

**University of Saskatchewan Submission to Federal House of Commons Standing
Committee on Finance Re: Pre-Budget Consultations
August 10, 2011**

INVESTING IN TALENT, DISCOVERY & INNOVATION FOR CANADA'S FUTURE PROSPERITY

As one of Canada's leading research-intensive universities, we are pleased to participate in your annual pre-budget consultation process.

Collectively, Canadian universities are a \$30-billion enterprise—comparable to the Canadian utilities sector and larger than the primary and fabricated metals or transportation sectors. The success of universities in developing highly qualified personnel, undertaking world-class research, and transferring these innovations for use by society is of critical importance to Canada's social and economic sustainability.

You have asked us to reflect on four primary issues, namely: **how to achieve sustained economic recovery in Canada; how to create quality sustainable jobs; how to ensure relatively low rates of taxation; and how to achieve a balanced budget.** From a strategic point of view, we feel that the Canadian federal budget should be balanced over the business cycle—with surpluses in good times enabling deficit financing to maintain programs that benefit Canada in periods of weak growth, as is occurring in the aftermath of the most recent worldwide recession.

From a university perspective, the following note contains our thoughts and recommendations on how university students, research, innovation and knowledge transfer impact all four of these inter-related challenges and why these critical areas should be supported in Budget 2012.

INVESTING IN STUDENTS

Investing in human talent is the most effective way to advance Canada's knowledge economy and long-term global competitiveness. Continuing to maintain and enhance Canada's investment in its universities will create jobs, increase productivity, and sustain economic growth, which will in turn address Canada's budgetary challenges in a time of global economic uncertainty.

Building on Success: Canada continues to take the lead among G7 nations for its proportion of citizens with an education beyond high school. In fact, the economic downturn resulted in increased enrolment at both undergraduate (4.1%) and graduate (7.2%) levels. But we still have some weaknesses to address. For example, per-student Canadian funding for teaching and research was approximately \$21,000 CAD in 2008-2009, compared to \$29,000 CAD in the U.S. and our percentage of PhD students per capita (which is an indicator of a highly skilled workforce) fell from 20th to 23rd place.

To compete effectively in today's global economy, it is imperative that we continue to invest in post-secondary education and increase the number of talented, productive graduates. Canada, the provinces and universities need to work together, in collaboration with industry, to ensure that a university education is accessible, affordable and relevant in today's society.

Closing the Aboriginal Education and Employment Gap: Though we have good numbers overall for post-secondary enrolment, there are still gaps. Our Aboriginal population is growing but this growth is not mirrored in growth of Aboriginal post-secondary graduates. The Canadian Aboriginal population grew by 45% from 1996 to 2006—six times faster than the non-Aboriginal population which grew by 8%. **At the same time, only 8% of Aboriginal people aged 25 to 64 in Canada have a university degree, as compared to 23% for non-Aboriginals.** In fact, more than one-third of Aboriginal people in Canada

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have not completed high school. One result is that unemployment among Aboriginals was 13.9 % in 2009, compared to 8.1% for non-Aboriginals.

This challenge is of critical importance for Saskatchewan. **In 2009, the Saskatchewan unemployment rate for Aboriginals was 13.3%, as compared to 4.2% for non-aboriginals.** Unemployment rates for Aboriginals living on reserve were considerably higher.

Over the next 15 years, 400,000 Aboriginal people will reach working age - this poses a huge opportunity for Canada. According to the Centre for Study of Living Standards, **closing the education gap between Aboriginals and non-aboriginals by 2026 would lead to income increases of \$36.5 billion, government revenues of \$3.5 billion, and a decline in government expenditures of \$14.2 billion.**

To help increase numbers of Aboriginal graduates, universities offer additional support programs, bursaries and increasingly relevant curricula. For example, the U of S International Centre for Northern Governance and Development furthers research, graduate training, and capacity building in partnership with northern and Aboriginal communities, industry and government. Still, more needs to be done to further reduce the gap. Aboriginal young people need to be equipped with the education and skills to fully participate in the economy. New structures, approaches and models will need to be explored that focus on increasing the number of Aboriginal graduates, teachers, researchers, industrial employees, and organizational leaders.

Addressing Demographic Challenges: By 2030, the number of people in Canada over 64 will double, but there will be little growth in the number of working-age people. Canada will need a pool of bright young graduates to fill the employment gap and to exploit new opportunities.

In addition to addressing the Aboriginal education gap as noted above, international students and international research can help to fill this void. Currently, there are approximately 100,000 full and part-time international students in Canada, representing 8% of all students and 20% of graduate students and international students contribute 6.5 billion to Canada's economy annually.

Aggressively recruiting and retaining more international students studying and working in Canada and expanding the pool of university-educated Aboriginal people will help address our demographic shift, leading to an expanded work force, increased tax base and revenue collection, reduced reliance on social programs, and enhanced Canada's global linkages and competitiveness.

Creating Jobs: Recent data indicates that Canada's economy has created 300,000 jobs for university graduates and 78,000 for college graduates since 2008. Unfortunately, among those Canadians without a post-secondary education, 433,000 jobs were lost in the same period. **Over their working lives, university graduates will typically earn over \$1 million more than those without post-secondary educations or college certificates.** Higher incomes and academic accomplishments translate into increased social and economic sustainability.

Expanding Experiential Learning: Coupling university education with hands-on experiential learning in industry often enhances student learning experiences/employability skills while at the same time building collaboration between universities and business. National commitments to IRAP, MITACs and other internship, scholarship and fellowship programs that promote experiential learning and translation of

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university education into practice should continue to be supported and expanded to include not only science and technology, but other areas such as business management and policy development.

RECOMMENDATION #1: Invest in programs that support all students' (domestic and international) ability to obtain an affordable, high-quality university education in Canada, with particular attention to recruiting Aboriginal students and ensuring their success. These measures could include increased support for scholarships and loans and initiatives that enhance experiential learning or address cultural challenges.

INVESTING IN DISCOVERY WITH IMPACT

Continuing to invest in university research and development initiatives will lead to world-class innovations that help improve productivity, create high-quality jobs, and support sustainable economic growth.

The federal government should maintain and enhance university research through its Tri-Council agencies, Canada Foundation for Innovation, Canada Excellence Research Chairs (CERCs), regional development agencies, and many other programs and initiatives that foster innovation and skills training, not just in the sciences but in business, medicine, law and the wide array of social and cultural areas. A drop in current levels of research funding would have a significant negative impact, not only on universities, but on Canada's longer-term national and global economic competitiveness.

Generating Economic Impact: Canadian universities create world-class research and innovation that lead to high-quality, sustainable jobs in knowledge-based industries. These jobs increase Canada's tax base and consumer spending (on housing, retail goods and services), both of which stimulate the economy.

For example, based on 2012-2013 forecasts, the Canadian Light Source and U of S VIDO-InterVac—two of Canada's largest investments in research infrastructure—**will employ more than 246 FTEs, resulting in more than \$5 million in federal and provincial taxes.** Using a conservative economic impact multiplier, we project these investments will yield almost \$60 million in annual output and create approximately 450 more jobs for Saskatchewan. This is not a short-term stimulus-related gain but rather long-term employment and income growth that will also spur economic impact outside the province. Discoveries at these research centres also provide foundations for commercialization.

Focus on Research with Impact: University research has tremendous social and economic impacts, regionally, nationally and internationally. At the U of S, our goal is to conduct research with demonstrable impact, focusing on six signature research areas:

- Aboriginal Peoples: (Engagement and Scholarship);
- Agriculture (Food and Bioproducts for a Sustainable Future);
- Energy and Mineral Resources (Technology and Public Policy for a Sustainable Environment);
- One Health (Solutions at the Animal-Human-Environment Interface);
- Synchrotron Sciences (Innovation in Health, Environment and Advanced Technologies); and
- Water Security (Stewardship of the World's Freshwater Resources).

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Such research helps solve national and international problems. For example, research at the U of S-based Canadian Light Source helps solve problems in medicine (isotopes, imaging, neutron science), agriculture (crop productivity, value-add), energy, the environment (soil sciences, water quality), and materials sciences. U of S VIDO-InterVac develops new vaccines to protect animal and human health against infectious diseases including those that pose pandemic threats.

University research also helps government ministries deliver on their mandates and priorities. For instance, the U of S Canadian Centre for Nuclear Innovation and the U of S Global Institute for Water Security will help Canada address priorities related to managing nuclear issues and Environment Canada's clean water agenda, respectively.

CERCs: The CERC program attracts world-class researchers, producing quality research in areas of global importance (*e.g.*, water security research at the U of S), providing opportunities for collaboration (*e.g.*, innovation clusters), and transforming knowledge into commercial success (*e.g.* potential start-up companies, patents, and licences). There are, however, issues of global importance that are not eligible for CERCs such as food security (global demand for food will double in the next 40 years). The CERC mandate should be expanded to include additional critically important areas where Canada is well-positioned to provide international leadership.

Ensuring Competitive Research Investment: Governments and universities in Canada rate fairly well in terms of R&D investments. As the largest external funder of university research, the federal government invests \$3 billion annually for direct costs of research, institutional costs of research, infrastructure, and salaries.

But between 2006 and 2008 Canadian R & D investments as a percentage of GDP decreased while most of the world's innovating nations increased resources for R & D and indirect cost support in Canada is low (23.3%) when compared to our U.S., U.K., and Australia counterparts (40% to 60%). We also have a low level of business expenditures on research and development (BERD): Canadian private-sector investment in R&D as a share of GDP is about one-half that of the U.S., one-third that of Sweden and one-quarter that of Korea.

To be internationally competitive, Canada must increase or at least maintain current levels of R & D funding, raise indirect cost support for university research to levels that are more comparable to those of other developed countries and address BERD levels.

RECOMMENDATION #2: Continue to invest in Canada's major university research programs through the Tri-Council, CFI and other federal departmental and agency research funding programs, including an expanded CERC program and increased levels of indirect cost support for research so as to be more in line with other developed countries.

INVESTING IN KNOWLEDGE TRANSFER

To create more high-quality jobs, enhance productivity and diversify Canada's economy, Canadian governments and universities must move beyond their current strengths in science, technology and resource development into new and emerging areas. As stated in the 2010 State of the Nation position

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paper by the Science Technology and Innovation Council, support for Canada's innovation system will attract and retain talent, support world-leading research, and transform discoveries into commercial success.

Advancing Commercialization and Knowledge Translation: Canada does high-quality research but this doesn't necessarily translate into knowledge transfer or commercialization. There are various reasons for this productivity gap, including cumbersome and inconsistent technology transfer programs and processes. Governments can increase productivity by reducing some of these administrative barriers and focussing on how best to support early-stage high technology. Universities can help by removing cultural barriers to commercialization, improving and simplifying technology transfer processes, and building better strategic partnerships with industry.

Unfortunately, the economic recession has negatively impacted commercialization efforts in Canada. The 2010 Canadian Licensing Activity Survey of the Association of University Technology Managers/AUTM identified a decrease in invention disclosures and licenses which, they hypothesize, is due to a risk-averse investment climate, staff declines and a shift in institutional priorities. Post-secondary education institutions cannot be expected to excel at technology transfer if they are understaffed and underfunded.

Providing very early-stage funding for university start-ups (pre-seed), for continued development of technologies' commercial applications, or through internships and fellowships, is critical for moving fledgling technologies to market.

A July 20, 2011 Globe and Mail story illustrates the impact this funding can have. University of Calgary researcher Anand Agarawala recently sold his technology start-up company to Google for approximately \$30 million. He credited his success to a \$20,000 university fellowship, stating: "If we did not get that money, I don't know where we'd be.... In Canada, we don't have that angel [investor] infrastructure." **This \$20,000 investment in an internship created wealth of \$30 million.** Often the statistics reported by groups such as AUTM report licensing revenue but do not report the wealth created by university technologies or their overall economic impact that enhance the tax base and revenues.

Programs such as the NRC Industrial Research Assistance Program and MITACs work collaboratively with university industry liaison offices, supporting translation of discoveries into commercial success through industry-university research collaborations and internships, technology patenting and licensing, and support for start-up companies. Investment in such programs should continue to be supported and augmented through measures such as tax incentives, flow-through shares, increased indirect cost percentages, and consistent intellectual property policies, as well as streamlining existing programs and processes and reviewing best practices used by other nations.

RECOMMENDATION #3: Invest both financially and strategically, in programs that enhance efforts to transform university research into commercial products and services. Specifically, support development and funding of best-practice technology transfer offices and fund more internships and fellowships with a commercial focus.

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Executive Summary

As one of Canada's leading research-intensive universities, we are pleased to participate in the federal 2012 pre-budget consultation process. Universities such as the University of Saskatchewan closely follow the federal budget discussion and decisions, as resource allocation impacts our ability to provide quality education and to undertake research that contributes to Canada's innovation agenda.

The success of universities in developing highly qualified personnel, undertaking world-class research, and transferring these innovations for use by society is of critical importance to Canada's social and economic sustainability.

Prime Minister Stephen Harper underscored this point when he stated in a 2009 speech: "Scientific and technological innovation is fundamental to economic and social progress. It creates good jobs, raises living standards and underlies improvements in medicine, communications and family life. No country can hope to remain prosperous and healthy without reinvesting a substantial portion of its wealth in science and technology." In addition, research and innovation contribute tremendously to environmental sustainability and our culture and social well-being as a nation.

In our view, the Canadian federal budget should be balanced over the business cycle – with surpluses in good times enabling deficit financing to maintain programs that benefit Canada in periods of weak growth as is occurring in the aftermath of the most recent worldwide recession.

Continuing to invest in Canadian universities will improve economic productivity, increase jobs, foster growth of tax revenue, and enhance economic sustainability. We strongly recommend that Canada continue to invest at current or higher levels in the following three critical areas:

- Programs that support all students' (domestic and international) ability to obtain an affordable, high-quality university education in Canada. In particular, programs should be targeted to increase the number of Aboriginal students successfully completing a university education .
- Canada's major university research programs through the Tri-Council, Canada Foundation for Innovation, and federal departmental and agency research funding programs, including an expanded Canada Excellence Research Chair program and increased levels of indirect cost support for research so as to be more in line with other developed countries.
- Programs that enhance the processes of transforming university research into commercial products and services. Specifically, support development and funding of best-practice technology transfer offices; and fund more internships and fellowships with a commercial focus.

To ensure economic stability and higher living standards for Canadians, we urge the federal government to sustain its commitments to research and to training the next generation of researchers and innovators. Most importantly, Canada needs to continue to invest in its universities in support of students, research, innovation and knowledge transfer programs.