OPERATIONAL PLANS (REGIONAL POLICY) AND RIs

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Basic facts – 1

Big differences in GDPs and GERDs of EU27

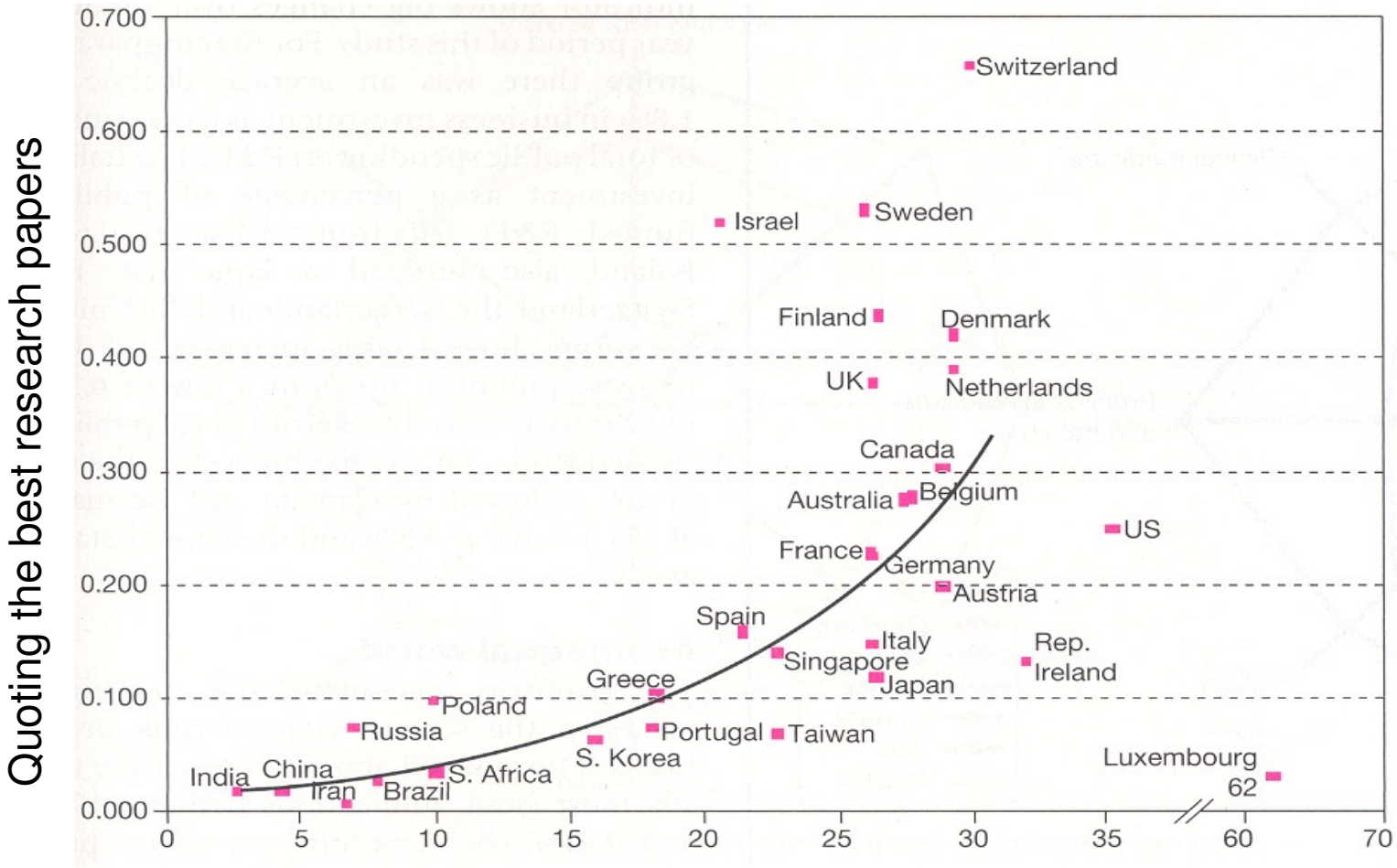
GDP per inhabitant varied by 1 to 7 across the EU27 Member States

Based on first preliminary estimates for 2007, Gross Domestic Product per inhabitant expressed in Purchasing Power Standards (PPS) varied from 38% to 276% of the average across EU27.

Country R&D expenditure in EU27 (mln euro in 2006) varied by 1 to 2000.

GERD ranging from 58 231 (Germany), 37 983 (France), 31 828 (United Kingdom) to: 191 (Lithuania), 112 (Latvia), 62 (Cyprus), 28 (Malta).
In the case of Poland: 1 513.

Comparison of economic situation and scientific achievements



Gross national income per resident (thou. USD)

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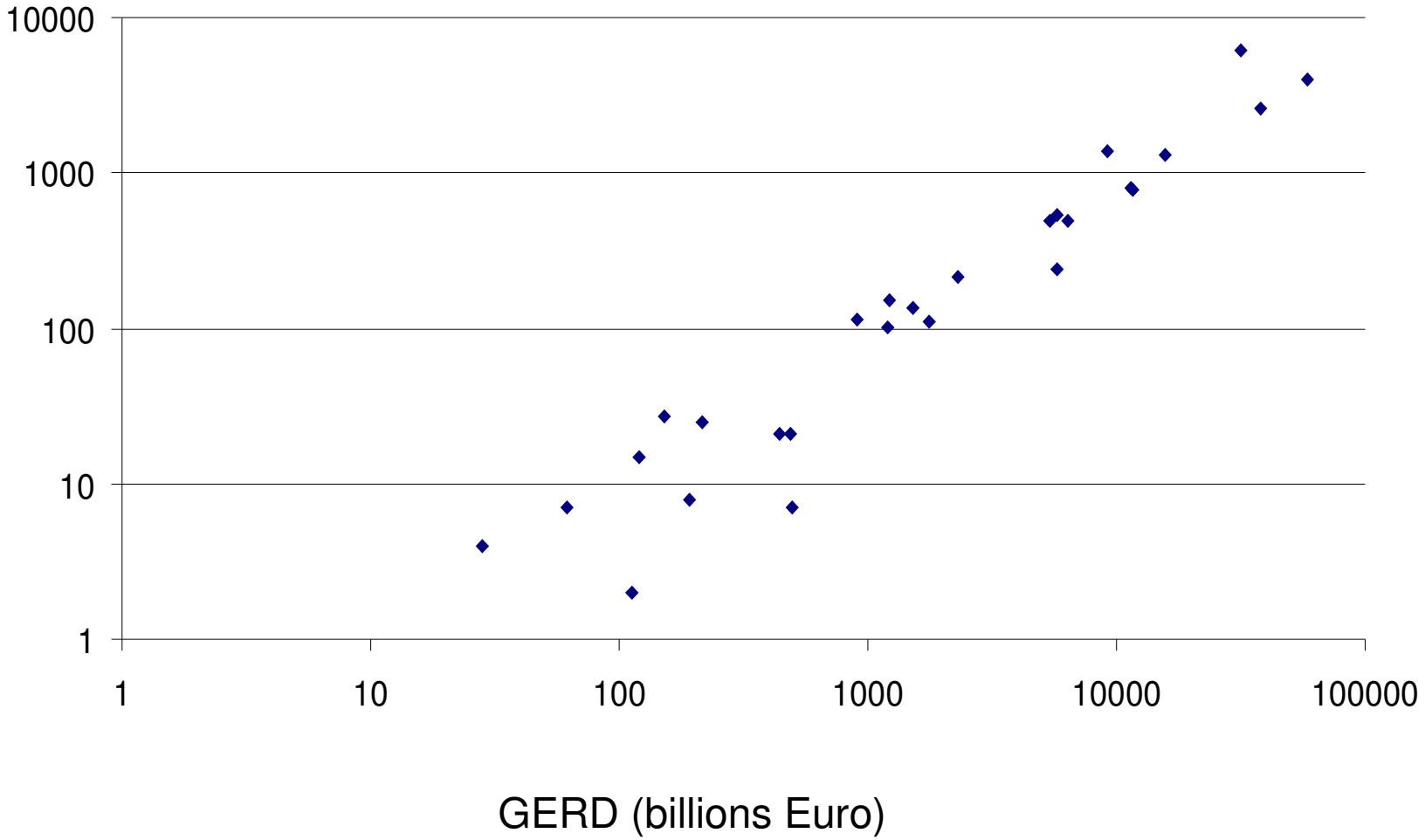
Number of ***Science*** and ***Nature*** publications vs **GERD** of a given EU country



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Basic facts - 2

- **Linear correlation between GERD and a number of *Science* and *Nature* publications. Thus, the excellence criterion (on a individual scale) turns into a GERD criterion (on a national scale).**

- **Excellent scientists (publishing in *Science* or *Nature*) are in each EU country. EU countries that are small and/or less intensive in science produce 25% of all *Science* and *Nature* publications with EU affiliation. Regional excellence.**

3. Small and/or less intensive in science EU countries provide ca. 30% of FP7 budget.

How to ensure full participation of small and/or less R&D intensive countries in pan-European infrastructural programmes?

Two solutions have been proposed:

6. **Involve small and/or less research intensive countries in distributed pan-European facilities. Most of ESFRI Roadmap 2008: *1. Biological & Medical Sciences, 2. Social Sciences & Humanities, 3. Environmental Sciences* infrastractures are of a distributed nature.**

9. **Develop regional partner facilities. But questions regarding: a/ do they include big and research intensive partners? b/ are they limited to meta regions? c/ what will be their future in 5 years?**

Polish Roadmap of RIs

Polish strategy

Parts of the Roadmap:

- **existing research infrastructure in Poland *(upgrade of selected existing RIs),***
- **international research infrastructure *(collaboration),***
- **infrastructural projects to be financed from structural funds *(preference for multidisciplinary projects),***
- **ESFRI 2008 Roadmap projects with Polish involvement *(preference for distributed infrastructures),***
- **research facilities for ESFRI Roadmap 2010 or 2012 to be proposed by and, preferably, build in Poland *(preference for multidisciplinary projects)*.**

Polish Roadmap of RIs

a/ Existing research infrastructure in Poland:

- **most important and valuable facilities**
  e.g. P4 laboratories of the The National Veterinary Research Institute in Puławy, Animal Facilities of Medical University in Bialystok, research vessels, cyclotrone, radiotelescope...,

- **Polish scientific stations abroad**
  e.g. Spitsbergen, South Shetlands Archipelago...,

- **modern university campuses with a relatively strong research infrastructure component**
  e.g. Ochota campus in Warsaw, Jagiellonian University campus in Cracow, Wrocław campus, Poznań-Morasko campus.

Polish Roadmap of RIs

Existing infrastructure

Polish Polar Station
Hjorsund fjord, Spitsbergen, since 1957

The Station, operating year-round,
carries out research in various branches of geophysics and the study of polar environment. Thanks to its unique location, high-tech labs and equipment, the Station has been recognized as the European Marine Biodiversity Flagship Site and has been chosen by NASA and WMO as their permanent measuring facility.

Polish Roadmap of RIs

b/ International research infrastructure

Polish membership in frontier science, international infrastructures, e.g.: CERN, SALT, ILL...

Polish Roadmap of RIs

c/ Infrastructural projects to be financed from structural funds

- **Operational Programme Innovative Economy**
- **A few projects, chosen by a multidisciplinary panel of experts**

Implementation: 2007 – 2013

Total estimated costs: 685 000 000,00 €

Polish Roadmap of RIs

c/ Infrastructural projects to be financed from structural funds

- **Centre for Preclinical and Technological Research CePT, Medical University of Warsaw, Ochota Campus, (2007-2013, 100 mln €);**
- **Lower Silesian Centre for Materials and Biomaterials, Wrocław Campus, (2007-2013, 140 mln €);**
- **Centre for Advanced Materials and Technology, Warsaw University of Technology (2007-2013, 100 mln €).**

Polish Roadmap of RIs

d/ ESFRI Roadmap projects with Polish involvement – financial contribution from the state budget

Projects selected by a multidisciplinary panel of experts:

EuroBioImaging, EURO-ARGO, CLARIN, COPAL,

ELIXIR, ESSource, XFEL, FAIR and others.

Polish Roadmap of RIs

e/ research facilities to be planned by and build in Poland *(preference for multidisciplinary projects)*

- **Expected recommendations: 2 large-scale research facilities (proposal for ESFRI Roadmap 2010 or 2012)**

Polish Roadmap of RIs – some ideas for future ESFRI road maps

Center for Physics of Cold Atoms and Light

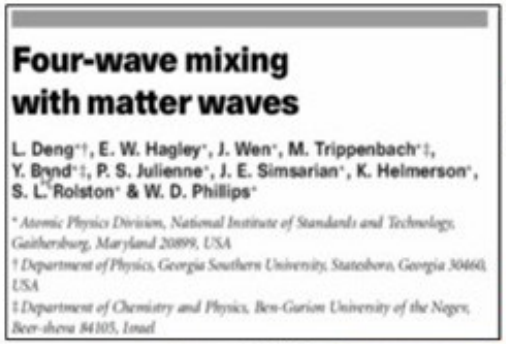
- **Goals**
  - to create a national platform for exchan of experience and training in the fields quantum optics, cold atoms physics an quantum information (in general: quant manipulations of atoms and photons)
  - to become creative element in Europea Research Area (ERA) and represent Pola in European and other international consortia and research programs
  - To become a partner and theoretical counterpart for National Laboratory for Atomic, Molecular and Optical Physics

- **Participants**
  - Center of Theoretical Physics - Polish Accademy of Sciences
    - Prof. Ivo Białynicki Birula
    - Prof. Kazimierz Rzążewski
    - Prof. Mariusz Gajda
  - University of Warsaw
    - Prof. Krzysztof Wódkiewicz
    - Prof. Marek Trippenbach
  - Jagiellonian University – Krakow
    - Prof. Jakub Zakrzewski
    - Dr Jacek Dziarmaga
    - Dr Krzysztof Sacha
  - Institute of Nuclear Studies
    - Prof. Eryk Infeld
  - University of Bialystok
    - Prof. Mirosław Brewczyk

Polish Roadmap of RIs – some ideas for future ESFRI road maps

Research highlights and future plans

- **Achievements**
- **Consolidating key players (scientists working in the field of quantum engineering in Poland)**
- **Forming of internationally recognized scientific groups in nonlinear atom optics and quantum optics and classical field approxiamtion for bosons at nonzero temperature**
- **Publishing (over last 3 years) around 100 scientific papers, including ca 40 in Phys. Rev. Lett and Nature.**
- **Creating an impact on students by organizing conferences and workshops**


Four-wave mixing with matter waves

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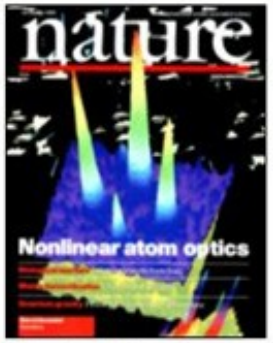

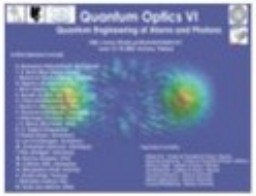

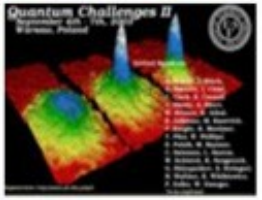

Planned activity:

- **Conferences and workshops (up to three month long)**
- **National and international research projects**
- **Short- and long-term scientific visits**
- **Cooperation with National Laboratory for Atomic, Molecular and Optical Physics and other National Centers mentioned in this presentation**
- **Exchange visits of the PhD students between groups**
- **Awards for the best students and young scientists**
- **Integrating the national scientific community**

Conclusions

- Science progress in economically and financially diversified Europe necessitates various criteria and instruments;

- *Individual Excellence* criterion promotes big and rich EU countries so far. ***Regional excellence*** criterion can reveal huge potential of smaller and poorer EU countries. **Regional infrastructures** (on ESFRI Road Map) should correspond to them;

- Decision-making process concerning the localization of ESFRI infrastructures or ERC's *IDEAS* ranking should be oriented towards the compromise based on these both criteria.