

Measuring R&D in the Nonprofit Sector: The European Experience

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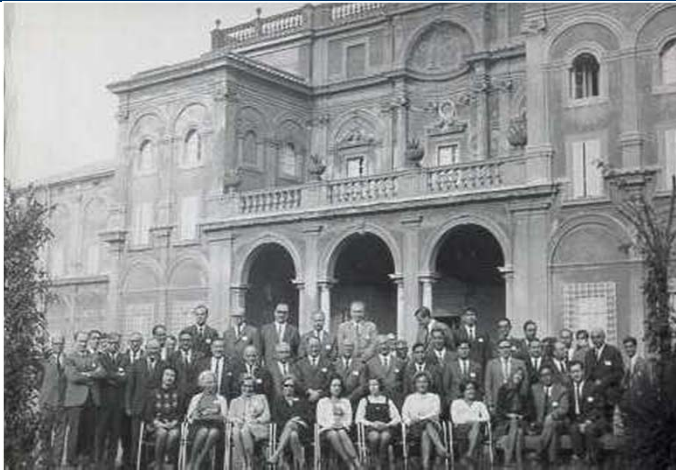
Measuring Research and Development Expenditures in the U.S.
Nonprofit Sector: Conceptual and Design Issues
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and Statistics, University of Torino

Content

- The Frascati Manual for R&D measurement.
- Some aggregate stats at the EU level.
- The case of the UK and Italy.
- Measuring R&D/Innovation in public services and administration.
- R&D (software innovation) in the provision and management of nonprofit services.

The founding fathers – Villa Falconieri - Frascati 1963-68 → **The Frascati Manual**



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Evolution of RD measurement *per* the Frascati Manual

- 1963** – The first Frascati Manual,
- 1970** - Streamlining with international classifications (SNA, ISIC),
- 1976** - Inclusion of SSH; “objectives” classification,
- 1981** - Higher education supplement,
- 1993** - Inclusion of software, environment, **PNP** definition changes.

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PNP definition in Frascati 1993 → 2002

- PNP includes (Frascati, #194, 2002):
 - Non-market, private non-profit institutions serving households (i.e. the general public).
 - Private individuals or households

(OECD definition) Non-market services cover those services provided to the community as a whole free of charge, or to individual consumers either free of charge or at a fee which is well below 50 per cent of production costs.

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PNP definition in Frascati 1993 → 2002

- Excluded from the PNP:
 - Those mainly rendering services to enterprises.
 - Those primarily serving government.
 - Those entirely or mainly financed and controlled by government.
 - Those offering higher education services or controlled by institutions of higher education.

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Evolution of RD measurement *per* the Frascati Manual

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- 1993** - Inclusion of software, environment, PNP definition changes,
- 2002** – Questionnaire, services, HRST
- 2014** – Ongoing revision

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Frascati revision 2014 underway

- Mainly adjustments and methodological improvements;
- No significant changes in PNP;
- No significant changes for digitalization of services;
- Though there is an ongoing discussion on the definition of R&D!

(Sirilli, 2014)

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EUROSTAT DATA

R&D % GDP

0.03
funded by
Nonprofit

SECTPERF: All sectors SECTFUND: All sectors UNIT: Percentage of GDP

	TIME	2003	2004	2005	2006	2007	2008	2009	2010	2011
GEO										
European Union (28 countries)		1.86	1.82	1.82	1.84	1.84	1.91 ^(a)	2.01 ^(a)	2 ^(a)	2.04
Euro area (17 countries)		1.87	1.85	1.84	1.87	1.88	1.96 ^(a)	2.06 ^(a)	2.07 ^(a)	2.12
Denmark		2.58	2.48	2.46	2.48	2.58 ^(a)	2.85	3.16	3	2.98
Germany (until 1990 former territory of the FRG)		2.54	2.5	2.51	2.54	2.53	2.69	2.82	2.8	2.89
Ireland		1.16	1.23	1.25	1.25	1.28	1.45	1.69	1.69 ^(a)	1.66 ^(a)
Greece		0.57	0.55 ^(a)	0.6	0.59 ^(a)	0.6 ^(a)	.	.	.	0.67 ^(b)
Spain		1.05	1.06	1.12	1.2	1.27	1.35	1.39	1.4	1.36
France		2.18	2.16 ^(a)	2.11	2.11	2.08	2.12	2.27	2.24 ^(a)	2.25
Italy		1.1	1.09	1.09	1.13	1.17	1.21	1.26	1.26	1.25
Netherlands		1.92	1.93	1.9	1.88	1.81	1.77	1.82	1.86	2.03 ^(b)
Austria		2.24 ^(a)	2.24	2.46 ^(a)	2.44	2.51	2.67 ^(a)	2.71	2.8 ^(a)	2.77
Poland		0.54	0.56	0.57	0.56	0.57	0.6	0.67	0.74	0.76
Portugal		0.71	0.74 ^(a)	0.78	0.99 ^(a)	1.17	1.5 ^(b)	1.64	1.59	1.52
Finland		3.44	3.45	3.48	3.48	3.47	3.7	3.94	3.9	3.8
Sweden		3.8 ^(a)	3.58 ^(a)	3.56 ^(a)	3.68 ^(a)	3.43	3.7 ^(a)	3.62	3.39 ^(a)	3.39
United Kingdom		1.73	1.67	1.7	1.72	1.75	1.75 ^(a)	1.82 ^(a)	1.77 ^(a)	1.78

R&D funded by Nonprofit

SECTPERF: All sectors SECTFUND: Private non-profit sector UNIT: Purchasing Power Standard (PPS) per inhabitant at constant 2005 prices

GEO	TIME	2003	2004	2005	2006	2007	2008	2009	2010	2011
European Union (28 countries)		5.4 ^(a)	5.6 ^(a)	5.8 ^(a)	6.5 ^(a)	6.8 ^(a)	7.1 ^(a)	7 ^(a)	7.1 ^(a)	7.2 ^(a)
Euro area (17 countries)		3.1 ^(a)	3.4 ^(a)	3.7	4.7 ^(a)	4.9 ^(a)	5 ^(a)	4.8 ^(a)	5.1 ^(a)	5.2
Denmark		18.7		19.3		26.2 ^(b)		26.4	28	29.6
Germany (until 1990 former territory of the FRG)		2.1	2.4	1.9	2.5	2.5	2.4	2	1.8	2.9
Ireland		0	0	0.8	6.5	2.4	2.5	2.5	2.3 ^(a)	2.3 ^(a)
Greece		1.3		1.8						1.3 ^(b)
Spain		1.1	1.6	2.2	1.6	1.6	1.8	2	2.1	1.7
France		4.7	4.6 ^(b)	4.5	4.5	4.4	5.7	4.4	4.4 ^(b)	4.5
Italy				4.1	8	8.3	8.1	8.5	8.8	8.7
Netherlands		11.5		14.4		13.4		15.7		21 ^(a)
Austria		2.5 ^(a)	3	3 ^(a)	3	3.5	3.6 ^(a)	4.4	4.5 ^(a)	4
Poland		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Portugal		2.4	3.2 ^(a)	4	4.5 ^(a)	5	4.6 ^(b)	11	13.4	5.6
Finland		7.5	8.4	8.6	8.9	9.5	10.7	11.5	11.7	12.9
Sweden		30.8 ^(a)		28.1 ^(b)		22.5		25.3		29.6
United Kingdom		21.5	21.5	22.3	22.7	23.6	24.8 ^(a)	24.6 ^(a)	23.3 ^(a)	23.3

In the US PPS 35.7 in 2009

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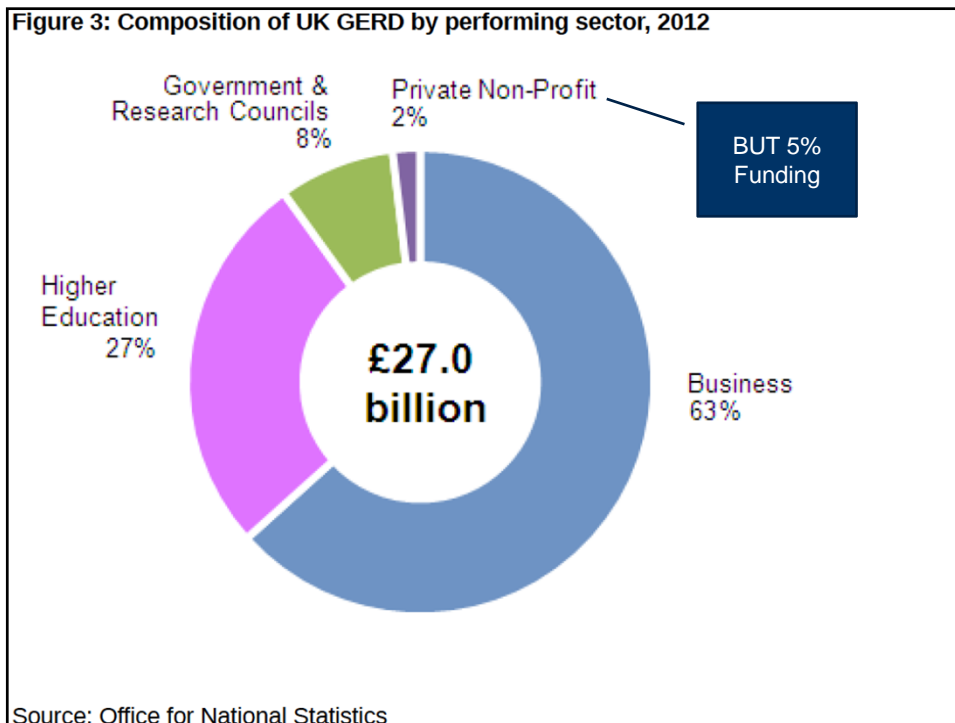
Performers of R&D funded by PNP

TIME: 2011
 SECTFUND: Private non-profit sector
 UNIT: Purchasing Power Standard (PPS) per inhabitant at constant 2005 prices

GEO	All sectors	Business	Government	HE	PNP
European Union (28 countries)	7.2	0.7	0.8	4.1	1.7
Euro area (17 countries)	5.2	0.6	0.9	1.7	1.9
Denmark	29.6	1.4	1.5	24.7	1.9
Germany (until 1990 former territory of the FRG)	2.9	1.5	1.5		
Ireland	2.3	0.1	0	2.2	
Greece	1.3	0	0	0.4	0.8
Spain	1.7	0.3	0.4	0.8	0.2
France	4.5	0.1	0.8	1.3	2.4
Italy	8.7	0.4	0.8	1.4	6.2
Netherlands	21	2.5	2.8	15.7	
Austria	4	0.5	0.2	4.0	1.3
Poland	0.3			0.1	
Portugal	5.6	0	0.1	1.1	4.4
Finland	12.9	0.3	1.4	7.3	3.9
Sweden	29.6	1.6	1.5	25.5	1
United Kingdom	23.3	1.9	0.9	17.6	2.9

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The UK PNP sector



R&D in PNP - UK

- The not-for-profit sector includes (but not only) registered charities and trusts that specialise mainly in health and medical research. Among the largest cancer research charities in the world; the Wellcome Trust is particularly important.
- Also: library and archive activities, botanical and zoological gardens and nature reserve activities, engineering and design activities and technical testing and analysis.

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Survey (census) R&D PNP

- Survey (census) based collection in 2012; next 2014 (biannual). Previous estimates from various sources, the prior survey was in 2005 with 2003 as the reference year.
- In 2010-2011 two waves to identify PNP R&D performers contacted approx. 690 potential performers.
- New identifications and previously known performers (esp. in health-related fields) accounted for about **200 organizations.**

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Survey (census) R&D PNP (2)

- The target response rate is 92% and for the non-responders, imputation is used.

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The Italian PNP sector

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PNP sector in Italy

- Census of PNP organizations in 2012 (2011)
previous in 2002 (2001).

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PNP sector in Italy 2001-2011

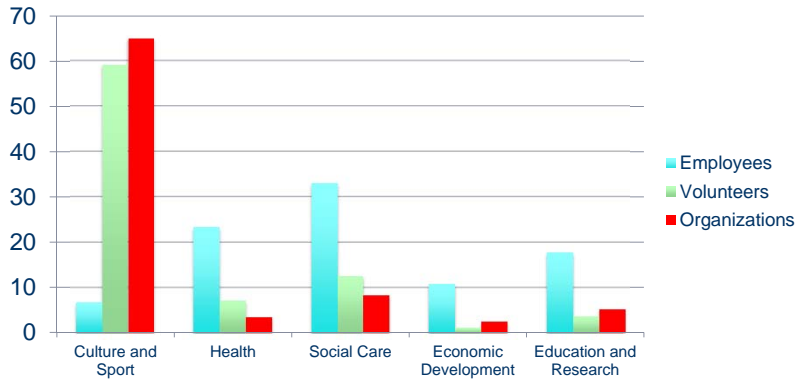
- 300k Organizations +28%
- 4.7M Voluntary workers +43.5%
- 680K Employees +38,4%
- 270K External paid workers + 169%

(Census PNP, ISTAT, 2012)

1/3 Mutual Assistance
2/3 Public Utility

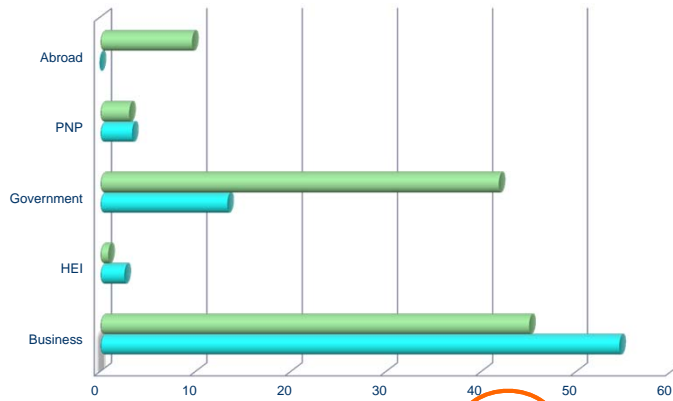
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Activity sector and resources, 2011



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GERD Italy, 2011



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	Business	HEI	Government	PNP	Abroad
Funded	45.1	0.9	41.9	3.1	9.7
Performed	54.6	2.6	13.4	3.4	0

R&D in PNP – Italy (1)

- Survey (census) of **363 institutions** that potentially can do intra-mural or extra-mural R&D. Identification made in 2008-2010 based on a survey and included organizations that have received tax donation (0.5% of income tax) for research.
- Survey implemented in 2013 (2011); 68,6% involved in R&D.
- Annual census survey.

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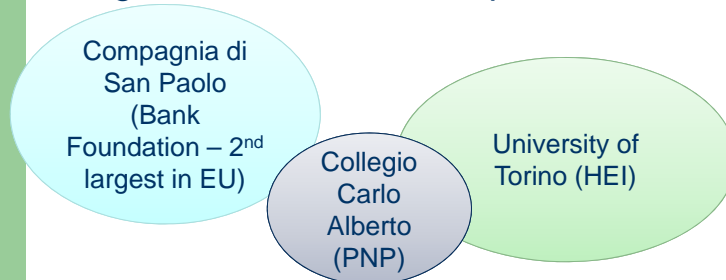
R&D in PNP – Italy (2)

- Very detailed survey with special information collected for Biotech, Nanotech and Energy research.

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PNP as performer – Private Research Organizations

- Cooperatives between HEI and PNP to create PNP research (and teaching) organizations. The example of Turin



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Digitalization of PNP in Italy: An Example

- Microsoft Italy has allocated EURO 5 Million donation in software support to Italian PNP in 2014 (2 millions already allocated to 370 organizations);
- From very simple solutions to complex innovative systems such as in the case of the cooperative group CGM for social enterprise that has created a new digital platform for sharing and archiving information on managing and innovation in social entrepreneurship (from 2k to 40k users).

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Measuring R&D/Innovation in public services and administration

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Public sector in EU

- National public services (can include):
education, research (PROs), healthcare,
communication services, water, transport,
- Public administration: e-government (EU,
national, regional, municipal)

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Public sector innovation (service innovation) measurement

- Service innovation (the introduction of a new service or an improvement to the quality of an existing service);
- Service delivery innovation (new or altered ways of supplying public services);
- Administrative and organisational innovation (changes in organisational structures and routines);
- Communication innovation:
-

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Public sector innovation (service innovation) measurement

- Innobarometer 2010 and 2012 : survey to measure innovation in public administration EU27, Norway and Switzerland;
- Pilot exercise European Public Sector Innovation Scoreboard (EPSIS) 2013;
- OECD discussion to introduce innovation in public sector in the OSLO manual (February, 2014 meeting);
- Particular interest in use of ICT and service innovation.

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R&D (software innovation) in the provision and management of nonprofit services.

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How to view and identify R&D activities in PNP services

- Service innovation (software based):
 - ✓ By service providers such as health, social security, etc.... Digitalization and continuous innovation in service provision (software innovation)
 - ✓ Extra-mural R&D funders (foundations). Innovation in the management of funds allocation
=> People involved in the development and management of the system are in part involved in R&D activities;

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How to view and identify R&D activities in PNP services

- Quality, usability, user experience, etc., all are aspects of inventive and innovative efforts in intangible service industries. Personnel engaged in efforts to plan and realize these improvements are R&D performers.
- These activities fuse the roles of research scientist, product designer and production engineer. Now we have computer scientists and engineers collaborating in the production of intangible new digital services.

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Criteria for identifying R&D in services (Frascati, 2002):

- Links with public research laboratories.
- The involvement of staff with PhDs, or PhD students.
- The publication of research findings in scientific journals, organization of scientific conferences or involvement in scientific reviews.
- The construction of prototypes or pilot plants.

→ **Incomplete and obsolete**

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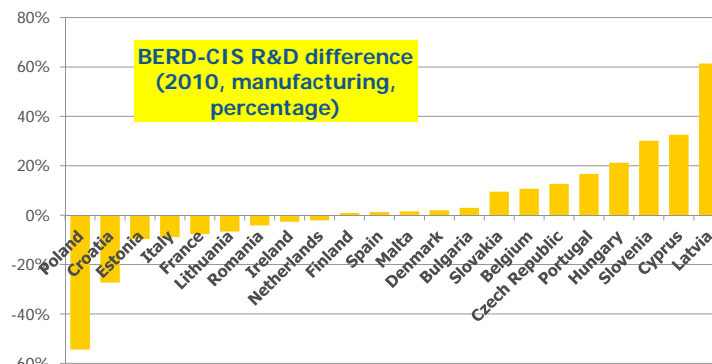
Oslo manual and CIS survey

- Oslo manual 1992, 1996, 2005, current discussion on updating. Measurement of innovation activities.
- Community Innovation Survey (CIS): CIS1 1992 CIS7 2010. First two rounds different surveys for manufacturing and service industries since CIS3 only one survey for all industrial sectors.
- Includes much more than innovation through traditional R&D: service innovation, organizational innovation, marketing innovation.
- Ongoing revision.

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Integrated use of R&D data: Users' and producers' dilemma

BERD (Frascati), Annual, all NACE industries, no size threshold
CIS (Oslo), selected NACE industries, 10 employees or more, sample



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Frascati manual and measurement of R&D challenges

- Frascati was formulated first for application to invention and innovation in manufacturing, then updated for high-tech industries and services, and will need further updating for the new digital service provision in PNP but also in PA and Business.

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R&D in the 1950s



R&D in the 2000s



R&D in the 20 ... s

