2000 APEC study. The multiplier for Nova Scotia is given at 1.5, but the analysis differs in that there is no inclusion of Indirect Spending. For comparison purposes, excluding the Indirect Spending from the Gardner Pinfold estimate generates a multiplier of 1.6.

A 2008 study conducted in New Zealand is also relevant. The study examines the contribution of all forms of foreign education in 2004, including “public and private tertiary” (e.g., university level) students (Infometrics, 2008). The impact on GDP of an estimated \$1.8 billion spending by students amounts to “a total contribution to GDP of \$2.21 billion”. The multiplier implied in these numbers is 1.23, a relatively low number in the literature on the subject.

There is an extensive literature on multipliers. One area of interest is the multiplier impact of tourism, an economic activity that suggests itself as having similar economic impacts as foreign students, in the sense that money is brought directly into an economy rather than, say, via the sale of an export product where there is a high probability of an import component. For this reason, special attention is paid to calculations of tourism spending multipliers.

¹⁴ Type I Multiplier = (initial impact + backward linkage)/initial impact. Type III Multiplier = (initial impact + backward linkage + forward linkage)/initial impact.

A thorough study, “Variations in Economic Multipliers of the Tourism Sector in New Hampshire” by Joshua Wiersma (2004) and others, has generated some interesting results. The study begins by noting an existing estimate of the tourism multiplier for New Hampshire of 2.61. A second study reports the multiplier as 1.6. After detailed analysis, the authors estimate the tourism multiplier for New Hampshire as 1.51. They then report on other tourism multipliers: a range of 1.32 to 1.67 for 114 towns; a range of 1.19 to 1.67 for 30 countries; and a range of 1.5 to 1.8 for IMPLAN studies using a common framework. Their conclusion: go for 1.5 where a specific number is needed for tourism.

The range of values in the literature suggests upper and lower values of the multiplier of 1.8 and 1.3 for the present study.

3.4 Survey Design

A survey was used as the central element of the study, to allow the direct determination of the economic contribution of international students to Nova Scotia, as well as to establish demographic and institutional characteristics. The survey was the sole means used to collect data on expenditures *by* students.

The survey addressed four main themes, although its focal point was measurement of expenditures by international students in Nova Scotia. The four themes of the survey were as follows:

- Institutional and program details of international students;
- Expenditures by international students, both academic and living;
- Demographics of international students, including sources of their financial support; and,
- Future intentions of international students, particularly with respect to remaining in Nova Scotia.

Students were not questioned about their personal income *per se*, both because of the survey’s expenditure-based approach, but also because of concerns that income-related questions might discourage students from completing the survey.

The literature describing prior surveys of international students was examined, including regional (Lebrun and Rebelo, 2006), national (Bond, 2007) and international surveys (Vickers and Bekhradnia, 2007). All prior studies examined educational institutions, demographics, satisfaction, and intentions, but none examined student expenditure in the manner of the present study. A prior ACOA survey provided a question in the institutional theme that addressed whether international students were intentionally or accidentally in Nova Scotia: “Was this University your first choice?” (Lebrun and Rebelo, 2006). The present study investigates this question further.

It was the intention that the survey be delivered to all international university students in Nova Scotia through an on-line survey tool, but survey development was done initially using a paper instrument. This allowed for simpler interface between the contractors and the Department of Education’s Steering Committee. Three iterations of survey development were subjected to Steering Committee input prior to focus group testing. Focus Groups were conducted at Acadia University, Saint Mary’s University and Mount Saint Vincent University to solicit student feedback. Further, post-focus group editing addressed clarity issues raised by the students. Final

editing, mainly structural in nature, was required to implement the survey in the chosen on-line utility.

The first thematic group of questions in the survey addressed institutional information related to the programs in which students were registered, namely, which university they were attending, enrolment status (full-time, part-time), which program they were attending, year of the program in which they were currently enrolled, as well as their expected year of graduation.

The second group of thematic questions addressed personal expenditures by international students. Questions were constructed to ensure that expenditures captured were made *within* the Province of Nova Scotia so that the direct economic impact by international students could be determined. Expenditure questions were organized around easily identifiable items, such as tuition, and when appropriate similar expenditures were grouped together. For example, communications-related utilities such as home telephone, cellular telephone, cable television and internet expenditures were rolled into a single question. Expenditures were also grouped by those easily considered on a monthly basis (utilities, food, etc) and those better associated with yearly totals (clothing, travel within the province, etc). This approach differs from other surveys in its level of detail and in allowing respondents to provide the detailed information required on an aggregate basis. The expenditure theme also addressed sources of funds for international students, taking care not to ask about income *per se* since this might have resulted in survey refusals. One question addressed the proportion of international student income from abroad to provide an indication of the *direct net injection* of money into the Nova Scotia economy via international students.

The demographic questions addressed common characteristics such as county of origin, age, gender, marital status, and number of dependents, as well as satisfaction with services received. These demographic data support a more robust analysis of international student expenditure by cross tabulation (for example, spending by single students vs. married students).

The final thematic group of questions addressed student intentions after graduation, including plans of future studies or employment, interest in staying in Nova Scotia, and interest in permanent residence.

Annex A provides a more detailed description of the survey, including the specific questions asked.

4. Data: Sources and Characteristics

4.1 The Survey: Expenditure by Students

During the fall term of 2008-09, invitations to complete the online survey were sent to all international students registered and attending classes at the 11 universities in Nova Scotia, via the international student coordinators at each institution. All 3,524 international students enrolled at Nova Scotia universities were invited to complete the survey, which was hosted on the Canadian Council on Learning (CCL) website. Eight hundred and thirty-four responded to the survey for a gross response rate of 24 percent.

Survey data were delivered to Dalhousie University by CCL as an Excel® file. The Excel® data were prepared for porting to SPSS® for analysis in a multi-step process:

- First, survey test run data were transferred to another worksheet. Test run data were identifiable from pre-release date-time codes and testers' responses to Screen 64, which asked respondents for "any additional comments."
- Second, duplicate entries were identified, and in each case, the second of the duplicate entries was transferred to another worksheet. There were seven duplicates, leaving a total of 834 respondents.
- Third, incomplete entries were identified and transferred to another worksheet. The ECHO survey utility does not force respondents to complete one question before proceeding to another. The criterion used for incompleteness was that the respondent had entered no expenditure data. Significant numbers of respondents completed expenditure questions but did not complete later demographics or intentions questions. Given the expenditure focus of this study, *completeness* was not taken literally as a criterion, but favoured maximizing the number of respondents to expenditure questions. There were 727 respondents, for a net response rate of 21 percent.
- Fourth, new variables were created where responses were made in text boxes rather than via 'radio buttons.' Respondents often included textual comments together with numerical entries, and so the new variables were populated solely with the numerical content of the original response in the appropriate format after taking account of the textual input.
- Finally, complete survey responses were ported to SPSS® for survey analysis.

The overall margin of error for the sample of 727 lies within 3.63 percent, 19 times out of 20. This margin of error is based on an underlying distribution that is normal, although expenditures are often characterized by other types of distribution such as Paretian or log-normal distributions. The nature of the distributions for many of the expenditure responses indicates that the distributions are not normal. Such variations from the usual assumptions associated with approximately normal distributions must be considered during data analysis.

Care is required when extracting information for individual universities from the sample. Subsets for individual universities become less representative as the proportion of responses for a university diverges from the known proportion in the population, as established by registration data. Respondents for Saint Mary's University, for example, are not represented proportionally in the survey, compared with their proportion of international student registrations. Other

‘unrepresentative’ sub-samples, Dalhousie University and Université Sainte-Anne, tend to be over-represented compared to the population (registrations). Regardless of representativeness, samples for individual universities are sometimes quite small and would only provide estimates with large margins of error.

A case might be made for the application of weighting to the survey, based upon the proportional representation of each university in the sample and the population. This was not done for this survey sample. The focus of the project is an expenditure analysis, and tuition aside, locale would be a better basis for weighting than university. Table 2 provides registration and survey response data for the 11 Nova Scotia Universities, organized by locale: those universities within Halifax Regional Municipality (HRM) and those outside HRM. Sixty-eight percent of respondents were from universities in HRM, compared to 68.8 percent in the population of international students. Since the HRM/not HRM distribution for the sample closely resembles that for the underlying population, weighting is not necessary.

Table 2: International Student Registrations and Surveys Analyzed, by University (2008-09)

University	Registered Students	University Percent of Population	University Returns Analyzed	Return Rate from University	Return Rate on Sample
Halifax Regional Municipality (HRM)					
Atlantic School of Theology	1	0.0%	1	100%	0.1%
Dalhousie University	1034	29.3%	266	25.7%	36.6%
Mount Saint Vincent University	218	6.2%	56	25.7%	7.7%
Nova Scotia College of Art and Design	63	1.8%	20	31.7%	2.8%
Saint Mary’s University	1078	30.6%	140	13.0%	19.3%
University of King’s College	29	0.8%	11	37.9%	1.5%
Sub-Totals	2423	68.8%	494		68.0%
Outside HRM					
Acadia University	438	12.4%	86	19.6%	11.8%
Cape Breton University	325	9.2%	76	23.4%	10.5%
Nova Scotia Agricultural College	78	2.2%	19	24.4%	2.6%
St. Francis Xavier	223	6.3%	27	12.1%	3.7%
Université Sainte-Anne	37	1.0%	25	67.6%	3.4%
Sub-Totals	1101	31.2%	233		32.0%
Grand Totals	3524	100.0%	727		100.0%
	(Population)		(Sample)		

Expenditure data were first examined, question by question, and tested for outliers using a box-plot approach (McClare & Sincich, 2006, p. 93). Entries lying outside three standard deviations of the mean were considered for exclusion, consistent with conventional practice. Candidate data for exclusion were compared to the results for Screen 40, number of dependents, since many cases represented the higher expenditures required of a family unit. Data identified as outliers were exclusively more than 3 standard deviations *above* the mean; there were no outliers below the mean. This process significantly condensed expenditure data, although distributions remained skewed, with notable differences between means, medians and modes. If the focus of this study were the definition of ‘the average student,’ then these differences would be of concern. Instead, the focus of the study is on the *overall* economic impact of international students on Nova Scotia, for which an average expenditure is but an intermediate calculation in the estimating process.

The survey question on expenditures on travel within Nova Scotia (Screen 21) had to be treated specially. A significant number of respondents explicitly (with supporting descriptive comments) included airfare to their home countries in their responses, rather than excluding it as required by the question, leading to a bimodal distribution of responses. The bimodality suggests two overlapping distributions and so, with the support of the descriptive entries, the distribution was truncated at \$1,000 per year (see Figure 3); therefore, this expenditure category only captures travel expenditures of \$1,000 or less. An alternative approach would be to exclude this

Frequency

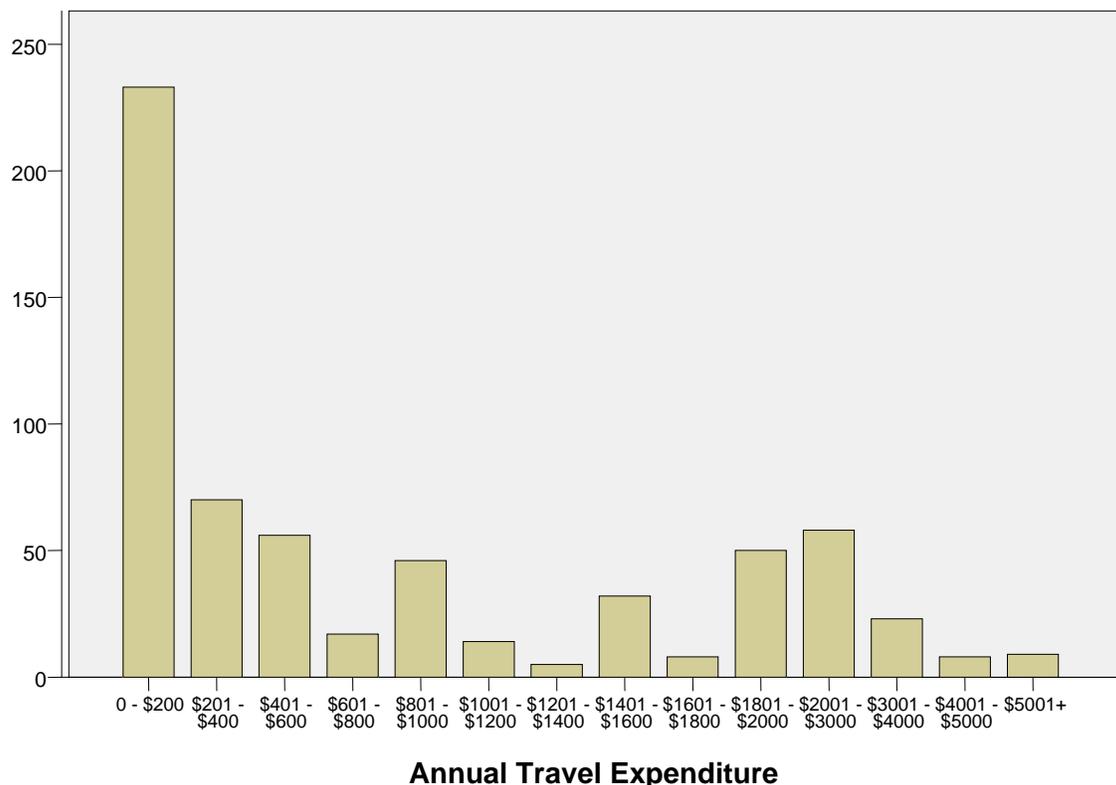


Figure 3: Expenditure Distribution for Travel in Nova Scotia.

expenditure category from the overall spending analysis. The effect of exclusion would be a reduction in average annual expenditure of \$215 per year, or a reduced contribution to the economy of approximately \$750,000.

The methodology for the study proposed determining expenditures on an annualized basis, but it became apparent that many students returned home, or left Nova Scotia for the summer months. Respondents were not questioned on this; therefore, it was necessary to estimate which students, or what proportion of students, stayed in Nova Scotia for the summer, and which left. Three questions were used to determine this: if students were neither registered for summer term (Screen 6) nor working off campus (Screens 62 and 63) then it was presumed that the respondent left Nova Scotia for the summer, and stayed only 9 months in Nova Scotia. If one or more responses to the three questions were affirmative, then it was presumed that the respondent stayed in Nova Scotia for a full 12 month period.

4.2 Expenditures for Students

Secondary sources, from government and university, were used to estimate expenditure *for* international students. Government sources consisted of two types: basic data tables showing trends in parameters such as population, enrolment or tuition; and data regarding the measures of enrolment used for the determination of grants to universities under the 2008-09 to 2010-11 Memorandum of Understanding between the Government of Nova Scotia and Nova Scotia universities. University sources consisted of annual financial reports for the fiscal year ending March 31st, 2008, supplemented where necessary by questions of clarification addressed to the universities through the Department of Education. Seven of 11 published accounts were available on the web, three were supplied as paper copies by the Department of Education; the Nova Scotia Agricultural College prepared a special summary table, since its normal accounts are embedded within those of the Nova Scotia Department of Agriculture.

The expenditures for students were taken from the last available complete fiscal year, 2007-08, and so they do not correspond to the fiscal year in which the survey was executed (2008-09). Expenditures by students are estimated seven to eight months after the completion of the fiscal year in which expenditures for students were estimated. Ideally, one might wait for the availability of 2008-09 accounts before completing the study, or alternatively, one might adjust the two sets of expenditures to a common basis. Instead, the expenditures for students and the expenditures by students have been used without adjustment. Statistics Canada (2009) indicates that the “all items” consumer price index for Nova Scotia changed only 0.4 percent from February 2008 to February 2009. Thus, the errors arising from using unadjusted results are considered negligible.

Expenditure for international students is estimated in two components. The first and most significant component is spending for international students through universities. This component includes government grants to universities, since it is the universities that expend the grants in the economy. The second component is expenditure by government for healthcare for international students through Medical Services Insurance (MSI). The expenditures through MSI were again obtained by the Department of Education. This second component is only one-quarter percent the value of the first, but is included for completeness.

5. Analysis and Findings

Analysis and findings are reported in the following subsections. Sections 5.1 through 5.4 present the results of demographic, institutional and intentions themes respectively, from the survey, as well as a summary of types of student comments. Section 5.5 presents the analysis of the expenditures theme from the survey. Section 5.6 presents the analysis of government and university spending for students, from secondary sources. Finally, Section 5.7 presents the analysis of the economic impact of international students in Nova Scotia, using an expenditure-based approach.

5.1 A Demographic Profile of International Students

This section presents the demographic characteristics of the survey respondents. Forty-eight percent of respondents were male. The respondent sample was young: the lower quartile age of respondents was 21; the median age was 22; and the upper quartile age was 25. See Table 3.

Survey respondents originated from 101 different countries. The number of countries may be higher since 17 percent of respondents did not complete the country of origin question. The top ten countries of origin were China (23.5 percent of respondents), USA (11 percent), Germany (6 percent), Bahamas (4.6 percent), India (4.3 percent), Egypt (3.2 percent), France (2.9 percent), Bermuda (2.3 percent), Bangladesh (2.1 percent), and Japan (2.1 percent). The third place result may not suggest increasing importance of Germany as a source country, since many German respondents were registered in Nova Scotia for the autumn term only. This is confirmed by examining country of origin only for the 521 students who were enrolled for courses in the winter term. In this case, Germany falls to eighth place, and the top five become China (24.1

Table 3: Demographic Profile – Gender, Age and Origin (2008-09)

	Number of Respondents	% of Respondents	Margin of Error, %
Gender (n=655)			3.8
Male	314	47.9	
Female	341	52.1	
Age (n = 656)			3.8
Under 20	94	14.3	
20 – 21	147	22.4	
22 – 23	175	26.7	
24 – 25	109	16.6	
26 - 29	76	11.6	
30+	55	8.4	
Origin by UNESCO Regions (n = 653)			3.8
Asia and Pacific	260	39.8	
Europe and North America	193	29.6	
Latin America and Caribbean	96	14.7	
Arab Countries	63	9.6	
Africa	41	6.3	
Top Three Countries (n = 652)			3.8
1. China	153	23.5	
2. USA	72	11.0	
3. Germany	39	6.0	

percent), USA (12.5 percent), Bahamas (5.8 percent), India (3.5 percent), and Bermuda (2.9 percent). France fell out of the top ten entirely. Population data held by the Department of Education credit China, the United States and Bermuda with first through third places.

Students from the ‘Asia and Pacific’ and ‘Europe and North America’ UNESCO regions represent 70 percent of respondents. The UNESCO regions of origin were used at the request of the Department of Education.

The capability of the respondents in Canada’s official languages is overwhelmingly weighted towards English, as shown in Table 4. Only nine respondents reported limited capability in English, with the balance reporting fluent over intermediate capability in a two to one ratio.

Table 4: Demographic Profile - Official Language Capabilities (2008-09)

	Number of Respondents	% of Respondents	Margin of Error, %
First Language (n = 659)			3.8
English	213	32.3	
French	25	3.8	
Other	421	63.9	
English Capability (n = 659)			3.8
Fluent	438	66.4	
Intermediate	212	32.2	
Limited or no capability (combined)	9	1.4	
French Capability (n = 657)			3.8
Fluent	47	7.2	
Intermediate	34	5.2	
Limited	158	24.0	
No capability	418	63.6	

Rented accommodations are most popular with respondents, by a 1.75 to one ratio compared to university residence. This is a positive finding for the rental market. Very few students reported owning accommodations, living with relatives, or ‘other’ accommodations. The proportion of international students living in university residence is highest for non-degree students at 62 percent and falls continuously, through bachelor and masters programs, to 2.5 percent for PhD students (1 of 40 respondents). The reverse is true for rented accommodations.

Table 5 presents employment, marital status and dependent profiles for respondents. Twenty-six percent of respondents work either on or off campus and another 38 percent are looking for work. Nearly 6 percent of respondents replied positively to more than one of the employment category questions, and thus held two or more jobs. Six of the 168 respondents answering ‘yes’ to the employment question replied ‘no’ to all 4 questions on category of employment, for reasons unknown.

Most respondents (88 percent) are single with no dependents (91.5 percent). Doctoral students were more likely to have dependents in Nova Scotia (46 percent of respondents), followed by 12 percent for masters students and 5 percent or less for undergraduates. Several of the respondents who answered ‘married’ to the marital status question did not respond to the question which classified the spouse or partner, so the total number of valid responses is less than expected for the latter (79 versus 82).

Table 5: Demographic Profile - Employment and Dependents (2008-09)

	Number of Respondents	% of Respondents	Margin of Error, %
Respondent Employed (n = 655)			3.8
yes	168	25.6	
no, but looking	250	38.2	
no and not looking	237	36.2	
Respondent Employment			
On campus in field of study	65	9.9	
On campus not in field of study	68	10.3	
Off campus in field of study	33	5.0	
Off campus not in field of study	37	5.6	
Hold two or more jobs	38	5.8	
Marital Status (n = 656)			3.8
Single (widowed, divorced or never married)	574	87.5	
Married	47	7.2	
Common Law	35	5.3	
Spouse or Partner (n = 647)			3.8
A Student	14	1.9	
A Student who is working	12	1.7	
Working, but not a student	24	3.3	
Neither a student nor working	15	2.1	
Not resident in Canada	14	1.9	
Spouse or Partner (n=648)			3.8
Canadian Citizen or Landed Immigrant	16	2.2	
Number of Dependents in Nova Scotia (n = 657)			3.8
None	601	91.5	
One	31	4.7	
Two or more	25	3.8	

	Level of Program		
	Non-Degree & Bachelor*	Masters	PhD
Respondents with Dependents in NS (n = 655)	24	14	18
N of program level	495	121	39
Percent of Category	4.8%	11.6%	46.2%
* Categories combined (both numbers of dependents and non-degree/bachelor) to avoid responses of less than 5			

Employment information suggests the importance of financing for students, and Table 6 examines this in more detail. Over half of respondents list their parents as their most important source of funding, with scholarships, bursaries and awards a distant second source. A third of respondents identify themselves (including employment income) as their second most important source of income.

Table 6: Demographic Profile - Sources of Income for International Students (2008-09)

Most important source of funding to finance education (n = 675, M.E. = 3.8%)	Number of Respondents	(%)
Parents	395	58.5
Scholarships, bursaries and/or awards	87	12.9
Yourself (includes savings and employment earnings)	70	10.4
Government loans	60	8.9
Other family members	16	2.4
Other	15	2.2
Student line of credit	13	1.9
Sponsorship by employer	11	1.6
Spouse or partner	8	1.2

The origin of respondents' funding is of particular interest in examining economic impact. The mean value of respondents' funds expended in Nova Scotia which comes from sources outside Nova Scotia is 68 percent; the median is 90 percent (see Table 7).

Table 7: Demographic profile – Origin of Income for International Students (2008-09)

What proportion of spending comes from funds from outside Nova Scotia?	n	Mean	Margin of Error #	Median	Mode	25th Percentile	75th Percentile
	396	68.5	2.9	90.0	100.0	31.25	100.0
# Margin of Error of Mean at 95% confidence							

Table 8 presents a summary of scholarships, awards and bursaries received by students. One hundred and seventy-nine respondents received awards with an average value of \$9,405. The statistics presented in Table 8 are calculated based on the number of recipients of awards (N in Table 8), not the entire sample of respondents.

Table 8: Demographic Profile - Scholarships, Awards and Bursaries (2008-09)

Program	N (Awards)	Mean	Margin of Error#	Median	Mode	25th Percentile	75th Percentile
Non-degree	10	\$2,876	\$2,132	\$2,000	\$2,000	\$800	\$3,281
Bachelor	104	\$5,540	\$2,048	\$2,000	\$1,000	\$1,000	\$5,680
Master	39	\$12,718	\$3,651	\$9,000	* \$5,000	\$2,500	\$20,000
PhD	26	\$22,409	\$3,623	\$24,000	\$25,000	\$20,000	\$25,625
All Awards	179	\$9,405	\$1,770	\$3,200	\$1,000	\$1,351	\$16,000
# Margin of Error of Mean at 95% confidence							
* Multiple modes exist; the smallest value is shown.							

5.2 University Profiles

Respondents were asked a series of questions related to the academic programs in which they were enrolled. Table 9 presents the academic profile of the survey respondents.

Sixty-nine percent of respondents are attending their first choice of university; PhD students reported the highest first choice response at 80 percent. This is considerably higher than the 51 percent first choice statistic reported by Lebrun and Rebelo (2006) for Atlantic Canada universities. Moreover, as shown in Table 10 overleaf, ninety percent of respondents were either satisfied or very satisfied with the services provided by their university.

Table 9: Academic Profile of International Students in Nova Scotia (2008-09)

	Frequency	(%)
Was this university your first choice? (n = 725, M.E. = 3.6%)		
Yes	498	68.7
No, another university in NS was	22	3.0
No a Canadian university outside NS was	118	16.3
No, a university in the US was	51	7.0
No, a university outside Canada and the US was	36	5.0
Full-time or part-time student? (n = 725, M.E. = 3.6%)		
Full-time	686	94.6
Part-time	39	5.4
Year of program (n = 726, M.E. = 3.6%)		
1 st inc. preparatory/foundation	190	26.2
2 nd	162	22.3
3 rd	177	24.4
4 th	161	22.2
5 th or higher	36	5.0
Level of program (n = 724, M.E. 3.6%)		
Non-degree	48	6.6
Bachelor	501	69.2
Master	135	18.6
PhD	40	5.5
Field of study (n= 725, M.E. = 3.6%)		
Agriculture, Natural Resources and Conservation	24	3.3
Architecture, Engineering, and Related Technologies	89	12.3
Business, Management and Public Administration	231	31.9
Education	25	3.4
Health, Parks, Recreation and Fitness	19	2.6
Humanities	40	5.5
Mathematics, Computer and Information Sciences	57	7.9
Physical and Life Sciences and Technologies	73	10.1
Social and Behavioral Sciences and Law	39	5.4
Visual and Performing Arts and Communications Technologies	25	3.4
Other	103	14.2
Expected year of graduation (n = 725, M.E. = 3.6%)		
2009	284	39.2
2010	214	29.5
2011	129	17.8
2012 or later	98	13.5

Table 10: Satisfaction Level of International Students in Nova Scotia Regarding Education Services (2008-09)

	University (n = 647, M.E. = 3.8%)		Agent (n = 176, M.E. = 7.4%)		Edu-Canada (n = 80, M.E. = 11.0%)	
	Frequency	%	Frequency	%	Frequency	%
Very satisfied	150	23.2	37	21.0	15	18.8
Satisfied	433	66.9	108	61.4	59	73.8
Dissatisfied	51	7.9	26	14.8	6	7.5
Very dissatisfied	13	2.0	5	2.8	-	-
I did not use these services	N/A ¹⁵	N/A	460	-	534	-

Ninety-five percent of respondents were full-time students. Each respondent was registered in the fall term (September to December 2008) and, of these individuals, 80 percent intended to register in the winter term (January to April 2009) and 38 percent intended to register in the spring/summer term (May to August 2009). Sixty-nine percent of respondents were studying at the bachelor level. All of the 40 respondents who were studying in Doctoral programs (PhD) were registered at Dalhousie University.

Table 9 shows the field of study in which respondents were registered, according to the categories used by Statistics Canada. Nearly one-third (31.9%) of respondents were registered in ‘Business, Management and Public Administration,’ with ‘Architecture, Engineering, and Related Technologies’ a distant second at 12.3 percent. If the responses for the categories for natural sciences and engineering are combined,¹⁶ they total 33.6 percent of respondents, indicating that this broad area of study is also of significant interest to international students.

5.3 Student Intentions

Student intentions are summarized in Table 11, overleaf. Half of the respondents indicated their intention to apply for permanent residency.

When asked about their future intentions upon completion of their current programs, 23 percent indicated they planned to enrol in another program while 54 percent said they planned to find work. Twenty-two percent of respondents were unsure of their future plans or indicated “other”. Of the respondents who planned to continue their studies, 33 percent wished to do so at their current university, 16 percent wished to attend a different university in Nova Scotia, 23 percent planned to attend a different Canadian university outside Nova Scotia, and 28 percent planned to study in another country. Of the respondents who planned to find work, 38 percent wanted to work in Nova Scotia, 35 percent planned to do this in their home country, and 27 percent planned to go work in another part of Canada. Of those planning to work in Nova Scotia or other parts of Canada there was a 10 to 1 preference for work in services over goods producing industries, in obvious alignment with the growth of knowledge-based economies.

¹⁵ Not applicable: “I did not use these services” was only an available choice for questions on use of an agent or Edu-Canada.

¹⁶ Agriculture, Natural Resources and Conservation; Architecture, Engineering, and Related Technologies; Mathematics, Computer and Information Sciences; and, Physical and Life Sciences and Technologies.

Table 11: Students' Intentions after Completing Current Program (2008-09)

	Number of Respondents	(%)
Do you plan to apply for permanent residency in Canada? (n = 663, M.E. 3.8%)		
Yes	339	51.1
No	140	21.1
Don't Know	184	27.8
Upon completion of your current program are you planning to: (n = 669, M.E. = 3.8%)		
Find work in Nova Scotia	138	20.7
Have not made a decision on your future plans	132	19.8
Return to your home country to find work or study	127	19.0
Find work in another part of Canada	99	14.8
Enrol in another program at your current University	51	7.6
Enrol in another program in another country	43	6.4
Enrol in another program at a different Canadian University outside Nova Scotia	36	5.4
Enrol in another program at a different Nova Scotia University	24	3.6
Other	17	2.5
If you are planning to work in Nova Scotia or elsewhere in Canada, in what field will you primarily be seeking employment? ¹⁷ (n = 651, M.E. = 3.8%)		
I do not plan to work in Nova Scotia or elsewhere in Canada after I graduate	144	22.1
Total, All Industries	507	77.8
Total, Goods-Producing Industries (Includes NAICS categories 11, Agriculture, forestry, fishing and hunting; 21, Mining and oil and gas extraction; 22, Utilities; 23, Construction; and 31-33, Manufacturing)	51	7.8
Total, Services-Producing Industries (Includes NAICS categories 41, Wholesale trade; 44-45, Retail trade; 48-49, Transportation and warehousing; 51, Information and cultural industries; 52-53, Finance, insurance, real estate and rental and leasing; 54, Professional, scientific and technical services; 55-56, Management, Administrative and other Support; 61, Educational services; 62, Health care and social assistance; 71, Arts, entertainment and recreation; 72, Accommodation and food services; 81, Other services (except public administration); and 91, Public administration)	456	70.0

¹⁷ The fields of employment are those of the North American Industry Classification System (US Census Bureau, 2007).

5.4 Student Comments

The survey offered an opportunity for students to make unprompted comments. Many chose to do so, as summarized in Table 12, with 241 comments in 14 categories. In some cases, a single commentary was counted against multiple categories, and so the number of completions of the commentary question is less than 241. Overall, high tuition and differential fees generated the most negative comments. The positive reaction towards Nova Scotia and the host universities was a striking contrast, albeit with much lower frequency. Sadly, comments about discrimination are also present.

Table 12: Classification of Student Comments (2008-09)

	Frequency	Percent
Tuition / Books / Differential fees are too high	56	23.2
Positive comment about the survey	37	15.4
Negative comment or suggestion about the survey	23	9.5
Would like more international student scholarships and financial aid	17	7.1
Would like it to be easier for international students to work off campus	13	5.4
Positive comment about Nova Scotia	11	4.6
Would like help finding employment in Nova Scotia post-graduation	9	3.7
Positive comment about university experience	8	3.3
Has faced discrimination based on race/ ethnicity in Nova Scotia	8	3.3
Would like more information on how to access international student scholarships, awards and bursaries	6	2.5
Would like help navigating government system (with respect to Visa/ Work Permits/ Immigration); Comment about healthcare or health insurance fees; Comment about taxation (response classes combined because responses less than 5)	10	4.2
Miscellaneous (single responses)	43	17.8
Total	241	100.0

5.5 Expenditure by International Students

Expenditures by international students were derived from the survey of international students. Annex B provides details of how this information was derived from the survey, and includes comparisons of various sub-samples of the data which validate the appropriateness of use of all data in the estimation of expenditures.

Table 13 provides proposed estimates of student expenditure, based on detailed analysis of survey results given in Annex B. The following two approaches were considered:

- The vertical approach, where averages of various categories of expenditure are summed to obtain average annual expenditure; and,
- The horizontal approach, where total expenditures for individuals are averaged to obtain average annual expenditure.

The vertical approach is preferred here because it does not require imputation of missing values, but the horizontal approach is also reported because the sum of means in the vertical approach does not permit direct determination of a margin of error for average annual expenditure. The estimate of average annual expenditure from the vertical approach is \$28,540. This implies total direct expenditures by international students of \$101 million per year in Nova Scotia. The estimate from the horizontal approach is within two percent of that for the vertical approach, a difference within the margin of error of \$800 (rounded from \$795).

Annual spending of \$28,500 per year in Nova Scotia (rounded from \$28,540) is similar to estimates in other reports, although the derivation of those other estimates was generally not explained. In British Columbia, Adrian Kershaw Consulting reported \$31,000 (2005, p. 17) and IPSEA reported \$32,000 (2005, p. 32). Lebrun and Rebelo reported \$25,000 for Atlantic Canada (2006, p. 29) and Newfoundland and Labrador (2007, p. 17) reported a low-end value of \$18,000 to \$25,000 for that province. In the United States, NAFSA reported \$25,000 USD per international student (2008, p. 2).

Table 13: Average Annual Expenditures by Students in Nova Scotia (2008-09)

	Vertical Approach	Horizontal Approach	
	Mean	Mean	Margin of Error ¹⁸
Education Costs	\$12,992	\$12,992	\$526 (4.0%)
Housing Costs	\$5,432	\$5,558	\$200 (3.6%)
Meals and Groceries Costs	\$3,267	\$3,514	\$164 (4.7%)
Other Goods and Services	\$6,850	\$6,921	\$370 (5.3%)
Average Annual Expenditure	\$28,540	\$28,985	\$795 (2.7%)
I			
Number of International Students	3,524		
II			
Average Expenditure	\$28,540		
III			
Total Direct Expenditure (I x II)	\$100,574,960		

¹⁸ Margin of error at 95% confidence

5.6 Expenditure for International Students

Expenditures by government and universities on education represent a significant component of the economic impact of international students in the Province of Nova Scotia. This section estimates expenditures for international students for the fiscal year ending March 31, 2008, the most recent complete fiscal year available at the time of the study. The estimates are based primarily upon the published accounts for the 11 universities in Nova Scotia, supplemented by Government information where necessary, such as for health care.

5.6.1 Expenditure Through Universities

Annex C provides a more detailed description of calculations of expenditure for students through universities.

Total overall expenditure for students through the universities was determined by adding *operating expenditure* (spending from government grants, excluding funding from tuition and student fees, and excluding direct payments to students through scholarships, stipends, bursaries, and assistantships), *non-operating expenditure* (spending from endowments, scholarly and applied research grants, less direct compensation to students) and *capital expenditure*. Expenditures in the form of direct payment to students were excluded from university spending to avoid double counting, because expenditures arising from payments to students were captured as student spending through the international student survey. It must be emphasized that the figures used in this report to quantify expenditure for students through universities represent the benefit to Nova Scotia's economy, and that these figures do not necessarily correspond to the amounts found in government or university budgets.

Expenditures for international students through universities were estimated by drawing upon the policy basis for the provision of Government of Nova Scotia funding to universities. The 2008-09 to 2010-11 Memorandum of Understanding between the Government of Nova Scotia and Nova Scotia Universities uses an enrolment-based funding formula. Weighted Full Course Equivalents (WFCE) are used as the enrolment measure, with data from the academic years 2003-04 to 2005-06 as the baseline. The 'full course equivalent' element of this measure addresses the combination of full and part-time enrolments, while the 'weighted' component addresses the varying costs of different programs, such as undergraduate arts and medicine. The Department of Education supplied the contractor with WFCE data which allowed the following ratio to be calculated:

$$\text{WFCE}_{\text{international students}} / \text{WFCE}_{\text{all students}}$$

Table 14 summarizes the results of the calculations. Table 14 also includes the component of spending through universities that is based upon grants from the Government of Nova Scotia, assuming that these grants can be apportioned according to the WFCE ratio. In 2007-08, universities spent \$52.8 million for international students, excluding direct payments to students. Half of that spending, or \$26.5 million, was based upon grants from the Government of Nova Scotia.

Table 14: Expenditures for Students through Universities (2007-08)

	Total Expenditure through Universities	NS Government Component of Expenditure
All Students	\$586 M	\$291 M
International Students	\$52.8 M	\$26.5 M

In addition to calculating total expenditures on students, average expenditures per student were estimated in Annex C using MPHEC data for full-time equivalent registrations for academic year 2007-08. Full-time equivalents for international students at Cape Breton University were reduced to eliminate those students registered and attending courses at a partner campus in Cairo, Egypt. The detailed calculations in Annex C are somewhat ‘noisy’ at the university level with respect to expenditure per student, sometimes showing expenditure per international student higher than the overall expenditure per student, and sometimes lower. This may be a program dependent variation, or an effect of use of full-time equivalent registration data. The province-wide weighted average is probably more appropriate for policy use. In 2007-08, universities spent \$15,379 per international student FTE, excluding direct payments to students. Half of that spending, or \$7,719 per international student FTE, was based upon grants from the Government of Nova Scotia. See Table 15.

Table 15: Expenditures per Full-time Equivalent Student through Universities (2007-08)

	FTEs	Expenditure per FTE through Universities	NS Government Component of Expenditure per FTE
All Students	35,515	\$16,513	\$8,206
International Students	3,434	\$15,379	\$7,719

Notwithstanding the provision of special services by universities, such as international student offices, comparison of all-university ‘all student’ and ‘international student’ expenditure per international student FTE does bring into question the policy basis for international student differential fees.

5.6.2 Expenditures on Healthcare for International Students

The only expenditures for students that were not made through universities were expenditures made by Medical Services Insurance (MSI) on behalf of those students who were eligible for provincially-funded health care.

According to data provided by the Department of Education, Government expenditure for healthcare for international students through Medical Services Insurance in 2007 was \$126,215. A total of 1,275 international students and 129 of their dependents claimed MSI in 2007 for a per-user average cost of \$89.90. This expenditure represented a per-capita cost of \$35.82 per international student, or \$0.14 per Nova Scotian. Figure 4 shows trends in MSI expenditures which follow those of international student registrations over the past 10 years.

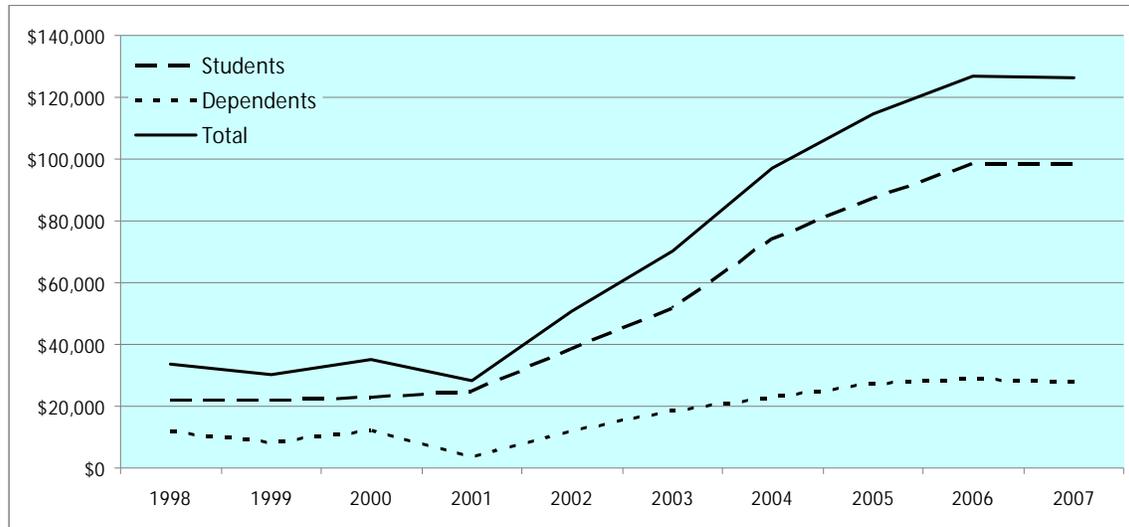


Figure 4: Expenditure on Healthcare for International Students (Nova Scotia Department of Health)

5.7 Economic Impact of International Students

This section draws upon the expenditure analyses presented in Sections 5.5 and 5.6, together with spending multipliers described in Section 3.3, to present an expenditure-based analysis of the economic impact of international students in Nova Scotia. As discussed earlier in the report, spending activity in the expenditure analysis is captured at the point of spending on final goods and services, avoiding intermediate expenditures, such as the payment of scholarships, bursaries or awards by universities to students.

5.7.1 Initial Impact

The initial or direct economic impact of international students on the Nova Scotia economy is summarized in Table 16. Expenditures by and for international students have been summed, generating an initial (direct) economic impact of \$154 million for 2008-09. This approximately equals the \$153 million in initial impact reported by Lebrun and Rebelo (2006, p. 29) for 6,119 international students in Atlantic Canada (p. 29). The present authors have deduced that Lebrun and Rebelo's 'contribution to the Atlantic economy' was based upon direct expenditures, by means of calculation. Thus, Lebrun and Rebelo's estimate corresponds to only line 'I' in Table 16. If the Lebrun and Rebelo direct spending estimate is adjusted for differing numbers of

Table 16: Initial (Direct) Economic Impact of International Students on Nova Scotia (2008-09)

		Spending
I	Expenditures by International Students	\$101 M
II	Expenditures for International Students through Universities (includes Government of Nova Scotia funds)	\$52.8 M
III	Expenditures for International Students through MSI	\$0.13 M
IV	Initial Spending (I + II + III)	\$154 M

students and different average spending per student in the two studies, there is only a one-half percent variance between the two.

Respondents to the survey were asked what proportion of the funds they spent in Nova Scotia came from outside Nova Scotia, and reported a median value of 90 percent. Thus, \$91 M of expenditures by international students represents an initial injection of new money to the Nova Scotia economy in 2008-09.

5.7.2 Final Impact

The final impact of international students upon the Nova Scotia economy is summarized in Table 17, wherein the initial economic impact is multiplied by the spending multiplier. Three values of the multiplier are used: an upper (1.8) and lower bound value (1.3), taken from Section 3.3, together with an intermediate, most likely value, taken to be 1.5. The final economic impact of international students on Nova Scotia is found to be \$231 million in 2008-09, based upon the most likely spending multiplier.

Table 17: Final Economic Impact of International Students on Nova Scotia (2008-09)

			Lower Bound	Most Likely	Upper Bound
IV	Initial Impact of International Students	\$154 M			
V	Spending Multiplier		1.3	1.5	1.8
VI	Final Impact of International Students (IV x V)		\$200 M	\$231 M	\$277 M

5.7.3 Parsing the Economic Impact of International Students

International students spent \$101 million in Nova Scotia in 2008-09, of which \$91 million was new money brought to Nova Scotia. This \$91 million is equivalent to export earnings, the final impact of which would be \$137 million after application of the most likely spending multiplier. This is considerably more than the \$100 million estimated by Gardner Pinfold for export earnings generated by “the five to six thousand international students studying in Atlantic Canada” (2006, p. 25).

Universities spent \$52.8 million from various sources (including the Government of Nova Scotia) for international students in 2007-08. Neglecting the small effect of the consumer price index, 0.4 percent for “all items” from February 2008 to February 2009 per Statistics Canada, (2009), international students spent nearly two dollars for every dollar spent through universities for the benefit of international students. Nearly \$1.75 of that \$2 was new money brought to Nova Scotia.

The Government of Nova Scotia’s share of the spending through universities for international students was \$26.5 million in 2007-08. Additionally, the Government of Nova Scotia spent \$126 thousand on Medical Services Insurance. Thus, again neglecting the effects of the consumer price index, international students spent \$3.80 for every dollar spent by the Government of Nova Scotia. Over \$3.40 of that \$3.80 was new money brought to Nova Scotia.

6. Summary and Conclusions

Nova Scotia faces a serious demographic challenge. Nova Scotia's population is aging and the proportion of younger people is in decline: Nova Scotia's dependency ratio will rise in the future with negative consequences, such as increased social services costs.

Over the next 25 years, Nova Scotia's population is forecast to grow negligibly, compared to a forecast of over 20 percent growth for all of Canada (Munro, 2007, p.5). Immigration offers a solution to this challenge, but Nova Scotia's performance in this regard is poor. Across the last four Canadian censuses, the proportion of foreign-born residents of Nova Scotia was approximately one-quarter of the proportion for Canada at large.

Sustained long-term economic growth requires a growing, well-educated workforce to support future knowledge-based activities. Unfortunately, Nova Scotia's university-age population, the very engine of a knowledge-based economy, is expected to fall 30 percent given current demographic trends in the next 20 years (McNiven, 2008).

International students think highly of Nova Scotia and its universities; therefore, opportunities exist to exploit students as immigrants, particularly when approximately half express interest in applying for permanent residence in Canada. International students as immigrants would help to offset Nova Scotia's demographic challenge, since their median age is only 22, which is the top end of a key declining age cohort.

Nearly 70 percent of international students in Nova Scotia come from either the 'Asia and Pacific' or 'Europe and North America' UNESCO regions. Two-thirds of international students report fluency in English, but only seven percent report fluency in French. Approximately 90 percent of international students were single, and without dependents in Nova Scotia.

Nearly 70 percent of international students are studying for bachelor degrees. 'Science and engineering,' 'business, management and public administration,' and 'humanities, social and behavioural sciences, and law' were the three most popular fields of study.

International students are beneficial to Nova Scotia economically. Most international students live in rental accommodations (with nearly a two to one ratio over university residence) to the benefit of local rental markets. This study estimates that the overall economic impact of international students on Nova Scotia's economy is \$231 million in 2008-09, or almost 0.75 percent of GDP¹⁹. International students injected \$91 million of new money to Nova Scotia in 2008-09, and spend \$3.40 of new money in Nova Scotia for every dollar spent by the Government of Nova Scotia.

Based on the results of the study, the following considerations are presented:

- Nova Scotia needs to reverse demographic trends to maintain desired economic growth, and projections of continuing low birth rates make such reversal largely dependent upon immigration. International students are a suitable target group for increasing immigration to Nova Scotia.

¹⁹ Based on GDP for 2007 of \$33 billion (Statistics Canada, 2009a).

- Edu-Nova offers recruitment support to Nova Scotia universities. The Edu-Canada website offers relevant information on universities, culture and regulation directly to international students. A university portal in the style of the United Kingdom's Universities and Colleges Admissions Service would be far more effective than either Edu-Nova or Edu-Canada in promoting Nova Scotia Universities. Such a portal would simplify the application process and encourage increased numbers of international students.
- International students provide a significant economic benefit to Nova Scotia, which makes current limits on funding of universities for international students through the university funding formula seem to be incongruous. Registration targets for international students might be more appropriate. Such targets are the norm in foreign jurisdictions seeking growing numbers of international students for local economic benefit.
- The current funding policy for Nova Scotia universities does not include a requirement for the collection of differential fees; instead, it allows universities to employ market-based differential fees as revenue instruments. These differential fees are supplementary to provincial formula-based funding. Universities earned nearly \$19 million in differential fees in 2008-09. If differential fees were eliminated, or offset by bursaries, applications by international students to Nova Scotia universities would be expected to rise due to lower tuition. A larger pool of applicants would not only increase the number of students enrolled, but could also improve the quality of the intake, and by extension increase the number and quality of potential immigrants in support of Nova Scotia's Immigration Strategy.
- International students are understood to be subject to health examination before being accepted for entry into Canada, and are healthier than the Canadian norm (Nova Scotia, 2005, p.1). The cost to Nova Scotia of providing MSI to those international students that have obtained MSI eligibility is less than \$90 per student per year. Offering MSI coverage to healthy international students upon arrival in Nova Scotia would be a significant differentiator, at negligible cost to the public purse.
- The European Union's Bologna Process established the European Higher Education Area (EHEA), in which education systems across 45 countries share common key features, in which qualifications offered by institutions in the EHEA are recognized for further education and employment alike, and in which there is a high level of mobility for students. The EHEA makes Europe especially attractive to international students. The international competitiveness of Nova Scotia universities would be strengthened if their programs were aligned with those in higher education areas such as the European Union.

Policy based on these findings would bring multiple benefits. It would address the decline of the university-age population in Nova Scotia, thus supporting a more knowledge-based economy. It would increase the number of international students in Nova Scotia, thus bringing increased direct benefit to the economy. It would increase satisfaction levels of already-satisfied international students, encouraging them to stay in Nova Scotia, addressing the province's demographic challenge.

The quality of life in Nova Scotia is among the best in the world. This report offers insights into how Nova Scotia could become a Canadian leader in the education of international students, and meet the goals of Nova Scotia's Immigration Strategy.

Annex A: Survey of International Students

A.1 ECHO

The survey of international students was executed on-line using ECHO, a Learning and Assessment Research System developed by the Canadian Council on Learning (CCL).²⁰ Surveys represent a subset of ECHO capabilities; it is most often used to administer learning assessment tests to large sample populations.

The International Student survey used two types of questions available in the ECHO system: single choice 'radio buttons' or free field text boxes. Free field text boxes were used for input of expenditure data as well, allowing respondents to qualify their inputs if they so desired. Figures A1 and A2 show examples of each type of question. Common features of the two question types include: one question per screen; the ability to revisit a question; the ability to log out and return to a partially created survey; and reporting of progress through the survey. The detailed structure of the questions reflects the limitations of ECHO when used as a survey tool. For example, Echo did not permit the use of 'choose all that apply' question types, nor did it have the ability to display multiple questions per screen. Had these options been available, the survey could have been shorter. For example, it would have allowed employment type to be addressed in a single question or screen, rather than four (see Figure A3, Screens 60, 61, 62 and 63). Ongoing ECHO development by CCL is addressing some of these limitations.

Survey questions follow in Section A2, without skip patterns, since final development of the survey occurred within the ECHO utility, without development of a shadow paper survey. Logic for the on-line ECHO survey is illustrated in Figure A3.

A.2 Survey Questions

Screen 1: What University are you currently attending?

- Acadia University
- Atlantic School of Theology
- Cape Breton University
- Dalhousie University
- Mount Saint Vincent University
- Nova Scotia Agricultural College
- Nova Scotia College of Art and Design
- Saint Mary's University
- St. Francis Xavier University
- University of King's College
- Université Sainte-Anne

²⁰ The ECHO system was made available by CCL as government furnished materiel, through the Nova Scotia Department of Education.

International Student Survey

Upon completion of your current program, are you planning to:

<input type="radio"/>	Enroll in another program at your current University
<input type="radio"/>	Enroll in another program at a different Nova Scotian University
<input type="radio"/>	Enroll in another program at a different Canadian University outside Nova Scotia
<input type="radio"/>	Enroll in another program in another country
<input type="radio"/>	Return to your home country to find work or study
<input type="radio"/>	Find work in Nova Scotia
<input type="radio"/>	Find work in another part of Canada
<input type="radio"/>	Have not made a decision on your future plans
<input type="radio"/>	Other

42%

←
[Click here to continue this survey later.](#)
→

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1.3.16012009

Figure A1: Sample 'Radio-Button' Style Question for ECHO

International Student Survey

How much do you spend MONTHLY, on average, on:

Communication Services? (such as home phone, cell phone, internet and cable television)

←
[Click here to continue this survey later.](#)
→

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Figure A2: Sample Free Field Text Entry Question for ECHO

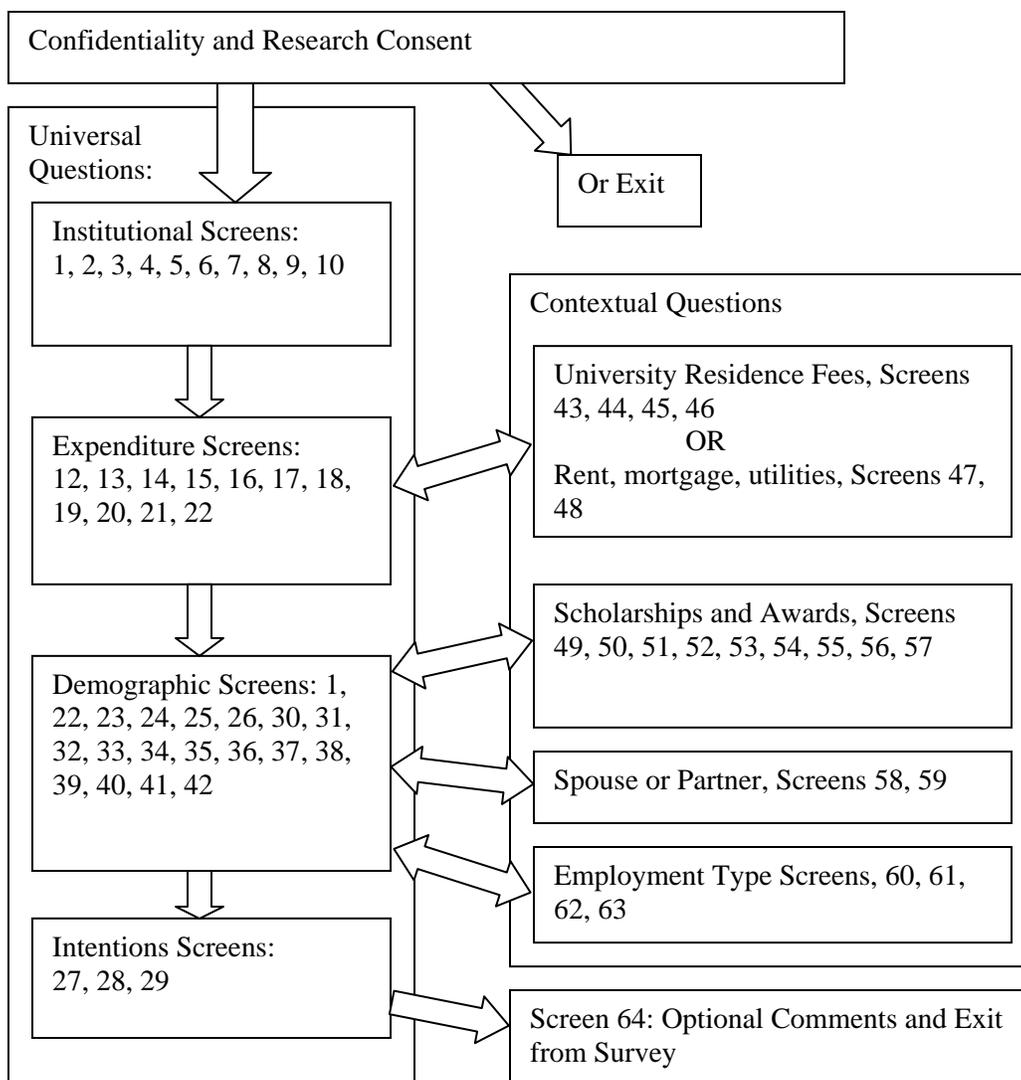


Figure A3: Logic for Survey

Screen 2: Was this University your first choice?

- Yes, my current university was my first choice
- No, another university in Nova Scotia was my first choice
- No, a Canadian university outside Nova Scotia was my first choice
- No, a university in the United States was my first choice
- No, a university outside Canada and the United States was my first choice.

Screen 3: What is your current student status? (For the term or semester in which you are now enrolled)

- Part-time Student (less than 3 classes this term)
- Full-time Student (3 or more classes, or taking thesis this term)

Screen 4: Are you taking courses in the following terms or semesters:

- Fall (September 2008 to December 2008)?
- Yes
- No

Screen 5: Are you taking courses in the following terms or semesters: Winter (January 2009 to April 2009)?

- Yes
- No

Screen 6: Are you taking courses in the following terms or semesters:

- Spring and Summer (May 2009 to August 2009)?
- Yes
- No

Screen 7: In what level of program are you currently enrolled?

- Bachelor
- Master - no thesis required
- Master - thesis required
- Doctoral
- Other (for example: non-degree; English as a Second Language (ESL); or exchange student)

Screen 8: What is your field of study?²¹

- Agriculture, Natural Resources and Conservation
- Architecture, Engineering, and Related Technologies
- Business, Management and Public Administration
- Education
- Health, Parks, Recreation and Fitness
- Humanities
- Mathematics, Computer and Information Sciences
- Personal Improvement and Leisure
- Personal, Protective and Transportation Services
- Physical and Life Sciences and Technologies
- Social and Behavioral Sciences and Law
- Visual and Performing Arts and Communications Technologies
- Other

²¹ The program choices available are those used by Statistics Canada.

Screen 9: In what year of your program are you currently enrolled?

- Preparatory/Foundation
- 1st
- 2nd
- 3rd
- 4th
- 5th or higher

Screen 10: In what year are you expecting to graduate from your current program?

- 2009
- 2010
- 2011
- 2012 or later

Screen 11: Are you currently receiving scholarships, bursaries or awards?

- Yes
- No

Screen 12: Do you live in residence?

- Yes
- No

Screen 13: What are your current accommodations?

- I live in University Residence
- I live in accommodations that I own
- I live in accommodations that I rent
- I live with relatives
- Other

Screen 14: How much do you spend MONTHLY, on average, on:

Communication Services? (*such as home phone, cell phone, internet and cable television*)

[free field text box]

Screen 15: How much do you spend MONTHLY, on average, on:

Groceries (food and other general household supplies)?

(*If you live in university residence, include food items purchased in addition to the meal plan*)

[free field text box]

Screen 16: How much do you spend MONTHLY, on average, on:

Transportation Costs? (*e.g., public transportation, car insurance, car payments, maintenance and gasoline. Please exclude the UPASS if it is included in your tuition fees and the cost of travelling to your home country*)

[free field text box]

Screen 17: How much will you spend in the 2008-09 school year (September 1, 2008 to August 31, 2009) for:

Tuition and university fees (*include international student differential fees*)?

[free field text box]

Screen 18: How much will you spend in the 2008-09 school year (September 1, 2008 to August 31, 2009) for:

Textbooks and Supplies?

[free field text box]

Screen 19: How much do you spend MONTHLY, on average, on:

Entertainment, recreation and tourism in Nova Scotia? (*include any relevant traveling expenses*)

[free field text box]

Screen 20: Please enter the estimated ANNUAL expenditures in your household on clothing and other goods and services (*please include expenses such as medical prescriptions and dental procedures, hair styling, personal hygiene items*)

Your household consists of you, your spouse or other dependents, but does not include roommates or parents

[free field text box]

Screen 21: How much do you spend ANNUALLY on travel within Nova Scotia, excluding travel for pleasure?

(Include transportation costs incurred between your current residence and the point or port of entry/exit to/from Canada for travel to your home country)²²

[free field text box]

Screen 22: Please enter the total value of any other expenditure(s) not included in the previous questions, which you have made or expect to make while in Nova Scotia as an international student.

(For example: furniture, computer, home appliance, etc)

[free field text box]

²² The responses to Screen 21 included comments that indicated that many respondents incorrectly included the cost of airfare to their home country.

Screen 23: How are you financing your education? Please select your most important or highest source

- Yourself (includes savings and employment earnings)
- Spouse or Partner
- Parents
- Other family members
- Scholarships, bursaries and/or awards
- Student line of credit
- Government Loans
- Sponsorship by employer

Screen 24: How are you financing your education? Please select your SECOND most important or highest source

- Yourself (includes savings and employment earnings)
- Spouse or Partner
- Parents
- Other family members
- Scholarships, bursaries and/or awards
- Student line of credit
- Government Loans
- Sponsorship by employer
- Not applicable

Screen 25: How are you financing your education? Please select your THIRD most important or highest source

- Yourself (includes savings and employment earnings)
- Spouse or Partner
- Parents
- Other family members
- Scholarships, bursaries and/or awards
- Student line of credit
- Government Loans
- Sponsorship by employer
- Not applicable

Screen 26: What proportion of your spending comes from funds from sources outside Nova Scotia? *(Please enter as a percentage, for example: 50%)*

[free field text box]

Screen 27: Upon completion of your current program, are you planning to:

- Enroll in another program at your current University
- Enroll in another program at a different Nova Scotian University
- Enroll in another program at a different Canadian University outside Nova Scotia
- Enroll in another program in another country
- Return to your home country to find work or study
- Find work in Nova Scotia
- Find work in another part of Canada
- Have not made a decision on your future plans
- Other

Screen 28: If you are planning to work in Nova Scotia or elsewhere in Canada, in what field will you primarily be seeking employment?²³ (*Select the field in which you are MOST likely to seek employment*)

- I do not plan to work in Nova Scotia or elsewhere in Canada after I graduate
- Agriculture, Forestry, Fishing and Hunting
- Real Estate and Rental and Leasing
- Mining, Quarrying, and Oil and Gas Extraction
- Professional, Scientific and Technical Services
- Utilities
- Management of Companies and Enterprises
- Construction
- Administrative and Support, Waste Management and Remediation Services
- Manufacturing
- Educational Services
- Wholesale Trade
- Health Care and Social Assistance
- Retail Trade
- Arts, Entertainment and Recreation
- Transportation and Warehousing
- Accommodation and Food Services
- Information and Cultural Industries
- Other Services (except Public Administration)
- Finance and Insurance
- Public Administration

Screen 29: Do you plan to apply for permanent residency in Canada?

- Yes
- No
- Don't know

²³ The fields of employment are those of the North American Industry Classification System (US Census Bureau, 2007).

Screen 30: Overall, how satisfied are you with the services provided by your University?

- Very Satisfied
- Satisfied
- Dissatisfied
- Very Dissatisfied
- Unsure

Screen 31: If you used the services provided by an Agent when searching for a university, how satisfied were you with these services?

- I did not use an Agent
- Very Satisfied
- Satisfied
- Dissatisfied
- Very Dissatisfied
- Unsure

Screen 32: If you used the service provided by EduCanada in your search for a university, how satisfied were you with these services?

- I did not use EduCanada
- Very Satisfied
- Satisfied
- Dissatisfied
- Very Dissatisfied
- Unsure

Screen 33: How long have you been in Nova Scotia as an international student?

- Less than a month
- Less than 6 months
- Less than 12 months
- Less than 2 years
- Less than 3 years
- 3 years or more

Screen 34: Please indicate your gender:

- Male
- Female

Screen 35: Please indicate your age (in years):

[free field text box]

Screen 36: Please indicate your country of Origin:

[free field text box]

Screen 37: What is your first language?

- English
- French
- Other

Screen 38: What is your capability in the English language?

- Fluent written and oral (I am capable of using the English language easily and accurately)
- Intermediate written and oral (I can work or study satisfactorily in English)
- Limited (I often require assistance to communicate)
- Not at all

Screen 39: What is your capability in the French language?

- Fluent written and oral (I am capable of using the French language easily and accurately)
- Intermediate written and oral (I can work or study satisfactorily in French)
- Limited (I often require assistance to communicate)
- Not at all

Screen 40: How many dependents (children or a spouse) are living with you in Nova Scotia?

- None, I do not have any dependents living with me in Nova Scotia
- 1
- 2
- 3
- 4
- 5 or more

Screen 41: What is your marital status?

- Single (widow, divorced or never married)
- Married
- Common Law (you live together with your partner)

Screen 42: What is your employment status?

- Working
- Not employed, but looking for work
- Not employed, and not looking for work

Screen 43: How much are you paying for university Residence Fees?

[free field text box]

Screen 44: Is your residency fee expenditure paid:

- For one term (September 2008 to December 2008)
- For two terms (September 2008 to April 2009)
- Annually (September 2008 to August 2009)

Screen 45: How much are you paying for university Residence Meal Fees?

[free field text box]

Screen 46: Is your residency meal plan expenditure paid:

- For one term (September 2008 to December 2008)
- For two terms (September 2008 to April 2009)
- Annually (September 2008 to August 2009)

Screen 47: How much do you spend MONTHLY, on average, on:

Rent or mortgage? (*including condominium fees*)

[free field text box]

Screen 48: How much do you spend MONTHLY, on average, on:
Utilities? (*including electricity, water and heating costs not included in your rent*)
[free field text box]

Screen 49: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:
Government of Canada Awards Program:
[free field text box]

Screen 50: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:
Canadian Commonwealth Scholarship Program
[free field text box]

Screen 51: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:
Canadian International Development Agency (CIDA)
[free field text box]

Screen 52: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:
Nova Scotia University
[free field text box]

Screen 53: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:
Other Nova Scotia Sources
[free field text box]

Screen 54: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:
Other Canadian Sources
[free field text box]

Screen 55: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:
Organization of American States Fellowship Program
[free field text box]

Screen 56: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:
International Sources (for example: USAID, Ford Foundation, United Nations)
[free field text box]

Screen 57: How much, if anything, are you currently receiving in scholarships, awards, or bursaries from the following:

Other Sources not previously listed (please enter amount only):²⁴
[free field text box]

Screen 58: Is your spouse or partner a Canadian Citizen or Landed Immigrant?

- Yes
- No

Screen 59: Is your spouse or partner

- A Student
- A student, who is also working
- Working, but not a student
- Neither a student nor working
- Not resident in Canada

Screen 60: Are you currently employed:

On-campus - in your area of study

- Yes
- No

Screen 61: Are you currently employed:

On-campus - not in your area of study?

- Yes
- No

Screen 62: Are you currently employed:

Off-campus - in your area of study?

- Yes
- No

Screen 63: Are you currently employed:

Off-campus - not in your area of study

- Yes
- No

Screen 64: Should you wish to make any additional comments about this survey for the Nova Scotia Department of Education, please enter them in the space below.

[free field text box]

²⁴ Despite the request for numerical data only, respondents often included explanatory text as well in free field text boxes, which was helpful in interpreting the data, albeit at the cost of considerable effort in preparing data for statistical analysis.

Annex B: Expenditures by Students

B.1 Calculating Average Annual Expenditures

Expenditures by students were estimated using the data collected by the international student survey. The survey expenditure data provide two options for expenditure analysis, based on visualizing a matrix of student expenditures: a *horizontal* approach averaging the totals of each individual student's categories of expenditure or a *vertical* approach totaling the averages of various categories of expenditures, such as tuition or utilities. See Figure B1, below. Two key considerations govern the choice between these two options: the first is missing expenditure data and the second is mutually exclusive categories of expenditure.

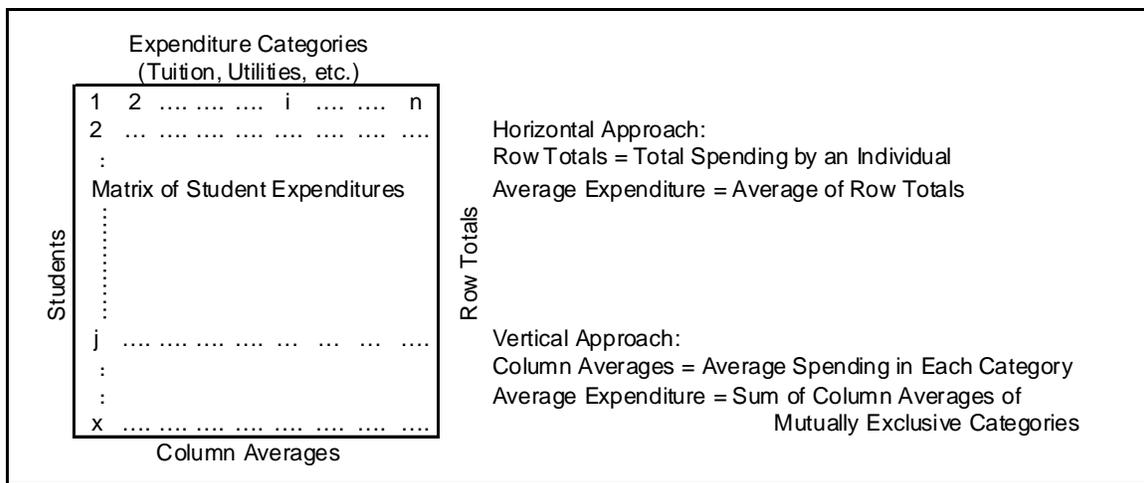


Figure B1: Approaches to Calculating Student Expenditure

With respect to missing expenditure data, the survey asked each respondent to estimate expenditures in 11 different questions, designed to simplify the respondent's effort. Free field entries were permitted and responses of zero were feasible in many questions; however, there were clear cases of missing responses to single questions, supported by textual responses from the respondent such as "I decline to answer" instead of a numerical entry. There are also cases where entries were identified as outliers and then excluded from analysis. In such cases, the horizontal approach would require that all expenditure responses from a respondent with missing or excluded entries be excluded from the analysis, since that individual's estimated total spending total (the row total in Figure B1) would be a known underestimate. Imputation of missing values could address this problem, but the contractors preferred not to use imputation in the study in absence of supporting information (for example, textual entries) from the respondents. The vertical approach does not require exclusion of all expenditure data for an individual in the event of a missing expenditure entry, because an individual's responses to different categories of expenditure become discrete data, as long as questions are independent, or mutually exclusive.

The vertical approach is challenged when responses are not mutually exclusive, and two such cases exist in the survey. In the first case, respondents are asked to estimate housing expenditures

for either university residence or for rent/mortgage and utilities. Column averages of these parameters would be realistic estimates of each expenditure category if calculated using the number of valid respondents (that is, the number of respondents who answered the question), but would lead to an over-estimate of average total expenditure if the column averages were summed. An alternative approach of averaging these expenditure totals over all respondents would produce correct total average expenditures, but at the expense of unrealistically low column averages. A third, preferred solution is to calculate means over valid responses, and then to derive a new housing expenditure variable using a weighted average of the two original housing categories (residence fees, and rent/mortgage and utilities), using the number of respondents in each of the original questions as the weighting factors. The new housing expenditure variable could also be derived at the respondent level, but would be more sensitive to missing expenditure data.

The second case of non mutual exclusivity lies with food and groceries. Students living off campus answered a question on groceries. Students living in residence answered a question on residence meal plan expenditures, *as well as* the groceries question, since students living in residence also have out-of-residence food expenditures, as well as expenditures on non-food grocery items. This results in overlapping categories for food and groceries expenditures. There are two solutions to this case. A pragmatic solution is to pad non-responses to the residence meal plan question with zeros before summing responses to this and the groceries question, to obtain an average food and groceries value over the number of respondents, but this obscures the original data structure. A better solution that is more respectful of the original data structure is to create a new, derivative variable that provides the total food and grocery expenditure for each student. The average food and groceries expenditure is then calculated over the number of respondents who responded to either residence meal plan or groceries, or both.

This report primarily uses the *vertical* approach, since the extra effort involved in dealing with non-mutually exclusive responses is more than offset by the benefit of reduced exclusions of data relative to the horizontal approach. Unlike the horizontal approach, the vertical approach does not provide a statistical distribution for individuals total spending, but this is not of concern when an economic impact analysis requires the sum of all individuals' spending in Nova Scotia; however, margin of error for average expenditure by students is estimated in Annex B4 by using the *horizontal* approach.

B.2 Expenditures by Students

The results of expenditures by students are reported in Table B1 for all expenditure categories, and all respondents. For many of the spending categories, differences between mean, median and mode suggest non-normal distributions, as could be seen fairly easily from the raw data.

Comparisons of means were made to test the appropriateness of use of all expenditure data. Table B2 reports the first of these examinations, as means of expenditures for those who had been students in Nova Scotia for six months or less compared to those who had been students for more than six months. Means have been tested for differences. Test results for two cases, tuition and fees and utilities are significant at the 95 percent level and another two, communications and other expenditures are significant at the 99 percent level. The trend of increasing 'other expenditure' with time is logical. Given the non-significant differences for most of the parameters, it is considered that use of the full data set is justified.

Table B1: Expenditure by Students

	Dur- ation	Mean \$	Median \$	Mode \$	Margin of Error*, \$
Education Costs					
Tuition & Fees (n = 685)	Ann.	12,337	13,000	15,000	547
Textbooks, etc (n = 691)	Ann.	654	500	1,000	37.22
Housing Costs					
Residence Fees (n = 216)	Ann.	4,703	4,400	6,000	382
Rent/Mortgage (n = 405)	1 Mo.	513	450	400	22.78
Utilities (n = 396)	1 Mo.	59	40	0	7.11
Meals and Groceries					
Groceries (n = 697)	1 Mo.	273	250	300	14.92
Residence Meals (n= 177)	Ann.	1,890	2,000	0	261
Goods and Services					
Communications (n = 682)	1 Mo.	111	70	100	11.23
Transportation (n = 660)	1 Mo.	67	20	0	8.84
Entertainment (n = 678)	1 Mo.	140	100	100	12.01
Clothing, Etc. (n = 621)	Ann.	1,925	1,000	1,000	225
Travel in NS (n = 376)	Ann.	215	150	0	21.58
Other Expend. (n = 581)	Ann.	1,469	1,000	1,000	147
* Margin of Error at 95% confidence					

Table B2: Comparison of Expenditures for Time as a Student

	6 Mo. Or Less		More than 6 Mo.		Estimated p-value
	N	Mean, \$	n	Mean, \$	
Education Costs					
Tuition & Fees	217	11,590.39	418	12,983.97	0.023*
Textbooks, etc	223	652.56	419	661.22	0.834
Housing Costs					
Residence Fees	123	4,926.71	93	4,407.97	0.188
Rent/Mortgage	94	500.22	309	519.00	0.496
Utilities	88	43.90	307	63.61	0.024*
Meals and Groceries					
Groceries	227	254.14	413	285.53	0.061
Residence Meals	105	1,931.03	72	1,790.71	0.710
Goods and Services					
Communications	220	82.67	401	121.99	0.001**
Transportation	214	55.67	392	72.88	0.084
Entertainment	220	141.78	412	137.48	0.745
Clothing, Etc.	208	1,822.37	394	1,956.89	0.585
Travel in NS	121	196.0	246	228.99	0.181
Other Expenditure	195	1,170.70	379	1,624.99	0.005**
Assuming equal variances:					
* Significant difference in average spending at the 95 percent confidence level, $p < 0.025$					
** Significant difference in average spending at the 99 percent confidence level, $p < 0.005$					

Table B3 compares means of categories of expenditures for various universities. In the second and third columns of the table, Dalhousie University and Saint Mary’s University are shown; columns 4 and 5 compare HRM and ‘not HRM’ universities, and columns 6 and 7 compare Acadia and Cape Breton Universities. The regional pairings (columns 2 and 3 and columns 4 and 5) show consistency apart from fee-based expenditures, and the HRM/not HRM comparison shows expected rent differences between urban HRM and other regions of the province.

Overall, it is appropriate to use all available expenditure data for estimating expenditures by students.

Table B3: Comparisons of Expenditures for University and Locale

Spending Category	Dalhousie	Saint Mary’s	All of HRM Universities	All of ‘Not HRM’	Acadia	Cape Breton University
Education Costs						
Tuition & Fees	13,082.76	11,433.71	12,046.41	12,933.32	15,665.67	12,812.81
Textbooks, etc	604.21	664.48	639.94	684.16	760.42	886.99
Housing Costs						
Residence Fees	5,185.21	4,066.75	4,800.79	4,588.22	5,316.14	4,177.80
Rent/Mortgage	542.94	494.13	544.91	412.11	416.59	451.81
Utilities	60.48	58.09	59.47	58.26	83.29	20.00
Meals and Groceries						
Groceries	299.73	265.40	283.56	250.39	229.15	266.69
Residence Meals	1,454.18	1,514.67	1,362.23	2,487.20	3,602.14	1,683.33
Goods and Services						
Communications	118.19	120.36	114.45	103.12	90.87	133.47
Transportation	65.41	54.80	61.68	77.91	77.27	84.14
Entertainment	140.39	149.35	143.01	133.24	118.05	156.74
Clothing, Etc.	2,032.75	1,801.78	1,974.87	1,816.32	1,502.73	2,543.44
Travel in NS	185.02	195.15	187.97	285.09	265.81	276.17
Other Expenditure	1,658.79	1,357.07	1,544.70	1,302.59	1,220.24	1,494.50

B.3 Average Expenditures by Students

The methodology for the study proposed determining expenditures on an annualized basis, but it became apparent that many students returned home, or left Nova Scotia for the summer months. Respondents were not questioned on this; therefore, it was necessary to estimate which students, or what proportion of students, stayed in Nova Scotia for the summer, and which left. Three questions were used to determine this: if students were neither registered for summer term (Screen 6) nor working off campus (Screens 62 and 63) then it was presumed that the respondent left Nova Scotia for the summer, and was only resident in Nova Scotia for nine months of the year. If one or more responses to the three questions were affirmative, then it was presumed that the student was resident in Nova Scotia for a full 12 months of the year. Based on the responses to these questions, 28 percent of respondents hold jobs off-campus, and 38 percent plan on registering for summer courses. Forty percent of respondents are working off campus and/or are registered for summer courses, without double-counting those who do both.

Table B4 provides estimates of student expenditure, based on survey results, assuming that 40 percent of students would reside in Nova Scotia for 12 months per year. For each category of expenditure, the table provides duration over which the expenditure occurred (annually or monthly), mean expenditure, and the margin of error, 19 times out of 20. For monthly expenditures, the table also provides intermediate estimates of expenditures for 9 or 12 months of residence in Nova Scotia. Annual estimates for the monthly categories were obtained by weighting the 9 and 12 month estimates according to the time spent in Nova Scotia:

$$0.4 (12 \text{ Month Expenditure}) + 0.6 (9 \text{ Month Expenditure})$$

The resulting estimate of average annual expenditure is \$28,540. Estimates of annual expenditure are also provided for Education, Housing, Meals and Groceries, and Other Goods and Services.

Table B4: Average Annual Expenditures by Students in Nova Scotia

Parameter	Duration	n	Mean	Margin of Error	9 Month Expenditure	12 Month Expenditure	Annual Expenditure
Tuition and University Fees	Annual	685	\$12,338	\$546	-	-	\$12,338
Textbooks and Supplies	Annual	691	\$654	\$37	-	-	\$654
Education Costs	Annual						\$12,992
Residence fees	Annual	220	\$4,703	\$296	-	-	\$4,703
Rent/Mortgage	Monthly	405	\$513	\$23	\$4,621	\$6,161	\$5,237
Utilities	Monthly	396	\$59	\$7	\$533	\$710	\$603.74
Housing Costs		625					\$5,432
Groceries	Monthly	697	\$273	\$15	\$2,457	\$3,275	\$2,784
Residence Meal Plan	Annual	178	\$1,890	\$176	-	-	\$1,890
Meals and Groceries Costs		697					\$3,267
Communications	Monthly	682	\$111	\$11	\$998	\$1,330	\$1,131
Transportation	Monthly	660	\$67	\$9	\$604	\$805	\$684
Entertainment and Recreation	Monthly	678	\$140	\$12	\$1,259	\$1,678	\$1,426
Clothing, Medical & Personal	Annual	621	\$1,925	\$226	-	-	\$1,925
Truncated Travel in NS	Annual	376	\$215	\$22	-	-	\$215
Other Expenditures	Annual	581	\$1,469	\$147	-	-	\$1,469
Other Goods and Services							\$6,850
Average Annual Expenditure							\$28,540
Notes: 1. Categories collected as annual expenditures used as reported by respondents 2. Categories collected as monthly expenditures annualized as weighted mean, based on 40% staying in Nova Scotia 12 months and 60% staying only 9 months. 3. Margin of Error at 95% confidence							

B.4 Error Estimation Using the Horizontal Approach

The vertical approach to estimating expenditures by students minimizes loss of respondents due to missing entries, but denies the opportunity for direct estimation of margin of error for average annual student expenditure. As a result, average annual expenditure by students was also estimated directly using the horizontal approach to provide an estimate of margin of error.

The ECHO utility does not require respondents to answer all questions; rather, it only advises respondents of questions for which there is no response. Thus, there were respondents whose responses included 'blank' or missing responses to questions. Additionally, box-plot testing for

outliers (see Section 4.1) resulted in some extreme-value entries (in every case, large values) being eliminated. Blank or missing responses to questions, or deleted extreme values, can be populated by imputed values, the simplest of which is the mean value of the parameter.

Missing values were imputed in two stages. First ‘logical zeroes’ were inserted where appropriate; for example: respondents who did not live in residence were not asked about residence fees, or residence meal plan fees. In these cases, blank entries for residence fees and residence meal plan fees are logically zero. Similarly, those who did live in residence were not asked about rent or mortgage, or about utilities. Again, in these cases, rent and mortgage and utilities charges are logically zero. Adding zeroes in such cases is, for present purposes, not imputation, *per se*. After the addition of logical zeroes, the remaining missing values were imputed using the mean value of responses for the particular expenditure category. The degree of imputation varied across 11 of the 13 categories of expenditure: there was 1 category with 2 imputations; 4 categories with between 36 and 49 imputations, inclusive; 3 categories between 67 and 76 imputations, inclusive; and 3 categories with more than 100 imputations. The number of respondents for whom imputation of at least one spending category was required exceeded 400.

As in the vertical approach reported in Table B4, the calculations in this section recognize that many international students return home for the summer. Respondents were not questioned on this practice and so it is assumed that if they are neither registered for spring or summer term classes nor employed off campus, then they are resident in Nova Scotia for only 9 months per year. If respondents registered for spring or summer term (Screen 6) and/or worked off campus (Screens 62 and 63), then it is assumed that they were resident in Nova Scotia for 12 months of the year. A new variable was created which indicated whether a respondent was resident in Nova Scotia for 9 or 12 months per year, based on this logic. Annual expenditures were then calculated for each respondent, *en route* to calculating statistics for annual expenditure for all respondents.

Table B5 compares the results of calculations using the horizontal approach, with inclusion of logical zero values and with imputation for missing values, with the results of the vertical approach, from Table B4. The overall means of the two approaches (‘average annual expenditure’) differ by less than 2 percent, which is within the margin of error provided by the horizontal approach (\$800 - rounded from \$795 - or less than 3 percent). Proportional differences between the vertical and horizontal approaches for major components of expenditure (education costs, housing costs, meals and groceries costs, and other goods and services) vary. Education costs are identical since no imputation was required for these parameters. Meals and groceries costs differed by seven percent for the two approaches, and meals and groceries costs and other goods and services had margins of error of approximately five percent.

Table B5: Average Annual Expenditure using the Horizontal Approach

	Vertical Approach	Horizontal Approach	
	Mean	Mean	Margin of Error ²⁵
Education Costs	\$12,992	\$12,992	\$526 (4.0%)
Housing Costs	\$5,432	\$5,558	\$200 (3.6%)
Meals and Groceries Costs	\$3,267	\$3,514	\$164 (4.7%)
Other Goods and Services	\$6,850	\$6,921	\$370 (5.3%)
Average Annual Expenditure	\$28,540	\$28,985	\$795 (2.7%)

²⁵ Margin of error at 95% confidence

ANNEX C: Expenditures for Students

This annex describes the calculation of government and university expenditures for this study. A key feature of the calculations for the determination of economic impact is that government contributions to expenditures are only captured when the government funds are expended by universities. The exception to this is spending on health care, which is addressed separately in the main body of the report.

Expenditure data were taken from annual financial reports for 2007-08 from the eleven universities in Nova Scotia²⁶. Questions of clarification were addressed to the Universities by a consolidated request through the Department of Education. Once the necessary information was collected, spreadsheets were prepared to calculate overall government and university spending, as well as the proportion of the overall spending that was attributable to international students.

Table C1 summarizes expenditures through universities *for all students*. The table includes spending related to the universities' *Operating Accounts*, their *Non-Operating Accounts* and *Capital*. The table includes both total spending and per capita spending, based on the total number of full-time equivalent (FTE) students enrolled at each institution. A weighted average of spending per student across all universities is also calculated. The expenditures do not include those based upon tuition, since tuition is captured as expenditure by students. Similarly, direct payments to students have been excluded from the calculations, since these payments are captured as expenditures by students in the survey. Thus, the figures do not necessarily correspond to budget amounts for either government or universities.

Accounts for the Atlantic School of Theology did not provide the same details of those of other universities. A simplified calculation was performed, wherein expenditure on scholarships, bursaries, or awards was deducted from total university expenditures, net of tuition. Any error arising from the simplification has minor effect, given the size and budget of this university.

Tables C2 through C6 provide the supporting calculations for each item included in Table C1. The *Operating Account* includes spending related to government grants (calculated in Table C2 for *all* governments; calculations for Nova Scotia Government grants alone are given in table C8) and the amount of other university expenditure excluding direct payments to students (calculated in Table C3). The *Non-Operating Account* includes endowments (calculated in Table C4) as well as scholarly grants and applied research contracts (calculated in Table C5). The amount of *Capital* spending is calculated in Table C6.

In addition, Tables C2 through C6 calculate the proportion of total spending for each category that is attributable to international students. This calculation is done using the proportion of weighted full-course equivalents (WFCE) for international students enrolled at each institution for 2003-04 to 2005-06. Weighted Full Course Equivalents for the average of these three years (2003-04 to 2005-06) are the policy basis for enrolment-based funding in the 2008-11 funding MOU between the Government of Nova Scotia and universities.

²⁶ Seven of 11 published accounts were available on the web, three were supplied as paper copies by the Department of Education, and the Nova Scotia Agricultural College prepared a special summary table, since its normal accounts are embedded within those of the Nova Scotia Department of Agriculture.

Table C1: Expenditures through Universities for All Students

	Operating Account						Non-Operating Account			Capital	XI	XII	XIII
	I	II	III	IV	V	VI	VII	VIII	IX	X			
	NS Grants 2008-09 ¹	Other Government Grants 2008-09	Total Government Grants (I) + (II)	Tuition & Fees ²	Proportion of Other University Expenditure less direct payment to students ²	Total Operating Expenditure (III) + (V)	Endowment ⁴	Scholarly grants and applied research contracts	Total Non- Operating Expenditure (VII) + (VIII)	Capital ⁵	Total Spending (VI) + (IX) + (X)	Total Student Population (FTEs)	Total Un- Spended Capital (XIII)
University			From Table 2, Column III		From Table 3, Column VII		From Table 4, Column I	From Table 5, Column V		From Table 6, Column I			
Acadia	\$26,782,000	\$0	\$26,782,000	---	\$12,195,230	\$38,977,230	\$249,000	\$4,895,012	5,144,012	\$6,645,000	\$50,766,242	3,159	\$16,
Atlantic School of Theology (6)	---	---	---	---	---	---	---	---	---	---	\$2,249,921	57	\$39,
Cape Breton	\$19,719,073	\$0	\$19,719,073	---	\$3,271,575	\$22,990,648	\$0	\$3,669,682	3,669,682	\$3,027,495	\$29,687,825	2,694	\$11,
Dalhousie	\$133,611,000	\$8,714,000	\$142,325,000	---	\$30,626,140	\$172,951,140	\$16,664,000	\$103,557,671	120,221,671	\$1,925,000	\$295,097,811	13,026	\$22,
Mount Saint Vincent	\$17,560,349		\$17,560,349	---	\$3,802,440	\$21,362,789	\$0	\$4,253,779	4,253,779	\$2,141,662	\$27,758,230	2,731	\$10,
Nova Scotia Agricultural College	\$17,507,000	\$0	\$17,507,000	---	\$1,551,960	\$19,058,960	\$0	\$13,152,285	13,152,285	\$151,000	\$32,362,245	695	\$46,
Nova Scotia College of Art and Design	\$8,054,424	\$0	\$8,054,424	---	\$1,287,052	\$9,341,476	\$0	---	0	\$1,441,993	\$10,783,469	854	\$12,
Saint Mary's	\$26,528,000	\$1,518,000	\$28,046,000	---	\$11,881,910	\$39,927,910	\$44,000	\$11,360,000	11,404,000	\$0	\$51,331,910	6,332	\$8,
St. Francis Xavier	\$28,350,697	\$859,977	\$29,210,674	---	\$23,212,952	\$52,423,626	\$0	\$5,841,648	5,841,648	\$6,744,988	\$65,010,262	4,440	\$14,
King's College (6)	\$4,041,881	\$158,784	\$4,200,665	---	\$2,332,945	\$6,533,610	---	---	---	---	\$6,533,610	420	\$15,
Universite Sainte-Anne	\$9,269,736	\$0	\$9,269,736	---	\$4,464,154	\$13,733,890	\$0	---	0	\$1,127,635	\$14,861,525	1,108	\$13,
Overall	\$291,424,160	\$11,250,761	\$302,674,921	---	\$94,626,357	\$397,301,278	\$16,957,000	\$146,730,077	\$163,687,077	\$23,204,773	\$586,443,050	35515	\$16,

Notes:

- (1) It is assumed that government grants are from the Nova Scotia Government unless otherwise stated, in which case they are entered in the Other Government Grants column
- (2) Tuition and fees will be captured under student spending to avoid double-counting of tuition expenditure
- (3) Includes, but is not limited to, external cost recoveries, income from corporations and foundations and gifts
- (4) Endowment a restricted fund that accounts for the capitalization of externally and internally restricted amounts, primarily donations, which cannot be spent. Typically this represents the proportion of earnings on the endowment fund that flows into university expenditures in the current year (the rest of which is re-invested in the endowment fund)
- (5) Capital fund represents a restricted fund that accounts for resources provided to the University for capital purposes and not reported in any other fund
- (6) Financial information was not available by fund. Total Operating Expenditure for these institutions represents total overall expenditure by the University, less the amount identified as direct payment to students in the form of scholarships, bursaries or awards

Finally, using the same format as Table C1, Table C7 adds up all the totals calculated in Tables C2 to C6 and presents total spending through universities *for international students*. Table C7 also calculates per capita spending based on the total number of full-time equivalent (FTE) international students enrolled at each institution. A weighted average spending for international students across all universities is also included.

The calculation of government grants for international students in Table C2 includes grants from the Nova Scotia government as well as other government grants. It is assumed that, unless the annual financial reports stated otherwise, the government grants listed in them originated from the Nova Scotia Government. When stated otherwise, the amount of the grant was included in the “other government grants” column. The calculation of total government grants for international students is based on weighted full-course-equivalents (WFCEs).

Table C3 calculates the total amount of other university operating expenditures excluding direct payments to students. This amount was calculated as total operating expenditure *less* tuition (which already gets captured through student spending) and government grants (which already gets captured in Table 2). Next, this amount is reduced by the estimated proportion of operating expenditure that is directly paid to students (e.g. scholarships, teaching assistantships, etc.). Expenditures related to *direct* payment to students are excluded in order to avoid the potential for double-counting these expenditures on *both* the university and student sides. The estimated proportion included in the spreadsheet was determined using data provided through email correspondence from Acadia, Dalhousie, NSAC, SMU, St. Francis Xavier and Université Sainte-Anne. For universities that did not provide an estimated proportion, an average was taken from the other universities. The calculation of other operating expenditure by universities for international students is based on WFCEs.

Table C4 calculates university endowment expenditure based on the data provided in the annual financial reports of the universities. Endowment is a restricted fund that accounts for the capitalization of externally and internally restricted amounts, primarily donations, which cannot be spent. Typically this expenditure represents the proportion of earnings on the endowment fund that flows into university expenditures in the current year (the rest of which is re-invested in the endowment fund).

In a number of instances endowment spending was not available at the fund level. It is thus assumed that endowment expenditure is either rolled into the operating fund, thus captured in previous Tables C2 and C3, or no endowment spending occurred in the 2007-08 fiscal year. For Dalhousie University, 17.5 percent has been deducted from the total endowment spent on international students, as according to the University this represents direct spending to students. Finally, the proportion attributable to international students in Table C4 is based on WFCEs.

Table C5 calculates total scholarly grant and applied research/contract spending by taking the total amount indicated in the annual financial reports and multiplying it by the proportion of non-operating expenditure for students *excluding* direct payment to students. This aforementioned proportion was determined based on additional information requested from the universities. Wherever universities did not provide this information, an average was taken from the universities who did provide the estimated proportion. Finally, the proportion attributable to international students is based on WFCEs.

Table C6 presents capital expenditure for international students. Capital expenditure represents resources spent by universities for capital purposes and not reported in any other fund. The proportion of capital expenditure attributable to international students is based on WFCEs.

Table C7 sums all the totals calculated in Tables C2 to C6 and presents total spending through universities for international students. This information is presented using the same format as Table C1. Table C7 also calculates per capita spending based on the total number of full-time equivalent (FTE) international students enrolled at each institution. A weighted average for the entire province is also included.

Table C2: Government Grants for International Students

	I	II	III	IV	V	VI	VII
	NS Grants 2008-09 ¹	Other Government Grants 2008-09	Total Government Grants	WFCE All Students ²	WFCE International Students ²	WFCE _{INT} / WFCE _{ALL} (V) / (IV)	Grant for International Students (III) * (VI)
University							
Acadia	\$26,782,000	\$0	\$26,782,000	30159.2	4576.1	0.15	\$4,063,641.80
Atlantic School of Theology	---	---	---	824.1	29.8	0.04	---
Cape Breton	\$19,719,073	\$0	\$19,719,073	21141.6	1482.6	0.07	\$1,382,873.03
Dalhousie	\$133,611,000	\$8,714,000	\$142,325,000	192351.9	17555.1	0.09	\$12,989,382.76
Mount Saint Vincent	\$17,560,349		\$17,560,349	24442.9	2197.1	0.09	\$1,578,461.99
Nova Scotia Agricultural College	\$17,507,000	\$0	\$17,507,000	6342.1	355.7	0.06	\$981,894.37
Nova Scotia College of Art and Design	\$8,054,424	\$0	\$8,054,424	9176.0	647.2	0.07	\$568,057.10
Saint Mary's	\$26,528,000	\$1,466,000	\$27,994,000	41223.8	6051.3	0.15	\$4,109,296.30
St. Francis Xavier	\$28,350,697	\$859,977	\$29,210,674	33905.6	1330.1	0.04	\$1,145,888.15
Kings College	\$4,041,881	\$158,784	\$4,200,665	7067.9	218.3	0.03	\$129,738.44
Universite Sainte-Anne	\$9,269,736	\$0	\$9,269,736	3745.4	244.8	0.07	\$605,856.93
Totals	\$291,424,160	\$11,198,761	\$302,622,921	370381	34688		\$27,555,091

Notes:

(1) It is assumed that government grants are from the Nova Scotia Government unless otherwise stated, when stated otherwise this is reflected in Other Government Grants column.

(2) Weighted Full-Course Equivalents (WFCE) are calculated on average WFCEs for three years (2003 - 2006) that is used to determine current University grants by the Province. WFCEs were provided by the Province to the consultant team.

Table C3: Other Operating Expenditure by Universities for International Students

	I	II	III	IV	V	VI	VII	VIII	IX
University	Grants	Tuition & Fees	Total (I) + (II)	Actual University Expenditure	Other Expenditure¹ (IV) - (III)	Proportion of operating expenditure as direct payment to students²	Proportion of Other University Expenditure less direct payment to students *(I- (VI)) (V)	WFCE_{INT} / WFCE_{ALL} (From Table C2, Column VI)	Other expenditure for International Students (VII) * (VIII)
Acadia	\$26,782,000	\$29,883,000	\$56,665,000	\$72,102,000	\$15,437,000	0.21	\$12,195,230	0.15	\$1,850,386
Atlantic School of Theology	---	---	---	---	---	---	---	0.04	---
Cape Breton	\$19,719,073	\$15,077,835	\$34,796,908	\$38,337,574	\$3,540,666	0.076	\$3,271,575	0.07	\$229,431
Dalhousie	\$142,325,000	\$110,184,000	\$252,509,000	\$285,090,000	\$32,581,000	0.06	\$30,626,140	0.09	\$2,795,114
Mount Saint Vincent	\$17,560,349	\$21,835,890	\$39,396,239	\$43,511,434	\$4,115,195	0.076	\$3,802,440	0.09	\$341,793
Nova Scotia Agricultural College	\$17,507,000	\$4,511,000	\$22,018,000	\$23,638,000	\$1,620,000	0.042	\$1,551,960	0.06	\$87,043
Nova Scotia College of Art and Design	\$8,054,424	\$5,345,761	\$13,400,185	\$14,793,098	\$1,392,913	0.076	\$1,287,052	0.07	\$90,772
Saint Mary's	\$28,046,000	\$49,987,000	\$78,033,000	\$90,823,000	\$12,790,000	0.071	\$11,881,910	0.15	\$1,744,170
St. Francis Xavier	\$29,210,674	\$30,049,085	\$59,259,759	\$83,694,445	\$24,434,686	0.05	\$23,212,952	0.04	\$910,607
King's College ³	\$4,200,665	\$8,829,611	\$13,030,276	\$15,555,108	\$2,524,832	0.076	\$2,332,945	0.03	\$72,054
Universite Sainte-Anne	\$9,269,736	\$3,466,696	\$12,736,432	\$17,310,360	\$4,573,928	0.024	\$4,464,154	0.07	\$291,771
Total	\$302,674,921	\$279,169,878	\$581,844,799	\$684,855,019	\$103,010,220		\$94,626,357		\$8,413,142

Notes:

(1) Other operating expenditure includes, but is not limited to, revenue spent from external cost recoveries, corporations and foundations and gifts

(2) Proportion of operating expenditure was identified by each University through email correspondence. Information was provided by Acadia, Dalhousie, NSAC, SMU, St. Francis Xavier and Université Sainte-Anne. In absence of a response from the remaining Universities, an average from the universities who provided information was taken.

(3) Actual expenditure is \$16,339,403. Because financial information is not available for King's by Fund, \$784,295 has been deducted here as payment directly to students in the form of Scholarships, Bursaries, Awards and Stipends. This information will be captured by student expenditure.

Table C4: Endowment Expenditure of Universities

	I	II	III
	Total Expenditure	WFCE _{INT} / WFCE _{ALL} (From Table C2, Column VI)	Endowment Expenditure for International Students (I) * (II)
University			
Acadia	\$249,000	0.15	\$37,781
Atlantic School of Theology	---	0.04	---
Cape Breton ¹	---	0.07	---
Dalhousie ²	\$16,664,000	0.09	\$1,254,702
Mount Saint Vincent	\$0	0.09	\$0
Nova Scotia Agricultural College	\$0	0.06	\$0
Nova Scotia College of Art and Design ³	\$0	0.07	\$0
Saint Mary's	\$44,000	0.15	\$6,459
St. Francis Xavier	\$0	0.04	\$0
Kings College ¹	\$0	0.03	\$0
Universite Sainte-Anne	\$0	0.07	\$0

Total **\$16,957,000** **\$1,298,942**

Notes:

Endowment is a restricted fund that accounts for the capitalization of externally and internally restricted amounts, primarily donations, which cannot be spent. Typically this expenditure represents the proportion of earnings on the endowment fund that flows into university expenditures in the current year (the rest of which is re-invested in the endowment fund)

(1) Revenue and Expenses were not available by fund

(2) 17.5% has been deducted as according to Dalhousie it represents direct payment to students

(3) Endowment Expenditure is distributed as scholarships and thus captured in student spending

TABLE C5: University Scholarly Grants and Applied Research/Contract Expenditure

	I	II	III	IV	V	VI	VII
	Total Scholarly grants and applied research contracts ¹	Proportion of non-operating expenditure for students ²	Proportion of non-operating expenditure for students as direct payment to students ³	Proportion of non-operating expenditure for students <i>excluding</i> direct payment to students (II) - [(III) * (IV)]	Scholarly Grants and Applied Research/Contract Expenditure for all Students (I) * (IV)	WFCE _{INT} / WFCE _{ALL} (From Table C2, Column VI)	Scholarly grants and applied research contracts expenditure for International Students (V) * (VI)
University							
Acadia	\$5,985,000	0.920	0.111	0.818	\$4,895,012	0.15	\$742,722
Atlantic School of Theology	---	0.950	0.585	0.394	---	0.04	---
Cape Breton	\$4,345,133	0.950	0.111	0.845	\$3,669,682	0.07	\$257,350
Dalhousie	\$132,131,000	0.950	0.175	0.784	\$103,557,671	0.09	\$9,451,258
Mount Saint Vincent	\$5,036,740	0.950	0.111	0.845	\$4,253,779	0.09	\$382,363
Nova Scotia Agricultural College	\$14,895,000	1.000	0.117	0.883	\$13,152,285	0.06	\$737,657
Nova Scotia College of Art and Design ⁴	---	---	---	---	---	0.07	---
Saint Mary's ⁵	\$14,660,000	1.000	\$3,300,000	---	\$11,360,000	0.15	\$1,667,558
St. Francis Xavier	\$6,761,167	0.900	0.040	0.864	\$5,841,648	0.04	\$229,159
Kings College ⁶	---	---	---	---	---	0.03	---
Universite Sainte-Anne ⁷	---	---	---	---	---	0.07	---
Total	\$183,814,040				\$146,730,077		\$13,468,065

Notes:

- (1) Includes but not limited to special purpose and trust funds, sponsored research
- (2) Universities were asked to indicate what proportion of non-operating expenditure is expended for students. Acadia, NSAC, SMU and SFX provided specific proportions to the question. For those universities with which the information was not provided, an average of the Acadia, NSAC SMU and SFX was used
- (3) Universities were asked to provide the proportion of non-operating expenditure paid directly to students. Four universities provided this information - DAL, NSAC, SFX and AST. For those universities from which direct information was not available, the average of DAL, NSAC, SMU, and SFX was used. AST was dropped in this calculation as a significant outlier
- (4) Information on non-operating expenditure is limited to endowment funds (for which all expenditure was directly to students and will be captured on the student spending side)
- (5) Saint Mary's provided a dollar figure rather than proportion of spending for students. As such Column V is calculated as (I) - (III)
- (6) Information for Kings College was not available at the fund level
- (7) Non-operating expenses consist solely of depreciation (captured under capital expenditure) and scholarships and bursaries

Table C6: Capital Expenditure for International Students

	I	II	III
University	Total Capital Expenditure ¹	WFCE _{INT} / WFCE _{ALL} (From Table C2, Column VI)	Capital Expenditure for International Students (I) * (II)
Acadia	\$6,645,000	0.15	\$1,008,248
Atlantic School of Theology	---	0.04	---
Cape Breton	\$3,027,495	0.07	\$212,314
Dalhousie	\$1,925,000	0.09	\$175,686
Mount Saint Vincent	\$2,141,662	0.09	\$192,509
Nova Scotia Agricultural College	\$151,000	0.06	\$8,469
Nova Scotia College of Art and Design	\$1,441,993	0.07	\$101,700
Saint Mary's ²	\$0	0.15	\$0
St. Francis Xavier	\$6,744,988	0.04	\$264,595
Kings College ²	\$0	0.03	\$0
Universite Sainte-Anne	\$1,127,635	0.07	\$73,701

Totals \$23,204,773

\$2,037,223

Notes:

- (1) Capital Expenditure represents resources provided to the University for capital purposes and not reported in any other fund
- (2) Information was unavailable at the fund level

Table C7: Spending through Universities for International Students

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
	Operating Account				Non-Operating Account			Capital			
	Government Grant	Tuition & Fees ¹	Proportion of Other Operating University Expenditure less direct payment to students ²	Total Operating Expenditure (I) + (II) + (III)	Endowment ³	Scholarly grants, applied research and grants	Total Non-Operating Expenditure (V) + (VI)	Capital ⁵	Total University Spending for International Students (IV) + (VII) + (VIII)	International Student Population	University Spending for International Students per Capita (IX)/(X)
University	From Table 2, Column VII		From Table 3, Column IV		From Table 4, Column III	From Table 5, Column VII		From Table 6, Column III			
Acadia	\$4,063,642	---	\$1,850,386	\$5,914,028	\$37,781	\$742,722	\$780,503	\$1,008,248	\$7,702,779	515	\$17,586
Atlantic School of Theology	---	---	---	---	---	---	---	---	\$39,286	1	\$39,286
Cape Breton	\$1,382,873	---	\$229,431	\$1,612,304	---	\$257,350	\$257,350	\$212,314	\$2,081,969	310	\$6,406
Dalhousie	\$12,989,383	---	\$2,795,114	\$15,784,497	\$1,254,702	\$9,451,258	\$10,705,959	\$175,686	\$26,666,143	1055	\$25,789
Mount Saint Vincent	\$1,578,462	---	\$341,793	\$1,920,255	\$0	\$382,363	\$382,363	\$192,509	\$2,495,128	177	\$11,446
Nova Scotia Agricultural College	\$981,894	---	\$87,043	\$1,068,937	\$0	\$737,657	\$737,657	\$8,469	\$1,815,063	53	\$23,270
Nova Scotia College of Art and Design	\$568,057	---	\$90,772	\$658,829	\$0	---	\$0	\$101,700	\$760,529	55	\$12,072
Saint Mary's	\$4,109,296	---	\$1,744,170	\$5,853,466	\$6,459	\$1,667,558	\$1,674,016	\$0	\$7,527,482	1006	\$6,983
St. Francis Xavier	\$1,145,888	---	\$910,607	\$2,056,495	\$0	\$229,159	\$229,159	\$264,595	\$2,550,249	200	\$11,436
King's College	\$129,738	---	\$72,054	\$201,792	\$0	---	\$0	\$0	\$201,792	35	\$6,958
Universite Sainte-Anne	\$605,857	---	\$291,771	\$897,628	\$0	---	\$0	\$73,701	\$971,328	27	\$26,252
Overall	\$27,555,091	---	\$8,413,142	\$35,968,233	\$1,298,942	\$13,468,065	\$14,767,007	\$2,037,223	\$52,811,748	3434	\$15,379

Notes:

- (1) Tuition and fees will be captured under student spending to avoid double-counting of tuition expenditure
- (2) Includes, but is not limited to, external cost recoveries, income from corporations and foundations and gifts
- (3) Endowment, a restricted fund that accounts for the capitalization of externally and internally restricted amounts, primarily donations, which cannot be spent. Typically this represents the proportion of earnings on the endowment fund that flows into university expenditures in the current year (that rest of which is re-invested in the endowment fund)
- (4) Expenditure on scholarships, bursaries and assistantships constitute direct payment to students, which is also captured under student spending. Universities were asked to indicate what proportion of operating expenditure is in the form of direct payments to students. This proportion has been deducted from Total Operating Expenditure on international students
- (5) Capital fund represents a restricted fund that accounts for resources provided to the University for capital purposes and not reported in any other fund

Table C8: Expenditures for Students through Nova Scotia Government Grants (2007-08)

	I	II	III	IV	V	VI
	NS Grants 2007-08 ¹	WFCE All Students	WFCE International Students	WFCEINT / WFCEALL (V) / (IV)	Grant for International Students (I) * (IV)	Grant for Domestic Students (I) - (V)
University						
Acadia	\$26,782,000	30,159.2	4,576.1	0.15	\$4,063,642	\$22,718,358
Atlantic School of Theology	---	824.1	29.8	0.04	---	---
Cape Breton	\$19,719,073	21,141.6	1,482.6	0.07	\$1,382,873	\$18,336,200
Dalhousie	\$133,611,000	192,351.9	17,555.1	0.09	\$12,194,094	\$121,416,906
Mount Saint Vincent	\$17,560,349	24,442.9	2,197.1	0.09	\$1,578,462	\$15,981,887
Nova Scotia Agricultural College	\$17,507,000	6,342.1	355.7	0.06	\$981,894	\$16,525,106
Nova Scotia College of Art and Design	\$8,054,424	9,176.0	647.2	0.07	\$568,057	\$7,486,367
Saint Mary's	\$26,528,000	41,223.8	6,051.3	0.15	\$3,894,099	\$22,633,901
St. Francis Xavier	\$28,350,697	33,905.6	1,330.1	0.04	\$1,112,153	\$27,238,544
Kings College	\$4,041,881	7,067.9	218.3	0.03	\$124,834	\$3,917,047
Universite Sainte- Anne	\$9,269,736	3,745.4	244.8	0.07	\$605,857	\$8,663,879
Totals	\$291,424,160	370,381	34,688		\$26,505,965	\$264,918,195

Notes:

(1) As reported in University Financial Statements

Reference List

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