UNIVERSITY OF CALGARY

SUBMISSION TO THE HOUSE OF COMMONS STANDING COMMITTEE ON FINANCE

Prepared for:

HOUSE OF COMMONS STANDING COMMITTEE ON FINANCE

August 6, 2014

INTRODUCTION

The potential for science, technology and innovation, and creativity to contribute to further improvements in the well-being of Canadians cannot be overstated. Investments result in the training of highly qualified people, enhancements in productivity and through the transfer and commercialization of new knowledge, lead to the creation of new companies and jobs. They also lead to improvements in environmental, cultural, social and health conditions. Canada's quality of life and economic prosperity depend on the country's ability to grow its knowledge base, to innovate and to translate new knowledge into significant benefits for society.

The University of Calgary is approaching its 50th anniversary. Located in one of Canada's most entrepreneurial, energetic and livable cities, the university's annual economic impact is almost $8 billion. The university attracted $330 million in sponsored research income in 2013. Our vision is to be an even greater university with global reach, while fulfilling our community's expectations by delivering academic and research excellence and societal impact. The university set the goal in its *Eyes High* vision of becoming one of Canada's top five research universities by 2016 and has put in motion a major leap forward through its Academic Plan and Strategic Research Plan.

The university recognizes and appreciates the government's ongoing commitment to funding university research. Federal funding acts as a keystone in Canada's research ecosystem, creating opportunities and leveraging significant dollars from other governments, industry, the not-for-profit sector and other sources.

The University of Calgary would like to thank the House of Commons Standing Committee on Finance for the opportunity to provide input into Budget 2015. Continuing the momentum of Canada's dedication to research and development through a new round of investment in the Canada Foundation for Innovation, predictable, sustainable funding of the Tri-Council agencies, and implementing the Canada First Research Excellence Fund, as well as creating new opportunities for our students, will help keep Canada at the forefront of research and innovation worldwide.

PREPARING CANADIANS TO TAKE THEIR PLACE IN OUR MODERN ECONOMY

Skills, Training, and Highly Qualified People

Better for Graduates

A university degree continues to show great value for graduates, leading to lifelong improvements in standards of living. The earnings premium associated with a bachelor's degree is substantial compared to college, trades and high school graduates. These trends remained strong during the recent recession, with 613,000 net new jobs created for those with a university education between May 2008 and May 2012[1]. Of the net new jobs created in Alberta since 2008, 56% have required a university education[2].

Better for Employers

One-third of all projected job openings out to 2020 are in occupations requiring university education[3]. Shortages of skilled labour are projected by Employment and Social Development Canada in: business, finance and administration occupations; natural, applied sciences and related sciences; health occupations; occupations in social science, education, government service and religion[4]. Skills shortages continue in many professions requiring university education, such as in health care, engineering and in management occupations — these shortages are holding back the economy from its true potential. With the continued growth in employment of university graduates during the recession, it is clear the skills provided by a university education are in high demand.

Better for Society

By improving the education of Canada's citizens, we enable individuals to acquire skills to work at their highest and best ability. The benefit of research and development to Canadian businesses and entire communities is significant, including increased productivity, economic growth, and individual and collective well-being.

---

[1]Statistics Canada, Labour Force Survey, May 2012
[2]Association of Universities and Colleges of Canada, Back to School Quick Facts, July 2014
[3]Employment and Social Development Canada, Imbalances Between Labour Demand and Supply - 2011-2020
[4]Ibid.

Innovation

Excellence in research underpins Canada's ability to improve productivity across all sectors of society. University research contributes significantly to the development of new products and services, new ways of doing things and new job opportunities for Canadians. These outcomes build the knowledge economy of today and tomorrow, and strengthen the nation's overall international economic competitiveness.

Through the recent economic downturn, the government is to be commended for its continued investments in Canada's innovation ecosystem. Targeted increases to the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Social Sciences and Humanities Research Council (SSHRC) have meant Canada remains in a strong position to compete on the world stage for the best students and researchers. Other programs, such as the Canada Excellence Research Chairs, the Banting Postdoctoral Fellowships and the Vanier Canada Graduate Scholarships, are manifestations of the government's worthwhile commitment to invest in today's and tomorrow's research leaders.

The creation of the Canada First Research Excellence Fund (CFREF) deserves special attention and gratitude. The government's commitment will enable and further strengthen Canada's leading research universities to compete with their peers around the world. The fund will drive productivity growth through discovery and applied research, and the training of highly skilled, adaptable graduates.

Canada's research intensive universities (U15) collectively attract 80% of all competitively allocated research funding in Canada and 87% of all contracted private-sector research in Canada. As a direct result, research intensive universities generate 80% of patents and start-ups and 81% of technology licenses of Canadian universities. Additionally, 71% of full-time doctoral students study at a research intensive university[5]. These outcomes are a direct result of sustained federal investments in the research ecosystem.

Federal investments in university research are paying off. For example, Tri-Council funded researcher Dr. Samuel Weiss, the inaugural Director of the Hotchkiss Brain Institute, has translated his pioneering work in stem cells and brain receptors into a new understanding of the causes of schizophrenia, Alzheimer's, and Creutzfeldt-Jakob disease. His work has led to a portfolio of commercialized patents and licenses and the University of Calgary spin-off company NeuroSpheres. Federally supported research at the University of Calgary's Petroleum Reservoir Group is changing the understanding of fluid flow in energy reservoirs which improves industry's ability to predict where the best quality and most economically recoverable oil can be found. This work has resulted in the spinoff company Gushor Inc., a petroleum reservoir fluid analysis and geosciences company that provides innovative solutions to practical production and exploration problems in the heavy oil industry.

---

[5]U15 Group of Canadian Research Universities, Our Impact

RECOMMENDATIONS

The University of Calgary recommends the federal government build upon its legacy of investments in research and innovation. It is imperative that any new investments include sustainable and predictable funding to ensure resources can be deployed to their fullest effect.

Canada Foundation for Innovation (CFI)

The University of Calgary supports a new round of investment, over a five-year period beginning in 2016, for the Canada Foundation for Innovation. Updated lab and equipment infrastructure is critical to maintaining research excellence and a leadership position for Canada. The availability of appropriate labs and infrastructure is key to attracting the best of worldwide talent to conduct research in Canada[6]. As Canada increases funding for research excellence through other programs, it is vital that infrastructure support remains in place to ensure researchers have the proper tools to conduct their work. On this key point, without the necessary infrastructure in place to conduct world-leading research, major opportunities for attracting and retaining top researchers in Canada would be lost.

In 2013, Professor Garnette R. Sutherland of the University of Calgary received CFI funding for his work in developing the neuroArm: an innovative robot designed for improved safety and outcomes of neurosurgery. CFI funding has created facilities that not only enable world-leading research, but support a sectorial advantage for entire industries. The Catalysis Surface Science Laboratory led by Dr. Pedro Pereira Almao and the Schulich School of Engineering for example, is utilized by industry to analyze oil and gas surface samples from *in situ* testing.

Without additional investment, CFI supports for research infrastructure will fall precipitously by the end of the decade from the current five year annual average of $444 million to under $100 million annually. To help put this in perspective for the University of Calgary, this would mean a drop of research infrastructure support from an average of $14.3 million per year down to less than $3 million per year. Such an impact would have a significant impact on the university's research activities.

---

[6]Lam, Alice. "What Motivates Academic Scientists to Engage in Research Commercialization: 'Gold', 'Ribbon' or 'Puzzle'*?" Research Policy 40*: 1354-68, 2011

Tri-Council Agencies

We propose that the Tri-Council agencies (CIHR, NSERC, and SSHRC), the drivers of discovery and applied research activity across the country, be supported by additional sustainable funding, including an increase of partnership programs which support university-industry collaboration. Increased funding through the granting councils facilitates discovery and applied research, and strengthens research capacity at Canadian universities. Partnership funding facilitates researchers collaborating with business, government and the non-profit research supporting community, transferring knowledge and commercializing discoveries.

One example of funding received through the Canadian Institutes of Health Research, Karl Riabowol, PhD, a University of Calgary researcher and member of the Southern Alberta Cancer Research Institute and Alberta Children's Hospital Research Institute, studies the biochemical underpinnings of aging and how it relates to cancer: namely, facilitating the aging and dying of cancer cells. This work has led to the discovery a new family of tumor suppressors that has implications for cancer diagnosis and treatment.

Further, small and medium sized enterprises (SMEs) face significant risk when investing in research, development and innovation. This risk would be reduced by encouraging new and deeper research partnerships between businesses and universities, enabling more SMEs to increase their productivity and improve their products. Enhancing current programs that encourage first time partnerships between SMEs and universities would be beneficial to industry and the economy. University-industry partnerships also improve student learning experiences and prepares highly qualified, adaptable graduates ready to succeed in today's and future labour markets. With the support of NSERC Engage Grants, the University of Calgary has actively partnered with SMEs to resolve problems and improve productivity. Our researchers worked with Pason Systems Corp. and Telvent, two Calgary-based SMEs, to improve software testing solutions, for example.

Canada First Research Excellence Fund (CFREF)

The CFREF has the potential to be a game-changer for Canada's research and innovation ecosystem. In Budget 2014, the University of Calgary was pleased to see the funding envelope for this program announced. This investment will ensure international competitiveness in attracting and retaining global talent; support breakthrough discoveries in our universities; foster disruptive as well as incremental innovations that lead to new industries and improved productivity; and, reinforce global networks of creativity and discovery that are strongly associated with world-class universities. CFREF will support universities nationwide in matching their strengths with opportunities. It will help the University of Calgary, a global leader in energy research, implement our comprehensive, industry partnered, Energy Research Strategy. The strategy focuses on discovering new energy sources, minimizing environmental impact, opening new markets, and planning for the future. The government should continue with its commitment to begin flowing CFREF funding in Budget 2015 and beyond.

Supporting Experiential Learning Opportunities

Fostering new partnerships between industry and universities should not be limited to formal research partnerships. There remains great potential to provide career-boosting opportunities for Canadian students through co-operative education and internships. By supporting pathways between universities and the workplace, more students will be equipped with the tools they need to get good jobs. Initiatives such as a voucher program or a federal tax credit to support internships and the hiring of co-op students by SMEs and not-for-profits, would pay dividends for society. In addition, funding to support institutions' development of co-op placements is needed. The federal government should also commit to increasing the number of co-op students it hires in the public service to pre-recession levels.

CONCLUSION

Continuing the positive trajectory of investment in Canada's research ecosystem is paramount to the success of Canada's research intensive universities in attracting global talent, conducting world-leading research, and developing the next generation of researchers for companies and universities. Through continued investment in the Tri-Council Agencies, the Canada First Research Excellence Fund, and the Canadian Foundation for Innovation, as well as enhancing support for student learning opportunities, the Government of Canada ensures Canada's place as a global centre for research excellence.

For more information contact:

Dr. Elizabeth Cannon
President and Vice-Chancellor
Administration Building 100
+1 (403) 220-5617

John Alho
Associate Vice President, Government and Community Engagement
MacKimmie Block 325C
+1 (403) 220-5634

University of Calgary
2500 University Drive NW
Calgary, AB T2N 1N4
ucalgary.ca