

The
**ECONOMIC
VALUE** *of the*
**UNIVERSITY
OF NEW
BRUNSWICK**

*Analysis of the Economic Impact
and Return on Investment
of Education*

EXECUTIVE SUMMARY

September 2015

emsi

INTRODUCTION

This study investigates the economic impacts created by the University of New Brunswick on the provincial economy and the benefits that the university generates in return for the investments made by its key stakeholder groups—students, society, and taxpayers.

As the largest educator in New Brunswick, and the oldest English-language university in Canada, the University of New Brunswick (UNB) provides a comprehensive education that has often been recognized as one of the best in Canada. Its multiple campuses, diverse programs, and many entrepreneurial, social and research programs give students an opportunity to increase their employability and achieve their individual potential through education. The university serves a range of industries in New Brunswick and supplies local businesses with skilled workers. Because of the university, society benefits from an expanded economy and improved quality of life. The benefits created by UNB extend as far as the provincial government, in the form of increased tax revenues and public sector savings.

The following two analyses are presented:

- **Provincial economic impact** analysis measuring the income created by the university and its students, visitors, and entrepreneurial activities in New Brunswick.
- **Investment analysis** weighing the benefits to students, society, and taxpayers in return for the costs of supporting the university.

The results of the study reflect the 2013-14 analysis year. Data and assumptions are based on academic and financial reports from the university, industry and employment data from Statistics Canada, outputs of EMSI's Canadian regional input-output model, and a variety of studies and surveys relating education to social behaviour. The study applies a conservative methodology and follows standard practice using only the most recognized indicators of economic impact

and investment effectiveness. For a full description of the data and approach, please contact the university for a copy of the technical report.

INVESTMENT ANALYSIS

- For every \$1 students invest in UNB, they receive a cumulative **\$2.80** in higher future earnings over the course of their working careers.
- Society as a whole in New Brunswick received **\$1.4 billion** in added income in 2013-14.
- Society received another **\$8.5 million** in social savings related to reduced crime, lower unemployment, and improved health across the province in 2013-14.
- Provincial taxpayers receive a rate of return of **11.1%** on their investment in UNB.

ECONOMIC IMPACT ANALYSIS

- Altogether, UNB and its students, visitors, and entrepreneurial activities added **\$1.2 billion** in income to the New Brunswick economy.
- New Brunswick received approximately **\$214.2 million** in added income in 2013-14 due to the spending toward UNB day-to-day operations, the spending of out-of-province students, and the spending of visitors to the province.
- Direct research spending by UNB, along with start-up and spin-off companies attributable to UNB, contributed another **\$80.3 million** in added income to New Brunswick in 2013-14.
- UNB graduates who were active in the provincial workforce in 2013-14 generated another **\$949.9 million** in added income through their higher earnings and increased productivity of their employers.

STUDY HIGHLIGHTS

PROVINCIAL ECONOMIC IMPACT ANALYSIS

Economic impact analysis measures the net added income created by UNB in the provincial economy through its own operational and direct research spending, the spending of its students, visitors, and entrepreneurial activities, as well as the enhanced productivity of the workforce. The backdrop for the analysis is New Brunswick.

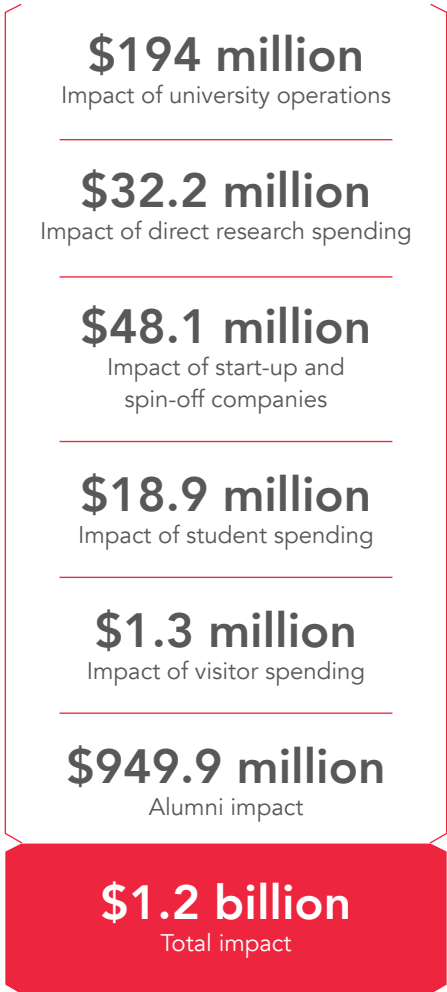
The New Brunswick economy is impacted by UNB in a variety of ways. The university is one of the province’s largest employers and a significant buyer of goods and services. It attracts monies that would not have otherwise entered the provincial economy through its day-to-day operations, its research activities, and the expenditures of its out-of-province students and visitors. Further, it fosters the development of new start-up and spin-off companies and provides students with the knowledge, skills, and abilities they need to become productive citizens and contribute to the overall output of the province. This is proven by UNB programs, such as nursing and engineering, that produce knowledgeable graduates who meet labor demands inside and outside of the province.

Results of the provincial economic impact analysis are broken out according to the following six impacts: 1) impact of university operations, 2) impact of direct spending on research, 3) impact of start-up and spin-off companies, 4) impact of student spending, 5) impact of visitor spending, and 6) impact of the skills acquired by graduates who are still active in the New Brunswick workforce.

IMPACT OF UNIVERSITY OPERATIONS

UNB is an important employer in New Brunswick. In 2013-14, the university employed faculty and staff

ADDED INCOME CREATED BY UNB IN 2013-14



equivalent to 1,991 full-time employees. Of these, 100% lived in New Brunswick. Total payroll at UNB was \$184.5 million, much of which was spent in the province for groceries, eating out, clothing, and other household expenses.

UNB is itself a large-scale buyer of goods and services. In 2013-14, the university spent \$108.1 million to cover its expenses for facilities, professional services, and supplies.

The total income that UNB created during the analysis year as a result of its day-to-day operations (excluding direct spending for research activities) was \$194 million, equivalent to 4,599 job equivalents. This figure represents the university's payroll for non-research operations, the multiplier effects generated by the spending of the university and its employees, and a downward adjustment to account for funding that the university received from local sources.

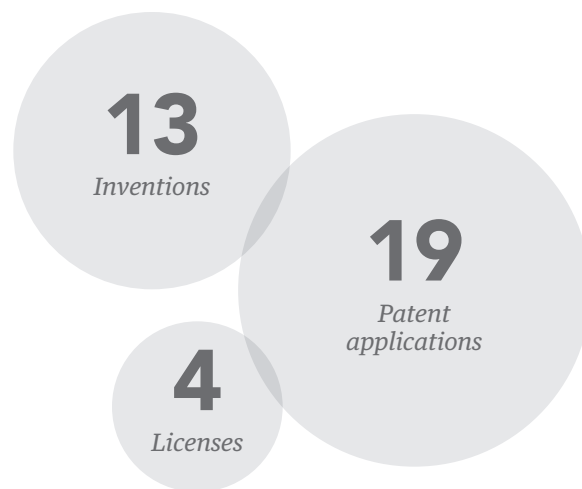
DIRECT RESEARCH SPENDING IMPACT

Research activities impact the economy by employing people and requiring the purchase of equipment and other supplies and services. Over the last four years, UNB received 54 invention disclosures, filed 91 new patent applications, and produced 21 licenses.

In FY 2013-14, UNB collectively spent around \$41.3 million on direct research and development activities. These efforts attracted new dollars into the province to support a large portion of the research activities, with 70% of funding received from federal sources. The research activities also brought in additional funds from sources within the province, including from foundations and provincial and local governments.

The direct expenditures on research activities by UNB stimulated other economic activity in the province that resulted in an additional \$32.2 million in provincial income for businesses and households. This is equivalent to adding 764 jobs. As with the university operations spending impact, this impact is beyond

INTELLECTUAL PROPERTY CREATED BY UNB, 2013-14



JOB EQUIVALENTS BASED ON INCOME

Job equivalents are a measure of the average-wage jobs that a given amount of income can potentially support. They are calculated by dividing income by the average annual wages per worker in the province. Based on the added income created by UNB, the job equivalents are as follows:

Impact of **university operations** = **4,599** job equivalents

Impact of **direct research spending** = **764** job equivalents

Impact of **start-ups and spin-offs** = **1,140** job equivalents

Impact of **student spending** = **448** job equivalents

Impact of **visitor spending** = **31** job equivalents

Alumni impact = **22,521** job equivalents

Overall, the added income created by UNB and its students and visitors supported **29,503** average-wage jobs in 2013-14.

the opportunity cost to the provincial economy of carrying out research at UNB.

BUSINESS START-UP & SPIN-OFF IMPACT

UNB creates an exceptional environment that fosters innovation and entrepreneurship, evidenced by the number of start-up and spin-off companies related to UNB created in the province. The establishment of these companies largely stems from funding UNB received for research. Start-up companies, created specifically to license and commercialize UNB owned intellectual property, have a strong and clearly defined link to UNB. Spin-off companies, created and fostered through institutional programs or faculty, students, and alumni do not have license agreements with UNB, but still have a clear and important link.

In FY 2013-14, start-up and spin-off companies related to UNB added \$48.1 million in income to the New Brunswick economy. Of this added income, \$25.7 million, equivalent to 610 new jobs, was due to the start-up companies. The remaining \$22.3 million, equivalent to 530 jobs, can be attributed to the spin-off companies.

IMPACT OF STUDENT SPENDING

Approximately 3,337 UNB students relocated to New Brunswick to attend school in 2013-14, including international students. While attending, these students spent \$48.4 million to purchase groceries, rent accommodation, pay for transportation, and so on. A significant portion of these expenditures occurred in the province, generating \$18.9 million in new income in the economy during the analysis year, equivalent to 448 new jobs.

VISITOR SPENDING IMPACT

Thousands of visitors from outside the province were attracted to UNB during the analysis year to attend commencements, sports events, and other activities sponsored by the institutions. While in the province,

visitors spent money for lodging, food, transportation, and other personal expenses. The off-campus expenditures of these out-of-province visitors generated a net impact of \$1.3 million in new income for the provincial economy in FY 2013-14, equivalent to creating 31 new jobs.

ALUMNI IMPACT

UNB's greatest impact results from the education and training it provides for local residents. Since the university was established, students have studied at UNB, with around 53% of UNB graduates remaining in New Brunswick and entering the provincial workforce with newly acquired skills.

During the analysis year, UNB's graduates generated \$949.9 million in added income in the province, equivalent to 22,521 new jobs. This figure represents the higher wages that graduates earned during the year, the increased output of the businesses that employed the graduates, and the multiplier effects that occurred as graduates and their employers spent money at other businesses.

One important note to keep in mind is this impact will increase significantly if more UNB graduates remain in the province and contribute toward provincial productivity. A large percentage of UNB graduates currently pursue career opportunities outside the province. Creating better employment options in the province will lead to more retention of UNB graduates, thereby generating even more in provincial income.

TOTAL IMPACT

The overall impact of UNB on the provincial economy during the analysis year amounted to \$1.2 billion, equal to the sum of the university operations' spending impact, the direct research spending impact, the start-up and spin-off impact, the student spending impact, the visitor spending impact, and the alumni impact. UNB added 29,503 new jobs to the New Brunswick economy. This added income was approximately 4.5% of the province's Gross Domestic Product.

INVESTMENT ANALYSIS

Investment analysis is the process of evaluating total costs and measuring these against total benefits to determine whether or not a proposed venture will be profitable. If benefits outweigh costs, then the investment is worthwhile. If costs outweigh benefits, then the investment will lose money and is considered unprofitable. This study considers UNB as an investment from the perspectives of students, society, and taxpayers. The backdrop for the analysis is the entire New Brunswick economy.

STUDENT PERSPECTIVE

In 2013-14, UNB served 10,618 credit students and 175 non-credit students. In order to attend school, students paid for tuition, fees, books, and supplies. They also gave up money that they would have otherwise earned had they been working instead of attending school. The total investment made by UNB's students in 2013-14 amounted to \$291.8 million, equal to \$93.5 million in out-of-pocket expenses plus \$198.2 million in forgone time and money.

In return for their investment, UNB's students develop the skills required for an increasingly globalized workplace and receive a stream of higher future wages that will continue to grow throughout their working lives. As shown in Figure 1, mean income levels at the midpoint of the average-aged worker's career increase as people achieve higher levels of education. For example, the average bachelor's degree graduate from UNB will earn \$26,200 more per year than someone with a high school diploma or equivalent. Over a working lifetime, this increase in earnings amounts to an undiscounted value of approximately \$1,113,500 in higher income.

The present value of the higher future wages that UNB's students will receive over their working careers is \$818.9 million. Dividing this value by the \$291.8 million in student costs yields a benefit-cost ratio of 2.8. In other words, for every \$1 students invest in UNB

STUDENT PERSPECTIVE

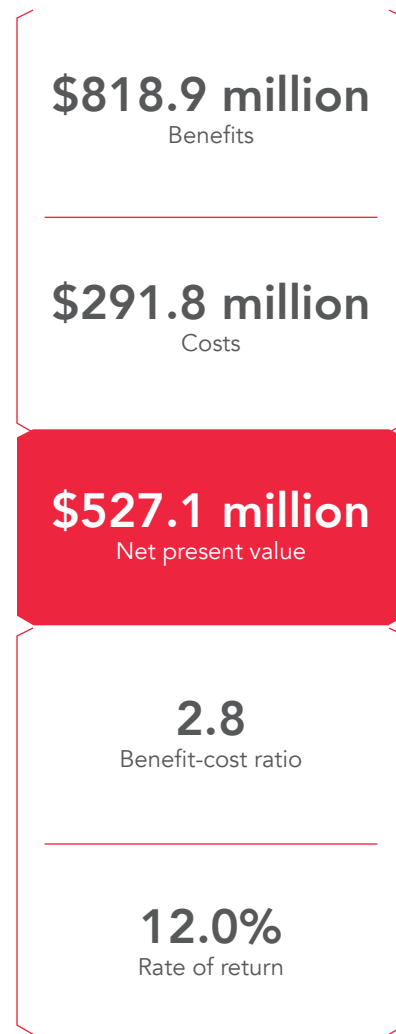
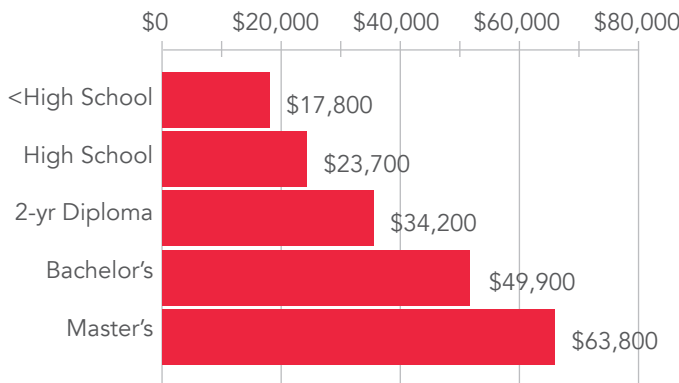


FIGURE 1. ANNUAL INCOME BY EDUCATION LEVEL AT CAREER MIDPOINT IN NEW BRUNSWICK



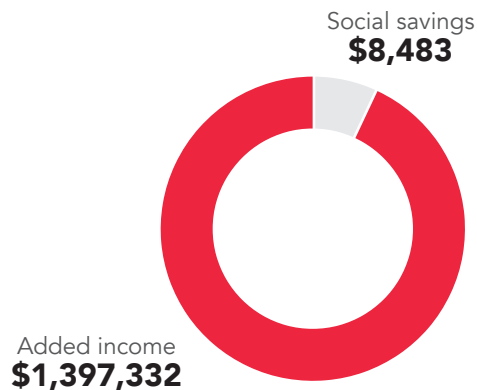
in the form of out-of-pocket expenses and forgone time and money, they receive a cumulative of \$2.80 in higher future wages. The return on investment to students (i.e., the benefit-cost ratio less the cost of the original investment) thus comes to \$1.80 in benefits returned over and above every \$1 in costs.

The average annual rate of return for students is 12.0%. This is a favourable return compared, for example, to the less than 1% return per annum that is generally expected from saving money in today's standard bank savings accounts.

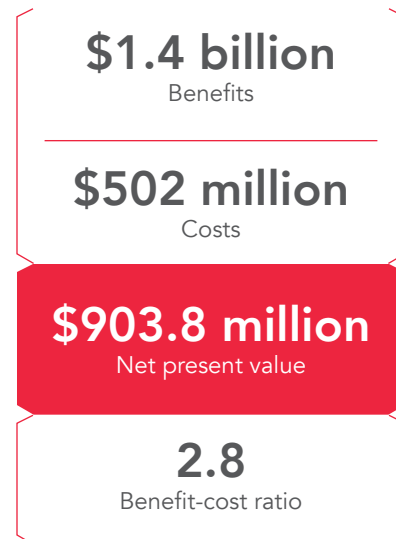
SOCIAL PERSPECTIVE

UNB aims to improve the socioeconomic well-being of the local and provincial community by increasing graduates' earning potential and by positively influencing the health and lifestyle habits of students. As a result, society as a whole in New Brunswick benefits from the presence of UNB in two major ways. The first and largest benefit to society is the added income created in the province. As discussed in the previous section, students earn more because of the skills they acquire while attending UNB. Businesses also earn more because the enhanced skills of students make them more productive. Together, higher student wages and increased business output stimulate increases in income across the province, thereby raising prosperity in New Brunswick and expanding the economic base for society as a whole.

FIGURE 2. PRESENT VALUE OF ADDED INCOME AND SOCIAL SAVINGS IN NEW BRUNSWICK (THOUSANDS)



SOCIAL PERSPECTIVE*



* The rate of return is not reported for the social perspective because the beneficiaries of the investment are not necessarily the same as the original investors.

Benefits to society also consist of the savings generated by the improved lifestyles of graduates. Education is statistically correlated with a variety of lifestyle changes that generate social savings across three main categories: 1) health, 2) crime, and 3) income assistance. Health savings include avoided medical costs associated with smoking, alcoholism, obesity, and mental illness. Crime savings include reduced Criminal Justice System expenditures, lower victim

costs, and increased productivity of individuals who are working rather than spending time in custody. Income assistance savings include the reduced demand for employment insurance benefits and employment-related social assistance.

Figure 2 shows the present value of the added income and social savings that will occur in New Brunswick over the working lifetimes of UNB’s 2013-14 students. Added income amounts to a present value of \$1.4 billion due to the increased lifetime incomes of students and associated increases in business output. Social savings amount to \$8.5 million, the sum of health, crime, and income assistance savings in New Brunswick. Altogether, total benefits to society equal \$1.4 billion (in present value terms).

Society invested \$502 million in UNB educations during the analysis year. This includes all expenditures by UNB, all student expenditures, and all student opportunity costs. For every \$1 of this investment, society as a whole in New Brunswick will receive a cumulative value of \$2.80 in benefits, equal to the \$1.4 billion in benefits divided by the \$502 million in costs. These benefits will occur for as long as UNB’s 2013-14 students remain employed in the provincial workforce.

TAXPAYER PERSPECTIVE

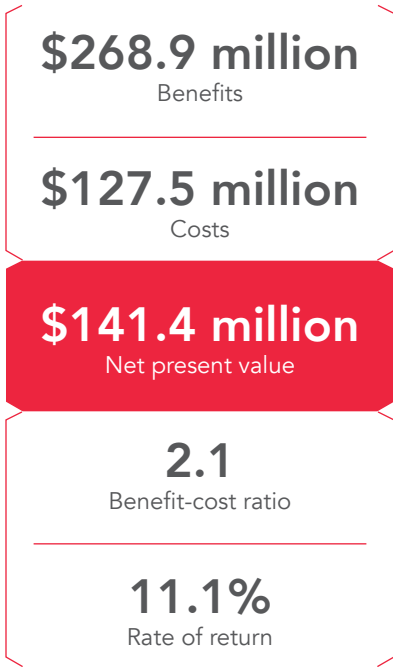
From the taxpayer perspective, benefits consist primarily of the taxes that provincial government will collect from the added income created in the province. As UNB’s 2013-14 students earn more, they will make higher tax payments. Employers will also make higher tax payments as they increase their output and purchase more supplies and services. By the end of the students’ working careers, provincial government will have collected a present value of \$265.5 million in added taxes.

A portion of the savings enjoyed by society also accrues to provincial taxpayers. Graduates are more employable, so the demand for income assistance reduces. Improved health habits lower the graduates’

demand for provincial health care services. Graduates are also less likely to commit crimes, so the demand for law enforcement services reduces. All of these benefits will generate a present value of \$3.4 million in savings to provincial taxpayers.

Total benefits to taxpayers are \$268.9 million, equal to the sum of the added taxes and public sector savings. Comparing this to the taxpayer costs of \$127.5 million—equal to the funding that UNB received from provincial government during the analysis year—yields a benefit-cost ratio of 2.1. This means that for every \$1 of public money invested in UNB, taxpayers receive a cumulative value of \$2.10 over the course of the graduates’ working lives. In other words, taxpayers fully recover the cost of the original investment and also receive a return of \$1.10 in addition to every \$1 they paid. The rate of return is 11.1%, a solid investment that compares favourably with other long-term investments in both the private and public sectors.

TAXPAYER PERSPECTIVE



CONCLUSION

The results of this study demonstrate that UNB creates value from multiple perspectives. The university benefits local businesses by increasing consumer spending in the province and supplying a steady flow of qualified, trained workers into the workforce. It enriches the lives of students by raising their lifetime incomes and helping them achieve their individual potential. It benefits society as a whole in New Brunswick by creating a more prosperous economy and generating a variety of savings through the improved lifestyles of students. Finally, it benefits provincial taxpayers through increased tax receipts across the province and a reduced demand for government-supported social services.

ABOUT EMSI

Economic Modeling Specialists International, a Career-Builder company, is a leading provider of economic impact studies and labour market data to educational institutions, workforce planners, and regional developers in North America and the UK. Since 2000, EMSI has completed over 1,200 economic impact studies for educational institutions in four countries. For more information about EMSI and its products and services, visit www.economicmodeling.com.