Whither innovation?  
Moving beyond the buzzword

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Federation of the Humanities and Social Sciences

Big Thinking Lecture
The HUB, Ottawa
3 October 2013

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1. What is innovation and why should it concern policymakers?
2. How has innovation been conceptualized in policy?
3. What is the problem with this conceptualization?
4. Is Canada good or bad at innovation?
5. Do existing innovation policies work?
6. Why is it important for Canada to think about innovation policy in a different way?
7. What needs to be done?
On public release today

Canada’s Future as an Innovative Society
A Decalogue of Policy Criteria

~ Endorsement Edition ~

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Today’s talk

Looking at Innovation from a Uniquely Canadian Perspective
The Case for a New Alliance of Practice, Policy and Scholarship

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The conventional wisdom...

• Innovation is about technology
• More science yields more technology
• More R&D yields more innovation
• More innovation yields higher growth, productivity and employment

*Therefore:*

• The policy problem becomes how to stimulate innovation and entrepreneurship
The “Canada Syndrome”...

*Structural dimensions:*

- High levels of knowledge and skills, but low levels of translation
- Lots of profitable businesses, but low investment in R&D
- Lots of money, but little capital for new ventures
The “Canada Syndrome”...

Cultural dimensions:

• not entrepreneurial
• risk averse
• lack of ingenuity
The “Canadian” solution...

- Subsidize industry R&D
- Import more knowledge producers
- Invest in research infrastructure
- Commercialize more university research
- Start more hi-tech companies
- Import more capital
- Import risk takers and entrepreneurs
The embarrassing result...

None of the measures we adopt appear to be having any effect
What’s the big idea?
The root of the problem...

Our policies and measures have become completely detached from what is known about innovation and how it creates wealth.
The policy issue is not how to stimulate innovation and entrepreneurship
The policy issue is how to create prosperity from innovation and entrepreneurship
What is innovation?

A socio-economic outcome, not an input or artifact

A new combination of factors that creates a new source of public welfare

A qualitative change: not in how much is produced, but in what is produced and how

Generates growth by displacing existing sources of value with new sources of value – “creative destruction”
What is R&D?

“...creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man (sic), culture and society, and the use of this stock of knowledge to devise new applications.”

[OECD Frascati Manual for R&D Statistics (2006)]
R&D and innovation?

• R&D is *not innovation*
• R&D is only one of many possible *inputs* to innovation
• More firms innovate than perform R&D
• R&D can also be a disincentive to investment
• R&D is highly *concentrated*
  – Fewer than a dozen sectors are R&D intensive (re-investing > 3% of revenues in R&D)
  – About 800 *large* firms worldwide perform roughly 80% of global R&D (by investment)
  – In Canada ca 75 companies perform ca 50% of R&D
Successful R&D combines many knowledge streams

**Market knowledge:**
- customers
- competitors
- suppliers
- networks
- social, political and economic trends

**Technical knowledge:**
- engineering
- science
- production

**Organizational knowledge:**
- finance
- management
- procurement

![Diagram showing the relationship between vision, models, means, plans, and outcome.]
Innovation policy?

Historically in the OECD region, Innovation Policy has been Technology Policy:

– Innovation defined narrowly in terms of technical change
– Policies aimed at producing and applying more technology
What’s wrong with this approach?

- There is *no shortage* of technology
- Innovation involves *much more than technology*
- Focuses public resources on “*technology producer goods*”
- Runs high risk of deflecting public resources from crucial innovation opportunities
Three essential concepts from the science on innovation:

1. Learning
2. System
3. History
1. Learning
FOUR BASIC TRUTHS ABOUT ENTREPRENEURSHIP AND INNOVATION:

They are *norms*, not exceptions

They *do not* create prosperity automatically

Societies become prosperous only if they *learn how to transform* them into public welfare

Societies sustain and increase prosperity only if they *continue* to learn as circumstances evolve
Ground zero for learning about innovation in Canada

• Our economy is driven by **capital-intensive** industries (resources and financial services)
• We are both a **resource-based** economy and a **knowledge-based** economy
• Our **resource sectors** are also among our most **S&T intensive** sectors

Very little of this is reflected in conventional approaches to assessing national innovation performance
The knowledge gap

**Innovations Indicators**

- R&D
- Venture capital
- Publications
- Licenses
- Company formation etc.

**Socio-economic Indicators**

- Profitability
- Growth
- Employment
- Exports etc.

**Process**
So how do we get numbers that reflect Canada’s innovation realities?
2. System
Innovation is a **process** not an artifact

All parts are important

Only as strong as its weakest part

"Whole system" diagnostics

**SYSTEM of INNOVATION**

All parts must function
Innovation is a complex system

NEW PARADIGM

COMBINATION

EXISTING PARADIGM

APPLICATION

TRANSFORMATION

STANDARDIZATION

ENTREPRENEURSHIP

DIVERSIFICATION

APPLICATION

STABILITY

STABILITY

New ideas

New structures

New investment

New industries

CONSOLIDATION

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Current focus of “innovation” policy

- **Combination**: New ideas, Stimuli, Subsidy, High value
- **Transformation**: New investment, New industries, Highest value
- **Standardization**: New risk, Instability, Stability
- **Disruption**: New investment, New industries, Highest value

- **Application**: New ideas, Stimuli, Subsidy, High value
- **Consolidation**: New risk, Instability, Stability
Natural habitat for public policy

- COMBINATION
  - New ideas
- APPLICATION
  - New investment
- DISRUPTION
  - New risk
- STANDARDIZATION
  - New structures
- ENTREPRENEURSHIP
- DIVERSIFICATION
- TRANSFORMATION
  - New industries
- STABILITY
- CONSOLIDATION
  - Legislation
  - Regulation
  - Procurement
  - Protection
  - Mitigation
  - Procurement
  - Protection
  - Mitigation

New ideas
New investment
New industries
The critical ("missing?") link

- Combination
  - New ideas

- Disruption
  - New risk

- Standardization
  - New structures

- Application
  - New investment
  - Industrial policy

- Transformation
  - New industries

- Entrepreneurship
- Diversification
- Consolation
The challenge for Canadian innovation policy

- COMBINATION
  - New ideas
  - New investment
  - New industries
  - New structures
  - New risk
- APPLICATION
  - Entrepreneurship
  - Diversification
- TRANSFORMATION
  - Stability
  - Consolidation
- STANDARDIZATION

?
3. History
History matters in innovation

Where you start plays a huge role in where you can go and how you can get there

Critical importance of

• *transferrable assets*
• *positional assets*
• “transitional” assets
The “Richter Scale” of innovation impacts - FREQUENCY

10  Once in a century

5   Once in a generation

3   Every few months or years

1   All the time
The “Richter Scale” of innovation impacts - INTENSITY

10  Structural realignment of national political, social, and economic factors

5   New social, economic or industrial paradigms

3   New products or processes

1   Incremental changes in products or processes
The “Richter Scale” of innovation impacts - OPPORTUNITY

10

HIGHEST OPPORTUNITY FOR ECONOMIC AND INDUSTRIAL REORIENTATION

5

STEADY GROWTH BUT GREATEST RISK OF STAGNATION AND DEPENDENCY

3

1
Canada on the innovation “Richter Scale”

- 10
- 5 NORTEL/MITEL telecom cluster
- 3 (RIM)
- 1 Oshawa automotive R&D center
Canada on the innovation “Richter Scale”

10 Manufacturing oil from sand
  - Political orientation – internal and external
  - Trade orientation
  - Human capital orientation
  - Demographics
  - Investment orientation
  - Currency
  - etc.

5 NORTEL/MITEL telecom cluster

3 (RIM)

1 Oshawa automotive R&D center
Value chain

Supply chain

highest value-added

lowest value-added

least specialized

most specialized

ICT
Medical
Nano
Bio etc.

Transferrable goods

Black swan strategy

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10 evidence - based principles

Non –prescriptive

Guides for policy making

Benchmarks for policy evaluation

Open-ended, but sufficient to move forward
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