

# Innovation Survey Indicators and their Use The 'Big Picture'

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Session 2: International Practices  
Workshop on the Review of Innovation Measurement in South Africa  
Pretoria, South Africa, 8-9 November 2011

# Outline

- ▶ **Definitions and measurement**
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    - Innovation systems
    - Actors
  - ▶ **Why innovation statistics matter**
    - Using innovation statistics
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# Definitions and measurement

# Definition

- ▶ For statistical purposes, the definition of innovation is taken from the Oslo Manual (OECD/Eurostat 2005). [www.oecd.org/sti/oslomanual/](http://www.oecd.org/sti/oslomanual/)
- ▶ An **innovation** is the *implementation* of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (OECD/Eurostat 2005, para. 146).
- ▶ A common feature of an innovation is that it must have been *implemented*. A new or improved product is implemented **when it is introduced on the market**. New processes, marketing methods or organizational methods are implemented when they are brought into actual use in the firm's operations (OECD/Eurostat 2005, para. 150).

# Measuring Innovation

- ▶ The activity of innovation requires connection to the market
  - ▶ R&D, capital expenditure, training, design, invention, purchase of knowledge, ... are innovation activities. They are NOT innovation unless there is a market connection.
  - ▶ OECD work shows that, in most countries, more firms innovate than do R&D. This is especially true in smaller economies
  - ▶ Innovation is measured in business surveys
  - ▶ Surveys are implementations of the OM definition
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# Measuring Innovation

## ▶ Innovation

- widely distributed
- Relatively common – more firms innovate than do R&D
- Information is captured by a business survey
  - Stratified statistical sample drawn from a register

## ▶ Business R&D

- highly concentrated. In Canada, about 50% of BERD is performed by 75 firms. South Africa?
- A rare event
- Frame may be different from that for innovation survey

# Measuring Innovation

- ▶ Innovation is dependent upon
    - Firm size ( employment data)
    - Industry (current industrial classification)
    - Regions (establishment not enterprise frame)
  - ▶ Data on each have policy implications
    - Micro and SME policy
    - Sector policy
    - Regional development
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# Why innovation matters



# Innovation Systems

- ▶ **A systems approach is implicit in Innovation Policy and the Oslo Manual**
    - Actors
      - Governments, education, health and research institutions, business, foreign institutions, ...
    - Activities
      - R&D, invention, diffusion of technologies and practices, design, HR development, ...
    - Linkages
      - Contracts, collaborations, co-publication, grants, monitoring, ...
    - Outcomes – short term
      - Jobs, growth, inclusion, greater equity, ...
    - Impacts – longer term
      - Wellbeing, culture change, global influence and leverage, ...
  - ▶ The activity of innovation is **dynamic, complex, non-linear** and **global**
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# Actors

- ▶ Each sector helps to make innovation happen
  - Government
    - Monetary and fiscal policy
    - Regulation
    - Support for education and training
    - Immigration and trade policy
    - Priorities
      - Energy, defence, space, climate change, food security, ...
    - Can the Public Sector, including public education, be innovative?
    - ...
  - Education
    - Culture of innovation and entrepreneurship
    - Human resource development
    - Generation of new knowledge
    - ...

# Actors

- ▶ **Business**
    - Converts knowledge to value through innovation
    - Successful innovation leads to wealth and well being and that is why innovation matters
    - R&D is not necessary for successful innovation
    - **Business should be part of public policy advice**
  - ▶ **PNPs**
    - Can provide resources, but can also can dominate the agenda
  - ▶ **Foreign institutions**
    - Donors or investors?
  - ▶ **Households**
    - Can consumer users be innovators?
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# Why innovation statistics matter

# Using innovation statistics

- ▶ There is no equivalent to GERD, only the propensity to innovate which
- ▶ There are quantitative indicators such as
  - The percentage of revenue from new or significantly improved products introduced in the last three years
- ▶ Surveys tell government about
  - Financial and human resources used by firms
  - Longer term requirements
  - Areas that may influence policy

# Using innovation statistics

- ▶ Not widely used in European innovation policy
  - ▶ Policy instruments are heavily weighted to R&D support
  - ▶ Academic analysts of innovation survey data do not address policy implications of their work
  - ▶ High-Level Panel on Headline Indicators
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# Using innovation statistics

- ▶ Data reliability?
  - By country and by sector? (A. Arundel)
  - See comparison of Finland and Portugal
    - Next presentation
  - Innovation statistics are still evolving
    - Well behind R&D and the SNA
  - There are opportunities for critical assessment

# Using innovation statistics

▶ [http://ec.europa.eu/commission\\_2010-2014/geoghegan-quinn/hlp/documents/20101006-hlp-report\\_en.pdf](http://ec.europa.eu/commission_2010-2014/geoghegan-quinn/hlp/documents/20101006-hlp-report_en.pdf)

## ▶ Headline Indicators

- Basket of three
  - 1 – *Hourly labour productivity*
  - 2 – *Patent applications weighted by GDP*
  - 3 – *Percentage of employment in knowledge intensive activities, or*
- One
  - 4 – *Share of fast growing (or young?) and innovative firms in the economy*
- And
  - 5 – *Contribution of innovative-related trade in manufactured goods to the balance of trade of goods*

# Using innovation statistics

## **Council of Canadian Academies to launch assessment on Socio-economic Impacts of Innovation Investments**

The Ontario Ministry of Economic Development and Innovation has asked the Council of Canadian Academies to assess best practices in measuring socio-economic outcomes and impacts of government spending on research and innovation activities that could be applied in the Ontario context.

In many developed and developing nations, innovation policy has become central to the efforts of governments at all levels to maintain their competitiveness in a global economy, which is increasingly becoming knowledge-based. The Government of Ontario has also made substantial investments in innovation, with the explicit aim of strengthening Ontario as a leading innovation-based economy.

However, the question remains: **what are the best practices for policy-makers to evaluate and measure the impact of their investments in innovation in terms of socio-economic effects such as output, employment, tax, creation of new ventures, development of entrepreneurship and social impacts?** The Council's assessment will attempt to answer this question by drawing on experiences from other provinces and countries and adapting them to the Ontario context.

[www.scienceadvice.ca](http://www.scienceadvice.ca)



Next?

# Next?

- ▶ Innovation statistics can shed light on
  - Public sector innovation (market?)
  - Innovation in the informal sector
  - Social innovation
  - Innovation in agriculture (Bogota process)
- ▶ More in the following
  - Read UNU-MERIT Working Papers 2011-009 and 2008
    - User innovation and the market
    - Social impacts of the development of science, technology and innovation indicators
    - [www.merit.unu.edu](http://www.merit.unu.edu) Click on Publications then Working Papers