

## BRITISH COLUMBIA NEEDS EFFECTIVE INTELLECTUAL PROPERTY FRAMEWORKS TO PROMOTE COLLABORATIVE RESEARCH AND COMMERCIALIZATION

*This edition of Policy Perspectives is guest-authored by **Val Walker** and **Stephen Higham** of Mitacs.<sup>1</sup>*

### HIGHLIGHTS

- BC has a high number of small businesses that contribute to a dynamic economy, but lack the capacity to make the province a leader in developing and commercializing new products or services.
- To strengthen its economic competitiveness, BC needs to grow businesses, in part by promoting collaboration between firms and universities through research partnerships.
- Stakeholders in BC must ensure that policies surrounding intellectual property are understandable and timely, to avoid deterring potential research partnerships and foreign direct investment in R&D.
- No consistency currently exists in IP policies in provinces across Canada or at individual postsecondary institutions, making navigating commercialization challenges even harder for potential collaborators.
- BC institutions would be well-served by clear and consistent guidelines to follow when it comes to IP for their researchers and industry partners.
- Best practices exist that can serve as a guide, including Google's Advanced Technology and Projects group that has recently created a collaborative agreement with universities called MURA – their multi-university research agreement.

Mitacs is a national, not-for-profit research organization that supports Canadian innovation through collaborative research projects linking businesses with leading experts at Canadian universities. Although we have a network of over 25 regional offices, our roots are in British Columbia, and our national headquarters remain in Vancouver.

Since 1999, Mitacs has supported over 13,000 research internships across Canada, and we've found that when innovative businesses team up with outstanding researchers, good things happen. Students gain valuable workplace experience and develop networks beyond academia; businesses gain access to elite researchers as they tackle important industry challenges; and governments see the benefits of growing firms and increased R&D.

This issue of *Policy Perspectives* provides an overview of results from a recent Mitacs research project examining what attracts (and deters) foreign direct investment in R&D to Canada, with a specific focus on Canada's outdated intellectual policy regime. We finish by pointing to a best practice in this space from Google's Advanced Technology and Projects (ATAP) group.

<sup>1</sup>The views expressed in this article are those of the authors and do not necessarily reflect the position of the Business Council of British Columbia.

## BC IS SET-UP FOR ECONOMIC SUCCESS

When it comes to innovation, one of Canada's greatest strengths is its research talent. To grow and strengthen an innovative economy, an effective strategy builds upon existing strengths. In BC, strengths are in abundance.

British Columbia enjoys numerous advantages as a place to create wealth and jobs, build businesses, and undertake high-value economic activity: abundant natural resources, highly-educated citizens, an entrepreneurial orientation, good physical infrastructure, reasonably competitive personal and business taxes, and favourable access to Asian and North American markets. Amidst continued uncertainty in the global economy, a struggling national economy, and declines in the prices of energy resources and other commodities, these strengths have served to make BC a Canadian growth leader and contributed to what is today a dynamic, diversified economy.

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Stemming from this dynamism, there are a significant number of innovative firms in British Columbia. Examples can be found in the flourishing advanced technology industry, with Bloomberg News recently pointing to Vancouver as “the new tech hub.”<sup>2</sup> Vancouver is home to three of Canada's four tech “unicorns,” and over 100,000 tech professionals are employed across the province, reflecting a vibrant community of small and medium-sized companies.

There is also no shortage of people with ideas. With eleven public and five private universities across the province, the production of scientific articles (per million people) in BC is well above the national average, ahead of both Ontario and Quebec.<sup>3</sup> Further, British Columbia ranks second among provinces in the percentage of people who report being early-stage entrepreneurs.<sup>4</sup> And the University of British Columbia was the only Canadian institution on the list of the top 100 worldwide universities granted U.S. utility patents in 2014.<sup>5</sup>

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## BUT NOT EVERYTHING IS COMING UP ROSES

While its technology sector is dynamic and growing, BC ranks fourth among the provinces in terms of tech industry GDP, revenues, employment, average weekly earnings and business counts.<sup>6</sup> Going beyond the technology sector, the vast majority of the nearly 400,000 businesses in BC are small, with a nation-leading rate of small businesses per capita.<sup>7</sup> Very few of these small firms ever reach a scale to be major contributors to overall R&D spending and related productivity gains, as they rarely have the capital to invest in R&D or

<sup>2</sup> Weise, Karen. (2014, May 27). Vancouver, the new tech hub: unable to bring all their international talent to the U.S., tech companies head to Vancouver. *Bloomberg*. Retrieved from <http://www.bloomberg.com/news/articles/2014-05-22/vancouver-welcomes-tech-companies-hampered-by-u-dot-s-dot-work-visa-caps>.

<sup>3</sup> Conference board of Canada. (2015). Scientific articles, provinces and international peers, 2012. Retrieved from <http://www.conferenceboard.ca/hcp/provincial/innovation/sci-articles.aspx>.

<sup>4</sup> Conference Board of Canada. (2014). *Entrepreneurial Ambition, Provinces and International Peers, 2014 or Most Recent Year*. Retrieved from <http://www.conferenceboard.ca/hcp/provincial/innovation/ambition.aspx>.

<sup>5</sup> National Academy of Inventors. (2014). *Top 100 Worldwide Universities Granted U.S. Utility Patents, 2014*. Retrieved from <http://www.academyofinventors.org/pdf/NAI-IPO-Top-100-Universities-2014.pdf>.

<sup>6</sup> BC Stats. (2015). *Profile of the British Columbia High Technology Sector: 2014 edition*. Province of BC.

<sup>7</sup> Government of British Columbia. (2015). *Small Business Profile 2015*. Retrieved from <http://www.bcstats.gov.bc.ca/StatisticsBySubject/BusinessIndustry/SmallBusiness.aspx>.

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other types of innovation at levels comparable to larger businesses.

Research shows that firms with 500+ employees are 15 times more likely to undertake R&D activities than those with less than 100.<sup>8</sup> Compared to peer countries like the United States, the Canadian economy relies heavily on small and medium sized businesses (SMEs),<sup>9</sup> and BC has a higher share of SMEs than the Canadian average.<sup>10</sup> This limits the overall capacity for businesses in the province to innovate, and may in part explain why patent production, a key measure of innovation performance, is lagging in British Columbia.<sup>11</sup>

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### **IP FRAMEWORKS CAN ENCOURAGE OR PREVENT COLLABORATIVE RESEARCH**

In a recent paper, *Leveraging Canada's Innovation Ecosystem: Opportunities to Increase R&D Investment in Canada*,<sup>12</sup> business leaders from a mix of sectors were interviewed to get their perspective on the strengths and weaknesses of Canada's innovation and research systems. Among the insights provided by business leaders, it was uniformly recognized that collaborating with universities provides significant benefits for businesses of all sizes. Such collaborations enhance the ability of SMEs to conduct R&D, both by providing them with access to top researchers and research infrastructure, and also by allowing them to overcome specific business challenges and create new ideas.

One of Canada's weaknesses identified by business leaders was restrictive policies on intellectual property (IP). The rules and regulations surrounding IP have important implications for universities in BC, and for the broader economy.

IP is defined by the Canada Business Network as, "the legal right to ideas, inventions and creations in the industrial, scientific, literary and artistic fields."<sup>13</sup> For businesses seeking to partner with Canadian universities on research projects, business leaders observe that "the commercialization of research stemming from industry-university partnerships, and the process of determining ownership of IP, is more challenging in Canada than most jurisdictions." They also report that the timelines associated with negotiating IP and commercializing innovations are too long and often negatively impact the competitiveness of Canadian businesses.<sup>14</sup>

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<sup>8</sup> Songsakul, T., Lau, B., & Boothby, D. (2008). *Firm Size and Research and Development Expenditures: A Canada-U.S. Comparison*. Industry Canada Working Paper 2008-2012. Ottawa: Industry Canada.

<sup>9</sup> Leung, Danny & Rispoli, Luke. (2014). *Economic Analysis (EA) Research Paper Series - The Distribution of Gross Domestic Product and Hours Worked in Canada and the United States Across Firm Size Classes*, no. 88. Ottawa: Statistics Canada.

<sup>10</sup> Innovation, Science and Economic Development Canada. (2013, August). *Key small business statistics*. Retrieved from <http://www.ic.gc.ca/eic/site/061.nsf/eng/02804.html>.

<sup>11</sup> Brydon, R., Chesterley, N., Dachis, B. & Jacobs, A. (2014, November 28). *Measuring innovation in Canada: the tale told by patent applications*. Toronto: C.D. Howe Institute.

<sup>12</sup> Higham, S., Walker, V. & Annan, R. (2016), *Leveraging Canada's innovation ecosystem: opportunities to increase R&D investment in Canada*. (P.13). Retrieved from <https://www.mitacs.ca/en/newsroom/publication/leveraging-canadas-innovation-ecosystem-opportunities-increase-rd-investment>.

<sup>13</sup> Canada Business Network. (2016). *What is intellectual property?* Retrieved from <http://www.entreprisescanada.ca/eng/page/2724/>.

<sup>14</sup> Higham, S. et al. (2016).

A well-balanced IP regime provides incentives to innovate while also promoting the efficient sharing of information to allow for incremental innovation. According to the Global Intellectual Property Centre (US Chamber of Commerce), companies in countries with strong IP systems are 40% more likely to invest in R&D.<sup>15</sup> On a range of over thirty indicators, results from their 2015 International IP Index show that Canada's IP regime scores relatively poorly, placing 11th behind such competitor countries as Australia or the United States.<sup>16</sup>

The federal government has started taking steps to upgrade the national policy framework for IP because, unlike the United States, Canada lacks a nationwide policy on knowledge transfer. Instead, individual governments and institutions develop their own policies, resulting in a range of approaches and a hard-to-understand patchwork across the country.

In some cases, IP is highly protected, while in other cases there is an effort to make it widely available for commercialization. In BC, for example, the government's website on intellectual property describes a mandate to manage intellectual property in a way that both protects provincially-owned IP while also making it available to the private sector, describing IP as a potential non-tax revenue for government.<sup>17</sup>

These IP issues are being played out on campuses across Canada. Many of Canada's research-intensive

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universities have recently updated their IP policies, hoping to allow for greater flexibility surrounding ownership, and the U15 has called for Canada to "invest in trials of new, progressive approaches to IP commercialization, such as those being implemented by some U15 institutions, in order to identify best practices and improve outcomes."

The different approaches can generally be categorized in three ways:

- University ownership (most restrictive): Under more restrictive IP policies, the university retains ownership of inventions, discoveries and creations that arise. If the university does not pursue commercialization, the inventor may request that the rights be reassigned to them.
- Joint-ownership: Less restrictive IP policies allow the creators of IP to retain ownership, with certain exceptions. In cases where the university commercializes intellectual property, the creator is compensated according to mechanisms laid out in the university's IP policy. Some universities also assign IP ownership to the faculty through whom the materials were created.

- Creator-ownership (most flexible): The creators of IP retain all ownership, and may choose to assign the IP to the university or pursue commercialization independently.

Not all IP frameworks fit neatly into one of these categories. Some institutions may have policies that place them in more than one of the above categories, depending on specific circumstances, or an institution may offer several "models" for ownership to be considered by research partners.

At the University of British Columbia, for example, intellectual property that is created through university research using UBC facilities, equipment, or funding remains owned by the university, while IP stemming from sponsored research is negotiated in a research agreement.<sup>18</sup> If university-owned IP is commercialized, the creator is entitled to 50% of royalties.

Conversely, at Simon Fraser University (and several other universities in the province), ownership of intellectual property is retained by the creator (unless a specific agreement states otherwise), but if commercialization occurs, the universities are entitled to a share of the revenue, based upon their contribution in developing the IP.<sup>19</sup>

Across the country, universities employ a range of approaches towards ownership and commercialization of IP. Generally, the trend at Canadian universities is to move away from more restrictive

<sup>15</sup> U.S. Chamber of Commerce, Global Intellectual Property Center. (2015) *Unlimited Potential (UP): 2015 GIPC International IP index: third ed.* Retrieved from [http://www.theglobalipcenter.com/wp-content/themes/gipc/map-index/assets/pdf/Index\\_Map\\_Index\\_3rdEdition.pdf](http://www.theglobalipcenter.com/wp-content/themes/gipc/map-index/assets/pdf/Index_Map_Index_3rdEdition.pdf).

<sup>16</sup> U.S. Chamber of Commerce, Global Intellectual Property Center. (2015).

<sup>17</sup> Government of British Columbia. (n.d.) *Intellectual property disposals*. Retrieved from <http://www2.gov.bc.ca/gov/content/governments/services-for-government/policies-procedures/intellectual-property/intellectual-property-program/intellectual-property-disposals>.

<sup>18</sup> The University of British Columbia. (n.d.) *Inventions and intellectual property*. Retrieved from <http://www.uilo.ubc.ca/pages/knowledge-mobilization/ip>.

<sup>19</sup> Simon Fraser University. (n.d.) *Graduate studies & postdoctoral fellows: research*. Retrieved from [https://www.sfu.ca/dean-gradstudies/current/research/intellectual\\_property.html](https://www.sfu.ca/dean-gradstudies/current/research/intellectual_property.html).

approaches, and towards those that allow the creator of the IP to retain ownership. While the prospect of commercialization can act as an incentive to retain university control over IP, business leaders interviewed by Mitacs told us that a lack of flexibility surrounding IP ownership can deter businesses from engaging in collaborative projects.

## BEST PRACTICES FROM GOOGLE'S ADVANCED TECHNOLOGY AND PROJECTS GROUP

An emerging best practice comes in the form of multi-partner agreements. When a university and a business seek to develop a research partnership, negotiations relating to IP can take months or up to a year to finalize, delaying or discouraging research that might otherwise be timely and profitable.

To overcome this challenge, in 2013 Google/Motorola's developmental research division (now Google's Advanced Technology and Projects group (ATAP)) signed a collaborative agreement with eight prominent public and private research universities, including Cal Tech, Harvard, MIT and Stanford. The Multi-University Research Agreement (MURA) lays out a comprehensive framework to deal with issues surrounding IP. In doing so, signatories are able to launch research collaborations over shorter time-frames, and the process of engaging in university collaborations is simplified.

From the initial signatories, other schools have partnered with ATAP, with Johns Hopkins recently becoming the 16th institution of higher education to add its name to the list of MURA partners. Guelph is currently the only Canadian university that is a signatory to the MURA, and it is now engaged in innovative research partnerships with Google ATAP.<sup>20</sup>

Through MURA partnerships, Google retains the option to negotiate exclusive licensing of the technology that emerges through the funding it provides to the university, but researchers retain the freedom to publish knowledge that has emerged through the project, provided that the materials do not disclose confidential information. And because of the established agreement, individual projects can be up and running in a matter of weeks.

The MURA represents just one innovative approach to dealing with IP in research collaborations. Across Canada, universities are experimenting. The University of Waterloo, for example, offers among the least restrictive IP policies in North America, whereby inventors retain ownership over their inventions, even in the case of joint research inventions. They are then free to commercialize their discoveries independently. While the university may miss out on potential revenue from commercialization, it enjoys a reputation as an innovation leader, and has been described as "the genesis of the entrepreneurial ecosystem that exists, (owing to) that intellectual property policy

which attracts commercially oriented researchers."<sup>21</sup>

To provide greater clarity around IP processes, some jurisdictions have developed template agreements for use in research collaborations. Among the best known is the UK government's Lambert Toolkit, which provides five model research collaboration agreements for use as starting points in establishing new collaborative projects between industry and university partners.<sup>22</sup>

In Canada and beyond, the range of approaches to IP frameworks reflect the reality that no single IP approach is ideal for all scenarios. Rather, as BC and other regions adapt to the changing global economy and technological disruptions, experimentation and adaptation will reveal the right policy mix for promoting innovation.

Collaborative research between industry and universities is essential to long-term economic development in British Columbia, and intellectual property is an important component of this collaboration. The best IP framework will balance the needs of research partners for mutual benefit.

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<sup>20</sup> University of Guelph. (2016, March 28). Prof, students team with Google to create 'password-free' world. *University of Guelph*. Retrieved from <http://news.uoguelph.ca/2016/03/prof-students-team-google-create-password-free-world/>.

<sup>21</sup> Moran, Francis & Valiquette, Leo. (May 30, 2011). *Accelerated: Waterloo's culture of collaboration*. Retrieved from <http://francis-moran.com/market-ing-strategy/accelerated-waterloos-culture-of-collaboration/>.

<sup>22</sup> Government of the UK. (2014). *Guidance: Lambert toolkit*. Retrieved from <https://www.gov.uk/guidance/lambert-toolkit>.