August 2017

Pre-Budget Submission to the House of Commons Standing Committee on Finance in Advance of the 2018 Budget

McMaster University thanks the Standing Committee on Finance for its work on the Pre-Budget consultations. In addition to this submission, McMaster also supports the submissions of the U15 and Universities Canada, the two associations that represent us at the national level. Universities in Canada play an essential role in performing research and contributing to innovation which has a direct impact on productivity and competitiveness.

McMaster is a globally renowned institution of higher learning and an innovative research community committed to advancing human and societal health and well-being. Situated in Hamilton, Ontario, with additional campuses in Burlington, Niagara, and Kitchener, McMaster is one of five Canadian universities consistently ranked in the world's top 100 universities. Of particular strength is our emphasis on research: in 2016, McMaster ranked second in the country for research intensity, with a total of $325M in sponsored research income for the year. To complement this strength, McMaster has long been focused on providing a high quality educational experience for our students. As a pioneer of experiential, self-directed, and interdisciplinary learning, McMaster places an emphasis on the integration of research and learning, providing all McMaster students with a unique opportunity to learn crucial skills and become productive members of Canada's workforce. As well, with over 7,800 full-time faculty and staff supporting 30,000 students, McMaster is one of Hamilton's largest employers.

McMaster appreciates the Committee's focus on productivity and competitiveness. These themes are essential to Canada's continued economic growth and development. McMaster believes that investment in research and education is paramount to increasing productivity, and helping Canadian businesses compete in the global marketplace.

The Role of Research in Innovation, Productivity, and Competitiveness

McMaster appreciates the government's commitment in Budget 2017 of $950M for the Innovation Supercluster Initiative, which will pair industry leaders with post-secondary institutions to promote economic development and growth in a targeted field. As a research-intensive institution, we are keenly aware of the important role that a broad range of research plays in developing a strong and competitive economy that spurs innovative and productive practices. We are looking forward to participating in this initiative.

The Fundamental Science Review, released in April 2017, highlighted the important role that scientific research and discovery plays in shaping a dynamic and competitive economy in Canada. McMaster is supportive of the review's recommendations, and looks forward to working with the federal government

to implement various measures to improve scientific discovery in Canada. Specifically, McMaster has long appreciated the support of the Federal Government for research activities through the Granting Councils, CFI, and regional economic development agencies such as FedDev Ontario. We appreciated the increased support for Granting Councils and the Research Support Fund announced in Budget 2016 and maintained in Budget 2017. We echo the call from our national associations for further investment into the Granting Councils and stable ongoing funding for the CFI. Also, we encourage the government to invest additional resources in the Research Support Fund in an effort to fund the full cost of research. We further support the vision for increased funding to international research collaborations.

Investing in Research Priorities is the Key to Enhanced Competitiveness

At McMaster we measure success by the degree to which we improve people's lives, contribute to our global knowledge base and advance the societies in which we live. In a time of technological revolution, economic upheaval and environmental disruption, Canada is faced with numerous challenges. However, McMaster views these challenges as great opportunities. By bringing together the best and brightest minds to collaborate and exchange ideas, our research can yield smart solutions, which ultimately improve lives and support the creation of a brighter world. Working with our partners in the federal government, we hope to build on our previous successes and continue to contribute to the productivity and competitiveness of Canadians using our innovative, interdisciplinary approach.

McMaster is leading research in many areas important to our local, national, and global communities. We believe that targeted investments into critical research areas of importance to Canadians is essential to make the largest impact on Canada's international leadership, world-class results, and above all, the productivity and health of our citizens. McMaster believes that centres of excellence and hubs for innovation can be created by investing in existing areas of expertise. These hubs attract businesses, highly qualified experts, further investment, and create jobs for members of their communities. This is at the essence of competitiveness for Canadian businesses: by targeting support and investment into cutting-edge research that involves industry partnerships, Canadian businesses are equipped with the tools they need to compete in a global market. At McMaster, we have several areas of expertise that align with Canadian priorities:

Advanced Manufacturing

McMaster continues to make strategic investments in advanced manufacturing to develop our research and training capacities and continue our strong leadership in this sector. Advanced manufacturing is an area of essential investment for Canada to remain competitive: manufacturing is a large contributor to the economy and is responsible for $3.15 of economic spin-off for every $1.00 of output. However, with intense global competition, Canada is increasingly falling behind our peers.

We have developed extensive partnerships with industry to advance innovation in advanced manufacturing. In fact, McMaster is the leading Canadian university in industry-sponsored research, attracting $588.7M of corporate research income over the last five years. Within advanced manufacturing, McMaster is poised to lead Ontario and the country in emerging sectors such as next-generation additive manufacturing and digital components and devices, and has the potential to make significant impact on a global scale.

Our Biomedical Engineering and Advanced Manufacturing (BEAM) project with Germany's Fraunhofer Institute is evidence of how targeted government investment can attract international investment and position Canadian institutions at the leading-edge in this sector. The BEAM project includes municipal, provincial, and federal support (through FedDev Ontario) and engages a significant number of industrial partners. McMaster is also continuing to make impressive contributions to the sector through the McMaster Manufacturing Research Institute (MMRI) and the McMaster Automotive Resource Centre (MARC), which recognizes the importance of the automotive industry in Southwestern Ontario.

Drug-Resistant Infections (Antimicrobial Resistance)

The devastating impacts of antimicrobial resistance to public health and the economy are being increasingly recognized across the globe, with the World Health Organization, the World Economic Group, and numerous countries making strong commitments to combat drug-resistant infections. The Michael G. DeGroote Institute for Infectious Disease Research (IIDR) is making a substantial impact in the area of drug-resistant infections. Its experts have won international recognition for innovative and rigorous infectious disease and drug-resistant infections programs and have developed the specialized expertise Canada needs to be an international leader in this field. Infectious diseases kill thousands of Canadians every year and are the world's most common killers of children and the elderly. Infectious disease costs are measured in a number of ways, including the effect of disease on health and quality of life, in dollars spent on health interventions, and in lost productivity.

Federal and provincial investments in the IIDR have enabled the creation of a unique combination of equipment, expertise and capacity that cannot be found anywhere elsewhere in the world. McMaster would encourage the government to focus investment, as other nations have, in this critical area to ensure Canada's position as a global solutions leader.

Studying the Aging Process through Longitudinal Cohort Studies

Census data recently released from 2016 reveals an unprecedented aspect of Canada's demographics: the number of Canadians over the age of 65 now exceeds the number of Canadians under the age of 15. This ratio is expected to widen, with close to one in four Canadians projected to be over the age of 65 by 2030. Helping older Canadians live a better quality of life, and enabling them to make positive, healthy choices to enhance their independence, are important goals that the government has set.

Because of these unique demographic shifts, it is more important than ever to invest in aging-related research. Longitudinal cohort studies that follow a large group of participants over an extended time period in order to determine the effects of various risk factors on healthy aging are particularly valuable. McMaster's Canadian Longitudinal Study on Aging follows more than 50,000 Canadians for twenty years, from the ages of 45 to 85. Other longitudinal cohort studies at McMaster include the Aboriginal Birth Cohort study, following 300 mother-baby pairs from the Six Nations Reserve in Ontario; the Prospective Urban Rural Epidemiology Study, following 220,000 people from all continents for five years; and the Canadian Health Infant Longitudinal Development study, which follows 3,500 Canadian children from pre-birth to school age.

However, the extended length of these studies – which allows them to discover unprecedented information about aging – means that they often face difficulties in securing consistent funding over their entire study period. McMaster would encourage the federal government to consider alternative methods of providing long-term funding to essential long-term cohort studies.

Nuclear Research

With the impending closure of the National Research Universal (NRU) reactor at Chalk River Laboratories in March 2018, nuclear research activities will be greatly impacted across the country. Currently, many Canadian and international researchers rely on the NRU to supply neutrons for their research, which paves the way for innovation in energy, environmentalism, nuclear physics, and medical sciences, including critically needed medical isotopes used to treat a variety of diseases. Upon the decommissioning of the NRU, the McMaster Nuclear Reactor (MNR) will be the only facility able to absorb any of the research demand created. While the MNR is able to increase its capacity to accommodate some additional research demand with investment from government, the closure of the NRU leaves a large gap in the future of nuclear research. McMaster urges the federal government to consider long-term solutions to neutron access in Canada. As well, McMaster recommends the creation of a consortium that could help facilitate international connections to research reactors in order to access neutron beams for research.

Truth and Reconciliation through Investing in Indigenous Education

We commend the government for its commitment to reconciliation with Indigenous peoples, a principle that we share and have worked to advance. We share the government's commitment to support and eliminate barriers for Indigenous students who wish to pursue postsecondary education. In Budget 2017, we were pleased to see the large investment into the Post-Secondary Student Support Program (PSSSP), which will provide financial aid to Indigenous students seeking to access post-secondary education. This opportunity is essential to the economic and social success of our country, and McMaster is supportive of any measure that seeks to narrow the gap between Indigenous and non-Indigenous postsecondary attainment rates. As the government continues to assess the PSSSP and other forms of financial support for Indigenous post-secondary students, McMaster looks forward to being a partner and resource in the discussion.

McMaster is located in close proximity to Six Nations of the Grand River, the largest reserve in Canada. With uniquely close ties to this community through many years of collaborative work, we have established a strong commitment to reconciliation at the University. An outdoor learning space, the Indigenous Circle, was opened in 2016 under the guidance of McMaster's Indigenous Education Council. In addition, the McMaster Indigenous Research Institute (MIRI) was launched in April 2017, and will focus on issues of health, environment, gender, language and culture, peace studies, and conflict resolution, striving to achieve research excellence for all Indigenous-related projects across campus.

Conclusion

McMaster University intends to continue working as an active partner in the economic development of both Ontario and Canada. Our commitment to world-ranked scholarship and focus on collaboratively

exchanging ideas and approaches makes us uniquely positioned to pioneer ground-breaking solutions to real-world problems, ultimately leading to a brighter world for all.

We appreciate the opportunity to make this submission as the government develops its next budget.