



Getting the Deal Done

Unlocking Innovation from Within Canadian Universities

**A Study of the Venture Investor/Technology
Transfer Office Relationship**

Darren Fung
Sana Halwani
David Kelton
Jake McEwan
Emmanuelle Richez

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ACTION  CANADA

About **The Authors**

Darren Fung is a Montreal entrepreneur who owns Stinky Rice Studios in Montreal. He is an accomplished Canadian composer whose works have been performed across Canada, and, as the youngest member of the board of directors for the Guild of Canadian Film Composers, is an advocate for emerging composers.

Sana Halwani is an intellectual property litigator with Gilbert's LLP in Toronto and has published several articles in the area of health law. She obtained her B.Sc. in Biochemistry from Queen's University, her M.A. in Biotechnological Law and Ethics from the University of Sheffield and her J.D. from the University of Toronto.

David Kelton is a Toronto physician specializing in radiology. He is interested in improving health with new technologies that have a patient-centered philosophy. His research interest is in open-source software innovations.

Jake McEwan is a Development Manager with Concord Pacific Group Inc, Canada's premier developer of master planned communities. Jake has also held a variety of government posts including chief political assistant to the B.C. Minister of Agriculture and Lands and Resort Development.

Emmanuelle Richez is a doctoral student in political science at McGill University in Montreal, where she is researching the impact of Supreme Court judgments on Canadian citizenship. She has worked as an aide to Quebec's minister of intergovernmental affairs and democratic reform; as a page at the House of Commons and as a legislative assistant.

Executive Summary

▶ One of the most important experiments taking place within Canadian universities is not in a laboratory or clinic.

The outcome of this experiment will impact Canada's future prosperity. It has the potential to improve our health and safety, protect our environment, and make our businesses more productive and competitive.

The goal of the experiment is to make Canadian universities the best at moving new discoveries to market. This experiment takes place within university technology transfer offices (TTOs). Without any dominant national policy, each office is testing different policies, operations, and strategies in the search for 'best practices'. Technology transfer is still much more art than science, but University research spin-off companies such as Google, Hewlett-Packard, Amgen, and Genentech, demonstrate the stakes involved.

For decades research output has been measured by the discovery and dissemination of new knowledge. This view is evolving as universities are recognized as critical drivers of knowledge-based economies. These "entrepreneurial universities" are measured by new research outputs such as patents and start-up company formation. TTOs are expected to be the catalysts within this new role.

Technology transfer is the point at which ivory-tower research begins the path to job creation and economic stimulation. It is where government and academia meet the private sector.

And here lies the problem.

The operational cultures of these three entities clash significantly. In the realm of commercialization, government, academia and the private sector have often acted independently and according to their own priorities. The result: many technologies stall, never making it to market, and leaving Canadians without a reasonable return on their research dollars.

We are Action Canada Fellows – young Canadians who are interested in public policy and Canadian competitiveness. As independent analysts, we are able to objectively synthesize information from diverse stakeholders.

The goal of our project is to study one dimension of this national experiment – the relationship between venture investors and the technology transfer offices – by speaking to both venture capitalists (VCs) and TTO managers. From this dialogue, we identified three recurring themes and compiled a list of recommendations that we believe will help unlock innovation in Canada.

Our recommendations are made with two broad goals in mind: to make Canadian universities the best environment in the world for scientific entrepreneurship and for university venture creation.

Our Recommendations

Make Technology Transfer a Priority

- 1 Universities should value and encourage faculty commercialization efforts.
- 2 TTOs should develop programs and structures that encourage closer ties to the investment community.
- 3 Universities should not view technology transfer as a profit center, but as a core mission.

Get the Deal Done

- 4 Universities should have clear equity and intellectual property policies that encourage entrepreneurship and investment.
- 5 TTOs should organize their structure and practices so that they can rapidly move through negotiations with investors.
- 6 New metrics should be developed to measure start-up success.
- 7 Governments should encourage the creation of mentoring or training programs such that novice venture capitalists in Canada are exposed to global best practices in venture investing.

Ensure Cash Flow

- 8 Governments should help bridge the funding gap.
- 9 Governments should provide a centralized point of delivery for their granting programs.
- 10 Governments should implement tax credits to increase high-risk early stage investing.

About Action Canada

Action Canada is a national organization based in Vancouver BC, committed to building leadership for Canada's future through an innovative fellowship program. Each year, up to 20 of Canada's top young leaders are selected to participate. Action Canada was founded by two eminent Canadians, philanthropist businessman Sam Belzberg and Simon Fraser University President Emeritus Jack Blaney in partnership with the Federal Government.

Our findings and report can be found online at www.innovation-action.ca

“Places that invest in innovation, that stroke the creativity of people, that market their ideas most effectively **will become the home to the most rewarding jobs, to the strongest economies and to the best quality of life.**”

– Ontario Ministry of Research and Innovation Website

“There is gold to be mined in our universities and research institutes. **The problem is that no one is mining them well.**”

– Canadian Venture Capitalist, Biotechnology Sector

Introduction

● ● ● ► “Canada holds its own against the world’s top innovators. But unless we begin to yield the benefits of our investments, Canada risks losing its ability to compete globally.”

– Gilles Rhéaume Vice-President – Policy, Business and Society, The Conference Board of Canada

In May 2007, the Government of Canada launched its Science and Technology Strategy, highlighting the importance of research and development to the economic growth of Canada. Canada’s universities are the incubators for this economic growth.

The term “entrepreneurial universities” has been used to describe a new role for universities beyond their traditional missions of research, teaching and community service. These entrepreneurial schools are increasingly expected to capture the value of their research efforts through various commercialization strategies.

Our Action Canada group studied one dimension of this new role – the transfer of university technology through spin-off company creation. The purpose of our policy research project is to put forward recommendations to maximize the flow of intellectual property from Canadian universities to market via university spin-off companies.

We view this issue simply through the lens of deal flow volume. Cognizant of the immense challenges involved with university spin-off creation, we focus on ways to increase deal flow of intellectual property (or IP) to market.

In other words, simply getting the deal done.

This report is unique for a number of reasons. The authors bring various backgrounds to the project, but all share an interest in public policy and enterprise within Canada. Our backgrounds allow us to objectively synthesize information from multiple stakeholder groups and to make recommendations on mechanisms for increasing economic growth within Canada.

Many of these recommendations have been made before, but have not been adequately implemented. We urge Canadian policy-makers to take a serious look at this issue before Canada slips further behind in the race towards a knowledge economy.

Background

The Technology Transfer Office

The transfer of research from within schools to the private sector for commercial development has become the focus of increasing public policy scrutiny and academic study. The movement of intellectual property (IP) from universities to the market is a long and complex process, which makes the study of this area more difficult.

The university technology transfer office (TTO) is a focal point of this new interest. These offices are variously characterized as brokers, barriers, entrepreneurial educators, and gatekeepers. TTOs themselves are a diverse group, but generally broker the relationship between the university faculty and the private sector, serving as a translator or facilitator.

Technology transfer occurs primarily in three ways: industry-university sponsored research dollars; licensing the technology to the private sector; and transferring the technology via a spin-off company.

The technology transfer office navigates these three routes under the broader policy practices of the institution. Universities in Canada have varied ownership policies of research inventions, although most have a blended policy of ownership. Several universities have begun to experiment with outsourcing their commercialization activities to private firms.

One of the areas of research, which remains largely unstudied, has been the relationship between venture investors and technology transfer offices. Because this relationship is critical, our Action Canada policy group chose it as the focus of this study.

Specifically, we examined the relationship between venture firm and technology transfer office practices: what works, what doesn't, and how to optimize this connection. We spoke to both VCs and TTO managers and synthesized a list of recommendations from these discussions that we believe will help unlock innovation in Canada.

The Technology Transfer Manager

Working within technology transfer offices is a demanding job, which requires balancing the unique priorities and dramatically different cultures of the private sector and university faculty.

Overall, technology transfer offices have significant staffing problems due to lack of resources. First, few offices can offer salaries that will attract and retain employees with both private sector experience and a knowledge of leading-edge research. Many offices suffer from high turnover and some positions remain unfilled for long periods of time. Second, many offices are very small. At these universities, the few technology transfer managers are forced to deal with the entire spectrum of technologies developed at the university. These offices are at a significant disadvantage relative to larger offices that can support specialists and thus create deep sector expertise. Salary is a clear incentive for these managers, but TTOs often do not have the capacity to offer competitive salaries. These resource limitations result in TTOs that are often staffed by generalists, although the job frequently demands deep sector expertise.

The Academic Entrepreneur

University faculty members are central to the success of technology transfer. They are critical to both the research and commercialization stages.

Attitudes and environments matter. The decision to commercialize research is driven by the personal beliefs of the researcher. Important secondary factors include the incentives provided by the intellectual property ownership policies of the university, tenure and promotion policies and practices, and the attitudes of the researcher's peers towards commercialization.

Critics of entrepreneurship within academia often question the impact upon academic freedom, especially the freedom to control the direction of research and to publicly share research results through publications. Interestingly, research has consistently shown that academic publication rates do not significantly drop during commercialization periods. In other words, star scientists remain star scientists even if they engage in commercialization efforts.

Evaluating Technology **Transfer Offices**

Measuring the performance of TTOs is difficult, mainly because of the lack of consistent data and the long timelines involved in commercialization. The richest regular source of data comes from a member organization, the Association of University Technology Managers (AUTM). AUTM has been conducting annual surveys of TTO managers since 1991, collecting data on licensing income, invention disclosures, patents pending, and start-up company creation. The survey is voluntary and was submitted in 2005 by 36 Canadian institutes, including universities, hospitals, and research centers. Comparisons of US and Canadian universities show that they have similar numbers of patents and licenses per dollar of research spending. However, US universities have more licensing revenue per dollar of research spending, which implies that US universities achieve a greater economic impact than Canadian universities.

A report by the Milken Institute, an American think tank, released in September 2006 was one of the first to compare the performance of technology transfer offices. The study looked at three measures: publication rankings, patenting rates, and TTO outcome rates and developed a formula to calculate the strength of the “university innovation pipeline”. The University of British Columbia (UBC) was the only Canadian school to be ranked in the top 20 universities by the Milken Institute University Technology Transfer and Commercialization Index: it was ranked eighth.

The Milken report also identified factors important to success on a national level: an open national innovation system that “minimizes partisan regulations, inefficiencies, conflicts and waste”, adequate funding and venture capital, innovation clusters that overcome geographical borders, and efficient technology transfer.

The paper also outlined broad best practices and recommended that universities:

- Provide incentives for TTO staff;
- Make long-term funding commitments;
- Hire well trained staff with an emphasis on private industry experience;
- Make technology transfer a priority for top level university administration; and
- Start benchmarking TTO activities and sharing data across universities to better develop best practices.

Venture Capital and **the Funding Gap**

University research is often far upstream of any prototype or marketable products. The ‘funding gap’ specifically refers to the investment required to develop a university technology into a prototype able to attract venture investing. What may appear to be a clear investment opportunity to a university scientist is often viewed by a venture investor as an immature idea that carries too much risk to justify capital. This difference in these views and risk tolerance creates the funding gap.

A Global **Problem**

The funding gap in university technology transfer is an international problem.

When venture capital is unavailable, the majority of start-up capital comes from informal investors: friends and family, and angel investors. The role of these groups in technology commercialization has not been well-studied.

A number of policies and programs have been suggested to help close this gap: proof-of-principle (POP) grants, publicly-supported VC funds, university funds, and programs in support of informal investor (“angels”) incentives.

Canadian **Venture Capital**

Canada is currently suffering from a lack of seed and early-stage capital. In the past, venture capitalists in Canada invested more funds in early stage and seed opportunities than their US counterparts. However, early Canadian venture funds underperformed other jurisdictions. Between 1998 and 2003, early-stage VC investments garnered a meager 3.1% return in Canada, compared to a 54.9% return in the United States. Such poor performance appears to have made Canadian VCs “gun-shy” when approaching future university spin-off opportunities. Further, Canada ranks only 9th out of 18 countries in the Global Entrepreneurship Monitor Study for level of informal or angel investment.

Recently, both the National Angel Organization (NAO) and Industry Canada’s Expert Panel on Commercialization have recommended increasing available capital in Canada by implementing tax policies such as the creation of a tax credit aimed at early-stage investors and the elimination of the withholding tax on capital gains made by foreign investors in the equity of private Canadian companies.

Most importantly, studies have shown that when the venture funding available in a university environment increases, so does the number of invention disclosures. More invention disclosures lead to more deals, and more deals lead to more technologies making it to market.

Venture Capital and **the Funding Gap**

University research and the commercialization of this research needs to be understood within the wider context of the Canadian postsecondary system. As of 2004, the funding for the direct costs of university research was provided by the universities (46.2%), the federal government (24.5%), the provincial government (11.2%), industry (8.7%), private non-profit investors (8.1%) and foreign investors (1.4%). As the main sources of external funding, the provincial and federal governments are expected to actively support the commercialization of university research. The federal government is expected to maintain a leadership role due to its oversight of the granting councils and thus closer relationship with research activities.

Since 1999, the federal government has produced four reports regarding the commercialization of university research.

1 Public Investments in University Research: Reaping the Benefits (1999)

The Expert Panel on the Commercialization of University Research’s main recommendation to the Advisory Council on Science and Technology was the creation of a national framework for IP ownership of federally-funded research. IP policies determine the rights and responsibilities of faculty inventors and university TTOs with respect to the commercialization of university research. Unlike in the US, individual universities in Canada are free to define their own policies. As a result, Canadian universities have a diverse set of policies ranging from full inventor-ownership to full university-ownership.

The panel’s recommendation that Canada adopt a national IP policy for federally-funded research was controversial and divisive, and no action was taken to implement it. The controversy reflects the fact that there is no clear winner in the innovation game between university-ownership and faculty-ownership of IP.

The report also stated that in order to effectively manage IP, TTOs needed to have the appropriate financial and human resources. To that end, they recommended a funding formula for federal investment, including funds for training more people in the realm of technology transfer. The panel also suggested both a tax policy review, with the goal of improving the climate for university spin-offs, and a general call for additional research funding.

2 Innovation Report (2000)

The House of Commons’ Standing Committee on Industry, Science and Technology’s Innovation Report emphasized research as an economic driver and marked an increase in support for university research. In its 2001 Speech from the Throne, the government outlined plans to place Canada fifth in R & D funding by 2010. As a result, a framework agreement was struck between industry and the Association of Universities and Colleges of Canada (AUCC) in 2002. This outlined goals and responsibilities for both the government and the institutes that receive federal research dollars. More research dollars mean higher expectations from the public of a return on investment, and it becomes more and more important that there is adequate support for the commercialization of future innovations.

3 People and Excellence: The Heart of Successful Commercialization (2006)

The Expert Panel on Commercialization, led by Joseph Rotman, noted that while research funding is relatively healthy in Canada, there is weak demand from the private sector for these innovations. As a result, little technology is commercialized.

The report's recommendations sought to address the lack of industry demand. The recommendations were structured around the themes of talent, research, and capital, and advocated the creation of a centralized Commercialization Partnership Board (CPB) to be the lead advisor on these issues to Industry Canada. Several provinces and the federal government have begun to make inroads in this area.

4 Science and Technology (S&T) Strategy (2007)

Immediately before publication of this report, the federal government announced a new Science and Technology (S&T) Strategy. Its recommendations include: aligning the programs and activities of existing organizations to increase commercialization outcomes; adopting a more integrated approach to support academic research and improving client service by consolidating, integrating and aligning funding programs; enhancing collaboration within the federal S&T community; fostering a culture that values and rewards ingenuity and entrepreneurship; and consolidating the roles and responsibilities of the many S&T advisory councils.

As these are new initiatives we cannot gauge their efficacy or the impact they will have on commercialization of technology in Canada.

Make Technology Transfer A Priority

Canada has spectacular education facilities, generating outstanding technology, and we are in a country where all of our programs and our attitude and culture is based on research and development. ... we are too much in the R & D mode, and not enough in the commercialization mode in this country.

– TTO Manager

Universities need to make these [technology transfer] offices a priority. Recruit entrepreneurs and people with industry experience. Bring in students from the business school. Pay them more. Incent them.*

– VC, IT Sector

As we move towards a knowledge-based economy, universities are finding that they must broaden their original scope of teaching, research, and community service to include a focus on bringing innovations to market. One mechanism for providing access to innovations is commercialization through licensing to existing firms and the creation of new technology-based firms. To maximize the returns from publicly-funded research, Canadian universities and the Canadian government must make technology transfer a priority.

The Canadian context finds our public institutions stretching their limited resources over a greater number of demands. Although TTOs are asked to bridge the gap between academia and private industry, often they are not equipped with either the financial, human, or institutional framework to do the job properly. One TTO staffer indicated that “there needed to be a lot more focus on bringing experienced people to the opportunities.”

But prioritizing the commercialization of technology is not simply a matter of throwing money at TTOs – though additional funding would certainly help. Our interviews identified need for a cultural shift in attitudes and relationships, as key to making technology transfer a priority.

*Five managers from the technology transfer offices of leading Canadian research universities and six partners from leading venture capital firms were interviewed to explore their experiences investing in Canadian university spin-offs. The interviews ranged from 25 minutes to over 2 hours. We summarize many of their observations and recommendations here. All statements are reflective of comments made during the interviews but may not be precise quotes.

Universities should **value and encourage faculty commercialization efforts**

- ● ▶ Academics need to decide if they want to be a CEO or a professor. They want to do both. Universities do not let them be the former.

– VC, Biotech Sector

The driving force in every university spin-off is the academic entrepreneur. Faculty inventors are often the first people to identify start-up opportunities. When the TTO managers interviewed complained of a lack of deal flow, they identified a reduction in the number of workable disclosures as the root of this problem. Therefore, academic entrepreneurs need to be provided with adequate incentives for identifying and disclosing such opportunities.

Both our interviews and literature review also noted clearly that the academic inventor's involvement beyond the research and disclosure stage is critical for deal success. Academic inventors are usually a critical source of technical expertise for the fledgling firms. In some cases, the academic entrepreneur also provides the business experience and contacts required to lead the start-up. In both cases, the continuing involvement of the inventor can be a key factor in the success and survival of the firm.

However, it is unreasonable to expect an inventor to perform their academic duties while taking a lead role in a new start-up company. If innovation is truly valued as a part of a university's mission, it should support flexible "start-up" sabbatical programs to allow faculty to pursue entrepreneurial activities.

In addition, universities should broaden their perspectives on scholarship and incent, or at a minimum, recognize commercial activity in a faculty member's academic or tenure review. Commercialization will not happen if it is not part of the broader university attitude and culture. Without commercialization being a valued component of faculty development, the current policies act as an implicit disincentive to entrepreneurship.

TTOs should develop programs and structures that **encourage closer ties to the investment community**

- ● ▶ There is a feeling that great technology is of immediate value, and it's not. This needs to be understood within a university environment. Great technologies with people that are proven capable have values. Technologies onto themselves are practically worthless, as are teams without a great technology. There needs to be both things in place.

– TTO Manager

TTOs and VCs often don't speak the same language.

This was echoed by VC's throughout our interviews; investors complained that many TTO officers have little experience dealing with the private sector. In addition, some TTOs complained that VCs misunderstand the academic space, while VCs also expressed frustration with some TTOs inability to, "speak in a language that an investor could understand."

One simple way to improve this relationship is to increase interactions between VCs and TTOs. Another is to diversify the leadership of TTOs to reflect their many partners. As such, we recommend that TTOs establish an advisory or governance board that reflects industry and investment stakeholders. The board could include entrepreneurs, venture capitalists, angel investors, and members of industry.

In addition, to help translate between the different languages spoken in the academic and venture capital community, we advocate the inclusion of these stakeholders in TTO service delivery. A model program is the University of British Columbia's University-Industry Liaison Office (UILO) Entrepreneur-In-Residence (EIR) program. The EIR manages its "New Ventures Program," which is actively tries to "identify and mobilize start-up companies arising from UBC research." Further, the EIR provides experience in the form of informal and formalized advice, and will often have contacts in the investment community to help match funder to fundee.

One TTO Manager stated, “Often the researcher with a Petri dish who wants to be a CEO will be his own worst enemy. Nobody wants to invest in someone who will learn how to run a company on the investment dollar.” This observation which was repeated throughout both VC and TTO interviews points to an important additional role to the technology transfer manager; that of the entrepreneurial educator. While the funding gap is a well recognized phenomenon, the ‘cultural gap’ between academics and venture creation can be just as difficult to navigate. It is a critical skill to be able to communicate between these two communities to facilitate the movement of technology between them. The inclusion of private sector stakeholders in TTO service delivery would help cross this cultural gap.

Universities should **not view technology transfer as a profit centre, but as a core mission**

- ● ▶ Technology Transfer’s primary and most important endpoint is getting the product to market. A TTO manager can ruin deals by inflated or unrealistic expectations, which results in the product never getting to market. When a product gets to market, not only does the university benefit from a royalty, but it also gains a lot of intangible reputational benefits. For this reason, TTOs should be willing to renegotiate downwards on every deal if necessary to get the deal done.

– TTO Manager

- ● ● ● ● ● ● ● ▶ Everyone makes a lot of money or no one does. I don’t know why there isn’t a greater push behind these technologies, it always seems like negotiations are a sport when they don’t need to be.

– VC, Biotech Sector

The most successful TTOs in Canada are the ones that are given the flexibility to get a deal done. Several TTO Managers indicated that few VCs are not willing to negotiate and rework the deal. TTOs must simply be reasonable in their negotiations and have the independence and resources to take risks. A TTO that cannot itself be entrepreneurial or offer staff incentives to help build companies will not be able to adapt to changing circumstances or attract the right personnel and resources. A TTO must be willing to do things creatively as an office to move things forward; one size does not fit all.

Creativity and deal-making are stifled when TTOs are viewed as university profit centers and there are false expectations of enormous financial returns to the university. ‘Big winners’ like Gatorade and Genentech are rare. A university administration intent on finding big winners is likely to block deals that would allow the university to meaningfully contribute to the economy. Universities must take a long-term view, especially in the life sciences in which it can take 20 years to develop a product from a laboratory finding.

Get the Deal Done

- ● ▶ Very few VCs are unwilling to negotiate and rework a deal. There is always a way to get the deal done.
– TTO Manager

Access to venture capital has been identified as one of the most important factors for start-up company growth. Our interviews showed that one of the overwhelming factors in a decision to invest in a university spin-off is the ability of the TTO to push the technology toward market quickly, a concept termed innovation speed. TTOs should relentlessly work to accelerate, monitor, and optimize negotiations to deal closure. From our conversations with university technology managers and VCs, we identified several steps that could be taken to improve the innovation speed of Canadian universities.

Universities should have clear equity and intellectual property policies **that encourage entrepreneurship and investment**

- ● ▶ TTOs should bring clarity to a deal. With clarity, we can figure out any investment.
– VC, Engineering Sector
- ● ● ● ● ▶ We want the inventor driving this, they need a big stake. The university can take 1% of equity. Future revenue deals can kill a growing company.
– VC, Engineering Sector

Unlike the 1999 Expert Panel on the Commercialization of University Research, most of the VCs and TTO managers we interviewed did not recommend that Canada adopt a national IP policy regarding federally-funded research. Instead they recommended that university IP policies be clear and provide academic entrepreneurs with significant incentives in return for their support of start-ups.

It is critical that academic entrepreneurs and VCs understand the terms of the IP policy so that it is possible for them to quickly and easily negotiate equity and licensing arrangements. There was no consensus on the most productive IP policy, among the VCs interviewed, but the majority expressed that they would only work with entrepreneurs who had a large equity stake as an incentive to drive the company forward.

TTOs should organize their structure and practices so that they **can rapidly move through negotiations with investors**

●●●●●●●▶ All we care about is speed. We are in a race with the IBMs and Nortels, I'm not sure the university we are working with now understands that.

– VC, Engineering Sector

●●●▶ No one in the world knows the value of the IP at the stage we see it. Why is there such a debate? Negotiations drag on forever.

– VC, IT Sector

In order to reduce the time required to reach a deal, TTOs could develop summary sheets of the typical terms for licensing or equity arrangements. These summary sheets would provide potential investors with a starting point for the negotiations and an opportunity to provide explanations if the terms required by the university differ from those conventional in industry.

This practice would be especially valuable when dealing with industries that require very fast time to market and do high volumes of intellectual property deals like the consumer electronics industry.

There are two main benefits to this approach.

The first has relates to marketing. Universities are competing with the private sector for venture financing. There is a perception, as expressed in our interviews and illustrated in the academic literature that negotiating with a university technology transfer office is complex and drawn-out. This ultimately leads to fewer deals and fewer start-up companies.

The second benefit would be to engage Canadian small and medium sized enterprises. This large group of companies has been shown to under-utilize technology from our academic centres.

The standardization would also benefit the smaller universities, research institutes, and hospitals. In technology transfer, scale matters. The sharing of standard forms would decrease the resource intensity start-ups require from these smaller offices.

New metrics should be developed

to measure start-up success

University administrators base their decisions on evidence-based recommendations, and policy makers need success stories to show a return on public investment. Currently the academic literature research is based on un-audited data from the AUTM surveys. This survey data emphasizes the licensing of university technologies to established firms, to the neglect of start-up company performance.

The emergence of best practice in deal flow will only happen if what works and what doesn't is well understood and shared among TTOs. We suggest that groups such as the Canadian Venture Capital Association (CVCA) lead the development of new metrics to measure start-up success. Such new metrics would provide important feedback to TTOs helping them to understand if their policies promote the creation and support of start-up companies.

Governments should encourage the creation of mentoring or training programs such that novice **venture capitalists in Canada are exposed global best practices in venture investing**

●●●▶ Canadian venture capital is immature.

— TTO Manager

The Canadian venture capital industry is at an early stage of development. In a country in which universities do a significant amount of the R&D, early-stage venture capital and academic entrepreneurship are interconnected and depend on each other for growth. When interviewed TTO managers indicated that Canadian VCs would benefit from additional and extensive operational experience. Strong operational experience allows VCs to add value to the companies in which they invest by focusing on the aspects of the company that will bring a return on investment for everyone.

Canada needs to jump-start its venture sector and help young venture capitalists develop global best practice in their field. One way to do so is through VC mentoring programs like the Kauffman Fellows Program.

This program, based out of Silicon Valley, places talented individuals in leading VC firms under the mentorship of industry veterans. The Fellowship is dedicated to enhancing human investment in the venture capital process globally. Alumnus of the program can be found in new and established venture firms, as well as in academic and public policy leadership positions.

While the Kauffman Fellows Program is a private program, governments can play a role in developing similar programs or in partnering with them in the context of technology transfer from universities. For example, the United Kingdom's Department of Trade and Industry has partnered with the Kauffman Program. The partnership involves venture capitalists working on a joint project with UK university technology transfer managers to share skills and develop a professional relationship.

Ensure Cash Flow

- ▶ The message that we are getting from our federal government is ‘stay in the lab, generate great technology, but for heaven’s sake, don’t sell any of it!’
– TTO Manager
- ▶ Our university has acquired lots of really high-tech equipment through research grants so that we can bring a technology to the point where it can be commercialized. However, we lack the funds necessary to actually run these new labs. This is the main problem of technology transfer in Canada.
– TTO Manager

University spin-offs face a challenging investment climate in Canada, one where classic venture capital and informal investors form smaller pools in comparison to those in a number of countries. Many of the TTO managers we interviewed lamented the limited venture funds available in Canada.

New public policy developments in this area must therefore recognize that proper investment into commercialization, including further training and removal of barriers to investment will allow our country to fully benefit from the fruits of our research.

Governments should help **bridge the funding gap**

- ▶ University and government seed funds create lands of the walking dead. They have no way to ensure follow-up funding which a company needs to grow. Its like going to a gunfight with a knife – you will die.
– VC, IT Sector

TTOs operate in a Canadian climate where research resources are stretched to their limit, and early-stage investors are both risk-averse and underperforming in comparison to their American counterparts.

One of the most significant problems facing academic inventors is their inability to take their academic research to a point where it is readily marketable. The lack of adequate “proof-of-principle” funding has created a gap where much innovation never makes it to commercialization.

In 1999, Scotland’s main economic development agency, Scotland Enterprise, spearheaded its Proof of Concept program. Designed to “improve the level and quality of commercialization in Scotland’s universities,” they invested an initial amount of £28 million, supporting nearly 200 projects to the commercialization level. As a result, over 500 new jobs were created and over £128 million in value-added economic activity was generated. To quote Scottish Executive Deputy First Minister Nicol Stephen, the “Proof of Concept Program is good for Scottish science, good for business growth, and good for (the) economy.” To match this level of investment as a percentage of GDP, Canada would have to increase the combined budgets CIHR Proof-of-Principle and NSERC Idea-2-Innovation programs by at least a factor of 10.

Governments should provide a centralized **point of delivery** for their **granting programs**

- ▶ We have countless grant programs and granting agencies, tax credits for scientific research and experimental development.

– TTO Manager

- ▶ Some of our biggest cities have 12 people doing the same job.

– VC, Biotech Sector

Canada needs public champions of academic entrepreneurship. We have a history of being a strong supporter of research and development. However, the end users of grants and other IP commercialization tools complain the complex web of government structure makes it difficult and frustrating to secure funding and commercialize. With so many agencies such as Networks of Centres of Excellence, Genome Canada and affiliates, CIHR, NSERC, and provincial investments via institutes, navigating bureaucracy can be trying at best.

In an era in which governments across the board are moving to “client-oriented strategies” and “one stop shopping”, it should be obvious that consolidating funding agencies to a single point of contact model, saves time and energy. Time better spent by TTO staffers and academic researchers to on what they do best – discovery.

As most technology transfer and investment is geographical, a provincial level advocate for cutting out redundancies, and amalgamating the many networks, funding programs, and transfer policies is needed. Provinces should therefore establish a central advocate for research commercialization with the power to consolidate programming and funding to improve efficiency.

For example, in 2005, Atlantic Canada saw the creation of a new network called Springboard. A joint effort between the Atlantic Canada Opportunities Agency (ACOA) and the Association of Atlantic Universities (AAU), Springboard provides a central delivery point for the technology transfer services, resources and funding it provides to its 14 member universities.

Although the rationale for Springboard was focused on resource sharing, it provides an excellent case study for the success of a “one-stop-shopping” model. As a result of Springboard’s appearance on the tech transfer scene, the notion of technology transfer in the Atlantic Provinces has matured. This is evidenced by the growing amount of participation of Springboard members in AUTM’s annually survey. As Springboard approaches the end of their third year of operation they expect that they will enjoy an “increasing number of disclosures, more deal-making and a general increase in the skill levels of network members.”

Governments should implement tax credits to **increase high-risk early stage investing**

- ● ► Out of a thousand new technology ideas, only five will be funded by VCs.

– VC Partner

Angels, many of whom are successful entrepreneurs looking to reinvest their financial gains and experience in new ventures, invest in the earliest-stage period of startup companies. However, as a large number of startups fail, angel investing has traditionally been a high-risk venture, and recently funding at this stage has been declining. This is creating a funding gap between the, “love money and sweat equity” phase and the venture capital investment phase.

Tax policy was a topic that came up in virtually every interview we conducted. We support the implementation of the Innovation and Productivity Tax Credit (IPTC) championed by the National Angel Organization. These changes provide an important opportunity to help cross the funding gap by helping to lower the risk of such investments.

Many US states offer a significant tax credit to angels as an incentive to invest. Wisconsin sports a 25% tax credit for angels who invest in their early stage technology businesses. Prior to the tax credit, Wisconsin angels invested a mere \$2 million in nine companies. However, after the credit came into effect in 2005, angel investment grew exponentially to a staggering \$19.5 million invested into 40 companies. By offering generous tax credits, the government helps manage the risk and encourages angel investment.

Conclusion

In Canada’s Science and Technology Policy Primer Minister Stephen Harper stated: “Canada’s New Government understands how crucial science and technology is to building a strong economy that provides good jobs and higher living standards to families and workers.” The majority of Canada’s new science and technology is generated in our universities. However, in order for Canadians to truly benefit from the economic fruits of this research, we must bridge the gap between basic research and marketable technology. Our report presents 10 concrete recommendations aimed at unlocking innovation from our universities, and moving Canada closer to the knowledge-based economy necessary to succeed in tomorrow’s world economy.

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References

●●●▶ References can be found online at www.innovation-action.ca/references



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