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Ontario lacks indicators to gauge impact of research and innovation programs: report

An expert panel has designed a sophisticated methodology for assessing the impacts of Ontario's innovation policies and programs although the province – like nearly all jurisdictions – lacks the indicators and data and measurement capabilities to implement it. The Ministry of Research and Innovation requested that the Council of Canadian Academies (CCA) assemble the Expert Panel on the Socio-Economic Impacts of Innovation Investments to get a better sense of how effective the \$600-700 million it spends annually on innovation is and how its investments can have a greater impact.

The panel — chaired by Esko Aho — senior fellow at Harvard Univ, a consultative partner for Nokia Corporation and former prime minister of Finland — was charged with recommending steps that could be taken to determine whether the \$3.2 billion in innovation-related investments made since 2005 are having the desired impact.

"The data are a key problem. Nobody is there in terms of what the panel envisioned so the report is visionary in that sense," says Dr Margaret Dalziel, associate professor at the Univ of Waterloo's Conrad Business, Entrepreneurship and Technology Centre, co-founder and VP research with The Evidence Network (and an expert panel member). "Creating an intervention is difficult so we wanted to isolate impact and bring it all back in to ensure it works within the whole system."

For Ontario, billions in innovation investment are at stake as the province seeks to determine whether its policies and programs are having the desired effect, namely an increase in competitiveness, productivity and economic activity.

The report notes that while Ontario is by far the largest economy in Canada, generating \$655 billion in GDP in 2011, it still has a trade deficit of \$100 billion. Its R&D spending is the second highest in the country at 2.23%, second only to Quebec (2.49%). In April 2008, MRI launched its Ontario Innovation Agenda which facilitated investment in key sectors including the bio-economy and clean technologies; advanced health technologies (oncology, regenerative medicine, and neuroscience); pharmaceutical research and manufacturing; and digital media and information and communications technologies. Yet without clear objectives and measurement tools, it has not been able to measure the impact of its investments.

To effectively gauge impact, the panel put forward a suite of measurement methodologies: case studies; scorecards and benchmarking; indicator-based frameworks; general econometric approaches (CDM and growth accounting); difference-in- difference estimation; matching estimation; regression discontinuity design; and, random field experiments.

"If the goal of measurement is to produce estimates of short-term impact, the best source of data is a properly designed client-based survey that minimizes the subjectivity of responses. If the goal of measurement is to firmly establish a rigorous, reliable, and long-term causal estimate of program impact, state-of- the-art approaches, like random field

experiments and regression discontinuity design, require specific program design, a substantial quantity of data, and a significant amount of time."

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CCA Expert Panel report

**ONTARIO INNOVATION
INVESTMENT PROGRAMS**

Direct academic support

Ontario Research Fund (Research Excellence and Research Infrastructure)
Early Researchers Award
Post-doctoral Fellowship
International Strategic Opportunities Program
OMAFRA-University of Guelph Research

Partnership Public and not-for-profit research organizations

Ontario Institute for Cancer Research
Ontario Brain Institute
Perimeter Institute for Theoretical Physics
Agricultural Research Institute of Ontario
Ontario Forest Research Institute

Innovation intermediaries

Ontario Network of Excellence:
* Ontario Centres of Excellence
* MaRS
Regional Innovation Centres
Business Ecosystem Support Fund
Health Technology Exchange
Agri-Technology Commercialization Centre
Centre for Research and Innovation in the Bio-economy
Water Technologies Acceleration Project

Direct business support

Ontario Venture Capital Fund
Ontario Emerging Technologies Fund
Innovation Demonstration Fund
Market Readiness Program
Investment Accelerator Fund
Life Sciences Commercialization Strategy
Business Mentorship and Entrepreneurship Program
Biopharmaceutical Investment Program

Indirect business support

Ontario Innovation Tax Credit
Ontario Business Research Institute Tax Credit
Ontario R&D Tax Credit
Ontario Interactive Digital Media Tax Credit
Ontario Tax Exemption for Commercialization

Public procurement

Green Focus on Innovation and Technology
Green Schools Pilot Initiative

"Any jurisdiction that wants to succeed needs to understand what it is doing (and) has to have the courage to want to know the answers," says Dalziel. "So far the report has been very well received and there have been good questions by the client."

In assessing Ontario's innovation ecosystem, it concluded that impact measurements alone cannot capture the nature of innovation. Using its firm-centric innovation ecosystem framework, the report conceptualizes innovation as an "intricate set of activities and linkages between the relevant players. From there, it determined that five behaviours must be examined: knowledge generation, innovation facilitation, policy-making, demand and firm innovation.

The report concluded, however, that for Ontario to properly assess these behaviours, it required the development of more indicators (both cross-sectional and time series) and benchmarking of policy-making and demand.

The expert panel classified Ontario's innovation support programs into six categories (with seven types of impact for each class) but without further work on data and policy, the province is nowhere closer to being able to identify its areas of strength.

In addition to a lack of data and impact estimates, the panel also found that "viable and agreed-upon indicators for policy-making and demand have not even been developed".

"Although a formidable undertaking requiring significant resources, measuring the impact of innovation investments ensures that the most effective innovation programs are supported with secure, stable, and sufficient funding in the face of competing demands and austerity measures," states the report."

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