ESF Workshop
Quality of Quality Assurance
Striving for Highest Standards in ex-post evaluation
Vienna, 6 - 7 October 2008

Criteria and indicators to evaluate the internationalization/embedment in the international collaboration of research performing organizations.

Introductory note

Emanuela Reale
CERIS CNR
e.reale@ceris.cnr.it

CONTENT

- What are research performing organizations (PROs)
- Criteria and indicators for ex-post evaluation
- Internationalization of research
- National experiences
- Conclusive remarks

Public Research Organizations (PROs)

- One of the key component of the R&D systems (14% of THE total R&D expenditures-GERD; 40% of total Government expenditures for R&D-GOVERD in EU15)
- Different weight of PROs in national R&D systems (they account from 18-20% of GERD in France, Italy and Portugal, to 4% in Sweden and Belgium)
- Different institutional configuration of PROs: public, semi-public, private-privatised centres, (Eurolabs, 2002)
- They are organizations which provide research and development, technology and innovation services to enterprise, governments and other clients (EURAB, 2005)

Variety of PROs mission

- *Policy-oriented institutions* (assisting government for decision making in sectors such as health, energy, environment, defence, transport, etc.) like the EPICs in France or Government Research Units in Italy
- *Industry-oriented institutions*, devoted to translate knowledge into useful application, to create linkages between basic research results and applied research, to develop cooperation with industry (like TNO in the Netherlands and SINTEF in Norway)
- *Academic-oriented institutions*, operating through labs, on both basic and applied research domains, in close connection with Universities, like CNR and INFN in Italy, EPTS in France

Variety of PROs functions

- EURAB 2005
  - Fundamental/Strategic research
  - Technological support to economic development
  - Supporting public policy
  - Technical norms, standards
  - Constructing, operating and maintaining key facilities (LSF, large computing facilities, large long-term data collections)

Factors affecting PROs performance (drivers of change)

- Changes in Government funding
- Marketization (contract from industry, from competitive funding at national, supra-national and local level)
- Policy priorities (internationalisation, innovation-oriented initiatives)
- Autonomy of institutions and individuals
- Changes in the modes of knowledge production
- Instruments devoted to enhance accountability (funding and evaluation)

Criteria for evaluation

- Evaluation as knowledge process devoted to understand all the effects coming from a specific action, i.e. a policy measure (direct-indirect, foreseen-unforeseen, wished-unwished) or the performance of a research institute
- Evaluation is based on a research design, articulated around key questions, which represent the objective of the analysis committed
- Criteria select the answers most suitable to address the evaluation questions. They identify the relevant dimensions for the assessment of the research institutes, thus circumscribing the evaluative design
- Criteria and indicators must fit together

Indicators for evaluation

- Based on conceptual framework coming from STI studies (i.e. linear model), definitions and normative understanding of the underlying reality.
- Indicators support policy makers providing a synthetic representation of the reality, not a complete and objective description of the reality (proxy)
- Indicators should be:
  - Designed for answering specific questions (relevance)
  - Built upon a conceptual model of the reality (definitions, state-of-the-art, delimitation of the elements to be measured)
  - Feasible in terms of data quality and availability (cost and time)
  - Transparent in terms of capability of users to understand background and limitations affecting indicators

Internationalization of research

- Intrinsic characteristic of the research effort affecting all the scientific disciplines with different rate and pace (trade off between internationalization as epistemic value and its effectiveness)
- Growing phenomenon due to the globalization of economies, the enlargement of competition for good researchers and research funds, the need to improve reputation and visibility at the knowledge frontier (quality indicator)
- Changing meaning: from internationalisation of researchers and research groups to embedment of institutions and individuals in international networks, capability to attract foreigners (researchers, clients), and to localize research activities abroad (researchers and units)
- European Framework Programmes and European Research Area as factors pushing toward internationalization

Internationalization of PROs

- Little empirical evidences on PROs internationalization
- RISE project (2000) surveyed 223 research institutes in Germany, Netherlands, Sweden and UK: 43% have a “very low international business orientation” measured by synthetic indicators including research contracts from foreign industry clients and the establishment of branch/representative offices abroad
- EUROLABS project (2002) surveyed 770 institutes. Indicators (co-publication, collaborative projects, funding from external sources) showed different levels of internationalization according to the type of research (basic-applied-development) and the type of institution (public, semi-public, private)

Internationalization of PROs

- Bergen and Hofer (2008) surveyed PROs in Germany and results show that:
  - Researchers had a low international mobility but PROs employ a high share of foreign researchers comparing with Universities
  - Internationalization is linked to the type of research developed (non-oriented research institutes are more internationalized than applied-oriented ones)
  - 57% of PROs had a specialized unit for internationalisation, 39% had an explicit international strategy
  - The share of foreign industry clients is low (projects with foreign partners)

The Italian experience

- Evaluation of Public Research Institutes CIVR 1999-2001
- Three-Years Evaluation Exercise VTR, CIVR 2001-2003
- Experiences of public research organizations (CNR, INFN)

Evaluation of Public Research Institutes CIVR 1999-2001

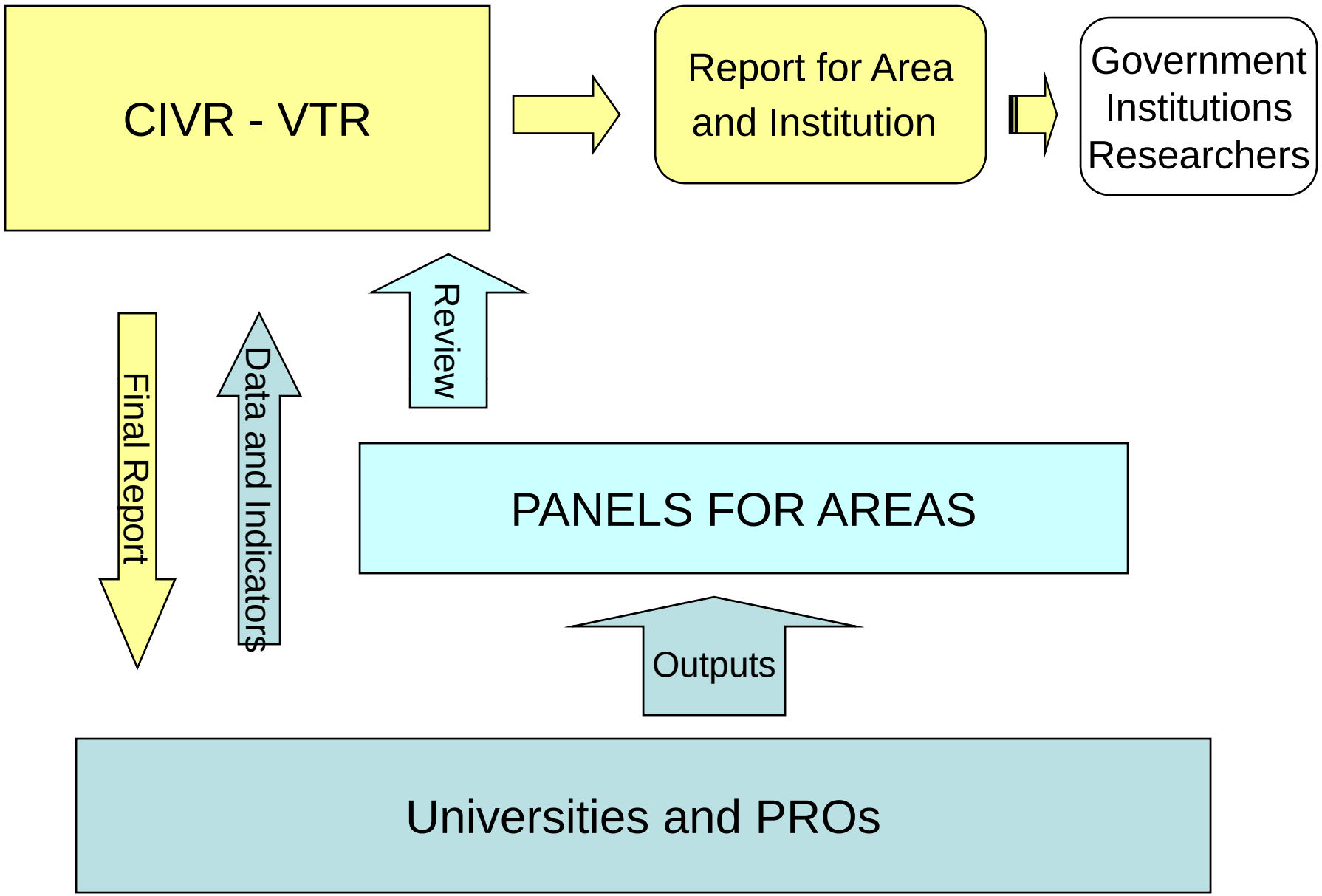
- Self evaluation and External evaluation
- Criteria for internationalization:
  - Internationalization of the research outputs (publication in journals included in the SCI Index or in other journals with international peer review)
  - Internationalization of research activities (projects, programmes, strategies)

Evaluation of Public Research Institutes CIVR 1999-2001

- Compulsory list of indicators justified on the basis of the specific characteristics of the Institutes (all were academic-related institutions)
  - Large international projects (importance, number and amount)
  - European projects
  - Co-publication and co-patenting
  - Funding from International/European sources
  - Mobility of researchers (in/out)

Experiences of PROs

- CNR produced indicators on JRC publications and a benchmark with the performance of other PROs in Europe (CNRS, CSIC, MPG)
- CNR, INFM and INFN produced also counts for other data: international conferences, coordination of international projects, memberships in editorial boards, evaluation panel, high level groups, prizes, etc.
- INFN and INFM proposed other indicators
  - the use of international infrastructures by internal research groups (time),
  - the number of users of national laboratories coming from abroad,
  - the use of international peer reviewing for selecting the projects to be funded or the project that can be submitted for external funding


CIVR - VTR
Report for Area and Institution
Government Institutions Researchers
Review
Final Report
Data and Indicators
PANELS FOR AREAS
Outputs
Universities and PROs

VTR 2001-2003

- Internationalization and/or international competitive potential was included as one of the criteria suggested to peers in order to evaluate all the outputs submitted by the institutions (Guidelines for Panels, www.civr.it)
- It was defined as “ranking of the product in the international scenario in terms of importance, competitiveness, circulation also editorial and appreciation by the scientific community including explicit collaboration with foreign researchers and research groups”
- This definition generated different interpretations between scientific areas

VTR 2001-2003

- Indicators (in different combinations) used by the Panels in order to assess the internationalization of the scientific outputs:
  - Internationalization derived from **publication** on the high prestige international journals and by **citations** received
  - Internationalization is detected by the **language** of publication
  - Internationalization is linked to the **collaboration** with international groups

VTR 2001-2003

- Internationalization as an academic-related concept: capability to attract resources, and to create collaborative pattern with international actors
- Indicators
  - Mobility of researchers abroad for more than 3 months
  - Researchers placed abroad which operated in the Institute for more than 3 months
  - Phd courses co-developed with other countries
  - Funding from EU and international sources

Comparing different Italian experiences

- Internationalization is mainly conceived as capability to publish in international journals, to attract external sources, to gain balanced rates of brain drain and brain gain
- VTR tried to include in the definition of internationalization different components in order to assess the outputs (language of publication, positioning, networking, diffusion, competitiveness)
- Each panels shape the definition according to the prevalent meaning of internationalization in the disciplinary area. Interesting results in terms of changing modes of knowledge production, but Panels asked for a more refined definition.
- All the indicators were feasible and reliable. Criticisms arise for the time of mobility, considered too long in some disciplinary areas
- Little attention to indicators devoted to analyse localization of administrative sites or research units abroad as well as to analyse the sources of funding from abroad (EUFP, International projects, ESA, Firms, Non-for-profit, etc.)
- No differentiation between Internationalization and Europeanization

A possible way forward

- Indicators that can be developed by using international sources
  - Co-publication and co-patenting with foreign researchers (bibliometric resources, EPO databases)
  - Network analysis in diachronic perspective (authors, inventors, participation in EUFP)
- Indicators that can be developed by using national sources:
  - Funding from abroad by source of funding
  - Mobility of researchers (brain drain and brain gain) by duration, age and career position
  - Research projects in collaboration with foreign partners (amount, type of partnership, type of funding organization, role in the partnership)
  - Students trained in Phd courses and Schools in collaboration with foreign institutions
  - Use of LSF and other international infrastructures
  - Research units located abroad (funding by source and human resources)
- Developing indicators using national sources implies hard work on definitions and methodologies in order to have comparable measures

Conclusions

- Internationalization is a broad concept which is mainly related to quality of research activities and results
- Internationalization is not as Europeanization. We need different criteria and indicators with a different relevance in the final judgement on performance
- Focus on institutions, not on individuals. Limited number of indicators taking into account difference between disciplinary and sub-disciplinary areas
- Concentration of internationalization in sectors and in geographic areas should be analysed (phenomena of marginalization, benchmarking of performance, comparison with parallel process affecting economic actors)