
AARHUS
UNIVERSITY
REFORMS OF HIGHER EDUCATION IN DENMARK
VIENNA, 10 JUNE 2013
RECTOR LAURITZ B. HOLM-NIELSEN

AGENDA

- Why reform the higher education system?
- Reforms in five waves – where do we stand
- Reforming an institution: Aarhus University
- What is in the crystal ball?

CHANGING DEMANDS FOR HIGHER EDUCATION?

- Increasing internationalisation and global grand challenges
- Competition from emerging knowledge economies
- New educational technologies, massification of higher education
- Knowledge the bridge towards sustainable economies, increased innovation, education and research (Innovation Union, Horizon 2020)

THE **POPULATION** OF THE WORLD IS NOW MORE THAN **7 BILLION**

The objective of Horizon 2020 is to contribute to solutions to the major challenges facing society, while at the same time ensuring EU's competitiveness:

- Public health and demographic change
- Food safety and sustainable agriculture
- Strategic resources and renewable energy supplies
- Sustainable transport systems
- Climate change
- Inclusive and secure democratic societies

NEED FOR **'ADVANCED HUMAN CAPITAL'**

Innovation Union 2020 predicts 1 million new research positions

The European Research Area Board recommends the following milestones for 2030:

- 50% of the EU's research funds should be allocated to ground-breaking basic research
- 20% of EU doctoral candidates should work outside their home country, and researchers should generally be more internationally mobile
- 5% of GDP should be be spent on research. Two-thirds of this spending should come from the private sector.
- The EU and its member states should triple spending on higher education degree programmes to 3.3 % of GNP

WHY **REFORM** THE HIGHER EDUCATION SYSTEM IN DENMARK?

The process in Denmark took off in the 1980s because of a growing consensus about an accumulated need for reforms.

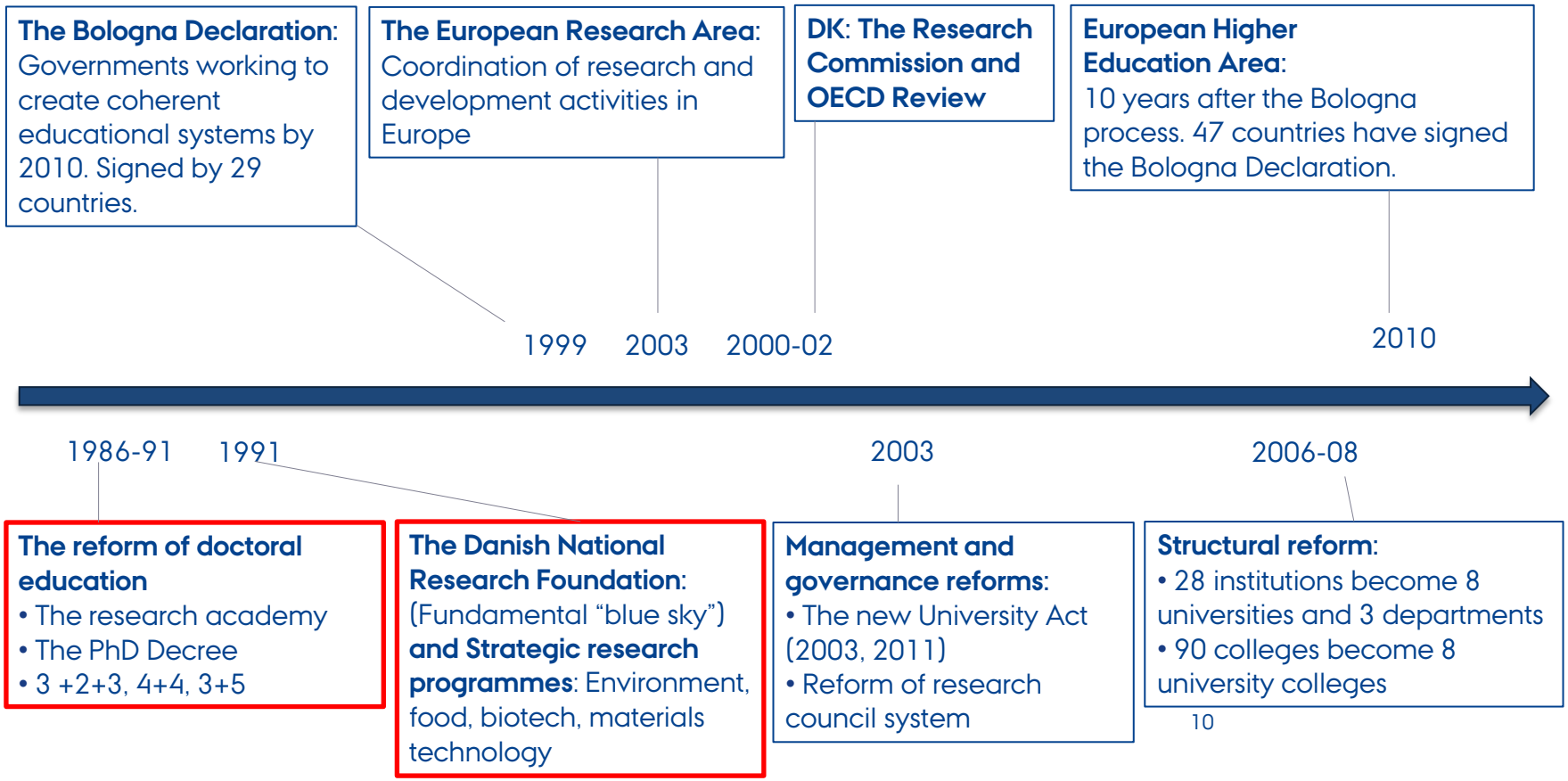
Need for:

- strengthening the quality of research and teaching
- Improving relevance of curriculum and research
- furthering interaction with the surrounding society

DANISH REFORMS IN **SEVERAL WAVES**

- Waves of reform in the context of a **long-term and coherent national strategy**, which culminated in the Research Commission (2000 and 2001) and the Globalisation Council (2005-06)
- A **reform of doctoral education** - from a form of apprenticeship to structured PhD programmes
- A **financial reform** - from Finance Act grants to output financing and competition
- A **management and governance reform** - from elected to appointed leaders
- A **structural reform** - a consolidated Danish university and research landscape
- An **education grant and loan scheme reform** – a more efficient student aid system

DANISH REFORMS IN A **EUROPEAN** PERSPECTIVE



REFORMS OF **DOCTORAL EDUCATION** AND **FINANCING**

- **From a form of apprenticeship to structured PhD programmes**
  - Establishment of the Research Academy (Forskerakademiet) (1986)
  - The PhD Decree (1990)
  - Tenfold increase in PhD production from 1985 to 2011

- **From Finance Act grants to output financing and competition**
  - The Danish National Research Foundation (1991)
  - Strategic research programmes (environment, food, biotech and materials, 1990-2004)
  - Taximeter financing of degree programmes
  - The Danish Council for Strategic Research (2004):
  - New formula for basic research block grants
  - The Danish National Advanced Technology Foundation (2005)

DANISH REFORMS IN A **EUROPEAN** PERSPECTIVE

MANAGEMENT, GOVERNANCE, AND STRUCTURAL REFORMS

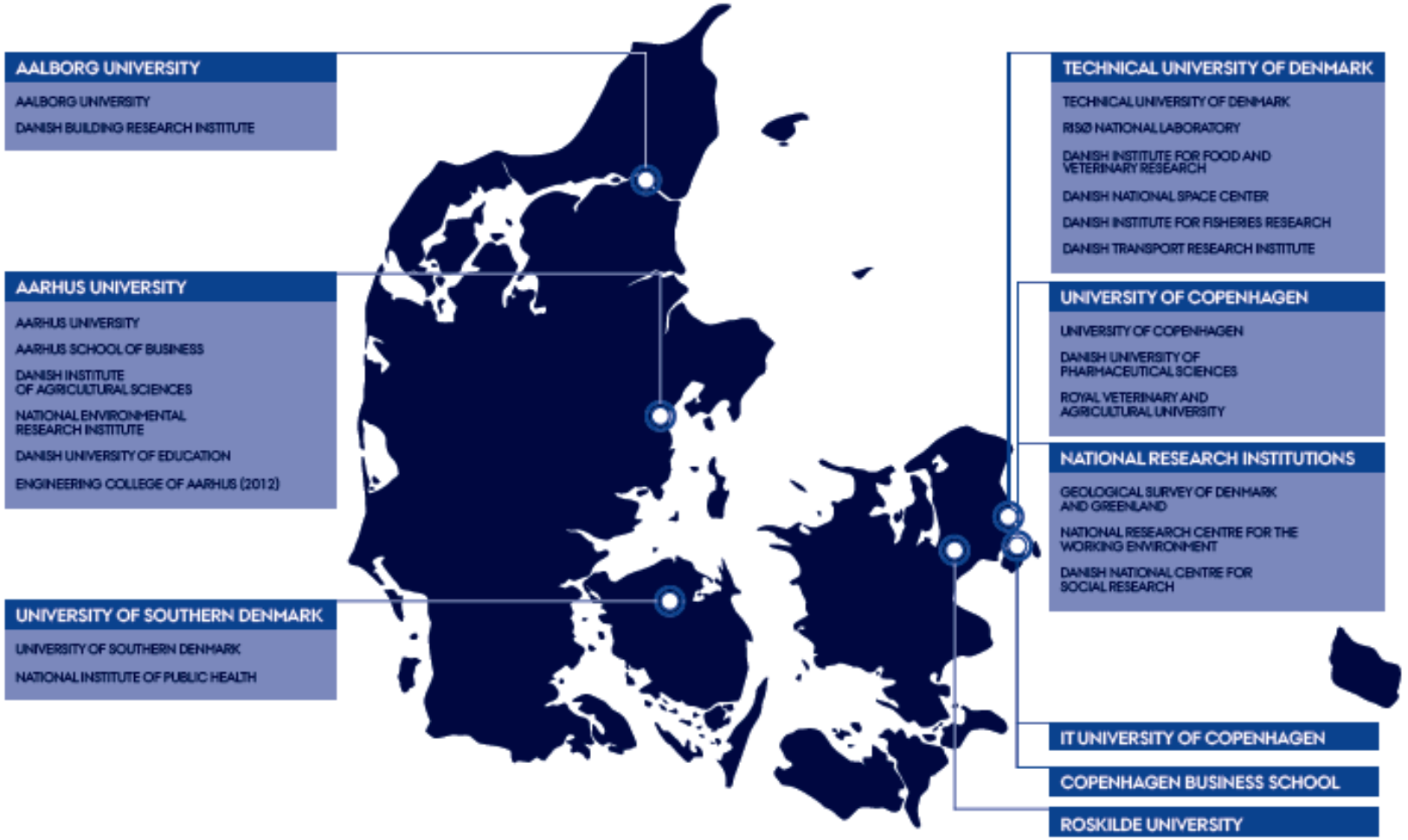
A management and governance reform - from elected to appointed leaders

- Autonomy: from state institutions to autonomous bodies within the public sector
- Accountability through the use of university performance contracts
- Governing boards with a majority of external members
- Appointed leaders in university governance structures: Rector, pro-rector, university director, deans and heads of department
- External and internal advisory councils collegial bodies

A consolidated Danish university and research landscape

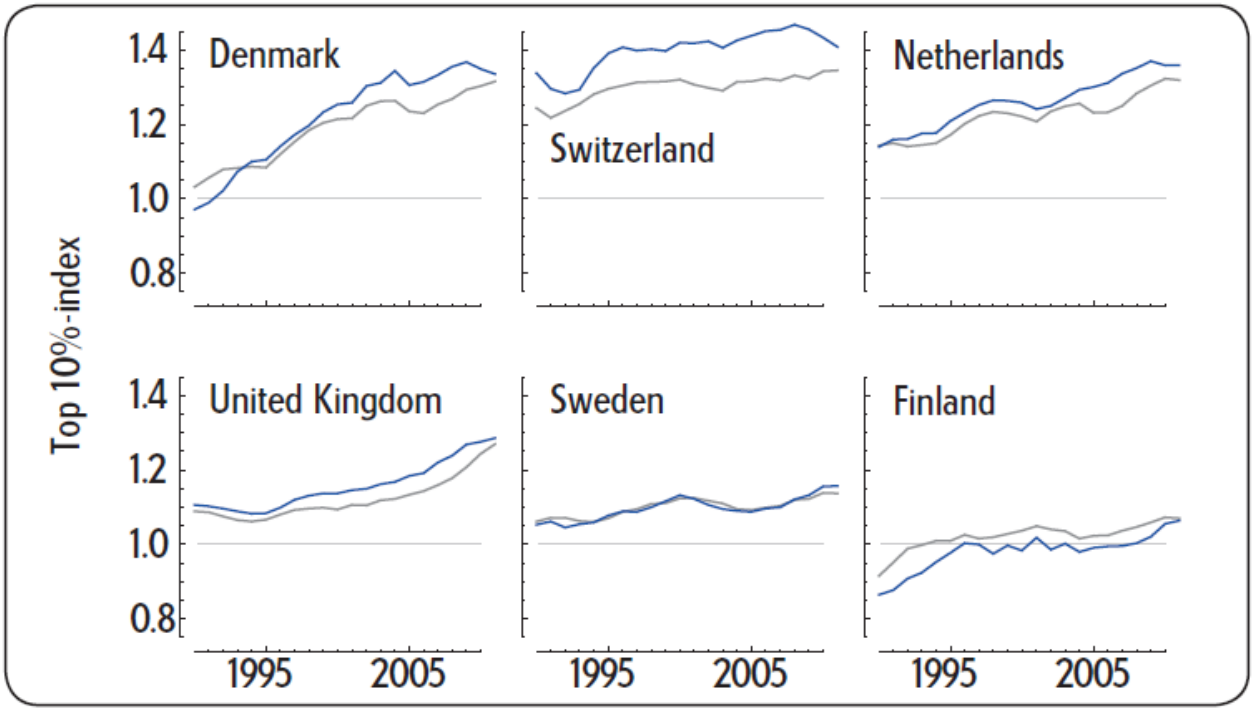
- Mergers: from 12 to 8 universities (2007)
- Government research institutions merged into the universities at the same time
- 90 educational institutions merged into to 8 university colleges without research duties

FROM 12+13 TO 8+3 UNIVERSITIES AND GOVERNMENT RESEARCH INSTITUTIONS



THE RESULT: MARKED INCREASES IN **RESEARCH IMPACT**

Figure 4.1. Development of the top 10 %-index between 1990 and 2011 for Sweden and the five reference countries. For comparison the national mean citation rate is shown as a grey curve and the grey horizontal line (with a value of one) shows the world average. The curves are based on 3-year moving averages.



- In 1990, On average, Danish research was cited less than the world average in 1990.
- Since 2005, Danish research citation rates have been approximately 35% above the world average

Source: The Royal Swedish Academy of Sciences, *Fostering Breakthrough Research*, p. 13 in appendix

CITATIONS PER. DOCUMENT 1996-2011

	Number of documents	Citations per. document
Switzerland	309.549	21,77
Denmark	**162.761**	**20,42**
USA	5.322.590	20,18
Netherlands	435.083	20,05
Sweden	304.831	19,09
Finland	153.964	17,64
Canada	790.397	17,55
Great Britain	1.533.434	17,42
Belgium	237.081	17,10
Israel	186.281	16,66
Norway	122.768	16,63
Austria	164.308	16,01
Australia	520.045	16,00
Germany	1.396.126	15,79

Source: Scimago Journal & Country Rank (www.scimagojr.com)

REFORMS AT INSTITUTIONAL LEVEL: **AARHUS UNIVERSITY** AS CASE

Mergers
- The Institute of Business and Technology in Herning
- The Danish Institute of Agricultural Sciences
- The National Environmental Research Institute
- The Aarhus School of Business
- The Danish School of Education

Joint strategy
- Research
- Education
- Talent development
- Knowledge exchange

The academic development process
- Unified executive management
- Interdisciplinarity

Merger
- The Engineering College in Aarhus

Implementation

5 faculties in Aarhus

→

9 faculties with **55** departments In Denmark as a whole

→

4 faculties with **27** departments Primarily in Aarhus

2006 2007 2008 2009 2010 2011 2012 2013

A NEW **MINDSET** FOR RESEARCHERS AND UNIVERSITIES

- Research must to a greater extent be defined in a social context.
- Scientific Social Responsibility (SSR)
- With reference to the principles of the Aarhus Declaration:
  - Basic research is the foundation
  - Freedom and trust in the individual researcher
  - Respect for the long-term perspective

AN **INTERDISCIPLINARY** APPROACH

- The major challenges facing society transgress traditional paradigms and disciplines
- The solutions must be found in close co-operation between the core fields of inquiry
- The core fields are the foundation of the the interdisciplinary
- Through cooperation, highly educated experts from different disciplines can identify completely new connections (transdisciplinarity)

INTERDISCIPLINARY CENTRES

Centers established after international peer review

- The Interacting Minds Centre
- The Participatory Information Technology Centre
- The Centre for Arctic Research
- The Centre for Integrative Sequencing
- The Centre for Integrated Register-based Research
- Already existing interdisciplinary centres: iNANO and MINDLab

Open process for the establishment of additional centres

- Possible themes: Food, Nutrition and Health, Aging, Smart Energy, Smart City

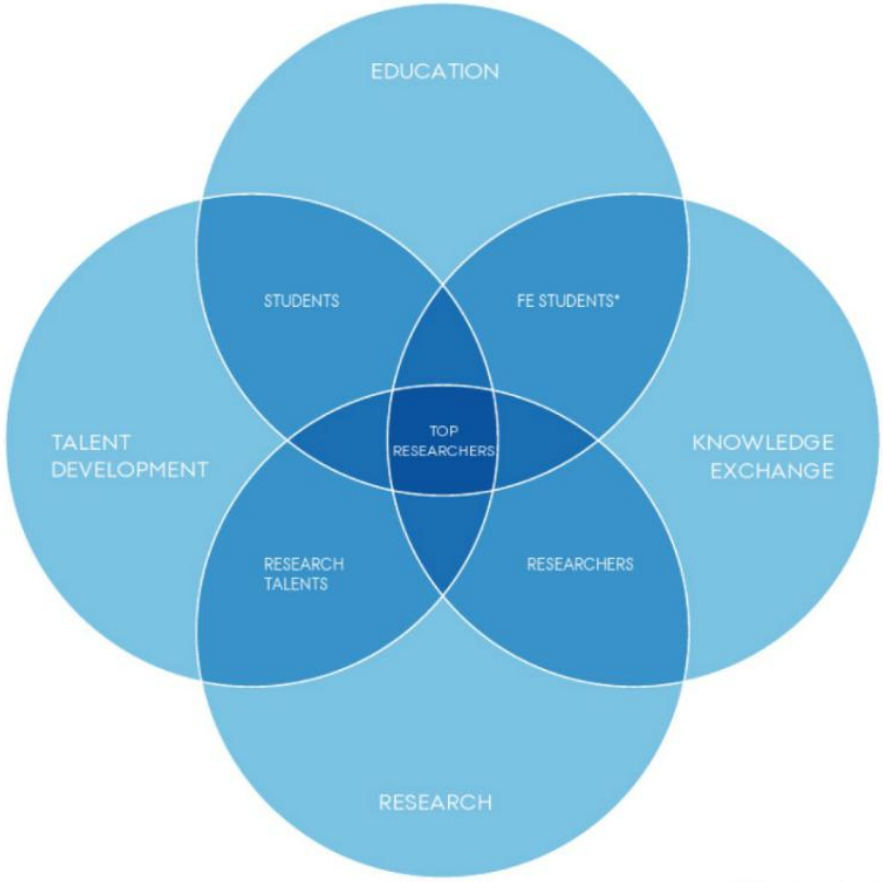
AARHUS INSTITUTE OF **ADVANCED STUDIES** (AIAS)

- The Institute recruits the best and the brightest and their duty is to make use of their talents in interaction
- The Institute offers Skov and Mortensen fellowships of 1-3 years. Recruitment of first 15 fellows has been completed
- There will be close interaction between the research programmes at Aarhus University and the fellows at the institute
- A board and a director independent of AU institutional structure
- High level international advisory group
- The AIAS building is in the middle of campus, and high quality facilities supports a dynamic research environment
- Initial budget 20 million Euro

- Inauguration June 13, 2013

TALENT DEVELOPMENT

- Talent development as a fourth core activity
- Global competition for the greatest talents
- A highly qualified labour force for society
- The Quadruple Helix combines the elite and mass university



* FE: Further education


AARHUS INSTITUTE OF ADVANCED STUDIES

AARHUS UNIVERSITY'S **ORGANISATIONAL CHANGES**

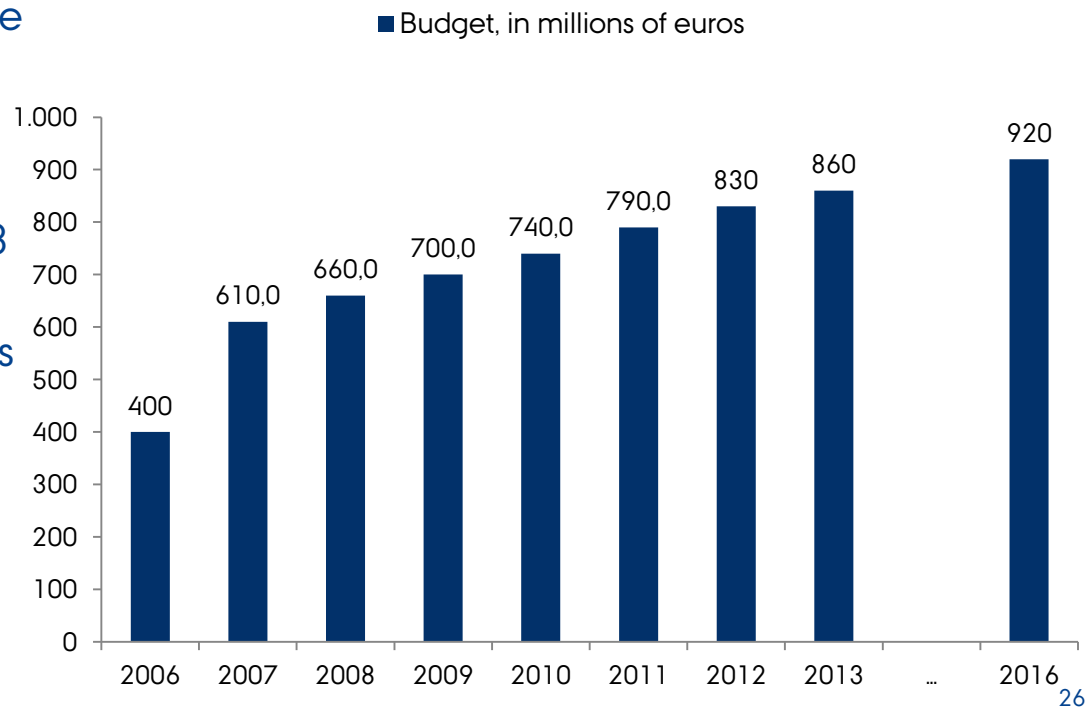
Organisation
- Fewer internal organisational barriers
- Greater academic critical mass
- More collaboration across organisational boundaries

Governance:
- A single senior management team that includes the deans
- Transversal responsibilities for the deans (research, education, talent development and knowledge transfer)

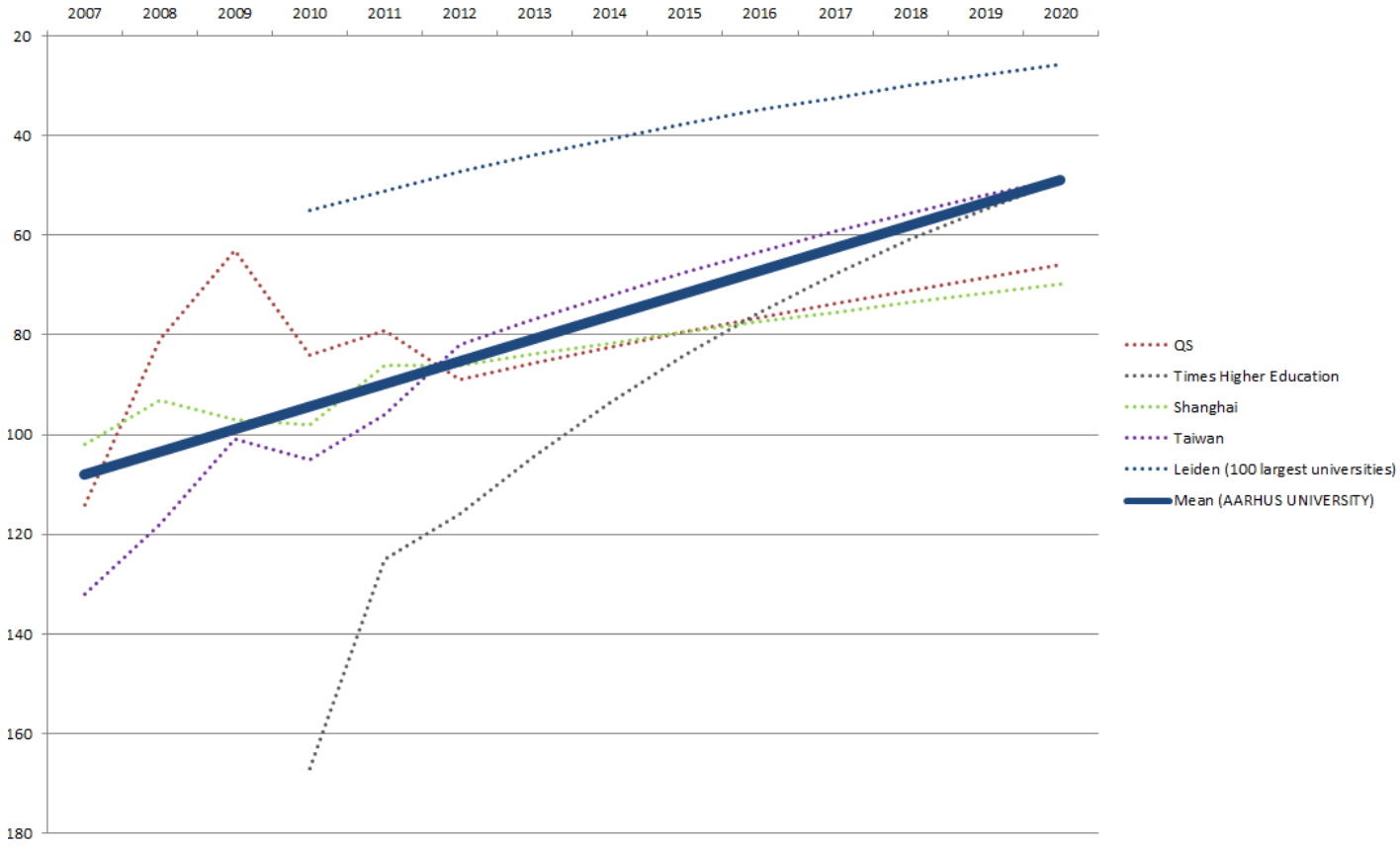
Staff involvement
- Fora for the four core activities at university level
- Academic councils for each faculties
- Participatory fora for each institute

AARHUS UNIVERSITY **ANNO 2013**

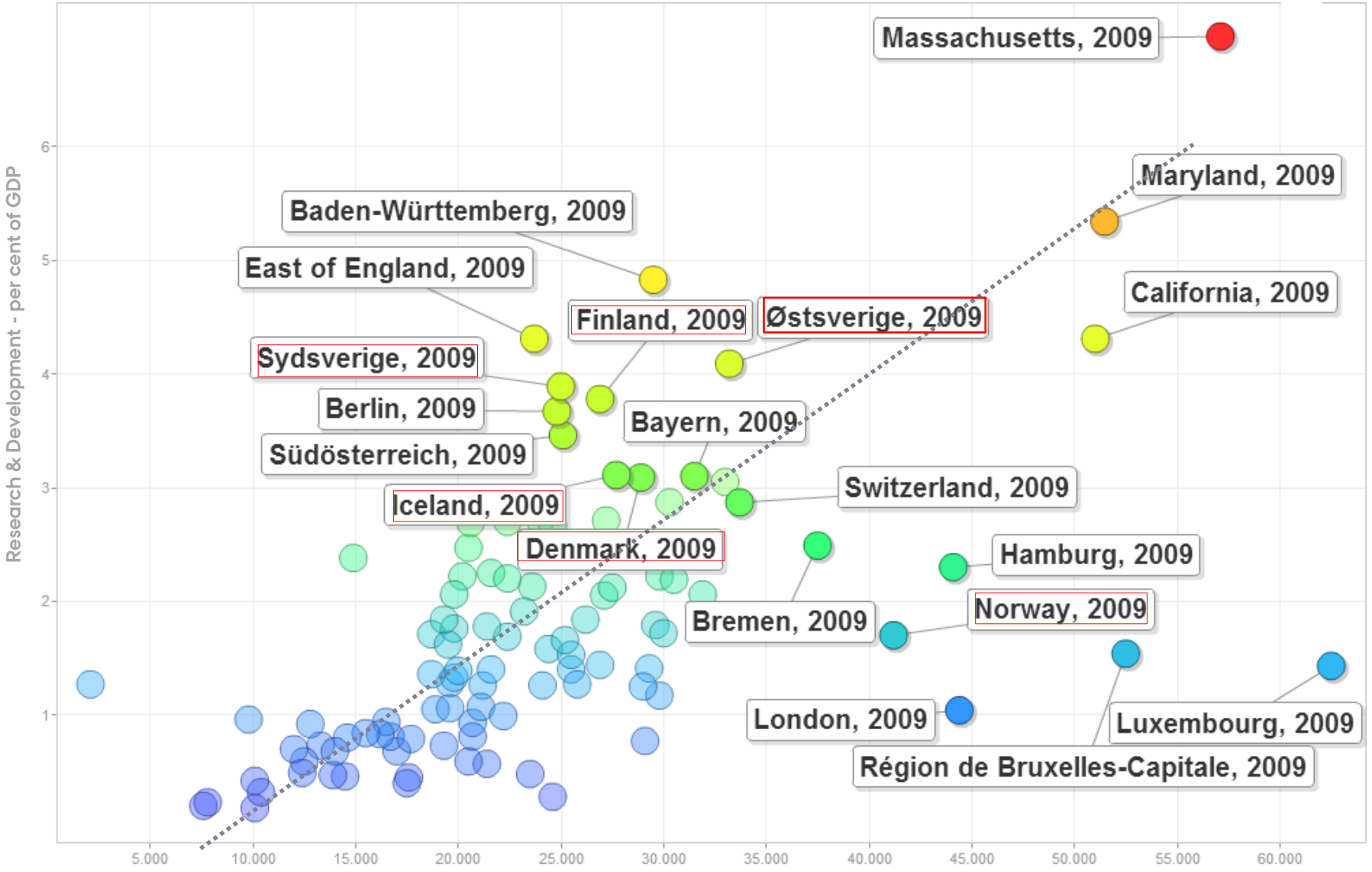
- 44,500 students (52% postgraduate students)
- 3,000 PhD students and early career researchers
- 4,500 international students of 103 nationalities
- 11,500 employees, 79 nationalities
- 12,000 publications in 2010
- Facilities: 600,000 m2
- 27% of public-sector research
- Budget: EUR 860m



A **LEADING** INTERNATIONAL UNIVERSITY



WHAT IS IN THE **CRYSTAL BALL**?



Source: Eurostat

WHAT DOES THE SECTOR **LOOK LIKE IN 20 YEARS?**

Opportunities and challenges

Geographical distances have become insignificant

Students per university:
- 1925: 1000
- 1975: 10,000
- 2025: 100,000
- ? : 1,000,000

Students in the world:
- 1925: 1,000,000
- 1975: 10,000,000
- 2025: 260,000,000
- ?

Fast-growing global market

FROM WHERE AND TO WHERE?

- From lecture halls and laboratories → MOOCs and freely accessible life-long learning?
- From physical campuses → Virtual campuses?
- From professors → Dispersed groups of research and teaching staff?
- From formal instruction → Informal coaching?
- From group teaching → Self-designed learning?
- From degree programme supply → Courses on demand?
- From national institutions → Transnational institutions for R,D&I and Education?
- From ministries of education → Trade ministries?
- From UNESCO → WTO?

Are we ready for the future knowledge market?
How would we improve ERA and EHERA
Are we sufficiently attentive to the inter-regional competition?


AARHUS
UNIVERSITY
THANK YOU FOR YOUR ATTENTION!
RECTOR@AU.DK