

# 2012 Economic IMPACT Study



Institutional Research and Planning

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[www.uOttawa.ca/services/irp/eng/research/Economic\\_Impact.html](http://www.uOttawa.ca/services/irp/eng/research/Economic_Impact.html)



uOttawa



# INTRODUCTION

Since 1848, the University of Ottawa has been Canada's university: a reflection, an observatory and a catalyst of the Canadian experience in all its complexity and diversity. Our university is characterized by its unique history, by its commitment to bilingualism, by its location both in the heart of the national capital and at the juncture of French and English Canada, and by its special commitment to the promotion of French culture in Ontario and to multiculturalism.

The University of Ottawa offers about 250 undergraduate programs and more than 200 graduate programs, and as of fall 2011, we had close to 41,500 students, with about 15 per cent pursuing their studies at the graduate level.

uOttawa is the world's largest English-French bilingual university, and students can study in the official language of their preference. In addition, our undergraduate immersion program, unique in Canada, provides more than 1,250 students with the opportunity to improve their French-language skills in a university setting. Our co-operative education program is the fourth-largest in Canada, with more than 70 disciplines offering this option and over 4,500 students enrolled in the fall of 2011.

The University is also among Canada's top 10 for research and ranks 9<sup>th</sup> in sponsored research income according to *Research Infosource's Canada's Top Research Universities 2011*, with total revenues of \$276 million in 2010-11.

With annual operating revenues surpassing \$1 billion, uOttawa makes a significant contribution to the local, regional and Canadian economy. As a major employer, the University sees about 60 per cent of its annual expenditures go toward salaries and benefits. Our academic personnel includes about 1,270 regular professors, more than 900 part-time professors, over 2,100 faculty in university-affiliated institutions and about 900 employees in other academic functions. Our support staff, excluding contractual positions, has over 1,600 members.

The University is a leader in the application of management best practices. The *Vision 2010 Strategic Plan* set the course for our growth and priorities over the past few years. We have now been closely tracking our goals since 2005 with an institutional scorecard that has been recognized in the industry as an innovative and informative performance-measurement instrument. And now, our new strategic plan, *Destination 20/20*, will guide us in establishing our goals and priorities to the year 2020.

Being such an important catalyst of the region's economy and a major public institution, the University is eager to provide information to the public about its activities and the impact it has on the region. Other major Canadian universities, such as the University of British Columbia, Queen's University, McGill University and Western University, have undertaken similar initiatives, and these have provided a baseline for our method and approach. This report summarizes the three major contributions that, from an economic perspective, our university makes to the Ottawa-Gatineau region.

First, the University of Ottawa plays a vital role in the area as a major employer and purchaser of goods and services. Using an economic demand-driven perspective, we estimate how the University's demand for goods and services affects the regional expenditure flow. Based on this approach, the increase in the Ottawa-Gatineau region's economic activity attributable to the University's presence over a given year is estimated at **\$1.17 billion** annually.

Second, university graduates earn more as a result of their postsecondary education. Taking into consideration the salary differentials that uOttawa alumni living in the region attain as a result of their education, we estimate that an additional \$1.12 billion are injected annually in the region. This education premium increases to **\$1.68 billion** annually once indirect effects are taken into account.

Finally, as a major research engine, uOttawa contributes to productivity gains in the Canadian economy, and in the region's economy in particular. This research contribution, measured as the increase in multi-factor productivity attributable to research undertaken at uOttawa since 1971 has an annual cumulative value of **\$1.27 billion** for the Ottawa-Gatineau region.

**The University of Ottawa's total regional economic impact is thus estimated at \$4.12 billion annually.** However, the regional impact of a university is not only of an economic nature. Universities also affect politics (e.g., an increase in citizen participation), regional demographics (e.g., changes in population mobility), infrastructure, culture, the region's image and identity and the quality of life in general. These additional influences, albeit important, are not measured in this report.

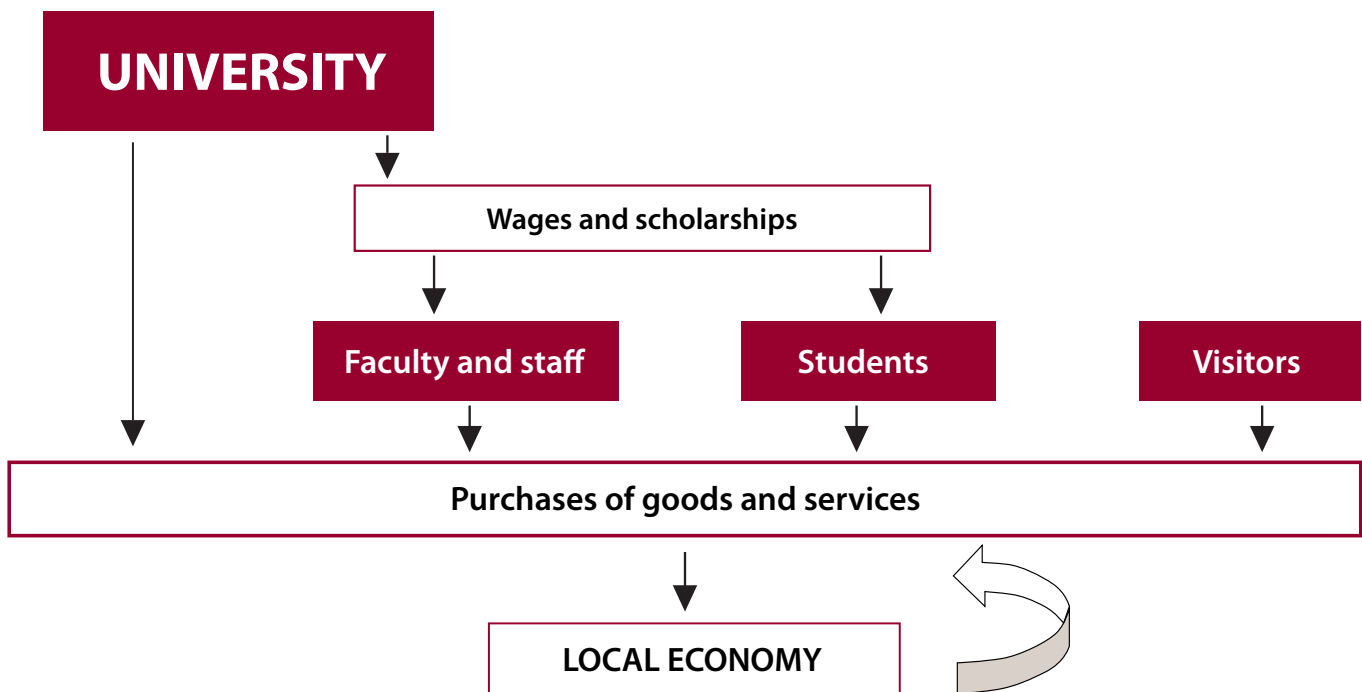
# SECTION 1:

## DIRECT CONTRIBUTION TO THE REGION'S ECONOMIC ACTIVITY

The estimate of the University's direct contribution to Ottawa-Gatineau's economic activity is based on (i) the local expenditures of the University, its staff and its students; (ii) the expenditures generated by people who came to the region because of the University's presence, for example, visitors at homecoming celebrations and (iii) the indirect effects generated by all these expenditures – that is, each dollar spent directly by the University or individuals associated with it generates additional transactions in the regional economy.<sup>1</sup>

For items (i) and (ii) above, we estimate the direct expenditures by the University as a corporation, by its students, by its professors and support staff and by visitors. These categories are broad; therefore, the expenditures considered also include those undertaken by related organizations that do business on campus, such as the bookstore and food services. Similarly, direct student spending includes not only the expenses undertaken by undergraduate and graduate students, but also those of postdoctoral fellows and of student associations. In addition, staff expenditures take into account the spending patterns of retirees.

Item (iii) takes into account the multiplier effect: every single dollar spent directly by any of the four groups cited above recirculates in the economy and stimulates further rounds of spending; therefore, the overall effect in the economy is multiplied. Estimating this multiplier effect provides a more complete picture of the true economic impact of the University. A graphic representation of the model, modified from the Queen's University report, is presented below.



<sup>1</sup> The approach used for this estimate closely follows how Queen's University applied a university economic-impact model developed by the American Council of Education in the 1970s.

One of uOttawa’s unique features is its location right at the border of two provinces. For this study, the local region is defined as the Ottawa-Gatineau economic region, as it is a widely accepted geographical unit used in the analysis of economic activity.<sup>2</sup> The economic impact of each of these elements for the Ottawa-Gatineau region is summarized in the table below. A more detailed explanation of how these numbers are derived follows.

<b>University of Ottawa’s contribution to the region’s economic activity</b>	<b>\$ millions</b>
University direct local spending on goods and services	\$229.3
Student direct local spending	\$273.0
Staff direct local spending	\$267.5
Visitors direct spending	\$12.6
<b>Total uOttawa local direct spending on goods and services</b>	<b>\$ 782.4</b>
Induced multiplier effect	1.5
<b>Total uOttawa contribution to the region’s economic activity</b>	<b>\$1,173.7</b>

## 1.1. UNIVERSITY DIRECT LOCAL SPENDING ON GOODS AND SERVICES

In estimating direct uOttawa spending on goods and services, we use a broad definition of the institution as a corporation, thus including expenditures by other businesses on campus, such as Chartwells, CHUO radio, Health Services, the bookstore and the Second Cup franchise in one of our residences. We also add expenses from the pension plan fund administration that are not included in the University’s financial statements. Direct university spending consists of expenditures in furniture and equipment, supplies, maintenance and utilities and other expenses, excluding expenditures on students (e.g., scholarships and bursaries) and on staff (e.g., salaries and benefits), which are accounted for elsewhere in this model.

In 2010-11, uOttawa’s total operating expenditures exceeded \$1 billion, with salaries and benefits representing the largest portion (60.8%). Once salaries and student-related costs are excluded, direct spending accounts for approximately one-third of total expenses—about \$333 million. In addition, the four associated businesses with operations on campus reported annual expenditures of about \$18.4 million. To estimate the share of direct spending that takes place locally in the Ottawa-Gatineau region, we apply a factor of 64 per cent to total annual expenditures.<sup>3</sup>

These calculations are summarized in the table below, where uOttawa’s direct local spending on goods and services is estimated at \$229.3 million.

<b>University direct local spending on goods and services</b>	<b>\$ millions</b>
uOttawa direct spending (net of salaries and student-related expenditures)	\$333.8
Associated businesses direct spending (net of salaries)	\$11.1
Pension plan expenses (net of salaries)	\$13.4
Total University direct spending	\$358.3
Estimated share of local direct spending	64%
<b>Total uOttawa local direct spending on goods and services</b>	<b>\$229.3</b>

<sup>2</sup> Ottawa-Gatineau includes both the Ottawa and the Outaouais economic regions. The Ottawa economic region (10) encompasses the following census divisions: Stormont, Dundas and Glengarry (3501), Prescott and Russel (3502), Ottawa (3506), Leeds and Grenville (3507) and Lanark (3509). The Outaouais includes the following census divisions: Papineau (2480), Gatineau (2481), Les Collines-de-l’Outaouais (2482), La Vallée-de-la-Gatineau (2483) and Pontiac (2484). Source: Statistics Canada.

<sup>3</sup> This estimate is based on the share of operational expenditures in the fiscal year 2010-2011 that were paid to uOttawa suppliers having an address in the Ottawa-Gatineau CMA.

## 1.2. STUDENT DIRECT LOCAL SPENDING

Student spending consists of all expenditures by full-time students in the region while they pursue their studies, as well as expenditures by postdoctoral fellows. Our assumption is that although the vast majority of full-time students already lived in the Ottawa-Gatineau region, had the University not provided its services, these students would have probably moved elsewhere; thus, their spending patterns are closely linked to uOttawa's presence in the area.<sup>4</sup> In the fall of 2011, enrolment at uOttawa consisted of more than 27,700 full-time undergraduate students, over 4,800 full-time graduate students and about 300 postdoctoral fellows.

The analysis also takes into consideration students' living arrangements and assumes that 40 per cent of full-time undergraduate students still live at home<sup>5</sup> and that all full-time graduate students live in an independent apartment. Average annual expenses for undergraduate and graduate students and for postdoctoral fellows are estimated separately. These average annual expenses are net of academic spending (such as tuition fees) since this revenue is already part of the direct University spending calculation.

Based on undergraduate student cost-of-living estimates from uOttawa's Financial Aid Office, total average expenses net of academic spending for an undergraduate student not living at home over an eight-month period are estimated at \$10,800. This figure aligns with other student living-cost estimates at the national level.<sup>6</sup> No distinction is made in costs for students living on or off-campus, particularly since public-transit costs are included in uOttawa's incidental fees. We also estimate that an undergraduate student living at home spends about \$1,500 for books, supplies and utilities such as telephone and Internet access.

For graduate students, it is estimated that spending equals income (from scholarships or employment) after an allowance is made for tuition, books and other academic costs. Using uOttawa internal analyses of graduate student financial support, we estimate that net graduate student disposable income is \$10,000 for master's students and \$17,000 for PhD students. Postdoctoral students have an average salary of \$40,000 a year,<sup>7</sup> which we assumed to be equivalent to their average disposable income.

In addition to direct student expenditures, this estimate includes expenditures by student organizations, namely the Student Federation at the University of Ottawa (SFUO) and the Graduate Student Association (GSAED).<sup>8</sup> Their annual expenditures are adjusted to obtain expenditures net of salaries and the local spending factor of 64 per cent is applied to calculate expenditures in the Ottawa-Gatineau region. The calculations are summarized in the table below, where uOttawa's total student direct spending is estimated at \$273 million.

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<sup>4</sup> Admittedly, Carleton University would attract some of these students.

<sup>5</sup> This estimate stems from the CUSC survey of first-year students. Although applying the first-year share of students living at home to all undergraduates may lead to an overestimation, this is a conservative bias and is thus accepted.

<sup>6</sup> In 2003-04, average living expenses for an undergraduate student in Canada were estimated at \$8,000 (<http://www.canlearn.ca/eng/postsec/cost/index.shtml>). Given a 1.8 per cent annual inflation rate, this amounts to \$9,000 in 2010-11. Because this is a Canadian average, the difference appears to come from higher regional costs.

<sup>7</sup> Post-doctoral fellow salaries range from \$32,000 to \$60,000 annually. In 2010-11, about 40 per cent of post-doctoral fellows had an annual salary greater than \$40,000; therefore, using the average for our calculation provides a conservative estimate of their total disposable income.

<sup>8</sup> Student associations' primary revenue consists of ancillary fees paid by students. Since annual living expenses averages used for estimating direct student spending above were calculated net of academic expenditures (i.e., excluding tuition and ancillary fees), student association expenditures are added to the analysis.

<b>Student direct local spending</b>	
Full-time undergraduate students (excluding medical residents)	27,736
Estimated share of full-time undergraduate students living at home	40%
Full-time master's students	3,301
Full-time PhD students	1,543
Postdoctoral fellows	300
Average expenses of undergraduate students living at home	\$ 1,600
Average expenses of undergraduate students living independently	\$ 10,800
Average expenses of master's students	\$ 10,000
Average expenses of PhD students	\$ 17,000
Average expenses of postdoctoral fellows	\$ 40,000
Total expenses of undergraduate students living at home	\$ 17,751,040
Total expenses of undergraduate students living independently	\$ 179,729,280
Total expenses of master's students	\$ 30,310,000
Total expenses of PhD students	\$ 26,231,000
Total expenses of postdoctoral fellows	\$ 12,000,000
<b>Subtotal student direct spending</b>	<b>\$ 266,021,320</b>
Direct net spending by student associations	\$ 10,965,980
Estimated share of local spending	64%
Local direct net spending by student associations	\$ 7,018,227
<b>Total student direct local spending</b>	<b>\$ 273,039,547</b>

### 1.3. ACADEMIC AND SUPPORT STAFF LOCAL SPENDING

In the fall of 2011, the University had close to 1,300 regular professors, over 2,100 faculty in university-affiliated institutions, more than 900 part-time professors, about 55 visiting professors and more than 250 adjunct professors. On the administrative side, the University had more than 1600 regular staff and over 700 term staff, for a total of about 2,350.

Wages and benefits for academic and support staff account for the largest portion of uOttawa's expenditures. In 2010-2011, total compensation for both academic and support staff (excluding academic staff in affiliated institutions but including medical residents) net of government contributions amounted to \$284.2 million. We estimated that 75 per cent of these net revenues are spent in the Ottawa-Gatineau region.<sup>9</sup>

We also take into consideration staff expenses associated with other businesses on campus and with affiliated institutions. Total annual salaries amount to \$7.3 million at associated businesses (i.e., Chartwells, the Bookstore, Health Services and CHUO Radio) and to \$45.5 million at affiliated institutions. These amounts are adjusted to reflect salaries net of government contributions and to estimate local expenditures, as illustrated in the table below.

In addition, retired uOttawa staff residing in the region have a direct impact on the local economy. As of fall 2010, the University of Ottawa had about 5,785 retirees, and we estimated 70 per cent still live in the Ottawa-Gatineau region. Based on 2010 retirement benefits of \$72.5 million, we estimate that about \$47.85 million were paid to residents and used a regional expenditure share of 75 per cent to estimate the local impact.

<b>Academic and support staff local direct spending</b>	<b>\$ millions</b>
uOttawa staff salaries (net of government contributions)	\$ 284.2
Associated businesses staff salaries (net of government contributions)	\$ 3.4
Affiliated institutions salaries (net of government contributions)	\$ 21.2
Subtotal staff salaries	\$ 308.8
Estimated share of local spending (staff)	75%
uOttawa retirees compensation	\$ 47.9
Estimated share of local spending (retirees)	75%
<b>Total staff local direct spending</b>	<b>\$ 267.5</b>

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<sup>9</sup> To estimate the percentage of staff expenditures that are made in the Ottawa-Gatineau region, two assumptions were made. First, we excluded all spending by staff living outside of the CMA (7 per cent in 2010). For the remaining staff, it is estimated that 18 per cent of their expenditures are not made locally, which translates into a total regional expenditure share of 75 per cent. The 18 per cent share of expenditures outside the region is calculated as follows. A Statistics Canada report, Spending Patterns in Canada, 2000, indicates that, on average, 65 per cent of Canadian household's income is spent in food, shelter, transportation and personal taxes, most of which happen locally. The remaining 35 per cent income is spent in other items (such as clothing, recreation, education, etc) of which we assume half (or 17.5 per cent) are done locally.



## 1.4. DIRECT SPENDING FROM VISITORS

The University of Ottawa organizes and hosts many activities that attract visitors to the region, such as graduation ceremonies, homecoming celebrations and conferences. Spending by these out-of-town visitors during their time in Ottawa-Gatineau can be attributed to the University.<sup>10</sup> Based on homecoming activities in the fall of 2011, it is estimated that about 16 per cent of participants come from out of town and spend an average of \$350 a day. Also, of the almost 5,000 graduates attending their convocation, we estimate that about 48 per cent are not originally from the Ottawa-Gatineau<sup>11</sup> region and were given, on average, three tickets to the ceremony, which translates into an estimated 7,590 visitors for that day.<sup>12</sup> The spending estimates associated with these activities are summarized below.

In addition, we have observed that about 20,000 visitors annually come to our region for conferences either organized or sponsored by uOttawa. Moreover, every year, prospective high-school students from outside the region visit our campus with at least one of their parents. Based on all Ontario high-school undergraduate-program candidates at uOttawa in a given fall who indicated this university as their first choice, we estimate that every year some 2,100 prospective students and their parents visit the regio.<sup>13</sup> Finally, out-of-town undergraduate students likely have family members visit them, especially during their first year of residence. Given that each year we admit about 900 new undergraduate students from Ontario high schools outside our region, we assume at least two family members visit for two days in their first year of studies.

Based on those calculations, the total number of annual visits to Ottawa due to university-related activities is estimated at 36,650, with an economic impact of \$12.6 million.

<b>Visitor direct spending</b>	
Out-of-town visitors for homecoming	675
Out-of-town visitors for graduation	7,590
Visits from out-of-town prospective students	4,200
Out-of-town visits for conferences	20,000
Visits from out-of-town parents to their children	3,600
Total visits	36,650
Average expenditures per day	\$350
<b>Total visitor direct spending</b>	<b>\$12,622,750</b>

<sup>10</sup> Although Ottawa-Gatineau region residents also participate in these activities, their expenditures are not included in the analysis.

<sup>11</sup> About 48 per cent of our undergraduate students did not reside in the Ottawa-Gatineau region at the time they applied for admission. This is the same percentage used to estimate the share of graduates who originally resided outside the region.

<sup>12</sup> Our convocation statistics indicate that between three and six tickets per graduate are requested for convocation ceremonies. In the fall 2010, the average number of tickets provided was four tickets per graduate, which was reduced to three tickets to account for the possibility that not all tickets are used.

<sup>13</sup> This estimate is based on annual application statistics. Every year, about 2,100 candidates coming from an Ontario high-school outside the Ottawa-Gatineau region, applied for admission at uOttawa and indicated this university as their first choice.

## 1.5. ESTIMATING INDIRECT ECONOMIC IMPACT

Our analysis so far has estimated uOttawa's **direct** economic impact. In addition to this direct impact, every dollar spent in the economy generates a multiplier effect in that a portion of it is spent again. A generally accepted multiplier (\$ X 1.5) is used in this study to estimate the **indirect** demand generated by the University: the result is a total contribution to the regional economy of around \$1.17 billion.

<b>University of Ottawa contribution to the region's economic activity</b>	<b>\$ millions</b>
University direct local spending on goods and services	\$229.3
Student direct local spending	\$273.0
Staff local direct spending	\$267.5
Visitors direct spending	\$12.6
<b>Total uOttawa local direct spending on goods and services</b>	<b>\$ 782.4</b>
Multiplier effect	1.5
<b>Total uOttawa contribution to regional economic activity</b>	<b>\$1,173.7</b>

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<sup>14</sup> A 1.5 multiplier has been used to approximate the indirect economic contribution of other postsecondary institutions in Canada, including the University of British Columbia, Simon Fraser University, the University of Waterloo, and to assess the contribution of international students in Nova Scotia.

# SECTION 2:

## THE ECONOMIC IMPACT OF EDUCATION (THE EDUCATION PREMIUM)

The second major contribution that a university makes to the regional economy consists of human capital creation. As of 2011, the University of Ottawa had more than 141,300 alumni spread across Canada and overseas, with about 54 per cent living in the Ottawa-Gatineau region. Broken down by program, this corresponds to about 1,400 alumni<sup>15</sup> from doctorate programs, more than 12,000 from master's and other graduate programs, over 52,000 from undergraduate programs and more than 1,000 medical doctors.

These university graduates enjoy higher annual earnings than individuals without university degrees, providing a driving force for spending in the regional economy. For instance, a male graduate from a bachelor's program in the 40-to-49-year-old bracket earns \$30,500 more than someone without the same level of education. The earning differential varies according to level of education, age group and gender, as illustrated below.

### Average salaries for Ottawa-Gatineau university graduates (2011)

Age group	Gender	Bachelor's		Master's		Doctorates	
		Average income (2011)	Differential with below bachelor's	Average income (2011)	Differential with below bachelor's	Average income (2011)	Differential with below bachelor's
20-29	Female	32,900	11,900	37,300	16,300	2,100	NA
	Male	35,200	12,500	34,300	11,600	59,200	36,500
30-39	Female	47,400	14,000	52,100	18,700	46,400	13,000
	Male	61,500	24,400	63,100	26,000	77,200	40,100
40-49	Female	58,200	16,000	68,500	26,300	86,500	44,300
	Male	78,400	30,500	80,300	32,400	71,700	23,800
50-59	Female	61,300	20,100	69,400	28,200	87,800	46,600
	Male	78,000	29,400	83,200	34,600	98,600	50,000
60-65	Female	43,300	9,200	77,000	42,900	95,400	61,300
	Male	64,500	17,200	70,900	23,600	102,700	55,400

Source: Based on Statistics Canada 2006 Census Data for the Ottawa-Gatineau CMA, adjusted for inflation to estimate 2011 average salaries (appropriate federal and provincial taxes were also deducted based on the 2011 tax year).

<sup>15</sup> Although the total number of alumni for uOttawa is about 173,000, the figure cited in this report corresponds to alumni having a known address on file.

Moreover, analyses show that individuals with higher levels of education can positively affect the people they work with and the average wages of the region they live in. Thus, in addition to higher individual earnings, a university degree may have spillover effects on the rest of the economy, and we use the same multiplier as in the previous section to estimate them.

The annual earnings differential of uOttawa alumni living in the Ottawa-Gatineau region is summarized in the table below (estimated at \$1.12 billion). Once the multiplier effect of this important group is accounted for, the direct and indirect effects of the education premium are estimated at \$1.68 billion.

<b>Earning differentials (education premium) of uOttawa graduates in the region</b>	<b>\$ million</b>
Doctoral programs alumni	\$40.7
Master's programs alumni	\$247.4
Graduate certificate programs alumni	\$5.8
Medical doctors	\$73.8
Undergraduate certificate programs alumni	\$4.7
Bachelor's programs alumni	\$748.6
<b>Direct education premium</b>	<b>\$1,120.9</b>
Multiplier	1.5
<b>Direct and indirect education premium</b>	<b>\$1,681.4</b>

# SECTION 3:

## THE ECONOMIC IMPACT OF UOTTAWA RESEARCH

To estimate the third component of our institution's economic impact, we use a method developed by Fernand Martin (1998),<sup>16</sup> which posits that universities make both basic and applied knowledge available to the Canadian economy, thus increasing its productivity. This increase in productivity, which happens over time, can be measured as annual cumulative value added to the economy.

The traditional measure of economic growth or output is provided by changes in the gross domestic product (GDP) of a country or a province. For instance, Ontario's GDP is estimated to have increased by \$328.1 billion, in 2002 constant dollars, since 1971.<sup>17</sup> Traditionally measured inputs, such as labour (e.g., number of workers) and capital (e.g., infrastructure), explain a large portion of the observed economic growth. However, innovation and improvements resulting from research activities, either by universities or by the private sector, contribute directly to the economy's long-term technological change, to technological dynamism and to the knowledge of the labour force. Such improvements in technology and know-how – the productivity changes – result in economic growth and are estimated using multi-factor productivity (MFP). Specifically, the productivity gains that can be attributed to university-based research activities come from (i) improving the supply of human capital (graduate students), (ii) producing research internally, and (iii) offering expert advice to external organizations.

In his 1998 paper, Fernand Martin estimated that the Canadian GDP growth attributable to increases in MFP is about 20 per cent. Applying this factor to Ontario's GDP growth since 1971, we estimate that approximately \$65.6 billion of such growth can be attributed to productivity gains resulting from research and development (R & D) activities.<sup>18</sup> Since some of these R & D activities take place overseas, Martin recommends that foreign effects be excluded, with a factor of 69 per cent used for this calculation.<sup>19</sup> The contribution that Ontario universities make to these gains is then estimated based on their share of total R & D expenditures in the province, reported as 34 per cent by Statistics Canada.<sup>20</sup> This results in an estimate of \$15.5 billion in MFP growth generated by Ontario universities in their province. Given that this study focuses on the economic impact in Ottawa-Gatineau, the regional share of this growth is estimated using as a proxy the City of Ottawa's share of Ontario's GDP, which has averaged 10 per cent in the last 10 years. Given that there are two universities in the city, the portion attributed to the University of Ottawa (82 per cent) is based its share of university research expenditures in the region.<sup>21</sup>

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<sup>16</sup> Martin, Fernand, 1998. "The Economic Impact of Canadian University R&D" in *Research Policy*, 27 (7), pp. 677-687. This approach has been also used by the University of British Columbia and Simon Fraser University in their calculations of economic impact.

<sup>17</sup> Conference Board of Canada, Provincial GDP Series.

<sup>18</sup> Martin's estimate of 20 per cent is based on an OECD analysis of growth since 1971. However, as this analysis ignores any productivity increases before 1971, the influence of technological progress may be underestimated.

<sup>19</sup> Martin derives the 69 per cent from different econometric analysis on this topic for Canada and other industrialized countries.

<sup>20</sup> Statistics Canada, 2009-10. Gross Domestic Expenditures on Research and Development in Canada (GERD), and the Provinces - National estimates 2001-2011 / Provincial estimates 2005 to 2009, Table 4.1 (Provincial distribution of gross domestic expenditures on research and development, by performing sector, 2009)

<sup>21</sup> COFO-UO Financial Report of Ontario Universities, 2000-2001 to 2009-10.

Thus, the contribution to increased productivity resulting from uOttawa investments in research since 1971 has an annual cumulative added value of \$1.27 billion. This calculation is summarized in the table below.

<b>Economic impact of uOttawa research</b>	<b>\$ millions</b>
GDP growth in Ontario since 1971	\$328,058.0
Growth attributable to multi-factor productivity (MFP)	20%
Ontario MFP	\$65,611.6
Exclusion of foreign R & D effects (x 69%)	\$45,272.0
Share of R & D by Ontario universities (x 34%)	\$15,392.5
Share of Ottawa MFP growth (proxy is Ottawa's share of Ontario's GDP)	10%
Estimated Ottawa-Gatineau MFP	\$1,539.2
<b>Share of R &amp; D by uOttawa (82% in Ottawa)</b>	<b>\$1,266.9</b>

# FUTURE ANALYSIS

This analysis has focused on the measurable economic impacts of the University of Ottawa, estimated at \$4.12 billion annually. However, as mentioned in the introduction, the University makes other important economic and social contributions that are not accounted for here. A broader, more extensive picture of the University's role in society will highlight its activities in and contribution to the region in a variety of areas, such as infrastructure, the arts, medical sciences and community service. Although this report has already accounted for some economic activity in those fields, we will build on this analysis to include an overview of our many undertakings from these perspectives, thus providing a more comprehensive portrait of the role the University of Ottawa plays in the region.

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