



PARTNERSHIP FOR OPEN  
INNOVATION IN NEW TECHNOLOGIES

---

# Policy issues in business innovation strategy and the marketing and distribution of innovation in Canada

Catherine Beaudry  
Polytechnique Montréal

One-Day Workshop: "Firms and the productivity puzzle »  
Rotman school of management  
25<sup>th</sup> October 2013

# Objectives

- Identify the available data
  - Within existing survey data
- Plan the collection of additional data
  - To be merged with existing data
- → to shed some light on firm innovation strategies, commercialisation strategies and diffusion strategies



# Plan of the presentation



Existing knowledge



Available data



Methodologies



PARTNERSHIP FOR OPEN  
INNOVATION IN NEW TECHNOLOGIES

# Innovation

## Product innovation

(OECD, 2010)

“A **product innovation** is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.”

## Process innovation

“A **process innovation** is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.”

## Marketing innovation

“A **marketing innovation** is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.”

## Organisational innovation

“An **organisational innovation** is the implementation of a new organisational method in the firm’s business practices, workplace organisation or external relations.”



PARTNERSHIP FOR OPEN  
INNOVATION IN NEW TECHNOLOGIES

Open innovation encompasses  
all four types of innovation

# Open innovation impacts...

## ... other study fields

- Strategy and business model (Chesbrough and Appleyard, 2007);
- R&D management and tools (Enkel *et al.*, 2009; Slowinski, 2005);
- Funding and investments (Chesbrough, 2003b; Ferrary, 2010)
- Technology intelligence (Veugelers *et al.*, 2010);
- National and regional SI (OECD, 2008; Belussi *et al.*, 2010);
- Knowledge management (Spithoven *et al.*, 2010);
- Globalization and internationalization (Li and Kozhikode, 2009; OECD, 2008);

## Definition

*“Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance in their technology.” (Chesbrough, 2003a)*



# Strong interest in industry

- Open innovation is now an integral part of innovation strategies for firms (Chesbrough, 2006; Chesbrough and Crowther, 2006; Enkel *et al.*, 2009)
- Open innovation is **more** than just idea and innovation outsourcing (Hansen et Birkinshaw, 2007; Gassmann and Enkel, 2004, Gassmann *et al.*, 2010)
  - → Firms now use and integrate internal and external knowledge to advance technology and rely on internal and external diffusion paths



# Types of openness

- One typology of open innovation
  - **Direction of innovation**

	Inside-out	Outside-in
Pecuniary	<b>Acquisition</b> (of what is available on the market: licences, expertise, etc.)	<b>Sale</b> (commercialisation of innovation, licensing out)
Non pecuniary	<b>Absorption</b> (use of external sources of innovation)	<b>Revealing</b> (externalising internal knowledge of the firms to gain indirect benefits)

*(Dahlander and Gann, 2010)*



# Open business model

- Moving beyond open innovation
  - The firm is not completely closed to the outside world, improvements are possible

Business model			
	Closed	Open	
Innovation	Outside-in activities	Use the technologies of others for our products	Use the technologies of others to create new products
	Inside-out activities	Unused technology internally used externally	Technology licensing improves our business model
	Closed activities	Closed innovation model	Actively searching assets owned by others





# Data difficulties I

- Merging Statcan data with external data raises issues of confidentiality
  - External data indirectly allows the identification of firms or individuals that would normally be anonymised data
- → Need for a procedure or protocol to merge internal and external data to avoid duplication of data collection



# Data difficulties II

- Each survey is not normally planned as a longitudinal study
- Merging data from numerous sources generally yields unbalanced panels
  - Problems linked with the quality of the resulting data
    - How representative is the data?
  - Problems related to the size of the sample obtained
    - How to calculate the non response bias of the resulting sample?



# Consequences?

- It is currently very difficult to draw a complete portrait of the factors that affect
  - Innovation
  - Innovation marketing
  - Innovation diffusion
- → An integrated, systematic and longitudinal approach is now in place
  - But not all relevant factors are investigated...



# Openness indicators found in...

- Survey of innovation and business strategies – SIBS 2009
- Survey of intellectual property management – SIPM 2010
- Survey of advanced technologies – SAT 2007
- Follow-up to the survey of advanced technologies – SATF 2007
- Survey of business incubation – SBI 2005, 2007
- Survey of innovation – SOI 1999, 2003, 2005
- Biotechnology use and development survey – BUDS 1999, 2001, 2003, 2005
- Survey of commercialisation of innovation – COI 2006, 2007
- Survey of commercialisation of intellectual property in higher education – CIPHE 1998 to 2009
- Research and development in Canadian industry – RDCI ...



# Data difficulties III



PARTNERSHIP FOR OPEN  
INNOVATION IN NEW TECHNOLOGIES

Looking for the proverbial needle...

# Intellectual property – IP

- Survey of intellectual property management – SIPM 2010
  - How firms protect, use and commercialise IP
  - How firms license and share IP
    - Patent pools, strategic alliances, partnerships, consortia, etc.
    - Licensing out → external path to market (inside-out)
    - Licensing in → outside-in
- Merging with financial data
  - Survival, productivity, growth, etc.
- Merging with patent data
  - Innovation performance



# Commercialisation

- Survey of commercialisation of innovation – COI 2006, 2007
  - Collaboration for commercialisation purposes
    - With whom and why
  - Share distribution network, resources or after-sale services
  - Client involvement
- Merging with financial data
  - Survival, productivity, growth, etc.
- Merging with patent data
  - IP exchange between organisations
  - Identify the reasons behind an open path to market
    - Last minute behaviour that is eventually detrimental to the firm?



# Collaboration

- Survey of innovation – SOI 1999, 2003, 2005 (not longitudinal...)
  - R&D collaboration → outside-in
  - Sources of innovation → outside-in
  - Collaboration for commercialisation purposes → inside-out
- Again: Merging with financial data
  - Survival, productivity, growth, etc.
- Unfortunately this is a topic not well covered by the Survey of innovation and business strategy





# SIBS 2009, 2012

- Outsourcing and subcontracting within and outside Canada
  - → outside-in
- Acquisition of advanced technologies
  - Via licenses and company acquisitions → outside-in
- Joint process innovation development and internalisation of process innovations developed elsewhere
  - → outside-in



# Adoption

- Survey of advanced technologies – SAT 2007
  - Obstacles to adoption and integration of new technologies
    - Lack of competences and refusal by workers to work with new technologies
    - Lack of support to training
  - How collaboration can remedy these obstacles to adoption
- This survey can bridge the survey of innovation and the newer SIBS



# Commercialisation of higher education innovation

- Survey of commercialisation of intellectual property in higher education – CIPHE 1998 to 2009
  - Provides information on spinoffs and licences emanating from the university
  - Measure the impact of the university as an open innovation player
  - But data is measured at the institutional level
- Merging with data on university patents
  - Follow their impact on society over the years
- Merging with financial data on these spinoffs and firms that have acquired licenses
  - Survival, productivity and growth of these firms



# Methodology issues

- Data merging reduces sample size
- Doubts about how representative the resulting samples are
- Endogeneity problems
  - Requiring valid instruments from secondary data
- Once these problems are addressed → Classic growth, survival and productivity models
- We need novel methods?



# Conclusions

- The systemic approach implied by a greater openness of the innovation process is not yet a reality in the various surveys, data and instruments
- If examined in relation to each other, the survey data can provide insight on the impact of innovation on survival, growth, productivity, performance, etc.
  - Taking into consideration university impact, government impact (via public research funding, and via various innovation support mechanisms) is crucial to a systemic analysis of innovation



# Conclusions – Data possibilities

	SOI	SAT	SATF	SIBS	SIPM	COI	CIPHE	BUDS
IP	X				X	X	X	X
Innovation types	~	X	X	X				~
Innovation sources	X	X						X
Collaboration	X	X	X	~		X	~	X
External commercialisation	X				X	X	X	
Adoption		X	X					
Support	X			X				~



We need a better boat...



PARTNERSHIP FOR OPEN  
INNOVATION IN NEW TECHNOLOGIES

# Thank you

Questions?  
Comments?



---

PARTNERSHIP FOR OPEN  
INNOVATION IN NEW TECHNOLOGIES

---