MICRODATA-BASED ANALYSIS OF SCIENCE AND INNOVATION: AN OECD PERSPECTIVE

Workshop on Evaluación de políticas de I+D e innovación en España”, 7 March 2017

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* All views are personal and do not necessarily represent the OECD. Slides draw on joint work with Silvia Appelt, Matej Bajgar and Chiara Criscuolo.
Traditional approach to sci, tech, inno (and all other) official statistics at OECD

- Statistical guidelines
- Focus on indicators
- International comparisons
For example: Public support for R&D

Trends in government tax incentive and direct support for business R&D, 2000-14

Tax support as a percentage of total (direct and tax) government support for business R&D, selected countries

Tax support indicators according to the type of firm

![Graph showing tax subsidy rates on R&D expenditures, 2016. The graph illustrates 1-B-Index, by firm size and profit scenario. Data and notes are available here: http://www.oecd.org/sti/Tax_subsidy.xls](http://www.oecd.org/sti/Tax_subsidy.xls)
Traditional approach to sci, tech, inno (and all other) official statistics at OECD

- Statistical guidelines
- International comparisons
- Problem: What OECD collects and reports is only the tip of the iceberg, what lies beneath would be useful but is beyond reach
  - Access constraints drive interest towards other non official sources, esp. those across jurisdictions
  - Challenge to the sustainability of official statistics → loss of research interest, potential policy relevance...
Four approaches

• Complementary microdata sources
  1. Leverage administrative *data*, whenever possible and relevant
    • Global standards?
  2. Experiment *collecting some data directly*, in areas where there is no clash with NSOs

• Addressing the NSO microdata access issue
  3. Promote the development and use of safe international data havens
  4. Distributed approach for existing NSO data*
The international dimension


- **Recommendation** of the OECD Council on Good Statistical Practice. Selected recommendations on microdata:
  - 4.5. Provisions are in place and internal guidelines are available to allow external user access to micro-data for statistical research purposes under strict protocols and only after anonymisation of the data.
  - 9.11. Access to micro-data is allowed for research purposes and is subject to specific rules or protocols (ECoP).
  - 11.5. Access to micro-data by international organisations is explored as a means to reduce the burden of countries responding to questionnaires.
The access issue

• The “safe”* principles of microdata access towards building trust:
  – Safe projects: appropriate use of data.
  – Safe people: skills, incentives, willingness to contribute to core NSO operation
  – Safe places/settings: safe havens/data enclaves, supervision,
  – Safe data: conf, ID-based data linking
  – Safe outputs: disclosure control, depositing outputs

• Sustainability:
  – Account for costs to NSO in research projects and policy endorsed studies
  – Account for benefits to NSO – i.e. not just a nuisance
  – Think of as infrastructure
  – Make microdata part of the business case for stat. enquiries.

New evidence
Approaches to evaluating impact

Firm-level single-country studies
- structure, concentration, characteristics of beneficiaries
- identifying causal effects
- heterogeneity, spillovers

Aggregate cross-country studies
- generalisability
- comparing policy design

Firm-level cross-country studies
- combined benefits...
- ...but challenging
  - data availability
  - comparability
  - confidentiality
New evidence - microBeRD: distributed microdata analysis

Confidential data in each country \( \{X_i\}_c \)

Statistical code prepared by OECD; implemented within countries

Non-confidential harmonised output

R&D survey
+ Corporate tax data
+ R&D grant/loan data
+ Business register data
+ Patent data
+ Innovation data

Statistical moments \( \text{pdf}(X)_c \)
New evidence

microBeRD: project aims

Harmonised cross-country descriptive evidence on incidence of public support for R&D
- structure
- concentration
- characteristics of beneficiaries

Evidence on causal effect of indirect and direct support
- comparing effectiveness
- effect on different types of firms
- interaction
- spillovers

Supporting evaluation capacity in participating countries
OECD-NESTI R&D micro-data project: Micro-data availability by type of data source

Preliminary analysis of micro-data situation in participating countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Business expenditures on R&amp;D</th>
<th>Business entitlement to tax support</th>
<th>R&amp;D grants, loans and other-non tax relief related financial support for R&amp;D</th>
<th>Business innovation survey data / Patent or other IP data</th>
<th>Business performance data</th>
<th>Firm ownership and demographic information</th>
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| Total | 21 | 16 | 18 | 21 | 20 | 21 |

Questionnaire on micro-data availability and expert participation – country responses received by 26 March 2015.

→ Update on micro-data access and linking arrangements (Q responses, data exploration)
Thank you / muchas gracias

We look forward to having Spain join soon microBERD

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Recent examples of use of distributed microdata approaches

- OECD/SIT work on Business dynamics and productivity: **DYNEMP** and **MULTIPROD**
- One country case studies
  - Denmark: impact of **design** capabilities on innovation
  - Canada (new): extent and impact of technology use
- Innovation
  - **Innovation in firms**
  - Innovation in services
- Careers of doctorate holders