



Connections between university research funding, publication performance and impact of research

Comparison of five countries

Otto Auranen¹, Laura Himanen¹,
Mika Nieminen², Hanna-Mari Puuska¹

13th Nordic Workshop on Bibliometrics and Research Policy
Tampere 11-12 September 2008

Auranen, Himanen,
Nieminen & Puuska
11 September 2008

- 1 Unit for Science, Technology and Innovation Studies, Institute for Social Research, University of Tampere, Finland (e-mail: name.surname@uta.fi)
- 2 Innovation Policy Research and Impact Assessment of R&D, Innovation Studies, VTT Technical Research Centre of Finland (e-mail: name.surname@vtt.fi)



Background

- tightening global economic competition
- rise of knowledge-intensive economy
- ideas of the New Public Management
- > current science policy priority in Western countries:
universities' efficiency in knowledge creation
- > university steering based on performance monitoring and competition
- universities are resource-dependent organisations
- > funding incentives widely used as steering instruments
- no clear picture of long-term benefits and impacts of funding incentives for university research productivity



Research questions

1. What is the development of university research funding in five OECD countries: Australia, Finland, the Netherlands, Norway, and the UK?
2. How competitive are the funding environments of university research and what is the development of competitiveness of funding in the compared countries?
3. Has the university sector become more efficient in producing scientific publications and gaining citations in countries where the funding environment is competitive?



Methodology 1: indicators of development and competitiveness of research funding

A. Universities' research funding

Data: HERD 1991-2006 (OECD), document data
(national sources and OECD)

B. Input-output orientation of government direct research funding

Data: document data (national sources)

C. Share of internal research funding

Data: structure of HERD 1991-2006 (OECD)



Methodology 2: output indicators

A. Publications¹ per country's higher education sector R&D expenditure

Data: HERD (OECD) and publication counts³ (ISI WoS) 1991-2006

B. Country's higher education sector's share of OECD² publications

Data: publication counts (ISI WoS) 1987-2006

C. Country's higher education sector's share of OECD citations⁴

Data: citation counts (ISI WoS) 1987-2006

1 publications=articles, reviews and letters in scientific journals

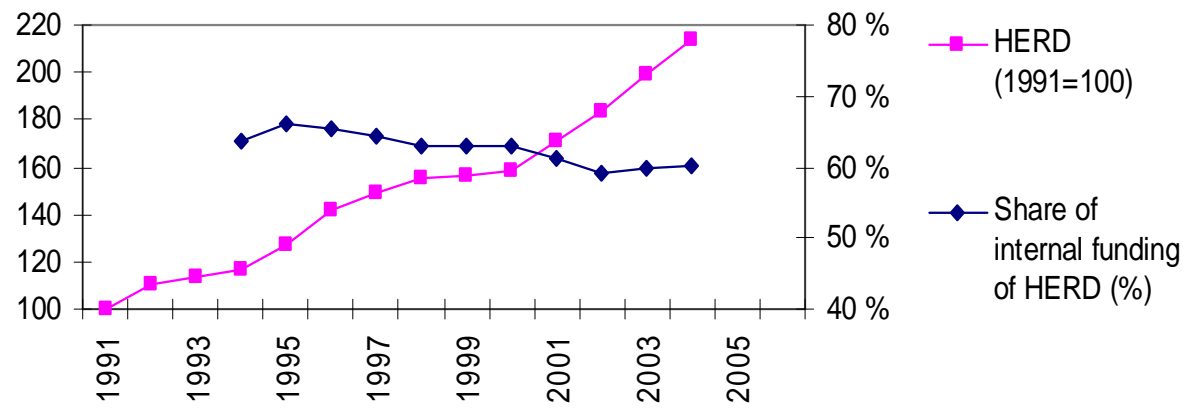
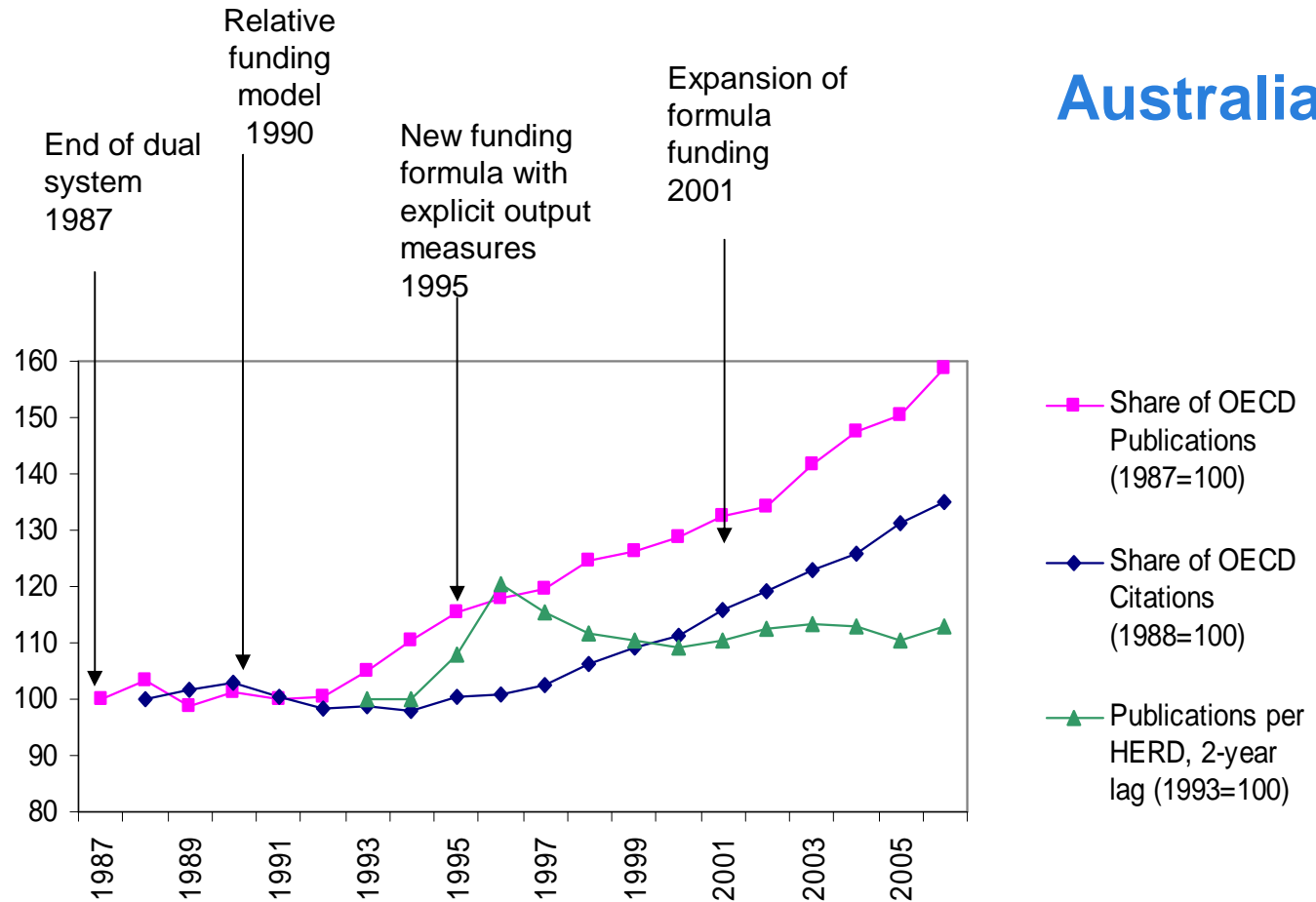
2 OECD=OECD15 excluding the US

3 unfractionalized counts

4 citations to publications published in 1987-2006

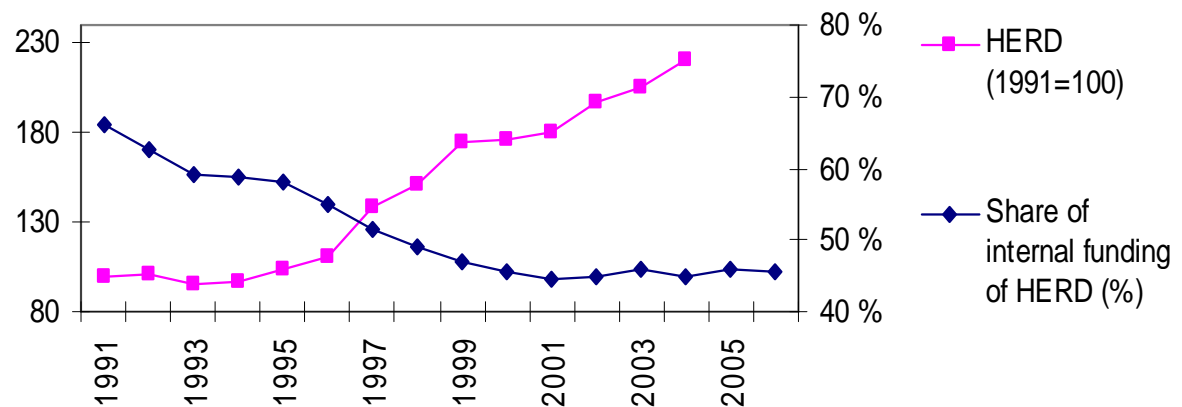
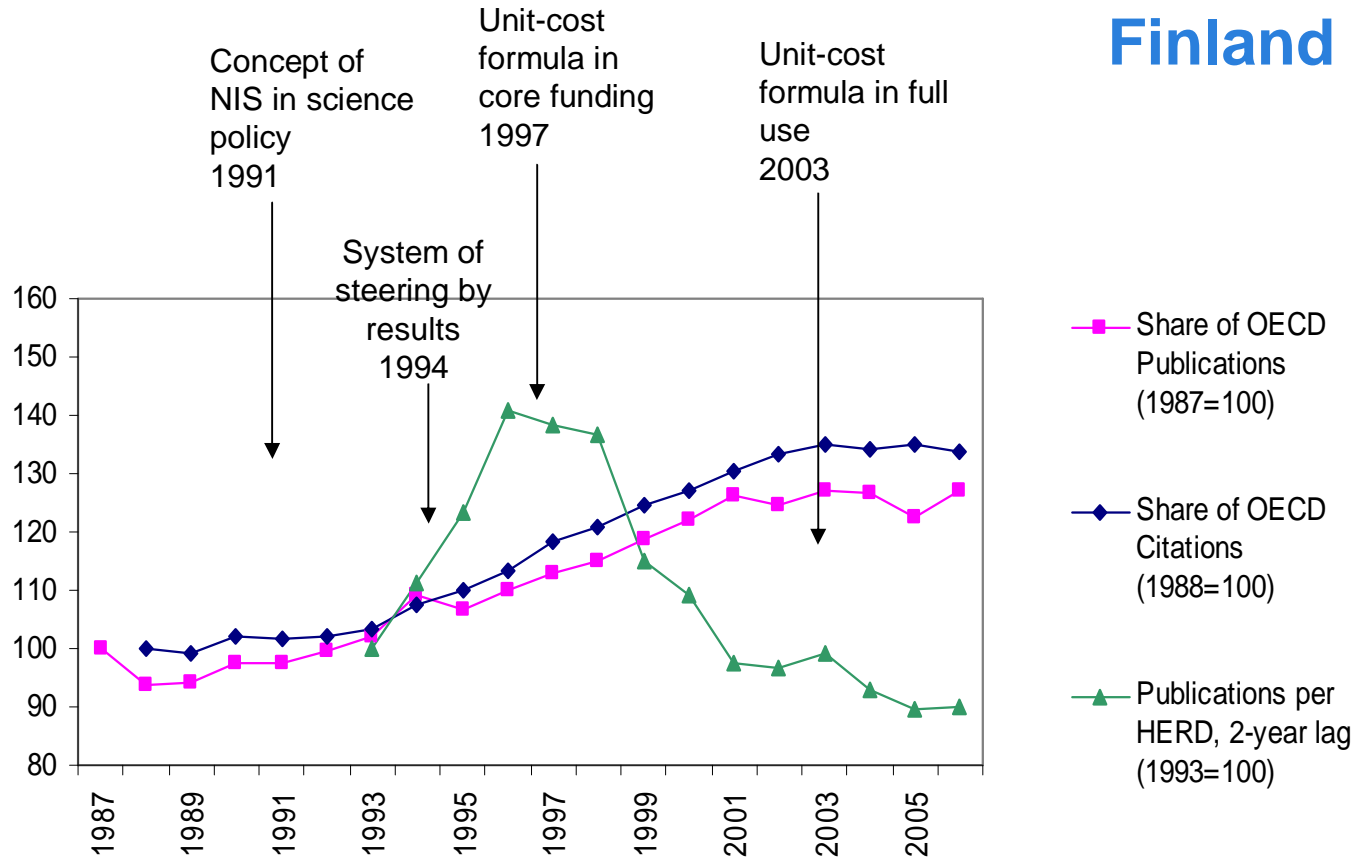


Australia



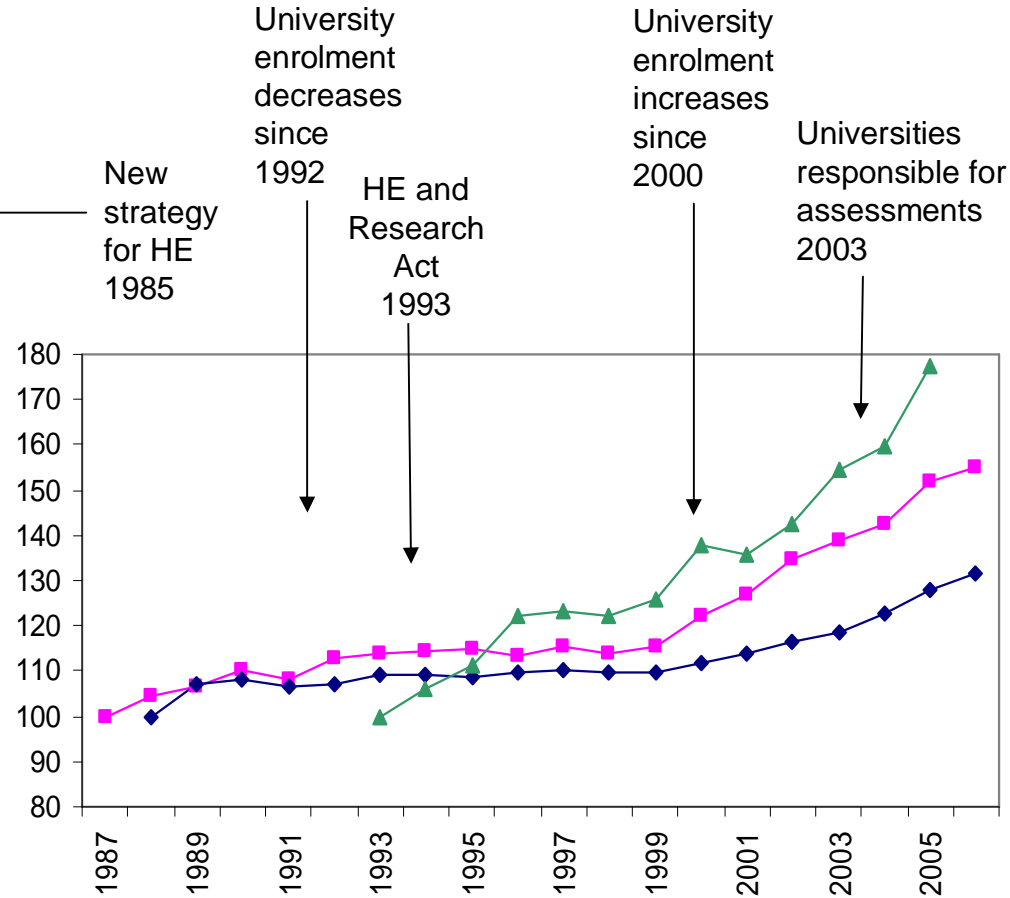


Finland

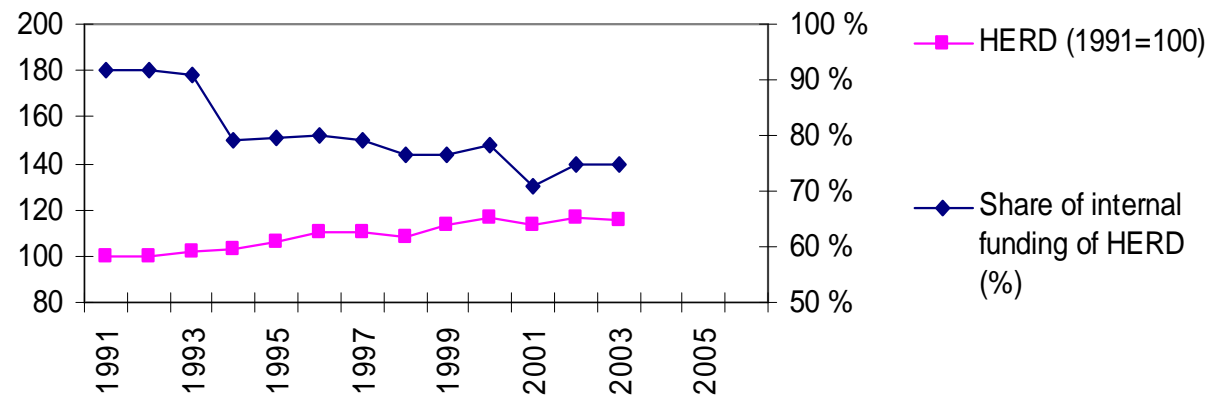




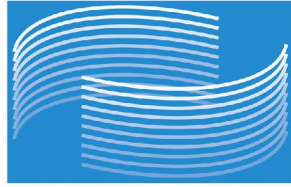
Netherlands



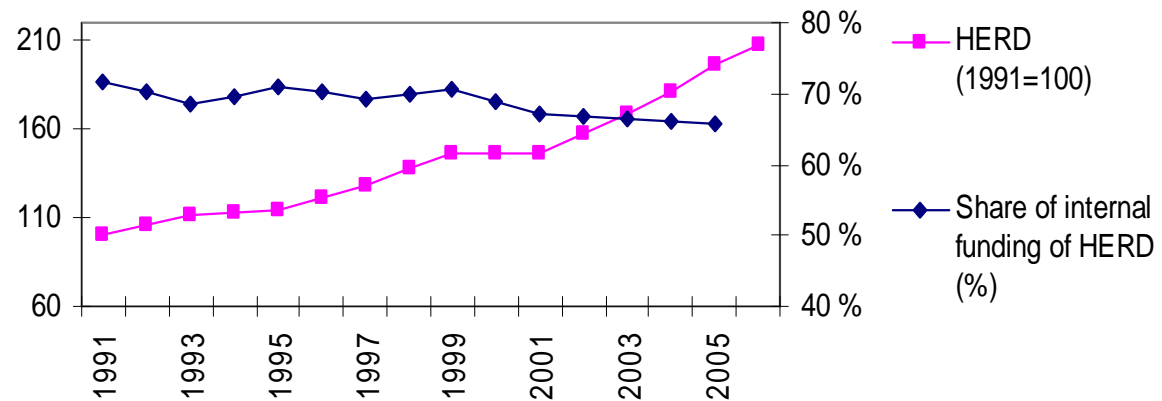
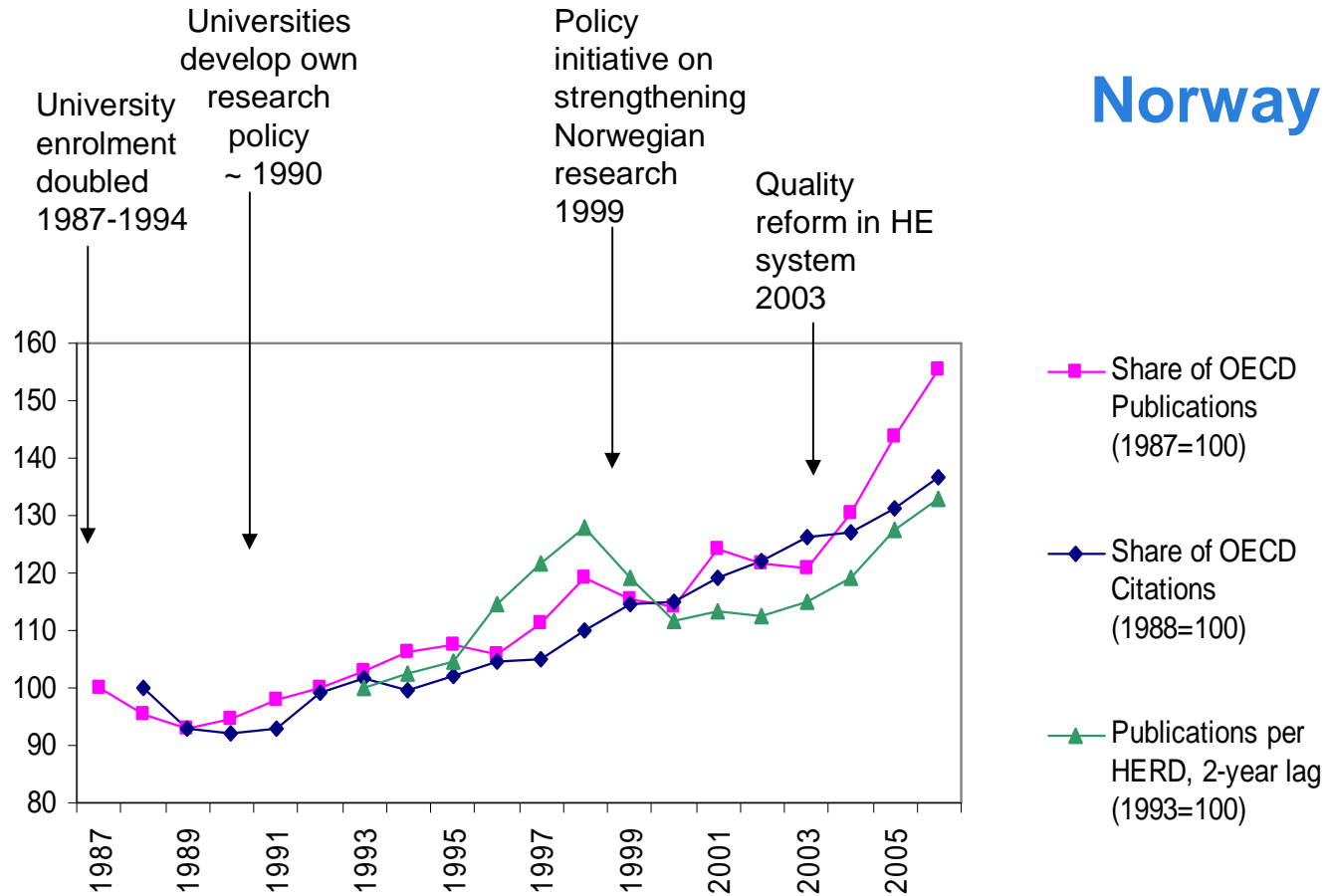
- Share of OECD Publications (1987=100)
- ◆ Share of OECD Citations (1988=100)
- ▲ Publications per HERD, 2-year lag (1993=100)

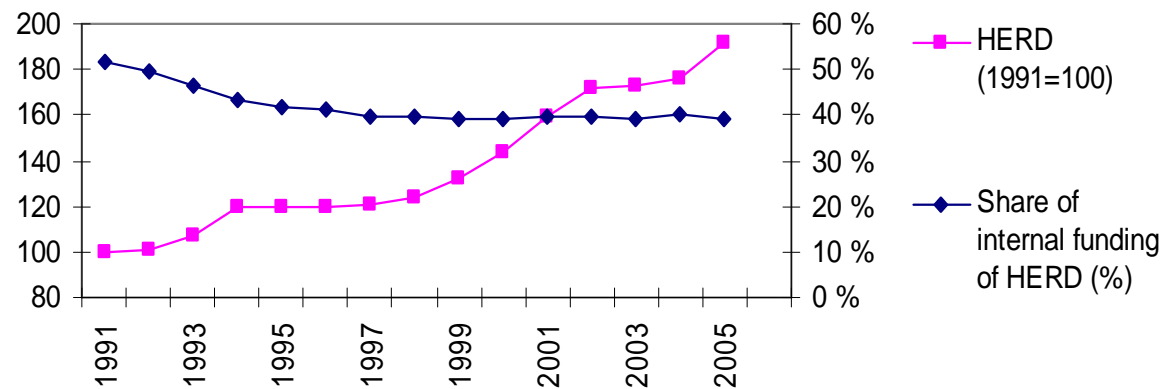
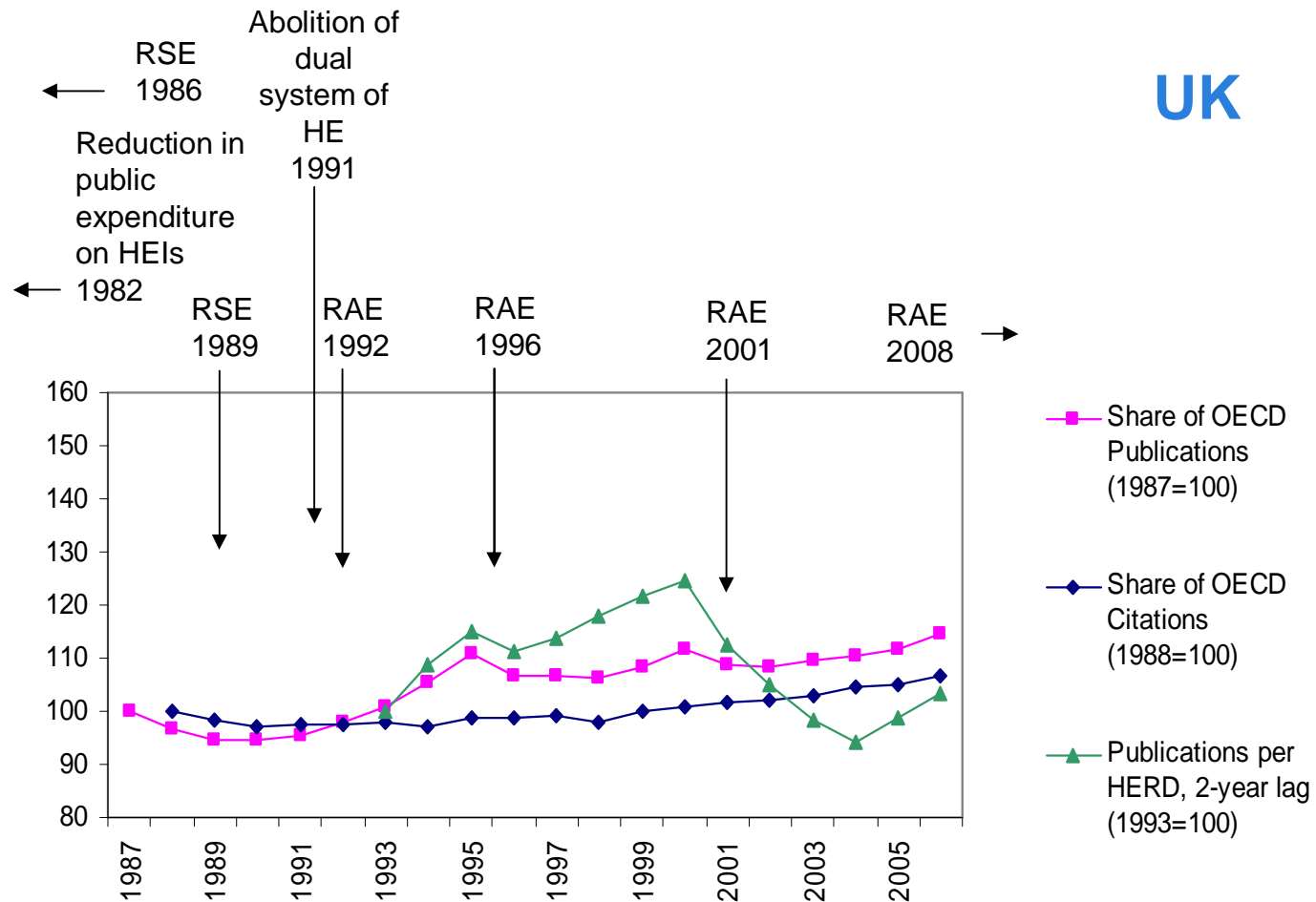


- HERD (1991=100)
- ◆ Share of internal funding of HERD (%)



Norway





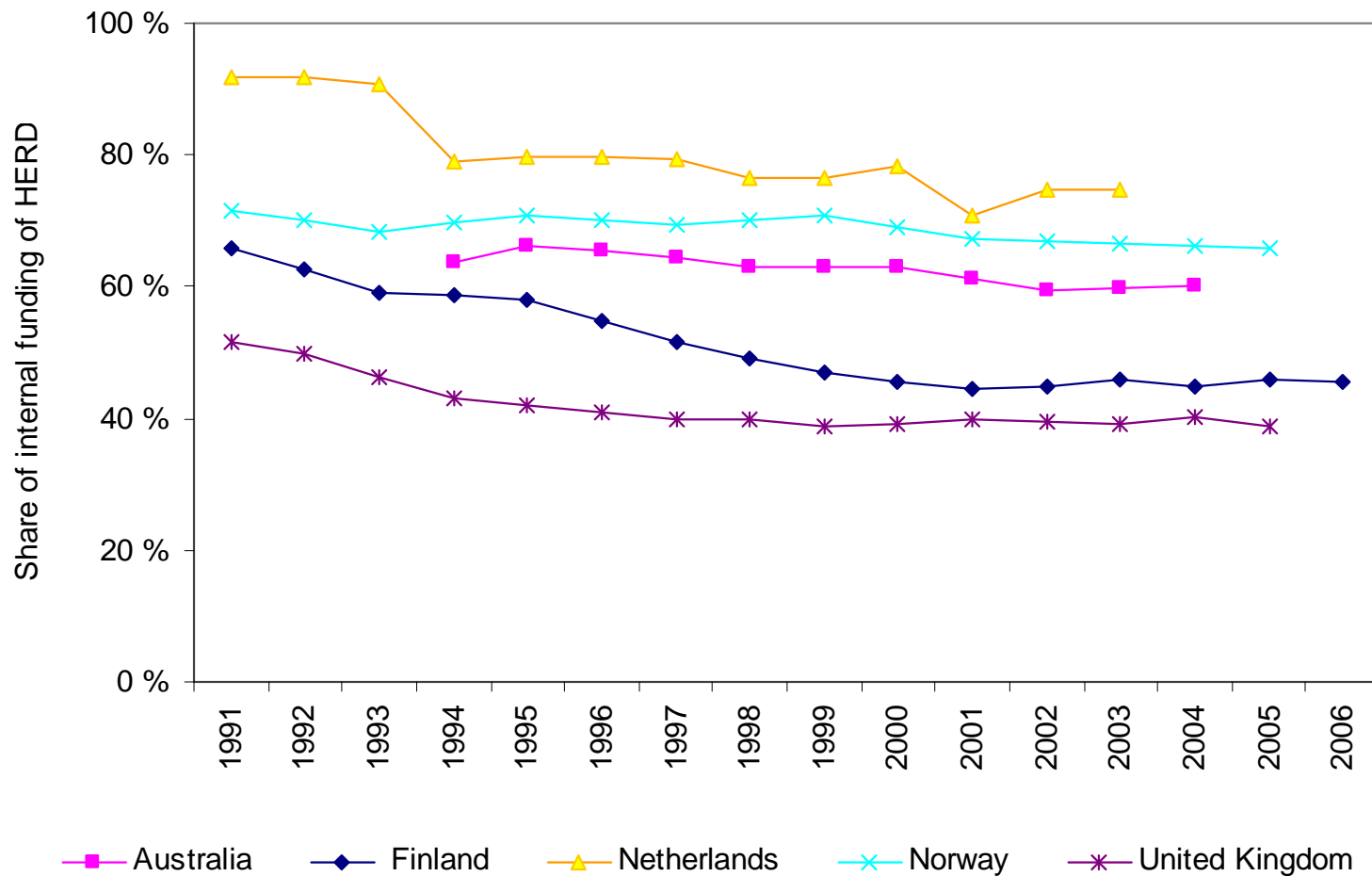


Summary

- notable increase in HERD in all the countries except in the Netherlands
- decrease in the share of internal funding in all the countries



Summary





Summary

- notable increase in HERD in all the countries except in the Netherlands
- decrease in the share of internal funding in all the countries
 - UK and Finland have the largest share of external funding
- funding systems for direct research funding in all the countries have become more output-oriented
 - UK and Australia have the most output-oriented systems
- the entire funding environment
 - UK the most competitive
 - Norway and the Netherlands relatively non-competitive

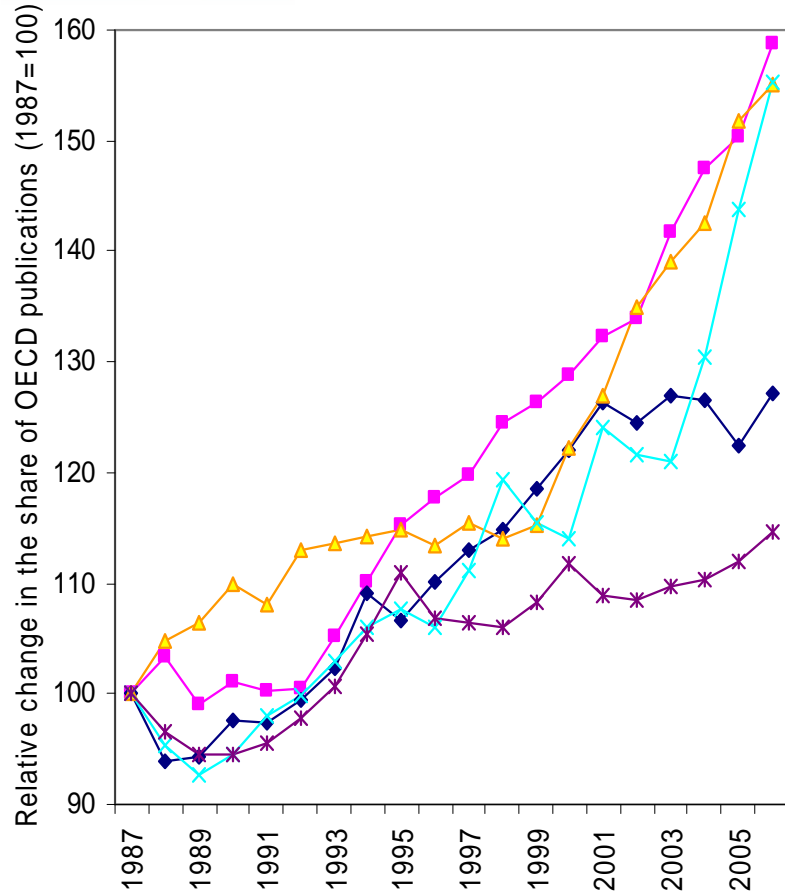


Summary

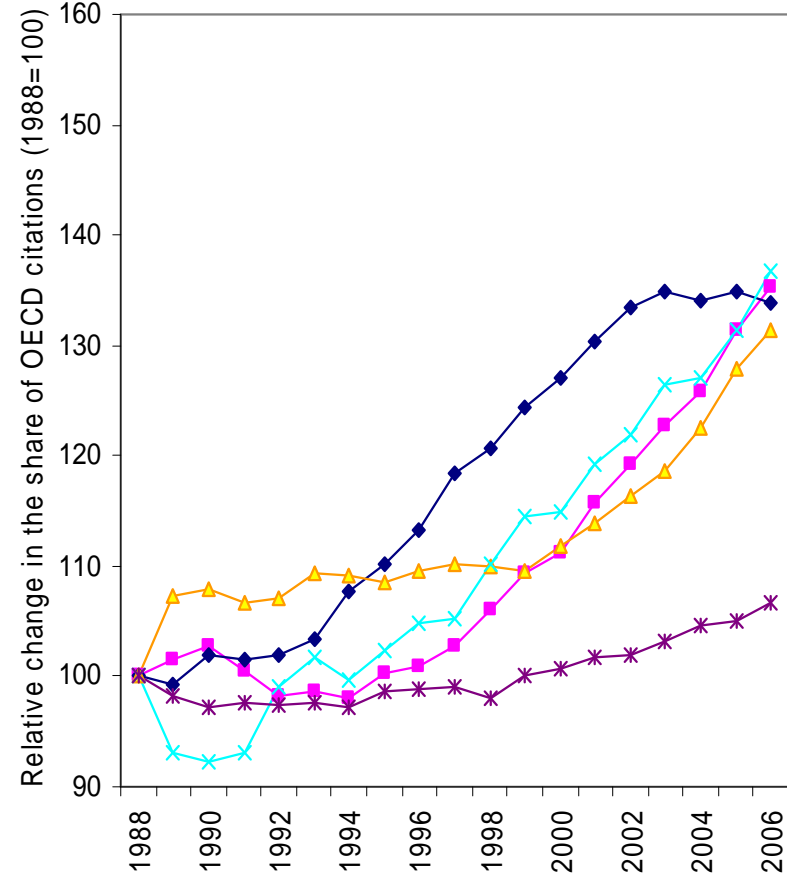
- long-time growth of international publications in compared countries
- growth of both publications and citations in compared countries above OECD average



Summary



- Australia
- ▲ Netherlands
- * United Kingdom
- ◆ Finland
- ✕ Norway



- Australia
- ▲ Netherlands
- * United Kingdom
- ◆ Finland
- ✕ Norway



Discussion

- no straightforward relation between competitive funding environment, publication performance and impacts
- variations in publication performance should also be examined in the context of qualitative policy and university related factors
- changes in the disciplinary structure in the compared countries must be taken into account
- ISI data are more focused on publications typical to the sciences and exclude much of the publications typical to the social sciences and humanities

THANK YOU FOR YOUR ATTENTION!