

1. In addition to the R&D activity defined by the OECD, should government be funding other business activities related to the commercialization of R&D? If so, what and why?
Much of the funding for R&D is aimed at Universities, who have the capacity for research and new idea generation but who also require a method of product development and commercialization. The gap between idea and commercialization, i.e., the value chain, needs to be filled primarily by industry skill sets. The design, development and deployment of marketable ideas from prototype to product launch requires significant funding and often carries significant business risk. More highly targeted funding to industry-led, applied research projects could significantly increase the rate of commercialization of Canadian R&D, while encouraging more private sector companies to engage.
2. Does Figure 2, the model of business innovation presented above, capture the key structural factors and inputs to innovation? If not, what is missing?
Figure 2 does not take into account the need for an integrated value chain in ultimately achieving the desired end result.
3. Regarding capital, is there an adequate supply of risk capital for Canadian firms at each stage of their growth (start-up, small, medium, large)? If not, why not? Where returns on investments are low, what are the reasons and potential solutions?
In the case of medium to large firms, there is a limited supply of risk capital for ideas developed internally.
4. Regarding ideas and knowledge, do you believe it is important for Canadian firms to perform their own R&D and, if so, what do you believe are the key factors that have been limiting business R&D activity in Canada?
Government funding into firms in order to develop R&D activity is very limited and many of the funding resources available have terms associated, such as payback requirements with premiums, which can make the funding unappealing. The funding sources available are not comparable to those offered in both the US and Europe, where significant funding is provided with fewer constraints which has the effect of reducing the business risk associated with initial development of an idea. As a result there is significantly more incentive for firms to develop higher risk/high reward oriented projects in other jurisdictions.
5. Regarding networks, collaborations and linkages, what are the main impediments to successful business-university or business-college partnerships? Does the postsecondary education system have the right capacity, approaches, and policies for effective partnerships with business?
A key impediment to the relationship between business and post-secondary institutions is the heightened expectation that if an institution has been engaged in a research project which generates intellectual property which may in future be useful in a product, the institution should share in the reward when the ultimate product goes to market. While educational institutions do generate significant and valuable ideas, in most cases commercialization of an idea often involves some or all of the following: several billion dollars of infrastructure, substantial additional R&D and product integration, and potentially even market creation, nearly all of which represents risk undertaken almost entirely by private enterprise. Universities may need to adjust their expectations/policies to reflect the real value of their contribution in the overall value-chain. Otherwise, businesses who can undertake their own R&D, will continue to limit their post-secondary research collaborations to basic research unless a win-win IP policies are put in place.
6. Regarding the creation of demand for business innovation, what role, if any, do you believe that government should play in being a "first customer" for R&D investments in Canada?
Like any large enterprise government procurement has a significant supply-chain impact. Sustainably productive enterprises make strategic investments in quality products and services that add-value to the enterprise's operational and strategic goals. Government should purchase what it needs to deliver its programs, services and policy outputs for Canadians. Procurement of technology in and of itself should not become the focus of government spending. First and foremost, technology acquisition should serve the interest of bona fide customer requirements not the reverse. The key is to establish a clear understanding of operational requirements that are linked to measurable and meaningful public-policy outcomes and ensure that the applicable technologies are clearly understood in the context of those requirements. In a fair and reasonable, competitive marketplace that is unencumbered by distortions to price, cost and value considerations, quality innovative products often prevail. The challenge is in getting the products to market in the first place which is

where targeted government support for promising applied research projects has the greatest potential impact on the knowledge value-chain, more so than procurement alone.

7. Regarding talent, is Canada producing sufficient numbers of graduates with the right skills to drive business innovation and productivity growth? In not, what changes are needed? Where demand for advanced skills is low, what are the reasons and what changes, if any, are needed?
The recruiting pool of students at the Ph.D. theoretical level is lower than most other OECD countries. When we recruit for this level across Canada we find that some of best students leave Canada for postdoc positions in other countries . We typically find ourselves going outside of Canada to identify great Canadian candidates. Canada needs to ensure the opportunity to pursue a Ph.D. level studies remains cost-effective and affordable to students.
8. Can you describe whether and how your firm employs students currently enrolled in community colleges, polytechnics and universities, and what government measures could make it easier to work with students during their academic programs and to recruit them after their graduation?
Our organization currently employs students from across Canada through universities and their respective coop programs. We also utilize NSERC IUSRA funding for undergraduate students as well as NSERC IR&DF for graduate students. Without these funds, we would not be able to provide as many opportunities as we currently do. Providing these kinds of opportunities is very beneficial to both parties: students learn and businesses train and recruit. One challenge that an R&D organization such as ours continuously deals with is the issue of intellectual property ownership. This significant business consideration can present substantial constraints on training and development of high quality talent.
9. With which federal programs supporting business or commercially oriented R&D in Canada do you have direct experience and knowledge? NRC/NINT Research Partnership; SR&ED Tax Incentive; NSERC-IPS; NSERC-IRF; NSERC-CRD; NSERC-Engage; NSERC-IRC; NSERC-Coop In your view:
 - a. Which of these programs are working, and why?
The relationships which work for us are: NRC/NINT Research Partnership; NSERC-IRF; NSERC Coop; and in some cases, NSERC-IPS. We leverage these programs to keep abreast of new and exciting areas of research taking place in the educational arena, establish relationships with top notch professors, and to have the opportunity to interact with talented students who will be Canada's future research leaders. These programs work because we are able to protect our field of use under the agreements that are established.
 - b. Which programs are not working, and why not?
NSERC-CRD; NSERC-Engage; and in some cases, NSERC-IPS. While we support projects in these programs, universities do not allow agreements which protect our field of use, thus projects are kept fundamental. Given the enormous industry infrastructure required to launch a product, without proper protection for our field of use, we are not willing to provide funding, confidential information and other forms of support, only to ultimately risk putting ourselves in the compromised position of having to license the project results or risk having them sold to our competitors.
10. If you have direct experience and knowledge of the SR&ED tax credit, what are your views in relation to the following:
 - a. Does the current structure of the SR&ED tax credit encourage incremental investment in R&D? Does it free up capital to invest in other aspects of innovation activities in the firm? Does this vary by size, ownership, sector or nationality of the firm?
The SRED and related ITC are effective, and compare favourably to initiatives offered by other jurisdictions to stimulate original and incremental R&D, recognizing however, that whether and to what extent incremental R&D or additional innovation may be required does not necessarily follow from activities that generate this deduction and credit in the first place. However, equally important is the significance of the deduction and credit to reduce the general cost of business that includes mobilizing the results of the research in business activities that benefit from them. That points to the importance of the connection between deduction and credit, and overall tax rates that apply to the income generated from using the results of the R&D. In that connection, as well, the tax transfer pricing associated with deploying the results of the research including rights within a

corporate group and whether and how that deployment generates taxable income is at least as important as whether incremental R&D or new innovation will take place or whether there would be an incentive despite the generosity of the deduction and credit to exploit the results of the research in other places.

- b. What are the strengths and weaknesses of the refundable portion of the SR&ED tax credit for Canadian-controlled private corporations and to what extent does it encourage the growth and commercial success of SMEs?

Generally speaking, one of the benefits of the deduction and credit is its effect to reduce business (including financing) costs. Large enterprises experience fewer cash flow and financing capacity restrictions than SMEs for whom the refund, effectively an advance of sorts from the government, is critical to being able to carry on business generally and therefore within that context to have the opportunity to conduct research. That said, once the refund is received, a possibly negative effect is the lack of control over how it is spent. The requirement to conduct business that is assumed to be within a range of activities for which the research is relevant, is a discipline on future research. However, it would seem all things being equal that the potential financial incapacity of SMEs is a more compelling consideration that supports a measure of generosity with respect to refundable credits to deal with pressures and limitations that larger enterprises do not face.

- c. Bearing in mind the improvements being made by the Canada Revenue Agency, are there additional opportunities for change to simplify the administration of the SR&ED tax credit and facilitate the application process?

The sophistication of the review process and the expertise the CRA is able to bring to bear continue to develop and improve. That said, the deductions and credits are most likely to achieve their objectives if they can be applied assuredly with some finality (taking account of the fact that for financial reporting purposes many relevant enterprises have to deal with “uncertain tax positions”). This requires a fairly fast pace to approve the qualification of relevant research programs or do what amounts to a parallel scientific review. Possibly, a closer active collaboration or contact between the CRA and affected taxpayers, or the implementation of pre-approved activities similar to the Advanced Pricing Arrangement (APA) in cross border transactions for non-arm's length transactions, so as to be able to take for granted the qualification of relevant research without scrutiny that is so “in depth” that it frustrates, through timing or overly refined review criteria, the achievement of the potential of the deduction and credit program.

11. How could the Government of Canada lighten the administration requirements of its programs on recipients and improve outreach to business?

In order to lighten the administration requirements of this program, the Government of Canada could introduce a simplified T-661 form similar to the “T1 Special Income Tax and Benefit Return” available to individual taxpayers. As a requirement to use such a form, Corporate taxpayers must be in the principal business of conducting Scientific and Experimental research. The absence of marketing/sales personnel or factory and assembly lines are examples of factors that could be taken into consideration in determining whether the facility's purpose is to solely conduct R&D activities, rather than to manufacture, market or sell a product. A simplified form would not only be beneficial to the taxpayer but would also simplify and expedite the scientific review process conducted by the Canada Revenue Agency. The current form requires an allocation of expenses on a project by project basis. For facilities who have several hundred scientists working on various projects concurrently over the year, the allocation of expenses becomes not only time consuming and burdensome but potentially inaccurate. If however, a facility were to be considered to be in the principal business of conducting R&D, such an allocation of expenses would be unnecessary since all expenses incurred would be considered “eligible expenses” for purposes of calculating the investment tax credit. Additionally, to even further simplify and lighten the administration requirements, the elimination of the addback and deduction of R&D expenses could be simply replaced by a refund, in the case of a CCPC, or a reduction of taxes payable to a non-CCPC.

12. How could the Government of Canada be more innovative and responsive to meet new needs or opportunities, and try alternative service delivery-approaches in its programs?

Current programming does not necessarily reflect a deliberate effort to systematically cultivate the unique role of progressive multinational corporations and affiliated operating companies with respect to strategic value creation in three key R&D related areas:

- translating Canadian research into profitable commercial applications sold through pre-established, sprawling, worldwide market channels;
- leading breakthroughs in areas where Canada has established competencies such as advanced materials research, surface chemistry, nanotechnology etc. in collaboration with leading international knowledge centres;
- attracting top intellectual talent to Canada from around the world and improving immigrant settlement programs in collaborations with provincial and municipal governments.

13. Are there any gaps in the Government of Canada's support to business and commercially-oriented R&D? Do firms performing R&D in other countries have an advantage over Canadian firms because of access to programs that are not available in Canada? What would be the principal features of new programming to fill these gaps?

With the exception of tax instruments like the SR&ED credit, Canada's support to business research is in the form of loans. Canada's support to university research is primarily in the form of grants, not required to be paid back regardless of outcomes. Most businesses view commercialization as bringing innovations to market. Often, universities view commercialization as launching small start-ups or licensing patents to industry (some of which may never result in commercialization in the marketplace).

The issue with this model is that universities do not have products/fields of use and therefore while they may be successful with some start-ups or licensing a few patents, they do not necessarily have an established value chain that they are innovating for; rather they often attempt to "partner" with industry to do research, with a view to converting their "partner" to a "customer" if the project is successful, relying on the "customer" to commercialize in the market. This model does not encourage businesses to work with universities and does not necessarily facilitate market-facing commercialization.

The scenario in certain European countries is more advantageous, as grants are provided to businesses, who can either contract universities to carry out fundamental, applied, or developmental research at the business' discretion (dramatically reducing IP ownership issues in industry-post-secondary institution interactions) or do internal R&D - whichever works best to bring a product to market in the given situation.

14. What lessons and best practices can be taken from provincial business and commercially oriented R&D programs, and how should the two orders of government align their programming?

Provincial bodies like OCE who support start-ups and/or provide funding to universities add a business development role not found in NSERC, that is, they make an effort to establish connections between the industry and the university. However, at the end of the day, the model is still to have university carry out contract (industry funded) research with the expectation that the university will then have earned the right to share in the commercialization rewards made possible by the industry's value chain. For companies capable of choosing between carrying out their own R&D or working with university, this is not necessarily a compelling business case.

The lesson learned from the provincial programs is that the model of adding an additional negotiation body who advocates on behalf of the university during IP negotiations, is ultimately no more effective than the Federal model. It does not necessarily close the gap with respect to funding private sector led applied research and commercialization efforts focussing primarily on funding basic university research which has a very limited capacity for commercialization in the absence of mission critical private sector value-chains.

15. Is there a difference between R&D and innovation? If yes, how are they different? Should government focus on R&D or Innovation? What should the balance be?

R&D and Innovation are not the same. Innovation is a process or cycle, which uses R&D in each of its stages. Innovation encompasses the following stages: opportunity identification, concept development, technology demonstration, and derisking. Various aspects of R and/or D occur in all of these stages before value can be captured in the commercialization phase.

