UNIVERSITY OF CALGARY

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SUBMISSION TO THE HOUSE OF COMMONS STANDING COMMITTEE ON FINANCE

Prepared for:

HOUSE OF COMMONS STANDING COMMITTEE ON FINANCE

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Introduction

The University of Calgary would like to thank the House of Commons Standing Committee on Finance for the opportunity to provide input into Budget 2018, and to supply recommendations responding to the committee's two primary questions: what federal measures would help Canadians to be more productive; and what federal measures would help Canadian businesses to be more productive and competitive. The university would also like to take this opportunity to acknowledge the investments made by this and preceding governments in support of research and infrastructure at Canada's universities. The federal government's commitment to strengthening Canada's university research capacity in previous budgets has been impactful and is appreciated.

The University of Calgary is a global intellectual hub located in Canada's most enterprising city. As one of Canada's leading research universities, we strive to provide a high-quality learning environment made rich by research, hands-on experiences and entrepreneurial thinking. We have a clear vision for research that matches our strengths with opportunities, increases our research capacity, and creates a dynamic research environment to promote research excellence. Our research efforts are focused around six key research themes, allowing us to work in collaborative partnerships with industry, community, government and non-profits, to direct efforts and resources to addressing some of our country's most significant socio-economic grand challenges. Our sponsored research funding for the 2015-16 year totaled $360.5 million, ranking us the sixth largest university in Canada by this measure. With more than 30,000 students, 500 postdoctoral scholars, and 1,800 faculty actively engaged in discovery, creativity, and innovation, supported by 3,200 staff, the University of Calgary is a major driver of both economic prosperity and quality of life for Calgary, Alberta and for Canada.

Innovation is the key driver of productivity growth in the 21st century. Well-developed innovation ecosystems, with vibrant and well-supported research universities, are critical to sustained economic growth in a dynamic and ever changing global economy. Universities perform the curiosity driven and solution oriented research that leads to the development of new ideas and the transfer and commercialization of knowledge and discoveries. Universities also train and graduate the highly qualified individuals who provide the knowledge workforce required to support, innovate and grow Canada's economy. As the Fundamental Science Review (FSR) panel report, *Investing In Canada's Future,* found, federal support for university research has been falling behind that of competitor nations.[1] We cannot afford to let this situation persist. Strengthened federal support for Canadian university research is critical to the country's continued long-term productivity growth. The University of

[1] Advisory Panel for the Review of Federal Support for Fundamental Science, *Investing in Canada's Future* (2017)

Calgary recommends that the government enhance budgetary support for research and innovation by implementing the research funding recommendations made by the Fundamental Science Review panel.

Improving productivity and competitiveness through investments in research

In June 2016, the government launched the Fundamental Science Review, chaired by Dr. David Naylor, with a mandate to "assess the program machinery that is currently in place to support science...in Canada" and, determine "how to optimize support for fundamental science...survey international best practices for funding science and examine whether emerging scientists face barriers...and [how] to address these barriers and what can be done to encourage Canada's scientists to take on bold new research challenges."[2] The panel was to provide advice on how to improve federal support for science. The FSR is the most comprehensive review of federal support for science in four decades, and delivers a vision for investigator-driven research that the University of Calgary heartily endorses. This vision is similarly endorsed by the U15 and Universities Canada, as well as other stakeholders. Canada's universities believe that a comprehensive reinvestment in research support by the federal government is necessary to ensure Canada's long-term economic competiveness.

The FSR panel found that federal support for university research has declined over recent years, resulting in a marked decline in funding of about 35 per cent in available real resources per researcher from 2006-07 to 2013-14. While there was an increase in the number of Canadian researchers during this time, the decline in available funds per research cannot be attributed to dramatic increases in their numbers, as the FSR "found no evidence that there was either unusually fast growth (of researchers) in Canada or that there is now a uniquely Canadian glut of extramural researchers."[3]

The funding mix provided by the federal government has also shifted over time, moving away from investigator-led project funding towards government directed research projects as a result of federal funding policy changes. In fact, inflation adjusted funding for investigator-led research declined by 3 per cent, while that for priority directed research climbed by 35 per

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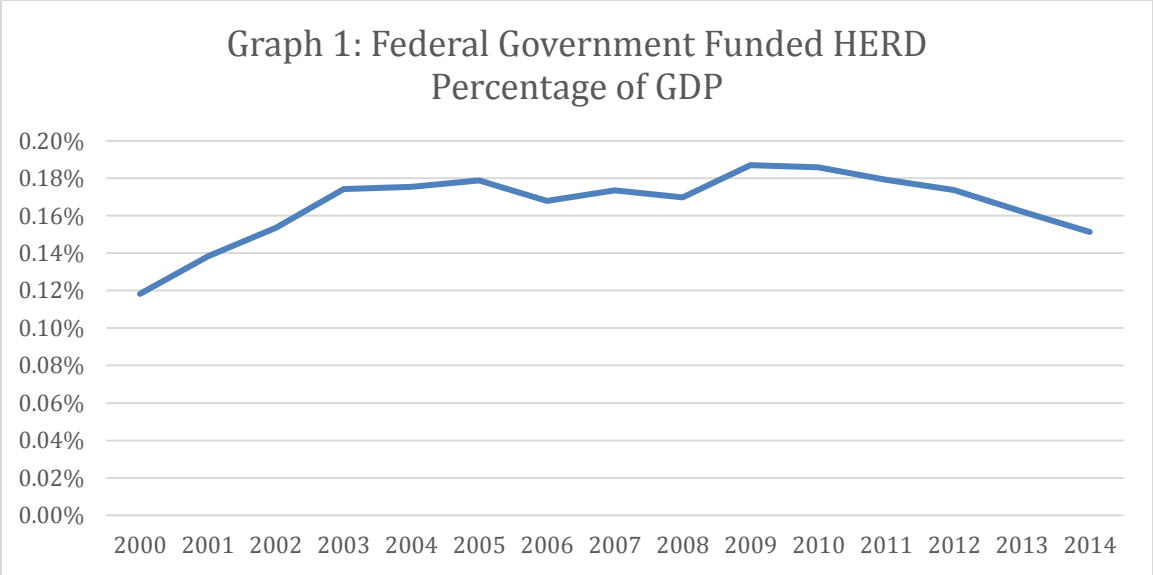
[2] Government of Canada, "Government of Canada Launches Review of Federal Support for Fundamental Science", *News – Canada.ca*, Last modified 2016.06.13, Accessed 2017.08.02, https://www.canada.ca/en/innovation-science-economic-development/news/2016/06/government-of-canada-launches-review-of-federal-support-for-fundamental-science.html.

[3] Advisory Panel for the Review of Federal Support for Fundamental Science, *Investing in Canada's Future* (2017)

cent.[4] This decline in available real resources and changes in funding directions, has created an environment where Canadian researchers are receiving less funding than in previous years, and an increased proportion of the funding they do is receive is directed by government to specific objectives, rather than investigator-led discovery.

The decline in federal government resources dedicated to university research is evident in nationwide statistics. Graph 1 below maps the federal government contribution to HERD (Higher Education Research and Development) from 2000-2014.[5] It highlights a worrisome trend of declining federal support for university research beginning in 2009. Federal support for university research has now dropped to 2002 levels.

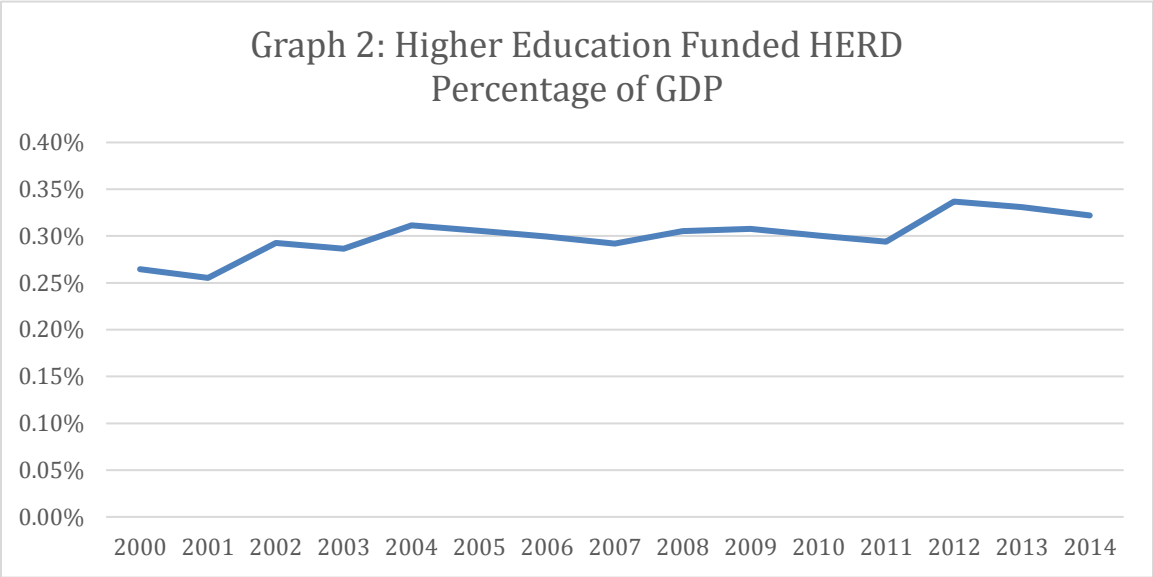


The decline reverses the strategic investments in research that began with Budget 2000. In that Budget, the government stated that "a nation's potential for innovation is strongly linked to its research capacity."[6]

The shortfalls created by the declining level of federal support for university research have resulted in systemic pressures on post-secondary research institutions to fill the funding gap. The drop of federal investment in recent years has been partially backfilled by internal funding allocations made by post-secondary institutions. Graph 2 below illustrates a 23 per cent

[4] Advisory Panel for the Review of Federal Support for Fundamental Science, *Investing in Canada's Future* (2017)
[5] Statistics Canada, "Table 358-0001 - Gross domestic expenditures on research and development, by science type and by funder and performer sector, annual (dollars)," *CANSIM - Canadian socioeconomic database from Statistics Canada*, Last modified 2017.06.22, Accessed 2017.07.17, http://www5.statcan.gc.ca/cansim/a05?lang=eng&id=3580001.
[6] Department of Finance Canada, "Making Canada's Economy More Innovative," in *Budget 2000: Better finances, better lives* (2000)

increase in own-source resources dedicated to HERD by post-secondary institutions since 2001.[7]



The funding balance between the federal government, post-secondary institutions, and other funders of higher education research is not typical compared to Canada's international peer competitors, who are not dependent upon institutional support to carry on research. The contribution of Canadian universities to funding the research endeavour is almost double that of peer institutions in the United States and in other countries, the amount is negligible. The FSR noted that it is "highly anomalous" and "is having adverse effects on both research and higher education across Canada."[8] The current funding model decreases Canada's research productivity, with our leading researchers seeking ever more competitive and ever smaller grants. The FSR indicated there was "no doubt that a major boost to funding for the ecosystem is urgently needed."

In response to these challenges, the FSR recommended a multi-year approach that would see strengthened federal investments to ensure researchers in Canada have access to the real resources required to succeed. Specifically, the FSR report recommends specific investments in the following areas:

- investigator-led curiosity driven and solution oriented research;
- support for early career researchers (scholarships and fellowships);

[7] Statistics Canada, "Table 358-0001 - Gross domestic expenditures on research and development, by science type and by funder and performer sector, annual (dollars)," *CANSIM - Canadian socioeconomic database from Statistics Canada*, Last modified 2017.06.22, Accessed 2017.07.17, http://www5.statcan.gc.ca/cansim/a05?lang=eng&id=3580001.

[8] Advisory Panel for the Review of Federal Support for Fundamental Science, *Investing in Canada's Future* (2017)

- renewed research chairs for excellent scholars and scientists (Canada Research Chairs);
- operational support for research and sustaining funding for capital projects; and,
- transforming the funding model for the Canada Foundation for Innovation's capital investments.

The FSR recommends that new investments be phased in over four budget cycles, growing from $390 million in the first year of investment to $1.3 billion by the fourth year. The FSR also emphasizes the coordinated and interdependent nature of Canada's research ecosystem, and recommended that investments be approached in a balanced, comprehensive and proportionate way that ensures funding supports the full research ecosystem. The recommended investments would cover gaps in funding compared to peer competitor nations.

Of the new funding, they recommend gradual increases in investigator-led direct project funding, beginning at $135 million in year one, growing to $405 million in both years three and four. As well, the report calls for $20 million to be earmarked for international collaborations, multidisciplinary work, high risk, high reward projects and research in response to fast-breaking issues or crises in year one, growing to $80 million in year four.

To support early career researchers, the FSR recommended an investment in scholarship and fellowship programs beginning at $35 million in year one, increasing to $140 million in year four. The report also recommends renewing the Canada Research Chair program at a cost of $35 million in the first year, growing to $140 million for each of years two through four. This significant infusion of new funding for research would ensure that the next generation of researchers is supported in their early careers with new and enhanced scholarships, fellowships, and Canadian research excellence is sustained through the research chair programs—this is critical to ensure the retention and attraction of the brightest and most productive scientists.

Investigator-led research pushes new bounds, and opens up new areas of discovery and business. Canada has funded the building of intellectual and physical capital with the aim to conduct investigator-led discovery and applied research, but currently, the research ecosystem lacks the ability to sustain these investments—to retain researchers and keep science infrastructure operating through its useful life.

The report recommends several investments specifically directed at supporting research infrastructure and operations to ensure science infrastructure can be sustained and that researchers have the resources they need to focus on research. First, the FSR recommends that the Research Support Fund receive an increase of $96 million in year one, growing to $478 million in year four. The report also recommends that operating support for small capital awards for individual researchers be increased by $30 million per year, and that the ratio of support provided by CFI for operating costs for major research facilities change from the current structure of 40:60 to 60:40, an increase of $35 million per year.

Finally, the report recommends transforming the funding model for CFI from one-time allocations to a regular, annual budget allocation. New research infrastructure is well-supported by the Canada Foundation for Innovation (CFI). However, CFI lacks a predictable funding envelope from the federal government and is currently funded through large, one-time allocations rather than regular, annual budget allocations. This leads to uncertainty in the research ecosystem and hampers long-term research planning. Providing a predictable, multi-year funding commitment to CFI would address this gap. A transformation of the CFI funding model to stable, predictable, annual funding will improve project planning that supports long-term projects, enabling universities to further focus on research strengths.

The absence of predictable funding degrades Canada's ability to attract the best and brightest, reducing short term and long-term competitiveness, particularly as it relates to participation in international research. For example, the University of Calgary has researchers collaborating with the CERN laboratory near Geneva to deepen our understanding of antimatter advancing frontiers of science and technology. This is an opportunity made possible for Canadian scientists, thanks in large part to funding from the CFI for the ALPHA-g project in antimatter physics.

Recommendation

As the centre of cluster economies large and small, universities lead and foster the creation of innovative ideas and technologies, support the growth of Canadian companies, and reduce the costs for businesses to operate.

Federal funding acts as the foundation of Canada's research ecosystem and needs to be strengthened if the country is to compete globally, enhance productivity and sustain economic growth. Each area of investment laid out by the Fundamental Science Review in the *Four-year Plan to Renew Canadian Research* addresses an acute gap in Canada's support for science. Its adoption will significantly enhance support for investigator-led curiosity driven and solution oriented research, and ensure Canada does not fall behind its global competitors.

The University of Calgary fully endorses the funding recommendations contained within the Fundamental Science Review's report, the *Four-year Plan to Renew Canadian Research.* We urge the federal government to adopt the report's research funding recommendations and move to enhance budgetary support for research and innovation in Budget 2018.