

University of Manitoba

Economic Impact Analysis

October 2009

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1 Executive Summary

A university is a catalyst for economic growth. The operations of a university and its varied undertakings result in significant and widespread economic impacts within their respective regions. In March 2009, the University of Manitoba (“the University” or “U of M”) engaged PricewaterhouseCoopers LLP (“PwC”) to assess the economic impact of the University’s operating, research and capital expenditures on the City of Winnipeg (“the City”) and the Province of Manitoba (“the Province”). The purpose of this study is to identify and examine qualitative economic, social and cultural benefits of the University, as well as quantify the economic benefits obtained from the University resulting from:

- University spending on operations, research, maintenance, and capital projects
- Out-of-town student and visitor spending, and
- Spin-off business expenditures.

The U of M is the largest and most comprehensive post-secondary institution in the Province. Through its 23 faculties and schools, the University provides social and cultural benefits to the broader community by:

- providing a learning environment;
- serving as a reliable source of knowledge; and
- supporting culture and recreation through a variety of programming.

The University also serves as an economic catalyst through purchasing and procurement activities, expanding human capital through education and training, and generating knowledge and innovation through research. In addition, the University contributes to economic growth by working collaboratively with the business community and industries within the region to better meet their future needs, by tailoring programs to better respond to the needs of Manitoba and through its health and research services.

The University is the only research intensive institution in the Province and is a key player in the Province’s overall innovative capacity. The University has its own technology transfer program and owns Smart Park Development Corporation (“Smartpark”) which is a research and technology park that fosters research partnerships between the University and industry, and supports development of high-tech companies.

The University contributes to the City tourism sector by attracting visitors to attend campus events, casual visitors to the City to visit students, faculty and staff and also by attracting students from outside of the City, the Province and Canada. All visitors and students contribute to the local economy through the purchase of accommodations, food, and other products and services.

In total, we have estimated that total initial expenditures associated with the University approximate \$1.0 billion which consists of:

- Operating and research expenditures made by the University;
- Capital expenditures projected to be spent by the University over 5 years;
- Expenditures made by out-of-town visitors and out-of-town students; and
- Expenditures from spin-off companies.

The total economic impact of the University extends well beyond the initial expenditures described above as a result of multiplier effects. These multiplier effects represent additional expenditures made within the provincial economy that were stimulated by the direct expenditures of the University. The following summarizes the economic impact of the University that is estimated to occur within the City (Table 1.1) and the Province (Table 1.2)¹.

- The impact from gross output resulting from all the initial expenditures attributable to the U of M is estimated at \$1.5 billion in Manitoba and \$1.3 billion in Winnipeg. Including University spin-offs the total gross output is estimated at \$1.8 billion in Manitoba and \$1.5 billion in Winnipeg.
- The \$855 million in initial expenditures attributable to the University is estimated to create \$829 million in direct value added impacts in the City and \$999 million in the Province. When including University spin-offs, the total value added impacts are estimated at \$1.1 billion in Manitoba and \$912 million in Winnipeg.
- All the initial expenditures attributable to the University support about 19,315 jobs throughout the Province and about 16,107 jobs in Winnipeg. When University spin-offs are included, total expenditures attributable to the University supports 20,877 jobs in Manitoba and 17,399 jobs in Winnipeg.
- Expenditures attributable to the University are estimated to generate \$251 million in total taxes, of which \$201 million are from activities within Winnipeg. Including University spin-offs the total tax revenue impacts are estimated to be \$286 million in Manitoba and \$231 million in Winnipeg.

¹ The economic impacts of spin-off firms have been included separately because the data was obtained from third party participants and was not verifiable.

Table 1.1 University of Manitoba Estimated Economic Impacts within Winnipeg (Direct, Indirect and Induced)²

Initial spending (\$ million)	\$426	\$299	\$56	\$73	\$855	\$163	\$1,018
Impact	Operating & research expenditure	Capital expenditure (over 5-year period)	Out-of-town Visitors	Out-of-town Students	Total Impacts (no spin-offs)	University Spin-offs	Total Impacts (with spin-offs)
Total Gross Output (\$ million)	\$643	\$418	\$87	\$112	\$1,261	\$215	\$1,476
Total Value Added (\$ million)	\$541	\$172	\$51	\$65	\$829	\$83	\$912
Total Labour Income (\$ million)	\$430	\$101	\$35	\$41	\$608	\$47	\$654
Total Employment (person years)	9,613	3,174	1,496	1,825	16,107	1,291	17,399
Total Taxes (\$ million)	\$116	\$52	\$14	\$19	\$201	\$30	\$231

Table 1.2 University of Manitoba Estimated Total Economic Impacts in Manitoba (Direct, Indirect and Induced)²

Initial Spending (\$ million)	\$426	\$299	\$56	\$73	\$855	\$163	\$1,018
Impact	Operating & research expenditure	Capital expenditure (over 5-year period)	Out-of-town Visitors	Out-of-town Students	Total Impacts (no spin-offs)	University Spin-offs	Total Impacts (with spin-offs)
Total Gross Output (\$ million)	\$789	\$507	\$102	\$130	\$1,528	\$239	\$1,768
Total Value Added (\$ million)	\$640	\$222	\$60	\$76	\$999	\$98	\$1,097
Total Labour Income (\$ million)	\$476	\$129	\$40	\$47	\$691	\$54	\$745
Total Employment (person years)	11,537	4,063	1,672	2,043	19,315	1,562	20,877
Total Taxes (\$ million)	\$146	\$65	\$17	\$23	\$251	\$35	\$286

² Slight differences due to rounding.

2 Introduction & Methodology

2.1 Introduction

Canadian Universities provide an array of economic benefits for communities and provinces. Not only do they serve as knowledge centres and incubators of innovation, they also produce tangible and immediate economic impacts through employment and expenditures on goods and services. Moreover, much of a University's expenditure occurs locally as do the wages earned by employed faculty and staff. These expenditures, in turn, support employment in other local industries and help to maintain a vibrant local economy. An economic impact analysis can help capture these benefits by quantifying the impact of a University on important economic variables such as Gross Domestic Product (GDP), employment, and government revenues.

2.2 The Purpose of this Report

In March 2009, the University engaged PwC to assess the economic impact of the University's operating, research and capital expenditures on the City and the Province. This work provides an update to a previous study undertaken by PwC in 2004, "*University of Manitoba, Regional Economic Impact Analysis*".

The purpose of this study is to document and quantify the economic benefits obtained from the University within Winnipeg and throughout Manitoba resulting from:

- University spending on operations, research, maintenance, and capital projects
- Out-of-town student and visitor spending, and
- Spin-off business expenditures.

This study also identifies and examines other economic, social and cultural benefits of the University. Since complete quantification of all beneficial impacts generated by a university is not possible as some economic, social and cultural benefits are not easily measured, we have attempted to address these benefits through qualitative discussion.

2.3 Report Outline

The report is structured as follows:

Section 1 is a summary of the University's total economic and qualitative impacts.

Section 2 outlines the methodology of an economic impact analysis.

Section 3 outlines the profile of the University.

Section 4 discusses the University's initiatives supporting community and cultural development.

Section 5 discusses the University's contributions to economic growth.

Section 6 discusses the University's research initiatives and commercialization efforts.

Section 7 outlines challenges faced by the University.

Section 8 presents the estimated economic impact of the University's operating and research expenditures.

Section 9 details the estimated economic impact of the University's capital expenditures.

Section 10 shows the estimated economic impact of out-of-town visitors associated to the University.

Section 11 details the estimated economic impact of out-of-town students enrolled at the University.

Section 12 illustrates the estimated economic impact generated from University spin-off companies.

Section 13 summarizes the University's economic impacts.

2.4 Report Limitations

This Report is not intended for general circulation, nor is it to be published in whole or in part, without prior written consent from PricewaterhouseCoopers LLP ("PwC"). We do not accept responsibility for any losses arising from unauthorized or improper use of this Report.

PwC has relied upon the completeness, accuracy and fair presentation of all the information, data, advice, opinions or representations obtained from various sources which we did not audit or otherwise verify. These sources (collectively, the "Information"), include:

- Interviews with key stakeholders and spin-off companies,
- Data provided by the University,

- The University website;
- Popular media publications and academic literature;
- Statistics Canada;
- Other various public sources, and
- Prior post-secondary institution economic impact studies.

The findings in the Report are conditional upon such completeness, accuracy and fair presentation of the Information. PwC has not verified independently the completeness, accuracy and fair presentation of the Information. We are providing no opinion, attestation or other form of assurance with respect to our work and we did not verify or audit any information provided to us.

PwC reserves the right at its discretion to withdraw or make revisions to the Report should PwC be made aware of facts existing at the date of the report that were not known to PwC when it prepared the Report. The findings are as of the date hereof and PwC is under no obligation to advise any person of any change or matter brought to its attention after such date, which would affect the findings and PwC reserves the right to change or withdraw the Report.

2.5 Qualitative Methodolgy

In our study, we examined the qualitative economic, social and cultural benefits of the University. This was undertaken by conducting interviews with selected senior faculty members, administrative personnel and key stakeholders. The benefits identified from our interviews include:

- Human capital and research initiatives necessary to encourage economic and community development; and
- Community and cultural contributions.

2.6 Defining Economic Impact

While Universities produce many qualitative benefits for an economy, the measurement of economic impacts is generally viewed as being restricted to quantitative, well-established measures of economic activity. The most commonly used of these measures are gross output, value added (or gross domestic product (GDP)), government tax revenues and employment:

- Gross Output – the total gross value of all business revenue. This is the broadest measure of economic activity and indicates the total sales and transactions triggered by operations.
- Value Added (GDP) – the “value added” to the economy or the unduplicated total value of goods and services. Includes only final goods to avoid double counting of products sold during an accounting period.
- Government Tax Revenue – the total amount of tax revenues generated for different levels of government.
- Wages and salaries – the total value of wages and salaries associated with employment impacts.
- Employment – the number of jobs created. It is expressed as the number of equivalent full-time jobs indicated in person years.

Moreover, it is convention to report the above economic impacts at the direct, indirect, and induced levels. These are defined below:

Direct impacts are changes that occur in “front-end” businesses that would initially receive expenditures and operating revenue as a direct consequence of the operations and activities of the University (e.g. the purchase of stationery by the University from a local supplier).

Indirect impacts arise from changes in activity by suppliers of the “front-end” businesses (e.g. purchase of merchandise from factory by local stationery business supplying the University).

Induced impacts arise from shifts in spending on goods and services as a consequence of changes to the wages and salaries of the directly and indirectly affected businesses (e.g. an increase in demand stimulated by University spending prompts stationery suppliers to hire new workers who then spend their wages on consumer goods in Manitoba).

Multipliers measure how much a dollar spent circulates and re-circulates within the economy magnifying the effects of the original expenditure.

The total impact of any given initial expenditure by the University is calculated by adding the direct, indirect and induced impacts.

2.7 Quantitative Methodology

In our study, economic impacts were measured using economic multipliers for Manitoba published by Statistics Canada and produced through Statistics Canada's input-output (I-O) model. Estimates based on I-O multipliers represent the effects of a one-time shock to the economy. Impacts arise from direct spending by an industry as well as through indirect spending via backward linkages (e.g. supply-chains) throughout the Manitoba economy.

Induced impacts were calculated using Statistics Canada data for the composition of goods and services consumed by households in Manitoba and Statistics Canada estimates of consumer spending within Manitoba versus spending outside of Manitoba. Household savings and taxes paid to the provincial and federal governments are considered to be leakage and are not accounted for in the induced impacts.

The proportion of direct, indirect and induced impacts occurring within Winnipeg, as opposed to within all of Manitoba, due to University expenditures is not directly observable. Therefore, to estimate the proportion of these impacts that occur within Winnipeg, we have allocated the impacts based on Winnipeg's share of industry employment. For example, if the University purchases \$100 in services from a Winnipeg design firm, that design firm may then increase its spending on office supplies. If Winnipeg accounts for 80% of Manitoba based employment in the office supply business, then it is reasonable to assume that 80% of the impacts will occur in Winnipeg.

This study has followed the same general methodology for estimating the economic impact of the University as the 2004 economic impact assessment.³

³ We have included University employment and salaries and wages in the direct impact of the University, whereas these impacts were excluded in the 2004 estimated impacts. Including direct University employment and associated wages and salaries produces multipliers that are robust and consistent with the literature relating to University economic impact.

3 University Profile

3.1 The University and Campus

The University was founded in 1877 and is the oldest university in Western Canada. It is located in Winnipeg, Manitoba, which is the largest city in the Province and drives the Manitoba economy. Winnipeg is the eighth largest city in Canada. The City and surrounding area has a population of approximately 700,000.⁴

The University is the largest and most comprehensive post-secondary institution in the Province. It consists of two campuses: the Fort Garry Campus, comprising of more than sixty academic and support buildings; and the Bannatyne Campus, a complex of ten buildings housing the University's medical, dental and pharmacy instructional units.

The University has several affiliated Colleges which include St. Andrew's College (Ukrainian Orthodox), St. John's College (Anglican), St. Paul's College (Roman Catholic), University College (secular), and College Universitaire de Saint-Boniface.

3.2 Faculty and Staff

As at March 31, 2009, the University employed a total of 8,242 staff. Of these total staff, 4,362 were full-time employees of which 1,862 were academic staff and 2,500 were support staff.

3.3 Student Body

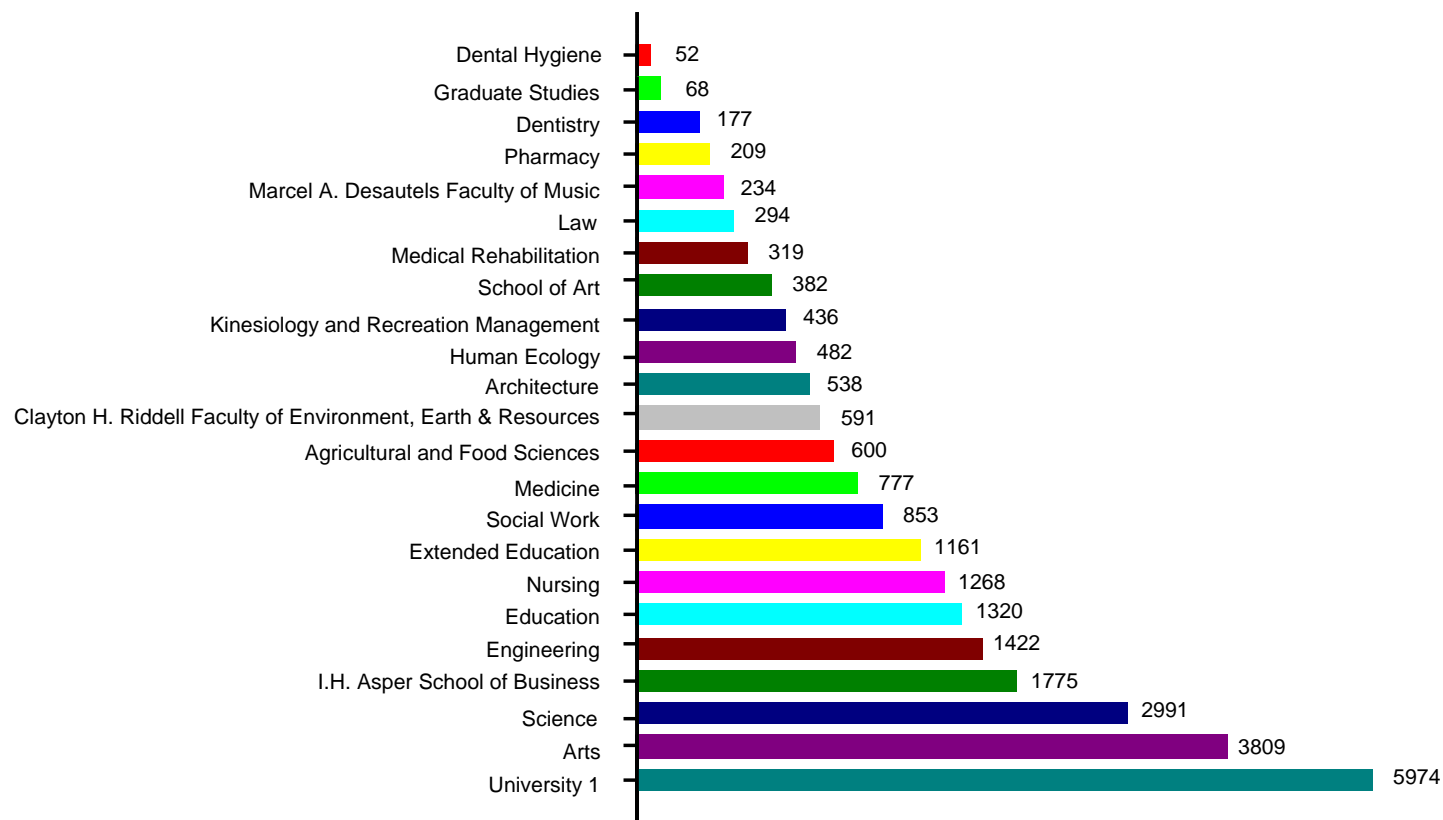
In a typical year, the University has an enrolment of more than 26,000 students. The majority of students who attend the University come from Manitoba. The following shows the breakdown of students by permanent residence for 2008:

Winnipeg	61%
Manitoba (outside Winnipeg)	23%
Other Provinces/Territories	8%
Other Countries	8%

⁴ Statistics Canada.

The following figure shows student enrolment levels for each of the University's 23 faculties and schools for the 2008/2009 academic year.

Figure 3.1 Combined Full-time and Part-time Student Enrolment by Faculty and School (as at November 1, 2008)



4 The University as a Community Resource

While the University is primarily an educational and research facility, it is also a significant source of social and cultural enrichment for the City and the Province. Stakeholder interviews and qualitative analysis have identified the following benefits provided by the University:

- A learning environment for the community
- A source of knowledge and assistance to the community
- A source of culture and recreation

4.1 A Learning Environment for the Community

In addition to its post-secondary education programs, the University offers many other types of educational programs that help to foster learning and benefit the greater community. Some examples include:

- The Faculty of Agricultural and Food Sciences began construction of the Glenlea Farm Education Centre, a centre designed to provide education to the community for various agricultural systems from food production and processing to food safety and lifestyle in June 2009.
- Mini University, a comprehensive day camp promotes social development and higher learning geared towards children of all ages.
- The Marcel A. Desautels Faculty of Music's Division of Preparatory Studies offers private or group music instruction to the public for various instruments, choir, jazz, and theory.
- The Stu Clark Centre for Entrepreneurship at the Asper School of Business provides many outreach programs including the Curry BizCamp in Entrepreneurship targeted to youth from lower socio-economic areas, as well as providing a certification course to allow middle and high school teachers to teach entrepreneurship in schools.
- The Women in Science and Engineering (WISE) program promotes science-related studies and careers to females in high school through the deliverance of workshops and camps for nearly 20,000 students.
- Seniors who are over 65 years old and are Canadian Citizens or Permanent Residents can attend classes and gain knowledge for interest purposes at the University with all application and tuition fees waived.

4.2 A Source of Knowledge and Assistance to the Community

The University also provides a significant source of information and various aids that are available to the public and provide benefit to the greater community. Some examples include:

- 19 University libraries are open for public use and are located throughout the two campuses and various local hospitals.
- The University hosts thousands of conferences and lectures that contribute to education in Manitoba.
- Law students at the Faculty of Law who work in the University of Manitoba Legal Aid Centre provide legal services to people financially unable to hire a lawyer.
- The Medical Information Line for the Elderly (MILE), which is staffed by the University pharmacists, provides information on prescription medicines to all Manitobans and is the only community based pharmacy consultation service in the Province.
- The students of the Dental Hygienist Program provide free information regarding proper dental care and oral hygiene through the Wisdom Tooth program.

4.3 A Source of Culture & Recreation

The University opens a number of its facilities to the public in an effort to promote culture and knowledge in Manitoba. Some of these facilities include museums relating to entomology, zoology, and mineralogy, as well as a planetarium, herbarium, and various galleries. The University also hosts a variety of musical and theatre performances.

The University actively promotes physical activity and offers physical and recreational opportunities to the public at its six fitness facilities throughout the two campuses. In addition, a wide range of sporting events are open for the public to attend and support the University of Manitoba Bisons and other teams as they compete in a wide range of sporting events.

5 The University as a Catalyst for Economic Growth

5.1 Contributing to Economic Growth

The University is able to continually contribute to local economic development and growth through the following three ways:

- purchasing and procurement activities,
- expanding human capital through education and training, and
- generating knowledge and innovation.

Manitoba has a diverse economy with various industries. Its primary industries are aerospace, agri-foods, finance and insurance, media, life science and biotechnology, transportation and distribution, mining, petroleum and manufacturing.

The University plays a key role in fostering these industries by providing and supporting research and an educated “home grown” work force essential to supporting Manitoba industries.

5.2 Training Future Business Leaders, Innovators, Social Service and Healthcare Providers

The University is an established academic and research centre that has generated skilled and valuable graduates since its inception. A highly educated community is key to being successful in a knowledge-based, global economy.

The University offers education in a diverse assortment of disciplines. Because of the University’s wide breadth of programs, the labour force needs of the Province are better met and the Province is able to retain students who would otherwise have to leave to take their training elsewhere. By building a domestic product of trained graduates, the Province will better retain educated people who will contribute to society and to the development of Manitoba’s economy. According to a 2007/2008 study completed by the Manitoba Council on Post Secondary Education, approximately 89% of 2007 graduates from Manitoba university institutions were living in Manitoba in 2008.

5.3 Meeting the Needs of the Province and the Residents of Manitoba

5.3.1 Tailoring Programs

In order to strategically respond to the social, economic and cultural needs of Manitoba, the University has expanded certain programs as well as developed new programs. Some examples of newly created programs designed to provide a foundation for careers in health care are a Bachelor

of Health Sciences, a Bachelor of Health Studies and a Masters of Physician Assistant Studies. In response to an increasing demand for dental hygienists and to fulfill dental requirements for population groups in need, specifically for the elderly, people in long term care facilities and Aboriginal populations, the School of Dental Hygiene has expanded the number of students able to enrol. Additionally, to respond to the Province's request to graduate more doctors, class sizes in the Faculty of Medicine have also been increased. Over the past 5 years, enrolment for first year medical students at the University has increased by 22%.

The University has close relationships within the business community to become more conscious of current and developing changes so that the curriculum in various areas can be updated. Many faculties have approached local businesses and industries (including education and healthcare) for feedback to better ensure that students are receiving appropriate training.

5.3.2 University of Manitoba Access Program

The University has created the University of Manitoba Access Program which is a program that sponsors university studies at the degree level to persons who have traditionally not had the opportunity for such experience because of social, economic, and cultural reasons or lack of formal education. Major focuses are academic and personal supports. These include an extensive orientation to university expectations, a staff taught credit course on study skills and exam preparation, individualized academic advising and personal counselling. Financial support is also available.

In addition, the Access Program provides a support network designed to increase the opportunity for Aboriginal student success. The University is highly proactive in seeking and recruiting Aboriginal students and now has a growing Aboriginal enrolment of more than 1,700 students. From 2004 to 2008, the number of self-declared Aboriginal Student Graduates at the University has increased by 26%. Further, as a result of the Access program, of 150 Aboriginal engineers throughout Canada, approximately one third are graduates from the U of M.

5.4 Supporting Growth of the Province

Through key stakeholder interviews conducted with the Deans from the Faculty of Engineering and the Faculty of Agricultural and Food Sciences, we have identified ways in which these two faculties contribute to economic growth and sustainability of the Province.

5.4.1 Engineering

The Faculty of Engineering plays an important role within the Province. Graduates from the faculty make up the great majority of engineers in the Province who are vital to the development of major Manitoba infrastructure projects and provide the knowledge base required to build bridges, railroads, buses and roads throughout the Province.

This faculty has built strong connections with local industries and the provincial government which have led to performing considerable amounts of valuable research for various businesses and the Province. These connections have also led to students being better connected to local businesses before graduation which leads to stronger retention. Some of the research performed by the faculty for the Manitoba government includes water and waste treatment, river bank erosion, flood mitigation, and traffic analysis. In addition, the faculty has been involved in a consulting role in a project to increase efficiency in hospital systems and operating rooms to process a greater number of people through surgery. As large amounts of the provincial budget go to health care, this research and collaboration will have a broader effect on the community to decrease wait times and reduce costs.

5.4.2 Agriculture

Agriculture is a fundamental part of Manitoba's economy. The Faculty of Agricultural & Food Sciences has a key role to play in the discovery and contribution of knowledge to serve the needs of Manitoba's agriculture and agri-food industry. Both students and faculty benefit from the close proximity to rural areas, federal research laboratories on campus and a strong agricultural community within Winnipeg. The faculty also contributes to the local community by working directly with nearby farmers on manure management strategies and agriculture production, and also by providing resources to farmers in order to help make it feasible for small farms to exist.

The Glenlea Research Station is a research facility operated by the University where the faculty has experimental farms and researches solutions for farming social issues, crop rotation, manure application, and minimizing environmental damage. Sharing the site of the Glenlea Research Station is the National Centre for Livestock and the Environment, a U of M based research community and facility that engages in world-class research partnerships to further the economic and environmental sustainability of livestock and crop production systems.

5.4.3 Supporting the City as a Major Centre

The University plays a strong role in the existence of many establishments around the Fort Garry/Fort Richmond area of Winnipeg. Since these areas are closest to the Fort Garry campus, many professors, employees and out of town students of the University live there, support the area and help it to prosper.

Several stakeholders interviewed expressed that if not for the University, the largest and most comprehensive university in the Province, that Winnipeg would not be the major centre that it is. When cities are major centres, they have a better ability to attract and retain people which contribute to economic sustainability and growth.

5.4.4 Health and Research Services

The University is the foundation of Manitoba's health research and services. The University is formally affiliated and actively collaborates with numerous organizations in the areas of health research and health care service delivery. Some of these organizations include: the University's two affiliated teaching hospitals (the Health Sciences Centre and the St. Boniface General Hospital), CancerCare Manitoba, John Buhler Research Centre, the Manitoba Institute of Child Health, Deer Lodge Centre, the Institute of Cardiovascular Science and the Canadian Centre for Agri-food Research in Health and Medicine. The vast majority of the health researchers working at these facilities hold academic appointments at the University and many are paid employees of the University.

Additionally, the University contributes to the health of the greater community as students from the Faculty of Medicine provide clinical service to over 30 different rural Manitoba communities and remote northern sites.

6 The University as a Knowledge Generator

6.1 World-Class Research

The University strives to be a leader among Canadian research-intensive universities, as well as a key player in building Manitoba's social and economic future. In addition, research and technology at the University greatly assists in faculty recruitment and retention. According to the "Top 50 Research Universities List 2008", the U of M ranked 12th out of Canada's top 50 research universities in terms of total sponsored research income.⁵

Research at the University has resulted in significant breakthroughs in the medical, agricultural, engineering and science fields, including:

- Developing canola, an oilseed crop which remarkably changed the Canadian agri-food industry and now provides most of Canada's edible oil.
- Global Public Health – Making advances and gaining knowledge that has significantly increased the understanding of HIV/AIDS such as being the first group to discover that HIV could be transmitted heterosexually and through mother's breast milk, and most significantly, identified groups of sex trade workers in Kenya who are immune to the virus. This has received international recognition in hopes of developing a vaccine. In addition, the University is an international leader in helping to decrease the spread of HIV/AIDS through development of education programs in developing countries.
- Mass Spectrometry – Developing new instruments and new techniques in mass spectrometry to examine matter at the molecular level with application in medicine, agriculture and biology.
- Climate Change – Exploring new sources of renewable energy and investigating effects of climate change in the Arctic.
- Global Grain Storage – Developing improved grain storage techniques and handling processes in order to better preserve grain in Canada and across the world to help improve the current state of world hunger.
- Communication Technology – Developing sophisticated wireless antenna technology to allow for two-way broadcasts which are used in satellite-phone systems by TV journalists to provide coverage of current events. Under development are many other technologies in remote sensing, telemedicine, smart vehicles and navigation systems.

⁵ Research Infosource Inc. "Top 50 Research Universities List 2008": <http://www.researchinfosource.com/top50.shtml>

Research at the University continues to provide a global impact. In addition to significant discoveries, the University is also involved in many ongoing research opportunities which have earned international acclaim. Some of these include:

- Sustainable Agriculture and Healthy Foods - Advancements in nutraceuticals and developing health-enhancing pills and powders derived from food with proven health benefits.
- New Materials – Developing stronger, lighter and less-expensive materials for multi-disciplinary use in areas such as aerospace, engineering and biomedicine.
- Regenerative Medicine – Opening a new regenerative medicine program and conducting stem cell research in order to find ways to regenerate cells that have stopped functioning, which is currently one of the most sought-after fields in medical research.
- Civil Societies/ Human Rights – Establishing the Arthur V. Mauro Centre for Peace and Justice, where researchers examine the social, economic and environmental aspects of peace and justice.
- Archaeology – Making advancements in digital imaging technology to reliably estimate demographic information from archaeological samples of bone or teeth.
- Healthy Aging – Examining our aging society and performing age-related studies leading to new information in areas such as cardiovascular health, psychological aspects of health and illness in later life, geriatric medicine and domestic/elder abuse.
- Aboriginal Health Research – Collaborating with Aboriginal communities and organizations to help measure the impact of social and environmental factors on health, and using research results to strengthen the health care system and to improve lives.
- Water Quality – Investigating water quality by looking at water policy and protection, aquatic ecosystems, nutrient leaching, pollution, climate change, drought and water infrastructure.

In addition to these key research areas, the University has also identified a number of future research opportunities in its 2008 Strategic Research Plan.

6.2 Research Chairs, Centres, Institutes, and Facilities

The University is currently home to 48 Canada Research Chairs (CRCs). CRCs are research professorships established by the CRC Program, which is a program that enables Canadian universities to attain excellence in research and helps to enhance Canada's competitiveness in the

worldwide knowledge-based economy. Chairholders are exceptional researchers who have been acknowledged either as world leaders or having the potential to lead in their field.

The University is home or a partner to 37 research centres, institutes, and shared facilities that foster collaborative research and scholarship, which reinforce the University's external profile as a key Canadian research institution and help to attract valuable research funding to the Province.

6.3 Research Funding

The University's research and special project funding for fiscal 2009 approximated \$133 million. This is an increase of approximately 8% from \$122 million of funding received in fiscal 2008.

The University receives this funding from many sources, including the Government of Canada (46%), the Government of Manitoba (14%), various sources in the United States (23%), foundations and associations (11%), business and industry (3%) and other (3%). The impact of these funds on the Manitoba economy is significant and is directly linked to the research efforts at the University.

6.4 Commercialization Efforts at the University

6.4.1 Technology Commercialization Programs

Research and technology at the University supports the growth of Manitoba's economy. New technology development is often recognized as the intellectual property of a university through patents, copyrights, trademarks, or other protective measures. Less tangible examples include partnerships, funded research and knowledge gained by students.

The University has developed the Technology Transfer Office ("TTO") which is one of Canada's most successful and productive intellectual asset programs according to The Association of University Technology Matters Annual Survey Data. The TTO assists in licensing technology and creating start up companies based on technology developed at the University. Since 2005, TTO has launched six new Canadian start-up companies.

The University has a strong patent portfolio comprised of 423 active patents and has successful licensing programs yielding a total of 76 active licenses. Royalty income from licensing activities was approximately \$2.2 million in fiscal 2009. In addition, the University has experienced a 43% increase in the number of invention disclosures over the past five years, with 66 new disclosures made in 2008/2009.

The University also plays a key role in Manitoba's overall innovative capacity. Fostering innovation helps to increase investment and create new enterprise and job opportunities for Manitobans. Smartpark, which is the University's research and technology park, aims to create growth by developing innovative research initiatives between the University and industry and by cultivating an environment to support and retain highly skilled students and researchers in the region.

7 Challenges

Based on interviews conducted with stakeholders, many positive aspects of the University were identified as noted in sections 4-6 in the Report. Stakeholders also identified several challenges of the University that need to be addressed in order for the University to continue to be a successful post-secondary institution and a major economic driver in Manitoba.

7.1.1 Funding

With limited budget increases and government-imposed tuition freezes since September 2000, one of the University's major challenges includes overcoming shortages in funding while still remaining competitive with other universities across the country. In April 2008, the Manitoba government announced that the tuition freeze would be in effect for one more academic year, and in September 2009, tuition fees will increase by 4.5%. Even though the cost of post-secondary education in Manitoba will rise in the near future, university tuition in the Province will still be lower than neighbouring provinces and will be below the Canadian average. Although stakeholders recognized that the University has an excellent reputation at being accessible in various ways, concern was expressed that as tuition begins to rise from frozen levels, that post-secondary education and the University may become less accessible to students originating from outside of Winnipeg and for students coming from lower income earning families.

7.1.2 Infrastructure

Another challenge faced by the University is that the physical infrastructure requires attention and upgrades being that it is the oldest university in Western Canada. The University is addressing this issue through planning of the capital budget and is in the process of upgrading several buildings throughout campus. Section 9.0 discusses capital projects in more depth.

7.1.3 Demographics

As the demographic trend shifts, enrolment figures at the University will be challenged by smaller high school graduate pools. Also, the ability to recruit and retain faculty is affected through the retirement of the baby-boomer generation and through a reduction in the number of doctorates and doctoral candidates being trained. In order to address these issues, the University is implementing strategic enrolment and retention management programs. This will help to recruit students that are more in line with their institutional goals and to retain more graduates in the Province.

7.1.4 Strengthening Relationships

It was also identified that in order to help retain more students in the Province after graduation, it is imperative for students to become better acquainted with local industry at the beginning of their university career. Interaction identifies the added value that graduates can provide to the City and the Province, the contributions that local businesses make to the University, and the benefits and opportunities of staying in Manitoba. It was suggested that this could be accomplished through introduction of more co-op programs and guest speakers from industry in classrooms.

Several stakeholders that were interviewed expressed that it is crucial for the University to continue to further their relationships and collaborations with local businesses, other universities, industry, other institutions and the community at large. A key challenge for the University in the next few years is to continue to build these relationships and to respond effectively to the needs of the Manitoba economy.

7.1.5 Competitiveness

It was further identified by stakeholder interviews that the University may be challenged by its size and breadth of program offering. The University is facing increased competition for grants, students, and faculty from other universities. Many stakeholders expressed the need for the University to promote their strengths and find a focus or niche within their vast program offering in order to become more competitive with other universities.

8 Economic Impact of Operating & Research Expenses

8.1 The University as an Operating Unit

The University produces significant economic impacts from expenditures related to its day-to-day operations, including expenditures for payroll, purchases of goods and services and research. The analysis that follows assumes that the operating expenditure data provided by the U of M for the 2009 fiscal year is representative of an average year and therefore the economic impact calculations will reflect the annual economic contribution of the University's operations.

In the following analysis, we have defined direct output impacts as the expenditure, value added, and employment directly attributable to operations of the University. Indirect impacts include consumption expenditures by faculty and staff in Manitoba as well as the second-round impacts of University spending on goods and services. Induced impacts are derived from consumption expenditures from wages and salaries induced by direct and indirect expenditures of the University.

Because wages and salaries comprise a significant share of the University's operating budget, it is useful to diagram how the impacts related to wages and salaries are defined. The direct, indirect, and induced effects can be illustrated by considering the following sequence of events⁶:

Step 1: The University (or any business) pays its employees.

Step 2: These employees in turn spend a proportion of their salaries on local goods and services.

Step 3: A proportion of these local sales are paid out as wages to local employees and profits to local employers/business owners.

Step 4: A proportion of this income is in turn re-spent on local goods and services.

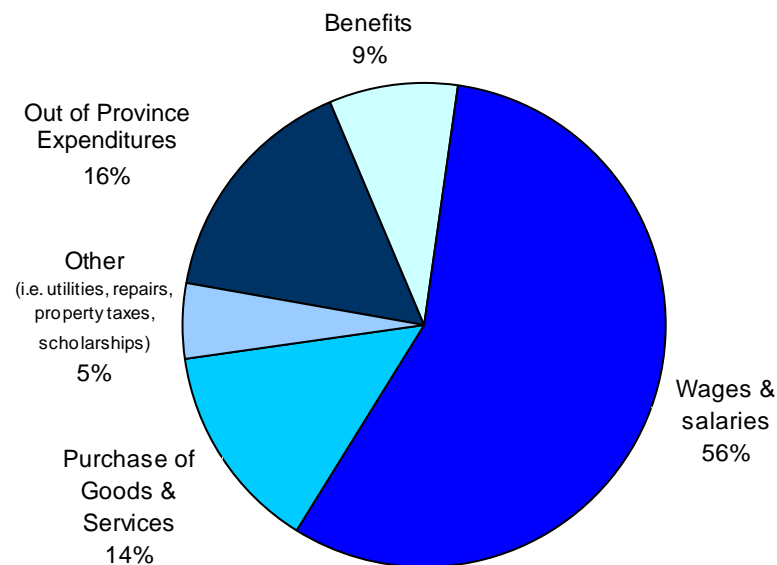
According to the above sequence, Step 1 (payment of wages and salaries to employees) accounts for the direct effect; Step 2 (spending of wages and salaries) accounts for the indirect effect; Steps (3) and (4) (subsequent payment and expenditures of wages and salaries) account for the 'induced' impacts.

⁶ Van A. Lantz, John. RG Brander, Yigezu A. Yigezu, "The Economic Impact of the University of New Brunswick: estimation and comparisons with other Canadian Universities", A Report Submitted to the Vice President (Academic), University of New Brunswick, September 2002

8.2 Operating and Research Expenditures

The U of M has a significant annual operating budget. The operational budget for the 2009 fiscal year ending in March was \$588 million. The majority of expenditures are related to compensation for staff and faculty, but also include purchases of goods and services, capital spending, scholarships, and employment benefits. The composition of operating expenditures in Manitoba is displayed in Figure 8.1.

Figure 8.1 University of Manitoba Operating and Research Expenditures



According to data provided to PwC by the U of M, \$92.3 million of university operating and research expenditures occurred outside of Manitoba and therefore were excluded from the analysis. We have also excluded spending for capital asset acquisition to avoid double-counting items included in the impacts generated by the University's capital expenditures as well as items that do not produce immediate economic impacts such as pension and employment insurance. In addition, benefits such as group health and disability insurance have been excluded as they have already been factored into the analysis through estimated household consumption spending by University employees. After adjusting for these items, the total direct expenditure included in the model was equal to \$426 million.

8.2.1 Gross Output Impacts

The gross output impacts attributable to the direct operations of the University in 2009 were calculated by itemizing operational expenditures and then mapping them to North American Industrial Classification System (NAICS) codes for use in our economic impact model.

As summarized in Table 8.1, the operating and research expenditures of the University created multiplier effects throughout the Manitoba economy equalling \$1.85 for each \$1 spent for a total gross output impact of \$789 million. Much of the impact is estimated to have occurred locally, with \$643 million (82%) of the total gross output impact occurring within the City.

The impact of operational expenditures is particularly large, and creates significant multiplier effects, because the majority of operational expenditures are for University payroll. Wages and salaries paid out by the University are assumed to be spent within the Manitoba economy, generating sales for local businesses which in turn pay out a portion of those sales as wages and salaries which are again circulated through the economy producing large induced multiplier effects.

8.2.2 Value Added Impacts

The gross output generated by the University produces associated value added of \$640 million in Manitoba, \$541 million of which is estimated to occur within the City.

Each dollar of expenditure by the University is estimated to generate \$1.50 in value added in Manitoba. The size of the multiplier for operational expenditures is due to salary and wages component of operational spending. Salaries and wages paid by the University are by definition part of the University's direct value added and create further value added in the Manitoba economy as they are spent on goods and services.⁷

Table 8.1 Gross Output Impacts of 2009 Operating and Research Expenditures Incurred by the University within the Province of Manitoba

Impact: Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$426,487,912		
Total Gross Output	\$643,390,647	\$789,301,979
<i>Direct</i>	\$395,653,223	\$426,487,912
<i>Indirect / Induced</i>	\$247,737,423	\$362,814,067
<i>Multiplier</i>	1.51	1.85

Table 8.2 Total Value Added Impacts of 2009 Operating and Research Expenditures Incurred by the University within the Province of Manitoba

Impact: Value Added	Winnipeg	Manitoba
Initial Expenditure - \$426,487,912		
Total Value Added	\$541,461,955	\$639,839,998
<i>Direct</i>	\$370,840,283	\$390,291,794
<i>Indirect / Induced</i>	\$170,621,673	\$249,548,203
<i>Multiplier</i>	1.27	1.50

⁷ Value added is essentially the sum of profits and wages, therefore, wages and salaries paid by the University are part of the University's direct contribution to value added or GDP.

8.2.3 Employment Impacts

Operational and research expenditures by the University are estimated to support 11,537 jobs in Manitoba through direct, indirect, and induced effects. Of these jobs, 9,613 are estimated to be located in the City. Because its operations occur primarily in Winnipeg, a majority (83%) of the total employment impact supported by expenditures of the University is estimated to occur locally.

Labour income includes the value of salaries and wages paid directly by the U of M to faculty and staff as well as those stimulated by the University's operations expenditures. In total, labour income supported by the University equals \$476 million. Approximately 90% of the labour income impact is estimated to have occurred in Winnipeg.

The high proportion of labour income earned in Winnipeg is due to the \$332 million of direct salaries and wages paid by the University.

8.2.4 Tax Generation Impacts

We have estimated that the University generated province-wide tax impact equals \$74 million in federal taxes, \$58 million in provincial taxes and \$13 million in municipal taxes.

These tax impacts include estimated federal and provincial personal and corporate income tax as well as indirect taxes such as GST, PST, and property taxes.

Table 8.3 Total Employment Impacts of 2009 Operating and Research Expenditures Incurred by the University within the Province of Manitoba

Impact: Employment	Winnipeg	Manitoba
Initial Expenditure - \$426,487,912		
Total Employment	9,613	11,537
<i>Direct</i>	6,355	6,782
<i>Indirect / Induced</i>	3,258	4,755
<i>Multiplier</i>	1.51	1.70

Table 8.4 Total Labour Income Impacts of 2009 Operating and Research Expenditures Incurred by the University within the Province of Manitoba

Impact: Labour Income	Winnipeg	Manitoba
Initial Expenditure - \$426,487,912		
Total Labour Income	\$430,323,682	\$475,978,711
<i>Direct</i>	\$358,003,203	\$370,079,280
<i>Indirect / Induced</i>	\$72,320,479	\$105,899,432
<i>Multiplier</i>	1.01	1.12

Table 8.5 Total Tax Revenue Impacts of 2009 Operating and Research Expenditures Incurred by the University within the Province of Manitoba

Impact: Total Taxes	Winnipeg	Manitoba
Initial Expenditure - \$426,487,912		
Total Taxes	\$115,565,315	\$145,701,753
<i>Federal</i>	\$59,269,436	\$74,489,753
<i>Provincial</i>	\$46,571,035	\$58,556,495
<i>Municipal</i>	\$9,724,844	\$12,655,504

8.3 Summary

- The University's initial direct operating and research expense is estimated at \$426 million, of which \$332 million is attributable to salaries and wages to administrative and academic staff. The initial operating and research expenditure generates an estimated \$789 million in total gross output province-wide and \$643 million within Winnipeg. Every \$1 million in operating and research expenditures produces \$1.85 million in gross output province-wide and \$1.51 million within Winnipeg.
- Operating and research expenditures are estimated to generate about \$541 million in total value-added economic impact in Winnipeg and \$640 million throughout Manitoba. Every \$1 million in university operating and research expenditures creates \$1.5 million in value-added impact in the Province.
- University operating and research expenditures are estimated to support 11,537 jobs in Manitoba of which 9,613 are within Winnipeg. The operating and research expenditures translate into \$476 million and \$430 million in total labour income to the Province and the City, respectively.
- The University's operating and research expenditures are estimated to generate \$116 million in taxes from activities within Winnipeg and \$146 million in taxes province-wide.

9 Economic Impact of Capital Projects

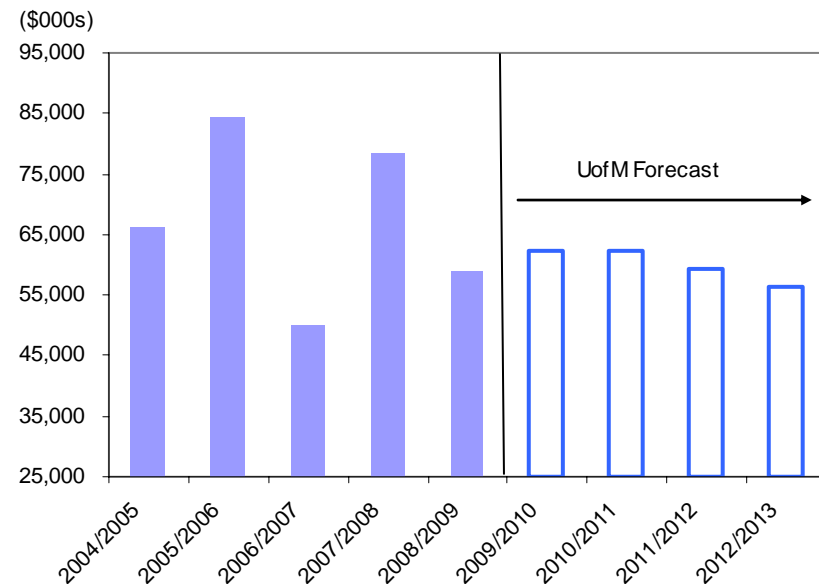
9.1 Capital Projects

In 2008, the University announced a large and ambitious plan, dubbed Project Domino, to redevelop its Fort Garry campus. Project Domino is a \$100-million project aimed at revitalizing the University's existing buildings and infrastructure. The project will retrofit existing facilities and relocate faculties and departments to better suit their needs. The centrepiece of the project is the renovation of Tache Hall, currently a student residence, which will become home to the Marcel A. Desautels Faculty of Music and the School of Art. Additionally, the plan for the Asper School of Business's new Downtown Campus is underway. The goal of this new campus is to offer cutting edge business education in a downtown location, within close reach of the Province's major centre of commerce. Other future capital plans include a new \$30 million residence building and a \$25 million deferred maintenance project which includes asbestos removal, roofing and sewer upgrades.

Other major capital projects recently completed include:

- **Delta Marsh Field Station** – upgrading of existing facility to a new energy-efficient facility with classroom space, laboratories for teaching and research, plant and animal specimen collections and a computer laboratory.
- **Aboriginal House** – a project designed to provide meeting space, career and academic counselling, student lounge, study area, and office space for the over 1,600 students of Aboriginal heritage enrolled at the University of Manitoba.
- **The National Centre for Livestock and the Environment** – the National Centre will provide a facility and tools for researchers from many disciplines to work together to find long-term solutions to the environmental challenges of intensive livestock production systems.
- **The Richardson Centre for Functional Foods and Nutraceuticals (RCFFN)** - the RCFFN is a \$31.3 million, 55,000 square foot hub for research into the health and medicinal properties of prairie crops such as wheat, oats and canola.

Figure 9.1 Actual and Forecasted In-Province Capital Spending by the University of Manitoba, 2004/05-2012/13



Source: University of Manitoba

The U of M has provided PwC with forecasts of its capital spending for its fiscal years 2008/09 to 2012/13. As shown in Figure 9.1, the University is forecasting capital project spending (excluding leakage for spending outside of Manitoba) of approximately \$240 million on a cumulative basis and for the 2008/09 fiscal year the University spent \$59 million in capital expenditures. The University has allocated \$227 million towards major construction projects and the remaining \$72 million for minor capital acquisitions (e.g. computers, books, vehicles, furniture, etc). In our analysis, we have assumed the \$72 million expenditure on minor capital acquisitions are provided by information and cultural industries.

It is important to note that the impacts from the University capital expenditures are one-time impacts based on completion of all of the projects in their entirety and do not apply on an annual basis.

Also, the forecasted capital spending in Figure 9.1 does not include major projects currently being considered by the University such as a new stadium or development of the Southwood golf course lands. Expenditures on large capital projects such as those referenced above would create substantial one-time economic impacts in addition to the impacts outlined in the following sections.

9.1.1 Gross Output Impacts

As summarized in Table 9.1, cumulative capital spending for equipment, construction and renovations, and other expenditures are estimated to be \$299 million. These expenditures are estimated to produce multiplier effects in Manitoba of \$1.69 in gross output per \$1 of capital spending. Total gross output stimulated in the Manitoba economy is therefore estimated to be \$507 million, of which \$418 million is estimated to occur within Winnipeg.

Table 9.1 Total Gross Output Impacts of Average Annual Capital Expenditures Forecasted by the University of Manitoba

Impact: Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$299,478,342		
Total Gross Output	\$417,655,133	\$506,909,442
<i>Direct</i>	\$276,013,553	\$299,478,342
<i>Indirect / Induced</i>	\$141,641,580	\$207,431,100
<i>Multiplier</i>	1.39	1.69

9.1.2 Value Added Impacts

Gross output generated by the University's proposed capital expenditures are estimated to produce associated value added of \$222 million in Manitoba, \$172 million of which is estimated to occur in Winnipeg. Province-wide, each \$1 of capital expenditures creates \$0.74 of added value.

Table 9.2 Total Value Added Impacts of Average Annual Capital Expenditures Forecasted by the University of Manitoba

Impact: Value Added	Winnipeg	Manitoba
Initial Expenditure - \$299,478,342		
Total Value Added	\$171,983,740	\$222,251,693
<i>Direct</i>	\$88,500,486	\$100,101,611
<i>Indirect / Induced</i>	\$83,483,254	\$122,150,082
<i>Multiplier</i>	0.57	0.74

9.1.3 Employment Impacts

The University's estimated capital projects and equipment expenditures supports 4,063 jobs in Manitoba. As a significant portion of the University's capital spending is for major construction and renovations, we have assumed that these construction jobs are located in Winnipeg. We have therefore estimated that 3,174 of the jobs supported by University capital expenditures are in Winnipeg.

Employment supported by the University's capital spending is estimated to have associated labour income impacts equal to \$129 million in Manitoba, of which \$101 million is estimated to stay in the City.

9.1.4 Tax Generation Impacts

We have estimated that the University would generate province-wide tax impacts equalling \$32 million in federal taxes, \$27 million in provincial taxes and \$7 million in municipal taxes through its capital expenditures.

These tax impacts include estimated federal and provincial personal and corporate income tax as well as local indirect taxes such as property taxes.

Table 9.3 Total Employment Impacts of Average Annual Capital Expenditures Forecasted by the University of Manitoba

Impact: Employment	Winnipeg	Manitoba
Initial Expenditure - \$299,478,342		
Total Employment	3,174	4,063
<i>Direct</i>	1,616	1,787
<i>Indirect / Induced</i>	1,558	2,277
<i>Multiplier</i>	1.96	2.27

Table 9.4 Total Labour Income Impacts of Average Annual Capital Expenditures Forecasted by the University of Manitoba

Impact: Labour Income	Winnipeg	Manitoba
Initial Expenditure - \$299,478,342		
Total Labour Income	\$100,667,143	\$128,708,174
<i>Direct</i>	\$58,059,569	\$66,317,080
<i>Indirect / Induced</i>	\$42,607,575	\$62,391,094
<i>Multiplier</i>	0.34	0.43

Table 9.5 Total Tax Revenue Impacts of Average Annual Capital Expenditures Forecasted by the University of Manitoba

Impact: Total Taxes	Winnipeg	Manitoba
Initial Expenditure - \$299,478,342		
Total Taxes	\$51,655,200	\$65,348,588
<i>Federal</i>	\$24,970,215	\$31,589,623
<i>Provincial</i>	\$21,327,784	\$26,981,612
<i>Municipal</i>	\$5,357,201	\$6,777,353

9.2 Summary

- The University's cumulative capital expenditures for the 2009 to 2013 fiscal years are estimated to be \$299 million generating an additional \$207 million in multiplier effects. The total gross output impact from university capital expenditure is estimated at \$507 million province-wide and \$418 million within Winnipeg.
- Every \$1 million of the \$299 million cumulative capital expenditures translate into approximately \$1.39 million in gross output in Winnipeg and \$1.69 million in gross output province-wide.
- University capital expenditures are estimated to produce \$222 million in total value added impact, of which \$172 million are from activities within Winnipeg. Every \$1 million spent on capital projects is estimated to result in \$740 thousand in added value in the Province and \$570 thousand in Winnipeg.
- Capital project expenditures are estimated to support a total of 4,063 jobs in the Province, of which 3,174 are from activities in Winnipeg. Capital expenditures generate \$129 million in total labour income in the province and \$101 million within Winnipeg.
- The \$299 million capital expenditures result in \$32 million in tax revenue to the federal government, \$27 million to the provincial government, and \$7 million to local governments. Total tax revenue of \$52 million is estimated from activities within Winnipeg.

10 Economic Impact of Out-of-town Visitors

In addition to the economic impacts generated from the University's operational, research and capital project expenditures, the University also contributes to boosting Winnipeg's tourism sector. The University attracts out-of-town visitors attending sporting events, conferences, cultural events, convocations, campus recruitment tours and casual visitors⁸ visiting students and faculty. These visitors generate economic impacts through spending on food, lodging, transportation, and retail in Winnipeg. In the following analysis, we assume these visitors would not have come to Winnipeg in the absence of the University. The following section details the impact of visitor spending on the Manitoba and Winnipeg economies.

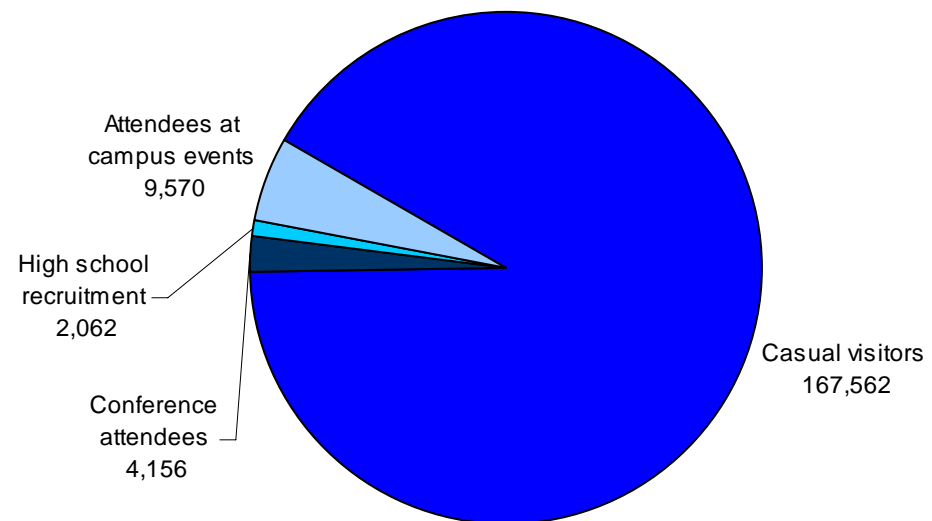
10.1 Visitation Overview

In this report we have defined out-of-Winnipeg visitation attributable to the University as comprised of the following categories:

- Casual visitors
- Conference attendees
- Attendees at campus events⁹
- High school recruitment

We have estimated total out-of-town visitors to the University equal to 183,349 in the 2008/2009 academic year based on data provided by the University and modeling assumptions derived from past economic impact studies¹⁰.

Figure 10.1 Visitors to the University of Manitoba



⁸ Out-of-town family and friends.

⁹ Each group of visitors is assumed to be exclusive; there is no double counting of visitors between the different visitor categories.

¹⁰ PwC Regional Economic Benefit Study: University of Waterloo (2001) and PwC Regional Economic Impact Analysis: University of Manitoba (2003).

The categories of visitors are defined as follows:

- 10.1.1 Casual Visitors:** consist of persons visiting and staying with University faculty, support staff, and/or students. This type of visitation is difficult to quantify since casual visitors do not have to register their campus presence. Therefore, we have relied on assumptions from *PwC Regional Economic Benefit Study: University of Waterloo* (2001) to estimate the number of casual visitors. Using the assumptions presented in Appendix C, Table C.1, the total number of casual visitors for the 2008/2009 academic year was estimated at 167,560.
- 10.1.2 Conference Attendees:** consist of out-of-province visitors to the U of M for conferences, seminars and workshops. We were unable to include visitors originating from outside Winnipeg but from within Manitoba due to a lack of data regarding the precise point of origin. Based on event data provided by the University and on the *2009 Conferences at University of Manitoba*, the total number of overnight visitors totalled about 4,156 persons.
- 10.1.3 Attendees at Campus Events:** consist of out-of-province visitors attending alumni events including convocation, sporting events and homecoming and reunions. For the 2008/09 academic year, the total number of out-of-town attendees and guests was estimated at 5,070 for convocations, 1,127 for homecoming and reunions, and 3,373 for players and coaches playing at games hosted by the University.
- 10.1.4 High School Recruitment:** consists of overnight out-of-Winnipeg high school students, parents, and high school counsellors who attend various recruitment activities on campus, such as campus tours, counsellor's seminar, evening of excellence, information day events, Manitoba IB (International Baccalaureate) Great Escape day, and international student workshops. The total number of out-of-town visitors to high school recruitment is estimated at 2,062.

10.2 Visitor Expenditures

Economic impacts related to casual visitor expenditures were calculated based on the following key underlying assumptions:

- Average expenditures from overnight visitors to Manitoba are estimated to be \$210 per day.¹¹
- University faculty, support staff, and/or students are assumed to host casual visitors in their homes. Therefore, casual visitor average expenditure excludes housing and it is assumed to be \$149 per day. To avoid double counting, we also assumed \$149 per day for conference attendees who stayed on-campus in residence.

¹¹ Based on 2004 CITIES Database from Statistics Canada. We are able to adjust the average visitor spending by the visitor's region of origin. We have also adjusted the 2004 data for Manitoba inflation between 2004 & 2009.

- Out-of-town casual visitors, conference attendees, prospective students and parents, and convocation attendees are assumed to spend two nights in Winnipeg. Out-of-town athletes and coaches are assumed to spend one night in Winnipeg, while homecoming and reunion attendees are assumed to spend three nights in Winnipeg.

Under these assumptions, the visitor expenditure by out-of-town persons is estimated at \$56 million in expenditures for the 2008/2009 academic year.

10.2.1 Gross Output Impacts

Expenditures made by visitors to the University that originated from outside of Winnipeg are estimated to be approximately \$56 million. These expenditures are estimated to produce multiplier effects of \$1.83 in total gross output to Manitoba for each \$1 of spending by out-of-town visitors associated to the University.

The total province-wide gross output impacts to the province are estimated to be \$102 million. Approximately \$87 million of this gross output is estimated to have occurred within Winnipeg.

10.2.2 Value Added Impacts

Out-of-town visitors are estimated to have supported nearly \$51 million in value-added within Winnipeg during the 2008/09 academic year. Total province-wide value added supported by out-of-province visitors to the University were estimated at \$60 million.

10.2.3 Employment Impacts

The \$56 million in expenditures by out-of-Winnipeg visitors to the University are estimated to support 1,672 full-time jobs province-wide through direct, indirect, and induced effects. We further estimate that the majority of these jobs (89% of the total impact) are located in Winnipeg.

Table 10.2 Total Gross Output Impacts of Expenditures by Out-of-town Visitors

Impact: Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$55,833,206		
Total Gross Output	\$87,367,117	\$102,012,892
<i>Direct</i>	\$55,833,206	\$55,833,206
<i>Indirect / Induced</i>	\$31,533,910	\$46,179,686
<i>Multiplier</i>	1.56	1.83

Table 10.3 Total Value Added Impacts of Expenditures by Out-of-town Visitors

Impact: Value Added	Winnipeg	Manitoba
Initial Expenditure - \$55,833,206		
Total Value Added	\$50,854,722	\$60,262,765
<i>Direct</i>	\$30,557,455	\$30,557,455
<i>Indirect / Induced</i>	\$20,297,267	\$29,705,310
<i>Multiplier</i>	0.91	1.08

Table 10.4 Total Employment Impacts of Expenditures by Out-of-town Visitors

Impact: Employment	Winnipeg	Manitoba
Initial Expenditure - \$55,833,206		
Total Employment	1,496	1,672
<i>Direct</i>	1,114	1,114
<i>Indirect / Induced</i>	381	558
<i>Multiplier</i>	1.34	1.50

Employment supported by visitor expenditures is estimated to have associated labour income impacts equal to \$40 million in Manitoba, of which \$35 million is estimated to stay in the City.

10.2.4 Tax Generation Impacts

We have estimated that out-of-town visitors to the University generated \$17 million in total tax impacts province-wide. These impacts include \$8 million in federal taxes, \$6.5 million in provincial taxes and \$3 million in municipal taxes. \$14 million in total taxes were estimated from activities within Winnipeg.

The above tax impacts include estimated federal and provincial personal and corporate income tax as well as other indirect taxes such as GST, PST, and property taxes.

10.3 Summary

- Visitors to the University are estimated to generate \$56 million in expenditures, which translates into \$102 million in total gross output province-wide. Economic activity stimulated in Winnipeg accounts for \$87 million of the total estimated gross output impacts.
- Spending by visitors to the University in the 2008/09 academic year is estimated to generate \$51 million in value added impact in Winnipeg and \$60 million province-wide.
- Spending by visitors to the University in the 2008/09 academic year is estimated to have created 1,672 full-time jobs in the Manitoba economy with 1,496 of these jobs are located in Winnipeg. Visitor expenditures are estimated to generate \$40 million in total labour income impacts in Manitoba and \$35 million within Winnipeg.
- Visitors attributable to the University are estimated to generate approximately \$17 million in taxes, of which \$14 million are from activities within Winnipeg.

Table 10.5 Total Labour Income Impacts of Expenditures by Out-of-town Visitors

Impact: Labour Income	Winnipeg	Manitoba
Initial Expenditure - \$55,833,206		
Total Labour Income	\$35,300,746	\$39,602,641
<i>Direct</i>	\$26,036,077	\$26,036,077
<i>Indirect / Induced</i>	\$9,264,668	\$13,566,564
<i>Multiplier</i>	0.63	0.71

Table 10.6 Total Tax Revenue Impacts of Expenditures by Out-of-town Visitors

Impact: Total Taxes	Winnipeg	Manitoba
Initial Expenditure - \$55,833,206		
Total Taxes	\$14,433,828	\$17,286,590
<i>Federal</i>	\$6,613,381	\$7,920,478
<i>Provincial</i>	\$5,432,845	\$6,506,615
<i>Municipal</i>	\$2,387,602	\$2,859,498

11 Economic Impact of Out-of-town Students

Spending by out-of-town students attending U of M is of significant importance to the Manitoba and Winnipeg economies. The University attracts students from across Manitoba and Canada, and in turn these students spend money in the local economy. Without the presence of the University, the spending would not occur and therefore we feel that it is important to include expenditures by out-of-town students in our analysis.

11.1 Students

The attraction of out-of-town students to Winnipeg generates an additional economic impact to the City and Manitoba through the student's spending on housing, food, retail, transportation and entertainment.

In the 2008/09 academic year, the U of M had 26,238 students enrolled in its undergraduate and graduate programs. Of the total enrollment, 1,157 full-time and part-time students lived on campus in residence¹². As shown in Figure 11.1, 61% of students originate from the City of Winnipeg, 23% are from other parts of Manitoba, 8% of students are from other parts of Canada and the remaining 8% from international locations.

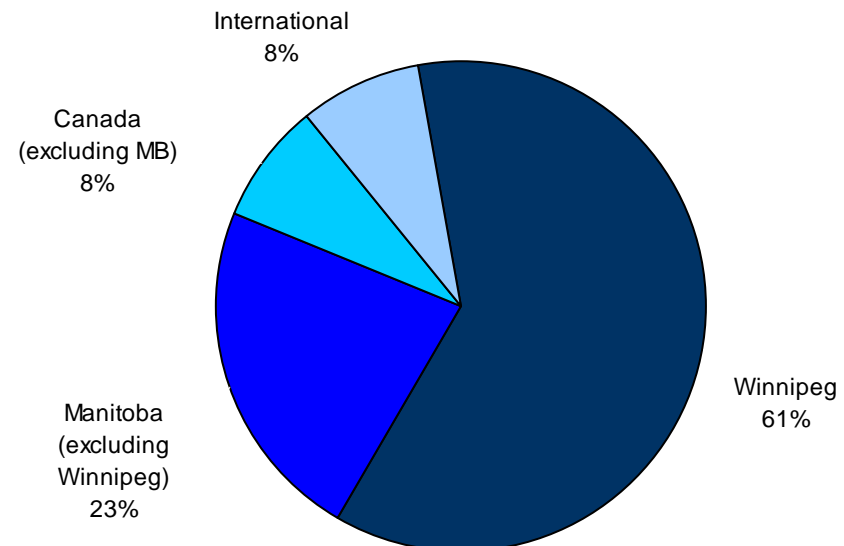
For purposes of this study, we assume that without the presence of the University, out-of-town students would not have relocated to Winnipeg. Based on this assumption, we have estimated only the economic impact of out-of-town University student expenditures.

11.2 Student Expenditures

Our estimate of student expenditures is based on the following assumptions:

- All expenditures for tuition and books have been accounted for in Section 8.
- Out-of-town students stay in Winnipeg for only 8 months during the Fall (Sep-Dec) and Winter (Jan-Apr) academic sessions.

Figure 11.1 Origin of University of Manitoba students



Source: University of Manitoba

¹² Data provided by the University of Manitoba

- 50% of part-time student expenditures have been deducted as being not attributable to the University.
- 100% of housing and 50% of food expenditure is deducted for students living on campus.
- On-campus residence is comprised only by full-time students from outside Winnipeg. On-campus residence is based on the share of full-time students by origin.
- International students are enrolled only in full-time programs.
- Table 11.1 illustrates the number of enrolled students in the University by the geographic origin, while the average expenditure per month per full-time student is described in Table 11.2.

Table 11.1 Students Enrolled at University of Manitoba and On-campus Residence by Origin

Student Origin	Full-time	Part-time	Total	On-campus	Off-campus
Winnipeg	12,173	3,832	16,005	-	16,005
Manitoba (excluding Winnipeg)	5,395	640	6,035	680	5,355
Canada (excluding MB)	1,685	415	2,099	212	1,887
International	2,099	-	2,099	265	1,834

Source: University of Manitoba and PwC calculations

Table 11.2 University of Manitoba student living expenses

Category	Amount (\$ / month)
Transportation	\$57
Retail and miscellaneous	\$265
Food	\$208
Housing	\$425
Entertainment	\$60

Source: University of Manitoba Student Affairs

Based on the assumptions outlined above, we have estimated that total expenditures by Manitoba students (excluding Winnipeg) is about \$43 million. Total expenditures from international and Canadian students (excluding Manitoba) are an estimated \$30 million. Therefore, the following analysis includes \$73 million in total out-of-town student expenditures.

11.2.1 Gross Output Impacts

The gross output impacts attributable to expenditures by out-of-town students enrolled at the University are estimated to be \$73 million. These expenditures are estimated to create multiplier effects throughout the whole province of \$1.78 in gross output per \$1 spent. Therefore the estimated impact generated by out-of-town students is \$130 million in total gross output province-wide. Approximately \$112 million of the gross output created is estimated to occur in Winnipeg.

11.2.2 Value Added Impacts

Expenditures by students from outside Winnipeg result in total value added of \$76 million in Manitoba and \$65 million within Winnipeg. Each \$1 spent by out-of-town students is estimated to have created \$1.04 in value added impact in Manitoba.

11.2.3 Employment Impacts

The \$73 million in initial expenditures from the University's out-of-town students are estimated to support about 2,043 full-time jobs province-wide through direct, indirect, and induced effects. We further estimate that the majority of these jobs (1,825 or 89% of the total impact) are located in Winnipeg.

Table 11.3 Total Gross Output Impacts of Expenditures by Out-of-town Students

Impact: Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$73,414,464		
Total Gross Output	\$112,277,487	\$130,327,451
<i>Direct</i>	\$73,414,464	\$73,414,464
<i>Indirect / Induced</i>	\$38,863,023	\$56,912,986
<i>Multiplier</i>	1.53	1.78

Table 11.4 Total Value Added Impacts of Expenditures by Out-of-town Students

Impact: Value Added	Winnipeg	Manitoba
Initial Expenditure - \$73,414,464		
Total Value Added	\$64,631,847	\$76,521,785
<i>Direct</i>	\$40,179,659	\$40,179,659
<i>Indirect / Induced</i>	\$24,452,188	\$36,342,126
<i>Multiplier</i>	0.88	1.04

Table 11.5 Total Employment Impacts of Expenditures by Out-of-town Students

Impact: Employment	Winnipeg	Manitoba
Initial Expenditure - \$73,414,464		
Total Employment	1,825	2,043
<i>Direct</i>	1,353	1,353
<i>Indirect / Induced</i>	472	689
<i>Multiplier</i>	1.35	1.51

Total employment created by out-of-town student expenditures is estimated to have an associated labour income impact of \$47 million, of which \$41 million are from activities within Winnipeg.

11.2.4 Tax Generation Impacts

Expenditures by out-of-town students attending the University are estimated to generate \$23 million in taxes to federal, provincial, and local governments. Approximately \$19 million of these revenues are derived from economic activities within Winnipeg.

11.3 Summary

- The estimated \$73 million in initial out-of-town student expenditures translates into over \$130 million in gross output impacts throughout Manitoba. Winnipeg accounts for \$112 million in total gross output impacts.
- Out-of-town students generated over \$76 million in total value added in Winnipeg and \$65 million province-wide.
- Out-of-town students enrolled in the University support 2,043 jobs and \$47 million in total labour income impact throughout the Province. Winnipeg accounts for 1,825 of these jobs and \$41 million of the labour income impact.
- Out-of-town students generate \$23 million in total taxes, of which \$19 million are from activities within Winnipeg.

Table 11.6 Total Labour Income Impacts of Expenditures by Out-of-town Students

Impact: Labour Income	Winnipeg	Manitoba
Initial Expenditure - \$73,414,464		
Total Labour Income	\$41,301,947	\$46,568,985
<i>Direct</i>	\$29,958,676	\$29,958,676
<i>Indirect / Induced</i>	\$11,343,271	\$16,610,309
<i>Multiplier</i>	0.56	0.63

Table 11.7 Total Tax Revenue Impacts of Expenditures by Out-of-town Students

Impact: Total Taxes	Winnipeg	Manitoba
Initial Expenditure - \$73,414,464		
Total Taxes	\$19,365,039	\$22,831,592
<i>Federal</i>	\$9,790,232	\$11,542,790
<i>Provincial</i>	\$6,701,077	\$7,900,643
<i>Municipal</i>	\$2,873,729	\$3,388,158

12 University Spin-offs

12.1 Spin-offs Defined

Spin-off companies range from being closely linked to the U of M to those with more tenuous linkages. The extent to which a spin-off's origination can be attributed to the University distinguishes the strength of the linkage.

A spin-off or attribution relationship between the company and the University can be categorized as follows:

- **Category 1 – Transfer of Technology**

Spin-offs holding technology transferred from the University as a prime component in their creation or expansion. This includes University sponsored ventures, ventures started with unlicensed technology (e.g. by a professor), and ventures started with University licensed technology.

- **Category 2 – Transfer of Knowledge (research)**

Companies with an identifiable transfer of intellectual resources that was significant to their success. This includes contract research, research partnerships, joint ventures, and employment of current students and graduates.

- **Category 3 – Transfer of Knowledge (people)**

Companies with no identifiable transfer or specific University technology or resources, but were started by graduates, faculty and/or staff.

In addition to these categories, all of the spin-offs identified were credible enterprises demonstrating growth potential within the Province. Other criteria used to determine the extent of attribution of the University to the spin-off included assessing the on-going relationships with the University through partnerships, agreements, and graduate hiring.

12.2 Identified University Spin-offs

The University identified ten U of M spin-offs to be interviewed. PwC conducted interviews with eight of these spin-offs companies in July and August 2009. Of the eight spin-offs participating in the interviews, one spin-off was located outside of Manitoba therefore the results of this interview were excluded from the economic impact analysis. Information requested during the interviews included the following: an assessment regarding the degree to which the spin-off's existence can be attributed to the University, the types of knowledge linkages between the spin-off and the University, and current financial information including revenues and capital expenditures.

12.3 Nature of University of Manitoba Spin-offs

The seven spin-off companies were concentrated in four business classifications as shown in Table 12.1. In 2008, three of the spin-offs had revenues over \$150 million with the remaining companies having revenues ranging from \$5 to \$13 million.

Overall, the respondent companies employ over 1,880 employees within Manitoba, with approximately 15% being U of M faculty, alumni or students. Table 12.2 summarizes the financial information provided by the spin-off companies surveyed.

During the interview, respondents were asked to determine to what extent the University influenced the start-up of their company as follows:

Which of the following statements most accurately reflects the degree to which Technology or Knowledge Transfers from the University influenced the start-up and/or continued operations of the subject company? (Spin-off attribution weighting in brackets)

(Please circle ONE letter)

- a) This Company would not exist **but-for** the University of Manitoba (80-100%)
- b) This Company is **primarily** a result of the University of Manitoba (60-79%)
- c) This Company has to a significant degree **relied** on the University of Manitoba (40-59%)
- d) This Company has, **at least in part**, developed as a result of the University of Manitoba (20-39%)

Using the information provided by respondents to this question, the degree to which the spin-off's existence was influenced by the U of M can be attributed. Results are summarized in Table 12.3.

Table 12.1 Respondent Business Classification

Business Classification	Number of Respondents
Health & Social Services	3
Plastic & Rubber Products	1
Electrical Equipment, Appliance & Components	2
Motion Picture & Sound Recording	1

Table 12.2 Respondent Financial Summary

Financial Category	
Total Revenue	\$680,000,000
Municipal Taxes	\$1,265,625
<u>Capital Investment in the Manitoba Region</u>	
Buildings	\$5,372,119
Machinery & Equipment	\$12,980,381
Contributions to the University	\$47,800

Table 12.3 University of Manitoba Attribution Results

University of Manitoba Attribution	Number of Respondents
a) "But-for"	0 (0%)
b) "Primarily"	1 (14.3%)
c) "Relied"	1 (14.3%)
d) "At least in part"	5 (71.4%)
Total Respondents	7 (100%)

12.4 Attributed Economic Impact

Based on the information provided during the interviews, we have estimated that University spin-off firms have attributable, in-province revenues of approximately \$163 million for the 2008 fiscal year. In-province revenues were approximated from the spin-off firms reported number of Manitoba based employees using output to employment ratios from Statistics Canada¹³. The resulting in-province revenue was then attributed to the University using the weighting scheme outlined in Table 12.3.

The economic impacts associated with University spin-offs are presented in the following sections.

12.4.1 Gross Output Impacts

The initial expenditures attributable to University spin-off companies are estimated to be \$163 million. These direct gross output impacts are estimated to create multiplier effects throughout the Province of \$1.47 in gross output per \$1 spent.

The total estimated gross output impact generated by University spin-offs is \$239 million province-wide. An estimated \$215 million of these impacts are estimated to occur within Winnipeg.

12.4.2 Value Added Impacts

University spin-offs are estimated to have generated over \$98 million in total value-added in Manitoba during the 2008 fiscal year. In other words, each \$1 generated by spin-off companies in gross output attributable to the University created \$0.60 in total value added.

Total value added within Winnipeg supported by University spin-off companies are estimated at \$83 million.

Table 12.4 Total Gross Output Impacts from University Spin-offs

Impact: Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$162,785,342		
Total Gross Output	\$215,137,290	\$239,453,039
<i>Direct</i>	\$162,785,342	\$162,785,342
<i>Indirect / Induced</i>	\$52,351,948	\$76,667,696
<i>Multiplier</i>	1.32	1.47

Table 12.5 Total Value Added Impacts from University Spin-offs

Impact: Value Added	Winnipeg	Manitoba
Initial Expenditure - \$162,785,342		
Total Value Added	\$83,342,819	\$98,082,246
<i>Direct</i>	\$51,528,826	\$51,528,826
<i>Indirect / Induced</i>	\$31,813,993	\$46,553,420
<i>Multiplier</i>	0.51	0.60

¹³ PwC did not attempt to verify the Manitoba employee estimates provided by the spin-off companies.

12.4.3 Employment Impacts

University spin-off companies support an estimated 705 direct and 586 indirect/induced jobs in Winnipeg. The total employment impact in Manitoba from University spin-off companies is estimated to be 1,562 jobs, of which 1,291 are located in Winnipeg.

Employment supported by University spin-off companies is estimated to have associated labour income impacts equal to \$54 million in Manitoba, of which \$47 million is estimated to stay in Winnipeg.

Table 12.6 Total Employment Impacts from University Spin-offs

Impact: Employment	Winnipeg	Manitoba
Initial Expenditure - \$162,785,342		
Total Employment	1,291	1,562
<i>Direct</i>	705	705
<i>Indirect / Induced</i>	586	857
<i>Multiplier</i>	1.83	2.22

Table 12.7 Total Labour Income Impacts from University Spin-offs

Impact: Labour Income	Winnipeg	Manitoba
Initial Expenditure - \$162,785,342		
Total Labour Income	\$46,788,207	\$54,024,479
<i>Direct</i>	\$31,203,685	\$31,203,685
<i>Indirect / Induced</i>	\$15,584,521	\$22,820,794
<i>Multiplier</i>	0.29	0.33

12.4.4 Tax Generation Impacts

University spin-offs generated a province-wide tax impact equalling an estimated \$18 million in federal taxes, \$14 million in provincial taxes and \$4 million in municipal taxes.

University spin-off activities within Winnipeg generated \$15 million in federal taxes, \$12 million in provincial taxes and \$3 million in municipal taxes.

Table 12.8 Total Tax Revenue Impacts from University Spin-offs

Impact: Total Taxes	Winnipeg	Manitoba
Initial Expenditure - \$162,785,342		
Total Taxes	\$29,742,179	\$34,956,119
<i>Federal</i>	\$14,980,156	\$17,606,246
<i>Provincial</i>	\$11,627,586	\$13,665,955
<i>Municipal</i>	\$3,134,437	\$3,683,918

12.5 Summary

- The estimated \$163 million in initial expenditures by University spin-off companies translates into over \$239 million in total gross output impacts throughout Manitoba. Winnipeg accounts for \$215 million of total gross output impacts.
- University spin-offs generated over \$83 million in total value added in Winnipeg and \$98 million province-wide.
- University spin-offs support over 1,562 jobs and \$54 million in total labour income impact throughout the Province. Winnipeg accounts for about 1,291 of these jobs and \$47 million of the labour income impact.
- University spin-offs generate \$35 million in total taxes, of which \$30 million are from activities within Winnipeg.

13 Summary of Economic Impacts

13.1 Total Combined Economic Impacts

Sections 8 through 13 examine the economic impacts attributable to U of M including the operating and research expenditures, planned capital expenditures, expenditures of out-of-town visitors and students to the University, and University spin-offs.

The combined initial expenditures generated by operating and research expenditures, planned capital projects, out-of-town student expenditures and visitor expenditures is estimated to be \$855 million, while initial expenditures including University spin-offs is estimated at \$1.0 billion. Operating and research expenditures represent the single largest source of expenditure at \$426 million, while planned capital spending is the second largest expenditure estimated at \$299 million.

It is important to note that the impacts of the \$299 million in future capital spending are one-time impacts based on completion of the planned projects in their entirety and does not apply on an annual basis.

13.1.1 Gross Output Impacts

Table 13.1 illustrates that initial expenditures attributable to the University generated \$1.5 billion in total gross output in Manitoba. With \$855 million in initial expenditures, the estimated multiplier effects in Manitoba is approximately \$1.79 in gross output per \$1 of initial spending.

Approximately \$1.3 billion of these total gross output impacts were realized within the Winnipeg economy representing a multiplier effect of 1.47.

Including University spin-offs the total gross output impact are estimated at \$1.8 billion in Manitoba and \$1.5 billion in Winnipeg.

Table 13.1 Total Gross Output Impacts from All Initial Expenditures Attributable to the University of Manitoba

Impact: Gross Output	Winnipeg	Manitoba
Total Gross Output (No Spin-offs)	\$1,260,690,383	\$1,528,551,764
<i>Direct</i>	\$800,914,447	\$855,213,925
<i>Indirect / Induced</i>	\$459,775,936	\$673,337,839
<i>Multiplier</i>	1.47	1.79
Total Gross Output (with Spin-offs)	\$1,475,827,673	\$1,768,004,803

13.1.2 Value Added Impacts

The total value added impacts are estimated at \$999 million for the Province and \$829 million for Winnipeg.

Each \$1 in initial expenditures attributable to the University creates multiplier effects of 1.17 and \$0.97 in value added for Manitoba and Winnipeg, respectively.

Including University spin-offs the total value added impacts are estimated at \$1.1 billion in Manitoba and \$912 million in Winnipeg.

13.1.3 Employment Impacts

Expenditures attributable to the University support 11,036 direct jobs and 8,296 jobs through indirect and induced effects for a total of 19,315 jobs in the Manitoba economy.

The total number of jobs created within the city of Winnipeg is estimated at 16,107.

Total labour income is estimated at approximately \$691 million province wide, of which \$608 million are associated with activities within Winnipeg.

Including University spin-offs the total employment and labour income impacts in Manitoba are estimated at 20,877 jobs and \$745 million, respectively. The total jobs and labour income created within Winnipeg, including University spin-offs are estimated at 17,399 jobs and \$654 million, respectively.

Table 13.2 Total Value Added Impacts from All Initial Expenditures Attributable to the University of Manitoba

Impact: Value Added	Winnipeg	Manitoba
Total Value Added (No Spin-offs)	\$828,932,265	\$998,876,240
<i>Direct</i>	\$530,077,882	\$561,130,519
<i>Indirect / Induced</i>	\$298,854,383	\$437,745,721
<i>Multiplier</i>	0.97	1.17
Total Value Added (with Spin-offs)	\$912,275,084	\$1,096,958,486

Table 13.3 Total Employment Impacts from All Initial Expenditures Attributable to the University of Manitoba

Impact: Employment	Winnipeg	Manitoba
Total Employment (No Spin-offs)	16,107	19,315
<i>Direct</i>	10,438	11,036
<i>Indirect / Induced</i>	5,669	8,279
<i>Multiplier</i>	1.54	1.75
Total Employment (with Spin-offs)	17,399	20,877

Table 13.4 Total Labour Income Impacts from All Initial Expenditures Attributable to the University of Manitoba

Impact: Labour Income	Winnipeg	Manitoba
Total Labour Income (No Spin-offs)	\$607,593,517	\$690,858,511
<i>Direct</i>	\$472,057,525	\$492,391,113
<i>Indirect / Induced</i>	\$135,535,993	\$198,467,399
<i>Multiplier</i>	0.71	0.81
Total Labour Income (with Spin-offs)	\$654,381,724	\$744,882,990

13.1.4 Tax Generation Impacts

Initial expenditures attributable to the University generates \$251 million in total government revenues. Tax revenues are estimated at \$125 million for the federal government, \$99 million for the provincial government and \$25 million for local governments.

The share of tax revenues generated within Winnipeg includes \$101 million in federal taxes, \$80 million in provincial taxes, and \$20 million in local taxes.

Including University spin-off the tax revenue impacts are estimated at \$286 million in Manitoba and \$231 million in Winnipeg.

Table 13.5 Total Tax Revenue Impacts from All Initial Expenditures Attributable to the University of Manitoba

Impact: Total Taxes	Winnipeg	Manitoba
Total Taxes (No Spin-offs)	\$201,019,381	\$251,168,522
<i>Federal</i>	\$100,643,264	\$125,542,644
<i>Provincial</i>	\$80,032,741	\$99,945,366
<i>Municipal</i>	\$20,343,376	\$25,680,512
Total Taxes (with Spin-offs)	\$230,761,560	\$286,124,642

13.2 Summary

In this section, the total combined economic impacts associated with the University are summarized.

- The impact from gross output resulting from all the initial expenditures attributable to the U of M is estimated at \$1.5 billion in Manitoba and \$1.3 billion in Winnipeg. Including University spin-offs the total gross output is estimated at \$1.8 billion in Manitoba and \$1.5 billion in Winnipeg.
- The \$855 million in initial expenditures attributable to the University is estimated to create \$829 million in direct value added impacts in the City and \$998 million in the Province. When including University spin-offs, the total value added impacts are estimated at \$1.1 billion in Manitoba and \$912 million in Winnipeg.
- All the initial expenditures attributable to the University support about 19,315 jobs throughout the Province and about 16,107 jobs in Winnipeg. When University spin-offs are included, total expenditures attributable to the University supports 20,877 jobs in Manitoba and 17,399 jobs in Winnipeg.
- Expenditures attributable to the University are estimated to generate \$251 million in total taxes, of which \$201 million are from activities within Winnipeg. Including University spin-offs the total tax revenue impacts are estimated to be \$286 million in Manitoba and \$231 million in Winnipeg.

Appendix A – Internal & External Stakeholder Interviewees

Table A.1 University of Manitoba Internal Stakeholder Interviewees

Dr. Digvir Jayas	Vice-President (Research)
Dr. Joanne Keselman	Vice-President (Academic) and Provost
Dr. Michael Trevan	Dean of Agricultural and Food Sciences
Dr. Douglas Ruth	Dean of Engineering
Dr. Dean Sandham	Dean of Medicine

Table A.2 University of Manitoba External Stakeholder Interviewees

Mr. Paul Vogt	Clerk to the Executive Council and Cabinet Secretary
Mr. Steven Kroft	President and CEO of Controlled Environments Ltd.
Ms. Coralie Bryant	Executive Director of the Manitoba Association of School Superintendents
Ms. Darlene Dziewit	President of the Manitoba Federation of Labour
Mr. Leonard Penner	President of Cargill Ltd.

Appendix B – Glossary of Terms

Direct Impacts are changes that occur in “front-end” businesses that would initially receive expenditures and operating revenue as a direct consequence of the operations and activities of the University (e.g. the purchase of stationery by the University from a local supplier).

Indirect impacts arise from changes in activity by suppliers of the “front-end” businesses (e.g. purchase of merchandise from factory by local stationery business supplying the University).

Induced impacts arise from shifts in spending on goods and services as a consequence of changes to the wages and salaries of the directly and indirectly affected businesses (e.g. purchase of merchandise from factory by local stationery business supplying the University).

Multipliers measures how much a dollar spent circulates and re-circulates within the economy magnifying the effects of the original expenditure.

Gross Output is total gross revenue from the sale of goods and services by a business. This is the broadest measure of economic activity and indicates the total sales and transactions triggered by operations. Measuring gross output may result in some items being counted more than once. To avoid double counting, the value added is often used.

Value Added is the measure of net output or the unduplicated value of goods and services that is added to the economy. It is equal to the gross output minus the cost of purchased inputs.

Employment is the number of additional jobs created. It is expressed as the number of equivalent full-time jobs indicated in person years.

Labour Force Income is the total value of wages and salaries associated with the employment impact.

Taxes is the total amount of revenues generated by the economic activity for different levels of government.

Appendix C – Methodology Assumptions for Out-of-town Visitor and Student Impact

Appendix C provides detailed methodology assumptions used to estimate the economic impact of out-of-town casual visitors, conference attendees, on-campus student recruitments, sports competition, alumni homecoming and reunions, convocation attendance, and students.

1. Casual Visitors

PwC relied on the following assumptions to estimate the economic impact of causal visitors to University faculty, support staff, and/or students:

- Total number of casual visitors for the 2008/2009 academic year was estimated based on the assumptions of previous PwC report *University of Manitoba – Regional Economic Impact Analysis*. Table C.1 illustrates the number of casual visitors that university faculty, support staff, and students are assumed to attract each year;

Table C.1 Underlying assumptions for the number of casual visitors attracted to the University of Manitoba

Type	Number of Annual Visitors Attracted to U of M per person
Faculty (full- or part-time)	6
Full-time students originating from outside of Winnipeg	10
Full-time students originating from Winnipeg	2
Part-time students originating from within or outside Winnipeg	1
Support Staff (full- or part-time)	6

Source: University of Manitoba, *Regional Economic Impact Analysis*, 2003

- University faculty, support staff, and/or students are assumed to host casual visitors in their homes. Therefore, lodging cost for casual visitors is zero;
- All overnight visitors were assumed to stay for two nights in Winnipeg;
- Expenditures incurred by casual visitors is estimated at \$148/day, which is based on the 2004 CITIES Database from Statistics Canada adjusted for inflation in Manitoba excluding accommodation.

2. Conference Attendees

PwC relied on the following assumptions to estimate the economic impact of conference attendees:

- Based on event data provided by the University and on the *2009 Conferences at University of Manitoba* list, the total number of overnight visitors totaled about 4,156 persons, of which 1,685 stayed on-campus residence;
- All overnight visitors were assumed to stay for two nights;
- Expenditures incurred by conference attendees staying off-campus were calculated using the \$210/night average per person trip expenditures of overnight visitors that was derived from the 2004 CITIES Database from Statistics Canada and adjusted for inflation in Manitoba;
- To avoid double counting, we excluded accommodation expenses from the daily expenditures incurred by conference attendees staying on-campus.

3. On-campus Student Recruitment

PwC estimated the economic impact of on-campus student recruitment based on the following assumption:

- The share of on-campus student recruitment and their guests originating from outside of Winnipeg is proportional to the share of students originating from outside of Winnipeg and enrolled at the University, which means 2,062 prospective students were from out-of-Winnipeg;
- All visitors were assumed to stay two nights in Winnipeg;
- Expenditures incurred by players and coaches were calculated using the \$210/night average per person trip expenditures of overnight visitors that was derived from the 2004 CITIES Database from Statistics Canada and adjusted for inflation in Manitoba.

4. Sport Competitions

PwC relied on the following assumption to estimate the economic impact of sport competitions at the University:

- All attendees of sporting events (excluding players, coaches, etc) originated from within Winnipeg and were not included in the economic impact;
- The number of out-of-Winnipeg players and coaches playing at the University of Manitoba was derived from the total number of regular and exhibition games hosted by the University and the number of players and coaches per visiting team;
- All out-of-town players and coaches were assumed to stay one night in Winnipeg;
- Expenditures incurred by players and coaches were calculated using the \$210/night *average per person trip expenditures* of overnight visitors that was derived from the 2004 *CITIES Database* from Statistics Canada and adjusted for inflation in Manitoba.

5. Alumni Homecomings and Reunions

PwC estimates of economic impacts associated with homecoming and reunion guests are based on the following assumptions:

- Data on out-of-town homecoming and reunion guests was provided by the University. For the 2008/09 academic year, 1,127 out-of-town graduates and their guests attended these activities. On average, these out-of-town graduates stayed for 3 nights in Winnipeg;
- Expenditures incurred by homecoming and reunion guests were calculated using the \$210/night *average per person trip expenditures* of overnight visitors that was derived from the 2004 *CITIES Database* from Statistics Canada and adjusted for inflation in Manitoba.

6. Convocation Attendance

PwC relied on the following assumptions to quantify the economic impacts attributable to convocation ceremonies:

- Assuming that there are on average four attendees per graduate, we have estimated a total of 13,000 attendees for the 2008-2009 convocation ceremonies;
- The share of graduating students and their guests originating from outside of Winnipeg is proportional to the share of students originating from outside of Winnipeg and enrolled at the University, which means 5,070 attendees were from out-of-Winnipeg;
- All visitors were assumed to stay overnight for two nights;
- Expenditures incurred by convocation visitors were calculated using the \$210/night *average per person trip expenditures* of overnight visitors that was derived from the 2004 *CITIES Database* from Statistics Canada and adjusted for inflation in Manitoba.

7. Out-of-town Student Enrolment

PwC relied on the following assumptions to estimate the economic impact of out-of-town student enrolment:

- All expenditures for tuition and books have been accounted for in section 8;
- Out-of-town students stay in Winnipeg for only 8 months during the Fall (Sep-Dec) and Winter (Jan-Apr) academic sessions;
- 50% of part-time student expenditures have been deducted as being not attributable to the University of Manitoba;
- 100% of housing and 50% of food expenditure is deducted for students living on campus;
- On-campus residence is comprised only by full-time students from outside Winnipeg. On-campus residence is based on the share of full-time students by origin;
- International students are enrolled only in full-time programs;
- Expenditures incurred by out-of-town students were based on the University of Manitoba Student Affairs student living cost estimate (Table C.2).

Table C.2 University of Manitoba student living expenses

Category	Amount (\$ / month)
Transportation	\$57
Retail and miscellaneous	\$265
Food	\$208
Housing	\$425
Entertainment	\$60

Source: University of Manitoba Student Affairs

Appendix D – Detailed Economic Impact Tables

Table D.1 – Economic Impacts of University of Manitoba Operating and Research Expenditures

Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$426,487,912		
Total	\$643,390,647	\$789,301,979
Direct	\$395,653,223	\$426,487,912
Indirect / Induced	\$247,737,423	\$362,814,067
Multiplier	1.51	1.85
Value Added		
Total	\$541,461,955	\$639,839,998
Direct	\$370,840,283	\$390,291,794
Indirect / Induced	\$170,621,673	\$249,548,203
Multiplier	1.27	1.50
Employment		
Total Employment	9,613	11,537
Direct	6,355	6,782
Indirect / Induced	3,258	4,755
Multiplier	1.51	1.70
Labour Income		
Total	\$430,323,682	\$475,978,711
Direct	\$358,003,203	\$370,079,280
Indirect / Induced	\$72,320,479	\$105,899,432
Indirect Taxes		
Total	\$22,458,954	\$28,799,302
Federal	\$5,476,916	\$6,943,416
Provincial	\$7,257,194	\$9,200,382
Municipal	\$9,724,844	\$12,655,504
Direct Personal Taxes		
Total	\$58,790,376	\$73,290,038
Federal	\$33,202,929	\$41,378,890
Provincial	\$25,587,446	\$31,911,148
Corporate Profit Taxes		
Total	\$34,315,985	\$43,612,413
Federal	\$20,589,591	\$26,167,448
Provincial	\$13,726,394	\$17,444,965
Total Taxes		
Total	\$115,565,315	\$145,701,753
Federal	\$59,269,436	\$74,489,753
Provincial	\$46,571,035	\$58,556,495
Municipal	\$9,724,844	\$12,655,504

Table D.2 – Economic Impacts of Proposed University of Manitoba Capital Projects

Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$299,478,342		
Total	\$417,655,133	\$506,909,442
Direct	\$276,013,553	\$299,478,342
Indirect / Induced	\$141,641,580	\$207,431,100
Multiplier	1.39	1.69
Value Added		
Total	\$171,983,740	\$222,251,693
Direct	\$88,500,486	\$100,101,611
Indirect / Induced	\$83,483,254	\$122,150,082
Multiplier	0.57	0.74
Employment		
Total Employment	3,174	4,063
Direct	1,616	1,787
Indirect / Induced	1,558	2,277
Multiplier	1.96	2.27
Labour Income		
Total	\$100,667,143	\$128,708,174
Direct	\$58,059,569	\$66,317,080
Indirect / Induced	\$42,607,575	\$62,391,094
Indirect Taxes		
Total	\$16,915,449	\$21,399,602
Federal	\$4,971,180	\$6,289,001
Provincial	\$6,587,068	\$8,333,248
Municipal	\$5,357,201	\$6,777,353
Direct Personal Taxes		
Total	\$19,133,882	\$24,206,124
Federal	\$10,635,514	\$13,454,905
Provincial	\$8,498,368	\$10,751,219
Corporate Profit Taxes		
Total	\$15,605,869	\$19,742,862
Federal	\$9,363,521	\$11,845,717
Provincial	\$6,242,348	\$7,897,145
Total Taxes		
Total	\$51,655,200	\$65,348,588
Federal	\$24,970,215	\$31,589,623
Provincial	\$21,327,784	\$26,981,612
Municipal	\$5,357,201	\$6,777,353

Table D.3 – Economic Impacts of Out-of-Town University-related Visitor Expenditures

Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$55,833,206		
Total	\$87,367,117	\$102,012,892
Direct	\$55,833,206	\$55,833,206
Indirect / Induced	\$31,533,910	\$46,179,686
Multiplier	1.56	1.83
Value Added		
Total	\$50,854,722	\$60,262,765
Direct	\$30,557,455	\$30,557,455
Indirect / Induced	\$20,297,267	\$29,705,310
Multiplier	0.91	1.08
Employment		
Total Employment	1,496	1,672
Direct	1,114	1,114
Indirect / Induced	381	558
Multiplier	1.34	1.50
Labour Income		
Total	\$35,300,746	\$39,602,641
Direct	\$26,036,077	\$26,036,077
Indirect / Induced	\$9,264,668	\$13,566,564
Indirect Taxes		
Total	\$4,537,035	\$5,433,753
Federal	\$924,467	\$1,107,182
Provincial	\$1,224,966	\$1,467,073
Municipal	\$2,387,602	\$2,859,498
Direct Personal Taxes		
Total	\$5,331,916	\$6,385,738
Federal	\$2,949,988	\$3,533,036
Provincial	\$2,381,928	\$2,852,702
Corporate Profit Taxes		
Total	\$4,564,877	\$5,467,099
Federal	\$2,738,926	\$3,280,259
Provincial	\$1,825,951	\$2,186,839
Total Taxes		
Total	\$14,433,828	\$17,286,590
Federal	\$6,613,381	\$7,920,478
Provincial	\$5,432,845	\$6,506,615
Municipal	\$2,387,602	\$2,859,498

Table D.4 – Economic Impacts of Out-of-Town Student Expenditures

Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$73,414,464		
Total	\$112,277,487	\$130,327,451
Direct	\$73,414,464	\$73,414,464
Indirect / Induced	\$38,863,023	\$56,912,986
Multiplier	1.53	1.78
Value Added		
Total	\$64,631,847	\$76,521,785
Direct	\$40,179,659	\$40,179,659
Indirect / Induced	\$24,452,188	\$36,342,126
Multiplier	0.88	1.04
Employment		
Total Employment	1,825	2,043
Direct	1,353	1,353
Indirect / Induced	472	689
Multiplier	1.35	1.51
Labour Income		
Total	\$41,301,947	\$46,568,985
Direct	\$29,958,676	\$29,958,676
Indirect / Induced	\$11,343,271	\$16,610,309
Indirect Taxes		
Total	\$5,609,020	\$6,613,096
Federal	\$1,176,443	\$1,387,039
Provincial	\$1,558,848	\$1,837,898
Municipal	\$2,873,729	\$3,388,158
Direct Personal Taxes		
Total	\$7,870,848	\$9,279,815
Federal	\$5,082,686	\$5,992,543
Provincial	\$2,788,161	\$3,287,273
Corporate Profit Taxes		
Total	\$5,885,171	\$6,938,681
Federal	\$3,531,102	\$4,163,208
Provincial	\$2,354,068	\$2,775,472
Total Taxes		
Total	\$19,365,039	\$22,831,592
Federal	\$9,790,232	\$11,542,790
Provincial	\$6,701,077	\$7,900,643
Municipal	\$2,873,729	\$3,388,158

Table D.5 – Economic Impacts of University Spin-off Firms

Gross Output	Winnipeg	Manitoba
Initial Expenditure - \$269,713,988		
Total	\$215,137,290	\$239,453,039
Direct	\$162,785,342	\$162,785,342
Indirect / Induced	\$52,351,948	\$76,667,696
Multiplier	1.32	1.47
Value Added		
Total	\$83,342,819	\$98,082,246
Direct	\$51,528,826	\$51,528,826
Indirect / Induced	\$31,813,993	\$46,553,420
Multiplier	0.51	0.60
Employment		
Total Employment	1,291	1,562
Direct	705	705
Indirect / Induced	586	857
Multiplier	1.83	2.22
Labour Income		
Total	\$46,788,207	\$54,024,479
Direct	\$31,203,685	\$31,203,685
Indirect / Induced	\$15,584,521	\$22,820,794
Indirect Taxes		
Total	\$9,138,629	\$10,740,672
Federal	\$2,582,391	\$3,035,096
Provincial	\$3,421,801	\$4,021,658
Municipal	\$3,134,437	\$3,683,918
Direct Personal Taxes		
Total	\$10,129,612	\$11,905,379
Federal	\$6,113,402	\$7,185,109
Provincial	\$4,016,210	\$4,720,270
Corporate Profit Taxes		
Total	\$10,473,939	\$12,310,068
Federal	\$6,284,363	\$7,386,041
Provincial	\$4,189,576	\$4,924,027
Total Taxes		
Total	\$29,742,179	\$34,956,119
Federal	\$14,980,156	\$17,606,246
Provincial	\$11,627,586	\$13,665,955
Municipal	\$3,134,437	\$3,683,918