

The Oslo Manual: Main Issues

International Training Workshop
on R&D and Innovation Statistics

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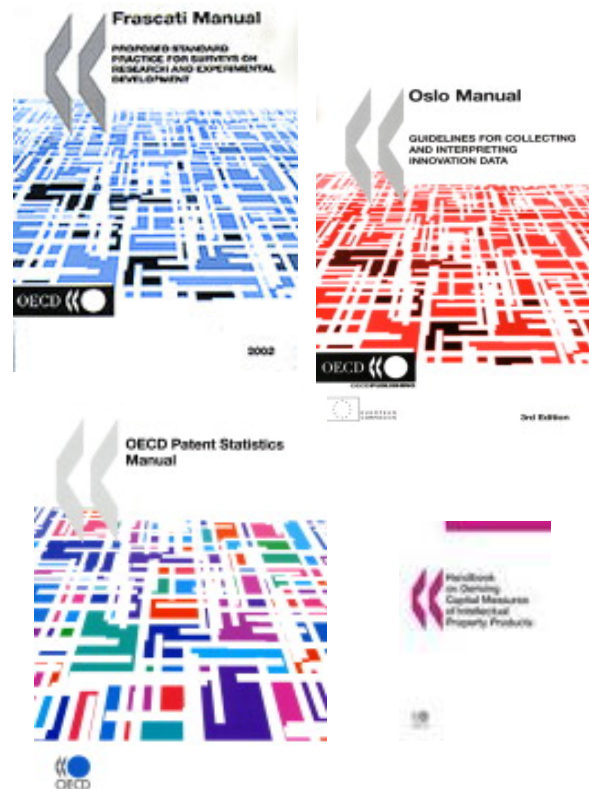
OECD: An overview

- Paris-based international organisation, led by Secretary General Angel Gurría.
 - Structure of Council, Committees and Secretariat.
- Mission: “to promote policies that will improve the economic and social well-being of people around the world”.
 - Forum for sharing experiences
 - Measurement and analysis based
 - Agreeing and setting standards
- Established in 1961. 50th anniversary.
 - Heir to Organisation for European Economic Cooperation established in 1947 to run the Marshall Plan
 - Expanded membership – work with non-member economies



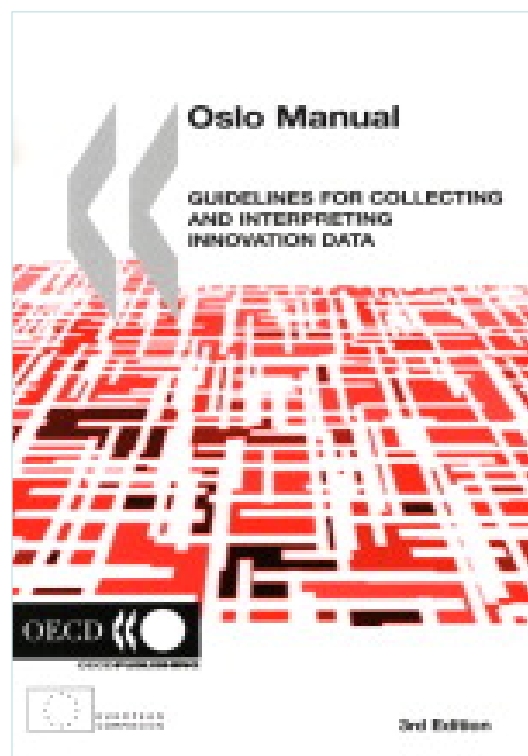
The S&T measurement standards

- Frascati Manual 1963 – R&D
- Oslo Manual 1992 (with Eurostat)– Innovation
- OECD Patent Statistics Manual, 2009
- Canberra Manual on HR devoted to S&T – 1995
- Other:
 - Statistical framework for biotechnology, etc...
 - Handbook on Deriving Capital Measures of Intellectual Property Products (with Stats Directorate)



The Oslo Manual

- Short-word for “OECD Guidelines for Collecting and Interpreting Innovation data”
- NESTI community of practice
- Codification of tacit knowledge from experience of asking questions to business on innovation practices and outcomes



Outline of presentation

- Background to latest version of the Oslo Manual
- User needs and concepts
- Definitions, classifications
 - Types of innovation
 - Types of innovation activities
- Survey methods
- Next steps on guidelines
- Brief overview of other relevant OECD work on innovation



User needs and concepts

- Key user needs:
 - Understanding the contribution of innovation to growth and economic performance
 - Go beyond R&D – input measurement
 - Benchmarking purposes
- Built on economic framework
 - innovation outcomes/inputs/defining features
 - elements from Schumpeter, business sector focus
 - systems of innovation approach
 - subject approach (the firm/enterprise)
 - creation and diffusion of knowledge



History 1/2

- Precursors
 - Surveys prior to CIS 1 in France, Germany, Italy, the Netherlands, Norway and Sweden
 - Exploratory survey in the U.S. (1985)
 - SPRU data on innovation
- Oslo Manual (1992) 1st edition
 - Product and process innovation
 - Mainly geared towards manufacturing
 - EU Community Innovation Survey (CIS) Wave 1: 90-92
 - CIS comparable surveys in Australia and Canada



History 2/2

- Oslo Manual 2nd Edition 1996
 - Co-managed with Eurostat since
 - Developed and reviewed through peer process (NESTI + ESTAT WP STI)
 - Broadening of innovation - services
- Oslo Manual 3rd Edition 2005- Main novelties:
 - Innovation in less R&D intensive industries, including services
 - Innovation definition expanded to organisational and marketing innovation
 - Linkages between actors in the innovation process
 - Annex on R&D in developing countries



Conceptual limitations

- Restrictions
 - Lack of corresponding accounting/reporting framework
 - Limits to reporting of role of external/policy factors
 - Restricted access to additional economic data on firms
 - Continuous process. Flows. Timing inputs and outputs.
 - Limited to incumbents.



Definitions - innovation

- What is an innovation?
 - Needs to be implemented by firms in ref period
 - Novelty to firm (q's on novelty to market)
 - But no (commercial) success criterion
- Four key types of innovation
 - Product innovation. Goods and services
 - Process innovation.
 - Marketing innovation.
 - Organisational innovation.



Examples of innovations – OM Annex B

- Production innovation
 - Goods: Appliances with new functions, software with new anti fraud, healthier food products...
 - Services: New financial products, web support service, wifi in hotels...
- Process innovation: New product quality control system, purchase of energy-saving equipment, electronic ticketing , cleaner oil/mineral extraction tools
- Marketing innovation: design/look change to products, intro new sale strategies, infosys through loyalty cards, 1st-time intro pricing or promotion methods, ...
- Organisational innovation: 1st-time intro of management systems, product/knowledge sourcing, 1st-time adoption of new workplace configuration...



Classifications

- Units: Organisation level at which innovation decisions are made.
 - Enterprise unit. Appropriate stat unit in most cases.
 - For large enterprises, PSU can be KAUs.
 - Secondary unit: Establishment. Location.
- Classification by main economic activity (ISIC) and size.
 - Pursue comparability in reporting
- Other classifications.... Public, MNEs...



Linkages

- Questions on:
 - Sources of knowledge and information
 - Internal sources / external sources:
innovation actors (suppliers, customers, HEIs) and sources of knowledge (e.g. patent disclosures, publications...)
 - Sources for purchases of knowledge and technology
 - Co-operation partners
 - Diffusion, knowledge management



Definitions – innovative activity

- Innovation active firms
 - Implemented, ongoing or abandoned
- Innovation activities:
 - R&D (intramural / extramural)
 - Activities for prod/process innovation
 - Acquisition of other external knowledge
 - Acquisition machinery, equipment, software, etc...
 - “Other” preparations for prod/proc innovations (design not counted as R&D) and market and staff preparation
 - Activities for marketing and org innovations



Definitions – innovative activity

- Innovation activities (cont'd):
 - Activities for marketing and org innovations
- Design (combines ...)
 - Elements part of R&D
 - Preparations of new products / industrial process
 - Marketing (form and appearance)
- Which data?
 - Qualitative / quantitative
- Analogies with intangible investment.



Objectives, obstacles and outcomes

- OM policy focus. Recommends collecting such data.
- Mainly qualitative
- Other:
 - Impact on turnover
- Hampering factors
- Appropriability of innovations: Formal and informal methods



Survey procedures 1/3

- Target population: at least >10 employees
- Frame population: Registers used by NSOs for SBS
- Survey design
 - Mandatory/voluntary – response rates
 - Census/sample – valid CVs – target samples
 - Domains – over allocation approaches, consistency
 - Sampling techniques – stratify by size and PAU
 - Panel data / repeated cross sections
 - Survey instrument:
 - Postal/personal-CAPI, CATI/web-based. Web-based.
 - Target respondent – management



Survey procedures – 2/3

- Survey design (ct'd)
 - Survey instrument:
 - Postal/personal-CAPI, CATI/web-based. Web-based.
 - Target respondent:
 - The questionnaire:
 - **OM provides definitions and recommendations for developing surveys, but not a template or list of indicators**
 - The questions: Pre-testing, cognitive testing, focus groups
 - Understand question, provide an answer, check meaningfulness
 - The ensemble: Pre-testing.
 - Mix with other questions/other instruments. E.g. R&D survey. Mutual impacts.
 - Follow up

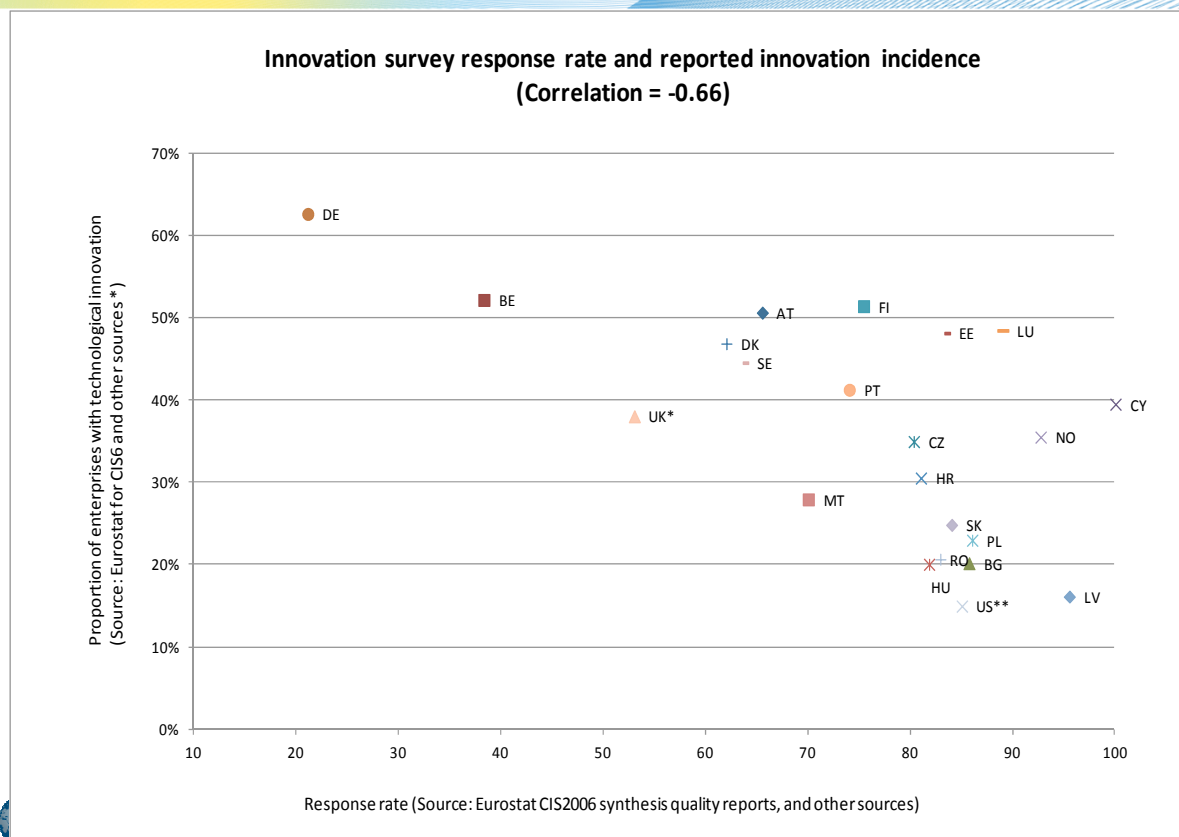


Survey procedures – 2/3

- Estimation methods
 - Weighting methods:
 - Inverse of sampling fractions of the sampling units, corrected by unit non response.
 - Further calibration
 - Weights by number of enterprises in stratum. Recommendation to try number of employees or turnover.
 - Non-response
 - MAR
 - Non response survey.
- Frequency
 - Recall bias vs cost/overload considerations
- Presentation of results
 - Descriptive and inferential analysis
 - Metadata
 - Availability for research and other analytical purposes



Response bias and potential impacts



Key issues for further development

- Key concepts. Implementation criterion / business sector.
 - User driven innovation
 - Public sector innovation – NESTI Task Force
- NESTI Task Force on business innovation survey design – cognitive testing
- Innovation activities and intangible investment:
 - Expenditure questions
 - OECD project on Intangible Assets
 - Treatment of design
- Interactions between R&D and innovation surveys
- Assessment of sources and impacts of non-response bias
- Work with regional expert groups to learn practical lessons, ensure comparability of approaches, and avoid unnecessary replication of guidelines



Other relevant OECD work

- Informal gathering of info on innovation surveys worldwide, presentations and discussions at NESTI
- Reporting of innovation data:
 - *OECD Innovation Strategy*, in particular “Measuring Innovation: A New Perspective” (2010)
 - STI Scoreboard. Forthcoming September 2011
- OECD Innovation microdata project
 - New indicators
 - Analytical work: microdata



OECD Innovation Microdata Project

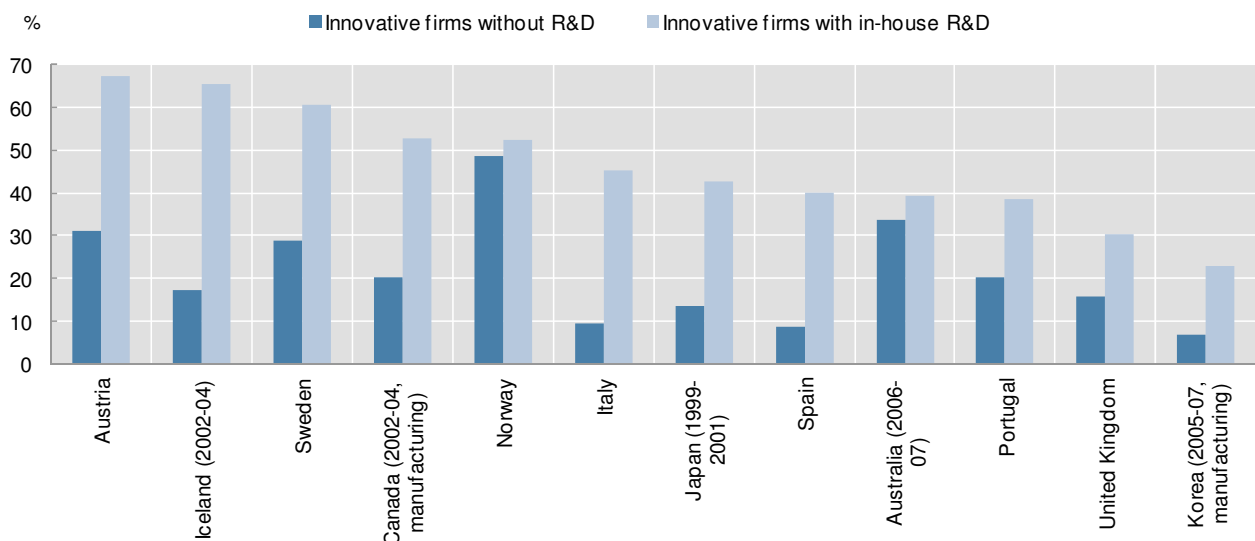
- Rationale and approach: restrictions on accessing microdata → decentralised approach with OECD coordinating and country leads, develop common routines (STATA/SAS)
- Participants and organisation: over 20 countries, around 50 researchers
- 3 modules: (1) indicators; (2) mixed modes and non-tech innovation; (3) innovation and productivity (econometric analysis)
- **2 phases: 2007-09 and 2009-11**
- **Data used for *OECD Innovation Strategy* reports, in particular “Measuring Innovation: A New Perspective” (2010)**



Innovation is not only about R&D...

New to market product innovators with and without R&D, 2004-06 (or latest)

As a percentage of innovative firms by R&D status



Source: OECD (2010), *Measuring Innovation: A New Perspective*, OECD, Paris.



IS can be used for investigating...

- determinants of and complementarities in:
 - innovation
 - sources of information for innovation
 - cooperation for innovation
 - obstacles to innovation
- effects of innovation on
 - productivity level or growth
 - exports
 - patenting
 - employment
- persistence and dynamics of innovation
- additionality or crowding out of government support for innovation



Questions

Thank you

