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INTELLECTUAL PROPERTY AND TECHNOLOGY TRANSFER: PROMOTING BEST PRACTICES

**Report of the Standing Committee on Industry, Science
and Technology**

Dan Ruimy, Chair

**NOVEMBER 2017
42nd PARLIAMENT, 1st SESSION**

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Chair**

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NOTICE TO READER

Reports from committee presented to the House of Commons

Presenting a report to the House is the way a committee makes public its findings and recommendations on a particular topic. Substantive reports on a subject-matter study usually contain a synopsis of the testimony heard, the recommendations made by the committee, as well as the reasons for those recommendations.

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has the honour to present its

EIGHTH REPORT

Pursuant to its mandate under Standing Order 108(2), the Committee has studied intellectual property and technology transfer and has agreed to report the following:

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CHAIR'S FOREWORD

Behind all great studies, there is a team of people including experts and individuals who put in time and effort in order to make a difference sharing their own opinions and thoughtful words. These are the people I would like to thank first — each and every contributor who took part in the study on intellectual property and technology transfer. They helped create a solid foundation from which the House of Commons Standing Committee on Industry, Science and Technology could begin its proposals.

Some of the most promising inventions and expertise are being developed in post-secondary institutions, including Canada's excellent universities, colleges and research hospitals. When industry collaborates with academia, scientific and technological breakthroughs lead to a flourishing economy. And yet, the Committee consistently heard during its 2017 manufacturing study of the difficulty of managing the intellectual property rights and technology transfer. Just as other countries have done, Canada's technology transfer policies need to evolve if the public is to benefit from the fruits of public and private research.

Between May 15 and June 20 2017, our Committee collected over 40 submissions and testimonies. Not only did multiple universities across Canada participate, but so did many expert individuals who presented their own studies. These contributions helped the Committee paint a clearer and easily understandable picture of the challenges and opportunities of Canadian technology transfer. The Committee is proud to present recommendations to the Government of Canada that will help all those who are involved or will be involved with technology transfer and, ultimately, all Canadians.

Dan Ruimy, M.P.
Chair

SUMMARY

Technology transfer is a highly collaborative and mutually beneficial process. It allows a) private firms to take advantage of academic expertise and publicly funded research; b) post-secondary institutions (PSIs) to generate revenues and disseminate new knowledge; and c) consumers to access new products and services. While PSIs have increased technology transfer activities since 1998, there are still many opportunities for improvement.

Current indicators and surveying methodologies do not provide stakeholders with a comprehensive understanding of technology transfer. Parties that might be inclined to engage in technology transfer activities may also lack the information necessary to identify and assess opportunities to do so. Many small and medium enterprises (SMEs) and entrepreneurs lack the resources and time to engage in technology transfer. The lack of uniform intellectual property (IP) licensing practices at PSIs can also constitute an obstacle to technology transfer.

The goal of technology transfer policy should not only be to commercialize academic intellectual property, but also to build the innovative capacities of PSIs, SMEs and entrepreneurs by facilitating collaborative ventures. The aim is to have a significant, positive impact on the Canadian economy. To that end, the Committee recommends, notably, that the Government of Canada (1) require Statistics Canada to launch an annual survey on technology transfer; (2) collaborate with stakeholders to create a 'toolkit' of flexible IP licensing practices; and (3) investigate new ways to support Canadian enterprises engaging in technology transfer with PSIs.



INTELLECTUAL PROPERTY AND TECHNOLOGY TRANSFER: PROMOTING BEST PRACTICES

INTRODUCTION

While available data suggests that technology transfer between academia and industry is occurring at an increasing rate since 1998, a strong impression remains that Canada does not perform as well as it should.¹ This report presents recommendations to facilitate and increase technology transfer in Canada.

On 31 October 2016, the Committee adopted the following motion:

It was agreed, — That the Committee undertake a study on intellectual property and technology transfer from post-secondary institutions to industry with the objective of creating value in the Canadian economy.

This study would:

- a) Review the various technology transfer practices and policies presently in use.
- b) Compare these practices nationally, and with the best international practices.
- c) Identify incentives for researchers to register intellectual property.
- d) Identify incentives and practices for the private sector to identify and utilize post-secondary intellectual property.
- e) Review partnerships between colleges, universities, government and the private sector.

The Committee's study on intellectual property (IP) and technology transfer consisted of seven meetings that took place between 15 May and 20 June 2017. The Committee benefited from a total of forty-two submissions, in the form of oral and written testimonies.

¹ See Viktoria Galushko and Ken Sagynbekov, "Commercialization of University Research in Canada: What Can We Do Better?" *International Journal of Business Administration*, Vol. 5, No. 5, 2014, p. 1; Jocelyn Downie and Matthew Herder, "Reflections on the Commercialization of Research Conducted in Public Institutions in Canada," *McGill Health Law Publication*, Vol. 1, No. 1, 2007, pp. 25-26.



CANADIAN TECHNOLOGY TRANSFER

The phrase “technology transfer” refers to transactions in which knowledge developed within academia is communicated to firms in the private sector for industrial and commercial purposes. As such, technology transfer constitutes a sub-category of “knowledge transfer.”² Knowledge can be transferred through multiple means, including collaborative research, publishing, consulting, standardization, hiring of graduates, etc., the use of which depends on circumstances, available resources and objectives of the involved parties.³ While technology transfer involves a variety of formal and informal means, the present report focuses more specifically on the channels of patenting, licensing and spin-offs in relation to IP law and policy.

With this focus in mind, technology transfer begins when research performed at a post-secondary institution (PSI)⁴ leads to a potential new product or service, followed by its commercialization by a “spin-off” firm or an existing one.⁵ Technology transfer often involves a “technology transfer office” (TTO). Hosted within PSIs, TTO personnel mobilize business, legal, and technical knowledge to promote and commercialize the fruits of academic knowledge.⁶ Technology transfer is portrayed as a highly collaborative and mutually beneficial process allowing for private firms to take advantage of academic

2 See Réjean Landry, Nabil Amara and Mathieu Ouimet, “Determinants of Knowledge Transfer: Evidence from Canadian University Researchers in Natural Sciences and Engineering,” *Journal of Technology Transfer*, Vol. 32, 2006, p. 563.

3 Organisation for Economic Co-operation and Development (OECD), *Commercialising Public: New Trends and Strategies*, Paris, 2013, pp. 18-21.

4 In the present report, a “Post-Secondary Institution” (PSI) means a post-secondary institution that performs research as one of its main activities, including universities, research hospitals, colleges and polytechnics.

5 See House of Commons, Standing Committee on Industry, Science and Technology (INDU), *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0850 \(Stephen Susalka\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0855 \(Stephen Boney\)](#). See also Association of University Technology Managers, “Submission to Standing Committee on IP and Technology,” Brief to the Committee; Intellectual Property Institute of Canada (IPIC), “Facilitating Technology Transfer,” Brief to the Committee, May 2017; U15 Group of Canadian Research Universities (U15), “Commercializing University Research,” Brief to the Committee, 7 June 2017.

6 See Tania B. Bubela and Timothy Caulfield, “Role and Reality: Technology Transfer at Canadian Universities,” *Trends in Biotechnology*, Vol. 28, No. 9, 2010, p. 447.

expertise and publicly funded research, for PSIs to generate revenues and disseminate new knowledge, and for consumers to access new products and services.⁷

IP law plays an important role in facilitating technology transfer. For example, the *Patent Act* confers upon the holder of a patent the exclusive right to use the “invention” described therein. This exclusive right protects its holder from anti-competitive practices that would threaten the commercial exploitation of the invention, enables the patent holder to transact with other parties by way of assignment or licensing, and facilitates speculation on the invention as capital.⁸ Transactions of and speculation on IP can serve as a focal point for further knowledge transfer, for example by facilitating the transfer of tacit knowledge to licensees through contact with the inventor.

Speaking on behalf of Innovation, Science and Economic Development Canada (ISED), Director General Mark Schaan, emphasized how “IP laws [including copyright, patent, trademarks and industrial designs legislation] ... play a critical role in encouraging innovation, attracting investment, and supporting other key drivers of the Canadian economy.”⁹ Mr. Schaan added:

IP-intensive industries are key drivers of the Canadian economy. ... they account for almost 14% of all jobs in Canada and over 25% of our GDP. About 40% of all Canadian exports are from IP-intensive industries. We know that SMEs [small and medium enterprises] that own IP are more likely to grow to scale and have a greater propensity to export. For example, SMEs that hold formal IP are four times more likely to export, 64% more likely to be high growth and 32% more likely to seek financing.¹⁰

There is therefore no doubt on the importance of IP law to the Canadian economy.¹¹

Canadian governments have actively supported the commercialization of academic research ever since the 1980s, with these efforts intensifying in the early 2000s. In “2002, as part of an agreement between the federal government and the Association

7 See INDU, *Evidence*, 1st Session, 42nd Parliament, 1 June 2017, [0905 \(Marc Nantel\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0845 \(Richard Gold\)](#). See also Ilison Bramwell, Nicola Hepburn and David A. Wolfe, *Growing Innovation Ecosystems: University-Industry Knowledge Transfer and Regional Economic Development in Canada*, Final Report to the Social Sciences and Humanities Research Council of Canada, Munk School of Global Affairs, University of Toronto, 2012, p. 47.

8 See *Patent Act*, R.C.S. (1985), c. P-4; INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1005 \(Alison McDermott\)](#).

9 INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1000 \(Alison McDermott\)](#).

10 *Ibid.*, [1005](#).

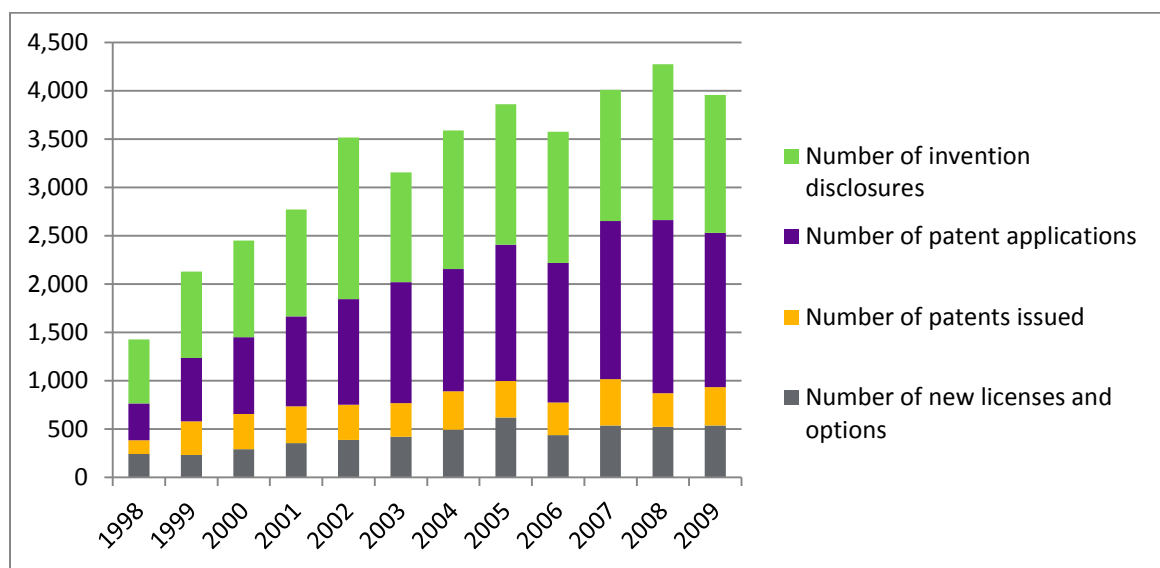
11 See INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0850 \(Laura O’Blenis\)](#); U.S. Chamber of Commerce, “Intellectual Property and Technology Transfer Submission,” Brief to the Committee.



of Universities and Colleges of Canada (AUCC), Canadian universities committed to ... triple commercialization efforts by 2010”¹² in consideration for doubling public funding in university-based research and development over the following eight years, totalling an increase of \$2.2 billion in federal funds for that period. The funds were channelled through the Tri-Council agencies, the Canada Foundation for Innovation, and other key federal programs such as the Canada Research Chairs Program.¹³

Canadian universities and research hospitals largely delivered on the engagement made in 2002: invention disclosures, patent applications, patents held, and new and active licenses substantially increased between 1998 and 2009 (see Figures 1 and 2).

Figure 1 – Technology transfer in post-secondary institutions, 1998-2009

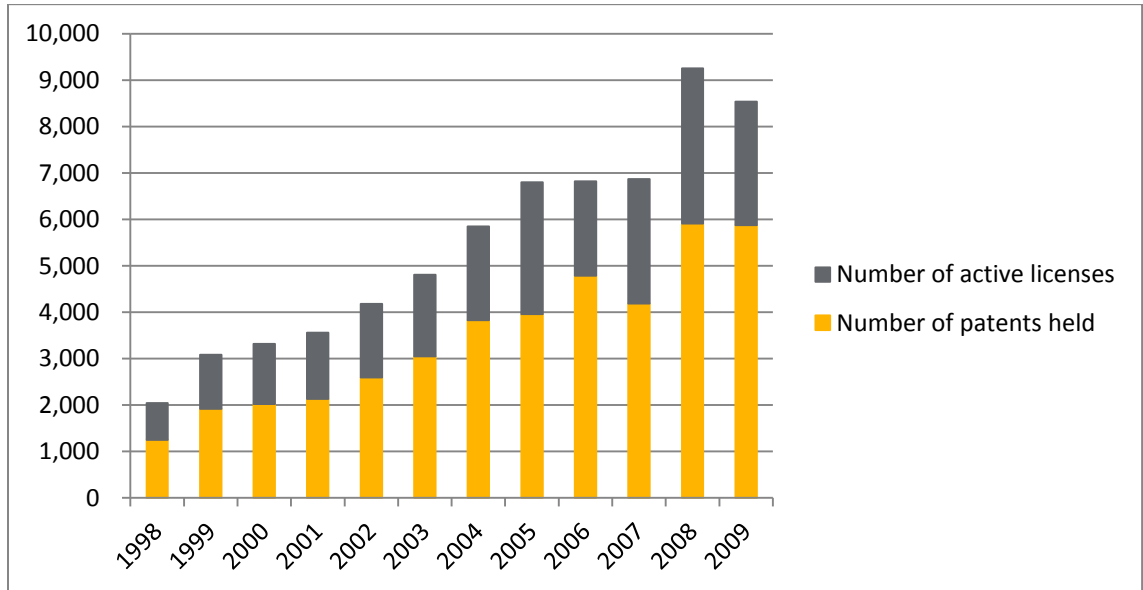


Source: Statistics Canada, [Survey of Intellectual Property Commercialization, by Higher Education Sector Indicators](#), 1998 to 2009. It should be noted that Canadian universities and research hospitals have substantially increased the numbers of invention disclosures, patent applications, patents issued, and new licenses and options between 1998 and 2009.

12 See Galusho and Sagynbekov, 2014, p. 1.

13 See Association of Universities and Colleges of Canada (AUCC), *Framework of Agreed Principles on Federally Funded University Research*, Ottawa: AUCC, 2002. See also Samuel Trosow, Michael B. McNally, Laura E. Briggs, Cameron Hoffman and Cassandra D. Ball, “Technology Transfer and Innovation Policy at Canadian Universities: Opportunities and Social Costs,” *Library and Information Science Publications*, Paper 23, 2012, p. 23; Bubela and Caulfield, 2010, p. 449; Amy S. Metcalfe, “Revisiting Academic Capitalism in Canada,” *The Journal of Higher Education*, Vol. 81, No. 4, 2010, pp. 496-497; Chantal Collin, *Federal Investments in Research and Development and Capacity Building in the Higher Education Sector*, Background Paper No. PRB 05-104-E, Ottawa, Library of Parliament, 2006, pp. 2-4.

**Figure 2 – Technology transfer in post-secondary institutions,
1998-2009**



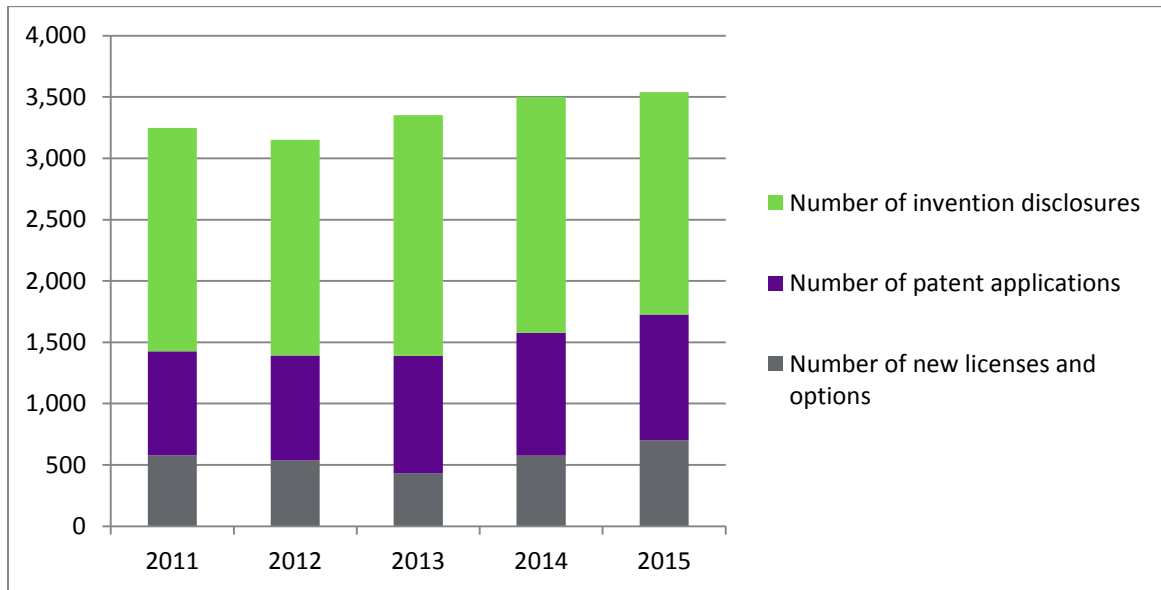
Source: Statistics Canada, [Survey of Intellectual Property Commercialization, by Higher Education Sector Indicators](#), 1998 to 2009. It should be noted that Canadian universities and research hospitals have substantially increased the numbers of patents held, and active licenses and options between 1998 and 2009.

Data compiled by the Association of University Technology Managers (AUTM) reveals that the numbers of invention disclosures, patent applications, and new licenses and options in Canadian research institutions have remained relatively stable since 2011 (see Figure 3).¹⁴

14 Oksana Akhova, Véronique Bougie, Maya Collum, Catherine Geci, Maya Medeiros, Nima Najand and Ben Rogers (eds), *AUTM Canadian Licensing Activity Survey: FY2015*, Oakbrook Terrace, Association of University Technology Managers, 2017, pp. 20-24, 26-30. See also INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1015 \(Konstantino Georgaras\)](#) (patent statistics for Canadian universities reflect areas of specialty and collaboration with a wide range of actors).



Figure 3 – Indicators of technology transfer in post-secondary institutions, 2011-2015



Source: Akhova et al. (eds), *AUTM Canadian Licensing Activity Survey: FY2015*, Oakbrook Terrace, Association of University Technology Managers, 2017. It should be noted that the number of invention disclosures, patent applications, and new licenses and options in “Canadian research institutions” have remained relatively stable since 2011.

The Chief Executive Director of AUTM, Stephen Susalka, offered the following commentary about Canada’s performance in comparison with the United-States:

Three points can be made with this data.

First, Canadian technology transfer is about 28% to 42% less efficient in generating invention disclosures in patent applications. Why? One reason could be inventor-owned IP policies are lowering the number of reported inventions and patent applications. They are being created, but just not counted. Also, there might not be as much of an emphasis on intellectual property disclosure and protections as in the U.S. through the Bayh-Dole Act that requires federally funded inventions to be disclosed.

My second point is that Canadian technology transfer is just as efficient in agreements executed and start-up companies formed, even though they start with fewer invention disclosures and patent applications. How? First, this statistic is impressive and reflects well on the quality of the technology transfer professionals in Canada as they are doing more with less. Second, successful Canadian start-up accelerators are likely contributing to the significant number of start-up companies. Third, a focus on IT-based technologies by some institutions are also likely to contribute to more start-ups than expected, due to lower overhead.

My final point is that Canadian technology transfer only produces about 27% of licensing revenue in comparison to the U.S. Why? First, again the inventor-owned intellectual property policy means some inventions, and perhaps some of the higher-value inventions, are not being counted here. Second, downstream funding sources, for example, for institutional prototyping funds or governmental commercialization funds, are perhaps not as prevalent as in the U.S.¹⁵

While these results are encouraging, witnesses identified potential areas of improvement, including better consideration of the specific needs of the private sector,¹⁶ the redistribution of risk and benefits of technology transfer between prospective partners,¹⁷ more consistent practices,¹⁸ and more entrepreneurship and business knowledge among academics.¹⁹ The present report summarizes the evidence received by the Committee under the themes of information, best practices and transfer environment.

INFORMATION

The lack of reliable and useful information capable of supporting policy-making and economic activity is perhaps one of the greatest obstacles to technology transfer in Canada. Current indicators and surveying methodologies do not provide policymakers with a comprehensive understanding of technology transfer. Furthermore, parties that might be inclined to engage in technology transfer lack the information necessary to identify and assess opportunities to do so.

A. Narrow indicators

While useful, current metrics do not adequately measure the performance and impact of technology transfer at local, regional and national levels, nor do they reflect the

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- 15 INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0850, 1005 \(Stephen Susalka\)](#).
- 16 See INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0930 \(Code Cubitt\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0900 \(Jeremy Auger\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0945 \(Jacqueline Walsh\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0915 \(Marshall Ring\)](#).
- 17 See INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0920 \(Code Cubitt\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0920 \(Jeff Musson\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0925 \(Anand Srinivasam\)](#).
- 18 See INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0855 \(Stephen Beney\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0915 \(Jeff Musson\)](#); Graham T. Gould Maule (Attica Consulting), "Recommendations for Improving Technology Transfer in Canada," Written response to INDU, July 2017.
- 19 See INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [1005 \(Stephen Beney\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0940 \(Anand Srinivasam\)](#); Inno-Centre, Brief to the Committee, 31 July 2017.



diversity of channels through which technology transfers occur between PSIs and the private sector.²⁰ Most current indicators of technology transfer focus on narrow outcomes that are relatively easy to measure, such as invention disclosures, patents held, active licenses, licensing revenues and spin-off companies. Such narrow indicators by no means capture the complexity and diversity of Canadian technology transfer:

These metrics and equivalents have been criticized for their focus on input/output measures that reflect a linear path for innovation ... (regardless of profitability and longevity). Such metrics are particularly problematic because they might only reflect quantities and not quality. In addition, these metrics reflect poorly on [technology transfer office (TTO)] activities, because they are focused on financial measures and not on the broader range of activities undertaken by TTOs. Unfortunately, current metrics have come to dominate science policy at a broader level because these are easily synthesized and understood by institutional and governmental policy makers, even if they inadequately capture the broader societal benefits of publicly funded research institutions.²¹

While valuable, IP-related and spin-offs indicators do provide information, focusing strictly on such indicators distorts the reality of Canadian technology transfer. For example, invention disclosures do not provide any clue to the patentability of an invention, let alone its commercial potential.²² These indicators also entirely ignore technology transfers initiated by the private sector towards post-secondary institutions, as it is often the case with polytechnics.²³ More generally, focusing on narrow, IP-related indicators comes down to measuring technology transfer on the basis of only some of its means — regardless of whether these means actually meet their intended goals.²⁴

One regrettable consequence of focusing on narrow, IP-related indicators is to understate the contributions of Canadian colleges and polytechnics. A number of witnesses insisted on these institutions' rich experience in channelling technology transfer towards regional economic development, notably through their focus on

20 See INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0900 \(Stephen Beney\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1005 \(Alison McDermott\)](#). See also Kristjan Sigurdson, Creso M. Sá and Andrew Kertz, "Looking Under the Street Light: Limitations of Mainstream Technology Transfer Indicators," *Science and Public Policy*, Vol. 42, 2015, pp. 632-634 ("[w]hile there is widespread recognition of the limitations of existing indicators among expert and practitioner technology transfer communities ... this recognition appears to be left by the wayside when the indicators are used as part of the policy-making process," p. 640); OECD, 2013, pp. 26-27; Trosow et al., 2012, pp. 6, 9.

21 Bubela and Caulfield, 2010, p. 450. See also Trosow et al., 2012, pp. 22-25.

22 See OECD, 2013, p. 31.

23 See INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0905, 0935 \(Dawn Davidson\)](#).

24 See INDU, *Evidence*, 1st Session, 42nd Parliament, 1 June 2017, [0935 \(Michael Geist\)](#).

applied research, prototyping and student placement.²⁵ However, many of these institutions do not pursue IP rights when collaborating with their private partners.²⁶ Focusing strictly on IP-related indicators may thus lead policymakers and stakeholders to underestimate the contributions of colleges and polytechnics, and fail to support their efforts.²⁷ The same may be said of other organizations, such as proof-of-concept centres, incubators and accelerators and centres of excellence.²⁸

The reliability of what data we do have also raises concern. For example, from 1998 to 2009, with the exceptions of 2000 and 2002, Statistics Canada performed an annual *Survey of Intellectual Property Commercialization, by Higher Education Sector Indicators* of all the members of the AUC as well as university-affiliated research hospitals. Since the late 1990s, AUTM's survey on licensing activities in Canadian research institutions has been used as a source of data on technology transfer.²⁹ Like Statistics Canada's survey before it, limited response rates may limit the accuracy of AUTM's portrait of Canadian

“[F]ocusing on narrow, IP-related indicators comes down to measuring technology transfer on the basis of only some of its means — regardless of whether these means actually meet their intended goals.”

25 See INDU, *Evidence*, 1st Session, 42nd Parliament, 1 June 2017, [0855, 0950 \(Christine Trauttmansdorff\)](#), [0920, 0950 \(Marc Nantel\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0920 \(Kenneth Porter\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [1020 \(Dawn Davidson\)](#) 25; Olds College, “Intellectual Property and Technology Transfer,” Brief to the Committee, 31 July 2017.

26 INDU, *Evidence*, 1st Session, 42nd Parliament, 1 June 2017, [0900 \(Marc Nantel\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0905 \(Dawn Davidson\)](#); Northern Alberta Institute of Technology (NAIT), Brief to the Committee, 30 June 2017.

27 See for example INDU, *Evidence*, 1st Session, 42nd Parliament, 1 June 2017, [0900 \(Marc Nantel\)](#) (“companies sometimes come to us for IP guidance and we do the best to help them. Of course, we don’t have much of a technology transfer office. Colleges don’t have the benefits of the indirect cost of research, or as it’s called now “the research support fund” which generally support that type of activity”).

28 See INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [1025 \(Ritch Dusome\)](#). See also Bramwell et al., 2012, pp. 35-38.

29 See also Canadian Alliance of Student Associations (CASA), Written response to INDU (recommending that Statistics Canada resume its survey).



technology transfer.³⁰ This criticism must however be nuanced by the fact that the survey features a strong representation of the country's academic research: the AUTM survey includes Canada's 15 largest research intensive universities and a number of less prominent but still research intensive institutions among its regular respondents. That being said, Sigurdson et al. criticize the AUTM survey for not verifying or validating the data submitted by Canadian research institutions, and for not ensuring that the reported data is collected and transmitted in a standardized manner.³¹

The Canadian context also limits the utility of the AUTM survey. Because some Canadian universities do not monitor the technology transfer activities of their faculty and students, the number of reported inventions disclosures, patent applications and licensing revenues is relatively lower than in countries where universities are expected to report on these numbers, such as in the United States.³² As a matter of fact, the AUTM appears to systematically underreport the performance of the University of Waterloo, an institution renowned for both its "inventor-owned" IP policy and economic importance to the Waterloo region.³³

Narrow indicators overstate the importance of formal channels of technology transfer and ignore cases of technology transfer from industry to academia. They also understate the diverse contributions PSIs make to innovation in Canada, as the Vice-President of Universities Canada, Pari Johnston, argued:

I want to talk about the value of measurement to make sure that we're also talking about the broad ways in which institutions like ours support innovation. I think that while we're focusing on specifics around patents and the number of licences developed, I think it's really important to remember that institutions like ours, through their highly qualified graduates, through creating incubators and accelerators on campuses where

30 See AUTM, 2017 (the "FY2015 survey was sent to 70 Canadian research institutions, not all research intensive. Thirty-six institutions responded for a response rate of 51.4 percent. This compares to the FY2014 survey which had 39 respondents for a response rate of 55.7 percent. It is also important to note that not all respondents reply to all questions," p. 13). See also Sigurdson et al., 2015, pp. 637-38.

31 Ibid. ("[t]he expectation that [TTOs] will report accurate information every year, and that what they report will be comparable, even in the absence of any verification system, is an unfortunately strong assumption to rely on when using AUTM data," p. 637).

32 See INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0855 \(Stephen Susalka\)](#).

33 See INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0910 \(Scott Smith\)](#). See also Sigurdson et al., 2015, p. 637; Cinzia Colapinto, "A Way to Foster Innovation: A Venture Capital District from Silicon Valley and Route 128 to Waterloo Region," *International Review of Economics*, Vol. 54, 2007.

small and medium-sized businesses can come for business solutions, are also part of creating Canada's innovative capacity.³⁴

But perhaps more importantly, the lack of indicators providing a more sophisticated and comprehensive picture of Canadian technology transfer “is reinforcing the perception among policymakers that the country faces a dangerous innovation deficit, which threatens long-term economic prosperity.”³⁵

A quick survey of relevant literature reveals that there is no shortage of proposals for new and improved indicators, indicating that much progress could be made in that regard.³⁶ We may consider the advances made at the University of British Columbia, where the University Industry Liaison Office developed a set of impact-based metrics for technology transfer activities that have generated international interest.³⁷

B. Imperfect information

Not only do policymakers and stakeholders lack a comprehensive portrait of Canadian technology transfer, but individual parties also struggle to identify opportunities to engage in technology transfer activities with PSIs. Private firms do not know what research is being performed in PSIs, what IP PSIs hold and how they could exploit it in their own business ventures. Lack of information about potential partners therefore constitutes a substantial obstacle to technology transfer.³⁸ While some firms that successfully engaged in technology transfer refrain from sharing their positive experiences with competitors,³⁹

“[I]ndividual parties also struggle to identify opportunities to engage in technology transfer.”

34 INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0925 \(Pari Johnston\)](#). See also U15, 2017; Universities Canada, “University Intellectual Property and Technology Transfer,” Brief to the Committee, June 2017; Karim Bawa (Centre for International Governance Innovation), “Leveraging University-Generated Intellectual Property to Benefit Canadian Industry,” Brief to the Committee, 1 June 2017.

35 Sigurdson et al., 2015, p. 640. See for example INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0905 \(James Hinton\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0905 \(Scott Smith\)](#).

36 See for example Trosow et al., 2012, p. 30; OECD, 2013, p. 26; Landry et al., 2007, pp. 565-66.

37 See Bubela and Caulfield, 2010, p. 447.

38 See INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0935 \(James Hinton\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0930 \(Code Cubitt\)](#); Bawa, 2017.

39 See INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0930 \(Ted Hewitt\)](#).



most witnesses pleaded in favour of improving access to information about academic research and IP.⁴⁰

Part of the information required to assess opportunities to engage in technology transfer activities is publicly available. However, it might not be readily usable in its current form. For example, a firm could consult Canadian and American patent registers to identify most patents held by Canadian PSIs, but only with much time and effort.⁴¹

The testimony of Vice-President Kenneth Porter, Innovate Calgary, highlighted not only the cost of obtaining and disseminating such information, but also the additional and sustained efforts necessary to make use of it:

When we first started thinking about [the Western Canadian Innovation Offices Consortium], we thought we would go to the academic institutions and provide a list of the strength of the research enterprise, go to industry and ask for what their needs were, and put that in a database, and everybody would find each other. That didn't work at all. What did work was hiring these eight people from Winnipeg to Vancouver, who learned the capabilities and the needs in their region. They also speak to each other on the phone once a week so that they can share this information across provinces and then put the opportunities and the capabilities together. It took that level of involvement to get our seven projects. It's really slow, meticulous, and painstaking work.⁴²

While essential to initiate technology transfer, the cost of identifying opportunities to do so is often outside the means of the average Canadian small and medium enterprise (SME). To overcome this cost and to promote technology transfer, several witnesses recommended the creation of an IP matchmaking or mapping program enabling private firms to easily access information about current academic research and IP, along with available governmental support.⁴³ The Committee made a similar recommendation to that effect in its recent report on *The Canadian Manufacturing Sector*:

The Committee recommends that the federal government explore ways to create an index of existing patents in Canadian post-secondary institutions so they can be readily

40 See for example INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0905 \(Jeremy Auger\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0925 \(Jeff Musson\)](#); U15, 2017.

41 See INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0935 \(Kenneth Porter\)](#).

42 Ibid., [0920](#).

43 See for example INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0850, 0930 \(Laura O'Brien\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0925 \(Jeff Musson\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0930 \(Bert van den Berg\)](#); Larry Shaw (Association of University Research Parks [AURP]), "Driving Industry and Academia Collaboration through Canada's R&T Parks," Brief to the Committee.

identified by industry, and explore ways to encourage the transfer of intellectual property from post-secondary institutions to Canadian industry.⁴⁴

Such matchmaking or mapping program could also constitute a valuable step towards addressing the issue of the foreign ownership of IP developed in Canada. IP lawyer James Hinton, for example, stressed that of “all Canadian-invented patents issued [in 2016], 58% are now owned by foreign companies. This is up from 45% a decade ago.”⁴⁵ Mr. Hinton argued that the Government of Canada should pay attention to foreign IP ownership and develop policy designed to increase domestic ownership of IP, a proposal supported by other witnesses.⁴⁶ Measures proposed include the establishment of a sovereign patent pool arrangement.⁴⁷

Many witnesses also highlighted the importance for SMEs to have access to timely strategic IP advice in order to determine whether and under which conditions a specific IP can benefit their business. To that end, witnesses suggested ways to provide such firms with free or affordable IP advice,⁴⁸ including a national IP concierge service that “could include a database of pro bono legal service with IP expertise and a suite of template agreements demonstrating best practices in university business negotiation.”⁴⁹

BEST PRACTICES

The goal of IP law is to promote innovation in a competitive marketplace. IP law- and policy-making aspire to maintain a balance between protecting innovators against anti-competitive practices on one hand, and foster a rich public domain for the benefit of

44 INDU, *The Canadian Manufacturing Sector: Urgent Need to Adapt*, Sixth Report, 1st Session, 42nd Parliament, May 2017, pp. 20. See also the “Government [Response](#) to the Standing Committee on Industry, Science and Technology’s report.”

45 INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0905 \(James Hinton\)](#).

46 *Ibid.*, [0905, 0930](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0900, 0950 \(Jeremy Auger\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0900 \(Jeff Musson\)](#); AURP, 2017.

47 See INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0905, 0935, 1005 \(James Hinton\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0955 \(Scott Smith\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0925 \(Anand Srinivasam\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [1015 \(Chris Plunkett\)](#), [1015 \(Jacqueline Walsh\)](#); Bawa, 2017. See also Catherine Beaudry and Andrea Schiffauerova, “Is Canadian Intellectual Property Leaving Canada? A Study of Nanotechnology Patenting” *Journal of Technology Transfer*, Vol. 36, 2011, pp. 666-669, 674-676.

48 See INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0945 \(Richard Gold\)](#) (suggesting that the government provides SMEs with a voucher for IP advice: “[i]t’s not about funding getting a patent, because a patent may not be the right answer, but I would fund getting that strategic advice”); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0955 \(Chris Plunkett\)](#).

49 INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0905 \(Pari Johnston\)](#). See also Universities Canada, 2017.



future innovators and the general public on the other. More specifically, according to Director General of ISED Mark Schaan:

Canada's IP regime has three main objectives. The first is to support innovation and enable innovators to extract value from their creations and recoup investments. The second is to ensure Canadians have access to a wide range of innovative products, new technologies, and new goods and services. The third is to promote consumers' confidence in the market place.

Well-functioning marketplace frameworks generate positive outcomes for Canadians. They provide incentives for innovation and creativity; ensure access to the latest technologies and ideas; foster competition; promote confidence in the marketplace; and balance competing stakeholder interests as well as the common good.⁵⁰

The grant and exploitation of exclusive rights is only one mean to achieve this goal, not the goal itself. "Closed" models of innovation calling for securing IP rights in every circumstance, and for exploiting the fruits of publicly funded academic research indistinctly from products and services generated by private research and development (R&D) may not be appropriate to all cases of technology transfer.

A. Risk

There seems to be a consensus among witnesses that risk for the private sector — financial and as well as in terms of opportunity costs — counts among the main deterrents for technology transfer. Diminishing risk for private partners appears therefore to be one of the key determinants of technology transfer:

When we talk about industry and how do we incentivize them to work with universities, they're incentivized only when they can get relevant access in a timely manner to valuable IP with minimal transaction costs. That's their incentive. They don't need much more, but that's very hard for them to get. Again, it's the university administration that has to find the internal processes to make this technology transfer more efficient and useful.⁵¹

Jacqueline Walsh

50 INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1000 \(Mark Schaan\)](#).

51 INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0950 \(Jacqueline Walsh\)](#).

Effectively, one of the roles of a tech-transfer office is to take some IP, de-risk it, put a package around it in order to be able to commercialize it and move it out of the university, and to actually do prototyping and proof of concept associated with that IP.⁵²

D. George Dixon
Vice-President, U15 Group of Canadian Research Universities

[D]e-risking the collaboration between academia and business has the capacity to unleash new and innovative ideas onto the world. Research, by its nature, is not certain to produce viable commercial outcomes, so engaging in research can be risky and cost-prohibitive.⁵³

Jeremy Auger
Chief Strategy Officer, Desire2Learn Inc.

Technology transfer offices will, where appropriate and cost-effective, make licensing more attractive by making the IP less risky by developing prototypes or other proofs-of-concept. Programs that help inventors validate the commercial potential of their discoveries through prototypes or proof-of-concepts can increase the adoption of some types of discoveries.⁵⁴

U15 Group of Canadian Research Universities

[L]icensees in the private sector are usually required to invest significant amounts of time, effort and resource to improve the commercial value of the patents being licensed before they themselves may use same [*sic*] to commercialize and license to other private sector partners.⁵⁵

Inno-Centre

It is not surprising that most companies want to minimize risk. However, risk-aversion can be an impediment to the adoption of high-potential but commercially unproven university IP.⁵⁶

U15 Group of Canadian Research Universities

[T]here is a broad range of evidence that Canada is still struggling on the demand side — in the pull from the private sector. For example, Canada businesses employ fewer

52 INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0955 \(D. George Dixon\)](#).

53 Ibid., [0905 \(Jeremy Auger\)](#).

54 U15, 2017.

55 Inno-Centre, 2017.

56 U15, 2017.



researchers and university-educated business managers, perform less research, and win fewer and smaller risk capital deals than do their U.S. counterparts.⁵⁷

Expert Panel on Commercialization
People and Excellence, 2006

One of the challenges facing university technology transfer is the weak linkages between the knowledge generation process in institutions of higher education and the capacity of the private firms to adapt the knowledge being generated for commercial purposes. A key issue is the lack of a receptor capacity that is capable of making full use of university-generated research.⁵⁸

Bramwell et al.
Growing Innovation Ecosystems, 2012

The issue of risk and technology transfer was summarized in similar terms in a previous report of the Committee:

The main challenge to the commercialization of intellectual property and technology transfer is the “valley of death,” the period between the creation of an invention and its commercialization. In the past, obtaining a patent was enough to attract attention and private-sector investment. Today, firms are reluctant to take on the risk of commercializing unproven inventions. Universities that hold patents therefore have to invest increasing amounts of effort and money to bring inventions to the commercialization stage. For example, they need to develop prototypes, prove the invention’s technical effectiveness and conduct market research.⁵⁹

In the same vein, one witness claimed that the main reason private firms engage in technology transfer is to save costs.⁶⁰ This may lead to frustration in the face of PSIs appearing to misunderstand the amount of risk to which a private firm exposes itself by engaging in technology transfer activities, which can lead to a breakdown of negotiations:

57 Expert Panel on Commercialization, *People and Excellence: the Heart of Successful Commercialization*, Ottawa, Government of Canada, 2006, p. 2.

58 Bramwell et al., 2012, p. 55.

59 INDU, *Innovation and Technology: An Exchange of Ideas*, Seventh Report, 1st Session, 42nd Parliament, p. 7.

60 See INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0935 \(Code Cubitt\)](#).

One of the frustrations I had, specifically, was that the technology transfer manager felt it was his duty to maximize profit for his university. He negotiated extremely hard, and ended up, I would argue, kind of sabotaging the deal for his own personal career growth. Having a standardized template and not trying to maximize every dollar would go a long way toward solving the problem.⁶¹

Code Cubitt
Managing Director, Mistral Venture Partners

What's interesting is you have industry and academia, both of which have certain objectives, and you have to figure out that common ground. ... I had a similar situation with one of our projects, whereby the tech transfer individual was pushing hard to maximize those dollars. Is that what's really about, or is it about getting that technology out into the ecosystem and let it kind of grow?⁶²

Jeff Musson
Executive Director, North of 41

If an SME puts in the money, then partially that particular [IP] is held by the SME and the SME should continue to develop the product. But if there's an IP created purely based on the government money that IP should be given to the building entrepreneurs and innovators in Canada, including the SMEs, to take it up, make more jobs, and create more wealth for the country. That is not being realized at all. Instead what we are doing is saying, "my professor did this or this is mine so I'm going to hold on to it" and there is a big department in the middle that comes and starts negotiating with you.⁶³

Anand Srinivasam
Technology Lead, EION Inc.

Canadians do not lack entrepreneurial spirit, but face constraints that discourage participating in technology transfer. Canada's private sector is dominated by SMEs that do not have enough resources to engage in such activities, "have fewer linkages with universities, are slower to adopt new technologies and are less likely to invest in research and development."⁶⁴ The fact that the Canadian private sector lacks the capacity to absorb academic IP and turn it into commercial success must be taken into account by policymakers in order to improve the overall performance of Canadian technology transfer.

61 Ibid., [0920 \(Code Cubitt\)](#).

62 Ibid., [\(Jeff Musson\)](#).

63 INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0925 \(Anand Srinivasam\)](#).

64 Ibid. See also Galushko and Sagynbekov, 2014, p. 12; Beaudry and Schiffauerova, 2011, p. 666; Bubela and Caulfield, 2010, pp. 448-449; Colapinto, 2007, p. 7.



B. Public funding

Over the last 40 years, technology transfer policy has focused almost exclusively on supporting PSIs. For example, much of public funding supporting technology transfer flows through the Tri-Council agencies, which are primarily dedicated to financing PSIs, not their private partners.⁶⁵ It is thus reasonable that stakeholders would expect these institutions to bear most of the responsibility for commercializing academic knowledge.

But while PSIs did increase their commercialization activities, the capacity of private firms to absorb academic IP and turn it into commercial successes has not followed suit. Policy should reflect the fact that technology transfer is a highly interactive process relying on close collaboration between partners separated by profound differences, notably by focusing on all parties involved.

One of the most substantial barriers to technology transfer is the lack of public and private funding necessary to cross the so-called “valley of death.” Witnesses have stressed that public funding provided to demonstrate the commercial potential of academic IP in order to reach market entry tends to be insufficient both in terms of the amount of funding provided and the duration for which it is provided.⁶⁶ Technology transfer officers within PSIs also depend on scarce resources, especially with the discontinuation of key programs supporting their activities, such as that of the IP Mobilization program in 2009.⁶⁷

Most witnesses recommended increasing public funds in order to mitigate the risk of technology transfer activities. Proposals include providing Tri-Council funded researchers with “commercialization coupons” in order to fund technology transfer activities;⁶⁸ require that universities direct a percentage of all public funds granted to support research to technology transfer activities;⁶⁹ reinstate the IP Mobilization program and

“Canadians do not lack entrepreneurial spirit, but face constraints that discourage technology transfer.”

65 See INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1005 \(Alison McDermott\)](#).

66 See INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0855 \(Stephen Beney\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [1010 \(D. George Dixon\)](#), [0845](#), [1005 \(Karin Hinzler\)](#); IPIC, 2017.

67 See INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0855 \(Kenneth Porter\)](#); Universities Canada, 2017. See also Galushko and Sagynbekov, 2014, p. 5.

68 See generally Kathleen E. Marsman, “Proposal for Commercialization Coupon For NSERC, CIHR and SSHRC Grant Holders,” Brief to the Committee, 2017.

69 See INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0850](#), [1010 \(Code Cubitt\)](#).

extend it to all Tri-Council agencies;⁷⁰ and fund twice what universities earn in IP revenues (which would have amounted to about \$77 million in 2009) in consideration for giving out their IP.⁷¹

The Government of Canada should seize the opportunity to expand its approach to technology transfer. Private firms should get involved in the early stages of the commercialization of academic IP in order to become invested in the process as a whole. New funding programs designed to directly benefit SMEs participating in technology transfer would aim to mitigate risk, build their private R&D capabilities and establish working relationships with PSIs. These funding programs could assist firms in gathering the resources needed to engage in technology transfer, minimize the risks associated with such activities, and increase opportunities for exchanges and collaborations with PSIs. The goal is to provide SMEs with more responsibility, autonomy and decision power over which risks they are willing to bear in collaboration with PSIs.

The Government of Canada could draw inspiration from two American federal programs a number of witnesses have favourably mentioned: the Small Business Innovation Research fund (SBIR) and the Small Business Technology Transfer fund (STTR).⁷² Under the SBIR, federal departments with a sizeable R&D budget must allocate a portion of that budget to small businesses entrusted to lead research projects in areas with commercial potential. Following directives established by Congress, each department establishes priority areas, solicits proposals and allocates funds on a competitive basis.⁷³ Canadian PSIs that receive sizable federal research funds could similarly have to devote a portion of these funds to involve local SMEs in their projects. Structured similarly to the SBIR, the STTR funds joint ventures between small businesses and non-profit research institutions dedicated to the commercialization of research, specifically in its early stages.⁷⁴ Both programs provide private firms with the funds they need to hire qualified employees, including graduate students.

70 Ibid., [0905, 0920 \(Pari Johnston\)](#).

71 See INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0900 \(Ted Hewitt\)](#).

72 See INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0945 \(Stephen Susalka\)](#), [0855 \(Kenneth Porter\)](#); U15, 2017. See also Galushko and Sagynbekov, 2014, p. 5; OECD, 2013, p. 100; Bramwell et al., 2012, p. 24; Expert Panel on Commercialization, 2006, p. 21.

73 See Office of Investment and Innovation, "[About SBIR](#)." See also Office of Investment and Innovation, *Small Business Innovation Research (SBIR) Program: Policy Directive*, Small Business Administration, 2014.

74 See Office of Investment and Innovation, "[About STTR](#)." See also Office of Investment and Innovation, *Small Business Terchnology Transfer (STTR) Program: Policy Directive*, Small Business Administration, 2014.



Such initiatives could be supplemented by programs designed to attract private funds for technology transfer and expand seed financing.⁷⁵ Graham Gould Maule from Attica Consulting, for example, recommended “creating a funding program that matches on a ratio ... a certain amount of government funds to those contributed by the private sector” in order to lower private financial investment and thus the associated risk.⁷⁶ Public funds could be allocated to not only facilitate internships and the hiring of students in the private sector, but also researchers from the private sectors to be temporarily assigned to projects led by PSIs, as support supplemental to research funding.⁷⁷

C. Institutional policies and template agreements

Unlike in other countries — most notably the United States thanks to its [Bayh-Dole Act](#) — Canadian universities do not have uniform IP ownership and licensing policies. For example, some universities claim all ownership of IP developed by members of their communities, others leave them in the hands of faculty and students, or adopt a hybrid approach. Each ownership approach presents its own advantages and disadvantages: “inventor-owned” universities provide more direct incentives to faculty and students to get involved in technology transfer, but “institution-owned” universities may devote comparatively more resources to promote and commercialize academic IP.⁷⁸

In contrast, testimony from Vice-President Christine Trauttmansdorff revealed that colleges and other PSIs represented by Colleges and Institutes Canada generally favour a quite different approach to IP ownership:

According to our most recent survey, more than 6,300 private sector firms utilized the R and D services offered by colleges and institutes last year, of which 85% were SMEs and microenterprises. In 90% of these partnerships, the industry partner reserved exclusive IP and commercialization rights. In cases where the college did retain the IP, it was almost always made available to the partners at no cost.⁷⁹

75 See also Expert Panel on Commercialization, 2006, pp. 18-19, 24.

76 See Graham T. Gould Maule (Attica Consulting), “Recommendations for Improving Technology Transfer in Canada,” Brief to the Committee, July 2017. See also INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0950 \(Marshall Ring\)](#); Galushko and Sagynbekov, 2014, p. 12.

77 See Expert Panel on Commercialization, 2006, p. 12.

78 See INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1010 \(Alison McDermott\)](#); IPIC, 2017; Universities Canada, 2017. See also Galushko and Sagynbekov, 2014, pp. 8-10; Trosow et al., 2012, pp. 9, 12-13.

79 See INDU, *Evidence*, 1st Session, 42nd Parliament, 1 June 2017, [0855 \(Christine Trauttmansdorff\)](#).

Witnesses disagree on whether the lack of uniform IP ownership policies among Canadian universities facilitates or hinders technology transfer. Several claimed that uniform IP licensing policies and practices would facilitate technology transfer by enabling private firms to build on the experience acquired engaging in technology transfer from one university to the next, and speed up negotiations towards establishing fruitful partnerships. For example, as the Executive Director of North 41, Jeff Musson, argued:

[Negotiating with different universities with different policies] has been a difficult process, not only from the entrepreneur's side—because your resources, time-wise, are kind of limited—but there are so many hoops that you have to go through when you end up having to negotiate. ... You have to streamline the process and standardize it across the board.⁸⁰

Other witnesses, however, refute the notion that a diversity of IP policies would have any adverse effect on technology transfer:

This has been studied to death in Canada and the unanimous conclusion is there's no point in coming up with uniform rules. It's actually not the barrier. Just like different firms have different approaches to how they think about their IP ... What you want is clarity and strategic knowledge so that when you approach a university, you know what they want to do.⁸¹

Richard Gold

Another witness argued that what matters is not so much that all universities adopt the same IP ownership policy, but that they each execute their own policies effectively, transparently and consistently.⁸²

It would be difficult for the Government of Canada to impose a single, uniform IP ownership or licensing policy for all Canadian universities. For starters, while many areas of IP law such as patents and copyright are of federal competence, education and most

80 INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0915 \(Jeff Musson\)](#). See also INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0855 \(Stephen Boney\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0955 \(Jeremy Auger\)](#), [1000 \(Karin Hinzer\)](#), [0920 \(Anand Srinivasam\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0850 \(Code Cubitt\)](#), [0915 \(Jeff Musson\)](#); AURP, 2017; Maule, 2017; IPIC, 2017.

81 INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [1030 \(Richard Gold\)](#). See also INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1010 \(Alison McDermott\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [1035 \(Scott Smith\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0905 \(Pari Johnston\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0915 \(Ted Hewitt\)](#); Universities Canada, 2017; Olds College, 2017.

82 See INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0910 \(D. George Dixon\)](#). See also U15, 2017.



of private law are of provincial competence. Moreover, in some universities, IP ownership policies form an integral part of collective bargaining agreements with faculty members.⁸³ Scott Smith, Director of Intellectual Property and Innovation Policy at the Canadian Chamber of Commerce, also argued that “[t]he mandatory implementation of uniform patent ownership policies [would interfere] with contractual freedom.”⁸⁴

There may be an advantage in having a diverse policy environment capable of accommodating a diverse array of opportunities for technology transfer and innovation, as Pari Johnston argued:

There is no single path for innovation and no magic bullet to achieve innovation. Each region and sector will require a unique mix of collaborations between universities, government, private, and non-profit sectors. At the centre of this innovation ecosystem is federal support that facilitates dynamic partnerships with flexible IP arrangements. Since innovation takes many forms Canada needs a policy ecosystem that is flexible and diverse.⁸⁵

Since “IP policies reflect the nature of research at an institution, the campus culture, and the infrastructure available to mobilize commercialization,”⁸⁶ PSIs seem better placed to determine their content in consultation with local partners. It was suggested to the Committee that there could be opportunities to intervene in key areas of IP management through specific funding arrangements, for example to adopt open-licensing models for humanitarian purposes, when appropriate.⁸⁷ The Government of Canada could also encourage universities to facilitate the commercialization of academic IP by the graduates that generated it, notably through the distribution of public funds under the condition that graduates retain (co-)ownership of IP, have a right of first refusal for its commercialization, or are automatically granted a non-exclusive license.⁸⁸

83 See INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1040 \(Alison McDermott\)](#), [1025 \(Mark Schaan\)](#).

84 INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0910 \(Scott Smith\)](#). See also Trosow et al., 2012, p. 14.

85 INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0900 \(Pari Johnston\)](#). See also INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0900, 0915 \(Kenneth Porter\)](#); U15, 2017; Universities Canada, 2017.

86 INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0900 \(Kenneth Porter\)](#).

87 See Asha Hollis, Juliet Guichon, Dylan Pillai, Samantha Cheuk, Rebecca Manion, Erika Friebe and Alexandra Greenberg, “Humanitarian Licensing Considerations in University Technology Transfer,” Brief to the Committee, 31 July 2017.

88 CASA, 2017.

That being said, the Committee finds that if uniform IP licensing policies could facilitate technology transfer, such policies would be better developed by stakeholders, with the support of the Government of Canada.

A number of witnesses have recommended the use of template agreements to facilitate negotiations between universities and private firms, standardize technology transfers on the basis of “best practices,” and thus make technology transfer more predictable.⁸⁹ Such template agreements are indeed growing in popularity among the Organisation for Economic Co-operation and Development (OECD) countries.⁹⁰ In 2013, this Committee had supported the establishment of template agreements to facilitate technology transfer:

“[U]niform IP licensing policies ... would be better developed by stakeholders, with the support of the Government of Canada.”

[T]hat the Government of Canada encourage universities to work together to develop template agreements by sector that could provide greater certainty for businesses entering into partnerships with university researchers.⁹¹

The United Kingdom’s “Lambert Toolkit” provides an example of such template agreements. The Lambert Toolkit is a set of decision tools and standard agreements designed to improve collaboration agreements between PSIs and private firms. The Toolkit includes 11 model bilateral and multilateral research agreements with accompanying guidance notes. The template agreements provide different approaches to determine which prospective partners would own and exploit IP resulting from research collaborations, and under which conditions. The Toolkit also includes a decision guide to help prospective partners select and tailor template agreements on the basis of their particular circumstances.⁹²

Flexibility of use should be emphasized. In 2013, the UK Intellectual Property Office commissioned an independent review of the Toolkit, eight years after its original launch. The review determined that the Toolkit benefited from wide awareness of its existence

89 See INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0925 \(Ritch Dusome\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [1020 \(Dawn Davidson\)](#), [1015 \(Karin Hinzer\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0850 \(Code Cubitt\)](#), [0920, 0935 \(Pari Johnston\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0900 \(Ted Hewitt\)](#); Bawa, 2017.

90 See OECD, 2013, p. 76.

91 INDU, *Intellectual Property in Canada*, Third Report, 1st Session, 41st Parliament, March 2013, p. 51.

92 See United Kingdom, “[University and Business Collaboration Agreements: Lambert Toolkit](#),” [www.gov.uk](#).



among PSIs and private firms, that it offered a sound and fair foundation for negotiation, and that it can provide workable solutions to key issues commonly arising from academia–industry collaboration.⁹³ That being said, most organizations that have used the Toolkit selected it as a compromise position and only 3% of them did so without modifying the template agreements.⁹⁴ While parties can benefit from template agreements as a starting point, they will still modify these agreements to suit their own, specific circumstances.

D. To patent or not to patent

There is no doubt that IP in general, and patenting and licensing in particular, can be viable strategies for technology transfer. Patents serve as markers of achievement for PSIs and they provide incentives to commercialize the fruits of academic research, which is often at the cutting edge of technological development.⁹⁵ That being said, some witnesses warned against overstating the commercial potential of academic IP, including Jeremy Auger, Chief Strategy Officer at Desire2Learn Inc.:

[A]cademic institutions are our partners, our customers, and in my opinion, something Canada should be very proud of. However, [Desire2Learn Inc.] has struggled to find value in university held IP that’s generated in isolation of the private sector, and in cases where this has happened, we found that the technologies many times already commonplace in the private sector, or not in a state where it would provide commercialization value.⁹⁶

Corroborating the testimony presented to the Committee, the OECD reported in 2013 that “[b]usiness surveys show that publications and collaborative research are rated highly significant [for technology transfer], while patent and licensing-based channels are rated low.”⁹⁷

Other witnesses cited the cost and complexity of securing, maintaining, protecting and exploiting an inventory of patents for PSIs.⁹⁸ For example, PSIs surveyed by Statistics

93 See generally Elaine Eggington, Rupert Osborn and Claude Kaplan, *Collaborative Research Between Business and Universities: The Lambert Toolkit 8 Years On*, London, Intellectual Property Office, 2013.

94 *Ibid.*, p. 3, 31.

95 See INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0855 \(Kenneth Porter\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0920 \(Anand Srinivasam\)](#); U15, 2017.

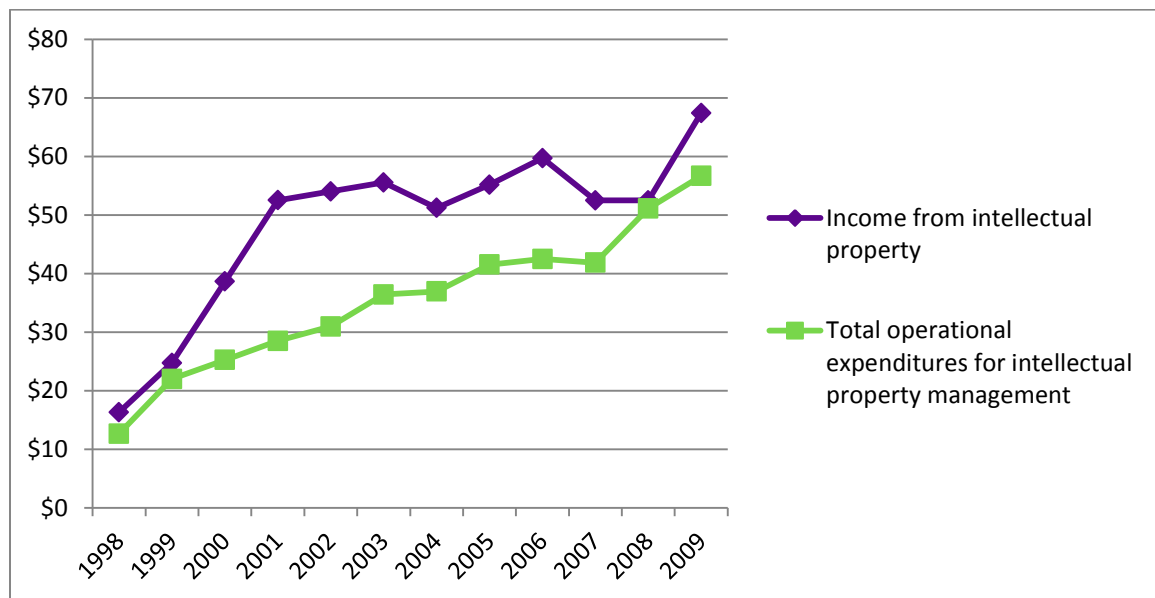
96 INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0900 \(Jeremy Auger\)](#). See also INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0915 \(Marshall Ring\)](#).

97 OECD, 2013, p. 19.

98 See INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0900 \(Jeff Musson\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0915 \(Ted Hewitt\)](#); NAIT, 2017.

Canada disclosed that, in 2009, their IP generated \$67.4 million in income, but that identifying, protecting, promoting and commercializing their IP also required expenditures of \$56.6 million. Figure 4 contrasts intellectual property expenditures and income in PSIs between 1998 and 2009.⁹⁹ The AUTM surveys do not provide the expenditures for IP management, but show an average license income of \$68.4 million from 2011 to 2015, with 2015 yielding the lowest income (\$60.05 million) and 2014 the highest (\$88.2 million).¹⁰⁰

Figure 4 – Intellectual property expenditures and income in post-secondary institutions, 1998-2009, \$ millions



Source: Statistics Canada, *Survey of Intellectual Property Commercialization, by Higher Education Sector Indicators*, 1998 to 2009.¹⁰¹

99 See also Bubela and Caulfield, 2010, pp. 449-450 (such relatively low net income from academic IP is apparently not limited to Canada: at least half of American and British universities do not make enough licensing revenues to cover the costs of IP management, with most revenues being concentrated in a small number of institutions).

100 AUTM, 2015, p. 29.

101 Criticism on the use of IP as a channel of technology transfer must take into account the available indicators. Figure 4 shows that institutions surveyed by Statistics Canada disclosed a relatively small margin of net income from the commercialization of IP. Commentators may thus be tempted to claim that low revenues justify giving up on or at least focusing less on formal, IP-based channels for technology transfer. Our assessment of the performance of IP-based technology transfer might differ should there be reliable data on their eventual positive externalities, such as socio-economic benefits. This is not an invitation to speculate on such benefits, but to develop rigorous means to observe them, as discussed above.



Witnesses have thus warned not to overstate the importance of IP in Canadian technology transfer, for

[i]t can have a corrosive effect on universities, that forego important publicly funded research in favour of potential licensing or patenting opportunities. With properly funded institutions, there is no need to chase licensing dollars. Instead, cutting-edge research ends up in the hands of businesses that can better leverage it for commercialization opportunities. This should not be viewed as lost revenue for universities or their researchers, but rather as a better return on the public's investment in post-secondary research.¹⁰²

Michael Geist

Witnesses have therefore pointed towards more opened models of innovation¹⁰³ — including IP sharing strategies such as patent pooling, technology bundles, open-access publishing and data sharing¹⁰⁴ — along with the example of Canadian colleges and polytechnics that prioritize assigning IP to their private partners at no cost.¹⁰⁵

ENVIRONMENT

The Government of Canada should continue to foster interactions and collaborations between PSIs and the private sector, especially SMEs. Failures to conduct technology transfer should serve as evidence of obstacles to the formation of academia–industry relations rather than the shortcomings of specific individuals, organizations or sectors of activity. The goal should not only be to commercialize academic IP, but also to build the innovative capacities of both PSIs and SMEs through collaborative ventures. Supporting the creation of a collaborative environment should therefore be a priority

“The goal should not only be to commercialize academic IP, but also to build the innovative capacities of both PSIs and SMEs.”

102 INDU, *Evidence*, 1st Session, 42nd Parliament, 1 June 2017, [0845 \(Michael Geist\)](#).

103 *Ibid.*, [0905 \(Michael Geist\)](#) (citing the example of Israel, where the military creates most technological innovations and claim none of the IP in order to facilitate commercialization).

104 *Ibid.*, [0845](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0850](#), [0945](#), [1010 \(Richard Gold\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0940 \(Bert van den Berg\)](#), [0900 \(Ted Hewitt\)](#); Bawa, 2017. See also OECD, 2013, pp. 68-80; Trosow et al., 2012, pp. 18-19.

105 See INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0910 \(Dawn Davidson\)](#); Olds College, 2017; NAIT, 2017. See also INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0900 \(Ritch Dusome\)](#).

of technology transfer policy.

A number of witnesses have claimed that, because of a lack of entrepreneurship within PSIs, faculty, students and even technology transfer personnel have little interest and experience in it.¹⁰⁶ For example, as Stephen Beney, President of the Intellectual Property Institute of Canada, stated:

[I]n my work with universities, a lot of it is education. They do not understand the basics of business and how to promote IP innovation. ... A long-term goal, I would say, is more of a cultural change and shift to an innovation culture. I know China right now is actually starting to look into that as well, because they don't have an innovation culture, but they will have one and we need to develop one as well. It's a long-term coaching the universities and possibly high schools.¹⁰⁷

Witnesses have therefore suggested providing students with IP and business training, sharing licensing income with inventors, integrate IP and technology transfer metrics in the assessment of academic performance, incentivize entrepreneurial activities with supplementary funding, and encouraging faculty to pursue business and consulting endeavours during sabbatical years.¹⁰⁸

There is utility in providing faculty and students with business and entrepreneurial training and support. Recent graduates are twice as likely as their professors to create spin-off companies, but they often lack the management skills that would facilitate the growth and success of these firms:¹⁰⁹

Many students want to use the inventions they develop in university to start their own businesses, but lack the skills and knowledge to do so. To help students make the leap into the private sector and commercialize inventions they develop at university, one stakeholder extolled the virtues of "entrepreneur centres." An entrepreneur centre serves as a kind of pre-incubator, focusing on providing practical training to young entrepreneurs by facilitating mentoring and delivering seminars on selling their inventions.¹¹⁰

106 But see INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [1005 \(Stephen Susalka\)](#).

107 INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [1005 \(Stephen Beney\)](#). See also INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0940 \(Anand Srinivasam\)](#); Inno-Centre, 2017.

108 See INDU, *Evidence*, 1st Session, 42nd Parliament, 15 June 2017, [0850](#), [0915 \(Code Cubitt\)](#), [1010 \(Pari Johnston\)](#); Maule, 2017.

109 See Galushko and Sagynbekov, 2014, p. 12; OECD, 2013, p. 42; Trosow et al., 2012, pp. 15-16.

110 INDU, *Innovation and Technology: An Exchange of Ideas*, Seventh Report, 1st Session, 42nd Parliament, p. 7.



Almost all witnesses highlighted the importance of faculty and students having a basic understanding of IP law.¹¹¹ One witness from ISED underlined IP education as a determining factor of success in technology transfer.¹¹²

A large number of witnesses stressed that the movement of human capital counts among the most effective means of technology transfer — which should be taken into account when developing indicators of technology transfer. As one witness argued, “[t]he largest intellectual property and technology transfers from academia to Canadian companies occur when one of these innovative companies hires these technically well-trained graduating students.”¹¹³ To integrate the private sector, however, graduate students must be networked into the broader innovation ecosystem in order to do design work, proof of concept and prototyping. This takes time and steady funding, which remains limited.¹¹⁴

The Government of Canada should continue to foster research collaborations between academia and the private sector, notably through the movement of human capital. The Government could expand the celebrated Mitacs programs not only in terms of available funds and duration of internship, training and collaborative endeavours, but also make these programs available to college and polytechnics students.¹¹⁵ Tax credits rewarding PSI–SME collaborations could also be considered.¹¹⁶ Bridging organizations such as proofs-of-concepts centres, technology access centres, business incubators and clusters more generally are important points of contact between PSIs and the private sector, and can therefore serve as catalysts for technology transfer activities.¹¹⁷

111 See for example INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0100 \(James Hinton\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 8 June 2017, [0855 \(Stephen Beney\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0925 \(Bert van den Berg\)](#), [1010 \(Chris Plunkett\)](#), [1015 \(Jacqueline Walsh\)](#); CASA, 2017; Inno-Centre, 2017; Nael Thaher and Helen Hambly, “Intellectual Property and Technology Transfer,” Brief to the Committee, 31 July 2017.

112 See INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1015 \(Alison McDermott\)](#).

113 INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [1000 \(Karin Hinzer\)](#). See also INDU, *Evidence*, 1st Session, 42nd Parliament, 16 May 2017, [1015 \(Alison McDermott\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 1 June 2017, [0855 \(Christine Trauttmansdorff\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 6 June 2017, [0855, 0920 \(Kenneth Porter\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0905 \(Dawn Davidson\)](#), [1005 \(D. George Dixon\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0905 \(Bert van den Berg\)](#), [0955 \(Chris Plunkett\)](#); U15, 2017.

114 INDU, *Evidence*, 1st Session, 42nd Parliament, 13 June 2017, [0845, 1005 \(Karin Hinzer\)](#).

115 *Ibid.*, [1010 \(Dawn Davidson\)](#); INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0905 \(Bert van den Berg\)](#).

116 See Expert Panel on Commercialization, 2006, p. 31.

117 See INDU, *Evidence*, 1st Session, 42nd Parliament, 20 June 2017, [0845, 0905, 0920 \(Bert van den Berg\)](#).

CONCLUSION

Facilitating and conducting technology transfer requires sustained focus, efforts and investments from all parties involved. It is imperative that the Government of Canada support access to reliable information on technology transfer activities and opportunities to support policy and endeavours in this area, the development of best practices, and the creation of an environment conducive to collaborations between PSIs and the private sector.



LIST OF RECOMMENDATIONS

RECOMMENDATION 1

The Committee recommends that the Government of Canada require Statistics Canada to develop — in collaboration with a wide range of experts and stakeholders such as the Canadian Intellectual Property Office, the Intellectual Property Institute of Canada, and the Association of University Technology Managers — a new set of indicators in order to provide comprehensive information on technology transfer between post-secondary institutions and the private sector.

RECOMMENDATION 2

The Committee recommends that the Government of Canada require Statistics Canada to launch an annual survey on technology transfers between post-secondary institutions and the private sector based on the new indicators. The disclosure of the indicators could be made mandatory or incentivized.

RECOMMENDATION 3

The Committee recommends that the Government of Canada facilitate access to information relevant to technology transfer for Canadian small and medium enterprises in order to promote collaborations between post-secondary institutions and the private sector, notably for the purpose of the commercialization of academic research.

RECOMMENDATION 4

The Committee recommends that the Government of Canada establish and promote a database of intellectual property assets held by post-secondary institutions.

RECOMMENDATION 5

The Committee recommends that the Government of Canada consider launching a pilot program designed to provide small businesses access to strategic intellectual property advice.

RECOMMENDATION 6

The Committee recommends that the Government of Canada study the opportunity to renew and expand funding allocated to programs supporting technology transfers between post-secondary institutions, (universities, colleges and polytechnics), and

Canadian enterprises. This should include the possibility of renewing financing for the Intellectual Property Mobilization program.

RECOMMENDATION 7

The Committee recommends that the Government of Canada investigate new ways to support entrepreneurs and Canadian enterprises engaging in technology transfer activities with post-secondary institutions.

RECOMMENDATION 8

The Committee recommends that the Government of Canada provide funding to promote formal collaborations between bridging organizations and the private sector. This could include funding to proactively promote post-secondary institution technology and know-how to Canadian enterprises.

RECOMMENDATION 9

The Committee recommends that the Government of Canada collaborate with industry, post-secondary institutions and relevant stakeholders to create a “toolkit” for Canadian technology transfer. Such a toolkit would include flexible intellectual property licensing template agreements, along with guidance on intellectual property sharing strategies.

RECOMMENDATION 10

The Committee recommends that the Government of Canada continue to support education initiatives designed to improve intellectual property law among faculty and students in post-secondary institutions, including those in campus led incubators and accelerators.

RECOMMENDATION 11

The Committee recommends that the Government of Canada extend the eligibility of Mitacs or similar programs to college and polytechnics students.

RECOMMENDATION 12

The Committee recommends that the Government of Canada explore methods of incentivizing the retention of Canadian produced intellectual property and know-how, from the technology transfer process through the start-up and scale-up of the enterprises applying the intellectual property or know-how.

APPENDIX A LIST OF WITNESSES

Organizations and Individuals	Date	Meeting
<p>Department of Industry</p> <p>Konstantinos Georgaras, Director General Canadian Intellectual Property Office, Corporate Strategies and Services Branch</p> <p>Alison McDermott, Director General Program Coordination Branch</p> <p>Mark Schaan, Director General Marketplace Framework Policy Branch, Strategic Policy Sector</p>	2017/05/16	61
<p>As individuals</p> <p>Jaipreet Bindra, Manager, Ernst & Young</p> <p>Michael Geist, Canada Research Chair in Internet and E-commerce Law Professor of Law, University of Ottawa</p>	2017/06/01	64
<p>Colleges and Institutes Canada</p> <p>Christine Trauttmansdorff, Vice-President Government Relations and Canadian Partnerships</p>		
<p>Niagara College</p> <p>Marc Nantel, Associate Vice-President Research and Innovation</p>		
<p>As an individual</p> <p>James Hinton, Intellectual Property Lawyer, Bereskin & Parr LLP, Advisor Council of Canadian Innovators</p>	2017/06/06	65
<p>Association of University Technology Managers</p> <p>Stephen Susalka, Chief Executive Officer</p>		
<p>Innovate Calgary</p> <p>Kenneth Porter, Vice-President Intellectual Property Management</p>		
<p>As an individual</p> <p>Richard Gold, James McGill Professor Faculty of Law, Faculty of Medicine, McGill University</p>	2017/06/08	66

Organizations and Individuals	Date	Meeting
Canadian Chamber of Commerce Scott Smith, Director Intellectual Property and Innovation Policy	2017/06/08	66
Centre of Excellence in Next Generation Networks Ritch Dusome, President and Chief Executive Officer		
Intellectual Property Institute of Canada Stephen Beney, President	2017/06/08	66
Manitoba Technology Accelerator Inc. Marshall Ring, Chief Executive Officer		
As an individual Karin Hinzer, Associate Professor and Canada Research Chair in Photonic Nanostructures and Integrated Devices University of Ottawa, School of Electrical Engineering and Computer Science	2017/06/13	67
Association of University Research Parks Canada Laura O'Blenis, Co-Founder and Managing Director		
Desire2Learn Incorporated Jeremy Auger, Chief Strategy Officer		
EION Inc. Anand Srinivasan, Technology Lead		
Polytechnics Canada Dawn Davidson, Associate Vice-President Research and Innovation, George Brown College		
U15 Group of Canadian Research Universities D. George Dixon, Vice-President University Research, University of Waterloo		
Mistral Venture Partners Code Cubitt, Managing Director	2017/06/15	68
North of 41 Jeff Musson, Executive Director		

Organizations and Individuals	Date	Meeting
<p>Universities Canada</p> <p>Pari Johnston, Vice-President Policy and Public Affairs</p> <p>Wendy Therrien, Director Research and Policy</p>	2017/06/15	68
<p>As an individual</p> <p>Jacqueline Walsh, Assistant Professor Entrepreneurship and Strategy, Memorial University</p>	2017/06/20	69
<p>Communitech</p> <p>Chris Plunkett, Vice-President External Relations</p>		
<p>Natural Sciences and Engineering Research Council of Canada</p> <p>Michael Lam, Senior Manager RPP Strategic Planning, Research Partnerships Directorate, Colleges, Commercialization, and Portfolio Planning</p> <p>Bert van den Berg, Acting Vice-President Research Partnerships Directorate</p>	2017/06/20	69
<p>Social Sciences and Humanities Research Council of Canada</p> <p>Ted Hewitt, President</p>		

APPENDIX B LIST OF BRIEFS

Organizations and Individuals

Association of University Research Parks Canada

Association of University Technology Managers

Attica Consulting

Canadian Alliance of Student Associations

Centre for International Governance Innovation

Cheuk, Samantha

Friebe, Erika

Greenberg, Alexandra

Guichon, Juliet

Hambly, Helen

Hollis, Asha

Inno-centre

Intellectual Property Institute of Canada

Manion, Rebecca

Marsman, Kathleen E.

Northern Alberta Institute of Technology

Olds College

Pillai, Dylan

Springboard Atlantic Inc.

TEC Edmonton

Organizations and Individuals

Thaher, Nael

U.S. Chamber of Commerce

U15 Group of Canadian Research Universities

Universities Allied for Essential Medicines

Universities Canada

Western Canadian Innovation Offices

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the Committee requests that the government table a comprehensive response to this Report.

A copy of the relevant Minutes of Proceedings ([Meetings Nos. 61, 64 to 69, 71, 73, 74, 81 and 83](#)) is tabled.

Respectfully submitted,

Dan Ruimy
Chair

