Pre-Budget Submission to the House of Commons Standing Committee on Finance

August 2017

UNIVERSITY OF ALBERTA

Canada has an unprecedented opportunity to re-invest in this nation's international leadership by asserting itself as an innovative nation that pushes the boundaries of knowledge for the benefit of economic growth and productivity. Through advancing research excellence and equipping citizens with the skills necessary to thrive in a fast-paced global environment, Canada's universities are key to positioning the nation as a global leader in discovery and innovation.

Canada's universities empower Canadians to explore novel pathways of inquiry, tackle global challenges, spark new businesses and innovate for the public good as well as generate tangible economic activity. The Conference Board of Canada calculates that the higher learning sector produces substantial return on investments, with overall economic impacts estimated between $75 and $80 billion per annum.[i]

The Government of Canada has affirmed the sector's importance through investments including $125 million to launch a Pan-Canadian Artificial Intelligence Strategy and $117.6 million for the Canada 150 Research Chairs Program, announced in Budget 2017. To ensure Canada continues to prosper into the future, support for this vital growth sector must continue to increase in alignment with the rest of the globe. In pursuit of a more productive and innovative Canada, the U of A presents the following recommendations for consideration in advance of Budget 2018.

INVESTING IN CANADA'S RESEARCH FOUNDATION

Fundamental research is a requisite component of any thriving innovative economy. Investments in Canada's research foundation are intrinsic to building a robust science and research ecosystem and enhancing capacity for innovation, with direct economic and social benefits across sectors.

While Canada has historically been a leader in this regard, fueled by federal investments in universities where much of this research takes place, Canada's investments have not kept pace with other leading nations. Presently, at less than 25 per cent, Canada's ratio of federal contributions to R&D in the higher education sector, as compared to other innovative countries, is atypically and unsustainably low. Higher education institutions have themselves subsidized this gap, which places significant financial pressure on institutions and dampening their ability to deliver on other priorities and core teaching mandates.

The landmark report from the Advisory Panel for the Review of Federal Support for Fundamental Science, *Investing in Canada's Future: Strengthening the Foundations of Canadian Research*[ii] *(*or the 'Naylor Report'*),* provides a fulsome pathway to remedy this gap and strengthen the foundation of Canadian research excellence. Through the guidance of this report, Canada can capitalize on its many advantages—including world-class universities and a highly-educated population—to invest in our nation's research foundation and regain our international standing.

Canada's granting councils are an essential conduit through which the nation can advance this leadership, as they provide funding for universities to foster productive research environments. However, granting council funding per researcher has been declining since 2008-09, with an accompanying movement away from independent investigator-led research, less success in securing international research prizes and slowed research publication output contrasted to international comparators.

Despite important recent investments, including an additional $95 million per year to the granting councils outlined in Budget 2016, there is a pressing need to further accelerate federal investments in Canada's research ecosystem through the granting councils. Doing so will help to reverse the deterioration of, and gain ground on, our international research competitiveness.

In addition to an infusion of funding, enhanced collaboration and harmonization among funding agencies is critical to supporting the full life-cycle and scope of research projects. This collaborative approach is a necessity for reducing barriers to success and encouraging dynamic, interdisciplinary teams that are able to take multi-faceted approaches to problems.

Recommendations

- In alignment with the Naylor Report, re-invest in Canada's fundamental research foundation, including through additional unfettered support to the granting councils.
- Encourage and foster strategic collaboration among funding agencies to promote full-funding for interdisciplinary projects.

THE CANADA FOUNDATION FOR INNOVATION

The Canada Foundation for Innovation (CFI) provides essential resources for the construction, maintenance and operation of state-of-the-art research infrastructure at advanced research institutions. Investments through such pathways as the John R. Evans Leaders Fund enable universities across Canada to continue developing the technology, knowledge and innovations needed to address global challenges.

Stability in annual funding for the CFI is critical for institutions to engage in long-term planning of research infrastructure and capacity, an essential endeavour if researchers are to pursue bold and novel research pathways, unencumbered by delays. Well-functioning research infrastructure and operations are additional draws for the best and brightest minds from around the world to conduct research in Canadian facilities.

Further, funding stability maximizes the functionality and longevity of new-build or renovated research spaces. This includes those made possible through the vital Post-Secondary Institutions Strategic Investment Fund (PSIF), which enabled the U of A to undertake 10 projects that directly impact the renewal and repurposing of existing facilities to address teaching and research priorities.

Recommendation

- Provide stable annual funding for CFI to support its programming, taking into account inflationary pressures and recommendations presented in the Naylor Report.

THE RESEARCH SUPPORT FUND

The Research Support Fund (RSF) is an indispensable channel through which researchers access facilities and administration (F&A) funding to cover the complex operations of projects not accounted for in the vast majority of research operating grants; this includes equipment upgrades, access to IT and knowledge resources, and costs associated with allocation of research grants and commercialization.

In its provision of partial reimbursement for research projects, RSF allocations have not kept pace with rising costs and are stagnating behind international comparators. In the absence of sufficient funding to cover F&A, research projects do not move forward effectively, equipment becomes underutilized, research grant allocation is delayed and knowledge translation is slowed. Universities are presently absorbing these costs by redirecting funds from operational budgets, which places pressure on other institutional priorities.

The structure of the RSF also poses challenges for research-intensive universities. Due to the sliding-scale contributions, larger institutions are penalized for greater success in attracting

competitive research grants, acting as a disincentive for innovation. For this reason, reviewing and re-configuring the RSF allocation formulas is important to encourage and reward world-class research excellence.

Recommendation

- In alignment with the Naylor Report, provide increased RSF funding and re-configure allocation formulas to cover the full cost of research.

CANADA'S DIVERSE TALENT

In order to advance as a thriving hub of innovation, Canada's diverse young talent must be provided with the skills and opportunities necessary to prosper in a competitive global labour market. Investing in Canada's future leaders and innovators will provide the greatest return for Canadians across sectors; their success is Canada's success.

EARLY-CAREER RESEARCHERS

While Canada must support its faculty, students and researchers at all stages of their careers, it is essential to empower the next-generation of highly-qualified researchers and innovators. In order to perform their best work, early-career researchers (ECRs) require a supportive, stable environment unimpeded by disciplinary boundaries, administrative hurdles or funding barriers. Stability provides ECRs the freedom to follow their research wherever it may lead, and is fertile ground for the production of discoveries whose positive impacts are felt within Canada and beyond our borders.

In Canada, ECRs face significant and varied barriers to success, including financial pressures and limited career opportunities. For example, the latest *Canadian National Postdoctoral Survey,*[iii] *f*ound that postdocs in Canada earn notably less than those working in other leading countries, with approximately 30 per cent of respondents not earning sufficient income to cover basic monthly expenses. ECRs also experience low research grant success rates because they have to compete directly with more established researchers for limited funding.

There are many steps that can be taken to remove these barriers, including an overall increase to Canada's funding agencies as explored above. However, to kick start their careers, the U of A proposes a dedicated ECR fund with flexible grant application deadlines to further encourage interdisciplinarity and emerging fields of inquiry.

In recognition of the value of a diversity of perspectives to the production of innovative research outcomes, Canada's universities are committed to ensuring greater equity, diversity and inclusivity across all levels of our campus communities, including in the allocation of research funding. The proposed ECR fund should likewise reflect Canada's diversity and incorporate encouragement of applications from under-represented populations, including women and Indigenous researchers.

Recommendation

- Create and fund an interdisciplinary Early Career Researchers Fund, taking into account the importance of diversity and equity in its allocation.

SUPPORTING INDIGENOUS CANADIANS

Indigenous Canadians continue to face roadblocks to full and meaningful participation at all levels of academia, to the detriment of research and teaching outcomes. Eliminating these barriers requires a coordinated effort to provide a well-funded and supportive environment for Indigenous Canadians at post-secondary institutions.

In response to the Calls to Action from the Truth and Reconciliation Commission, universities are taking steps to build these environments. For example, the U of A has increased enrolment of self-identified Indigenous undergraduate students in 2016-17 by 9.6 per cent over the previous year. The

Government of Canada has also advanced efforts to provide an enhanced funding environment, including a $90 million increase to the Post-Secondary Student Support Program announced in Budget 2017, and by engaging in a comprehensive review of federal support programs for Indigenous students' pursuit of post-secondary education. The U of A looks forward to the results of this review and supports the government as it takes steps to invest further in Indigenous students at Canada's post-secondary institutions.

Recommendation

- Continue to enhance financing and support for Canada's Indigenous population in the post-secondary sector.

COLLABORATION AND GLOBAL COMPETITIVENESS

Advancing international collaboration fosters job creation and skills development, opens doors to new knowledge and capital across economic sectors and cultivates deeper global trade relationships. As some nations are implementing inward-looking policies and closing their borders, it is more important than ever for Canada to deepen its engagement with the world.

Collaborations with international research organizations and universities offer significant opportunities for Canadian innovation. Through an infusion of diverse perspectives, expertise and capital, all research endeavours become stronger and more impactful with the inclusion of an international partner. The Government of Canada has sent a clear signal that now is the time to further open pathways to international talent through initiatives that include the launch of the Canada 150 Research Chairs Program and the Global Skills Strategy.

However, while Canada is a desired participant in international science, in order to keep up with the rapid evolution of the international research ecosystem, Canada must become the partner of choice for international collaborators. Canada's research-intensive universities provide potential partners with access to a breadth of competitive advantages—including highly-qualified talent and state-of-the-art facilities—and are uniquely qualified in capacity and reputation to attract and retain international investment and collaboration.

The U of A builds and sustains high-quality, interdisciplinary, multinational research projects across the globe, with partnerships with close to 400 governments and partner institutions in nearly 50 countries including India, China and Germany. One example is the Sino-Canadian Energy and Environment Research and Education Initiative (SCENEREI), an energy research collaboration between the U of A and Tsinghua University, the world's highest ranked energy university. Partnerships like this are indispensable for world-class research outcomes and in attracting greater international talent and investment.

However, due in part to frequent misalignment of international funding cycles and project timelines, it can prove challenging for universities to meet adjudication and funding application timelines to support international collaborations. In this regard, a dedicated funding program for international research that builds on existing funding programs could be beneficial.

Recommendation

- Establish a new funding program for strategic international research partnerships.

[i] The Conference Board of Canada, *Globalization and Canada's PSE's*, p.10, November 2016.
[ii] Advisory Panel for the Review of Federal Support for Fundamental Science, *Investing in Canada's Future: Strengthening the Foundations of Canadian Research,* April 10, 2017.
[iii] The Canadian Association of Postdoctoral Scholars, *The 2016 Canadian National Postdoctoral Survey Report,* November 2016.