Assessing Innovation Measurement

How accurately do we measure innovation and the resultant outcomes delivered to society and the economy

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NCSES/CNSTAT Workshop
Advancing concepts and models of innovative activity and STI indicator systems
The challenge

• The Workshop
  – Identify questions that
    • Cannot be answered now
      – But could be with additional data
        » That has a reasonable chance of being collected

• This presentation
  – Indicators to capture
    • The changing nature of innovation
    • Policy and other uses of innovation data and indicators
    • International comparison
Response – Two approaches

• What *can be done now* with the existing definition of innovation (Oslo Manual 3rd ed.) and existing data

• What *could be done* if changes were made to the definition in the revision of the OM and new data sources were developed

See [www.merit.unu.edu/publications/working-papers/abstract/?id=5832](http://www.merit.unu.edu/publications/working-papers/abstract/?id=5832) for more discussion and references
Now – Innovation for measurement purposes

- An *innovation* is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation 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 organisational methods are implemented when they are brought into actual use in the firm’s operations (OECD/Eurostat 2005, para 150)
Changes leading to now

• The economy % of GDP (BEA)
  
<table>
<thead>
<tr>
<th></th>
<th>1947</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>25.4</td>
<td>12.1</td>
</tr>
<tr>
<td>Wholesale and Retail trade, Transportation and Warehousing</td>
<td>21.2</td>
<td>14.7</td>
</tr>
<tr>
<td>Total</td>
<td>46.6</td>
<td>26.8</td>
</tr>
</tbody>
</table>

• The classification SIC ➔ NAICS
  – See NAICS 51: Information

### Types of innovation

<table>
<thead>
<tr>
<th>Components</th>
<th>Product</th>
<th>Process (Production + Delivery)</th>
<th>Organisation</th>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td></td>
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Measurement now

• Four types of innovation, but they overlap
  – How to resolve

• Systems approach
  – More measures of linkages
    • Sources of information, collaboration and prototypes

• Business demographics
  – Size of firm, Age of firm, where are gazelles?
    • How do innovative gazelles differ from non-innovative gazelles?
  – Entry and exit, by size, by innovative or not.
# Business demographics and innovation

<table>
<thead>
<tr>
<th></th>
<th>High entry</th>
<th>Low entry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Exit</strong></td>
<td>Volatile – new industries ICT services Exit might result from mergers</td>
<td>Structural change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UK retail, UK pubs</td>
</tr>
<tr>
<td><strong>Low Exit</strong></td>
<td>New opportunities, disruptive innovation</td>
<td>Stable - audit, actuarial services, …</td>
</tr>
</tbody>
</table>
More firms innovate than do R&D

<table>
<thead>
<tr>
<th>Company characteristics</th>
<th>All Companies (000)</th>
<th>Product or Process innovation Per cent</th>
<th>No. of innovative companies (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>1,220.1</td>
<td>14.3</td>
<td>174.5</td>
</tr>
<tr>
<td>With R&amp;D</td>
<td>57.1</td>
<td>64.2</td>
<td>36.7</td>
</tr>
<tr>
<td>No R&amp;D</td>
<td>1,163.0</td>
<td>11.8</td>
<td>137.2</td>
</tr>
</tbody>
</table>

Source: NSF 16-308
Policy now

• Promoting innovation in different sectors for different socioeconomic objectives
• Supporting gazelles through innovation and/or entrepreneurship policies
• Policy for non-R&D performers
  – SBIR, vouchers, state and municipal support
  – Innovation parks
Second approach

- Change/Generalise the definition to
  - Measure innovation in all SNA 2008 sectors
    - General government + public corporations = Public Sector
    - Household sector including individuals
    - Business sector (corporations financial and non-financial)
Changing/Generalising the definition

• Main changes
  – Process and the two methods become one process with three components
  – ‘improved’ becomes ‘changed’ avoiding normative statements
  – Market becomes ‘potential users’
  – Process change is linked more closely to potential users

• For the business sector, this makes little difference
A generalized definition

• An *innovation* is the implementation of a new or significantly *changed* product or process. A product is a good or a service. Process includes production or delivery, organisation, or marketing processes.

• A new or significantly changed product is *implemented* when it is *made available to potential users*. New or significantly changed processes are implemented when they are brought into actual use in the operation of the institutional unit, *as part of making product available to potential users*. 
Outcomes

• Internationally comparable definitions of innovation for all SNA sectors
• Support for policy development in the Public and Private sector, and for monitoring and evaluation of implemented policies
• Stimulus for more analysis of innovation in all SNA sectors and the interactions between them
Restricted innovation

*Are intentions realised?*

• So far the focus has been on inferring the activity of innovation using internationally agreed definitions to support measurement

• Policy interest goes beyond just innovation
  – Sustainable innovation, green innovation, …
  – Sustainable innovation for inclusive development

• To measure this ‘restricted’ innovation requires additional surveys, including social surveys, conducted at different times
  – As well as definitions of sustainable, inclusive, green. …

• Additional time scales require a longer term measurement perspective.