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ANALYSIS OF THE ECONOMIC CONTRIBUTION OF CAMOSUN COLLEGE

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EXECUTIVE SUMMARY

This report presents the economic contribution of Camosun College within its service area and for the province as a whole. Two analyses are presented: 1) *economic growth analysis* determining the income, employment, gross domestic product (GDP) and tax revenue impacts and 2) *investment analysis* from the perspectives of students and taxpayers.

ECONOMIC GROWTH ANALYSIS

The combined economic impacts related to college operations, college capital costs, college student spending, visitor spending show that Camosun accounts for approximately $96.4 million in total income impacts in the Camosun regional economy and $125 million for the provincial economy. When combined with the accumulated productivity impact of Camosun graduates, Camosun generates total income impacts of over $900 million in the regional economy and over $1 billion for the provincial economy. In addition, direct expenditures related to Camosun College in the provincial economy generate incremental employment impacts of 1,265 full-time equivalents (FTEs) in the regional economy and 1,855 FTEs in the provincial economy as a whole; $107 million in GDP for the regional economy and $156 million for the province; and a combined federal and provincial tax revenue impact attributable to Camosun College is $158 million for 2011-12.

College Operations Impact: Direct expenditures by the College on wages and salaries increase the regional income in the Camosun Service Area by 70 million. The College's expenditures on non-labour operations increases regional income in the Camosun area by another $7.1 million.

Capital Expenditure Impact: Direct expenditures by the College on capital costs and construction, maintenance and repair increase regional income in the Camosun Service Area by $36.1 million.

Student Spending Impact: About 17.6% of Camosun's students come from outside the region to attend college in the Camosun Service Area and their spending generates $17.9 million in added income in the Camosun Service Area economy.

Visitor Spending Impact: An estimated 13,566 visitors came from outside the region to attend college events during the fiscal year 2011-12, and stayed an average of 2.5 nights in the Camosun Area. The spending effects of visitors account for about $4.5 million in added income for the region.

Accumulated Student Productivity Impact: As Camosun College-trained students graduate annually and become employed in the provincial or local economy economy, (many of whom originated from other parts of Canada or abroad), average incomes rise, resulting in increased tax revenues, and economy-wide multiplier effects. The cumulative impact of Camosun's past and present students over the past 30 years is estimated to be $899.6 million in added income to the provincial economy, including an estimated $819.2 million in added income in the Camosun region.

INVESTMENT ANALYSIS

Students: Higher educational attainment provides substantial value to the students themselves, in addition to the economies where they work, and to society overall. A report by Human Resources and Skills Development Canada, (2008) identifies the key benefit of higher education levels as being higher earnings. These earnings differentials make the investment in a Camosun College education worthwhile from a financial perspective at the individual level. The aggregate Camosun student body enjoys, on average, $43.3 million in higher earnings per year as a direct result of their education.

When considered over the course of a working lifetime, the cumulative present discounted value of the earnings differential associated with the future income increments of Camosun College students is estimated to $813.6 million. When considered together with the present value of the costs of this education, the aggregate net benefits value as a result of their attendance at Camosun is estimated to be $726.2 million. It is estimated that students receive a 15% annual rate of return on their education investment. This excludes marginal benefits attributable such as improved health, increased retirement savings, and other benefits.

Taxpayers: Increased incomes of Camosun graduates generate increased tax revenues, as well as additional social benefits, such as reduced crime, welfare, health care support, and others. The college not only pays for itself but also provides a surplus that supports other government programs.

Conclusion

The results of the analysis indicates that Camosun yields an attractive return on investment for students as well as for the provincial and local government and society at large.

I. INTRODUCTION

1.1 Context

Community colleges function along several dimensions and provide extensive positive economic benefits. They supply education and technical skills training to local and export 'markets', providing the human resources and labour skills required for growth and diversification, as well as social impacts related to decreased health costs, higher average incomes and tax revenues generated, decreased reliance on social assistance and increased savings for retirement. They also provide the basis for innovation in products and processes across a wide spectrum of industries. They serve as the focal point for the performing and visual arts, for debate on emerging issues, and athletic activities, thereby enriching the lives of all in the communities they serve. Community colleges extend their reach into the local and provincial economies, providing assistance in addressing health, scientific, environmental and resource management issues.

Camosun College is one of the most comprehensive public post-secondary institutions in the Province of British Columbia, offering a variety of programs ranging from Career, Technical and Vocational programs to 4-year Baccalaureate degrees. As well, the college offers several Co-Operative Education Programs. The College is comprised of two campuses (Interurban and Lansdowne campuses), serving nearly 18,500 learners registered in degree, diploma and certificate programs as well as courses offered through the Continuing Education Department. Each year Camosun welcomes over 800 International students, thereby generating "export services" and generating incremental value to the Province of British Columbia. The College employs approximately 900 staff with an annual budget of $100 million. Camosun is also home to the Pacific Institute for Sport Excellence, serving over 18,000 students, 1,400 high performance Canadian athletes and thousands of Greater Victoria community members each year.

In addition to the standard static economic impacts resulting from college-related expenditures, Camosun College generates substantial dynamic economic impacts resulting from the retention of higher educated persons in the provincial economy. These impacts result not only from increased marginal tax impacts associated with incremental earnings of its alumni, but substantial socio-demographic impacts, including reduced health care costs, increased capacity for savings and asset accumulation, and labour force impacts resulting from the retention of highly qualified persons (HQPs) in British Columbia.

This study uses a variety of economic analysis techniques to demonstrate the full range of economic and social impacts resulting from the educational investment and other services provided by Camosun College. These impacts are clearly delineated as economic and social impacts (as well as the impacts associated with the export of services) on individual students and local communities and the province as a whole.

1.2 Study Objective

This study undertakes a comprehensive approach to measuring the economic impacts resulting from the direct expenditures of Camosun College, its students, staff, and visitors on the broader community. Economic activities associated with higher education generate economic impacts beyond those arising from the direct expenditures themselves. These incremental impacts arise from the dynamic effects resulting from higher education related to improved health outcomes, higher incomes, decreased reliance on social assistance, higher tax revenues, and the impact on the labour force and productivity.

1.3 Scope of work

This report estimates the economic impacts of Camosun College's education activities (of both campuses) using a combination of a standard approach to economic impact assessment as well as a discussion of the dynamic socio-economic impacts (including social, health, workforce productivity, human resource impacts, attraction and retention of international students, and other socioeconomic impacts) on the provincial economy based on the direct expenditures and employment generated by Camosun College. In short, this study estimates impacts of the following dimensions of College operations:

- Direct impacts associated with 'direct expenditures' and employment in the local economy;
- Indirect and induced economic impacts resulting from rounds of re-spending within the broader economy, including incremental expenditures to the province that would not occur without the College;

This study follows the methodology laid out in the 2007 study entitled Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth.[1] The analyses focuses on both 1) *investment analysis* from the perspective of students and taxpayers, and 2) *economic growth analysis* to determine the relative contribution of Camosun to regional and provincial employment, income, gross domestic product (GDP), and tax revenue impacts.

This study estimates the additional economic and socioeconomic impacts associated with:

- College-educated workforce, attributable to Camosun College, leading to higher average incomes and related tax revenues generated;
- Improved health outcomes and reduced health costs associated with higher education;
- Improved labour productivity associated with higher education;
- Export value associated with the international students, generating incremental export revenues for the province;
- Attraction and retention of international students;

More specifically, this study provides the following separate and distinct analysis:

1. Discounted student return on investment of time and money;
2. Taxpayers' real money return on their annual investments in Camosun;
3. Social/health benefits and reduced costs to BC of students educated at Camosun;
4. Direct, indirect and human capital benefits to the regional economy (Greater Victoria, CRD); and
5. Revenues from outside the region, including a disaggregated mini-analysis of the "export value" associated with International Education.

The *investment analysis* examines economic impacts associated with Camosun College from the perspective of students and taxpayers, as a result of their investment in higher education. The benefits to students include higher lifetime earnings. The benefits to society include the cumulative growth in income, the growth in tax revenue, and the positive benefits associated with reduced crime rates, improved health benefits, lower unemployment, reduced reliance on social assistance and unemployment insurance, increased retirement savings and reduced reliance on old age security payments. These benefits to society occur annually and continue to accumulate as Camosun College graduates are retained and employed in the local and provincial economy. The

[1] C.C. Benefits Inc., Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth, August, 2007.

annual flow of estimated future benefits are discounted to the present value and compared to current annual cots.

This study also provides a brief review of the literature, providing evidence and theory that these are real and important economic impacts. To ensure comparability of results with the Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth study, the results of this analysis are presented as 1) net present value; 2) rate of return, 3) benefit cost ratio and payback period.

The *economic growth analysis* examines the contribution of Camosun to the regional and provincial economy resulting from direct expenditures in the economy made by students, visitors, and Camosun itself, as well as increased skill levels in the local economy directly attributable to Camosum College. The BC Stats Regional I-O Model is used to estimate the direct, indirect and induced income, employment, Gross Domestic Product (GDP) and tax revenue impacts for the regional economy surrounding Camosun College service area (described in detail in Chapter 1) and the provincial economy as a whole.

Chapter 1 provides an overview of the scope of work and the methodological framework. Chapter 2 provides an overview of the regional economy, a profile of Camosun College and a discussion of the social benefits associated with increased education. The results of the economic impact analysis of Camosun in the region and for the province as a whole are provided in Chapter 3. The results of the investment analysis approach are provided in Chapter 4.

II. DATA SOURCES AND ASSUMPTIONS

Estimating the benefits and costs of higher education requires three types of information: (1) the profile of the college and its student body, (2) economic profile of the region, and (3) statistics relating higher education to improved social behavior. For the purposes of this study, information on the college and its students was obtained from Camosun, data on the regional and provincial economy were drawn from public databases, and statistics on social behavior were provided by national studies and surveys.

2.1 Regional Profile

Camosun College opened in 1971 and adopted the name "Camosun", a local First Nation (Songhees) word meaning "where different waters meet and are transformed." Today Camosun College offers educational programming to approximately 18,500 learners a year in certificate, diploma, Bachelor degree and continuing education programs. The College generates substantial economic impacts per year with over 900 employees and an annual budget of over $105 million. The college not only generates economic impacts through its direct employment and expenditures in the regional economy. Camosun makes a substantial economic contribution to the local and provincial economy through the cumulative impacts associated as a result of its highly skilled, job-ready graduates, contract training opportunities for local business, research, and improved socioeconomic outcomes related to higher education. Camosun offers university transfer and applied degree programs, career and trades training for highly skilled technical professions, upgrading and preparatory programs, and continuing education to meet the needs of the community.

The geographical framework used to describe the regional impacts associated with Camosun College is based on the Camosun College Region[2] (Figure 1). This region is used by the BC Stats Input Output Model to report regional economic impacts associated with Camosun College.

Figure 1: Camosun College Region

Source: BC Stats, Camosun College Region

[2] There are 15 College Regions in BC, which are the responsibility of the Ministry of Advanced Education and Labour Market Development The boundaries largely follow School Districts or aggregates of School Districts.

The Camosun College Region is used to describe the 'Camosun Service Area' in both the growth and investment analysis contained in this report. Estimated incremental income attributable to Camosun College is compared to total income in the Camosun College Region to estimate the relative impacts of the college in the region. A summary of total income (labour and non-labour) for the Camosun College Region for 2011-12 is provided in Table 2.1.

Table 2.1: Total Income (Labour and Non-labour), Camosun College Region, 2011-12

Type Of Income	Total Income ($ Thousands)	% Of Total
Labour income[1]	$8,835,357	59%
Non-labour income[2]	$6,423,304	41%
Total	**$15,258,661**	**100%**

Source: BC Stats, Socio-economic Profiles, College Regions (CRs); Statistics Canada, 2006 adjusted to $2012 Canadian Business Patterns (Catalogue no. 61F0040XCB, semi-annual);

1. Earnings; Includes Camosun faculty and staff w ages and salaries.
2. Dividends, interests, and rents; Does not include transfers.

2.2 Camosun College Profile

Revenues and Expenditures

Table 2.2 shows Camosun's annual revenues by funding source: a total of $105.8 million. Tuition and fees (25 million) account for 23.8% of total revenues. Revenue from other sources include training agreements with private businesses, donations, and interest payments. The tuition and fee payment data is used to estimate the cost of education from the perspective of students and the total public funding (grants and contributions and contract services) are used to estimate the cost of education from the perspective of taxpayers.

Table 2.2: Camosun College Revenues by Source (FY 2011-12)

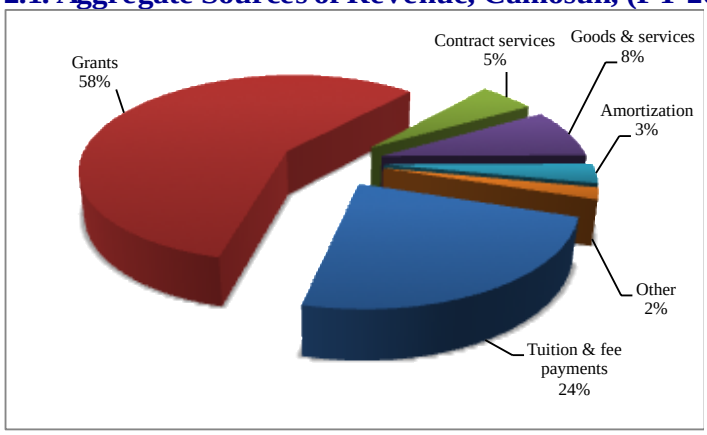
Revenue Source	Total ($M)	%
Tuition and fee payments[2]	$25.2	23.83%
Grants and contributions[2]	$60.9	57.63%
Contract services[2]	5.5	5.18%
Goods and services	$8.7	8.22%
Amortization of deferred contributions	$3.4	3.24%
Other	$2.0	1.90%
Total Revenues	**$105.8**	**100%**

1. Total tuition is comprised of both domestic and international tuition and is net of grants, scholarships, and bursaries awarded to students during analysis year.
2. Grants and Contributions and Contract Services are both included in public funding

Source: Camosun College Audited Financial Statements, March 31, 2012

As can be seen in Figure 2.1, grants and contributions comprise the largest proportion (57.6%) of total revenue for Camosun's College, followed by tuition and fees (23.8%).

Figure 2.1. Aggregate Sources of Revenue, Camosun, (FY 2011-12)



Source: Camosun College Audited Financial Statements, March 31, 2012

Based on discussions with Camosun College, total full and part-time faculty and staff employment in fiscal year 2011-12 is converted to full-time equivalents (FTEs) of employment (Table 2.3). Full-time Camosun Faculty comprises the largest proportion of employment (401 FTEs), followed by employment of part-time Camosun faculty (392 FTEs) in fiscal year 2011-12.

Table 2.3: Total Employment Camosun College, Full Time Equivalents (FTEs), (FY 2011-12)

	Employee FTEs
Faculty in Trades and some Health programs (BCGEU)	69
Camosun College Faculty Association (CCFA)	401
Part-time Camosun Faculty (CUPE)	392
Administration	57
Total FTEs of Employment	**919**

Source: Total full tie equivalents of employment (FTEs) provided by the college.

A large proportion of Camosun's total direct expenditures remain in the local economy, and the re-spending of these direct expenditures result in economic impacts. Total wages and salaries ($83.8 million) account for the largest proportion (79.3%) of Camosun's total direct expenditures in fiscal year 2011-12 with non payroll expenditures (operating, maintenance, and other non-payroll expenditures) totaling $21.7 million (Table 2.4).

The proportion of Camosun's expenditures remaining in the local region is based on discussions with Camosun College officials and is consistent with the proportions used in the 2007 Economic Contribution of Camosun College study.[3] Roughly 85 percent of salaries, wages and benefits paid to Camosun employees are assumed to remain in the local economy while a conservative estimate of direct operating, maintenance, and other non-payroll expenditures paid to local sources (50 percent) is assumed. As a result, an estimated 75 percent of Camosun College direct expenditures ($82.1 million) remain in the local economy for fiscal year 2011-12, providing labour income and support for local businesses (Table 2.4). As discussed below, the re-spending of direct expenditures in the regional economy generates further indirect and induced economic impacts.

[3] C.C. Benefits Inc., Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth, August, 2007.

Table 2.4: Camosun College Direct Expenditures, (FY 2011-12)

Spending Categories	Total ($M)	Net % Local	Net Local Spending ($M)
Salaries, wages and benefits	$83.8	85%	$71.3
Operating, maintenance, and other non-payroll expenditures	$21.7	50%	$10.8
Total Expenditures	**$105.6**	**75%**	**$82.1**

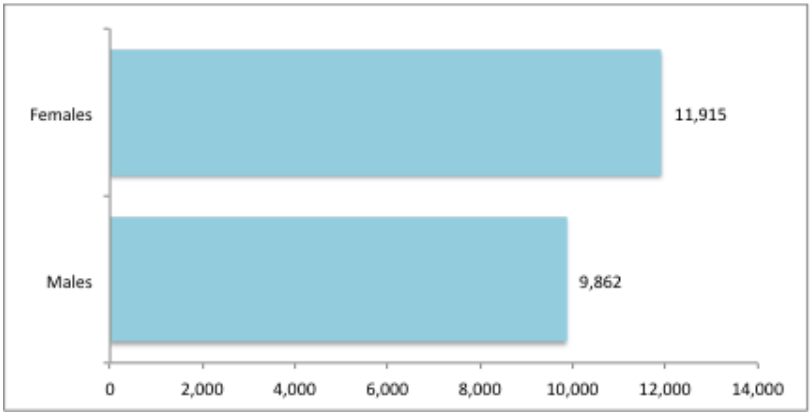
Source: Total dollar amounts provided by the college. Camosun College Operating Fund, Operations and Fund Balance, For the Twelve Months Ending March 31, 2012. Estimated percent of spending that occurs locally calculated is based on the distribution in the 2006 Economic Impact study for Camosun College, adjusted for changes in labour market composition.

Student Demographics

This study also provides a demographic profile of Camosun College's student population, examining the distribution of student age, gender, education level upon entry program of study and credit hour equivalents (CHEs) achieved. A total of 21,776 students were enrolled at Camosun in 2011-12, with the majority enrolled in credit programs (13,304 students) and 8,372 enrolled as non-credit students.

The total number of female students enrolled at Camosun in 2011-12 outweighs the number of male students. More than half of the students (54.7%) enrolled in credit and non-credit programs at Camosun in 2011-12 at Camosun College in 2011-12 are female, with male students comprising 45.3% of the total student population (Figure 2.2).

Figure 2.2: Camosun College Enrolment (Credit and Non-Credit), by Gender, Fiscal Year 2011-12



Source: Gender characteristics of Camosun College students, 2011-12.

This same phenomenon is true when examining the number of students enrolled in credit programs only. More than half of the students (50.7%) enrolled in credit programs at Camosun in 2011-12 are female. Table 2.5 provides a breakdown of Camosun's student population enrolled in credit programs by age, gender, and school or centre in which they were enrolled in 2011-12. An examination of the age distribution shows that the average age of students enrolled in credit programs at Camosun was 26.1 with a median age of 23.2 in 2011-12 (Table 2.4). Given an average age of students enrolled in credit programs is greater than the median age implies that there are a few students at the upper end of the age distribution pulling the average age up.

Table 2.5 provides an overview of the age and gender characteristics of Camosun College credit students by School or Centre for Fiscal Year 2011-12

Table 2.5: Student Age And Gender By School Or Centre, (FY 2011-12)

School or Centre	Number of students	Male (%)	Female (%)	Average Age	Median Age
Access	2,970	46.30%	53.70%	28	24.3
Arts and Science	4,850	41.84%	58.16%	23.5	21.6
Business	2,204	38.34%	61.66%	27.1	24.3
Centre for Sport and Exercise Education	341	54.25%	45.75%	23.1	21.9
Health and Human Services	1,342	13.49%	86.51%	28.1	24.7
Student Services/Registrar's Office	15	33.33%	66.67%	40.9	39.5
Trades and Technology	2,677	91.30%	8.70%	26.8	24.5
Camosun College	**13,304**	**49.43%**	**50.57%**	**26.1**	**23.2**

Source: Age and gender characteristics of Camosun College credit students by School or Centre for Fiscal Year 2011/12.

This study also converts the distribution of students' education level at Camosun for the year of analysis (2011-12) to the total number of credit hour equivalents (CHEs) achieved per year.

The distribution of the level of education by broad education category upon entry level to Camosun College is provided in Table 2.6 (Column 1). However, the distribution of education level upon entry does not reflect the distribution of the total number of students currently studying at Camosun since not all students are in their first year of college, and some may have entered two year programs and others 4 year programs – others may have completed their high school graduate equivalency degree and then re-enrolled in other programs at Camosun or elsewhere. As a result, the proportion of Camosun's student body within each of the education level categories in the year of analysis (2011-12) must be estimated. Based on discussions with Camosun College, the analysis assumes the proportionate distribution of students within each educational level in 2011-12 is consistent with the proportionate distribution used in the 2007 Economic Contribution of Camosun College study (Column 2).[4] The resulting estimated proportionate distribution of students by educational level in 2011-12 is provided in Column 3 in Table 2.6.

Table 2.6: Students by Level of Education, Entry Level and Analysis Year, 2011-12

Education Level	Column 1 Entry Level[1]	Column 2 Of Total	Column 3 Analysis Year[2]	Column 4 % OF TOTAL
< High School (HS)/GED[3]	5,226	24%	4,137	19%
High School(HS)/GED[3]	9,146	42%	3,920	18%
One year post HS or less	2,613	12%	5,662	26%
Two years post HS or less	3,920	18%	7,186	33%
> Two years post HS	871	4%	871	4%
Total	**21,776**	**100%**	**21,776**	**100%**

Source: Based on the methodology used by the Adapted from data supplied by Camosun, March 2013.
1. Refers to the level of education of the student body upon entry
2. Refers to the redistribution of students by education level at the start of the analysis year.
3. Graduate equivalent degree (GED)

[4] C.C. Benefits Inc., Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth, August, 2007.

As students move through their educational program from entry level toward the final year of their programs, the distribution students' education levels at Camosun College in any representative year is not the same as the distribution of students' education levels upon entry. This change in the distribution of students' educational levels is reflected as the differences between column 2 and Column 4 in Table 2.6.

This study also estimates the total number of credit hour equivalents (CHEs) embodied in the student body based on distribution of students' education level in the representative year (Column 3 in Table 2.6).

A credit hour equivalent (CHE) measures the level of educational attainment based on the amount of time embodied in a course credit and is generally used as a standardized comparison unit to compare educational attainment across institutions or to measure the opportunity cost of time used to attain the educational credit.[5]

The methodology used to estimate the total number of embodied credit hour equivalents (CHEs) achieved by the student body in the representative year of analysis (2011-12) is consistent with the methodology used in the 2007 Economic Contribution of Camosun College study. The estimated total CHEs and the corresponding average number of CHEs completed per student program category for the analysis year is shown in Table 2.7. Based on a review of the student distribution by educational program at Camosun and discussions with Camosun College representatives, the distribution of students by educational program category (Column 2) and the average number of CHEs assumed per educational program category (Column 4) shown in Table 2.7 are assumed to be unchanged from those used in the 2007 Economic Contribution of Camosun College study.[6]

Table 2.7: Estimated Credit Hour Equivalents (CHEs), Camosun, 2011-2012

Student Program Category	(Column 2) Student Distribution	(Column 3) Head Count[3]	(Column 4) Avg CHEs	(Column 5) Total CHEs	(Column 6) % FTE[4]
Cat. 1 - 3-year diploma/degrees	0%	0	0	0	0%
Cat. 2 - Two-year diploma	3%	653.28	28	18,330	94%
Cat. 3 - Certificate graduates	6%	1306.56	35	45,961	117%
Cat. 4 - Apprenticeship students	6%	1306.56	13	16,996	43%
Cat. 5 - Transfer track and continuing	46%	10016.96	19	193,376	64%
Cat. 6 - ABE/ESL/GED	12%	2613.12	17	45,099	58%
Cat. 7 - Workforce students[1]	26%	5661.76	1	6,903	4%
Cat. 8 - Retired and/or leisure students	1%	217.76	1	201	3%
Total/Weighted Average[2]	**100%**	**21,776**	**15**	**326,866**	**50%**

Source: Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth, August, 2007; Adapted from data supplied by Camosun.

1. The workforce students category includes a mix of credit and non-credit students taking business and/or professional development courses to enhance their career or improve their skills.
2. Average credit hour equivalents (CHEs) exclude retired/leisure students as these are excluded from the analysis.
3. Student breakdown based on headcounts rather than FTEs.
4. The FTE per educational program category is calculated by dividing average CHEs by the assumed number of CHEs required to complete an FTE (i.e., 30 CHEs).

5 The Credit Hour Equivalents (CHEs) time-based units for measuring educational attainment used by universities and colleges and are based on the Carnegie Unit, which assesses secondary school attainment.

6 2007 Economic Contribution of Camosun College study, CC Benefits, August 2007.

Both instructional and practical hours undertaken by Camosun students during the academic year are estimated and converted to credit hour equivalents to estimate the total CHEs achieved by the student body in educational programs in 2011-12. As noted in the 2007 Economic Contribution study, the estimation of CHEs is based on headcounts rather than full time equivalents (FTEs). The estimated total CHEs is calculated by multiplying the total head count per educational program (column 3) times the average CHEs per program (column 4) and is estimated to be 326,866 with a weighted average of 15 CHEs per student for 2011-12.

The proportion of time students are attending school (on average) relative to a full year equivalent (FTE) is also calculated (column 6 in Table 2.7) by dividing average CHEs by the assumed number of CHEs required to complete a full time equivalent, (i.e., 30 CHEs required to complete an FTE). Retired and leisure students (1%) are not assumed to attend Camosun to acquire skills that will increase their earnings and are therefore not included in the analysis. Students attending Camosun College for academic upgrading or to learn English as a Second Language (ESL) comprise 12% of the student body and are assumed to have a lower incremental impact relative to that of other students, because some are already educated and are taking courses to obtain the skills they need to access the workforce. As such, the corresponding percent economic value attributable to their education is assumed to be roughly 75% (relative to a 100% attribution for other students).

2.3 Opportunity Cost of Students' Investment in Education

The concept of opportunity cost measures the value of the next best use of an individual or organization's resources used is a commonly used concept in benefit cost analysis. In this analysis, opportunity cost is used to measure refers to the value of students' time and earnings used to an education at Camosun College rather work full time. To calculate the value of students' opportunity costs, the full earning potential of students is estimated, and then adjusted to account for what students are actually earning while attending college.

Similar to the methodology used in the 2007 Economic Contribution of Camosun College study, median earnings at the midpoint of individual's career, sorted according to their current level of education, and adjusted to 2011-12 dollar levels are used to estimate the earnings potential for students (Table 2.8).

Table 2.8: Average Earnings at Midpoint of Individual's Working Career, 2011-12

Education Level	Average Earnings	Difference
One year short of HS/GED	$28,769	-
HS/GED equivalent	$34,544	$5,778
Certificate	$38,903	$4,361
Diploma	$44,352	$5,451
Greater than diploma	$49,583	$5,233
Average Earnings	**$37,270**	**-**

Source: Based on Table 2.5 in 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth, August, 2007; Adjusted to 2011-12 dollars.
Earnings based on Statistics Canada's national earnings by level of education and regionalized to reflect earnings prevalent in the college region using socio-economic data provided by BC Stats;

Total average earnings ($37,270) represents the overall average annual income at the mid-point of individuals' life time earnings distribution across all education levels.

The overall annual average of $37,270 reflects an annual income at the mid-point of individuals' lifetime earnings distribution rather than the earnings potential of students while studying. The

overall median lifetime income is adjusted to reflect the age of the students (26.1) entering the labour force to better estimate the full earning potential of Camosun students while enrolled, resulting in an estimated average opportunity cost (earnings potential) of $20,121 per student, assuming full-time employment.

Many students work while attending college, and in reality, do not forego the entire $20,121. An adjustment must be made to the estimated opportunity costs of the time spent earning the degree to value student earnings while earning a degree. Consistent with the 2007 Economic Contribution of Camosun College study, this analysis estimates that students attend college, on average 50 percent relative to a full-time year of study (FTE). Based on this, the analysis discounts the estimated opportunity cost per student of $20,121 by 50%, assuming that students are able to work the rest of the year and do not accrue any opportunity cost when they are not actually attending Camosun, resulting an estimated gross annual opportunity cost per student of $10,060.

The estimated opportunity cost must be further adjusted to reflect the employment patterns of the Camosun student body. While some students are retired or attending for personal enrichment and giving up 0% of their full earning potential, other students are attending college full-time and giving up 100 percent of their earning potential. This study assumes that working students are giving up, on average, 43% of their full earning potential, based on the analysis in the 2007 Economic Contribution of Camosun College study.[7] In addition, working students also forego a substantial proportion of their leisure time to attend college, which is estimated to have an assumed value equal to 20% of the students' gross opportunity cost based on the analysis in the 2007 Economic Contribution of Camosun College study. These adjustments are applied to the overall average opportunity cost $10,060 for the Camosun student body, as shown in Table 2.9.

The total opportunity cost of education from the student perspective is shown in Table 2.9. Students able to work while attending college maintain all or part of their incomes, but give up a significant amount of their leisure time.

Table 2.9: Estimated Opportunity Cost of Student Investment in Education, by Employment Status, 2011-12

Employment Status	Head Count	Opportunity Cost	% Adjustment[1]	Total
Retired/leisure	166	$10,060	0.0%	$5
Non-working	7,033	$10,060	100.0%	$70,974,208
Working	14,576	$10,060	62.6%	$92,047,916
Subtotal	21,776			$163,022,129
Net of unrestricted grants and bursaries[2]				($811,288)
Total Gross Opportunity Cost				**$162,210,840**

Based on Table 2.6 in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adjusted to 2011-12 dollars.
1. Percent of earnings foregone relative to full earning potential, plus value of leisure time for working students.
2. Assumed 40% of total grants and bursaries awarded during the analysis year were paid directly to students.
Source: 2007 Economic Contribution of Camosun College study; adapted from data supplied by Camosun..

The estimated opportunity cost associated with student investment in their Camosun college education of $163 million is further reduced to adjust for grants and scholarships provided to students. The resulting net opportunity costs of education for the Camosun student population is estimated to be $162.2 million in the 2011-12 analysis year.

[7] Earnings foregone by working students relative to their full earning potential is calculated in the 2007 Economic Contribution of Camosun College study based on earnings data supplied by BC Stats

2.5 Student Origin, Spending and Settlement Patterns

In addition to students attending Camosun via distance programs, a substantial proportion of Camosun' students originate from outside the region to attend college. Based on a review of enrollment data and discussions with Camosun representatives, the percentage of students originating from outside the region is assumed to be 17.6 percent.[8] These students generate incremental direct expenditures in the local economy on a variety of items including food, rent, transportation, other services to name a few, which support local businesses, create jobs and incomes for local residents, thereby contributing to economic growth in the region. Table 2.10 provides a breakdown of total estimated direct expenditures for out-of-province students. Average student expenditure estimates were obtained from Camosun College officials. Total direct expenditures for students from outside the region are estimated to be $14,889 while in the area. Average student expenditures are adjusted to account for the percentage that leaks from the regional economy, based on a review of the inter-industry linkages in the BC Input-Output Model. Total net spending multiplied times the number of out-of-region students provides an estimate $37.1 million in gross expenditures. Student expenditures are further adjusted downward to account for the estimated proportion of room and board payments that are already counted as incremental income in the regional economy to avoid double counting (e.g., for rent and other forms of household income). This analysis results in an estimated $27.3 million in total direct student expenditures.

Table 2.10: Out of Province Student Direct Expenditures (Excluding Tuition and Other Payments to Camsun), FY 2011-12

Budget Item	Gross Spending	% After Leakage	Net Spending
Books and supplies	$1,635	40%	$654
Room and board	$7,084	90%	$6,376
Personal expenses	$4,689	60%	$2,813
Transportation	$1,481	60%	$889
Total	**$14,889**	**65%**	**$9,678**
Number of students from outside region			3,833
Subtotal			$37,091,107
Net of household income			($9,774,466)
Total Direct Expenditures			**$27,316,641**

Source: Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth, August, 2007; Adapted from data supplied by Camosun.
Assumed 40% of room and board goes to the consumption sector and is excluded from total spending. Room and board calculated by multiplying the weekly living allowance for students times number of weeks in academic year, net of transportation costs.

Students who remain in the area upon exiting college also contribute to the economic growth of the region, while students who settle in the province (whether inside or outside of regional boundaries) benefit provincial and local taxpayers through higher earnings and improved lifestyles. Table 2.11 presents the settlement patterns of Camosun's students.

A substantial proportion of students remain in the local region upon graduation. Consistent with the 2007 Economic Contribution of Camosun College study, this analysis assumes that roughly 86% of students remain in the region, while 97% stay in the province (inclusive of students who remain in-region) one year after graduating from Camosun. In addition, this analysis assumes that

[8] In Academic Year 2011/12, an estimated 17.6% of Camosun students were from outside the region. This is considered to be an underestimate as people change their address to the Victoria area, and address changes not tracked by Camosun.

33% of students, will leave the region over the next thirty years due to attrition (e.g., retirement, out- migration, or death). For the province as a whole, the thirty-year attrition rate is assumed to be 5 percent. The "settling-in factors" used in the 2007 Economic Contribution of Camosun College study, (shown in Table 2.11), refer to the average number of years needed by students to settle into their careers and start accruing benefits. This means for example, that for diploma graduates it is assumed that the onset of benefits will be delayed by 2.1 years. These settling in factors are used to estimate the stream of cumulative student productivity impacts related to the retention of Camosun graduates in the local economy in Section 3 of this report.

Table 2.11: Student Retention and Settlement Patterns

	Values
Students remaining in region after leaving college	86%
Students remaining in province after leaving college	97%
Thirty-year attrition rate (leaving region)	33%
Thirty-year attrition rate (leaving province)	5%
Settling-in factors (years):	
Diploma graduates	2.1
Certificate graduates	0.6
Transfer track students	2.6
Workforce students	0.1
ABE/ESL/GED students	0.6

Source: Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth, August, 2007; Adapted from data supplied by Camosun.
Source: Student retention variables supplied by the college. Thirty-year attrition used for the analysis. Settling-in factors adapted f rom Norton Grubb, "The Economic Benefits of Sub-Baccalaureate Education," CCRC Brief No. 2, ISSN 1526-2049 (New York, NY: Community College Research Center, June 1999).

2.5 Higher Earnings Benefits

Higher educational attainment provides substantial value to the individuals themselves, to the economies where highly educated individuals work, and to society overall. A special report by Human Resources and Skills Development Canada (HRSDC), entitled "What Difference Does Learning Make to Financial Security?"[9] identifies the key benefits of higher education levels as being higher earnings and lower unemployment risks, both of which contribute to individuals´ and household financial security.

Earnings differentials not only make the investment in post-secondary education worthwhile from a financial perspective at the individual level, but also translate into higher fiscal tax impacts for both provincial and federal levels of government. This study will estimate the present value of the lifetime earnings differential as a measure of economic gain at the individual level. It will also estimate the relevant incremental tax impacts associated with the present value of the lifetime earnings differential for Camosun College's graduates retained in the local economy as a partial measure of the economic value of associated with the College's programming from society's perspective.

The overall average earnings typically rise with years of education, with the earnings curve for those with high school or less, flattening relatively quickly. The Statistics Canada 2006 Census data indicate that earnings rise with education level in all provinces and territories across Canada.[10]

[9] For full report, see http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=54
[10] Source: Statistics Canada, Census, Catalogue no. 97F0017XCB2001002.

Investment in higher education not only benefits society more generally by improving public health, safety, the environment, and such imponderables as political and community participation, it also benefits the individual. Individuals make the investment in secondary education for various reasons including love of learning, self-improvement, securing interesting work, and also in the expectation of earning a higher income. The economic returns to individuals measured as the increase in lifetime earnings has been well documented in the literature. The special report done by Human Resources Development and Skills Development Canada (HRSDC) entitled, "*What Difference Does Learning Make to Financial Security?"*[11] (2008) uses Canadian Census data on earnings across all provinces and found that the knowledge-based economy is driving a greater-than-ever demand for skills and higher education levels. Using Canadian data on education attainment and earnings levels, this report found that in all provinces and territories, higher education yields higher earnings.

Measures of the earning differential due to education indicate this earnings differential is growing over time. Census Canada data shows that those who completed their education with a high school diploma earned on average $4,300 more than those without a high school diploma and achieving education beyond high school offered an even greater earnings benefit.[12] An examination of the average earnings differential over an individual's lifetime shows that while earnings typically increase during an individual's peak earning period (aged 35 to 54), the average earnings differential due to differences in education attainment holds over the lifetime earnings stream.

Also, it can be seen that the average earnings differential for those with a high school diploma or less flattens out early in the lifetime earnings stream, contributing to an increased earnings differential later in life.[13]

Based on the earnings statistics for the British Columbia labour force, the cumulative lifetime earnings differentials for those with a community college degree or diploma translates into substantial returns to investing in education for individuals. An estimation of the lifetime earnings associated with a Camosun College degree or certificate is quantified using current published earnings statistics for the British Columbia labour force as well as current statistics on Camosun College graduates and their retention in the provincial economy.

We estimate the value of a Camosun College graduate over their working lifetime based on the value of the annual earnings differential due to education over a 40 year career using a discount rate to obtain the standard present value calculation over an income stream. This calculation includes two major adjustments that must be made in order to derive an economically sound average net present value for a university degree. An adjustment for the explicit (out-of-pocket) costs of the degree must be made in addition to the opportunity costs of the time spent earning the degree. To value lost earnings while earning a degree, we use the average fulltime earnings for individuals without a college degree or certificate in British Columbia using census data. The earnings differential is adjusted to 2012 dollars to determine the equivalent annual return over investment (e.g., costs). The annual incremental earnings and the costs are discounted to adjust for the fact that costs and benefits occur annually, using a discount rate for comparison purposes.

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[11] Human Resources and Skills Development Canada, "What Difference Does Learning Make to Financial Security?", January 2008. See http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=54.

[12] Source: Statistics Canada, Census, Catalogue no 97F0019XCB2001002.

[13] Income data from the 2001 and 2006 Canadian Census surveys relate to the calendar year prior to the census year, i.e., 2000 and 2005 respectively. For additional information, please refer to the 2006 Census Dictionary, Catalogue no. 92-566-XWE.

The returns to post-secondary education are much greater than the net present value of incremental lifetime earnings to the individual.

A growing body of literature examining the benefits of investment in post-secondary education to both the individual and to society at large have identified the linkages to increased economic well being as a result of increased education. Wolfe, B and Haveman, R. in "*Accounting for the Social and Non-market benefits of Education"*, provide a summary of this literature and argue that these effects are substantially larger than the market-based returns to education and must be considered in order to correctly evaluate the optimum level of investment in post-secondary education.[14] We take this topic up in the following discussion on the economic benefits resulting from post-secondary education from society's perspective.

Economic Returns to Higher Education – Society's Perspective

Lifetime net earnings differentials due to post-secondary education also translate into significant marginal tax impacts. In fact, this becomes a non-trivial benefit when estimating the marginal tax impact associated with the present value of the cumulative lifetime earnings differential for Camosun College graduates that are retained in the B.C, economy. Similar to the point of reference associated with the static economic impacts associated with the Camosun College-related direct expenditures in the economy, the comparison point of reference for Camosun College graduates retained in the local economy is to consider the economy without the college's existence. Given the nature of the educational programs and professional and graduate degrees offered at the College, without Camosun College the province would not have the opportunity to educate and retain these graduates, and would have to attract them from other regions of the country or abroad.

The average earnings are converted to 2012 values, and the 2012 British Columbia marginal tax rates on personal income are used to determine the appropriate marginal tax rate for this analysis.[15] From the province's perspective, it is the marginal British Columbia tax rates (and not the combined Federal and British Columbia tax rates) that are relevant to determine the incremental tax revenues to the province based on the earnings differentials for Camosun College graduates retained and working in the province. The 2012 British Columbia marginal tax rate on personal income is used to estimate the incremental tax benefits associated with the earnings differential for Camosun College graduates employed in the Camosun region and in B.C. to determine the present value of the marginal tax value as a result of the annual earnings differential over a 40 lifetime earnings stream. It should be noted however, that the marginal tax rates on personal income do not include the indirect tax impacts on goods and services consumed, property taxes, or corporate taxes resulting from business start-ups, and therefore, the estimated marginal tax impacts in this analysis underestimate the total marginal tax impacts associated with the earnings differentials of British Columbia graduates.

However, the marginal tax benefits not only result from the Camosun College graduates working in the provincial economy based on the students graduating in the current year. It results from all Camosun College graduates from previous years currently working in the economy. An analysis of Camosun College alumni working in the regional and provincial economy and their earnings provides an estimate of the annual marginal tax impact associated with Camosun graduates.

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14 Wolfe, B and Haveman, R. *Accounting for the Social and Non-market benefits of Education*, in "The Contribution of Human and Social Capital to Sustained Economic Well-being", ed. John Helliwell with the assistance of Aneta Bonikowska, Human Resources Development Canada, PQ, 2001 provide a summary of the literature examining the non-market benefits of investment in education.

15 The marginal tax rate is based on the 2012 http://www.taxtips.ca/taxrates/BC.htm

2.6 Social Benefits

In addition to the marginal tax benefits to the provincial economy attributable to the earnings of Camosun College graduates working in the province, the province benefits from substantial socio-demographic impacts due the increase in the level of education in population. Higher education is statistically correlated with a variety of social benefits, (positive externalities), many of which represent avoided social costs that would have otherwise drained public resources absent the education provided by Camosun. Examples of social benefits include avoided costs associated with reduced incidence and duration of unemployment, reduced incidence of poverty, reduced crime, reduced health-related costs and reduced costs associated with substance abuse. Statistics Canada, Human Resources and Skills Development Canada (HRSDC), and Health Canada conduct variety of studies and surveys analyzing the impacts of higher education and improved social benefits.

Positive Externalities Associated with Education

Colleges provide positive externalities to society not typically counted in standard economic impact analysis studies. A number of published studies have examined the socio-demographic benefits to an economy that are directly linked to increased education. Barbara Wolfe and Robert Haveman in their paper entitled *Accounting for the Social and Non-market benefits of Education* published by Human Resources Development Canada in "The Contribution of Human and Social Capital to Sustained Economic Well-being"[16] provide a summary of the literature examining the socioeconomic contribution of increased education and investment in human capital to economic growth and well-being. The socioeconomic impacts of investments in education include the following:

- a positive link between individual's level of education and education received by their children;
- a positive relationship between individual's level of education and their own health status (resulting in lower health care costs);
- a positive association between an individual's and the health status of their family members (resulting in lower health care costs);
- a positive relationship between an individual's level of education and their socioeconomic outcomes, as well as the socioeconomic outcome of their offspring, including:
    - reduced risk of unemployment,
    - reduced risk of periods of lower income,
    - reduced crime,
    - increased financial security, and
    - increased savings for retirement.

This body of research provides substantial evidence that educational attainment in one generation has positive effects on the educational attainments of their offspring (including health, education, and crime related activities) in the next generation. In addition, a more educated workforce is more likely to possess a greater capacity to develop technologies and innovative processes (resulting in increased productivity) and to have greater capacity to receive and apply new technologies (increased receptor capacity). In addition, businesses are more likely to locate in areas with a higher educated workforce and a larger proportion of highly qualified persons (HQPs).

[16] Wolfe, B. and Haveman, R., "Accounting for the Social and Non-market benefits of Education", in The Contribution of Human and Social Capital to Sustained Economic Well-being, Ed. John Helliwell with the assistance of Aneta Bonikowska, Human Resources Development Canada, PQ, 2001.

These socio-economic impacts translate into real and sizable economic impacts, and become particularly important when considered at a time when provincial governments are faced with aging populations, labour force shortages, rising health care costs, and in most cases, smaller budgets. An assessment of the optimal level of investment in education requires a comprehensive assessment of all of the returns to education, both market-based returns (earnings differentials, marginal tax impacts, GDP, employment) as well as the socioeconomic impacts (associated with increased financial security, reduced risk of unemployment and crime, as well as reduced health care costs).

While the socioeconomic and intergenerational impacts of investment in education are generally omitted when assessing the economic impact of education, the results of the literature indicate that these effects are large - and are perhaps larger the market-based impacts of education (marginal tax benefits and private returns to education), and therefore should be considered to correctly evaluate the value of investment in post-secondary education.

This study analyses three broad categories of social benefits:

1) health savings,
2) crime savings, and
3) welfare and unemployment savings.

Health savings are generally measured as avoided medical costs associated with reduced absenteeism and fewer incidents of alcohol, tobacco and substance abuse. Crime savings are measured as benefits associated with avoided incarceration, prosecution, police, and victim costs. Unemployment and welfare benefits are measured as avoided costs related to the reduced number of social assistance and unemployment insurance claims.

The analysis calculates the reductions in the probability that individuals will incur costs related to health, crime, or welfare and unemployment as a result of each additional year of higher education. Due to the reduced probability that individuals will incur these costs due to higher education levels, the analysis converts these expenditures into avoided social costs to the public.

To ensure consistency with the 2007 Economic Contribution of Camosun College study, results of the analysis are gauged from two perspectives, 1) a *broad* perspective that tallies all benefits, and 2) a *narrow* perspective that tallies only benefits to provincial and local government.

2.7 Health Savings

A large body of research indicates that Canadians in lower socio-economic status have higher needs for health services, and this result holds true for Canadians of all age groups.[17] [18] [19] In general, statistics show a positive correlation between higher education and improved health habits, which means reduced health-related expenditures to the public. This is also the conclusion of recent reports by the Chief Public Health Officer[20] and the Senate Subcommittee on Population

[17] Canadian Institute for Health Information, *Exploring Urban Environments and Inequalities in Health—CPHI Data Briefs Cover Canada's 33 Census Metropolitan Areas* (Ottawa, Ont.: CIHI, 2010), accessed from <http://www.cihi.ca/cihiweb/dispPage.jsp?cw_page=cphi_cma_canada_2010_e>. See also Canadian Institute for Health Information, *Injury Hospitalizations and Socio-Economic Status* (Ottawa, Ont.: CIHI, 2010).

[18] Canadian Institute for Health Information, *Health Indicators 2010* (Ottawa, Ont.: CIHI, 2010). See also Canadian Institute for Health Information, *Reducing Gaps in Health: A Focus on Socio-Economic Status in Urban Canada* (Ottawa, Ont.: CIHI, 2008).

[19] M. Lemstra et al., "High Health Care Utilization and Costs Associated With Lower Socio-Economic Status: Results From a Linked Dataset," *Canadian Journal of Public Health* 100, 3 (2009): pp. 180–183.

[20] Public Health Agency of Canada, *The Chief Public Health Officer's Report on the State of Public Health in Canada: Addressing Health Inequalities* (Ottawa, Ont.: Minister of Health, 2008).

Health[21], as well as an international report by the World Health Organization whose results point to disparities in health outcomes (using multiple measures of health) associated with socio-economic status.[22]

The 2008 Canadian Institute for Health Information (CIHI) report *Reducing Gaps in Health: A Focus on Socio-Economic Status in Urban Canada* showed that hospitalization rates for multiple health indicators were consistently higher for people in lower socio-economic groups than for the middle and high groups in each of the Canadian Census Metropolitan Areas (CMAs) examined.[23]

One of the main drivers for socio-economic status is education, and university education in particular. Statistics Canada conducts the National Population Health Survey, which is a longitudinal study on the determinants of health and the basis for the agency's Statistical Report on the Health of Canadians. The report cites that "socio-economic status in general, and education specifically, is very often positively associated with health status and health behaviours". [24] A university education tends to increase: financial security, job security and satisfaction, literacy and numeracy skills. These are considered to be important to the population for accessing health products and services, making healthy decisions, and avoiding physical and mental health illness associated with challenging socio-economic conditions.

In estimating the reductions in absenteeism, tobacco and alcohol abuse, this study follows the methodology laid out in the 2007 study entitled Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth.[25] Table 2.11 presents calculated reductions in worker absenteeism, smoking, and alcohol abuse as a function of higher education.

Table 2.11: Probability of Absenteeism, Tobacco and Alcohol Abuse by Level of Education

Education Level	Days[1]	% Year[2]	Prob.[3]	% Reduction[4]	Probability[3]	Reduction[4]
< HS/GED	12.0	4.6%	26.6%	-	6.7%	-
HS/GED equivalent	11.1	4.3%	24.7%	7.1%	6.0%	9.4%
One year post HS or less	10.7	4.1%	22.9%	7.1%	5.5%	9.4%
Two years post HS or less	10.1	3.9%	19.9%	13.2%	4.5%	17.3%
> Two years post HS	9.8	3.8%	17.9%	9.9%	3.9%	13.0%
Annual costs per alcohol abuser[5]	$7,628					
Annual costs per tobacco abuser[5]	$3,269					

Source: Based on Table 2.10 in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adjusted to 2011-12 dollars.

1. Average number of days of absenteeism by education level.
2. Calculated by dividing absenteeism days by the number of working days per year (260).
3. Probability an individual will be a smoker or an alcoholic.
4. Calculated reduction in the probability that an individual will abuse tobacco or alcohol.
5. Smoking and alcohol related costs include health care, prevention and research, property damage, workplace losses, worker's compensation, and productivity losses. They do not include law enforcement and social welfare costs, as these are implicitly included in crime and welfare costs, respectively.

[21] Senate Subcommittee on Population Health of Standing Senate Committee on Social Affairs, Science and Technology, *A Healthy, Productive Canada: A Determinant of Health Approach* (Ottawa, ON: Senate of Canada 2009).

[22] World Health Organization, *Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health* (Geneva, Switzerland: WHO, 2008), accessed from <http://whqlibdoc.who.int/publications/2008/9789241563703_eng.pdf>.

[23] This analysis is an extension of previous work by the Canadian Population Health Initiative (CPHI) examining the relationship between health and socio-economic status.

[24] Millar W, Stephens T. Social status and health risks in Canadian adults: 1985 and 1991. *Health Reports* 1992; 5: 143–156 (Statistics Canada Cat. No. 82-003-XPB).

[25] C.C. Benefits Inc., Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth, August, 2007.

Broad Perspective: Under the broad taxpayer perspective, all health-related benefits to society associated with reduced absenteeism, tobacco and alcohol abuse are counted and are considered public benefits - including those that accrue solely to employers and individuals. Health-related benefits to society associated with reduced absenteeism are average earnings per day multiplied by number of days saved. Smoking and alcohol-related savings are calculated by multiplying the number of individuals who will *not* have to incur health- related costs times associated costs of smoking and alcohol abuse per year.

Narrow Perspective: Under the narrow perspective, taxpayers benefit from reduced absenteeism only in cases where the provincial and local government is an employer. For consistency of methodology and comparison of results, the analysis uses the methodology used in the previous (2007) Economic Contribution of Camosun College study to describe the narrow perspective and assumes a taxpayer's portion of absenteeism savings at 2.9%, equal to the estimated public portion of employment in the region. As for smoking and alcohol-related savings, taxpayers benefit to the extent that provincial and local health subsidies required (to hospitals, for example) can be reduced due to higher education and it is assumed that 13.1% of total health benefits can be counted as taxpayer savings.[26]

2.8 Crime Savings

Higher levels of education levels are statistically associated with lower probability of committing a crime. Table 2.12 provides a summary of the distribution of the probabilities associated with crime by education level. From society's perspective, two types of crime-related expenses are considered: 1) policing, courts, legal aid, corrections, and prosecution, and 2) victim costs, including those associated with pain and suffering. For consistency of results and comparison purposes, the analysis uses the methodology used in the previous (2007) Economic Contribution of Camosun College study to

Table 2.12: Probability of Committing a Crime by Level of Education

Education Level	Probability[1]	% Reduction[2]
< HS/GED 16.4% -	6.40%	-
HS/GED equivalent	13.70%	16.90%
One year post HS or less	12.20%	10.90%
Two years post HS or less	10.20%	16.60%
> Two years post HS	9.10%	10.40%
Annual cost per criminal offence[3]		$6,238
Annual cost per victim		$5,983
Prov. & local govt. justice expenditure (%)[4]		75%

Source: Based on Table 2.11 in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adjusted to 2011-12 dollars.

1. Shows the probability that an individual will commit a criminal offence by education level, weighted according to the gender breakdown of the student body.
2. Shows the calculated reduction that an individual will commit a crime.
3. Crime costs include police, court, legal aid, adult correction, and prosecution costs.
4. Refers to the percent of total justice expenditures covered by provincial and local government.

Broad Perspective: Under the broad taxpayer perspective, all reductions in crime-related expenses are counted as a benefit to society. Social benefits associated with crime savings are determined first by multiplying the number of criminal offences that will *not* occur times the average cost per offence. Savings to victims are calculated in a similar fashion.

[26] This is consistent with the methodology and assumptions used in the 2007 Economic Contribution of Camosun College study.

Narrow Perspective: Under the narrow perspective, crime victim savings are represented as avoided costs to potential victims, not to taxpayers. As a result, none of the avoided crime victim savings are claimed as taxpayer savings. The analysis model assumes that nearly all crime savings accrue to provincial and local taxpayers.

2.9 Welfare and Unemployment Savings

Higher education not only reduces the risks of experiencing low-income, it also reduces the probability of individuals experiencing unemployment and reduced dependence on social assistant or. Unemployment insurance. A comparison of the unemployment rate of Canadians by education level using the most recent Census Canada data indicates a strong correlation between lower incidence of unemployment and post secondary education. In examining the unemployment rate for Canadians by education level and across provinces, holding a post-secondary diploma (PSE) as compared to obtaining a high school diploma is associated with lower unemployment throughout Canada. Analysis of the unemployment rate by education level shows that Canadians with post-secondary education, the unemployment rate was comparatively low (5.1% for trades and college graduates and 4.0% for university graduates). The difference in the unemployment rates between high school and post secondary education ranged from 1 percent (Alberta and BC) to 5 percent (Newfoundland and Labrador) percentage points.

This study utilizes the probability of individuals applying for social assistance and/or employment insurance by educational level laid out in the 2007 Economic Contribution of Camosun College study and shown in Table 2.13.[27]

Table 2.13: Probability of Social Assistance and Unemployment by Level of Education

	Welfare		Unemployment	
Education Level	**Prob.** [1]	**% Reduction**[2]	**Prob.** [1]	**% Reduction**[2]
< HS/GED	5.1%	NA	7.70%	NA
HS/GED equivalent	3.8%	25.6%	6.50%	15.9%
One year post HS or less	3.1%	18.4%	5.80%	10.1%
Two years post HS or less	2.1%	30.6%	4.90%	15.3%
> Two years post HS	1.6%	23.1%	4.50%	9.5%
Av. social assistance per individual, per year[3]	$7,553			
Av. duration on social assistance (no. of months)	19			
Av. employment insurance benefits per individual/yr[4]	$328			
Av. duration on unemployment (no. of months)	5			

Source: Based on Table 2.12 in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adjusted to 2011-12 dollars.

1. Probability that individual will go on welfare or claim unemployment by education level,
2. Shows the calculated reduction that an individual will be go on welfare or claim unemployment.
3. Social assistance costs based on total provincial social assistance transfers divided by total number of persons on welfare in analysis year
4. Annual unemployment costs based on average duration on unemployment (weeks) times average weekly employment insurance benefits

Broad Perspective: Reduced welfare and unemployment claims multiplied by the average cost per year are counted in full as benefits in the broad taxpayer perspective.

Narrow Perspective: All benefits stemming from reduced social assistance are claimed as taxpayer benefits, while none is claimed for unemployment, because these costs are not borne by provincial taxpayers.

[27] Consistent with the methodology and assumptions used in the 2007 Economic Contribution of Camosun College study the analysis assumes that average duration on welfare and unemployment is 18 and 4 months, respectively.

2.10 Summary

The broader elements of the database as well as the key assumptions needed to determine the results are presented in this chapter. In general, data are drawn from four sources: 1) the institutional research and financial departments at Camosun College, 2) public databases, 3) studies and surveys, and 4) the economic literature. Additional detail on data sources, assumptions, and general methods underlying the analyses are conveyed in the remaining chapters and appendices. The results of the economic impact analysis are presented in the next two chapters. Chapter 3 presents the economic impacts associated with Camosun College using a growth analysis approach using economic impact analysis while, Chapter 4 presents the economic impacts associated with Camosun College using an investment analysis approach, examining return on investment, benefit-cost ratios and internal rate of return measures.

III. ECONOMIC GROWTH ANALYSIS

3.1 Introduction

The BC Stats Regional Input Output Model (BCIOM) is used in this study to estimate the economic impacts related to direct expenditures in the regional and provincial economies associated with Camosun College. The BCIOM shows the interconnection of industries, government and households in the regional and provincial economies. The regional backdrop figures from the socio-economic profile data provided by BC Stats are used to derive the total labour and non-labour income impacts. The BC Stats Regional I-O Model is used to then estimate the so-called "multiplier" impacts attributable to the economic activities of Camosun and the increased incomes of students.[28] Camosun graduates remaining in the regional or provincial economy receive higher incomes attributable to their Camosun education, and as a result have greater purchasing power, are more productive, and support the local businesses that hire them. Combined, these factors increase earnings across other industries and generate multiplier effects within the local and provincial economy.

Camosun College activities generate impacts the economy in several ways: (1) from its day-to-day operations (direct expenditures on labour and non-labour operations), (2) from the direct capital expenditures of Comosun College, (3) from the spending of students who come from outside the region to attend college, (4) from the spending of visitors who come from outside the region to attend college events, (5) from Comosun College students who enter the workforce with increased skills. Camosun's direct expenditures on labour and non-labour operations generate direct earnings of faculty and staff and income impacts generated through the non-labour operational expenditures, as well as earnings and income generated through the regional multiplier effects. The college capital expenditures effect includes the income impacts generated through the capital expenditures plus additional earnings and income generated through the action of regional multiplier effects. The student and visitor direct spending (over and above their tuition and college fees) represent incremental expenditures entering the regional economy. The past student productivity impact captures the cumulative income growth that occurs in the regional, and provincial economy as a whole, as students substantially contribute to the economy's human capital stock and make existing industry more productive.

3.2 Impact of College Operations

Wages and Salary Direct Labour Expenditures

Camosun's annual payroll represents direct income impacts to its employees which adds to the earned income of the regional economy. In addition, a portion of Camosun's non-payroll purchases (purchases supplies and services, etc.) contributes directed expenditures in the local economy. These direct expenditures generates additional income throughout the regional economy as the businesses and individuals supplying their goods and services to Camosun make purchases (indirect impacts). Furthermore, as businesses and households re-spend the incremental income generated by Camosun College, induced impacts are generate in the regional and provincial economy. The total impacts associated with the direct, indirect, and induced economic impacts (i.e., multiplier effects) resulting from the incremental direct expenditures in the regional and provincial economy due to Camosun College are reported in the pages that follow.

[28] Multipliers are generally defined as the total effect divided by the direct effect – or the direct and indirect effects divided by the direct effect. For example, an impact effect described as 150% of the direct effect would be associated with a multiplier of 2.5 (direct effect = 1.0; indirect effect = 1.5).

Table 3.1 provides a summary of total employment at Camosun College for the fiscal year 2011-12. Total part-time employment is converted to full time equivalents (based on the average number of hours worked by part-time employees) and added to total full time employment to obtain full time equivalents (FTEs) of employment.[29]

Table 3.1: Total Employment, Camosun College
Measured as Full Time Equivalents (FTEs), 2011-12

	FTEs
CUPE	392
BCGEU (faculty in Trades and some Health programs)	69
CCFA (Camosun College Faculty Association)	401
Admin	57
Total FTEs	**919**

Source: Camosun College

Economic Impacts of Camosun Operational Expenditures

Table 3.2 summarizes the effect of college operations spending in the regional economy. Total direct expenditures associated with Camosun College's operations in 2011-12 appears in the top row. The total employment impact resulting from Camosun College's operational expenditures is 1,257 FTEs of employment. This is comprised of 919 in direct FTEs of employment at Camosun College in addition to 116 in indirect employment and 222 FTEs generated through induced employment impacts.

Table 3.2: Provincial Operating Expenditure Impacts, Camosun College, 2011-12
Direct, Indirect and Induced Impacts

	Direct	Total Indirect*	Induced**	Total Impact
Total expenditures, operation ($M)	**105.6**			
Employment (#FTEs)***	919	116	222	1,257
Household income ($M)	83.9	5.3	11.3	100.5
GDP at basic prices ($M)	90.0	7.6	19.7	117.3
Tax revenue ($M)	11.4	0.9	2.6	14.9

Source: BC Stats Regional I-O Model based on Camosun College direct expenditures on operations, 2011-12.
* The total indirect impact is the sum of the effect on direct suppliers and other supplier industries
** Includes effects generated by project spending and activities of supplier industries
*** Employment estimates are based on average annual wages in 2011-12.

Additional indirect and induced income impacts are also generated as a result of Camosun College's direct expenditures on operations. Indirect income impacts represent income generated in other industries (i.e., off-campus effects) as a result of direct college spending.[30] Induced income impacts results from multiple rounds of spending of direct and indirect income generated in the economy. The BC Stats Input-Output I-O model adjusts for spending that leaks from the economy, and allocates what is left to the appropriate sectors of the I-O model impacted by Camosun College operational expenditures. Total household income impacts are $100.5 million, comprised of $83.9 million in direct income impacts (faculty and staff wages and salaries), $5.3 million in indirect income impacts and $11.3 million in induced income impacts.

[29] Total full time equivalents (FTEs) of employment at Camosun College for fiscal year 2011-12 was obtained from Camosun College.

[30] As described earlier, actual multiplier effects indicated by the BC Stats Regional I-O Model are discounted to account for the shift of resources from next-best uses.

The total Gross Domestic Product (GDP) generated as a result of Camosun College operational expenditures is $117.3 million. This is comprised of $90 million in direct GDP impacts, $7.6 million in indirect GDP impacts and $19.7 million in induced GDP impacts.

The combined federal and provincial tax revenue impacts generated as a result of Camosun College's direct expenditures on operations are $14.9 million in 2011-12. The combined tax revenues are comprised of $11.4 million in direct tax revenue impacts, $.9 million in indirect tax revenue impacts and $2.6 million in induced tax impacts. Table 3.3 provides a breakdown of the total federal and provincial direct tax revenue impacts ($11.42 million) associated with Camosun's direct expenditures on operations in 2011-12.

Table 3.3: Distribution of Direct Tax Revenue Derived from Camosun College Direct Operations Expenditures, 2011-12

	Federal	Provincial	Local	Total
Taxes on products ($M)*	0.31	0.40	0.00	0.71
Personal income taxes ($M)	7.74	2.98		10.72
Total Tax Revenue	**8.05**	**3.37**	**0.00**	**11.42**

Source: BC Stats Regional I-O Model based on Camosun College direct expenditures on operations, 2011-12.

Table 3.4 provides a breakdown of the total federal and provincial indirect and induced tax revenue impacts ($3.46 million) associated with Camosun's direct expenditures on operations in 2011-12.

Table 3.4: Federal and Provincial Indirect and Induced Tax Revenue Derived from Camosun College Direct Operations Expenditures, 2011-12

	Indirect impact	Induced Impact**	Total impacts
Federal ($M)	**0.44**	**0.83**	**1.27**
Personal income tax	0.36	0.63	0.99
Corporation income tax	0.14	0.34	0.47
Net taxes on products	-0.05	-0.13	-0.19
Provincial ($M)	**0.32**	**0.96**	**1.28**
Personal income tax	0.14	0.24	0.38
Corporation income tax	0.06	0.15	0.21
Net taxes on products	0.13	0.57	0.69
Local ($M)	**0.14**	**0.77**	**0.91**
Total tax revenue ($M)	**0.90**	**2.56**	**3.46**

Source: BC Stats Regional I-O Model based on Camosun College direct expenditures on operations, 2011-12.

The BC Stats Regional I-O Model determines the economic impacts remaining in the regional and provincial economy based on the nature of the direct expenditures in each expenditure category. Table 3.5 provides a summary of the GDP, income and employment impacts remaining in the Victoria Region associated with Camosun College Direct expenditures on operations.

Table 3.5: Regional Impacts, Camosun College Operations Expenditures, 2011-12 Victoria Region, BC

	Direct Impact	Indirect Impact	Induced Impact	Total Impacts
Total GDP ($M)	90.0	2.0	2.8	94.8
Total household income ($M)	83.9	1.4	1.9	87.2
Total employment (FTEs)	919	40	50	999

Source: BC Stats Regional I-O Model based on Camosun College direct expenditures on operations, 2011-12.

3.3 Impact of College Capital Expenditures

In addition to its operation expenditures, Camosun also undertakes capital, maintenance and repair expenditures that contribute to the overall local earnings. These expenditures also create a ripple effect in the regional and provincial economy that generates additional income, GDP, employment and tax revenue impacts. Table 3.6 summarizes the economic impacts associated with Camosun College's capital expenditures in the provincial economy. Rather than chose a single year of analysis (including the current analysis year) average direct capital expenditures by the college, average direct capital expenditures over the next five years (planned) is used to estimate the economic impact associated with Camosun's capital expenditures.

The total employment impact resulting from Camosun College's average annual capital expenditures is roughly 53 FTEs of employment. This is comprised of 28 in direct FTEs of employment at Camosun College in addition to 18 in indirect employment and 7 FTEs generated through induced employment impacts. Additional income impacts are also generated as a result of Camosun College's capital expenditures. Total household income impacts are $3 million, comprised of $1.7 million in direct income impacts, and another $1.1 million in indirect income impacts and $.4 million in induced income impacts.

The total Gross Domestic Product (GDP) generated as a result of Camosun College capital expenditures is $4.3 million. This is comprised of roughly $2 million in direct GDP impacts, $1.5 million in indirect GDP impacts and $.6 million in induced GDP impacts. The combined federal and provincial tax revenue impacts generated as a result of Camosun College's capital expenditures is $.6 million in 2011-12.

Table 3.6: Provincial Capital Expenditure Impacts, Camosun College Annual Direct, Indirect and Induced Impacts

	Direct	Indirect	Induced	Total Impacts
Employment (#FTEs)*	28	18	7	53
Household income ($M)	1.72	1.09	0.35	3.16
GDP at basic prices* ($M)	2.15	1.54	0.61	4.30
Total tax revenue ($M)				
Federal ($M)	0.17	0.12	0.03	0.32
Provincial ($M)	0.09	0.07	0.03	0.19
Local ($M)	0.02	0.03	0.02	0.07
Total tax revenue ($M)	**0.28**	**0.22**	**0.08**	**0.58**

Source: BC Stats Regional I-O Model based on Camosun College average capital expenditures 2011-12 to 2016-17.
* Includes wages, benefits, unincorporated business income, operating surplus and net taxes on factors of production

Table 3.7 provides a summary of the GDP, income and employment impacts remaining in the Victoria Region associated with Camosun College capital expenditures.

Table 3.7: Regional Capital Expenditure Impacts, Camosun College Annual Direct, Indirect and Induced Impacts

	Direct Impact	Indirect Impact	Induced Impact	Total Impacts
Total GDP ($M)	2.15	0.2	0.1	2.45
Total household income ($M)	1.72	0.1	0.1	1.92
Total employment (FTEs)	28	1	1	30

Source: BC Stats Regional I-O Model based on Camosun College average capital expenditures 2011-12 to 2016-17.

3.4 Student Spending Impacts

Camosun students from outside the province, (in addition to long distance students enrolled in Camosun's distance learning programs) generate incremental direct expenditures that would not have otherwise entered the regional economy in the absence of the college. These incremental expenditures translate into increased revenue for local businesses and the economy as a whole. Direct student expenditures listed in Table 2.10 (net of leakage and household income) are used in the BC Stats Regional I-O Model. The direct expenditures of Camosun's out-of-province students generate substantial economic impacts, with a total employment impact equal to 456 FTEs and a total household income impact of $18.7 million in the provincial economy (Table 3.8). The spending of Camosun's out-of-province students also results in $30.3 million in added GDP and a total of $11.2 million in combined Federal and provincial tax revenue in the provincial economy.

Table 3.8: Economic Impact of Camosun College Student Spending
Total Direct, Indirect and Induced Impacts for Province of BC, 2011-12

	Direct Impact	Indirect Impact	Induced Impact**	Total Impacts
GDP at basic prices* ($M)	0.0	27.1	3.3	30.3
Employment (#)*	0.0	419.2	36.8	456.0
Household income ($M)	0.0	16.8	1.9	18.7
Total tax revenue ($M)				
Federal ($M)	3.0	0.79	0.14	3.93
Provincial ($M)	4.5	1.50	0.16	7.82
Local ($M)	0.0	0.97	0.13	1.10
Total tax revenue ($M)	**7.5**	**3.27**	**0.42**	**11.19**

* Includes wages, benefits, unincorporated business income, operating surplus and net taxes on factors of production
** Includes effects generated by project spending and activities of supplier industries

Table 3.9 provides a summary of the GDP, income and employment impacts remaining in the Victoria Region associated with the direct expenditures of out-of-province students attending Camosun College.

Camosun's out-of-province students generate substantial economic impacts for the Victoria Region economy, with a total employment impact equal to 176 FTEs in added employment and a total household income impact of $5.4 million in the regional economy. The spending of Camosun's out-of-province students also results in $7.2 million in added GDP in the regional economy

Table 3.9: Regional Impacts, Camosun College Student Spending
Victoria Region, BC, 2011-12

	Direct Impact	Indirect Impact	Induced Impact	Total Impacts
Total GDP ($M)	0.0	6.7	0.5	7.2
Total household income ($M)	0.0	5.1	0.3	5.4
Total employment (FTEs)	0.0	167	8	176

Source: BC Stats Regional I-O Model based on Camosun College student expenditures 2011-12 to 2016-17.

3.5 Visitor Spending Impacts

Camosun College also attracts visitors from outside the province to attend college events (e.g., sporting events, graduations). Visitors to the Camosun College region generate additional direct expenditures that would not have otherwise entered the economy. This translates into increased revenue for local businesses and the economy as a whole. The economic impact for visitors As

shown in Table 3.10, direct spending by Camosun College visitors generates a substantial economic impact on the provincial economy, with a total employment impact of 89 FTEs and a household income impact of $3.1 million and a GDP impact of $4.5 million in the provincial economy.

Table 3.10: Provincial Economic Impacts Resulting from Visitor Expenditures Camosun College, 2011-12

	Direct Impact	Indirect Impact	Induced Impact**	Total impacts
GDP at basic prices ($M)	0.0	3.9	0.5	4.4
Employment (#)*	0.0	83	6	89
Household income ($M)	0.0	2.8	0.3	3.1
Total tax revenue ($M)				
Federal ($M)	0.34	0.23	0.02	0.59
Provincial ($M)	0.51	0.22	0.03	0.76
Local ($M)	0.04	0.11	0.02	0.17
Total tax revenue ($M)	**0.89**	**0.56**	**0.07**	**1.52**

Source: BC Stats Regional I-O Model based on Camosun College visitor expenditures 2011-12.
* Employment estimates are based on average annual wages in 2011-12. Includes total employment over the life of the project
Visitor direct expenditures based on estimated number of visitors, average nights per visit and average spending per day received from Camosun College (an estimated total number of out-of-province visitors in 2011-12 of 13,566 staying an average of 2.5 nights).

Table 3.11 provides a summary of the GDP, income and employment impacts remaining in the Victoria Region associated with the direct expenditures of out-of-province students attending Camosun College.

Table 3.11: Regional Impacts, visitor Spending, Camosun College Victoria Region, BC, 2011-12

	Direct Impact	Indirect Impact	Induced Impact	Total Impacts
Total GDP ($M)	0.0	2.4	0.1	2.5
Total household income ($M)	0.0	1.8	0.1	1.9
Total employment (FTEs)	0.0	60	0	60

Source: BC Stats Regional I-O Model based on Camosun College visitor expenditures 2011-12.
Source: Based on estimated number of visitors, average nights per visit and average spending per day received from Camosun College (an estimated total number of external attendees in 2011-12 of 13,566 staying an average of 2.5 nights).

3.6 Past Student Productivity Impact

Graduates from Camosun's technical, vocational, career, and 4-year baccalaureate programs have entered the regional workforce since the college first opened in 1971, contributing greatly to the province's stock of human capital. Camosun's impact on the economy includes its capacity to provide skills training and career enhancement opportunities to its graduates for high paying occupations in the regional and provincial economies. Over time these skills have accumulated in regional and provincial workforce, leading to earnings for Camosun graduates, which in turn generate additional rounds of consumer spending, which translates to increased business output, leading to more consumer purchases and regional multiplier impacts. It is this cumulative sum of the circular flow of direct and spin-off impacts that comprise the total impact of past student productivity on labour and non-labour income in the economy.

For consistency of results and comparison purposes, the analysis in this section uses the methodology used in the previous (2007) Economic Contribution of Camosun College study to

estimate the economic impact of past student productivity based on the estimated number of Camosun skills currently active in the workforce, measured in terms of CHEs (Table 3.12).

The analysis in this section uses the enrolment of the college covering the period from 1983 until the current analysis year in 2012, as provided by Camosun. Annual enrollment figures are adjusted to account for the estimated percent of retired and leisure students, as these students are not assumed to bring new skills to the region upon exiting college (Table 3.12). An adjustment is made to the total number of students to account for students who leave the region upon exiting Camosun. These students are removed from the analysis (column 3 in Table 3.12), reducing the headcount to include only those who settle in the area. An adjustment is also made for the proportion of students that have not yet entered the labour force (Column 4). The analysis assumes past students have left Camosun and found employment, with the exception of the last two to three years. This adjusted is based on based on the estimated percent of students who are already employed while attending college.

An allowance is made for the time to settle into the workforce upon graduation (settling-in factors) as shown in Column 5, though only for the last two years of the analysis. The settling-in factors from Table 2.10 are used to adjust the staggered rate at which graduates remaining in the regional or provincial economy and entering the labour force actually settle in to their jobs and communities. Similar to the analysis in the previous (2007) Economic Contribution of Camosun College study it is assumed that by the end of the third year after graduation, the settling period is over and the proportion of Camosun graduates employed in the labour force have settled into their jobs. A further adjustment is made to subtract students who have out-migrated, retired, or died over time, based on the thirty-year attrition variable from Table 2.11. As shown in table 2.11, roughly 86% of students stay in the region upon exiting college, while 97% stay in the province (inclusive of students who remain in-region). However, the retention rates only apply to the first year. The analysis also assumes that 33% of students, and thus associated benefits, will leave the region over the next thirty years due to attrition (e.g., retirement, out- migration, or death). Similar to the analysis in the previous (2007) Economic Contribution of Camosun College study it is assumed that the thirty-year attrition rate for the province is 5%. Following these adjustments, the net number of students who are active in the workforce appears in Column 7.

The average number of CHEs generated per student per year back to 1983 is shown in column 8. It is assumed that the average CHEs for the analysis year (2011-12) apply though time. The average CHEs are multiplied by the number of students active in the workforce (Column 7) to obtain a total of 4.6 million CHEs currently embodied by students in the Camosun region and 5.3 million CHEs in the province. Consistent with the analysis in the previous (2007) Economic Contribution of Camosun College study, the total number of CHEs currently embodied by students in the Camosun region is further reduced by 5% to account for alternative education opportunities (i.e., the percent of students who would have still been able to obtain an education even without Camosun). The estimated number of CHEs remaining after this calculation are estimated to be 4.4 million CHEs in the regional economy and approximately 5.0 million CHEs remaining in the provincial economy that are attributable to the existence of Camosun.

Table 3.12: Estimated CHEs Embodied in the Camosun Region Workforce

Year	Student headcount[2] 1	Non-Related students (%)[3] 2	Students remaining in region (%)[3] 3	Students who have left college (%) 4	Students settled into jobs (%) 5	Thirty year attrition (%) 6	Students active in workforce 7	Av. # CHEs[3] 8	CHEs active in workforce 9
1983	9,698	99%	86%	100%	100%	67%	5,532	15	82,982
1984	10,057	99%	86%	100%	100%	68%	5,823	15	87,338
1985	10,415	99%	86%	100%	100%	69%	6,118	15	91,777
1986	10,774	99%	86%	100%	100%	70%	6,421	15	96,316
1987	11,132	99%	86%	100%	100%	71%	6,729	15	100,938
1988	11,491	99%	86%	100%	100%	72%	7,044	15	105,661
1989	11,849	99%	86%	100%	100%	73%	7,364	15	110,466
1990	12,208	99%	86%	100%	100%	74%	7,691	15	115,372
1991	12,566	99%	86%	100%	100%	75%	8,024	15	120,360
1992	13,599	99%	86%	100%	100%	76%	8,799	15	131,991
1993	13,325	99%	86%	100%	100%	77%	8,736	15	131,034
1994	13,907	99%	86%	100%	100%	78%	9,236	15	138,533
1995	15,557	99%	86%	100%	100%	79%	10,464	15	156,956
1996	16,042	99%	86%	100%	100%	80%	10,927	15	163,898
1997	16,539	99%	86%	100%	100%	81%	11,406	15	171,088
1998	17,077	99%	86%	100%	100%	82%	11,922	15	178,834
1999	17,705	99%	86%	100%	100%	83%	12,511	15	187,672
2000	17,422	99%	86%	100%	100%	84%	12,460	15	186,897
2001	17,764	99%	86%	100%	100%	85%	12,856	15	192,834
2002	17,202	99%	86%	100%	100%	86%	12,595	15	188,931
2003	17,222	99%	86%	100%	100%	88%	12,903	15	193,549
2004	17,504	99%	86%	100%	100%	89%	13,264	15	198,954
2005	17,058	99%	86%	100%	100%	90%	13,071	15	196,063
2006	17,406	99%	86%	100%	100%	91%	13,486	15	202,286
2007	20,947	99%	86%	100%	100%	92%	16,408	15	246,113
2008	20,857	99%	86%	100%	100%	94%	16,692	15	250,383
2009	21,737	99%	86%	100%	100%	95%	17,582	15	263,723
2010	22,695	99%	86%	99%	100%	96%	18,364	15	275,462
2011	22,839	99%	86%	89%	54%	97%	9,065	15	135,975
2012	21,776	99%	86%	67%	50%	100%	6,211	15	93,164
Total CHEs active in the workforce									**4,795,549**
Less 5%									-239,777
Adjusted Total CHEs active in workforce									**4,555,772**

Source: Based on Table 2.12 in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adjusted to 2011-12 dollars.

1. Column 1 shows the combined total of credit and non-credit students over the period from 1983 to 2012.
2. The analysis assumes that the same data and assumptions for the current year also apply to the other years in the timeframe, based on the methodology used in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adjusted to 2011-12 dollars

Source: Adapted from data supplied by Camosun, See also Tables 2.6 and 2.10.

Consistent with the methodology used in the previous (2007) Economic Contribution of Camosun College study, the estimated CHEs embodied in the regional and provincial workforce in Table 3.12 (Column 9) are converted to direct earnings using the estimated net value per CHE of $132 (see Table 4.2), representing the incremental earnings received by students for each CHE of instruction received at Camosun.[31] The estimated incremental CHEs embodied in the regional and provincial workforce are converted to direct earnings by multiplying estimated net value per CHE of $132 by the 4.6 million net CHEs in the regional economy and 5 million CHEs in the provincial economy resulting in approximately $601 million in earnings directly attributable to cumulative body of Camosun-generated skills currently active in the regional workforce, and $660 million in direct income in the provincial workforce.

In addition, non-labour income impacts are estimated for the Camosun region and for the provincial economy. Non-labour income impacts represents the economic benefits in the economy resulting from the increased productivity for the businesses that employ Camosun graduates, increased investment, and increased property values due to accumulated CHEs remaining in the regional and provincial economy. The estimation of the non-labour income direct impacts attributable to past student productivity in this section follows the methodology used in the previous (2007) Economic Contribution of Camosun College study and is based on an estimated disaggregation of higher student earnings in each the industrial sectors of the IO model multiplied by their associated value added-to-earnings ratios.

The accumulated non-labour income direct impacts attributable to Camosun graduates represent an increased value to the economy as a result of increased productivity. However, these impacts are scaled down in recognition of the possibility of a "substitution effect". Allowance for a substitution effect is accepted practice in measuring the extent of the incrementality of economic impacts attributable to Camosun College on the regional and provincial economy. The substitution effect takes account of the extent to which local businesses would be able to recruit and hire graduates from other colleges, schools or universities in the absence of Camosun College.

It is difficult to determine the size of the actual substitution effect that may occur in the economy in the absence of Camosun College. This study assumes a conservative estimate of the non-labour productivity impacts and assumes a 65 percent substitution effect. As a result, the non-labour income impacts attributable to Camosun in 2012 is estimated to be $82.9 million for the regional economy and $91 million in the provincial economy.

In total, the combined value of the labour and non-labour income provides an estimate of the direct income impact of past student productivity equal to $684 million for Camosun Region and $751 million for the provincial economy.

[31] The value per CHE is estimated by combining earnings/education data from Table 2.8 with information on aggregate student achievements during the analysis year (from Table 2.7), adjusted downward to account for the ability bias and other factors discussed in Chapter 2.

Table 3.13: Economic Impacts of Past Student Productivity, Camosun College Direct, Indirect and Induced Impacts, 2011-12

	Direct Impacts	Indirect Impacts	Induced Impacts	Total Impacts
Victoria Regional Economy				
Household income ($M)	$683.90	$43.20	$92.11	$819.21
Tax revenue ($M)				
Federal ($M)	$72.34	$5.52	$12.62	$90.48
Provincial ($M)	$38.30	$3.22	$12.62	$54.14
Total tax revenue ($M)	$110.64	$8.74	$25.23	$144.61
Provincial Economy				
Household income ($M)	$751.00	$47.44	$101.15	$899.59
Tax revenue ($M)				
Federal ($M)	$79.44	$6.06	$13.86	$99.36
Provincial ($M)	$42.06	$3.53	$13.86	$59.45
Total tax revenue ($M)	$121.50	$9.59	$27.71	$158.80

Source: Based on Tables 2.9 and 4.3 and outputs supplied by BC Stats Regional I-O Model.

The indirect and induced income impacts resulting from a skilled workforce is also included in the economic growth analysis. Increased labour productivity is associated with increased output of businesses and therefore, increased demand for inputs, which in turn produces a set of regional economic multiplier effects that are all captured as part of the indirect impacts. To calculate the indirect and induced income and tax impacts impacts, the analysis utilizes the BC Stats Regional I-O Model aggregate income multipliers for fiscal year 2011-12.

The indirect income impact related to the accumulated productivity due to Camosun graduates retained and working in the regional economy is estimated to be $43 million and the induced income impact is estimated to be $92 million (Table 3.13). The combined direct effects of past student productivity and indirect impacts yields a total of $819.2 million in added income attributable to the accumulation of Camosun skills in the regional workforce and $900 million in the provincial economy. This figure does not include the effect of educated workers on innovation and technical progress. This effect is excluded from the analysis as it is difficult to measure due because it spills beyond businesses employing skilled workers. In addition, the GDP and employment impacts associated with the accumulated productivity associated with Camosun College students retained in the regional and provincial economy are not included in this analysis.

3.7 Total Economic Impacts

The total income impact on the regional and provincial economy attributable to Camosun College includes the impacts resulting from Camosun College operations and maintenance, capital expenditures, student spending, visitor spending, and accumulated productivity effect and is shown in Table 3.14.

Table 3.14: Total Income Impacts Attributable to Camosun College, 2011-12, Camosun Region and Provincial Economy

	Regional economy ($M)	Provincial Economy ($M)
College operation expenditures impacts	$87.2	$100.5
College capital expenditures impacts	$1.9	$3.2
Student spending impacts	$5.4	$18.7
Visitor Spending impacts	$1.9	$3.1
Past student productivity impacts	$819.2	$899.6
Total	**$916**	**$1,025**

Source: Based on outputs supplied by BC Stats Regional I-O Model.

Total income impacts associated with Camosun College is approximately $916 million in the regional economy and $1 billion in the provincial economy. The accumulated productivity impact is the largest and most important impact of Camosun, resulting from the higher incomes of students and their employers. These results demonstrate that Camosun is an important contribution to economic growth through its own operations and capital spending, the spending of its out-of-region students visitors, and the increase in productivity due to past graduates remaining active in the provincial workforce. A summary of total economic impacts attributable to Camosun College for the province and the regional economy is provided in Table 3.15.

Table 3.15: Summary of Total Impacts Attributable to Camosun College, 2011-12, Regional and Provincial Economy

	Regional Economy ($M)	Provincial Economy ($M)
Total household income impacts ($M)	$916	$1,025
Total GDP impacts ($M)	$107	$156
Total employment impacts (FTEs)	1,257	1,855
Total tax revenue impacts ($M)	$173[1]	$187[1]

Source: Based on outputs supplied by BC Stats Regional I-O Model.
1. Tax revenue impacts represent the combined total federal and provincial tax revenue impacts.
Note: GDP and employment impacts associated with accumulated productivity attributable to Camosun graduates retained in the regional and provincial economy are not included in the analysis.

IV. INVESTMENT ANALYSIS

This chapter considers Camosun as an investment, first on the part of students, then on the part of provincial and local government. The investment analysis focuses on the Camosun Service Area and examines the impact of Camosun on regional economic growth. Impact estimates are reported in terms of labour income (i.e., earnings) and non- labour income (i.e., sum of all dividends, interests, and rents). The analysis estimates both annual benefits, and future benefits expressed in present value terms.

To ensure consistency of methodology and comparison of results, the analysis in this section is based on the methodology used in the previous (2007) Economic Contribution of Camosun College study. In general terms, investment analysis evaluates total costs against total benefits to determine whether or not a proposed venture will be profitable. As a general rue of thumb in benefit-cost analysis, if benefits outweigh costs, then the investment is worthwhile. Alternatively, when costs outweigh benefits, the investment will lose money and is thus considered infeasible.

4.1 Student Perspective

Students invest in post-secondary education in return for a future higher earnings distribution over the remainder of their working lifetime. From the students' perspective, the benefits focuses on the extent to which student earnings increase as a result of their investment in higher education, while costs include the value of what they have given up in order to achieve a college education.

The total cost of education (Table 4.1) from the student perspective, include tuition and fees ($25.2 million) plus student opportunity cost from Table 2.8 ($162.2 million). Consistent with the methodology used in the previous (2007) Economic Contribution of Camosun College study, the analysis includes a reduction to account for aggregate measure of tuition and fees paid by retired and leisure students.

Table 4.1: Student Out of Pocket Costs and Opportunity Costs, Camosun College, 2011-12

Cost Component	Total
Tuition and fees	$25,222,308
Opportunity cost	$162,210,840
Subtotal	$187,433,148
Net of revenue from retired/leisure students[1]	($10,117.07)
Total	**$187,423,031**

Source: Based on Table 2.1 and 2.6 in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth.

1. Equal to number of CHEs generated by retired and leisure students times cost of tuition and fees per CHE.

The resulting aggregate costs of education (out-of-pocket costs plus opportunity costs) totaled $187.4 million in the 2011-12 analysis year.

The expected future stream of earnings benefits for students varies across students according to their level of education as they progress through their college education. Students who move from a high school diploma to a Bachelors degree may expect $10,000 in higher annual earnings, whereas an individual moving from a high school diploma to a Certificate would expect $4,000 in higher annual earning. This earnings differential and is referred to as the 'marginal value' of moving from one education level to the next and requires information on the value of each CHE

students achieve during the single analysis year. The methodology used to determine this value draws on the average earnings by education level derived in Table 2.8 and allocates the "earnings differential" differences to the CHEs completed within each level.

The aggregate higher earnings that accrue to Camosun students is determined by multiplying the value per CHE times the corresponding number of CHEs completed (Table 4.2). As noted in Section 2, the aggregate higher earnings that accrue to Camosun students reflects earnings at the midpoint of the students' careers, not immediately upon exiting college. It would be reasonable to assume that earnings will be lower at the start of an individual's career and higher near the end of it – and that earnings at the midpoint serves as a reasonable average.[32] As a result of this analysis, the aggregate Camosun student body enjoys, on average, an estimated $43.3 million in higher earnings each year as a direct result of their education.

Table 4.2: Aggregate Higher Earnings Per Year at Midpoint of Lifetime Earnings, by Education Level

Education Level	Net CHEs[1]	Value Per CHE	Aggregate Higher Earnings
HS/GED equivalent or less	41,944	$172	$7,221,837
One year post HS or less	173,655	$116	$20,059,211
Two years post HS or less	106,432	$144	$15,309,654
> Two years post HS	4,834	$138	$668,972
Total	**326,866**	**$132**	**$43,259,674**

1. Net of retired and leisure students.

Source: Based on in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; See calculation and assumptions in Tables 2.5, 2.6, and 2.7.

It is important to not however, that the $43.3 million in aggregate earnings differentials do not occur in one year alone, but rather, these earnings differentials occur for many years out over the lifetime earnings distribution for a Camosun graduate long after students make their initial investment of time and money in their education. As a result, benefits must be projected out into the future over the estimated lifetime earnings distribution and discounted to the present value to facilitate a comparison with costs to determine the feasibility of the investment. As per the methodology used in the previous (2007) Economic Contribution of Camosun College study, the time horizon for the analysis is defined from the time the student enters (or re-enters) the workforce at (average) age 26.1 until they retire at age 65 (or over their earnings lifetime).

A discount rate is used to discount the projected higher student earnings to present values to reflect the time value of money. For this analysis the assumed discount rate is 4.0%. Present values of benefits are collapsed to one number and compared to student costs to derive investment analysis results, expressed in benefit/cost ratios, rates of return and payback periods. The investment is feasible if returns match or exceed the minimum threshold values, i.e., a benefit/cost ratio greater than one, a rate of return that exceeds the discount rate, and a reasonably low payback period (Table 4.3).

As commonly suggested in economic theory, the discount rate used to convert future costs and

[32] Students are rewarded for their education with higher incomes now and into the future, generally for as long as they remain active in the workforce. At the same time, Statistics Canada data indicates that the gap between educated and non-educated workers grows through time and that the income increment from schooling grows as well. The annual increase in student earnings shown in Table 4.2 refers to the middle of students' careers. A somewhat smaller figure is therefore expected in years immediately following the single year of college operations, and a larger figure in the latter part of students' careers.

benefits to present should reflect the investor's opportunity cost of capital, (in economic terms, this means the discount factor should yield the rate of return that an could reasonably be expected to obtain from alternative investment schemes).

As per the methodology used in the previous (2007) Economic Contribution of Camosun College study, a discount rate of 4.0% is used in this study, which is a typical and relatively low rate often applied in public investment projects.

The aggregate student earnings differential of $43.3 million is projected out across the working life of students and discounted back to the present using a 4% discount factor, yielding a cumulative present value of aggregate earnings differential of $913.6 million (Table 4.3).

Table 4.3: Estimation of Present Value of Benefits and Costs, Student Perspective

	Results
Present value of future benefit stream[1]	$913,601,072
Present value of costs	$187,423,033
Net present value	$726,178,039
Benefit/cost ratio	4.9
Internal rate of return	14.9%
Payback period (no. of years)	9

Source: Based on in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth;

1.Calculated by projecting average annual higher student earnings from over the established time horizon, discounting the future benefit stream to the present using an assumed rate of 4.0%, then summing final discounted values together.

To determine whether attending college is a good investment from the students' perspective, the present value of the benefit streams (future stream of earnings differential) resulting from attending Camosun, the economic analysis compares this to the associated present value of costs (equal to $187.4 million). Because costs only occur in the single analysis year, they are already in current year dollars, and the present value of costs is reported in Table 4.1.

A comparison of the present value of the benefit stream with the present value of costs yields a benefit/cost ratio associated with student investment in Camosun College of 4.9 (equal to $913.6 million in benefits divided by $187.4 million in costs).

Based on the cost of college and the present value of the stream of associated future benefits, Camosun students earn an average returns of 14.9% on their investment of time and money on a Camosun college education. Given rates of return prevailing in the financial market, this is an impressive return. The estimated payback period is estimated to be 9 years on students' foregone earnings and out-of-pocket costs[33] is defined as the length of time it takes to entirely recoup the initial investment (Table 4.3).

[33] Payback analysis is generally used by to rank alternative investments when safety of investments is an issue. However, it takes no account of the time value of money.

4.2 Taxpayer Perspective

Examining benefits from a taxpayer perspective involves an assessment of both benefits and costs from society's perspective as a whole, including students, employers, businesses, and others who potentially benefit from the educational activities and attainment of Camosun College graduates. From this broader stance, *all* benefits generated by Camosun College are counted, regardless of who benefits. However, as introduced in the previous (2007) Economic Contribution of Camosun College study, a narrower taxpayer perspective would restrict the benefits to include only those that could receive an actual monetary gain such as the provincial and local government, whether in the form of added tax revenue or reduced government expenditures. In both the broad and narrow perspectives, costs comprise provincial and local government support of the college.

Broad Taxpayer Perspective

Examining benefits using broad taxpayers perspective requires an assessment of the "social" benefits associated with Camosun College graduates' education, consisting of an estimate of added income and avoided social costs. Added income (income growth) is measured by the increase in economic activity as a result of higher earnings and added skills of Camosun students and their contribution to the production of higher income in the province. The social benefits associated with avoided social costs is measured as reductions in both private and public expenditures as a result of improved lifestyles in the form of reduced health care costs, lower crime, and reduced welfare and unemployment manifested as a result of Camosun students' educational attainment.

An assessment of income growth requires a measurement of the increase in economic activity as a result of higher earnings and added skills of Camosun students. The skills Camosun students acquire while attending college, help make business capital more productive (i.e., buildings, machinery and other factors of production) and therefore help businesses earn more. Skilled labour and capital complement each other in a production process. An increase in skilled labour increases the productivity and income of existing capital, and encourages the attraction of additional capital investment. This in turn raises profits and other business property income. It is the combined increases in labour and capital income that is considered the *direct impact* of a skilled workforce. In contrast, the *Indirect impacts associated with* a skilled workforce occur when the higher incomes of educated workers enable them to spend more on goods in the local economy , while the increased output of businesses that employ them also creates a demand for more inputs (indirect impacts) and, consequently, input spending. The combined effect of these two spending items leads to multiple rounds of spending and output production, referred to as the *induced impacts*. It is this combined total of several rounds of spending constitutes the total income impact associated with a skilled workforce.

The methodology used to estimate the direct, indirect and induced income growth impacts is based on the methodology used in the (2007) Economic Contribution of Camosun College study. The measurement of the direct impacts on income growth associated with Camosun in the province builds on the estimation of the present value of projected higher student earnings (from Table 4.3), adjusted downward to account for students who leave the province. The out-migration and attrition variables shown in Table 2.11 are used to adjust for out migration. The indirect impact of higher student earnings on labour income analysis is calculated using a multiplier derived from the BC input-output (I-O) model described in Chapter 3.

This analysis uses a reduction factor to the estimated impacts to take account of alternative education opportunities such as private trade schools and colleges, correspondence schools, and so on. The reduction factor for Camosun is assumed to be 5 percent, indicating that 5% of the student

body could have obtained an education elsewhere without Camosun College).[34] Similar to the 2007 Economic Contribution of Camosun College study, the analysis assumes that benefits generated by students are not directly attributable to Camosun and discounts results accordingly.

The analysis make another adjustment to account for the fact that a portion of benefits generated by the college may not be directly linked to the provincial and local government costs of supporting it. The analysis assumes that the college would have to shut down below some minimum level of enrolment (35%).

The net effect of Camosun College on income growth in the provincial economy is estimated by applying these adjustment factors, as showin in Table 4.4. The results of the analysis shows a combined annual income growth impact of $79 million.

Table 4.4: Estimated Aggregate Annual Benefits, Broad Taxpayer Perspective

Benefit Component	Total
Income Growth	
Labour income	$47,557,747
Non-labour income	$31,456,459
Subtotal, Income Growth	**$79,014,206**
Social Savings	
Health Benefits	
Absenteeism savings	$1,112,801
Fewer smokers	$1,530,430
Fewer alcohol abusers	$1,431,361
Crime Benefits	
Fewer criminal offences	$43,499
Crime victim savings	$41,725
Welfare/Unemployment Benefits	
Social assistance	$44,485
Employment insurance	$32,917
Subtotal, Social Savings	**$4,237,219**
Total Public Benefits	**$83,251,424**

Source: Based on in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adapted from Tables 2.12 to 2.14.

The analysis also estimates the avoided social costs benefits (social savings) of $4.2 million stemming from the activities of Camosun and its students. The social savings shown in Table 4.4 arise as a result of the positive behavioral changes as individuals reach higher levels of education, and are based on the results of Tables 2.11 to 2.14, showing improved social behavior by levels of education.

As can be seen in Table 4.4, the results of Camosun's educational programs leads to a reduction in health-related absenteeism from work by 67,560 days per year, resulting in an annual average savings of lost productivity equal to roughly $1.1 million. Other health related benefits resulting from the educational impact of Camosun's programs related to decreased tobacco and alcohol use. As a result of the positive externalities associated with Camosun College's educational benefits there are 334 fewer smokers per year with an annual average savings to society

[34] The alternative education variable is derived using a ratio of private to public colleges in the province, then conditioning this to the average earnings per worker in the region.

of $1.5 million and 132 fewer alcohol abusers *per year*, providing an annual average savings of $1.4 million.

The social benefits associated with the positive education impacts of Camosun College also include reduced social costs associated with reduced crime and reduced reliance on social assistance and unemployment insurance. The avoided social costs associated with the educational impacts of Camosun College include an estimated reduction of 271 criminal offenses over the course of students' working career with an annual cost savings of $43,500 in direct crime savings, and $41,725 in savings to otherwise would-be crime victims.[35]

The social benefits also include an average annual reduction of 151 social assistance and 92employment insurance claims is approximately 151 and 92 respectively, corresponding to an annual dollar savings amount of roughly $44,485 for decreased welfare reliance and $32,900 in unemployment insurance savings.

The educational benefits associated with Camosun College generates a combined total annual public benefits of $83.3 million to the provincial economy in the year of analysis 2011-12. Annual benefits in Table 4.4 are projected out into the future and discounted to the present value so that they can be compared to costs. Similar to the time horizon for the growth analysis, the time horizon for the growth analysis is equal to the assumed retirement age of 65 minus the average age of the student body (26.1 years). Table 4.5 provides a summary of the present value of benefits and costs using an assumed discount rate of 4.0%. The total present value of future added income is $1.6 billion and future avoided cost is $77 million with a present value of combined benefits or $1.7 billion under the broad taxpayers perspective.

The present value of total costs ($75.7 million) shown in Table 4.5 represents the value of Provincial and local government support of Camosun in the single analysis year alone.

Table 4.5: Estimated Present Value of Benefits and Costs, Broad Perspective

	Results
Present value of future added income	$1,642,232,335
Present value of future avoided social costs	$77,176,256
Total benefits, present value	$1,719,408,592
Total costs, present value	$75,743,938
Benefit/cost ratio	22.7

Source: Based on in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adapted from present value of projected costs and based on Tables 2.2 and Table 4.4.

The present value of benefits and costs under the broad taxpayers perspective yields a benefit/cost ratio of roughly 22.7 (including the measure of *all* benefits generated regardless of to whom they may accrue). While students are the direct beneficiaries of a higher future earnings distribution, and employers are the direct beneficiaries of lower absenteeism, and others are beneficiaries of reduced crime, reduced tobacco and alcohol usage, and other improved social outcomes, these benefits do not necessarily return direct benefits to provincial and local taxpayers who provide the direct funding. Because investors and potential beneficiaries are not one and the same, common investment analyses measures such as rate of return, payback period, and net present value no longer apply.

[35] As outlined in the 2007 Economic Contribution of Camosun College study, crime costs are defined broadly to include spending associated with police, prosecution, courts, legal aid, and adult corrections.

Narrow Taxpayer Perspective

Using a more narrowly defined taxpayer perspective, the analysis is somewhat different. The public benefits shown in Table 4.4 are limited to include those that specifically accrue to provincial and local government. Benefits resulting from income growth are limited to higher provincial and local tax payments. Under the narrow taxpayer perspective, avoided social costs are limited to those received strictly by provincial and local government, while benefits to private residents, local businesses or the federal government are excluded.

A summary of the annual benefits that accrue to provincial and local taxpayers in terms of added tax revenue and reduced government expenditures under the narrow taxpayer perspective is provided in Table 4.6. The added tax revenue equal to $17 million is derived by applying provincial and local government tax rates to the annual income growth shown in Table 4.4.

Table 4.6: Estimated Aggregate Annual Benefits, Narrow Taxpayer Perspective

Benefit Component	Total
Added Tax Revenue	**$16,999,809**
Reduced Government Expenditures	
Health Benefits	
Absenteeism savings	$29,995
Substance abuse savings[1]	$344,081
Crime Benefits	
Justice savings	$85,225
Welfare Benefits	
Social assistance saving	$39,430
Subtotal, Reduced Government Expenditures	$468,735
Total Government Benefits	**$17,468,544**

Source: Based on in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Adapted from data supplied by Tables 2.12 to 2.14.

1. Inclusive of reduced government expenditures related to reduced tobacco and alcohol abuse.

The impact of reduced government expenditures related to absenteeism and substance abuse is shown in Table 4.6. Under the narrow taxpayers perspective, social benefits (avoided social costs) such as absenteeism savings are restricted to include only the portion pertaining to provincial and local government employers. Alternatively, savings from reduced tobacco and alcohol abuse are included, based on provincial and local government subsidy of general health care.

Avoided costs of crime is computed by subtracting victim costs and the cost of federal crimes, as these accrue to provincial taxpayers, yielding decreased justice expenditures equal to $85,225 per year. This analysis yields total annual government benefits of $17.5 million in 2011-12.

The annual benefits shown in Table 4.6 are projected out to the future then discounted back to the present, which provides the current time value of all future benefit increments that accrue strictly to provincial and local government. A summary of present values and financial analysis ratios are provided in Table 4.7 The future stream of government benefits yields an overall value of $376.7 million resulting from a year's support of Camosun. Total Costs ($75.7 million) represent the annual contribution of provincial and local government to Camosun. The benefit/cost ratio of 5.0 indicates a profitable investment. The rate of return to provincial and local taxpayers of 15% is also provides a strong indication that Camosun generates a surplus that provincial and local government can use to fund other programs.

Table 4.7: Estimated Present Value of Benefits and Costs, Narrow Perspective

Results	
Present value of increased provincial and local government tax revenue	$368,858,587
Present value of reduced provincial and local government expenditures	$7,864,590
Total benefits, present value	$376,723,177
Total costs, present value	$75,743,938
Net present value	$300,979,239
Benefit/cost ratio	5.0
Internal rate of return	15.00%
Payback period (no. of years)	9

Source: Based on in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; See Tables 2.2 and 4.6

4.3 Comparison of Social Benefits Results

The inclusion of social benefits with an attribution to college education (reduced crime, welfare and unemployment, and improved health) not directly related to the operations of the college and are defined as benefits that are 'external' to Camosun College. However, the legitimacy of including these benefits in the calculation of financial measures such as the rate of return to higher education is questioned by some, who would most likely argue that only direct benefits, (e.g., higher earnings), should be counted. Total benefits reported in Tables 4.5 and 4.7 include social benefits reported here as attributable to the college. Following the lead taken by the 2007 Economic Contribution of Camosun College study, and to examine the financial indicators under the alternate point of view, Table 4.8 provides a summary of the rates of return for both the broad and narrow perspectives (excluding social benefits). It is interesting to note that even under the narrow perspective with social benefits excluded, the rates of returns on government investment are still well above usual benchmark values (4%), benefit/cost ratio are greater than 1 confirming that taxpayers receive substantial value from investing in Camosun College, even when we do not consider the range of social benefits that are highly correlated with post-secondary education.

Table 4.8: Taxpayer Perspectives Without Social Externalities ($ Thousands)

	BROAD PERSPECTIVE With Social Savings…		NARROW PERSPECTIVE With Social Savings…	
	Included	Excluded	Included	Excluded
Net present value	$1,719,408,592	$1,642,232,335	$376,723,177	$368,858,587
Internal rate of return	-	-	15.80%	15.30%
Benefit/cost ratio	22.7	21.7	5.0	4.9
Payback period (years)	-	-	9	9.2

Source: Based on in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; See Tables 4.5 through 4.7.

4.4 Comparison of Private and Public Benefits

Aggregate annual benefits reported in Tables 4.2 and 4.4 are expressed in Table 4.9 on per CHE and per full time equivalent (FTE) student basis. This provides a comparison of private and public benefits from another perspective.

As shown in Table 4.2, the annual average income of Camosun students increases roughly $132 for every hour of credit or non-credit instruction they complete, representing a private benefit of

#$132 per CHE. In terms of public benefits, as can be seen in Table 4.9, for every hour of instruction, $242 is added to provincial income for every hour of instruction provided by Camosun College. The upper two rows of the table refer to student benefits. The remainder of the table summarizes public benefits, with the bottom row showing total public benefits.

Table 4.9: Comparison of Annual Benefits Per CHE and Per FTE Student

Student Benefits	Per CHE[1]	Per FTE Student[1]
Increased student earnings, gross	$132	$3,970
Increased student earnings, after tax	$100	$3,040
PUBLIC BENEFITS		
Income growth	$242	$7,654
Health-related savings [2]	$12	$337
Crime savings [3]	0.26	$8
Welfare/unemployment savings [4]	0.24	$6
Total	**$255**	**$8,005**

Source: This table is based on in the 2007 Economic Contribution of Camosun College: Analysis of Investment Effectiveness and Economic Growth; Table 4.9

1. Annualized values exclude benefits from retired students.
2. Inclusive of savings due to reduced absenteeism and tobacco and alcohol abuse.
3. Inclusive of savings due to reduced crime and victim costs.
4. Inclusive of savings due to reduced social assistance and employment insurance claims
   Source: See Table 4.2 and 4.4.

The results are presented on both a CHE and FTE basis. What does this comparison tell us? Examining these results strictly in monetary terms, one important result emerges - the public stands to benefit substantially more from the education provided by Camosun than students do. For example, we know by definition, that an FTE student completes the equivalent of 30 credit hours of class work to complete a full year of study. In addition, a full time year of study will yield $3,970 in higher annual income (before tax) for the average Camosun student; it will increases regional income by $7,654 and in addition - it will provide $8,000 to the public annually. These results are all annual averages of benefits that will accrue for years into the future, for at least as long as students remain in the workforce.

However, when we examine the students' benefit from one CHE of Camosun attendance with a $100 annual increase in their after-tax earnings. By comparison, the public gains from that same hour of instruction total to about $337 in added annual income growth and assorted social savings per CHE. Therefore, the public benefits more from the education provided by Camosun than do students.

4.4 Conclusions

The results of the economic impact analysis show that Camosun is an attractive investment to its major stakeholders, students as well as provincial and local government. From the perspective of students, the rates of return on student investment in their education at Camosun College exceed alternative investment opportunities. From the perspective of the provincial and local government, the expenditure of taxpayer funds in support of Camosun College creates a wide variety of positive social benefits and, actually returns more to government budgets than it costs. In the absence of the increased tax revenues and avoided costs provided by Camosun education, the provincial and local government would need to raise taxes to make up for these lost revenues and added costs.

APPENDIX A: SUPPORTING TABLE

Table 4.3b: Estimating CHEs of Instruction Embodied in the Provincial Workforce[1]

	Student headcount[2]	Non-Related students (%)[3]	Students remaining in province (%)[3]	Students who have left college (%)	Students year attrition (%)	Students active in workforce	Average CHEs[3]	CHEs active in workforce
Year	1	2	3	4	6	7	8	9
1983	9,698	99%	97%	100%	73%	6,796	15	102,235
1984	10,057	99%	97%	100%	74%	7,141	15	107,440
1985	10,415	99%	97%	100%	75%	7,495	15	112,766
1986	10,774	99%	97%	100%	76%	7,857	15	118,216
1987	11,132	99%	97%	100%	77%	8,228	15	123,791
1988	11,491	99%	97%	100%	78%	8,607	15	129,496
1989	11,849	99%	97%	100%	79%	8,995	15	135,332
1990	12,208	99%	97%	100%	80%	9,392	15	141,301
1991	12,566	99%	97%	100%	81%	9,798	15	147,406
1992	13,599	99%	97%	100%	82%	10,746	15	161,664
1993	13,325	99%	97%	100%	83%	10,671	15	160,538
1994	13,907	99%	97%	100%	84%	11,286	15	169,799
1995	15,557	99%	97%	100%	85%	12,795	15	192,492
1996	16,042	99%	97%	100%	86%	13,371	15	201,167
1997	16,539	99%	97%	100%	88%	13,970	15	210,181
1998	17,077	99%	97%	100%	89%	14,619	15	219,936
1999	17,705	99%	97%	100%	90%	15,360	15	231,092
2000	17,422	99%	97%	100%	91%	15,317	15	230,445
2001	17,764	99%	97%	100%	92%	15,828	15	238,135
2002	17,202	99%	97%	100%	94%	15,534	15	233,701
2003	17,222	99%	97%	100%	95%	15,760	15	237,118
2004	17,504	99%	97%	100%	96%	16,051	15	241,487
2005	17,058	99%	97%	100%	96%	7,671	15	115,414
2006	17,406	99%	97%	100%	96%	9,079	15	136,178
2007	20,947	99%	97%	89%	96%	12,031	15	180,459
2008	20,857	99%	97%	89%	97%	12,104	15	181,556
2009	21,737	99%	97%	89%	98%	12,744	15	191,167
2010	22,695	99%	97%	89%	99%	13,442	15	201,628
2011	22,839	99%	97%	89%	100%	13,664	15	204,957
2012	21,776	99%	97%	89%	100%	13,028	15	195,418
Total CHEs active in the workforce								**5,252,515**
Less 5%								-262,626
Adjusted Total CHEs active in workforce								**4,989,889**

1. Numbers may not add due to rounding.
2. Column 1 shows the combined total of credit and non-credit students. In the case that enrolment data is unavailable, the missing information is calculated internally in the analytical model.
3. In the absence of better data, the analysis assumes that the same data and assumptions for the current year also apply to the other years in the timeframe.

Source: Adapted from data supplied by Camosun, See also Tables 2.6 and 2.10.