

Can the efficiency of the public research system be measured ?

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- *"A more open research system" NOU 2011: 6 , delivered May 2, 2011*
- *Establish **indicators for "results"***
- *Relate these to **use of resources***
- *Measure **efficiency**/productivity*
- *Suggest **changes** in the distribution of resources that might improve efficiency*
- *Special emphasis on **basic research**, research with a long time horizon and **doctoral education** ("competence building"): higher education sector*

Measuring the efficiency of public sector research



What to measure

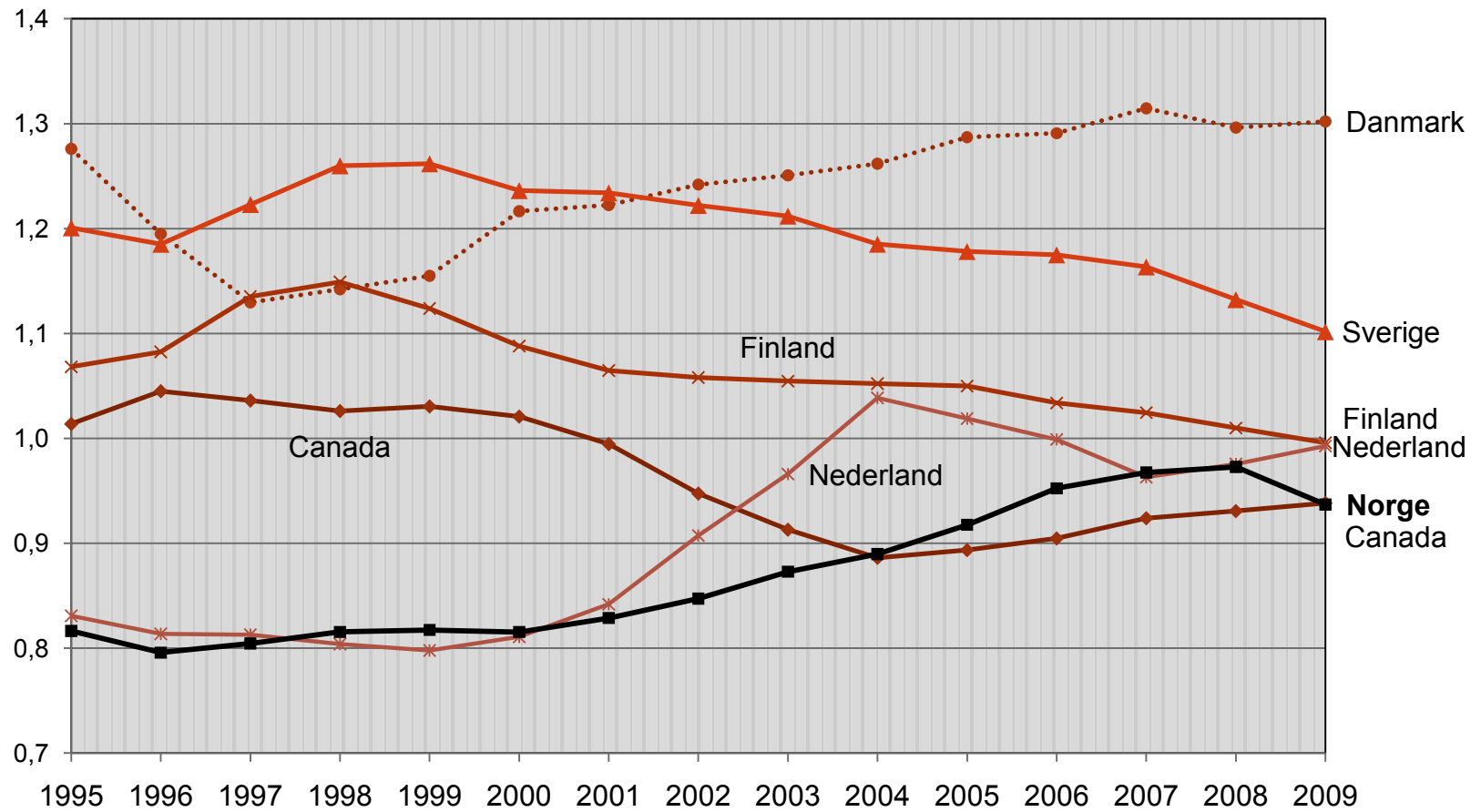
- Quantity?
- Quality? Use by the research community (citations)?
- Use in society at large? (social returns) – important but difficult to measure in precise way (more research needed)
- Education of researchers/phd (absorptive capacity)
- Internationalisation
- Efficiency – relate results to resources (R&D as defined by the OECD) – with a lag!

How (pilot-project)

- Quantity: Two databases, “Cristin” (everything) and ISI Web of Science (journal articles)
- Quality (citations): ISI Web of science (articles)
- How to adjust for differences between different areas in science? A methodological innovation
- PhD production (rel to labour force)
- Involvement in EU research, cross-country co-authorship in research
- Compare Norway with other “similar” countries

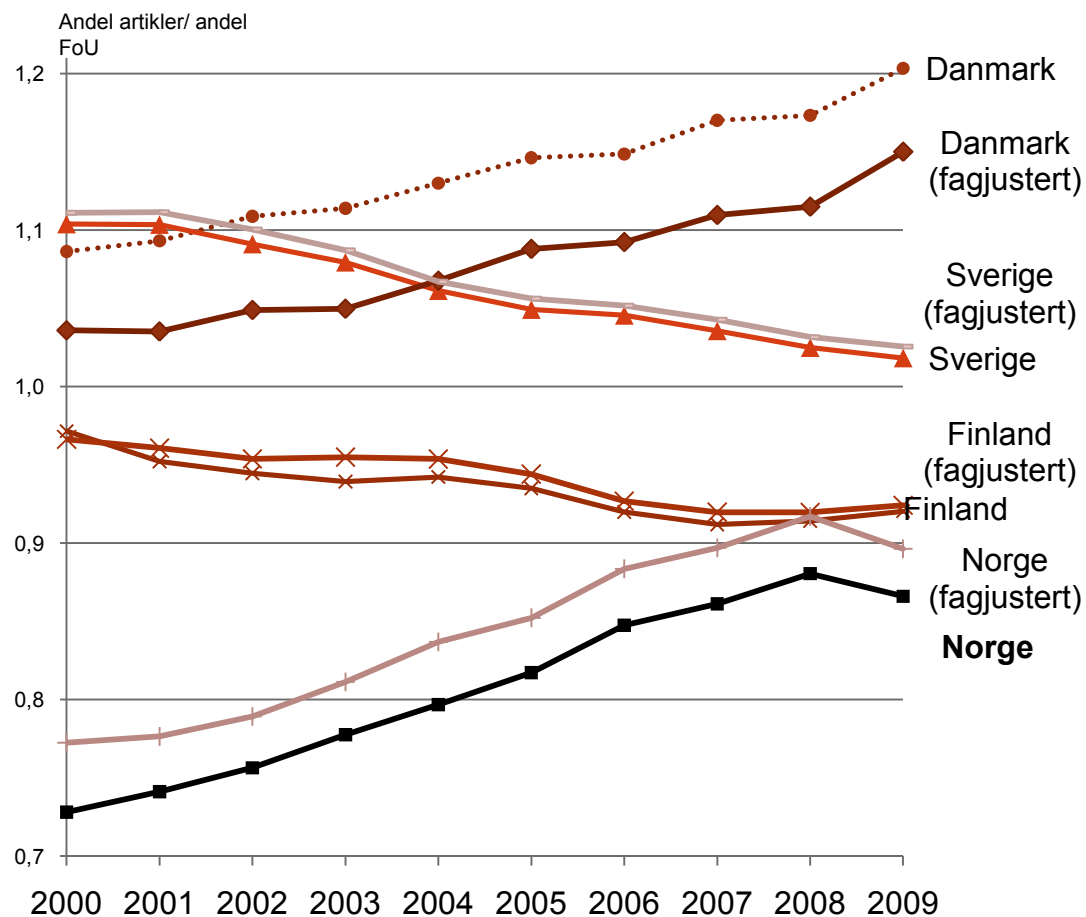
**Result: A “barometer” for the efficiency of public sector research –
A tool for everybody, not just an instrument for control ...**

Research production (articles) relative to public R&D expenses, selected countries



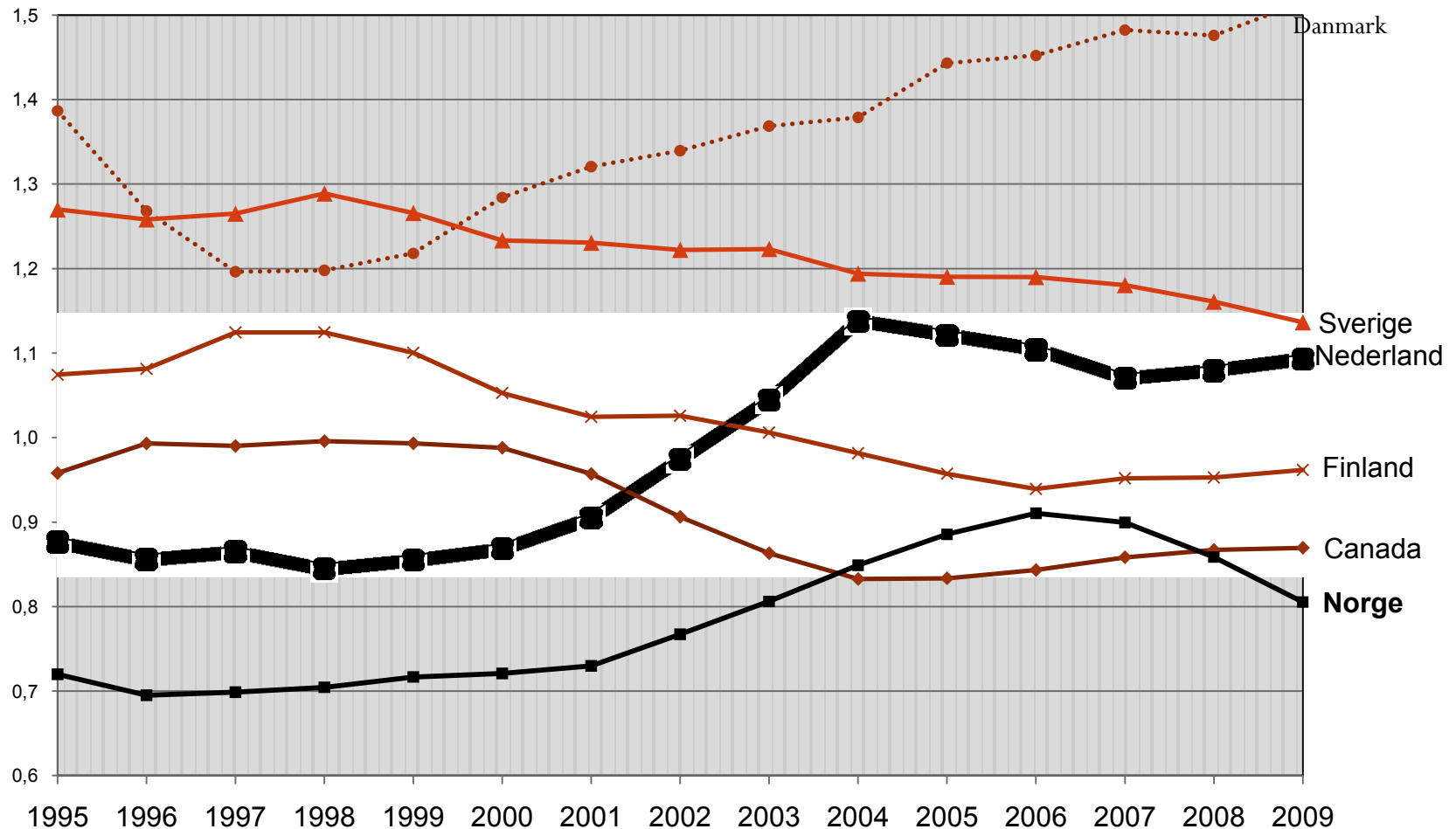
Source: Calculations based on data from ISI Web of Science and the OECD

Differences in composition of expenses do not explain a lot



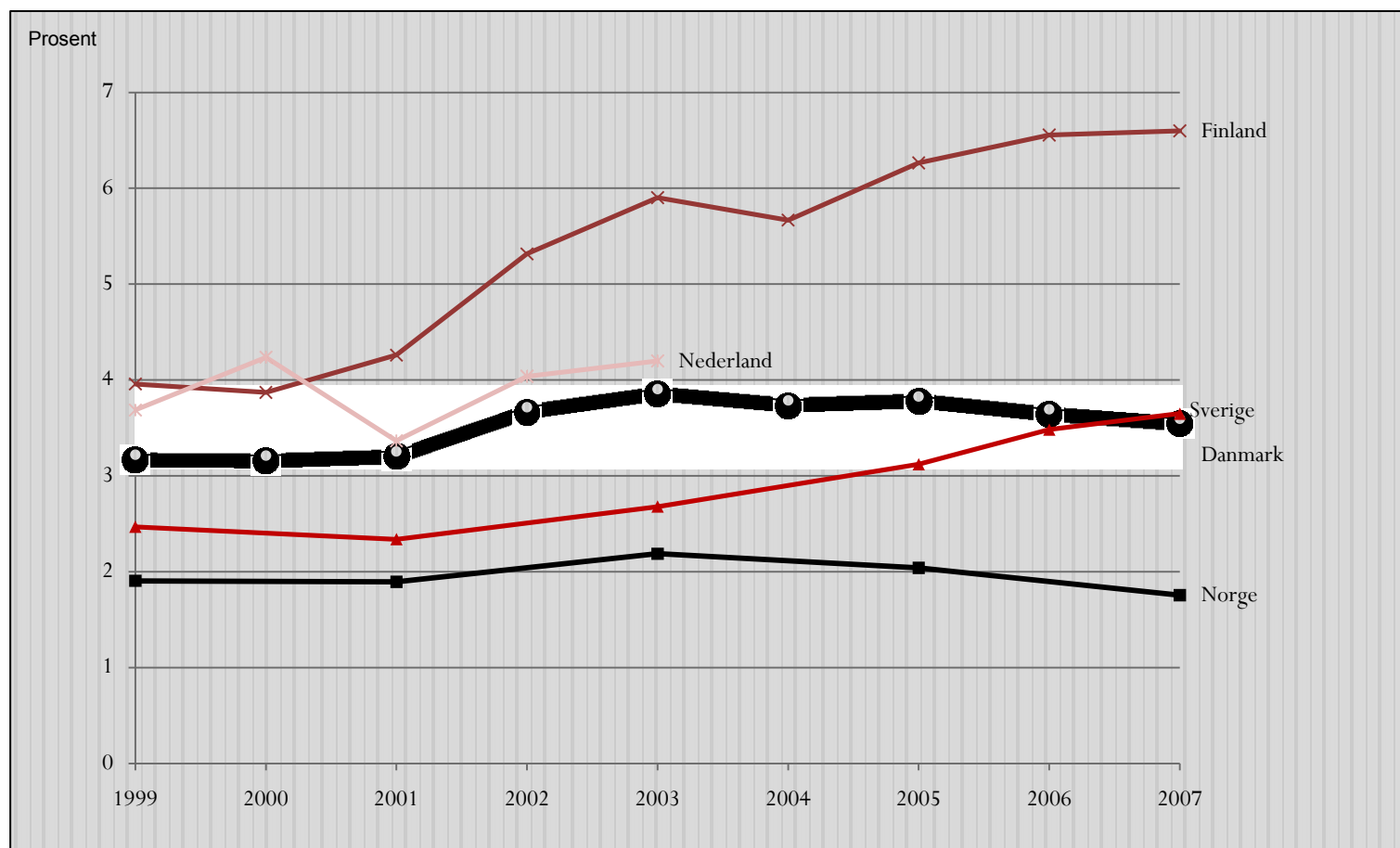
Source: Calculations based on data from ISI Web of Science and the OECD

Citations relative to public R&D expenses, selected countries



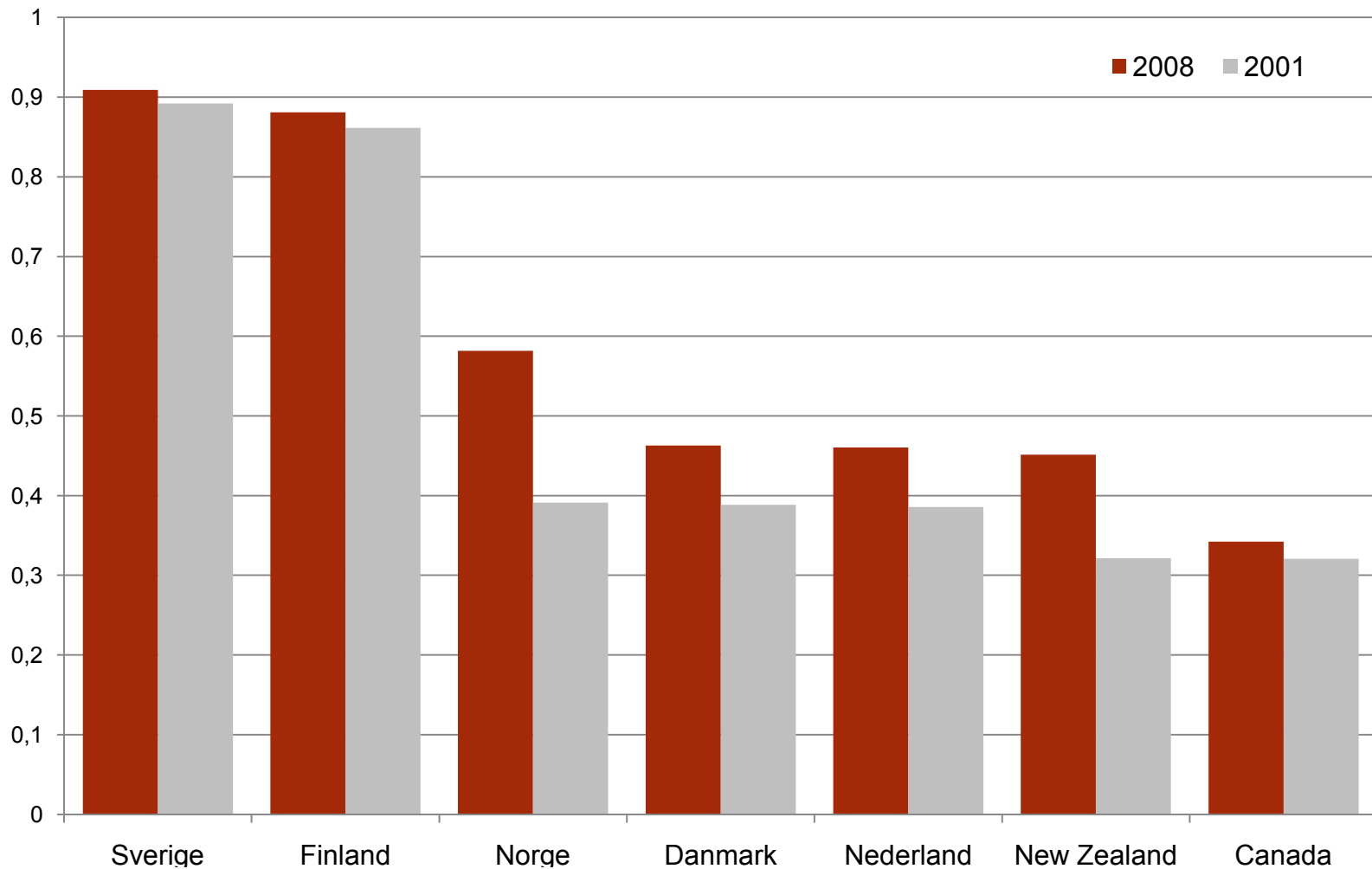
Source: Calculations based on data from ISI Web of Science and the OECD

Internationalisation: R&D support from the EU as a percentage of public R&D



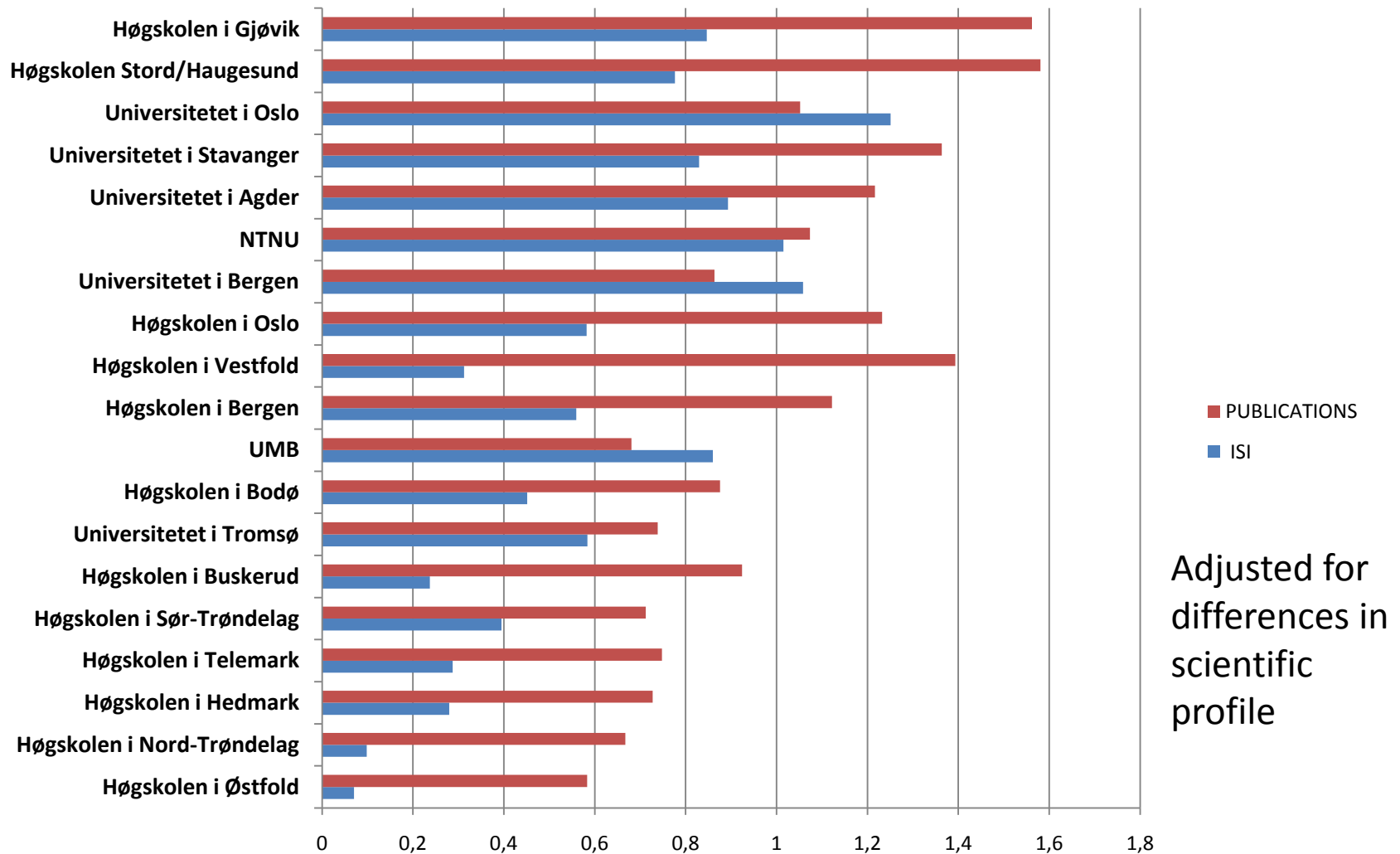
Source: Calculations based on data from NIFU and the OECD

New PhDs per thousand employed , 2008 og 2001



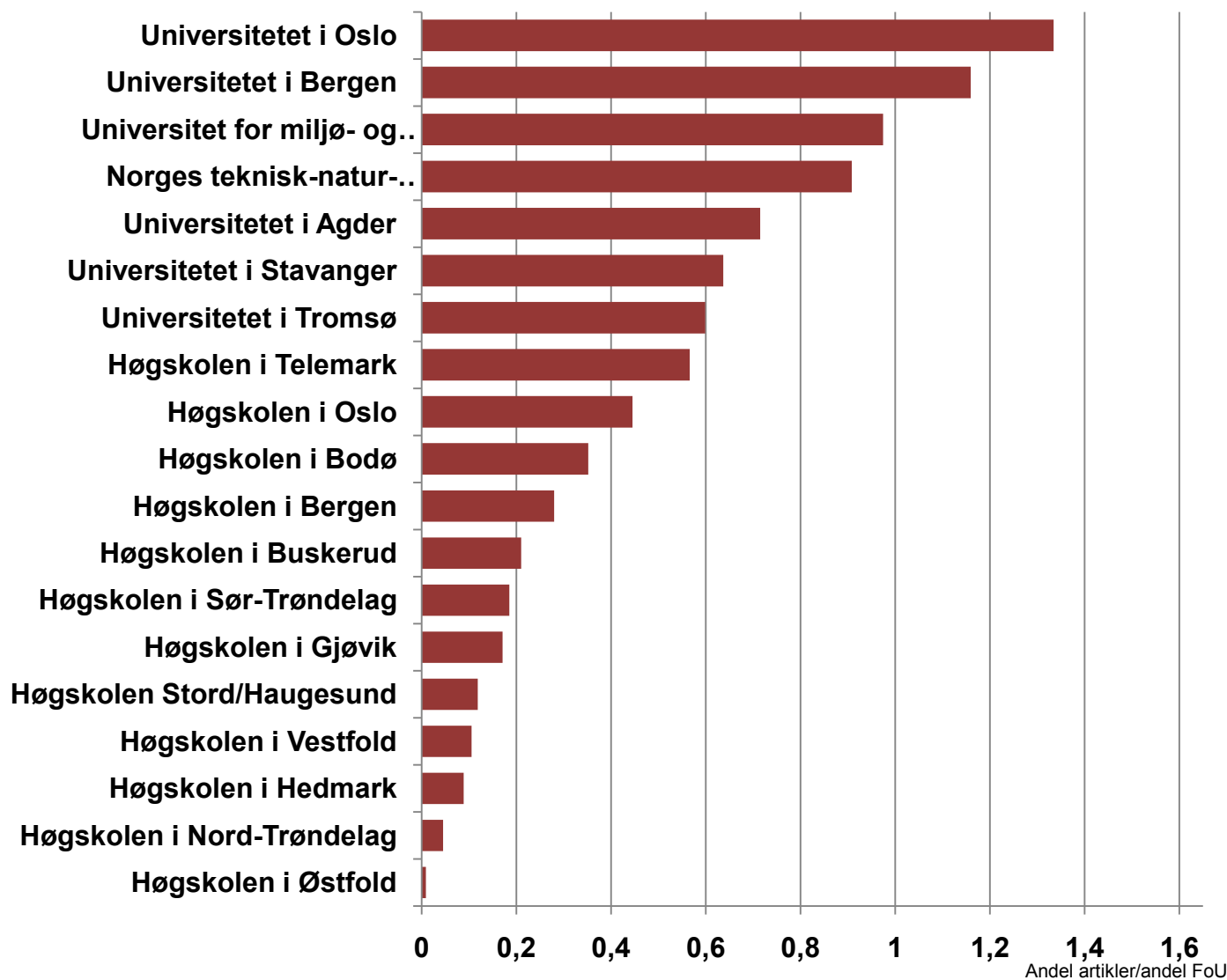
Source: Calculations based on OECD(ISCED 6)

Norway: Big differences in research productivity (publications and articles (ISI) relative to R&D expenses)



Source: ISI Web of Science, Statistics Norway and DBH (Cristin)

And even more so for citations (relative to R&D expenses)



The “barometer”: still some way to go for Norway ...



Some **general** lessons:

- Much of what we wish to measure is **difficult** to measure (with **precision**)
- Need for **more research and better indicators of social and economic effects** of publicly financed research (OECD take the lead?)
- But production, scientific use and **productivity/efficiency** of publicly funded research can be measured
- Would be easier if **international R&D statistics are improved** (more comparable and divided into humanities, social science, natural science, technology etc.)