

The Mitacs logo features the word "Mitacs" in a bold, white, sans-serif font. The letter "i" is lowercase and has a white dot above it. The background of the logo is a blue circle with a white dot in the center, resembling a stylized sun or a light source. The background of the entire page is a solid blue color with a subtle pattern of overlapping, semi-transparent blue shapes that create a sense of depth and movement.

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Leveraging Canada's Innovation Ecosystem: Opportunities to Increase R&D Investment in Canada

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Executive Summary

Canada belongs at the top of global competitiveness rankings. Our many assets – a highly skilled workforce, exceptional quality-of-life, world-class research institutions and strong culture of entrepreneurship – ought to make us an international leader on measures of innovation and R&D.

Unfortunately, we know this is not the case.

Canada's subpar innovation performance is widely-understood as a significant economic challenge. Rather than dwelling on Canada's status as a middle-of-the-pack performer, Mitacs seeks to contribute something constructive to the dialogue.

We know that increasing business investment in research and development is crucial to supporting innovation, and that this is an area of particular weakness for Canada. We also know that Canada is rarely the first choice for multinational companies when they choose where to invest in R&D. To better understand the factors that attract or deter investment, we spoke directly with Canadian business leaders representing subsidiary companies across a range of industries.

Business leaders told us that Canada has a number of strengths, including:

- A high quality of life;
- A respected research capacity and skilled workforce;
- An entrepreneurial culture; and
- Significant tax incentives.

Along with strengths, however, participants identified significant weaknesses that could act to deter foreign investment in R&D:

- Lack of coordinated access to R&D support and bureaucratic delays;
- An outdated intellectual property (IP) system;
- Jurisdictional confusion and lack of coordination across research systems; and
- Lack of communication and promotion of opportunities for collaboration.

Mitacs believes that Canada can and should be a global innovation and research leader. In the following paper, we summarize the feedback we received from Canadian business leaders, and where possible, we support their perspectives with research. Doing so sheds light on the factors that attract or deter foreign investment in R&D, while also providing insight into strategies for strengthening Canada's overall research attractiveness.



Table of Contents

Executive Summary	3
Table of Contents	4
Introduction.....	5
Key Drivers in Attracting Foreign R&D Investment to Canada.....	6
1. High Standard of Living and Quality of Life	6
2. Recognized Research Excellence and a Highly Skilled Workforce	7
3. Culture of Entrepreneurship and Start-up Environment.....	8
4. Canadian Subsidies for R&D Activities	10
Barriers Limiting Foreign R&D Investment in Canada	11
1. Lack of Coordinated Access to R&D Support and Bureaucratic Delays	11
2. Canada's Outdated IP Regime	13
3. Lack of Communication/Promotion of Opportunities for Collaboration	14
Opportunities to Improve Canada's Attractiveness for R&D Investment.....	15
1. Canada Must Better Incentivize R&D by Rebalancing Direct and Indirect Support Measures	15
2. Canada Needs a Coordinated, Client-Centric Approach to Incentivizing R&D	16
3. Canada Must Invest in Training Programs that Grow the Knowledge Economy.....	17
Conclusion	18
Abbreviations.....	19
Endnotes	20



Introduction

Research and development (R&D) and other innovation-related activities play a vital role in driving productivity and strengthening Canada's global competitive advantage.¹ As the Canadian economy confronts the challenges of depressed energy prices and global economic uncertainty, promoting investment in R&D and innovation is increasingly important to Canadian policymakers.

To that end, federal and provincial governments annually spend billions of dollars on direct and indirect support for business R&D. Despite such public investments, however, business expenditure on R&D (BERD) – measured as a percentage of GDP – has decreased significantly over the past decade.² In the past year alone, BERD in Canada is forecast to be \$15.5 billion, declining by 2.6% from the previous year.³ This contributes to a reduction in total expenditure on R&D (gross expenditure on R&D or GERD) which is expected to decline by 0.7% to \$31.6 billion.⁴

Canada's relative investment in R&D among economic peers is also on the decline. Canada currently ranks 22nd among OECD countries in BERD, down from 16th in 2006.⁵ The Conference Board of Canada also reports that Canada's BERD as a share of GDP ranks it in last place among 16 peer countries, and that merely matching the peer average would require a doubling of Canada's BERD intensity.⁶

Simply put, Canada is falling behind in global competitiveness.

One way of stimulating domestic innovation and R&D is to increase foreign investment, and relatedly, the participation of Canadian firms in global high-value innovation supply chains. We know that when large multinational enterprises (MNEs) invest in R&D in Canada, they enable international technology transfer and strengthen regional innovation systems.⁷ In recent years, however, BERD financed from abroad has declined,⁸ and Canada has slipped in overall global competitiveness rankings.⁹

For Canada to curb these trends and position itself near the top of global competitiveness and prosperity rankings, it is important to identify the factors that drive global headquarters of large MNEs to invest in innovation and R&D operations. To support this objective, Mitacs partnered with Canada's Public Policy Forum to conduct interviews with business leaders representing Canadian subsidiaries across five industries: natural resources, manufacturing, aerospace, pharmaceuticals and information and communication technology (ICT).

Specifically, these industry leaders were asked:

1. What are the key drivers and barriers to investing in R&D in Canada?
2. Are there attributes that give Canada a competitive advantage when it comes to R&D or other innovation-related activities?
3. What do you recommend to governments to motivate your headquarters to consider Canada for R&D and other innovation-related activities?

Through semi-structured interviews and dialogue, we gained insight into the business perspectives on Canada's R&D investment environment, and identified lessons for increasing foreign R&D investment in Canada. Following the interviews, all data were provided to Mitacs staff who conducted a comprehensive analysis of the key issues and themes identified by business leaders. This paper is the outcome of that assessment.

In particular, the objectives of this report are to:

- Identify Canada's key drivers and barriers in attracting foreign R&D investment; and
- Highlight opportunities to improve Canada's attractiveness for foreign R&D investment.

This report will be of value to anyone with an interest in Canadian innovation policy, and in particular to those seeking an in-depth analysis of the factors that influence foreign investment in R&D.



Key Drivers in Attracting Foreign R&D Investment to Canada

Although articles, reports and studies on Canadian competitiveness and innovation tend to paint a bleak picture of Canada's innovation and R&D accomplishments, such materials often undervalue our country's many strengths. In terms of global competitiveness, Canada's assets should not be overlooked. A number of recent reports affirm Canada's attractiveness as a great place in which to invest and conduct business:

- Canada is the best place in the G-20 for business according to both Forbes and Bloomberg;¹⁰
- Canada's university-centred research system is internationally respected, and performs above the OECD average by several measures;¹¹
- Ranking fifth among peer countries for its production of scientific articles, Canada punches far above its weight in the production of knowledge;¹²
- The country is considered to be the easiest place to start a business in the G-7 according to the World Bank;¹³
- Canada is a leader in early stage entrepreneurial activity, with an activity rate just behind the US and tied for second with Australia;¹⁴ and
- Canadian banks have been rated as the soundest in the world for eight consecutive years by the World Economic Forum.¹⁵

Many of these findings were validated by business leaders during our interviews. In particular, when asked to identify Canadian assets in attracting foreign investment in R&D, several strengths were identified by participants:

1. Canada's high standard of living and quality of life;
2. Recognized research excellence and a highly skilled workforce;
3. A supportive culture of entrepreneurship and strong start-up environment; and
4. Canada's R&D tax subsidies.

These strengths are discussed in greater detail below, and the messages from business leaders are supplemented with research where possible.

1. High Standard of Living and Quality of Life

Business leaders we interviewed felt that Canada's high standard of living and quality of life are important factors that serve to attract global investment. By locating R&D facilities in locations with a high quality of life, companies are better able to attract and retain top talent. This was recognized as a significant advantage for Canada.

Such comments are consistent with data. With one of the highest standards of living in the world, Canada scores top marks on measures of housing, income, health, personal security, and education. In addition, Canadian cities score highly in international rankings of overall livability, with a 2015 report by Mercer placing three Canadian cities in the top global 20 (Vancouver, Toronto and Ottawa).¹⁶ On economic measures, four Canadian cities placed in the top 100, according to a 2014 study by the Brookings Institute and JPMorgan Chase.¹⁷

Together, such qualities improve the wellbeing and morale of workers, and are factors known to positively influence MNEs in locating R&D activities.¹⁸



2. Recognized Research Excellence and a Highly Skilled Workforce

Canadian business executives understand that a key advantage in attracting international investment is Canada's world-leading research excellence. Business leaders explained that the availability of highly-skilled workers, top-quality researchers, universities and facilities provide a number of benefits for companies that choose to invest in Canada.

Interview respondents also felt that the quality and availability of highly-skilled workers and researchers allows subsidiary companies to locate and recruit talent with relative ease, reducing the amount of time spent training and establishing R&D capabilities. As one interviewee from the natural resources sector explained, "Canada has many reputable academic institutions that provide a strong incentive to do business here. It makes it easier for companies to outsource some research to local researchers or experts, rather than bring[ing] in in-house experts."

Another individual described their company's experience partnering with universities and colleges to carry out on-the-ground research, which allowed them to develop tools that met the needs of their particular project while reducing the costs associated with working in Canada.

Some felt that for an MNE seeking entry into the Canadian market, collaborating with Canadian universities not only provides access to top talent, but also plays a role in legitimizing a company's operations in the new market – an essential requirement for resource development projects: "One reason for working with universities and colleges is developing social license for the organization to work in Canada."

Research confirms that Canada's highly-skilled workers and researchers, as well as its top universities and research facilities, are primary considerations for MNEs when deciding where to locate R&D activities.¹⁹ For example, when it comes to Canada's skilled talent and education infrastructure, what we heard from industry leaders is reflected in international rankings – Canada is ranked number one among OECD countries in the percentage of adults aged 25-64 who have obtained a tertiary education (53% compared to OECD average of 32%), and Canadian universities are globally competitive, with three placing in the top global 40 for overall rankings.²⁰

In addition, Canadian researchers are global leaders. Further supporting the comments of business leaders, Canada ranks seventh in the world in the number of publications tracked in the Scopus database, and contributed 4.1% of the global total of 9.6 million research publications over 2005-2010,²¹ despite being home to just 0.5% of the global population. Canada also ranks well against peer countries, publishing a larger share of scientific articles than countries such as Germany, the United States and Japan.²²

"Canada has many reputable academic institutions that provide a strong incentive to do business here. It makes it easier for companies to outsource some research to local researchers or experts, rather than bring[ing] in in-house experts."

- Executive from natural resource industry



3. Culture of Entrepreneurship and Start-up Environment

a. Culture of Entrepreneurship

The business leaders we spoke with felt that Canada does well in fostering a supportive environment for entrepreneurship, agreeing that “Canada’s entrepreneurial spirit... makes this country an ideal place to invest in R&D activities.” Many felt that relative to other countries, Canada excels in supporting entrepreneurs and encouraging individuals to take the risks necessary for business success.

Such comments are again consistent with research. For example, Ernst & Young ranks Canada highly for its entrepreneurial culture, scoring third amongst G-20 countries behind South Korea and the United States. Their report attributes this entrepreneurial culture to the low costs of insolvency in Canada, and a strong emphasis on research and innovation, reflected in the proportionately high number of scientific and technical journal articles published each year.²³

The London-based Global Entrepreneurship Monitor adds, “the Canadian population offers a highly supportive culture for entrepreneurship; it is regarded as a good career choice. Successful entrepreneurs enjoy high status and Canadian media are seen to report fully on entrepreneurship.”²⁴ This cultural trait is reflected in the high share of Canada’s working age population reporting early-stage entrepreneurial activities, trailing only the United States (first place) and effectively tied with Australia in second place.²⁵

This supportive culture contributes to increased rates of venture capital investment in Canada, led by B.C. and Quebec, and again trailing only the United States. The Conference Board of Canada reports that between 2009 and 2013, venture capital investment rates increased by 61% in Canada, even as rates declined in most peer countries.²⁶ Continuing this trend, the first half of 2015 saw \$1.2 billion invested in 300 deals – a 33% increase over the same period a year earlier.²⁷

However, it should be noted that the majority of this funding goes towards later-stage financing of firm growth,²⁸ and the availability of investors varies by region.²⁹ There is room for growth, and support for early-stage firms is needed to sustain and grow entrepreneurial Canadian firms. Venture capital supports strong regional innovation systems by ensuring that start-up companies and entrepreneurs have the funding they need to commercialize their ideas and grow the economy. Such funding also provides firms with funds to pursue R&D activities, which contributes to both business innovation and labour productivity growth.³⁰

“Canada’s entrepreneurial spirit makes this country an ideal place to invest in R&D activities.”

- Executive from pharmaceutical industry



b. Start-Up Environment

We heard from executives that the regional innovation systems, or “clusters” found across Canada serve as valuable resources in attracting investment. Clusters are spatial concentrations of independent companies, service providers, and research organizations, operating in interrelated industries. They are often promoted as a strategy to stimulate R&D and innovative activity through the exchange of knowledge and the shared use of facilities. In Canada, among the best-known and most successful examples is Waterloo’s ICT cluster.³¹

Some business leaders attributed the access regional clusters provide to specialized research institutions, highly qualified small and medium-sized enterprises (SMEs), and regional incentives as key factors in making a compelling case for their global parents to outsource research activities to such areas.

The companies operating within such clusters also provide attractive investment opportunities. As an executive from the ICT industry explained, “One of the biggest growth areas in Canada is through the acquisition of start-up companies. It’s an easy way to build up a presence here. If the start-up environment is supported and innovative, it attracts the attention of large MNEs looking to expand.”

One business leader’s comments further support the role of clusters in attracting investment: “Montreal’s advanced aerospace cluster has helped our company expand, and our company has benefited from access to other subsidiaries and Canada’s relatively advanced state of technology and education.”

“If the start-up environment is supported and innovative, it attracts the attention of large MNEs looking to expand.”

- Executive from ICT industry



4. Canadian Subsidies for R&D Activities

a. Indirect Support for Business R&D

Canadian executives view the country's generous subsidies for R&D activities as an incentive for MNEs to invest in Canadian research. The Scientific Research and Experimental Development (SR&ED) Program is the single largest federal program that supports business R&D in Canada, annually providing over \$3 billion in tax incentives to over 20,000 claimants,³² and the message from business leaders was clear: the SR&ED program is a factor that attracts foreign investment to Canada.

SR&ED is a decades-old federal tax incentive program to encourage Canadian individuals, partnerships, businesses or corporations of all sizes, and across all sectors, to conduct R&D in Canada. It is designed to encourage SMEs and start-up firms to conduct R&D, while still providing benefits to larger companies.

In 2011, the expert-panel leading the Review of Federal Support to R&D submitted their final report, titled *Innovation Canada: a Call to Action* (commonly referred to as the Jenkins Report). The Jenkins Report described the SR&ED program as overly complex, and explained that relative to other countries, Canada had an over-reliance on tax-incentives in the mix of federal support for BERD, as opposed to direct expenditures. The report recommended a greater focus on labour rather than capital costs.³³

Specifically acknowledging the findings of the Jenkins report, in 2012 the federal government changed the rules surrounding SR&ED eligibility to disqualify capital expenditures and reduce federal payments.³⁴

While the longer-term impact of these changes remains to be seen, several business leaders expressed concern that changes to the program could make it more difficult to attract international investment. As stated by an executive in the Aerospace and Defence sector, "This has significantly hurt us because it has decreased the incentive for more R&D that could be claimable under SR&ED."

b. Direct Support for Business R&D

While not discussed extensively by interviewees, there are many programs and grants available in Canada that provide direct support for industry-related R&D. For instance, Canada's granting councils play an essential role in providing funding for innovative research across the country.

Among the longest-running direct-support federal programs in Canada is the Networks of Centres of Excellence (NCE) Program. This program is a joint initiative of the Natural Sciences and Engineering Research Council, the Social Sciences and Humanities Research Council, the Canadian Institutes of Health Research, Industry Canada and Health Canada. The program attaches expectations of industry partnerships and commercial exploitation to funding for academic research, promoting research excellence and commercial relevance and "a national research capacity that 'floats across' existing academic institutions and provincial jurisdictions."³⁵

Canada's granting agencies are also responsible for the innovative Centres of Excellence for Commercialization and Research (CECR) program. Focusing on key areas of the Canadian economy, CECRs match clusters of research expertise with the business community to promote the commercialization of new products, technologies and services.

Other important national programs include the National Research Council's Industrial Research Assistance Program (IRAP), which provides innovation assistance to SMEs, with regional offices across the country, and the Mitacs suite of programs, particularly the Accelerate graduate student research internship program. Such programs play an integral role in supporting Canada's innovation system, building research capacity, and attracting foreign investment in R&D activities.



Barriers Limiting Foreign R&D Investment in Canada

Together, Canada's strengths represent a substantial resource in attracting foreign R&D investment and recruiting top researchers. However, these assets should not be taken for granted. For all of Canada's strengths, there are also areas of concern. When asked to identify barriers that deterred foreign investment in R&D, several issues were identified by the Canadian business leaders interviewed in this study:

1. Lack of coordinated access to R&D support/jurisdictional confusion and bureaucratic complexity;
2. Canada's outdated IP regime; and
3. Lack of communication and promotion of opportunities for collaboration.

This section will discuss and explore these issues, supporting the feedback we received from Canadian executives with research wherever possible.

1. Lack of Coordinated Access to R&D Support and Bureaucratic Delays

a. Coordinated Access to R&D Support

We heard from some business leaders that accessing Canada's R&D incentives was perceived as a challenge for attracting global investments. They explained that the various incentives are not provided through a single, centralized department, and often have complex eligibility criteria. Additionally, changes are often made as funds are introduced, renewed or discontinued, further complicating the system.

A lack of coordination between the regional and national systems in Canada has been identified as a significant challenge by experts,³⁶ along with a lack of integration between research centres, clusters and networks.³⁷

In addition to SR&ED credits, support to research-intensive businesses in Canada is provided through IRAP, the Canadian Accelerator and Incubator Program (CAIP), Export Development Canada (EDC), Business Development Canada (BDC), the Northleaf Venture Catalyst Fund and the Small Business Job Credit (as well as programs at the provincial level). Despite the availability of support, a 2015 report from Pricewaterhousecoopers (PwC) found that nearly half of Canada's emerging tech companies do not utilize any government funding at all.³⁸ The report's authors suggest that emerging companies are leaving valuable government funds on the table because they are either unaware that such funds are available, or because they feel that accessing government grants is too time-consuming and costly at the start-up stage. In doing so, they may limit their ability to grow and attract the attention of larger investors and MNEs.



b. Jurisdictional Confusion & Bureaucratic Complexity

Another limitation of the Canadian system that was identified by interviewees was a lack of coordination across levels of government. Business leaders felt that Canada's myriad of agencies across multiple levels of governments can make it challenging, particularly for international investors, to identify the relevant stakeholders with whom to engage. As a representative of the pharmaceutical industry explained, "Large MNEs don't often know which government agency to go to because there are disparate efforts going on to sell Canada. There is a need to better coordinate efforts, instead of competing with one another."

They went on to explain that the complexity and confusion within the system can also make it more time-consuming and expensive to conduct R&D activities. Describing their experiences working with various governments in Canada, business leaders used such terms as "inflexible," "prescriptive," and "slow." A representative of the resource industry argued that the province of B.C. makes it "nearly impossible for companies to justify the costs of exploring for oil when they spend so much time filing paperwork."

Part of the problem in Canada is that jurisdiction over the development of innovation and research policy connects to multiple constitutional responsibilities (training, education, trade, economic development, etc.). As a result, over the past several decades, federal and provincial governments have implemented a broad range of innovation policies across multiple departments with very little coordination. Along with non-governmental organizations and regional development agencies, there are many actors in Canada's research and innovation system, often in competition with one another for research investments.

These concerns were explicitly acknowledged in the 2011 Jenkins Report. A key recommendation was that steps be taken to "provide a single point of contact for Canadian businesses seeking to undertake R&D/innovation activities, and guide business 'clients' to the program and service providers that best meet the timelines and supports that the industry client needs."³⁹ While work has begun to improve coordination and simplify the system (notably through the National Research Council's Concierge service), more remains to be done.

"Large MNEs don't often know which government agency to go to because there are disparate efforts going on to sell Canada. There is a need to better coordinate efforts, instead of competing with one another."

- Executive from pharmaceutical industry



2. Canada's Outdated IP Regime

For businesses seeking to partner with Canadian universities on research projects, interview participants expressed concern 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 largely felt that Canada's current system of IP laws needs improvement, and that doing so would enhance Canada's competitiveness.

It was noted that Canada's IP laws are inconsistent in the impact they have on different industries. For example, a specific IP framework applies to Canada's process of signing procurement contracts with defence contractors, whereby ownership of IP emerging from the contract belongs to the government. Concern was expressed by representatives of this sector that this could limit the potential growth of defence companies in Canada.

Our research supports the claim that IP laws affect various industries differently. For example, a report from *Canada's Research-Based Pharmaceutical Companies (Rx&D)* argues that Canada's IP regime affords less protection to innovators in their industry than to those in other advanced economies, drawing attention to long timelines associated with regulatory delays. They argue that such delays could negatively affect the patent terms associated with discoveries, thereby impacting the competitiveness of Canadian firms.⁴⁰

A well-balanced IP regime provides the incentive 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.⁴¹ 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.⁴²

In response to concerns, the Canadian government began taking steps to upgrade the national policy framework for IP. The 2014 Economic Action Plan confirmed that Canada would join key international trademark agreements, with implementation to take place between 2015 and 2017.

An issue of particular significance for researchers is that in Canada, there is currently no national strategy to govern IP ownership in industry-university partnerships. Instead, each university has its own policy, resulting in a range of approaches. Many of Canada's research-intensive universities have recently updated their IP policies to allow for greater flexibility surrounding ownership (or are in the process of doing so), 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."⁴³



3. Lack of Communication/Promotion of Opportunities for Collaboration

A number of the business executives interviewed felt that more could be done in Canada to incentivize collaboration on R&D. One business leader summarized, "The tech industry and governments need to do a better job of engaging the universities and research-intensive firms." It was uniformly recognized that collaborating with universities provided significant benefits and enhanced the ability of Canadian firms to attract foreign investment in R&D activities, but there was little consensus on whose responsibility it should be to promote such collaboration.

Evidence shows that in the 21st century, research collaboration is increasingly important to achieving positive results, and it has lasting benefits for both sides of a partnership.⁴⁴ Canada boasts healthy funding linkages between universities and the private sector, with levels of industry-financed public R&D expenditure slightly higher than OECD averages.⁴⁵ And reportedly, 55-60% of research conducted by Canadian universities is externally funded.⁴⁶ However, Canada's capacity for knowledge transfer across the research ecosystem has been identified as a major weakness by the Global Entrepreneurship Monitor,⁴⁷ and currently, universities initiate the majority of collaborations.⁴⁸

For Canada, a geographically large country with a diverse and quickly changing economy, it can be challenging for businesses to identify potential partners for research collaboration. In a recent survey undertaken by the *Chambre de commerce du Montréal métropolitain*, 39% of businesses that had not teamed up with a university in the previous three years reported that greater awareness of collaborative opportunities would be helpful.⁴⁹ The benefits of university-industry collaboration may also be under-reported, as nationally, one in three companies report that such partnerships are either "not very relevant" or "not relevant at all."⁵⁰

Recognizing this challenge, the Canadian government's Industrial and Technological Benefits (ITB) policy seeks to incentivize companies to collaborate within and across sectors in bidding for defence and security procurement contracts. Through a points system, proposals are encouraged to include Canadian SMEs in supply chains, and research collaboration with post-secondary institutions is also recognized. One small business executive explained the appeal of the program from his company's perspective: "The ITB-Industry Canada program gives companies like ours an opportunity to work with exceptional partners to bring innovative technologies to market."⁵¹



Opportunities to Improve Canada's Attractiveness for R&D Investment

R&D is an important contributor to both business innovation and labour productivity growth,⁵² and foreign R&D capital has been shown to have beneficial effects on domestic production.⁵³ In the context of slumping global demand for commodities such as oil and gas, fostering an economic environment that attracts investment in R&D is a strategic approach to long-term economic growth.

As business leaders have revealed, Canada enjoys a number of substantial benefits that help to attract foreign investment in R&D. However, a number of challenges also face Canadian companies as they seek to attract foreign direct investment to support research activities. To invigorate the economy and improve Canada's overall R&D capacity, stakeholders across all sectors must take steps to leverage Canadian strengths and work to mitigate its challenges.

Based on our executive interviews and supplemental research, below we provide three opportunities to improve Canada's attractiveness for foreign R&D investment. While these recommendations do not attempt to address all of the issues and ideas that business leaders shared with us, they seek to provide a starting point for discussions of how Canada might strengthen its overall R&D competitiveness.

1. Canada Must Better Incentivize R&D by Rebalancing Direct and Indirect Support Measures

It is clear from the feedback we received that Canadian business leaders view indirect support for R&D as an important asset in attracting research investments. However, both high-profile panels⁵⁴ and economic experts⁵⁵ have called for greater emphasis on direct support for incentivizing R&D. Canada's declining rates of R&D spending are further evidence that Canada's current focus on indirect support is not achieving the policy goals it is intended to achieve. Therefore, we recommend that the approach be rebalanced to maximize Canada's research attractiveness, with greater emphasis on direct support measures.

While Canada's support for business R&D is among the most generous in the world, relative to other countries this support is weighted heavily towards indirect support through tax credits (most notably SR&ED). Indirect support is recognized as being advantageous for promoting business R&D in a non-discriminatory and widely available approach, and indirect measures are generally simpler and less expensive for governments. The drawback is that if a government has specific policy objectives (for example, promoting a strategic sector), the broader eligibility requirements of indirect measures make specific objectives more difficult to pursue.⁵⁶ It also provides no mechanism to distinguish between more or less impactful and innovative R&D – all qualifying activities are treated the same.

In recent years there have been gradual reductions to the SR&ED program, and federal budgets have enhanced measures for direct support. Our research suggests that this is the right approach. However, to maximize the immediate impact of existing indirect support measures, the federal government should also consider allocating indirect funds more strategically. This could be done through more focused funding mechanisms to support transformational research in key sectors and to enhance incentives for MNEs to collaborate with SMEs and/or academic researchers. A first step may be to create more strategic and focused tax incentives that reward such collaborations, or that focus on priority industries.

Business leaders offered several suggestions on the type of targeted tax credit that they would find useful, including this from an ICT sector representative: "If there was a tax credit that rewarded partnering with universities to do advanced research that would be something [our business] would consider. That would provide a significant competitive advantage." Another interviewee suggested that governments "establish a tax credit that tech firms could access to set up partnerships with academic institutions. They could use a start-up funding/tax credit model. This would allow companies to partner with schools, recruit students and identify products that they might not otherwise have considered."



Others felt that a lack of government involvement in motivating capital investments had a negative impact on SMEs, including a business leader from the pharmaceutical industry: “One of the declining areas in Canada is access to venture capital for SMEs. Government is not involved in this area at all. Our country needs to think beyond exports, and towards partnerships and selling products to larger companies. Together we need to provide opportunities for SMEs to display research and gain access to key leaders around the world.”

2. Canada Needs a Coordinated, Client-Centric Approach to Incentivizing R&D

Business leaders told us that the lack of coordination between levels of government and a lack of information sharing among stakeholders significantly complicate the Canadian system. An MNE considering investment in Canadian R&D may encounter federal, provincial and regional governments offering unique and separate incentives, often in competition with one another. It was suggested that this contributes to jurisdictional confusion and bureaucratic delays that ultimately deter foreign investment in Canadian R&D. Therefore, we recommend that the government promote a client-centric approach in supporting and promoting R&D initiatives.

Making the system more navigable to clients begins by strengthening the coordination of overlapping programs and incentives. The improved coordination of R&D policy, program design, and implementation across government was a central recommendation of the Jenkins Report,⁵⁷ and the Canadian government has gradually taken steps to simplify its support for businesses, notably with the consolidation of research grants⁵⁸ and the NRC's Concierge service. However, the feedback we received overwhelmingly suggests that the system's complexity continues to be a significant challenge.

The need for greater coordination goes beyond government. Participants indicated that a key strategy to overcoming the challenges of insufficient coordination was sustained and meaningful dialogue among stakeholders across the system. To accomplish this, levels of government, MNEs, SMEs, academic institutions, and other intermediary and support organizations in Canada's innovation ecosystem need to collaborate by collecting and sharing indicators, trends, developments and other information in support of evidence-based decision-making.

A good example can be found in an initiative of the Canadian Council of Chief Executives, with their recently created Business/Higher Education Roundtable.⁵⁹ The roundtable's goal is to strengthen dialogue and cooperation between employers and educators, with participants representing some of Canada's largest companies and post-secondary institutions, including 27 leaders from Canadian private sector, universities, colleges and polytechnics.

In addition to strengthening collaboration and improving the coordination of programs and services, Canada needs to do a better job of promoting the resources and programs that are available to potential investors. Our interviews with Canadian executives identified challenges in accessing Canada's existing R&D funding programs. Business leaders indicated that a lack of easy access to funding, and a lack of awareness of existing funding opportunities, limits their ability to take full advantage of the R&D incentives available to them.

The Mitacs model provides a noteworthy example. To effectively promote programs and support clients, a team of Business Development staff work to help initiate projects and collaborations and thereby bridge the gap between academia and industry. They proactively approach businesses, professors and students to identify opportunities for research collaboration, and ensure Mitacs' responsiveness to clients. Such proactive business development seeds ongoing collaboration, as is reflected by the 82% of companies who continue to collaborate with the academic supervisor who had been involved in their Mitacs research project.⁶⁰



3. Canada Must Invest in Training Programs that Grow the Knowledge Economy

As the executive leaders we spoke with explained, one of Canada's greatest strengths in attracting investment is its people, and maintaining and strengthening this advantage will be essential in an increasingly idea-driven economy. Therefore, we recommend that Canada prioritize and invest in the development of highly educated and technically skilled workers.

The importance of investing in knowledge and training is highlighted in the 2015 OECD Science, Technology and Industry Scoreboard: "Investment in education, research and innovation generates knowledge-based capital, which makes a key contribution to the productivity and competitiveness of the private and public sector alike."⁶¹

To leverage a skilled workforce and harness Canada's entrepreneurial culture, graduate-level researchers must be provided with opportunities to apply their skills and knowledge to help solve industry challenges. The need for such opportunities is underscored by a 2013 survey of postdoctoral fellows, in which Mitacs (in partnership with the Canadian Association of Postdoctoral Scholars) found that the majority of postdocs would not obtain faculty positions at universities, and they were not receiving adequate training to help them succeed in non-academic settings: "Barring significant changes in the supply of postdocs or the demand for new faculty, only a minority of postdocs will obtain a faculty position. And yet, half of the survey's respondents report having no exposure to non-academic careers, and 87% either have no access to career counselling or are uncertain of their access."⁶²

This need to provide graduate students and postdocs with training for careers outside of academia was also highlighted by Dr. Daniel Munro of the Conference Board of Canada:

Many students and employers hold that graduates have inadequate professional skills – including skills to identify and land jobs, and to perform effectively in diverse careers. At the same time, many employers underestimate the skills that PhDs already have and the contributions they can make. Together, these perceptions limit employer demand for doctorates and contribute to the difficult transitions PhDs experience as they pursue diverse careers beyond the academy.⁶³

While protecting and supporting the need for basic research and knowledge, the high quality research performed at Canadian universities and the cutting-edge knowledge they create should be fully-utilized to boost the economy and create high-paying jobs. Doing so requires the development of networks that link industry and post-secondary institutions, and challenges universities to incorporate the innovation needs of industry into their mandate for education and training. Universities must also provide trainees with professional development opportunities to better prepare them for potential careers beyond academia.

As we've heard, Canada's world-leading research excellence is a key asset in attracting foreign investment. To retain this advantage requires an ongoing and long-term commitment to the training programs and initiatives that strengthen the knowledge economy and retain top research talent in Canada.



Conclusion

At Mitacs, we believe that Canada has the necessary ingredients to be at the top of global competitiveness rankings. To get there will require a collaborative effort among the many stakeholders in Canada's innovation ecosystem, and Mitacs will continue to show leadership in building partnerships across sectors, and promoting collaboration to resolve Canada's innovation challenge.

To support the recommendations outlined above, Mitacs commits to the following:

1. Mitacs will continue to demonstrate leadership in building research collaborations. We know from experience that building networks across sectors has lasting benefits across the innovation and research ecosystem, and incentives to drive collaboration can further strengthen Canadian competitiveness.
2. Mitacs is committed to working with partners across Canada's innovation ecosystem to build synergy and coordinate efforts in research, innovation and training. Mitacs is actively coordinating efforts to facilitate innovation and research with organizations nationwide, including NRC-IRAP, NSERC, SSHRC, Genome Canada and numerous others.
3. Mitacs is committed to working with our partners to deliver innovative training programs that respond to Canada's essential research needs and ensure that Canada retains top research talent.

Canada's business leaders understand that there is no single program or policy that can resolve Canada's research and innovation challenges. Nationwide, there are many programs and initiatives working to strengthen Canada's overall research and innovation capacity. Amidst global economic uncertainty in an era of slow-growth, decisions on how to position Canada as a research and innovation leader take on added importance. This requires regular and rigorous evaluation of program objectives and outcomes to identify best practices and ensure that resources are optimally allocated to solve innovation challenges and build research capacity.

Mitacs seeks to lead by example.

There is no reason that Canada should perpetually lag peer countries on measures of innovation including R&D. While the causes of Canada's underperformance are multi-faceted and overlapping, they are not insurmountable. Fortunately, Canada need not start from scratch in overcoming its research and innovation challenges. By leveraging and building upon its strengths, Canada can overcome the challenges identified by business leaders. Doing so will make Canada an even more desirable country in which to invest, research, do business, and thrive.



Abbreviations

BERD	Business Expenditure on Research and Development
CAIP	Canadian Accelerator and Incubator Program
CECR	Centres of Excellence for Commercialization and Research
GERD	Gross domestic Expenditures on Research and Development
MNE	Multi-National Enterprise
NCE	National Centres of Excellence
NRC	National Research Council
ICT	Information and Communication Technology
IP	Intellectual Property
IRAP	Industrial Research Assistance Program
ITB	Industrial and Technological Benefits
NSERC	National Science and Engineering Research Council
OECD	Organization for Economic Cooperation and Development
R&D	Research and development
SSHRC	Social Sciences and Humanities Research Council
SME	Small and Medium Sized Enterprises
SR&ED	The Scientific Research and Experimental Development Program



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