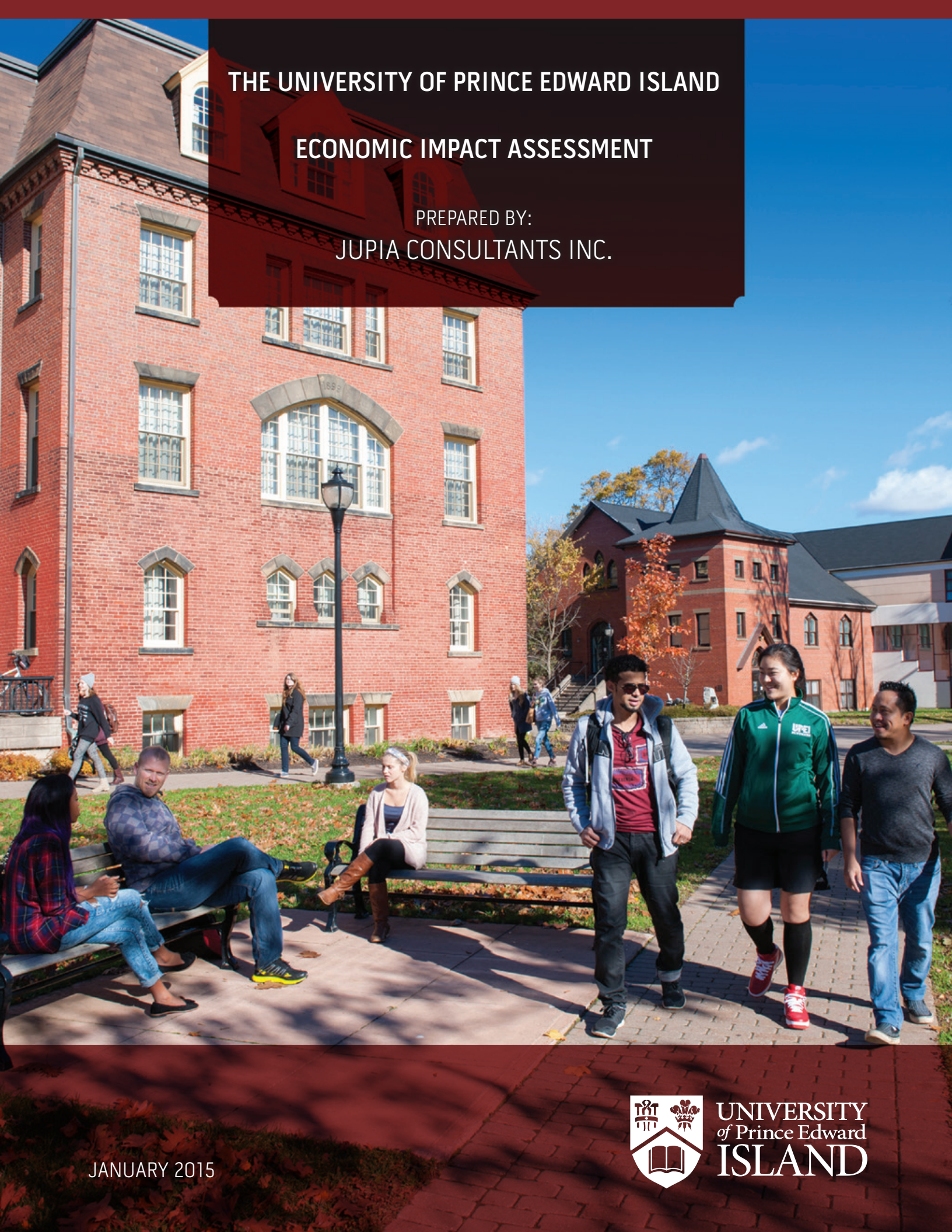


THE UNIVERSITY OF PRINCE EDWARD ISLAND

ECONOMIC IMPACT ASSESSMENT

PREPARED BY:
JUPIA CONSULTANTS INC.



JANUARY 2015



UNIVERSITY
of Prince Edward
ISLAND

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Executive Summary

The University of Prince Edward Island is the province's only university and as such it plays a critical role supplying skilled talent into the Island's labour market. As will be demonstrated below the university is also a key catalyst for research and development activities. At the same time, UPEI is a significant contributor to the provincial economy. In 2013, the direct GDP contribution of the university sector on PEI was the second highest among the 10 Canadian provinces as a percentage of total GDP (Figure 1)¹.

Total university expenditures in 2013 were \$137.5 million. UPEI directly employed over 1,100 people in 2014 and there are 4,403 students enrolled as of November 2014 of which 1,636 were from outside the province (Section 2.1).

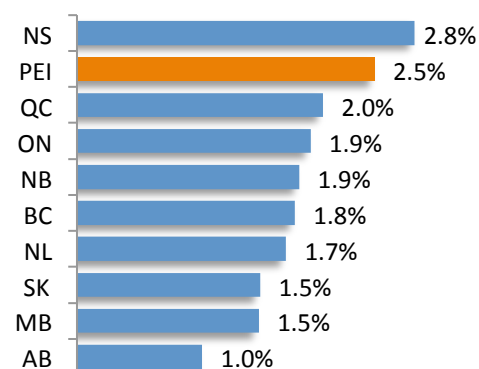
The university's direct expenditures in 2013 of \$137.5 million boosted provincial gross domestic product (GDP) by \$150.1 million – including off campus student spending, supply chain spending and indirect impact effects. This represented nearly three percent of the Island's total GDP. This economic activity supported more than 1,400 full time equivalent (FTE) jobs across the Island. The university's economic footprint sustained 23 out of every 1,000 jobs on the Island in 2013. And the employment supported by the university represents higher skilled and higher wage jobs. The average weekly wage for a worker associated with UPEI is 46 percent higher than for an average worker across Prince Edward Island (Section 2.3).

UPEI's economic contribution boosted government tax coffers by an estimated \$35.4 million in 2013 including \$19.5 million for the provincial government alone (Section 2.4). Table 1 shows the summary economic impacts.

Businesses large and small across the Island benefit from having a large university located in Charlottetown (Section 2.6). In the fiscal year 2014, the university did business with over 930 local suppliers or one out of every nine business establishments on the Island. In total these firms generated \$24.8 million worth of revenue from the university. Beyond the direct supply chain, the economic activity generated by UPEI led to an estimated \$69 million worth of consumer spending on the Island including \$9.9 million on food expenditures, \$4.3 million on clothing and accessories and \$15.7 million on transportation. An estimated \$5.5 million was spent on recreation during 2013 as a result of UPEI's economic activity.

This report also models the projected economic impact associated with the new School of Sustainable Design Engineering and Centre of Engineering Design and Industry Partnerships (Section 3). The initial construction phase will boost provincial GDP by \$17 million and support 251 FTE jobs. By 2017-2018 the operational impacts of the new school will include a \$12.5 million boost to provincial GDP, 120 FTE jobs and \$2.8 million worth of annual tax revenue to governments. At full ramp up in 2021-2022, the GDP impact rises to \$20.6 million per year, 198 FTE jobs and \$4.6 million worth of annual tax revenue to governments.

Figure 1: University sector's share of provincial GDP (2013)



**Direct GDP contribution. Chained 2007 dollars.
Source: Statistics Canada CANSIM Table 379-0030.*

¹ This report looks at the university's direct, indirect (supply chain) and induced economic impacts. Statistics Canada's comparative GDP table is based on direct impacts only.

Executive Summary (cont.)

This report also summarizes some of the broader, positive impacts arising from UPEI's operations (Section 4). A greater share of Prince Edward Island's overall research and development spending occurs in higher education sector compared to all but two other provinces in Canada. Based on Statistics Canada's input-output model, the university's direct spending on research lifted the province's research and development sector revenue by an estimated \$29.5 million in 2013.

There is data to suggest UPEI provides good value for the provincial taxpayers' investment. On Prince Edward Island, provincial government funding makes up only 34 percent of total university and college revenue ranking the province's post-secondary education system third lowest among the 10 provinces for reliance on provincial funding.

UPEI is also a significant driver of export revenue for the province. The number of international students is up more than three fold over the past decade. In total, 37 percent of all students are from outside the province. Statistics Canada tracks the value of interprovincial and international services revenue by selected industries. In 2011, the most recent year data is available, the education services sector on PEI generated \$27.3 million worth of interprovincial and international export revenue. On a per capita basis, no other province in Canada generated more export revenue from education services than did Prince Edward Island.

UPEI's primary role as a provider of skilled talent will be even more important in the years ahead. As is shown in Section 5, most of the industries on PEI that are in growth mode require a higher percentage of post-secondary educated workers. The Island features an exciting and fast growing biosciences cluster. It also has an above average sized information technology sector. Its aerospace and defence sector has also become an important economic engine over the past 10-15 years. These and other knowledge-intensive industries will need the talent UPEI will supply.

Executive Summary (cont.)

Table 1: UPEI's summary economic impact on Prince Edward Island (2013)*

	UPEI direct <u>expenditures</u>	Students living <u>off campus</u>	Total impact (2013)
Output and GDP impacts			
Direct output (expenditures)	\$137,477,355	\$13,122,000	\$150,599,355
Direct GDP contribution	\$109,937,450	5,496,826	\$115,434,276
Total GDP contribution**	\$142,557,329	7,533,781	\$150,091,110
Employment and income impacts on PEI			
Direct employment (FTE)***	1,024	49	1,073
Total employment supported on PEI (FTE)**	1,367	76	1,443
Direct and indirect labour income	\$78,967,120	\$2,955,590	\$81,922,709
Total labour income supported on PEI**	\$87,848,088	\$3,233,564	\$91,081,652
Taxation impacts on PEI**			
Provincial government only	\$17,746,984	\$1,717,708	\$19,464,691
All levels of government	\$32,635,180	\$2,741,503	\$35,376,683
<i>Taxes as a percentage of GDP</i>	23%	36%	24%
Consumer spending impacts on PEI			
Total consumer spending	\$66,515,238	\$2,448,332	\$68,963,570

Shown in current dollars. **Includes direct, indirect and induced economic impacts. *Full time equivalent (FTE) employment figures.*

1. Introduction

1.1 Purpose of this report

The objective of the project is to estimate the economic contribution arising from the operations of the University of Prince Edward Island economy including direct, indirect, and induced effects. This report provides estimates of gross domestic product (GDP) as well as employment, employment income, taxation and consumer spending. In addition, the report includes a broader set of data to better frame the story of the contribution the university makes to the Island economy. While the university's primary role is to turn out skilled talent for the labour market, its direct economic contribution is also a very important contribution. UPEI is also a driver for much of the Island's research and development activities and through its international students is supporting efforts to attract skilled immigrants.

1.2 The economic impact model

The economic impact model is based on Statistics Canada's Input-Output (I-O) tables which provide a detailed profile of how expenditures in specific sectors flow through the provincial and national economy as well as by international trade. The I-O tables are developed using actual spending patterns within specific industries and provinces and therefore estimates of new economic activity are based on the expenditure profile of previous activity in those industries. The economic impact model evaluates the direct, indirect, and induced economic impacts, using the following parameters:

- *Direct impact* measures the value added to the economy from the university's expenditures that is attributed directly from the employees, the wages earned, and the revenues generated.
- *Indirect impact* measures the value-added the university generates within the PEI economy through the firm and organizational demand for intermediate inputs or other support services (e.g. the university's supply chain).
- *Induced impacts* are derived when employees in the aforementioned industries spend their earnings and owners spend their profits. These purchases lead to more employment, higher wages, and increased income and tax revenues, and can be felt across a wide range of industries.

The I-O tables trace the impact of economic activity (output shock) on the provincial and national economies (including imports and exports). In addition to the output, GDP and employment impacts, the economic impact model estimates the amount of tax revenue supported by the industry as well as consumer spending impacts.

Table 2: The Economic Impact Model

Direct effect -within province (where available)	Simple multipliers (direct and indirect) - within province and rest of Canada	Total multipliers (direct, indirect and induced) - within province and rest of Canada
⇒ Output	⇒ Output	⇒ Output
⇒ GDP basic price	⇒ GDP basic price	⇒ GDP basic price
⇒ Labour income	⇒ Labour income	⇒ Labour income
⇒ Jobs	⇒ Jobs	⇒ Jobs
⇒ International imports	⇒ International imports	⇒ International imports
⇒ Export shares		

There are over 200 industries for which detailed I-O data is available. For this project, the multipliers for the industry group NAICS 61130 (universities) were used. In addition, the secondary impacts arising from off-campus student spending have been estimated.

2. Economic impact analysis UPEI annual expenditures

2.1 Economic impact model parameters

The university provided 2013 and 2014 information on direct spending, employment and student enrolment on Prince Edward Island (Table 3). This data was considered the 'direct' input to the economic impact model used to determine the university's indirect and induced employment on the Island; direct, indirect and induced gross domestic product (GDP) contribution and other impacts.

Table 3: UPEI employment and enrolment profile (2014)

Total expenditures on PEI in 2013: \$137.5 million

Total UPEI employment (2014): 1,103*

UPEI enrollment (as of November 2014)**

Total registrants: 4,403

Full-time registrants: 3,854

Part-time registrants: 549

UPEI students by origin (as of November 2014)

International students: 703

Domestic students (other than PEI): 936

PEI-based students (all years of study): 2,764

**This includes faculty (including sessionals), staff, and student employees. It excludes employees on leave without pay, maternity leave, long term disability, grad students and post-doctoral students (within a fellowship stream).*

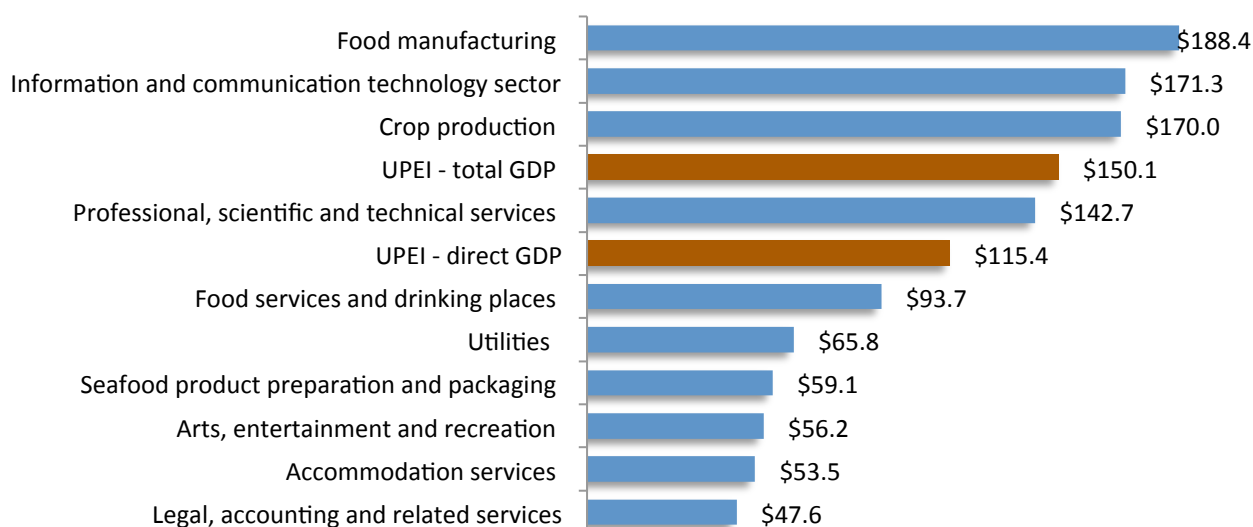
*** Total registrations (headcount) for all programs, new and returning students.*

2.2 Industry output and GDP impacts

In 2013, the University of Prince Edward Island directly spent \$137.5 million on the Island. This included payroll, overhead, research and other expenditures. In addition, the students not from Prince Edward Island and living off campus generate an estimated \$13.1 million worth of direct spending during the year. In total, the direct spending associated with UPEI on the Island in 2013 was \$150.6 million.

The value of this spending to the PEI economy is represented by its impact on the province's gross domestic product (GDP) which represents the value added from industry output that stays on the Island. In 2013, the \$150.6 million worth of direct industry output generated by UPEI resulted in \$115.4 million worth of GDP directly on PEI. In addition to direct effects, there are indirect (supply chain) and induced economic effects resulting from UPEI's spending. Including these indirect and induced economic effects on PEI, the industry generated an estimated \$150.1 million worth of GDP on PEI (Table 4).

Figure 2: GDP contribution for selected industries (PEI) - \$Millions



Source: All but UPEI contribution taken from Statistics Canada CANSIM Table 379-0030. Figures shown in constant dollars for 2013.

UPEI's GDP impact on Prince Edward Island compares favorably to other important sectors of the Island economy as shown in Figure 2. UPEI's direct GDP contribution is nearly double that created by the seafood product preparation and packaging sector. With indirect and induced effects, UPEI contributes more to the Island economy than the entire professional, scientific and technical services sector.

UPEI's total GDP impact on Prince Edward Island (including direct, indirect and induced effects) represents approximately 2.9 percent of the total GDP from all industries.

Table 4: UPEI industry output and GDP impact on PEI (2013)

	UPEI expenditures	Off-Island students living off campus	Total impact (2013)
Direct output (expenditures)	\$137,477,355	\$13,122,000	\$150,599,355
Direct GDP contribution	\$109,937,450	5,496,826	\$115,434,276
Direct and indirect GDP contribution	\$118,877,066	6,793,776	\$125,670,841
Total GDP contribution*	\$142,557,329	7,533,781	\$150,091,110

**Combined direct, indirect and induced effects.*

Derived using Statistics Canada's I-O Tables at the M level (2010). See Appendix A for the full methodology and sources list.

2.3 Employment and labour income effects

UPEI is one of the largest employers on Prince Edward Island. On a full time equivalent basis, the university directly supported 1,024 jobs in 2013. With the impact of supply chain and induced spending as well as the off campus spending associated with the students not from Prince Edward Island and living off campus, the university's economic footprint on PEI sustained over 1,440 full time equivalent (FTE) jobs in 2013 or 23 out of every 1,000 jobs on the Island (Table 5).

To put this employment level in perspective, UPEI directly employs (on an FTE basis) a similar amount of employees as the banking sector and the accommodation services sector. UPEI employs more workers than the arts, entertainment and recreation sector; and the computer systems design and related services sector.

At the same time, UPEI generates above average employment income due to the high level of skills and educational attainment required by the sector's employers. The university sector generates 64 cents worth of labour income on PEI for every dollar of direct spending compared to 37 cents in the banking sector, 34 cents in the meat product manufacturing sector, 30 cents in the aerospace product and parts manufacturing sector and 17 cents in the telecommunications sector. This higher level of labour income translates to relatively higher GDP and taxation impacts.

The total labour income generated directly and indirectly by the university on PEI in 2013 was \$81.9 million. Including induced economic effects, the total labour income supported by the university on Prince Edward Island rises to \$91.1 million.

Table 5: UPEI employment and labour income supported on PEI (2013)

	UPEI expenditures	Off-Island students living off campus	Total impact (2013)
Direct employment (FTE)*	1,024	49	1,073
Direct and indirect employment (FTE)*	1,131	69	1,200
Total employment supported on PEI (FTE)*	1,367	76	1,443
Direct and indirect labour income	\$78,967,120	\$2,955,590	\$81,922,709
Total labour income supported on PEI**	\$87,848,088	\$3,233,564	\$91,081,652

*Full time equivalent employment.

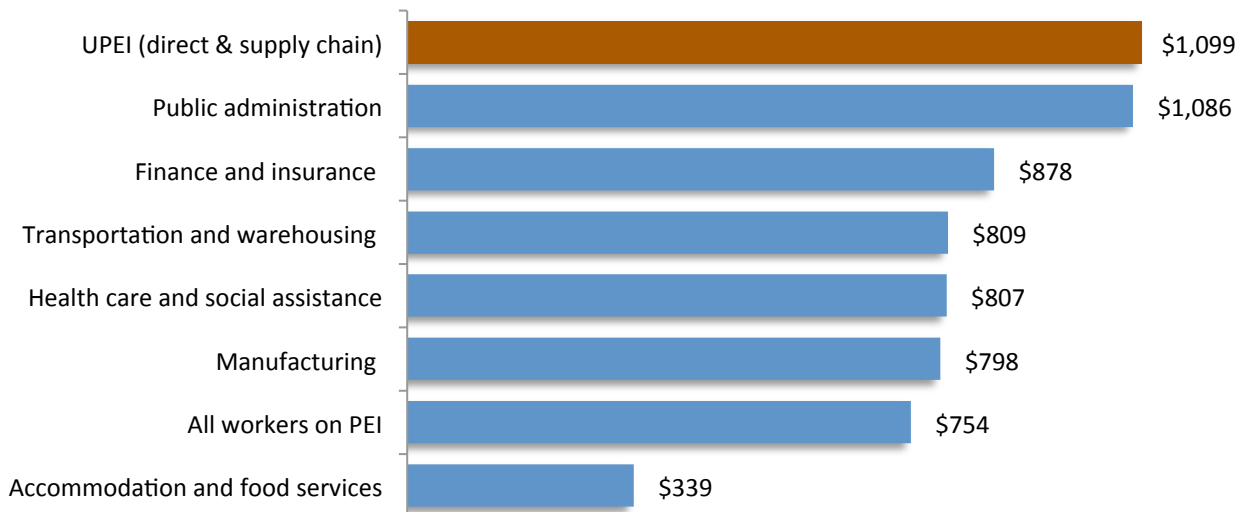
**Combined direct, indirect and induced effects.

Derived using Statistics Canada's I-O Tables at the M level (2010) and other Statistics Canada CANSIM tables. See Appendix A for a full source list.

Figure 3 shows the average weekly wage income generated by the university (directly and through its supply chain) to other industries on the Island². The average wage for a worker associated with UPEI is 46 percent higher than for an average worker across Prince Edward Island. The average weekly wage is three times higher compared to the accommodation and food services or retail trade sectors on the Island.

² This excludes supplementary labour income such as pension contributions and other benefits.

Figure 3: Average weekly wage income comparison (2013)



*Average weekly wage income (direct and indirect) associated with the university's direct and indirect spending in 2013. Average weekly employment income for other sectors taken from Statistics Canada CANSIM Table 281-0027.

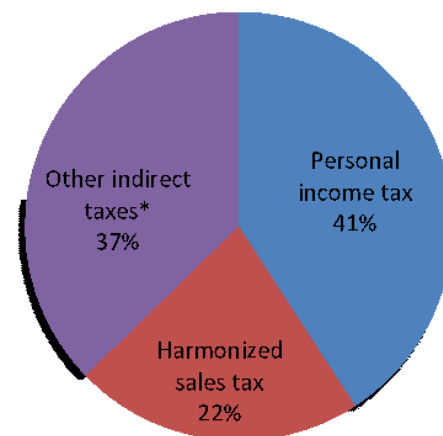
2.4 Taxation effects

Driven mainly by the high level amount of employment income, the university provides an above average amount of tax revenue to governments. As shown in Table 6, UPEI's economic activity on the Island generated an estimated \$19.5 million worth of tax revenue for the provincial government in 2013 and \$35.4 million for all three levels of government. The university contributed an estimated \$14.5 million in personal income tax (PIT) to federal and provincial governments as well as \$7.7 million worth of harmonized sales taxes (HST). Finally, indirect taxes generated from the university accounted for an estimated \$13.2 million worth of revenue to federal, provincial and local governments.

In total, taxes generated by UPEI on the Island were equivalent to 24 percent of its GDP contribution.

Figure 4 shows the breakdown of taxes generated by the university on the Island in 2013 by type of tax.

Figure 4: Taxes generated by UPEI in 2013 – by type (% of total)



*Includes property taxes.

Table 6: Taxes generated on PEI from UPEI's expenditures (2013)*

	UPEI expenditures	Off-Island students living off campus	Total impact (2013)
Provincial government only*	\$17,746,984	\$1,717,708	\$19,464,691
All levels of government*	\$32,635,180	\$2,741,503	\$35,376,683
<i>Taxes as a percentage of GDP</i>	23%	36%	24%

*Combined direct, indirect and induced effects. Derived using Statistics Canada's I-O Tables at the M level (2010) and other Statistics Canada CANSIM tables relating to taxation and spending. See Appendix A for a full source list.

**In addition to non-refundable HST, indirect taxes include business-related property taxes, fuel taxes and other fees and levies.

NOTE: The university sector on PEI generates tax revenue in other provinces. This additional revenue for federal and provincial governments was not included in the economic impact model.

2.5 Consumer spending effects

The employment income generated by the university in 2013 supported a wide variety of consumer spending on the Island. Table 7 shows the estimated direct, indirect and induced consumer spending activity supported by the industry by major expenditure category. The figures are based on the average household expenditures on PEI and on the assumption that the industry's employment income would be spent in a similar pattern to the average household across the Island.

In total, the employment income generated by the cluster supported nearly \$69 million worth of consumer spending during the year. This included \$9.9 million on food (groceries and restaurants), over \$17 million in housing-related expenditures such as mortgage payments, utilities and furniture, and over \$15.7 million on transportation costs that are mostly related to vehicle purchases, operations and maintenance. As shown in Table 7, the industry supported \$5.5 million worth of spending on recreation and another \$4.5 million on health and personal care.

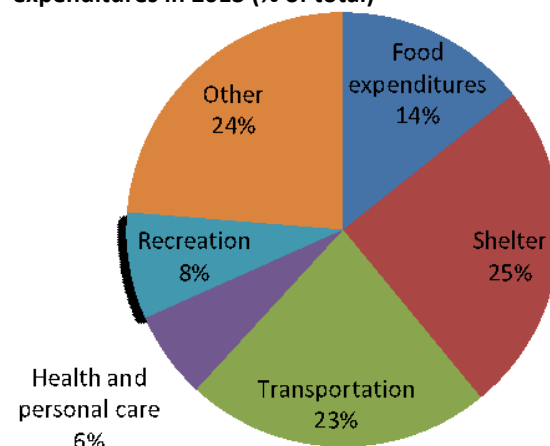
Figure 5: Consumer spending generated by UPEI expenditures in 2013 (% of total)

Table 7: Estimated consumer spending from UPEI induced economic activity on the Island (2013)

Total current consumption	\$68,963,570
Food expenditures	\$9,884,167
<i>Food purchased from restaurants</i>	<i>2,361,980</i>
Shelter	\$17,051,649
<i>Household operations</i>	<i>5,558,400</i>
<i>Household furnishings and equipment</i>	<i>2,166,281</i>
Clothing and accessories	\$4,323,049
Transportation	\$15,711,653
<i>Gas and other fuels</i>	<i>3,912,624</i>
Health care	\$3,185,547
Personal care	\$1,291,071
Recreation	\$5,478,218
<i>Entertainment</i>	<i>1,160,605</i>
Education	\$1,099,449
Gifts of money, support payments and charitable contributions	\$2,421,777

Source: Derived using Statistics Canada's I-O Tables at the national M level (2010) and CANSIM Table 203-0021 Survey of household spending (SHS), household spending (2012). See Appendix A for a full source list.

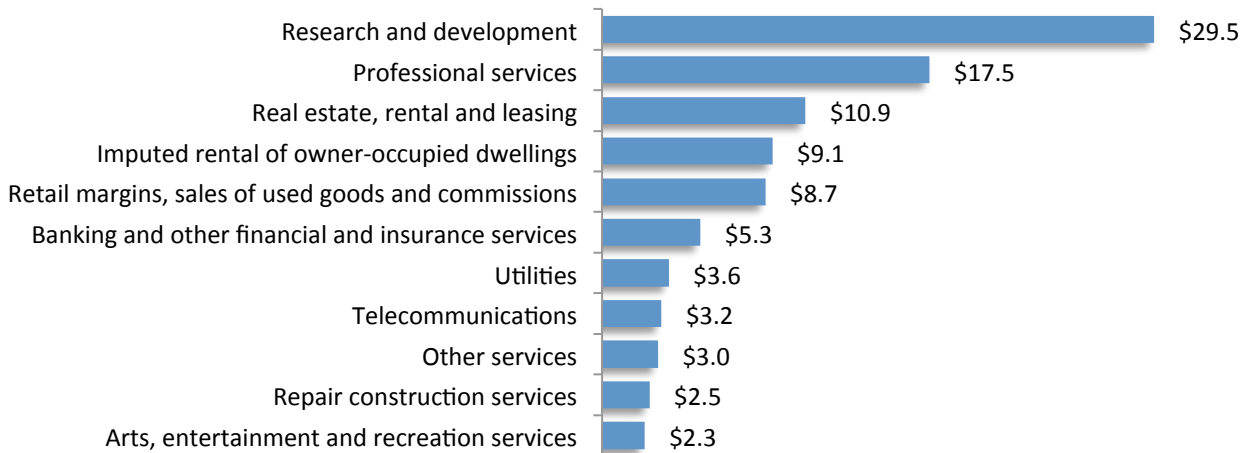
2.6 UPEI supply chain and induced economic impacts

Statistics Canada's input-output model estimates the economic impacts from direct spending as well as indirect (supply chain) and induced spending. UPEI has a significant supply chain on the Island. Between May 1, 2013 and April 30, 2014, the university did business with 936 different suppliers on the Island. In total, these firms generated \$24.8 million worth of business from working with the university. To put this in perspective, one out of every nine businesses on Prince Edward Island is a direct supplier to the university (virtually all businesses derive income from the consumer spending generated by the university).

The university's direct spending as well as its supply chain spending and induced effects boost output in a number of other sectors across the PEI economy. Figure 6 shows which sectors generate significant economic activity from UPEI's operations. The figures are derived using Statistics Canada's input-output model. The sector with the largest impact, other than educational services, is research and development. UPEI's direct and supply chain spending boosted the research and development sector by an estimated \$29.5 million in 2013 (more on this in Section 4.1 below).

The professional services sector made up of accountants, lawyers, engineers, etc. benefited from \$17.5 million worth of economic activity in 2013. The finance and insurance sector was boosted by \$5.3 million and telecommunications providers generated \$3.2 million in business because of the university in 2013.

Figure 6: Indirect and Induced economic activity in selected sectors of the PEI economy (2013) - \$Millions
As a result of UPEI's operational spending*



**And the impact of off-campus student spending as defined above.*

Imputed rent of owner-occupied dwellings represents the amount expended associated with the purchase of housing.

Source: Derived using Statistics Canada's I-O Tables at the national M level (2010). See Appendix A for a full source list.

3. The economic impact of the new UPEI School of Sustainable Design Engineering

In November 2014, UPEI unveiled plans for its new School of Sustainable Design Engineering and Centre of Engineering Design and Industry Partnerships, the first program of its kind in Canada³. UPEI's School of Sustainable Design Engineering will focus on bioresources, mechatronics, and sustainable energy with programming designed with hands-on learning and a team-focused, project-based approach. Students can choose from the two-year Engineering diploma or the new four-year Bachelor of Science in Sustainable Design Engineering degree program. In addition to the School's program, a new Centre of Engineering Design and Industry Partnerships will include four focused labs—food processing, sensory and sortation, sustainable energy, and robotics—where students and faculty can work on pilot-scale, industrial R&D projects.

The total capital cost of the new facilities will be \$26 million of which \$23 million will be invested in new facilities and \$3 million in new equipment. The economic impact model below is based on the \$23 million in new construction. It was assumed the \$3 million worth of equipment purchases would be made from off-Island suppliers and therefore would generate little economic benefit on the Island.

The projected student enrolment numbers are shown in Table 8. The economic model assumes the per student costs associated with the new School of Sustainable Design Engineering and Centre of Engineering Design and Industry Partnerships will be similar to the current cost structure for the university as a whole. When the school is fully ramped by the latter part of this decade, it will have an enrollment level equivalent to 13 percent of the current total university's student population.

Table 8: Projected economic impact from the UPEI engineering program expansion

	2014- 2015	2015- 2016	2016- 2017	2017- 2018	2018- 2019	2019- 2020	2020- 2021	2021- 2022
1st Year	72	100	125	150	175	200	200	200
2nd Year	45	54	75	94	113	131	150	150
3rd Year	0	36	43	60	75	90	105	120
4th Year	0	0	34	41	57	71	86	100
Total students	117	190	277	345	420	492	541	570

Source: UPEI.

Table 9 shows the estimated economic impact associated with the development of the new School of Sustainable Design Engineering and Centre of Engineering Design and Industry Partnerships. The initial \$23 million worth of infrastructure construction represents an amount equivalent to 4.2 percent of all capital investment on construction across the Island in 2014. This project is forecasted to boost provincial GDP by \$17 million, generate \$11.7 million worth of labour income and support 251 full time equivalent (person year) employment during the construction phase. Governments will see an initial boost of tax revenue worth some \$4.5 million from the construction activity. Local businesses will benefit not only as suppliers to the construction project but from the consumer spending boosted by the increase in labour income. Overall, the construction phase of the project is expected to boost consumer spending on the Island by \$8.8 million.

³ This overview was adapted from a UPEI news release from November 28, 2014.

When the facility is operational the impact of students, research and other economic activity will be significant. There is a ramp up phase to student enrolment but by 2017-2018 the operations associated with the new School of Sustainable Design Engineering and Centre of Engineering Design and Industry Partnerships will generate some \$12 million worth of output (expenditures) and boost direct GDP by over \$9.6 million per year on the Island. With the supply chain and induced effects, the new school should boost the GDP by an estimated \$12.5 million per year in 2013 dollars.

At full ramp in 2021-2020, the new school will generate an estimated \$20.6 million worth of GDP to the Island economy, support 198 full time equivalent jobs and \$12.7 million worth of labour income. At full ramp, governments are expected to benefit from annual tax revenue of more than \$4.6 million with \$2.5 million of that amount going to provincial government coffers. Consumer spending will be boosted by more than \$9.6 million worth of spending on local products and services on the Island.

The economic impact of out-of-province students

As with the university as a whole, the new School of Sustainable Design Engineering and Centre of Engineering Design and Industry Partnerships is expecting to attract students from other parts of Canada and across the world. It is anticipated that 40 percent will be international students. This is an important economic consideration as these international students strengthen the economic case for ongoing public investment in the university.

Table 9: Projected economic impact from the UPEI engineering program expansion

	From initial construction (2014-2015)	From operations 2017-2018	From operations 2021-2022
Output and GDP impacts on PEI			
Direct output (expenditures)	\$23,000,000	\$12,022,734	\$19,863,648
Direct GDP contribution	\$11,093,452	\$9,614,302	\$15,884,498
Total GDP contribution	\$16,957,855	\$12,466,991	\$20,597,637
Employment and income impacts on PEI			
Direct employment (FTE)	187	90	148
Total employment supported on PEI (FTE)**	251	120	198
Total labour income supported on PEI	\$11,663,139	\$7,682,532	\$12,692,880
Taxation impacts on PEI			
Provincial government only	\$2,425,118	\$1,523,076	\$2,516,387
All levels of government	\$4,495,087	\$2,811,378	\$4,644,885
Taxes as a percentage of GDP	27%	23%	23%
Consumer spending impacts on PEI			
Total consumer spending	\$8,830,886	\$5,816,922	\$9,610,567
Food expenditures	1,265,682	833,707	1,377,429
Shelter	2,183,489	1,438,268	2,376,269
Transportation	2,011,900	1,325,243	2,189,531
Health and personal care	573,238	377,593	623,849
Recreation	701,494	462,075	763,429

**Shown in 2013 dollars. See the detailed methodology and sources in Appendix A.*

4. Broader economic benefits from the university on Prince Edward Island

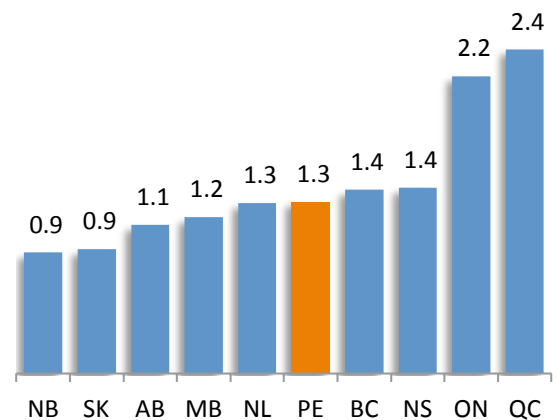
This section looks at some of the other important ways the University of Prince Edward Island has a positive impact on the Island economy.

4.1 UPEI: Catalyst for research on PEI

Most economists agree that research and development (R&D) investment is critically important to a successful, modern, knowledge-intensive economy. Prince Edward Island is average among the 10 provinces for R&D spending as a percentage of GDP among the 10 provinces (2012 is the latest data available from Statistics Canada). Figure 7 shows how Prince Edward Island compares to other provinces across Canada. In total, there was an estimated \$63 million worth of overall R&D spending in 2012.

According to the publication *UPEI By the Numbers* (November 2013), the university generated \$17.5 million worth of external grants and contracts in 2013. This includes \$8.6 million worth of research-related salaries and benefits. UPEI has one Canada Excellence Research Chair, five Canada Research Chairs and eight endowed chairs.

**Figure 7: GERD* as a percentage of real GDP (2012)
By province (%)**



GERD* = Gross domestic expenditures on research and development. Sources: Statistics Canada CANSIM Tables 379-0030 and Table 358-0001.

In its 2015 review of 19 primarily undergraduate universities, Maclean's magazine ranked UPEI first in Canada for its ability to attract research dollars⁴. The industry research firm, Research Infosource Inc., recently ranked UPEI 4th among 22 undergraduate Canadian universities for international research collaboration⁵ and second among the 22 universities for research intensity.

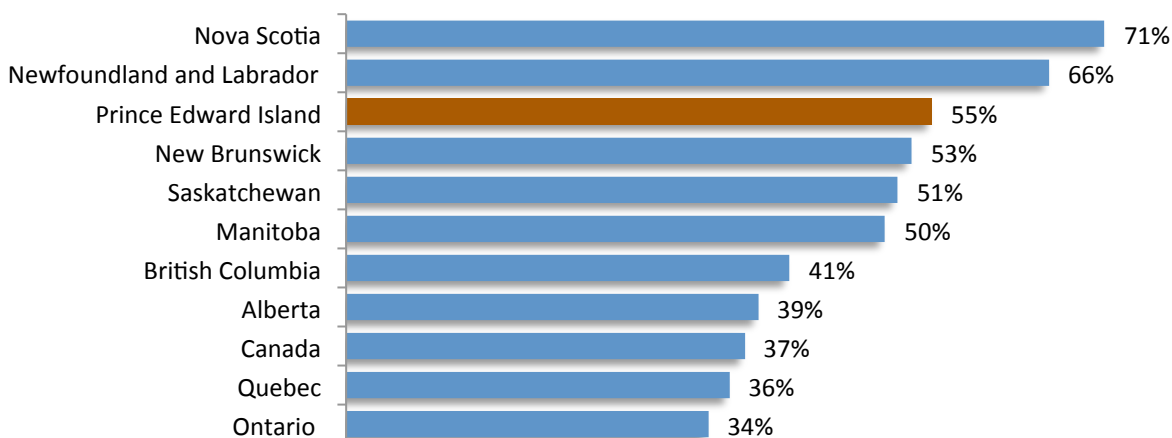
This research horsepower is having an impact. The higher education sector on Prince Edward Island, led by the university, is a catalyst for research and development spending. According to Statistics Canada's input-output model, the university's direct spending on research lifted the province's research and development sector revenue by an estimated \$29.5 million in 2013.

⁴ Maclean's magazine: University Rankings 2015: Total Research Dollars.

⁵ Source: Research Infosource Inc. Spotlight on University International Research Collaboration 2008-2012 (for universities with mainly undergraduate programs).

Statistics Canada tracks gross domestic expenditures on research and development by science type and by funder and performer sector for each of the 10 provinces on an annual basis. Between 2009 and 2012, 55 percent of research and development spending on Prince Edward Island was associated with the higher education sector (the rest of R&D spending was in other sectors such as government and private industry). This was third highest among the 10 provinces across Canada. Only Nova Scotia and Newfoundland and Labrador relied more on the higher education sector to drive research and development activity (Figure 8).

Figure 8: Percentage of total R&D expenditures performed by the higher education sector
Annual average 2009-2012



All funding sources and all sectors.

Source: Statistics Canada CANSIM Table 358-0001.

UPEI's Atlantic Veterinary College: A key research asset

One of the main reasons why UPEI is a Canadian leader for university-based research is UPEI's Atlantic Veterinary College. The Atlantic Veterinary College at UPEI is globally recognized for its outstanding educational programs, clinical and diagnostic services, research, and service to industries and communities in the Atlantic Region and around the world. The Atlantic Veterinary College at UPEI is home to several research and service centres with focuses ranging from human health-related biomedical research to animal health and welfare. One of these centres, the Centre for Veterinary Epidemiological Research, is considered to be a world leader in strategic research for food-producing industries and affiliated organizations, and is home to a Canada Excellence Research Chair in Aquatic Epidemiology.

UPEI's Atlantic Veterinary College has provided research support to the Island's traditional agriculture and fish sectors and has also been a catalyst for the growth of the bioscience's cluster on PEI. The Atlantic Veterinary College at UPEI and its partner organization the National Research Council of Canada - Institute for Nutrisciences and Health are driving most of the life sciences research on PEI.

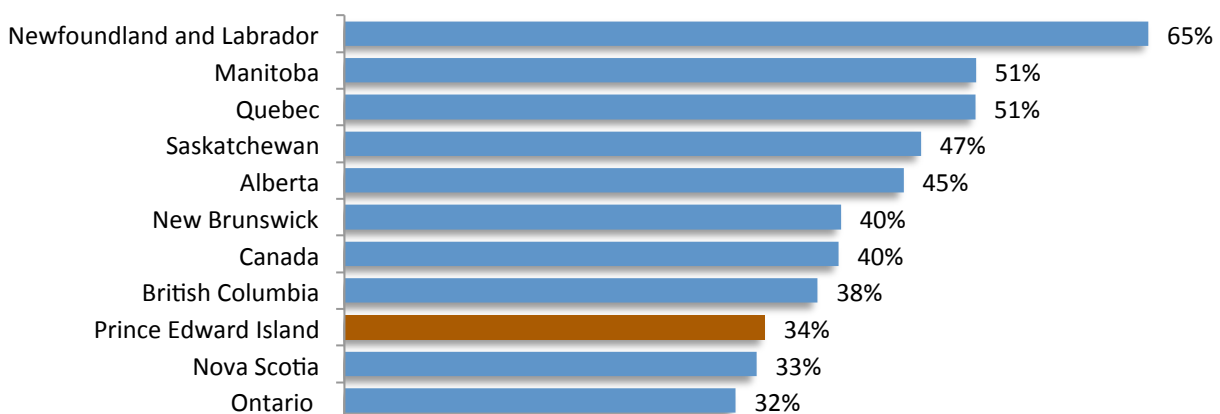
4.2 Value for provincial taxpayers' investment

Statistics Canada provides detailed information on the sources of funding for Canada's universities and colleges on a provincial basis⁶. In 2013, provincial governments contributed 40 percent of all revenue to the university and college sector across Canada. The other 60 percent is generated from tuition, other levels of government, research funding organizations, donations, endowments, etc.

On Prince Edward Island, provincial government funding accounts for 34 percent of total university and college revenue ranking the province's post-secondary education system among the lowest in the country for reliance on provincial funding (Figure 9). UPEI is doing a good job of leveraging the provincial taxpayers' investment into a significant economic impact.

Other important funding sources are the federal government (11 percent of the total), tuition and other fees (22 percent) and the sale of services and products (14 percent). Interestingly, the university and college system on PEI generates more revenue from the sale of services and products (excluding tuition and other student fees) than all other provinces in Canada. Across the country, 8.3 percent of total university and college revenue comes from this source.

Figure 9: Percentage of total university and college funding directly from the provincial government (2013)



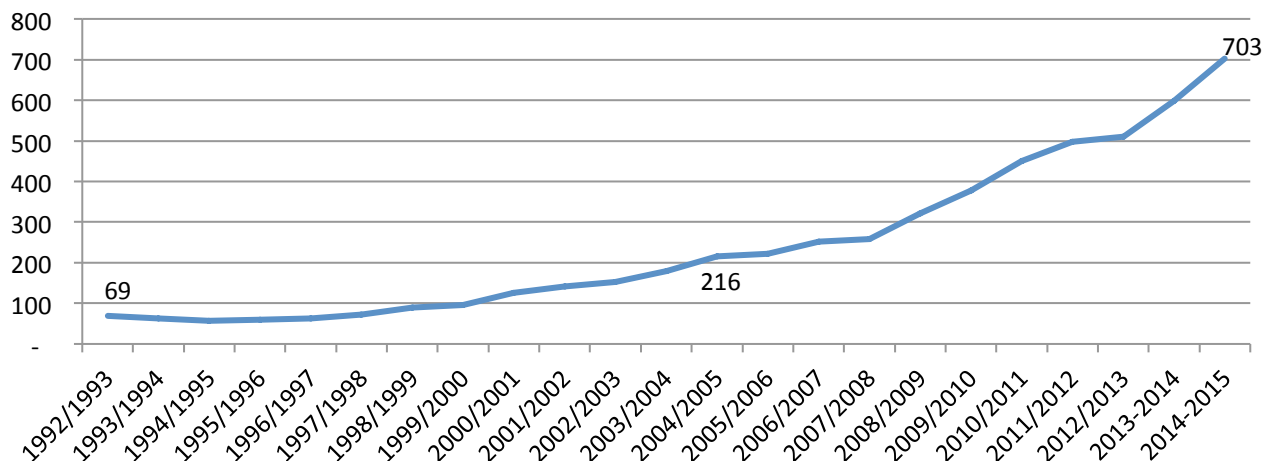
Source: Statistics Canada CANSIM Table 477-0058 - Financial information of universities and degree-granting colleges, revenues by type of funds.

⁶ This data is not available specifically for universities. It includes publicly-funded colleges as well.

4.3 UPEI: A driver of export revenue for the province

UPEI has been expanding its base of international students in recent years and that is bringing significant export revenue to the province. In 2014-2015 there were 703 international students up more than three fold over the past decade (Figure 10). In addition to tuition and fees, these students also spend thousands of dollars each year in the local economy on rent, food, entertainment and other services.

Figure 10: International university students – Prince Edward Island

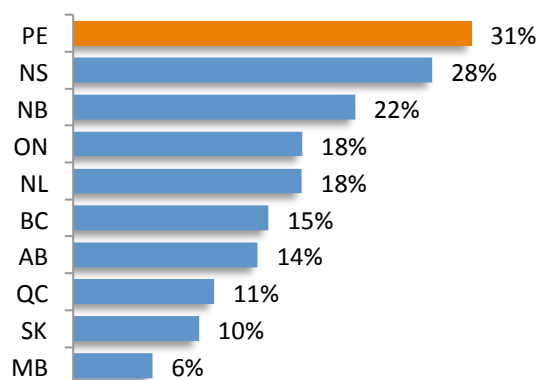


Source: 1992-1993 to 2012-2013 international enrollments taken from Statistics Canada CANSIM Table 477-0019. 2013-2014 and 2014-2015 data provided by the University of Prince Edward Island.

The 'export' revenue for Prince Edward Island from education services is impressive (e.g. tuition payments). Statistics Canada tracks the value of interprovincial and international services revenue by selected industries. In 2011, the most recent year data is available, the education services sector⁷ on PEI generated \$27.3 million worth of interprovincial and international export revenue. While the data from Statistics Canada does not break down this revenue by source, it is clear from the UPEI enrollment data that it is a major driver of this export revenue. In addition to the international students, in 2014, UPEI has 936 students from other provinces.

As shown in Figure 11, PEI generates a higher share of its education services revenue from export sources than all other provinces in Canada. Table 10 shows the comparison for each of the 10 provinces.

Figure 11: Percentage of total education service revenue from interprovincial and international exports (2011)



Source: Statistics Canada CANSIM Table 386-0003.

⁷ Education services revenue includes tuition and related fees paid by students for secondary and post-secondary education. It is the direct revenue generated from the service delivery and does not include government and other indirect funding.

On a per capita basis, PEI generates more revenue from education services than any other province. In addition, export revenue from this sector rose by 42 percent between 2007 and 2011. Given the expansion of international students in the last two years it is likely export revenue has continued to grow.

Table 10: Education services export revenue 2007-2011 (\$millions)

	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>Per Capita (2011)</u>	<u>% Change 2007-2011</u>
Newfoundland and Labrador	\$25.9	\$30.9	\$24.0	\$24.9	\$28.5	\$54.28	+10%
Prince Edward Island	19.2	20.2	24.0	24.2	27.3	\$189.53	+42%
Nova Scotia	140.8	142.4	128.9	130.6	136.9	\$144.95	-3%
New Brunswick	57.6	73.4	61.2	61.5	67.0	\$88.68	+16%
Quebec	373.8	391.8	317.8	342	358.2	\$44.73	-4%
Ontario	985.0	1043.1	1160.0	1372.5	1501.4	\$113.20	+52%
Manitoba	42.9	48.0	35.7	26.0	28.9	\$23.42	-33%
Saskatchewan	42.5	40.7	29.4	37.6	34.9	\$32.73	-18%
Alberta	244.9	251.0	250.1	270.5	283.1	\$74.69	+16%
British Columbia	304.9	284.2	333.2	404.8	447.1	\$99.37	+47%

Source: Statistics Canada CANSIM Tables 386-0003 and 051-0001.

For the Island economy to prosper, it will need new growth sectors. Education services is a particularly valuable growth industry because in addition to being a source of high value revenue for the post-secondary education system, it also has the benefit of providing a potential pool of skilled workers for the Island economy in the years ahead. One of the best ways to attach an immigrant to the local community is through the post-secondary education system. After spending four or five years in the province attending university, the student is already acclimated to the local community, weather, etc.

4.4 UPEI: Supplying the talent for a knowledge-based economy

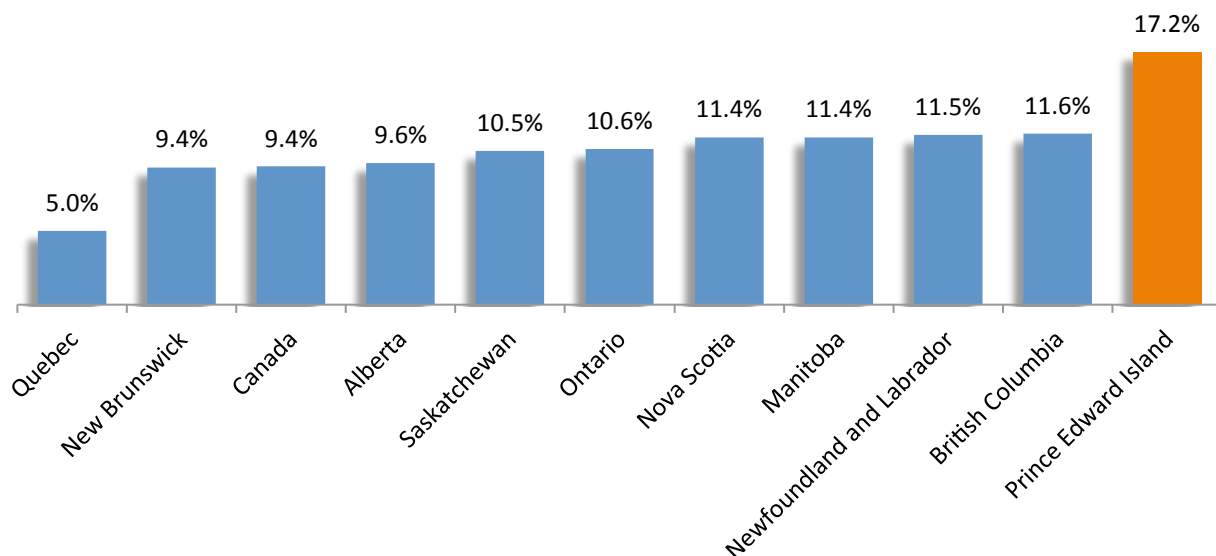
The University of Prince Edward Island is unique in that it is the only university in the province. Without UPEI, residents would need to leave the Island to undertake university studies. In addition, the university provides professional workshops and related training that is unavailable elsewhere in the province. Some of this programming draws in students from across the country (e.g. aquatic health). While the full impact of not having a university would be challenging to model, there are examples that illustrate the point.

The PEI biosciences cluster

Over the last decade or so, the Prince Edward Island biosciences cluster has exhibited robust growth. In 2012, the industry directly employed nearly 1,000 people and generated over \$188 million worth of output. Private sector revenue growth doubled between 2006 and 2012. The cluster has leveraged the province's traditional industries such as agriculture and fishing to build an exciting cluster of new start-up companies.

UPEI has been a key source of talent pool for the biosciences cluster. Statistics Canada tracks the number of students enrolled in university by major program area. As the biosciences cluster has grown so has the number of students enrolled in related programs. Between 2002-2003 and 2012-2013, the post-secondary education institutions on PEI increased enrolment in physical and life sciences programs by 35 percent. There are now nearly twice as many students enrolled in these programs on PEI as a percentage of total university students compared to Canada as a whole. No other province has a higher percentage of its university students enrolled in physical, life sciences and related technologies programs (Figure 12).

Figure 12: Percentage of total university students enrolled in physical, life sciences and related technologies programs (2012-2013)*



**Includes physical sciences; marine sciences; biological and biomedical sciences; natural sciences; nutrition sciences; human biology; and science technologies/technicians.*

Source: Statistics Canada CANSIM Table 477-0029.

The university has also been a key source of talent for the growing aerospace and defence and information technology sectors.

The Fredericton, New Brunswick engineering cluster

The University of New Brunswick has been turning out a surplus of engineering talent for decades and that is widely believed to be a key reason why Fredericton has developed a significant export-oriented engineering services sector. There are more engineers in Fredericton per 1,000 population than all other cities in Canada.

By contrast, Prince Edward Island has the lowest percentage of engineers in its population among the 10 provinces across Canada. There are 11.2 persons who studied engineering in university per 1,000 people living on the Island compared to 26.1 per 1,000 across the country. While there are many other factors that influence the growth of specific industries, the availability of locally trained talent is likely one of the most significant factors. The new four year university-level engineering program at UPEI will help build the engineering talent needed by entrepreneurs to create and expand engineering-related businesses.

Ensuring the right amount of university graduates to support economic growth

Overall, Prince Edward Island still has fewer persons enrolled in university compared to other provinces (Table 11). For the most recent year the Statistics Canada data is available (2012-2013), there were 300 persons enrolled in UPEI for every 10,000 persons living on the Island. This is 18 percent below the national average and tied with New Brunswick for the lowest percentage of university students in the population among the 10 provinces.

The conclusion below discusses this important point in more detail.

Table 11: University enrolment per 10,000 in the population (2012-2013) – by province

	2012/2013 enrolment	10-year % change
Canada	365	+23%
Newfoundland and Labrador	352	+8%
Prince Edward Island	300	+16%
Nova Scotia	465	+4%
New Brunswick	300	-9%
Quebec	369	+10%
Ontario	373	+26%
Manitoba	358	+18%
Saskatchewan	312	-9%
Alberta	329	+25%
British Columbia	385	+92%

Source: Statistics Canada CANSIM Table 477-0019.

5. Conclusion: UPEI and the Island's future prosperity

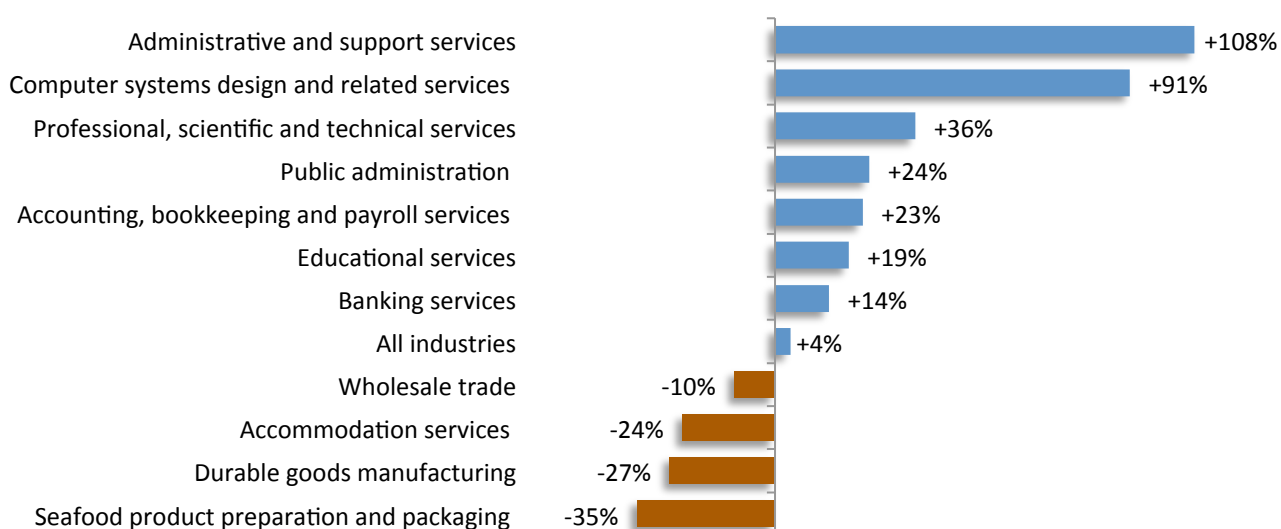
The University of Prince Edward Island is a significant economic driver for the province. Through its direct, indirect and induced impacts, the university boosts the provincial GDP by over \$150 million per year and supports over 1,400 full time equivalent jobs across the Island. It also contributes an estimated \$35.4 million to government coffers each year. The university's expenditures and the impact of student spending on the Island boosts consumer spending over \$69 million per year and the 936 PEI-based suppliers to the university benefit from nearly \$25 million worth of business per year.

The university will have an even more important role to play in support of the province's prosperity in the years ahead. It can increase its economic impact through an expansion of its programs (such as the new engineering school) and by attracting more students from outside the province. As shown above, PEI already benefits more than any other province from export revenue into the education service sector.

But UPEI's role will go beyond direct economic impact. The university will be a key source of talent to feed the Island's knowledge-based industries. The Island features an exciting and fast growing biosciences cluster. It also has an above average sized information technology sector. It's aerospace and defence sector has also become an important economic engine over the past 10-15 years. These and other knowledge-intensive industries will need the talent UPEI will supply.

Over the last 10 years, sectors with a heavy reliance on university-educated workers have been expanding their employment while many of the sectors with not as much requirement for post-secondary educated workers have been in decline (Figure 13). Overall, the goods producing sector saw its total employment decline by 15 percent between 2004 and 2013 while the services sector expanded its employment by eight percent.

Figure 13: 10-year employment growth/decline by selected sectors – Prince Edward Island*



*Percentage change in total employment between 2004-2013. Source: Statistics Canada CANSIM Table 281-0024.

At the same time, Prince Edward Island ranks seventh among the 10 provinces for the percentage of its population with a university degree (Table 12). While the Island will have to increasingly attract talent from outside its borders to fill its labour market demand, the ability to attract talent to the Island first to study and then to stay and work provides a win-win generating revenue and economic activity and ensuring key industries such as biosciences and IT can continue to grow.

Table 12: Percentage of the population with a university certificate, diploma or degree at bachelor level or above (2011)

	<u>All ages</u>	<u>25-44 years</u>
Canada	21%	31%
Newfoundland and Labrador	13%	22%
Prince Edward Island	17%	25%
Nova Scotia	19%	30%
New Brunswick	15%	24%
Quebec	19%	29%
Ontario	23%	34%
Manitoba	18%	26%
Saskatchewan	15%	24%
Alberta	21%	29%
British Columbia	22%	32%

Source: Statistics Canada National Household Survey 2011.

Appendix A: The Economic Impact Model – Sources and Methodology

<u>Statistic:</u>	<u>Description:</u>
Employment, enrollment and expenditure figures for the university (2013, 2014)	Supplied by the university.
Off-campus student expenditure estimates	
	International students 703
	Off-Island domestic students 936
	Total off-Island 1,639
	Students living in residence 424
	Net off-Island students (living off-campus) 1,215
	Est. monthly spend \$1,200
	Annualized spend \$10,800
	Annual spending on PEI from off-Island students \$13,122,000
Direct, indirect and induced GDP, employment and income estimates	Uses Statistics Canada Input-Output multiplier and impact estimates at the M industry level. Provincial Input-Output Multipliers, 2010. Catalogue no. 15F0046XDB. Industry Accounts Division. Statistics Canada.
HST paid	Based on the ratio of HST collected to total provincial personal income in 2012 (Source: provincial budget documents and FP Markets 2012).
Personal income taxes paid	Derived using several sources including Statistics Canada CANSIM Table 202-0501 - Income tax, by economic family type and CANSIM Table 202-0707 and Statistics Canada CANSIM Table 203-0022 - Survey of household spending (SHS) for 2012.
Property taxes paid (from employment income)	Derived using Statistics Canada CANSIM Table 203-0022 - Survey of household spending (SHS) for 2012.
Indirect taxes	Source: Statistics Canada Input-Output tables. These indirect taxes are levied on the business activity (not employment income) and include such tax areas as: business property taxes, fuel taxes, vehicle license fees, land transfer taxes, and any sales taxes arising out of the corporate activity.
Estimated consumer spending impacts	Derived using Statistics Canada CANSIM Table 203-0022 - Survey of household spending (SHS) for 2012.
Provincial output by industry comparison	Uses Statistics Canada CANSIM Table 381-0031 Provincial gross output, by sector and industry.
Provincial GDP by industry comparison	Uses Statistics Canada CANSIM Table 379-0030 Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS).
Export data for the education services sector	Includes interprovincial and international export revenue. Statistics Canada CANSIM Tables 386-0003 and 051-0001.

<u>Statistic:</u>	<u>Description:</u>
UPEI suppliers as a percentage of total businesses.	Statistics Canada. Canadian Business Patterns 2014. Excludes business establishments in the health care, education and public administration sectors.
Enrolments in post-secondary educational institutions	Source: Statistics Canada CANSIM Table 477-0029 - Postsecondary enrolments, by program type, credential type, Classification of Instructional Programs.
International student enrollment	1992-1993 to 2012-2013 international enrollments taken from Statistics Canada CANSIM Table 477-0019. 2013-2014 and 2014-2015 data provided by the University of Prince Edward Island.
Occupational comparisons	Source: Statistics Canada. 2011 National Household Survey.
Average weekly employment income data	Source: Statistics Canada CANSIM Table 281-0027 Average weekly earnings (SEPH), by type of employee for selected industries.
Comparison of PEI industries by employment growth/decline	Statistics Canada CANSIM Table 281-0024.
Provincial research and development expenditure data	Source: Statistics Canada CANSIM Table 358-0001 - Gross domestic expenditures on research and development, by science type and by funder and performer sector.
Provincial funding comparison for the post-secondary education sector	Statistics Canada CANSIM Table 477-0058 - Financial information of universities and degree-granting colleges, revenues by type of funds.



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