“Recherche sans frontières” when science turns global

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Outline

- National science policies in post –war Europe: “Recherche avec frontières”
- The EU’s attempts at creating a European Research Area: dead ends and new departures
- The global science challenges of the 21st Century: “Recherche sans frontières”

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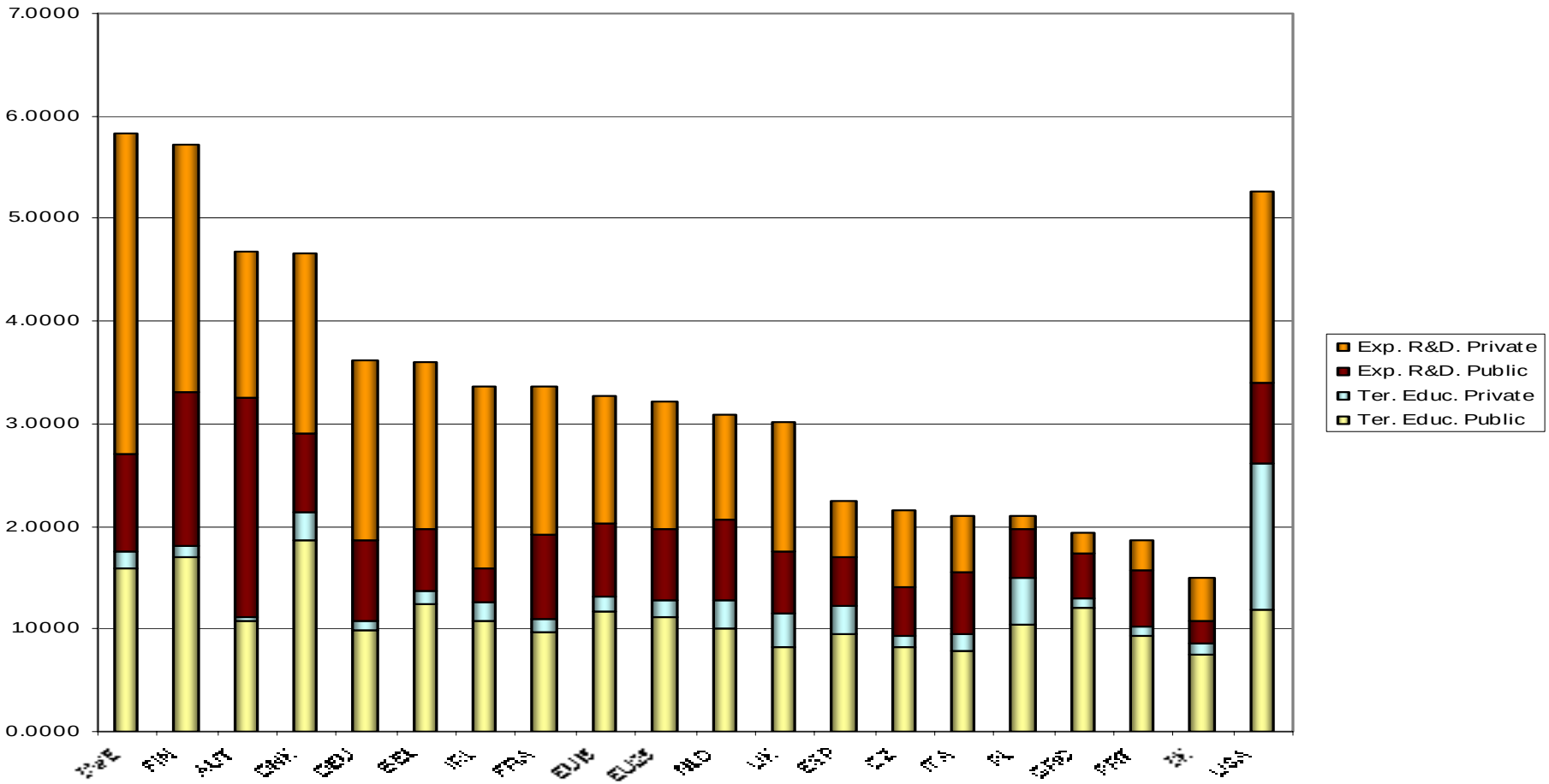
1. Many European diagnoses…

- Post-war Europe research characterized by a phenomenon of what I have called a **Dutch "knowledge" disease**.
  - Crowding out of fundamental research in private R&D,
  - Crowding out of applied research in university research
- Core European problem is one of lack of private knowledge investment
  - Reliance on public funds justified in continental and Northern European countries from perspective of equal access and progressive income taxation
  - However, over the 90's the tax burden has been significantly reduced for both businesses and high income citizens
- With "free" access to public knowledge, result has been an overall increase in inequality
  - Unique opportunities for catching up in private knowledge investment (example of equity funds interest in EU firms)
  - Need for tuition debate as in UK

Europe's research landscape

- Figures highlight that the European research landscape is far from homogeneous: some countries such as SE, CH, FI, DK, even DE seem to outperform the US on the basis of the 2006 Innovation Scoreboard
- Regional knowledge strongholds based on specialisation do exist throughout Europe, much like the situation in the US with concentration in East and West coast
- European initiatives, such as the ERA, ERC, EIT are an illustration of the disarticulated nature of S&T policy in EU with national, sometimes regional policy prerogatives, fragmentation, lack of critical mass and limited scope for EU action within current Treaties.
- History of European institutions involving higher education not promising: yet most significant progress through voluntary agreements (Erasmus, Bologna) on the basis of national reforms

Total knowledge investments



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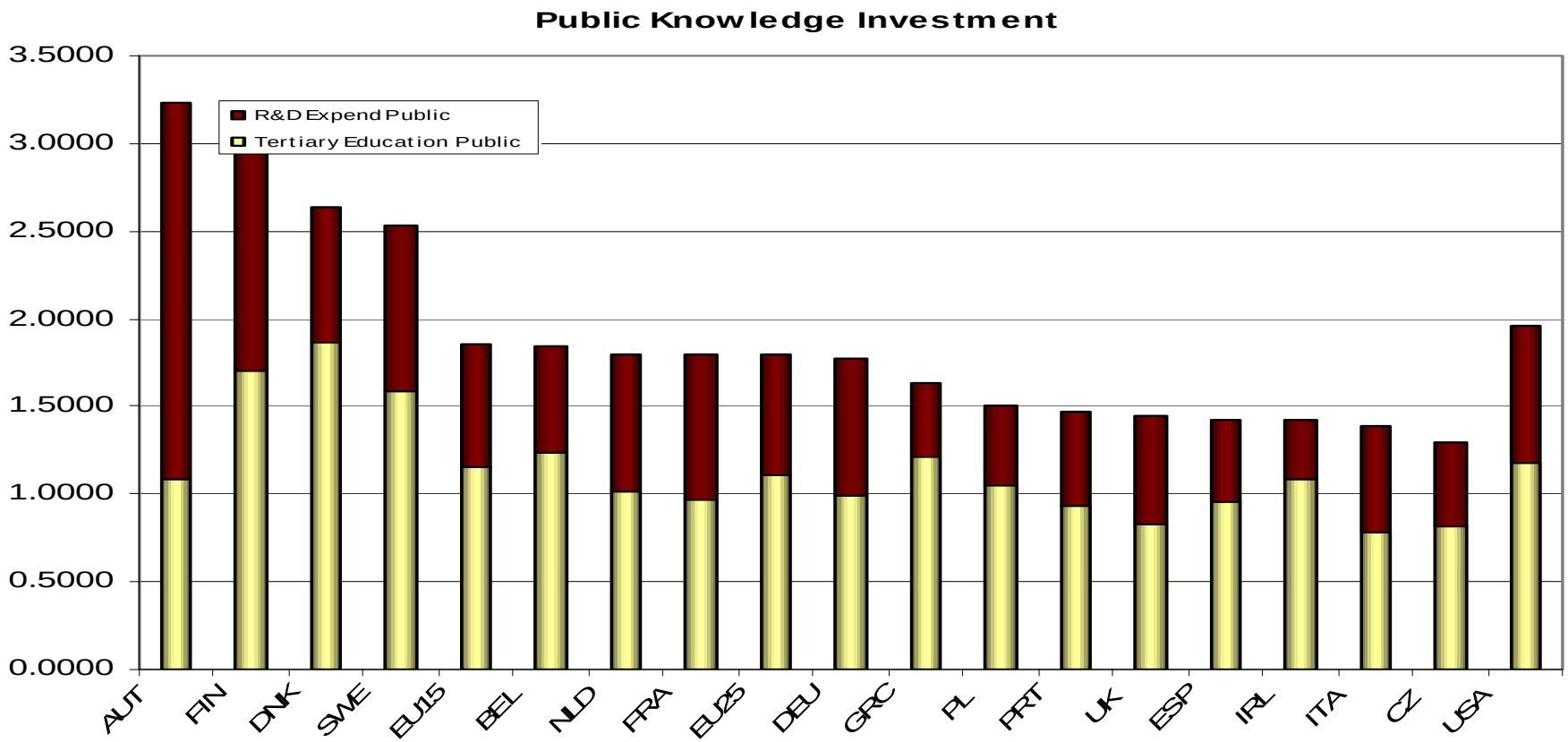
Public knowledge investments



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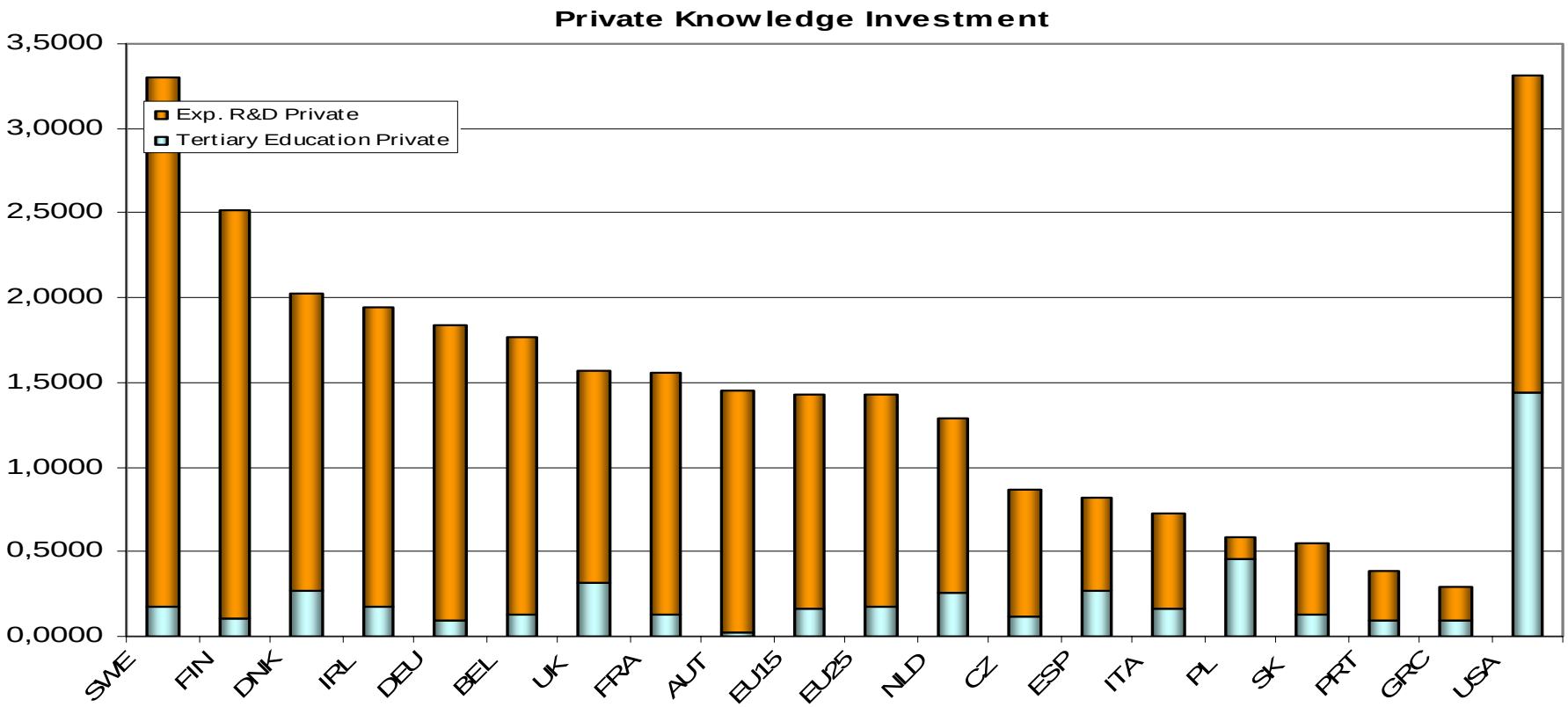
Private knowledge investments



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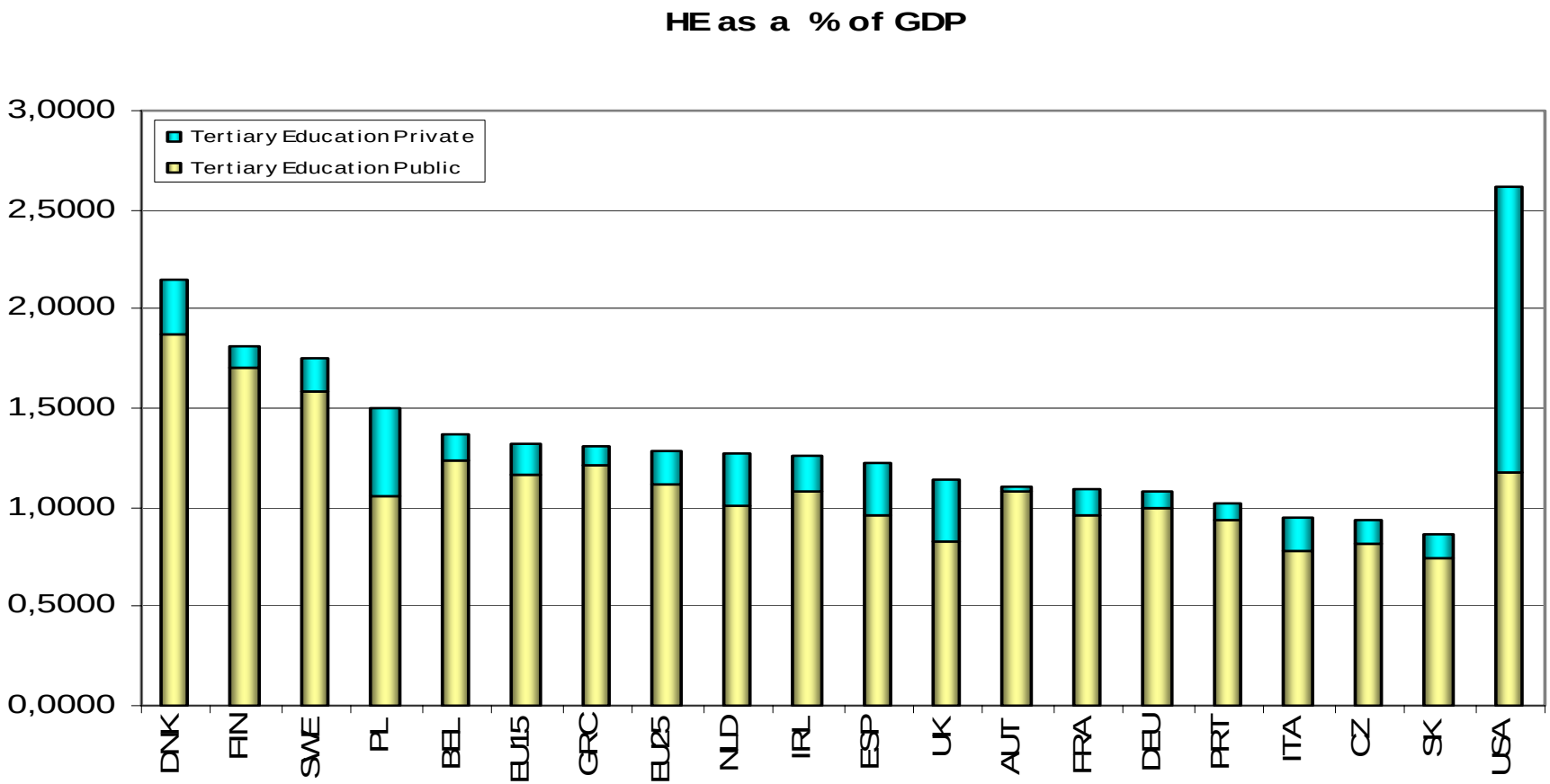
Higher education investment



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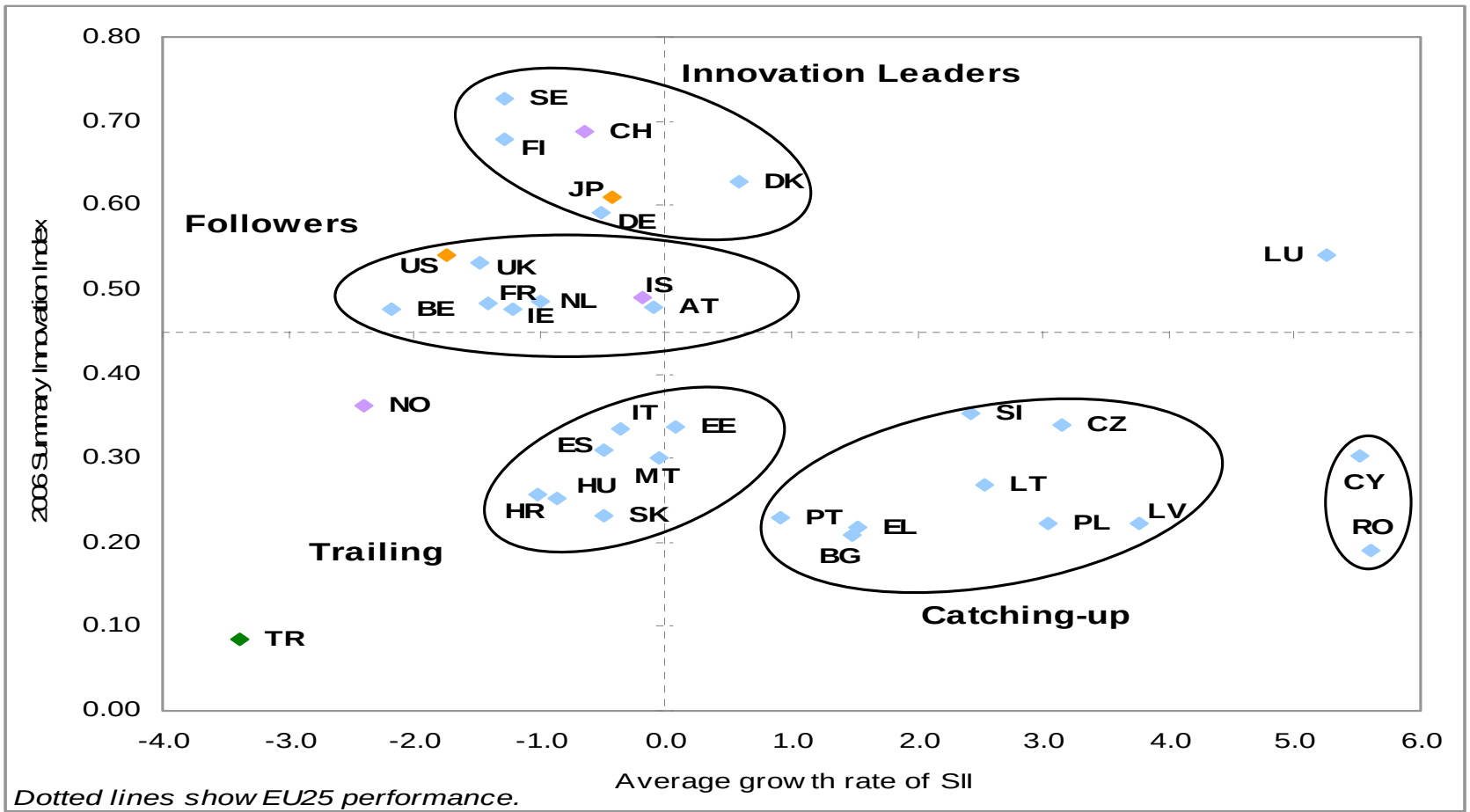
Innovation Scoreboard 2006



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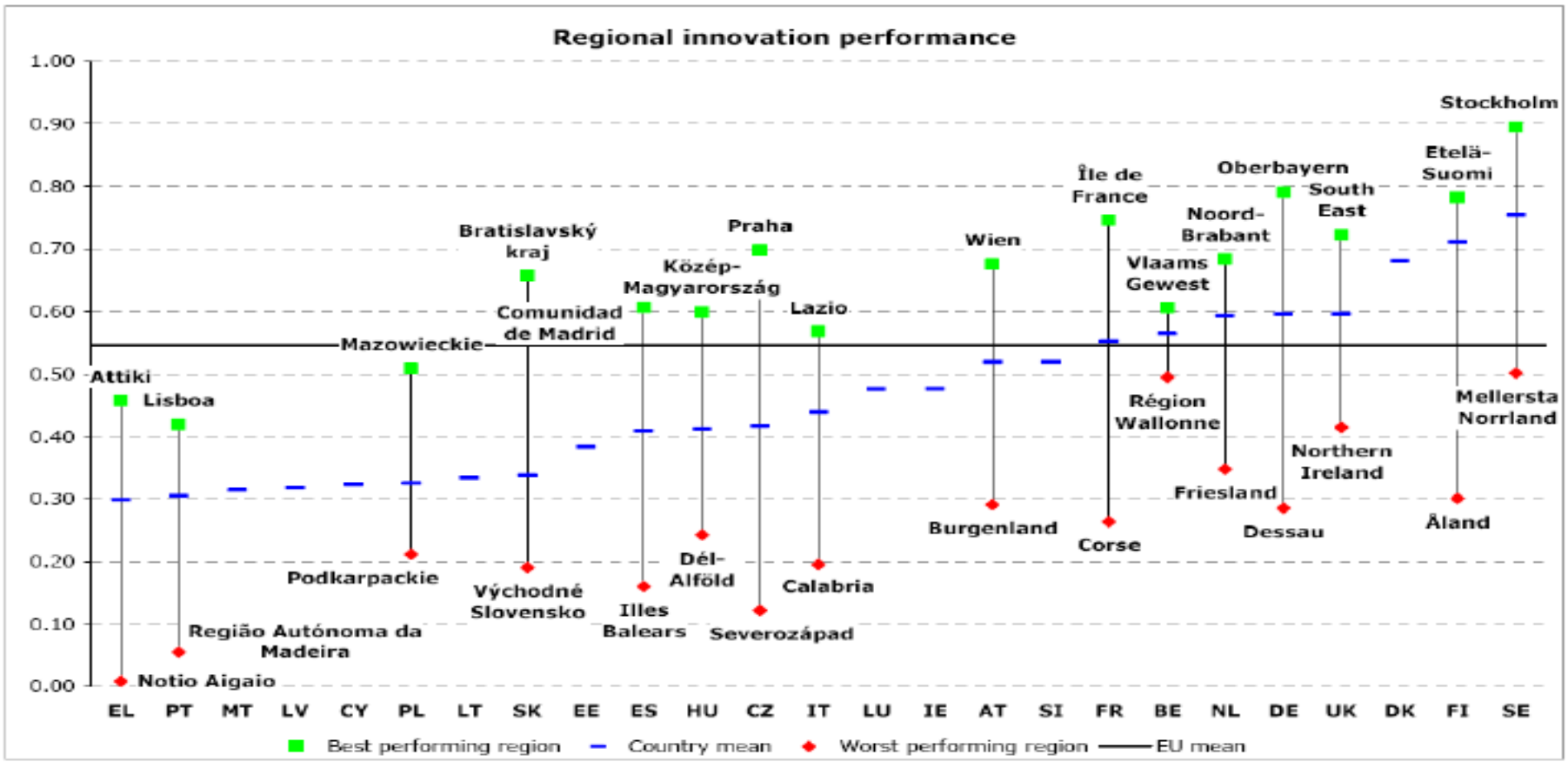
Regional Specialisation



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2. Europe's basic research challenges

- More concentration of research (not more students): 200 US research universities, how many in Europe?
- More differentiation (e.g. focus on graduate students)
- Increased autonomy and selectivity in admissions (US and Asian examples)
- More inter-disciplinarity and changing mindset of students and staff
- More flexible employment regimes

However,

- Many are very good; solid performance in top 100, few in top 20
- Many examples of good collaboration with industry

At policy level,

- Action up to universities and national or regional governments
- At European level: funding agencies (ERC as new initiative but strongly independent form EC)

Research outside universities

- Europe has many high quality large multilateral research organisations: CERN, ESA, EMBL…, and national organisations: CEA, Max Planck Gesellschaft, TNO, IMEC, Fraunhofer
- Also large variety of small national institutes: need critical mass, mergers, closer links to universities. *National, regional governments to act*
- Envy of Europe not US FFRDCs, but Silk, Cold Spring Harbor, Scripps, Woods Hole..
  - Closely linked to university; strong graduate programmes
  - Physically concentrated
  - 150-400 faculty
  - Strong Technology Transfer
  - Funding largely from federal agencies
- European level action:
  - Funding ('ERCs')
  - Public, transparent performance evaluation: follow up 'Busquin' assessments
  - How to create 'Cold Spring Harbors'?

Institutional support for innovation

- Attractive large-scale cooperative schemes (are about to) exist: EUREKA Clusters, Joint Technology Initiatives. EIT would compete for companies, people etc
- Companies in e.g. micro-electronics (MEDEA+ EUREKA Cluster) have strong view on research landscape: high-quality university centres, few (3) large scale institutions to bridge gap between university research and in-company R&D. EIT would not add, worse compete
- National, regional (DE, SE, FR, FI, CH, UK, Flanders, Catalonia, .) policies promoting innovation cover standard elements (VC, incubators…) but focus increasingly on regional concentrations of players as a basis for (inter-)national coalitions
- Examples (Flanders, NL, Austria, Germany) of strategic partnerships between public and private research in structural strategic partnerships emphasize critical mass and geographical concentration

3. The mutual globalization and localization of knowledge

- Globalization of S&T: importance of international access; of exchange of codified knowledge, global scientific communities where knowledge is shared.
- But at the same time strong localization of knowledge: knowledge appears a “joint” production factor (codified and tacit knowledge) subject to different local increasing returns and global access features
- As a result a significant world wide increase in basic science knowledge hotspots:
  - Agglomeration effects in knowledge increasingly at the level of tacit knowledge accumulation, hence crucial importance of universities
  - Up to now US and to a lesser extent other Anglo-Saxon universities (Canada, Australia, UK) have acted as global attractor poles for international scientists and engineers

Different national science policy challenges

- Three broad categories of policy challenges:
  - For high income countries, such as Japan or the EU, the policy challenge is one of the sustainability of Schumpeterian dynamism
  - For emerging economies (BRIC), the policy challenge appears more linked towards the design of “technological competitiveness” policies
  - For developing countries, the policy challenge will have to focus on the disarticulated knowledge systems: including the design of pro-poor innovation policies within e.g. context of agriculture and rural development
- These are only though accents: e.g. particular relevance of technological advance as a cumulative process for emerging economies (BRIC), today maybe less for developed countries?

With one common feature: A2K

- A2K is essential at all levels of development:
  - With respect to global issues the list is increasing day by day: food, health, climate change, environment, energy, safety;
  - With respect to local issues such as water management, transport, logistics, urban mobility, migration, innovation and entrepreneurship, etc.
  - The complexities of the problems imply a more open innovation process, involving many players: public, private, local, national, international.
  - In all those areas the old policy obsession with national technological competitiveness appears outdated. One witnesses the coming to an end of geographically determined technological competitiveness…

Conclusions:

global sharing of knowledge as new source of innovation

- The global dimensions of “collaborative innovation” can go hand in hand with the huge concentration of R&D efforts in the US, Japan and the EU with the BRIC countries catching up
- Such physical concentration will need increasingly to address global welfare problems and demands:
  - In this sense the most important long term enabling factor of OECD countries’ over-concentration of R&D is in enhancing A2K
  - Not just access to the required knowledge but also to the tools to replicate and improve upon knowledge
  - Access not as passive consumption but as right and ability of participation: as a factor enlarging the resource base of potential innovators

But also:

Local sharing of knowledge as new source of innovation

- New private BoP innovation policies:
  - From large foreign companies (development through profits) to social entrepreneurship
  - Link with micro-financing and access to knowledge
- New forms of strategic alliances with public sector and NGOs
  - Private challenges of pro-poor innovation policies:
    - it is expensive to be poor
    - it is expensive to service the poor
  - Private sector to some extent follower with NGOs as the identifier of innovation niche opportunities
- Role of local public sector in setting the fences of the commons in nature but also in innovation, in creative commons