She Figures 2009

Seniority & Setting the Scientific Agenda

October, 30th 2012

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Outline

- Introduction & Summary
- Seniority
- Setting the Scientific Agenda

She Figures 2009 pt. II

Seminar: Equal Opportunity and Gender Studies, 30OCT12
Tobias Huber, Laurin Ostermann, Mathias Sassermann

This manuscripts serves as an addition to the talk and gives a compact summary touching on the most important facts and insights discussed. The talk comprises two chapters of She Figures 2009 [?], a study on the representation of women in academia by the European Commission's Directorate-General for Research, namely '*Seniority*' and '*Setting the Scientific Agenda*'.

1 Seniority

There has been a strong feminization of the student population in the last 30 years, yet still a severe vertical segregation persists.

In the EU-27, 55% of enrolled entry-level and 59% of graduate students are female. 48% of PhD students, 45% of PhD graduates and 44% of Grade C academic staff are women. At Grade B the number has gone down to 36% and at Grade A we find only 18% of the academic staff to be female.

In most countries, these grades refer to a starting scientific career as a PostDoc (C), senior PostDoc positions with original research responsibilities (B) and Full Professors (A), respectively.

Possible reasons for this drop-off could be direct discrimination, e.g. choices made by selection committees, and indirect discrimination through gender-based selection criteria or self-censuring rooted in gender stereotypes. Thus, the study introduces the notion of a Glass Ceiling, referring to obstacles holding women back from accessing the highest levels of the academic career. Quantitatively, a Glass Ceiling Index is defined as

$$GCI = \frac{\text{Men at Grade A}}{\text{Men at Grades A, B and C}} : \frac{\text{Women at Grade A}}{\text{Women at Grades A, B and C}}.$$

Let us point out that there are different classifications for these Grades in different countries and that this study relies on head-counts only, so there is no distinction between part-time and full-time occupations. The average over all countries is $GCI_{EU-27} = 1.8$ with no country featuring a GCI smaller than 1.

A comparison between 2002 and 2006 shows a slight improvement but the study advocates '*proactive policies to close the gender gap*'. Furthermore, they observe significant variations among the different fields.

In science and engineering only 31% of entry-level students are girls, 36% at the PhD graduate level, and then 33% at Grade C, 22% at Grade

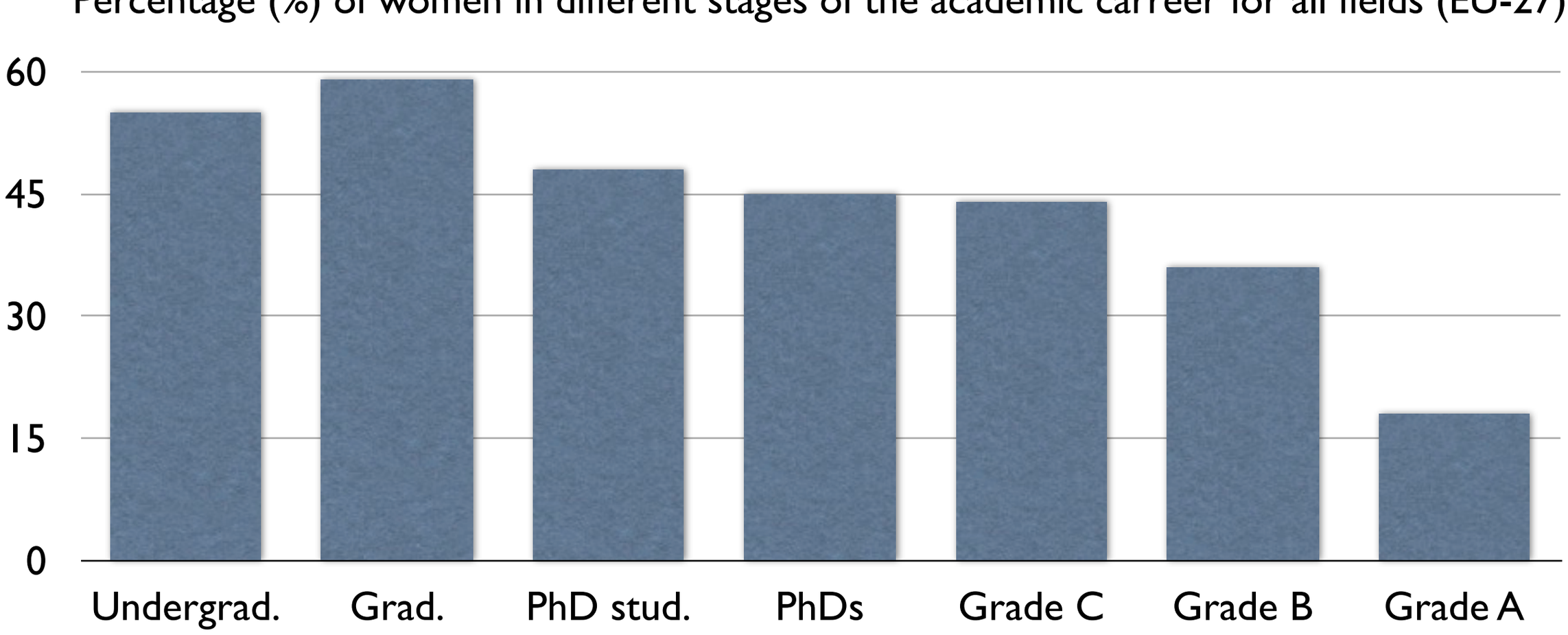
Introduction

Seniority

Vertical Segregation

Strong feminisation of student population in the last 30 years but still strong vertical segregation

Percentage (%) of women in different stages of the academic carreer for all fields (EU-27)



- Existence of a Glass Ceiling

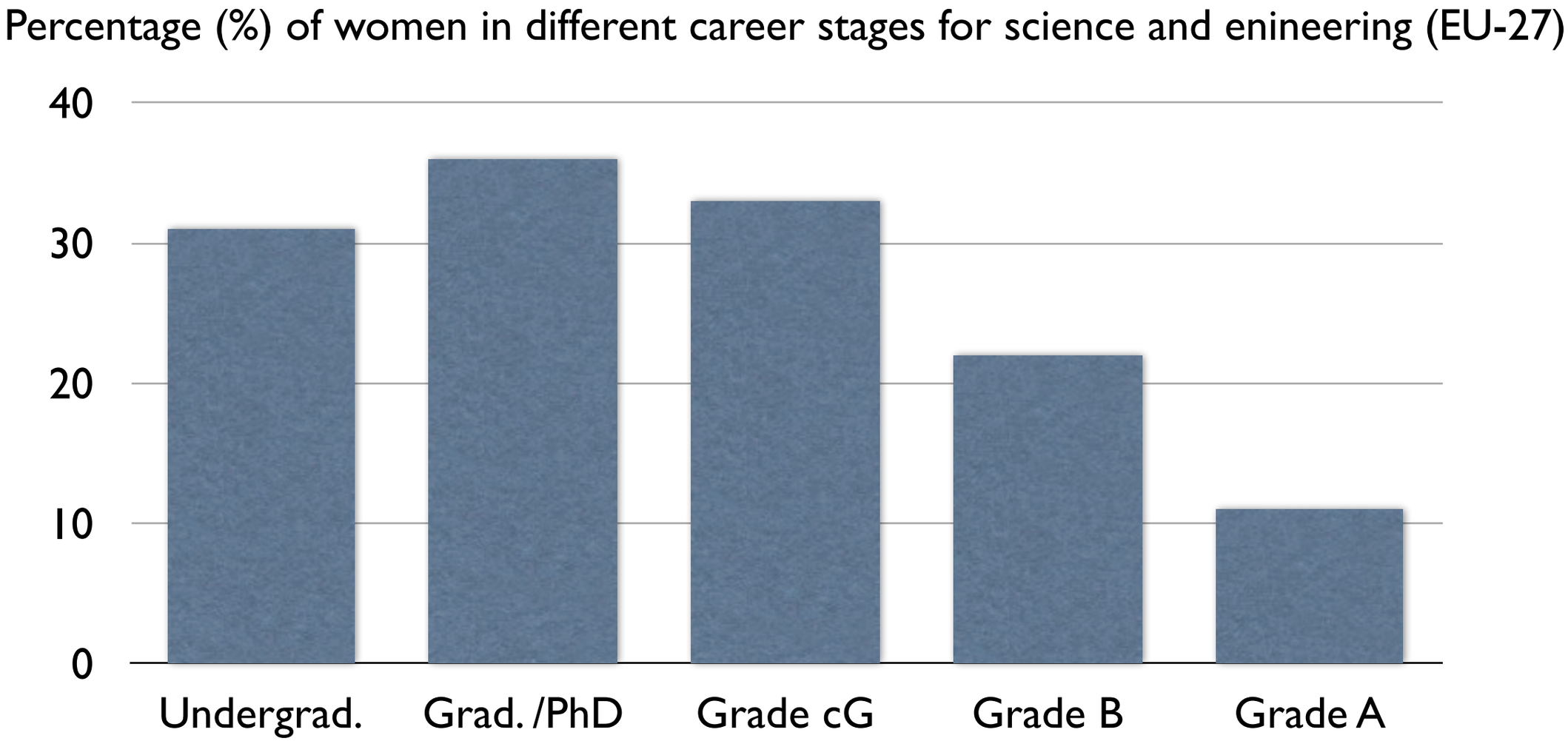
  - Glass Ceiling Index (GCI)
    quantifies how much harder it is for women compared to men to reach top-positions in academia. EU-27 average is 1.8.

- Reasons?

- Direct discrimination: committees,…

- Indirect discrimination: stereotypes,…

Strongly depends on the field



Lack of appeal for girls to start such studies, but also boy‘s preferences. ‚More mixed composition should not mean alignment on the male model.‘

- 2002 → 2006: overall slight improvement, more pronounced in science/engineering

- Yet, averaging masks local differences, e.g. Grade A: 32% female in Romanian, 2% in Malta.

- Careful: Grade-Classification is not unique.

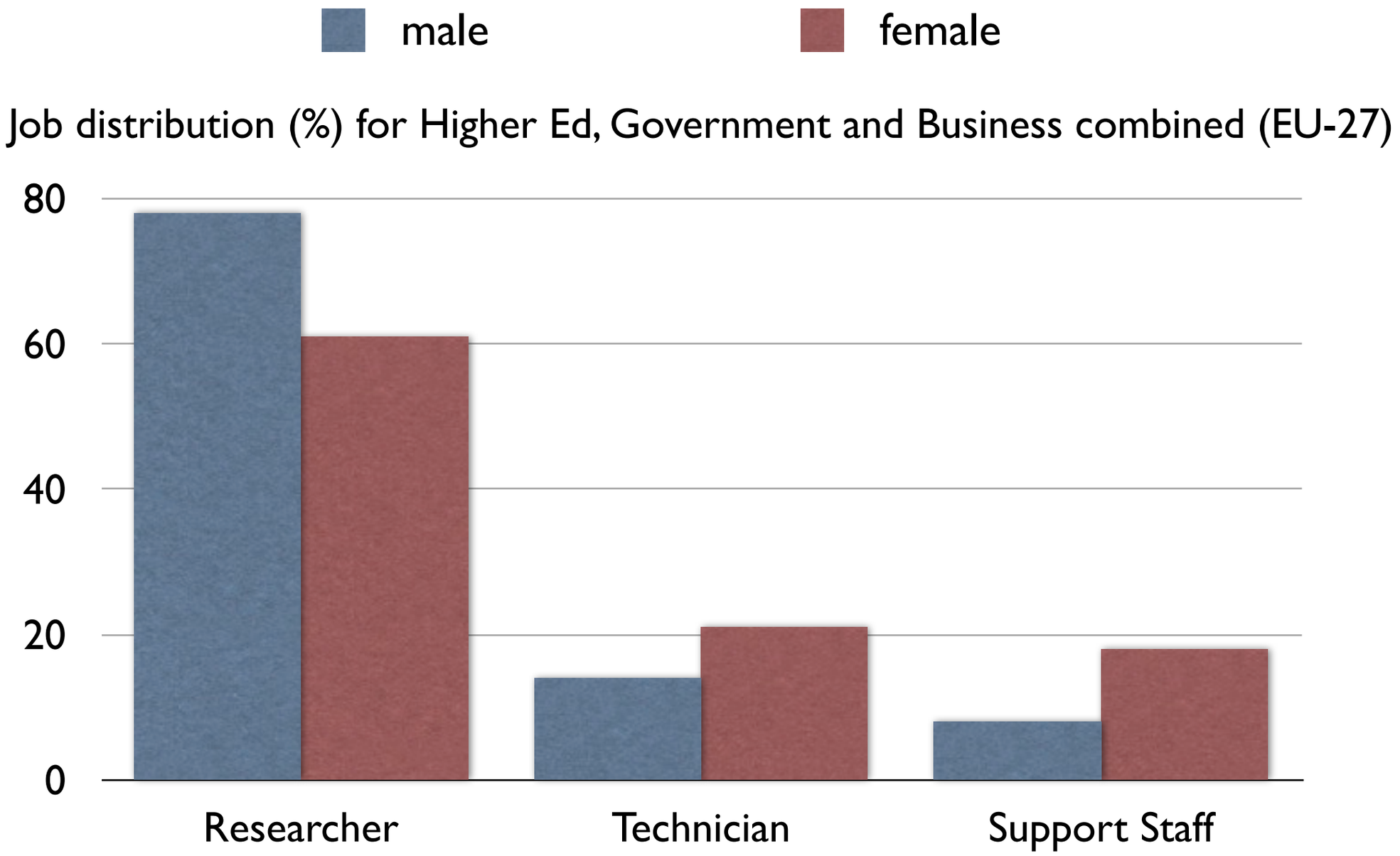
- Possible explanation (hypothesis, no data available): generation effect. Today‘s Grade A women were among a very small portion of female students when they started out.

- But: Grade A share still disproportionately low compared to girls among students → no ‚automatic‘ catch-up. or spontaneous equalization.

Suggestions

- Policies are needed!
  - Mixed composition of committees
  - Increase in objectivity of selection criteria
  - Tutoring of women
  - Fixing of target quotas
  - Fight against stereotypes

R&D jobs


male
female
Job distribution (%) for Higher Ed, Government and Business combined (EU-27)
80
60
40
20
0
Researcher
Technician
Support Staff

Gender Pay Gap

- Exogenous part: differences in education, sectorial affiliation, labour market experience, tenure,…
- ‚Unexplained' part: direct discrimination or unobserved heterogeneity
- No country shows higher or equal wages for women compared to men (despite laws)
- EU-27 average: 25% (22% in Physics/Math)

- Most categories: gap is higher in public sector (7 pp). Hypothesis: maybe industry cannot afford to pay top-women less?

- Gender pay gap is the widest in the occupations that are most open to high-level female researchers

- Widens with age → hints at Glass Ceiling

Introduction

Setting the Scientific Agenda

- Women‘s underrepresent. in high levels has various consequences

  - lack of role models for girls starting out

  - weak presence and resulting male dominance → unconsciously biased decisions: ‚discriminatory snowball effect‘

- EU-27: only 9% of universities have female rectors. (18% Grade A) → ‚leaky pipeline‘

- 22% of board members are female → gender-biased decisions

- Promotion of women is critical for the cause of women in science, diversity in research objectives and strategies

Research funding

- 21/26 countries: higher success rates for men, but nowhere more than 10%
  - Careful with success rates: not as many women as men apply for grants
- Less R&D expenditure → more female researchers

Seniority
Outline

- Definitions
- Proportions of men and women
- in a typical academic carrer
- in science and engineering
- Proportion of female academic staff

Seniority
Outline

- Grade A academic positions
  - Proportion of women in grade A
  - Percentage of grade A staff/all staff
  - Distribution of grade A staff
    - across fields of science
    - across age groups

Seniority
Outline

- Glass ceiling index
- R&D personnel: distribution by occupation
  - for Higher Education sector (HES)
  - for Government sector (GOV)
  - for Business Enterprise sector (BES)
  - all sectors
- Gender pay gap

Country Code Abbreviations

AT - Austria
BE - Belgium
BG - Bulgaria
CY - Cyprus
CZ - Czech Republic
DE - Germany
DK - Denmark
EE - Estonia
EL - Greece
ES - Spain
FI - Finland
FR - France
HU - Hungary
IE - Ireland
IT – Italy
LT – Lithuania
LU - Luxembourg
LV - Latvia
MT - Malta
NL - Netherlands
PL - Poland
PT - Portugal
RO - Romania
SE - Sweden
SI - Slovenia
SK - Slovakia
UK - United Kingdom
CH - Switzerland
HR - Croatia
IL - Israel
IS - Iceland
NO - Norway
TR - Turkey

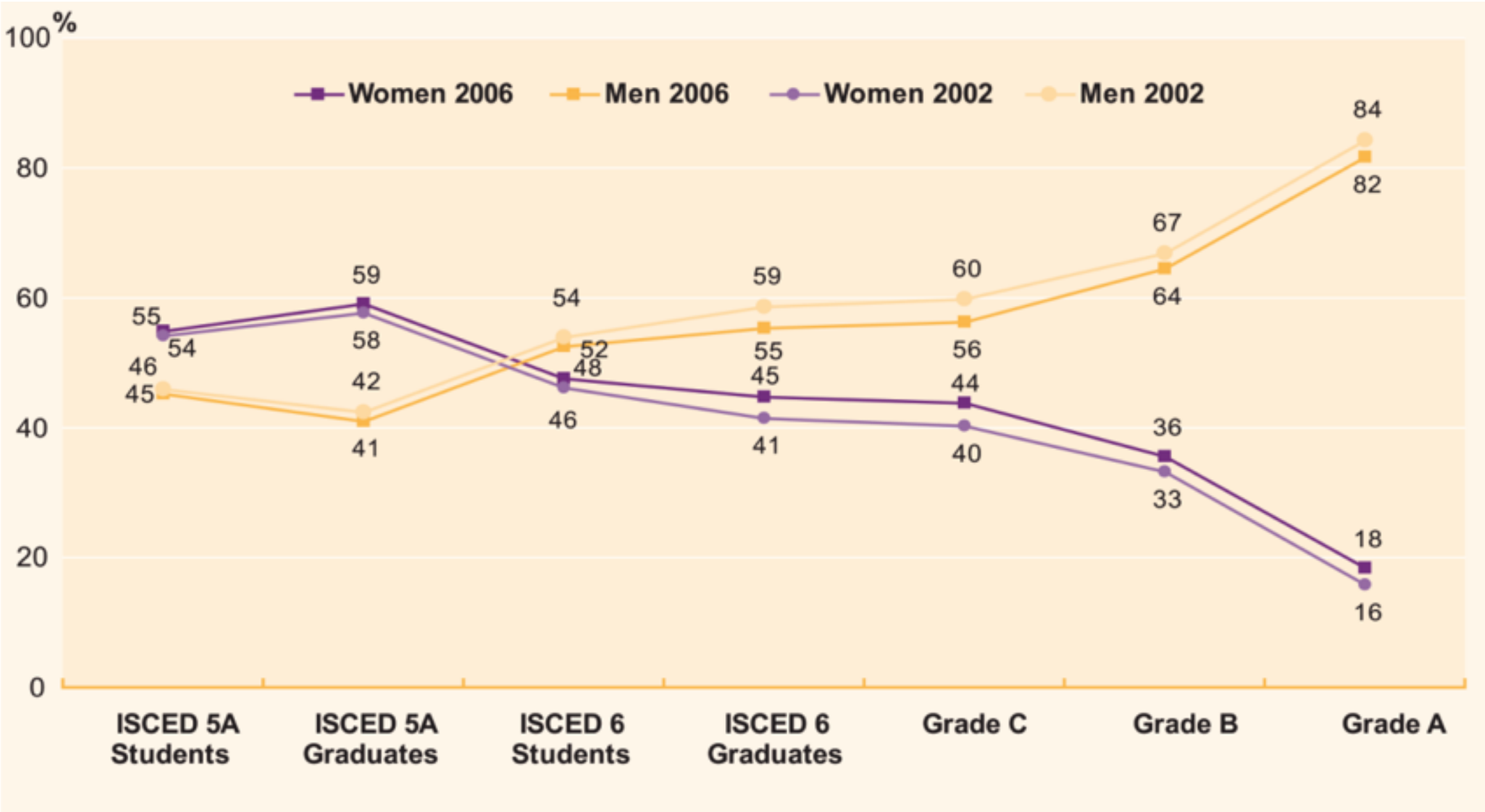
Grade Definitions

- ISCED 5: Tertiary programmes to provide sufficient qualifications to enter into advanced research programmes & professions with high skills requirements.
- ISCED 6: Tertiary programmes which lead to an advanced research qualification (PhD).

Grade Definitions

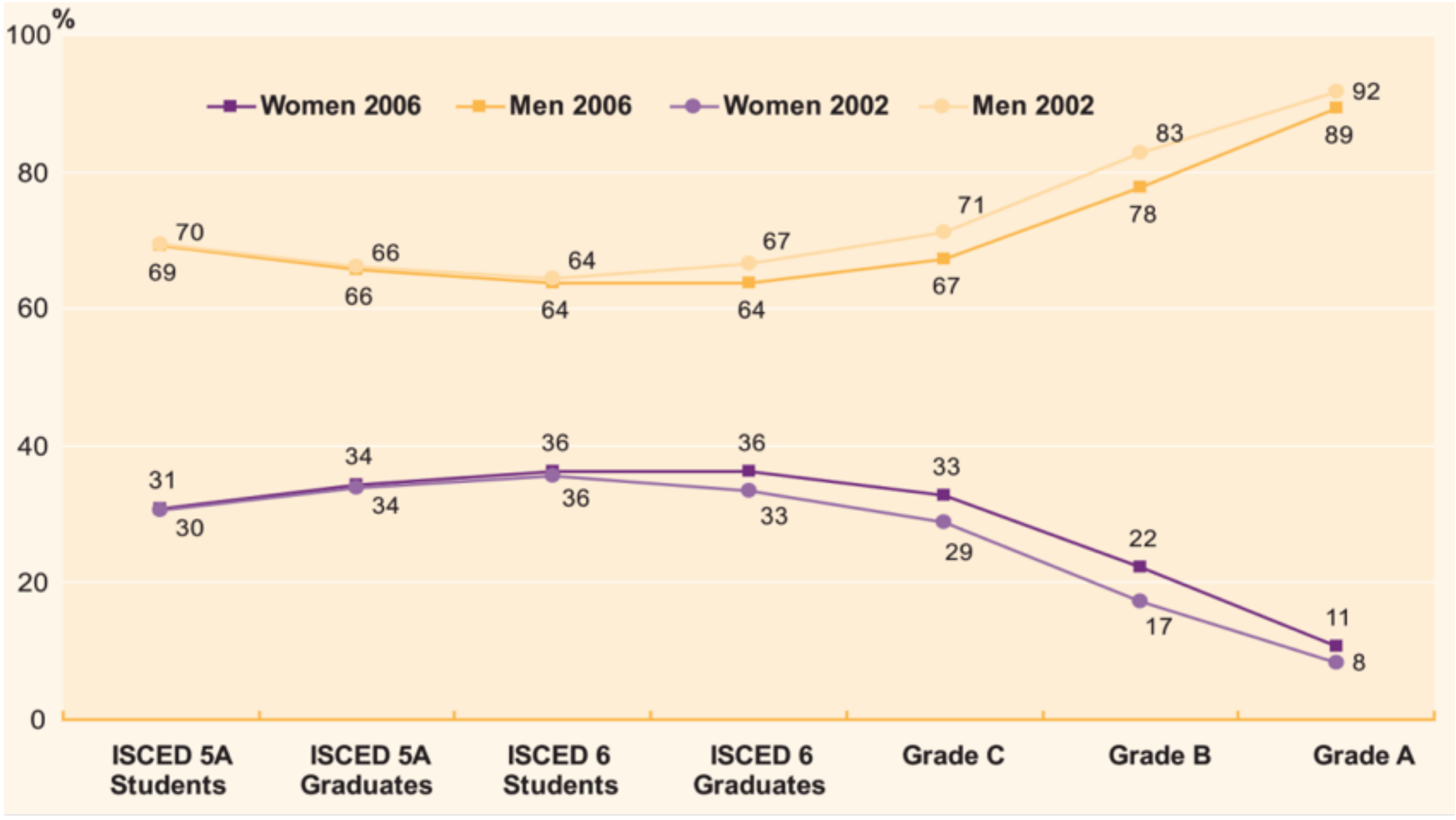
- Grade A: The single highest grade/post at which research is normally conducted.
- Grade B: Researchers working in positions not as senior as top position (A) but more senior than newly qualified PhD holders.
- Grade C: The first grade/post into which a newly qualified PhD graduate would normally be recruited.

Proportions of men and women in a typical academic career



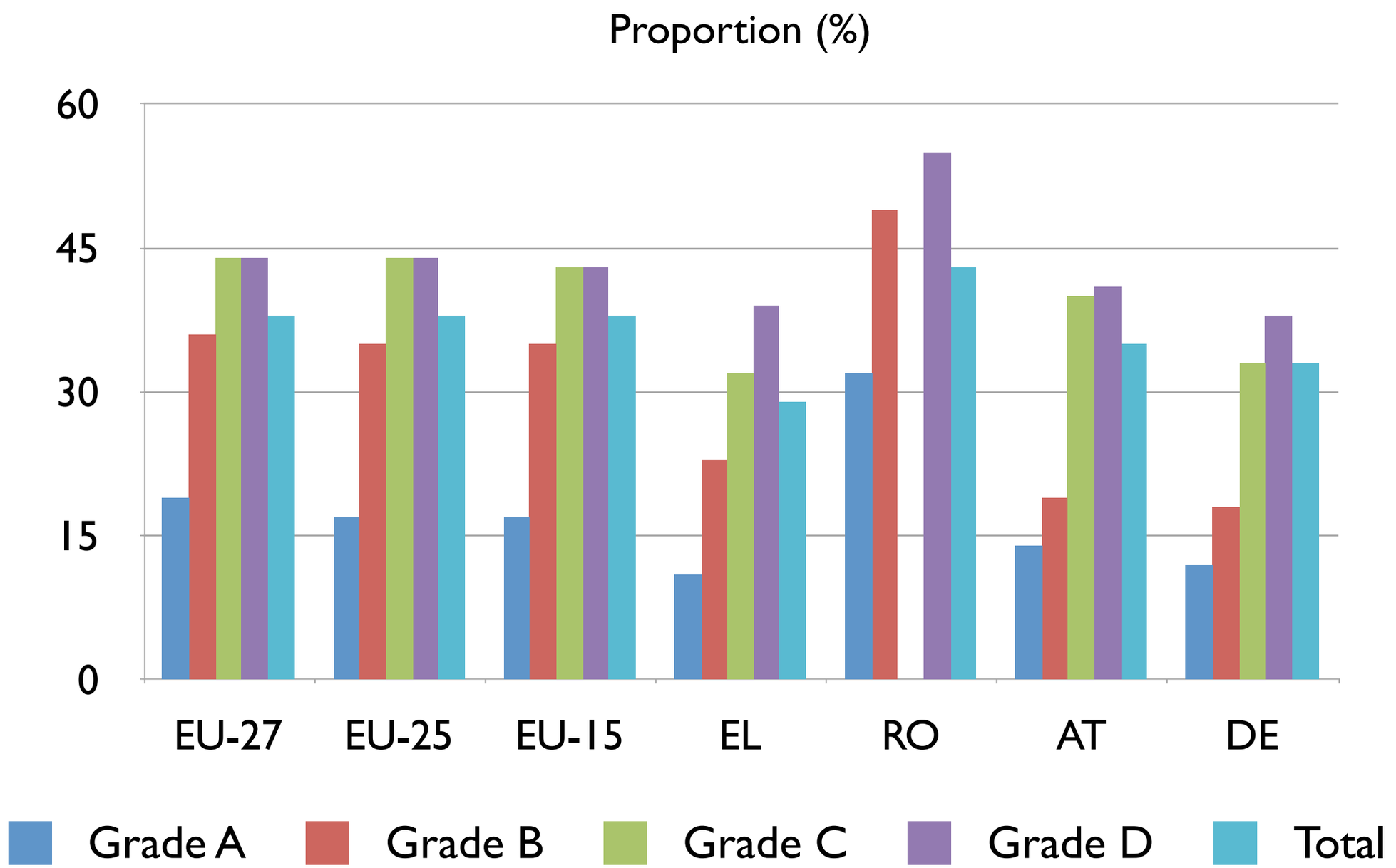
Source: Education Statistics (Eurostat); WiS database (DG Research); Higher Education Authority for Ireland (Grade A)

Proportions of men and women in science and engineering

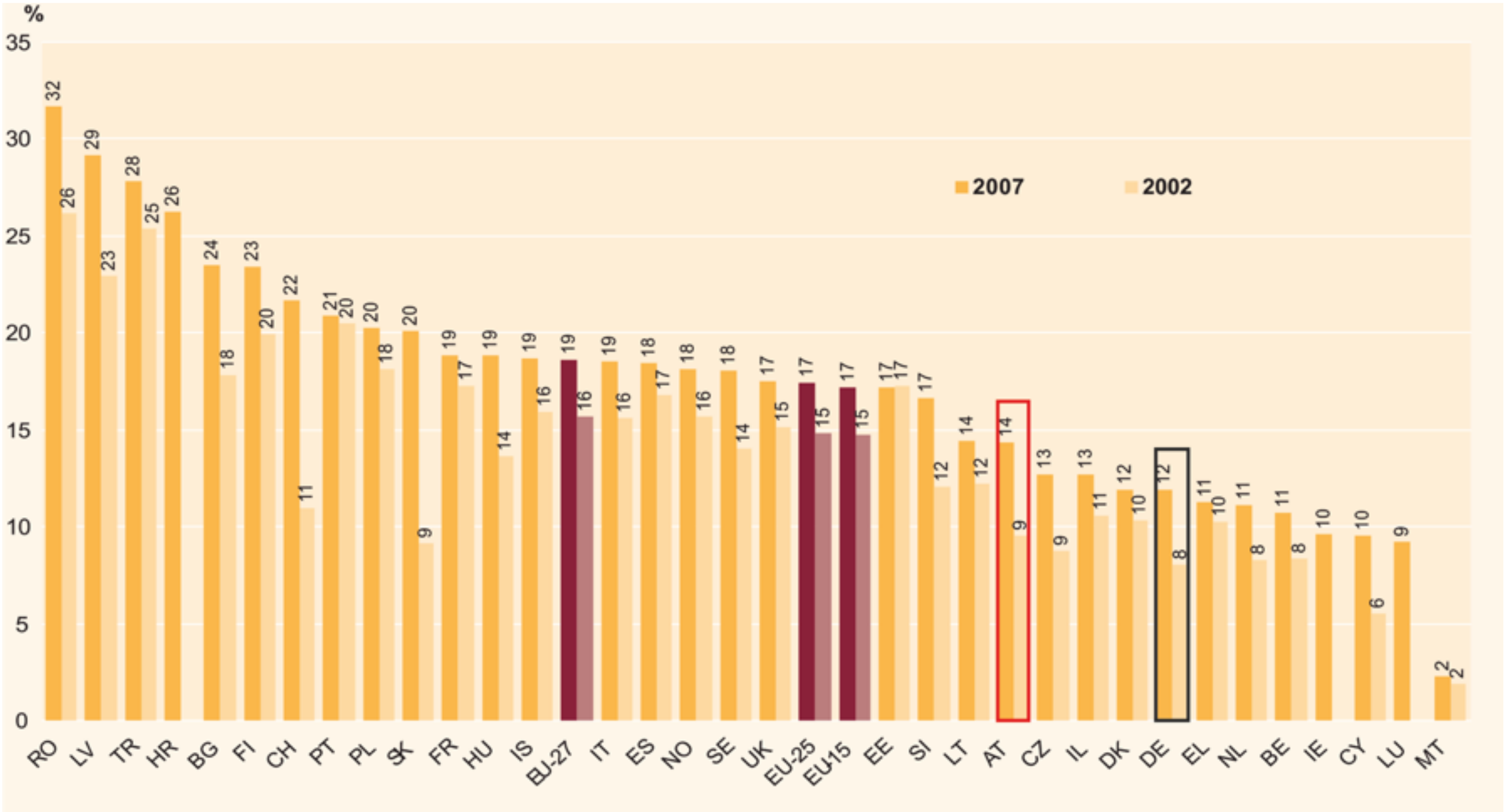


Source: Education Statistics (Eurostat); WiS database (DG Research)

Proportion of female academic staff

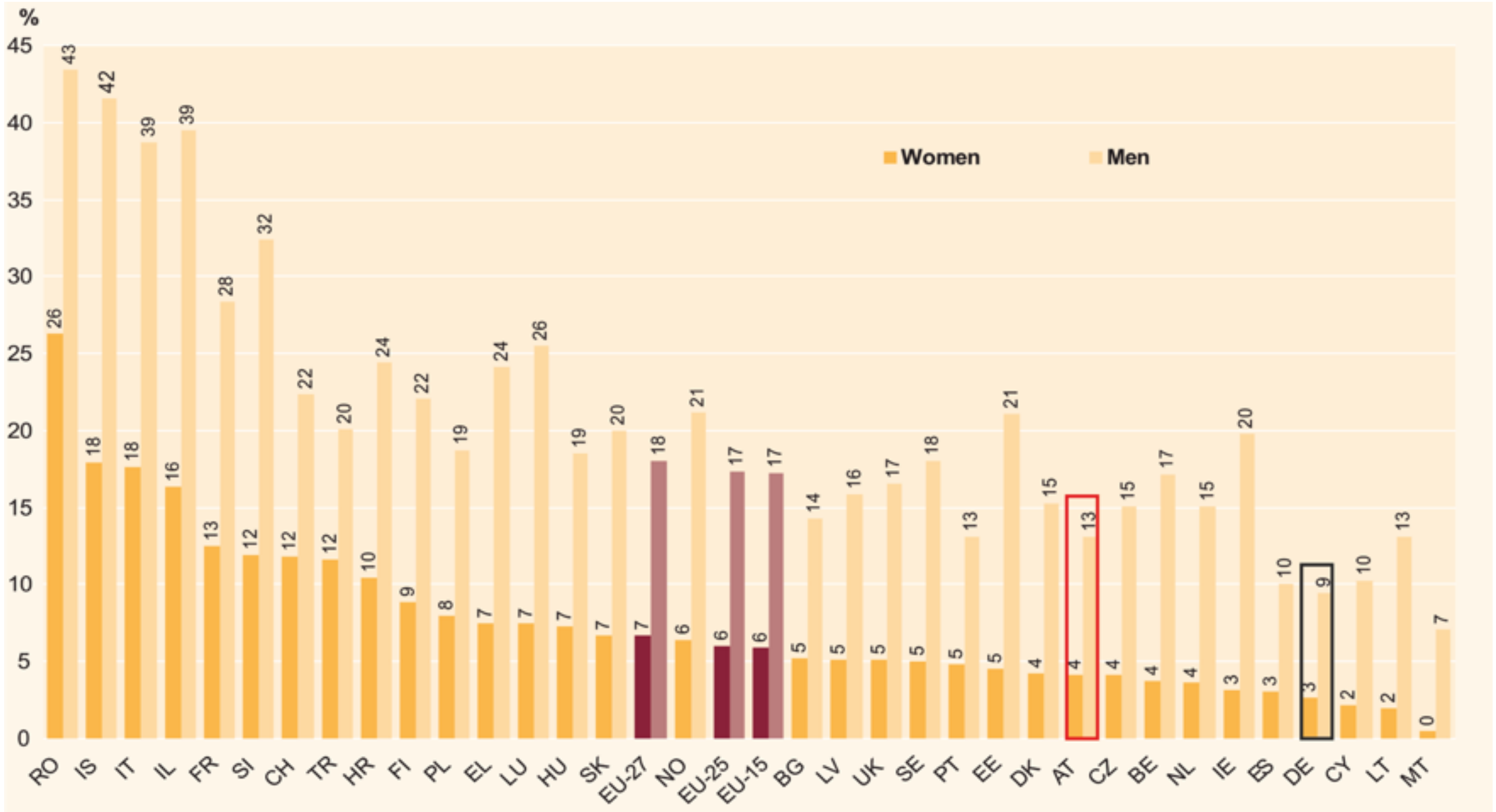


Grade A academic positions
proportion of women in grade A



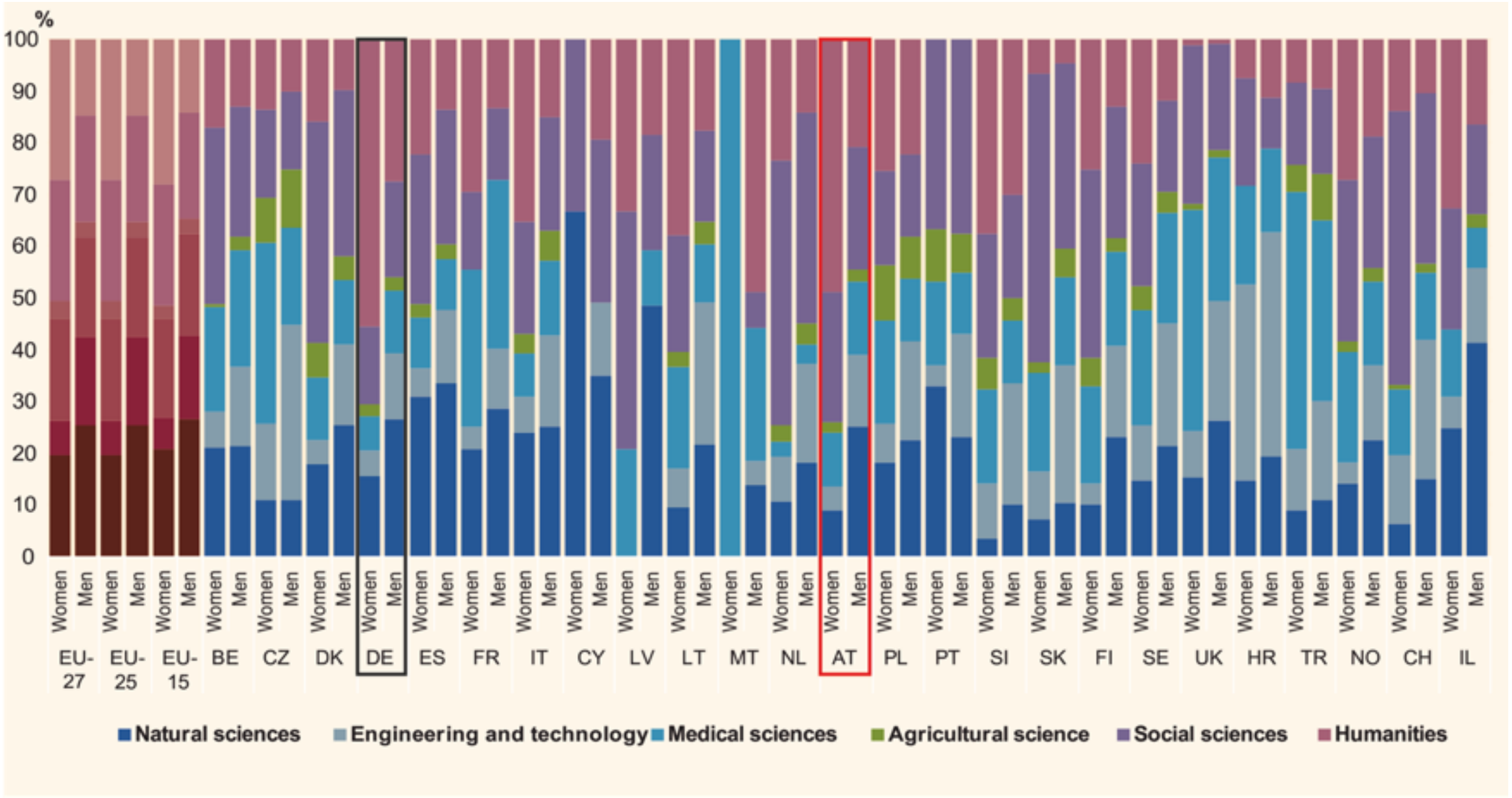
Source: WiS database (DG Research); Higher Education Authority for Ireland

Grade A academic positions
percentage of grade A staff/all staff



Source: WiS database (DG Research); Higher Education Authority for Ireland (Grade A)

Grade A academic positions distribution across fields of science

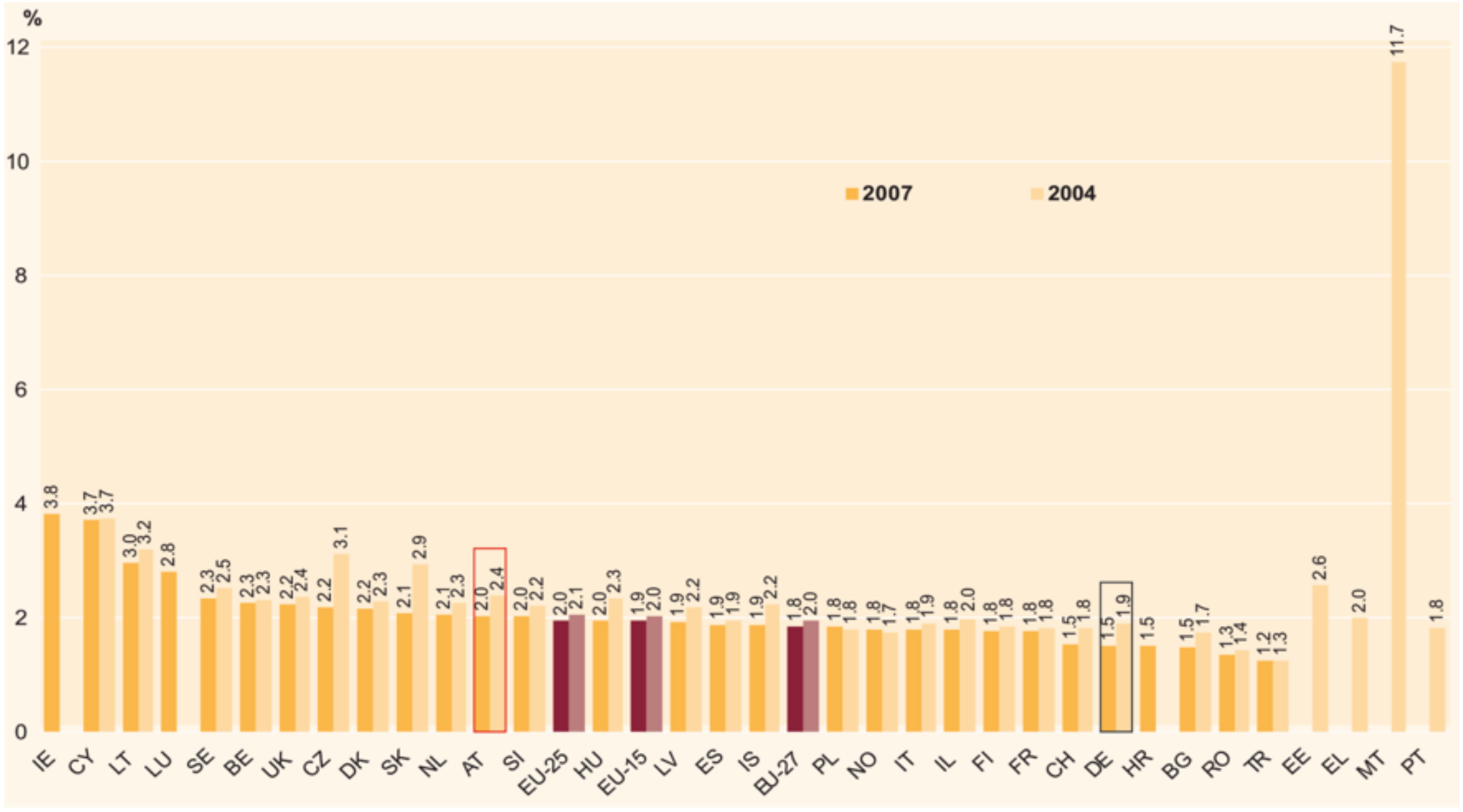


Source: WiS database (DG Research)

Grade A academic positions distribution across age groups

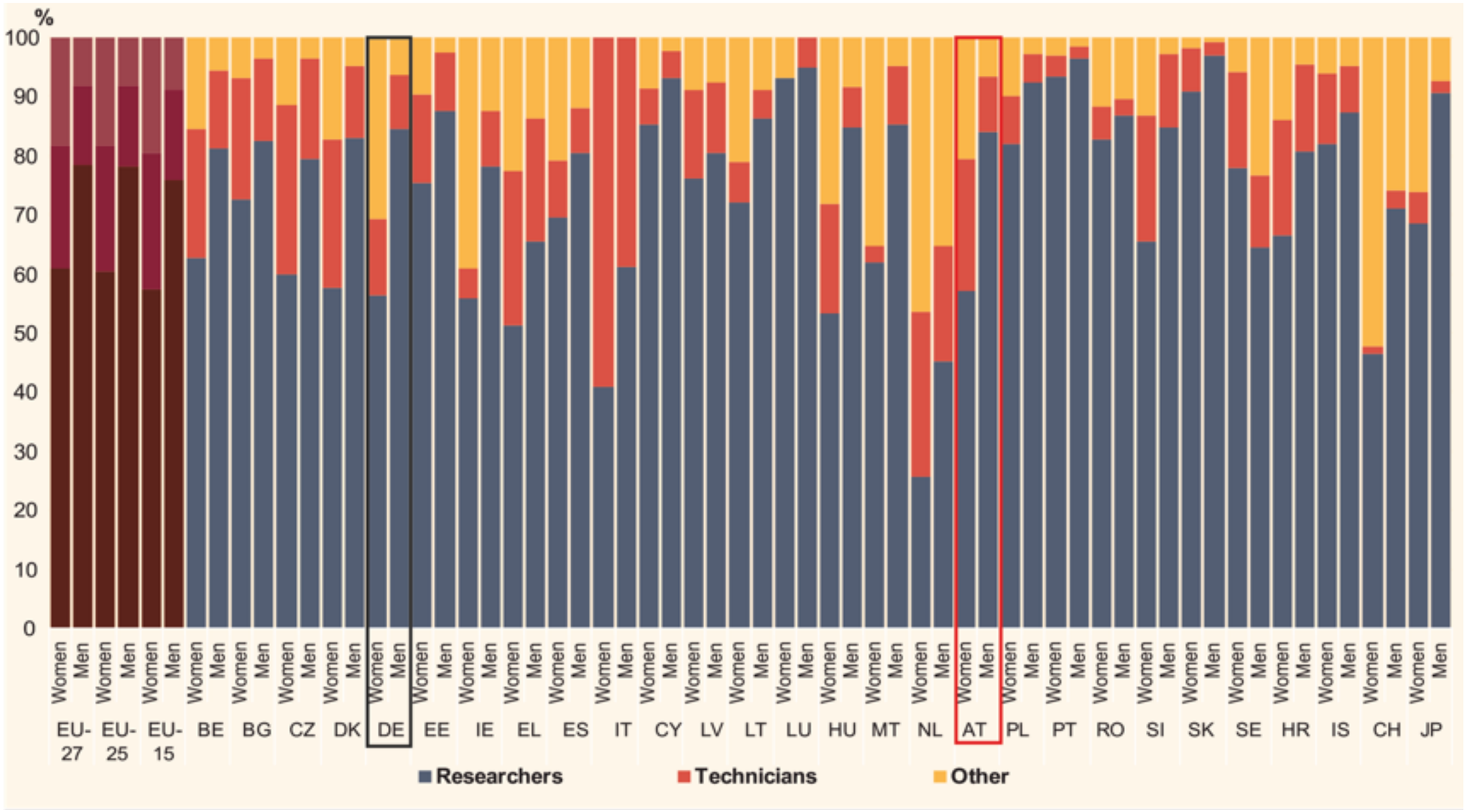
Source: WiS database (DG Research)

Glass ceiling index



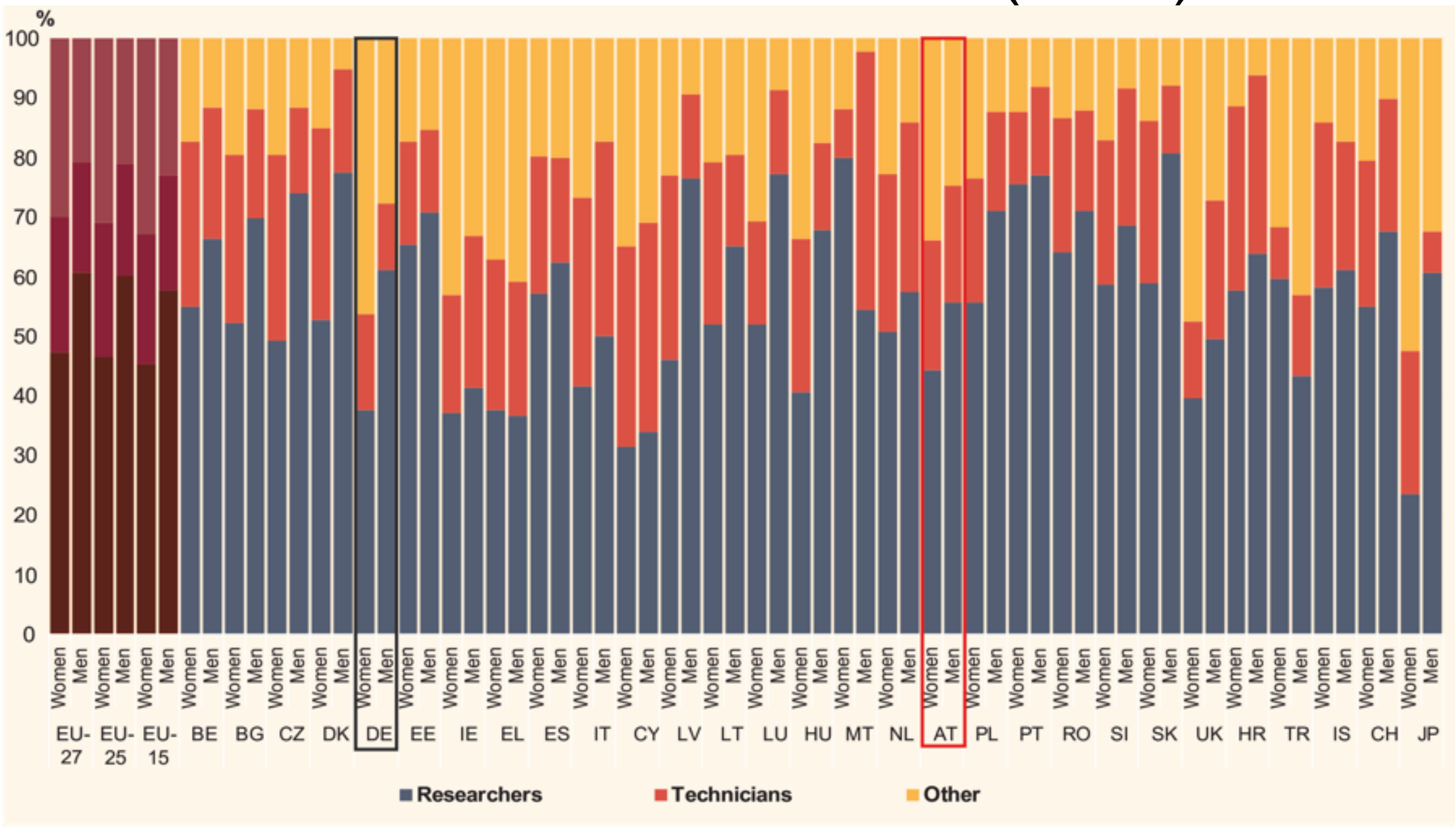
Source: WiS database (DG Research); Higher Education Authority for Ireland (Grade A)

R&D personnel distribution across occupations for Higher Education sector (HES)



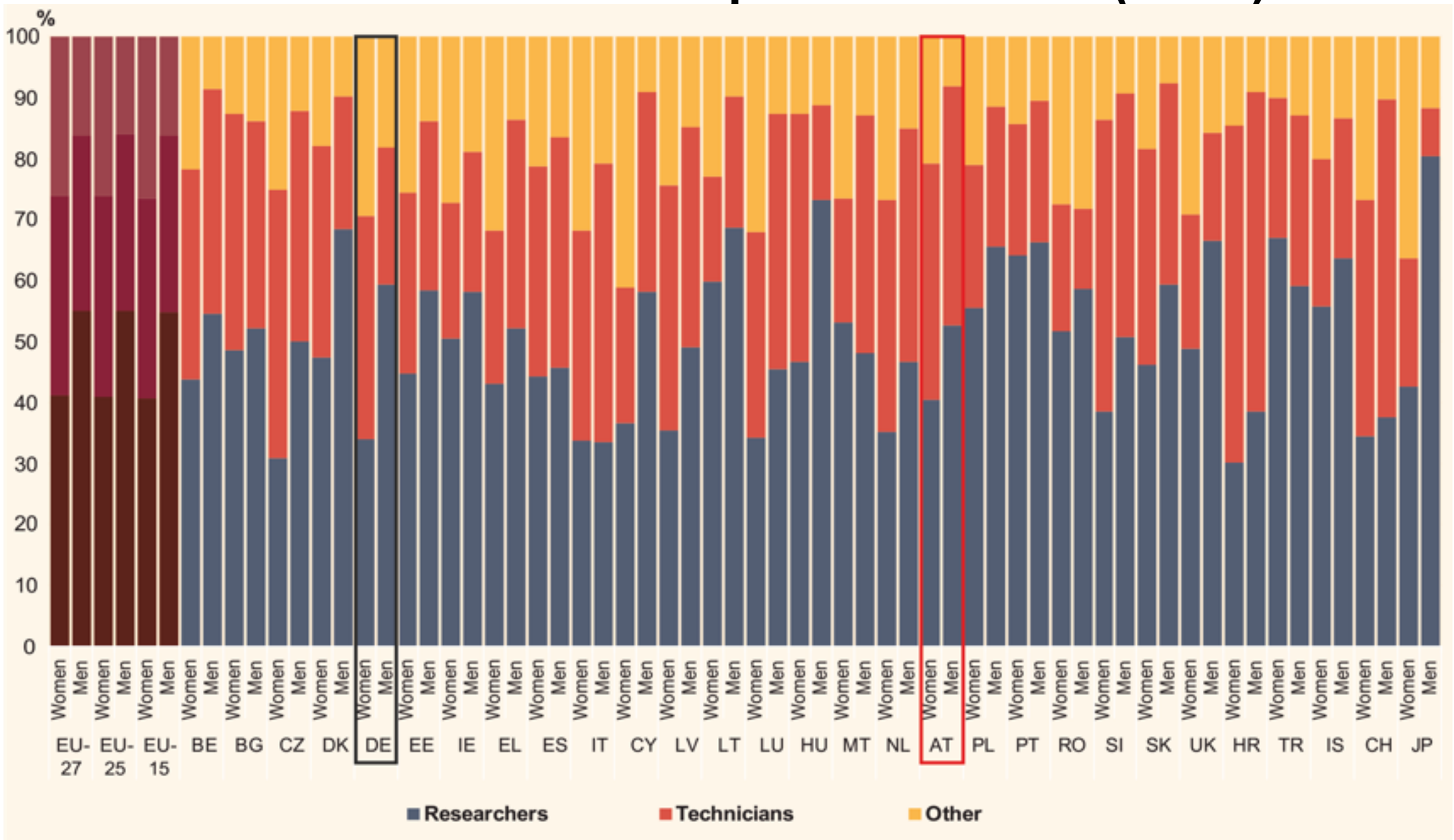
Source: S&T statistics (Eurostat)

R&D personnel distribution across occupations for Government sector (GOV)



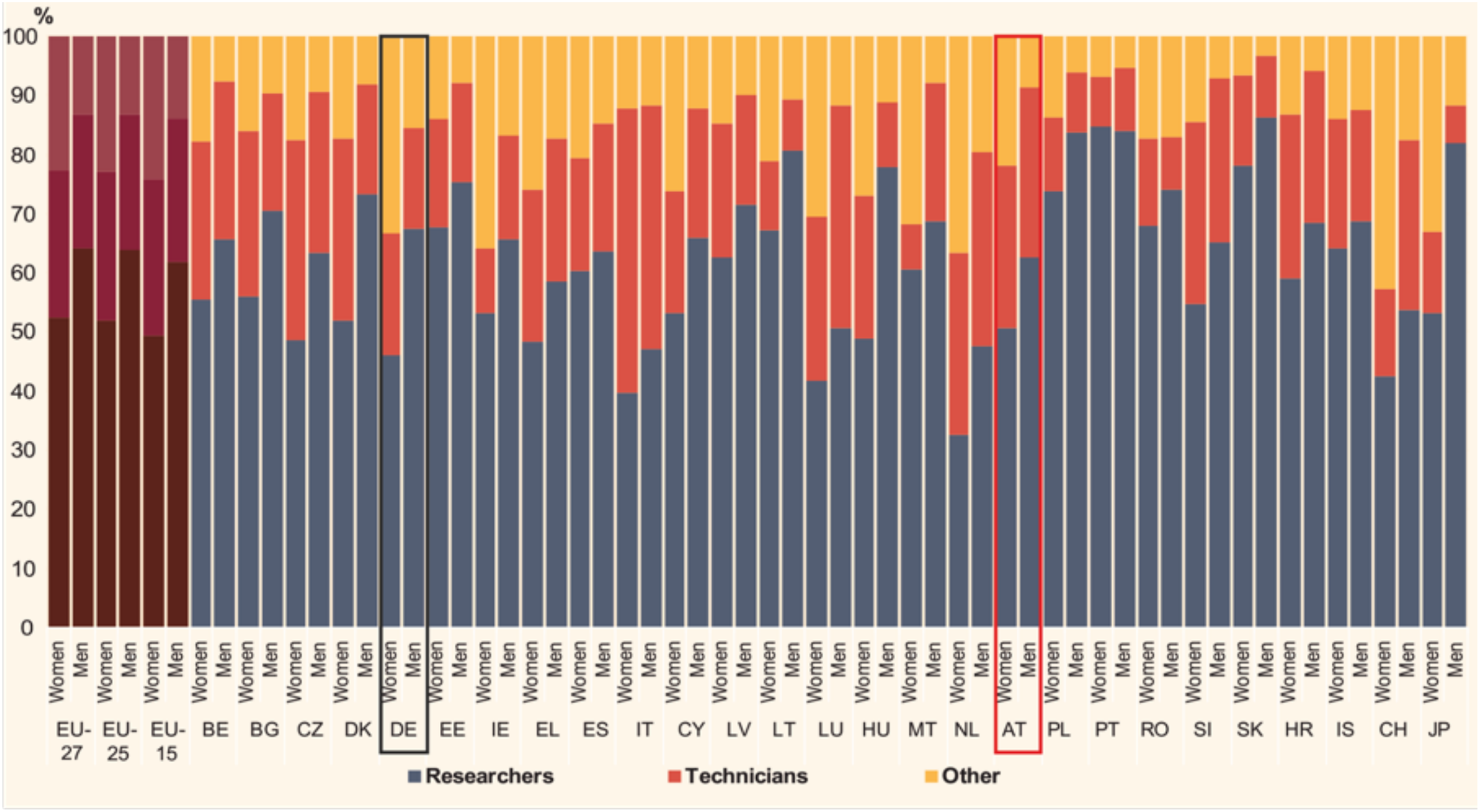
Source: S&T statistics (Eurostat)

R&D personnel distribution across occupations for business enterprise sector (BES)



Source: S&T statistics (Eurostat)

R&D personnel distribution across occupations for all sectors



Source: S&T statistics (Eurostat)

Pay Gap

- Equal pay for equal work
  - Principle: Treaty of Rome (1957)
    - Legislation: Series of EU directives (1975)
- Nevertheless still a wide gap between earnings today

Pay Gap

measured in

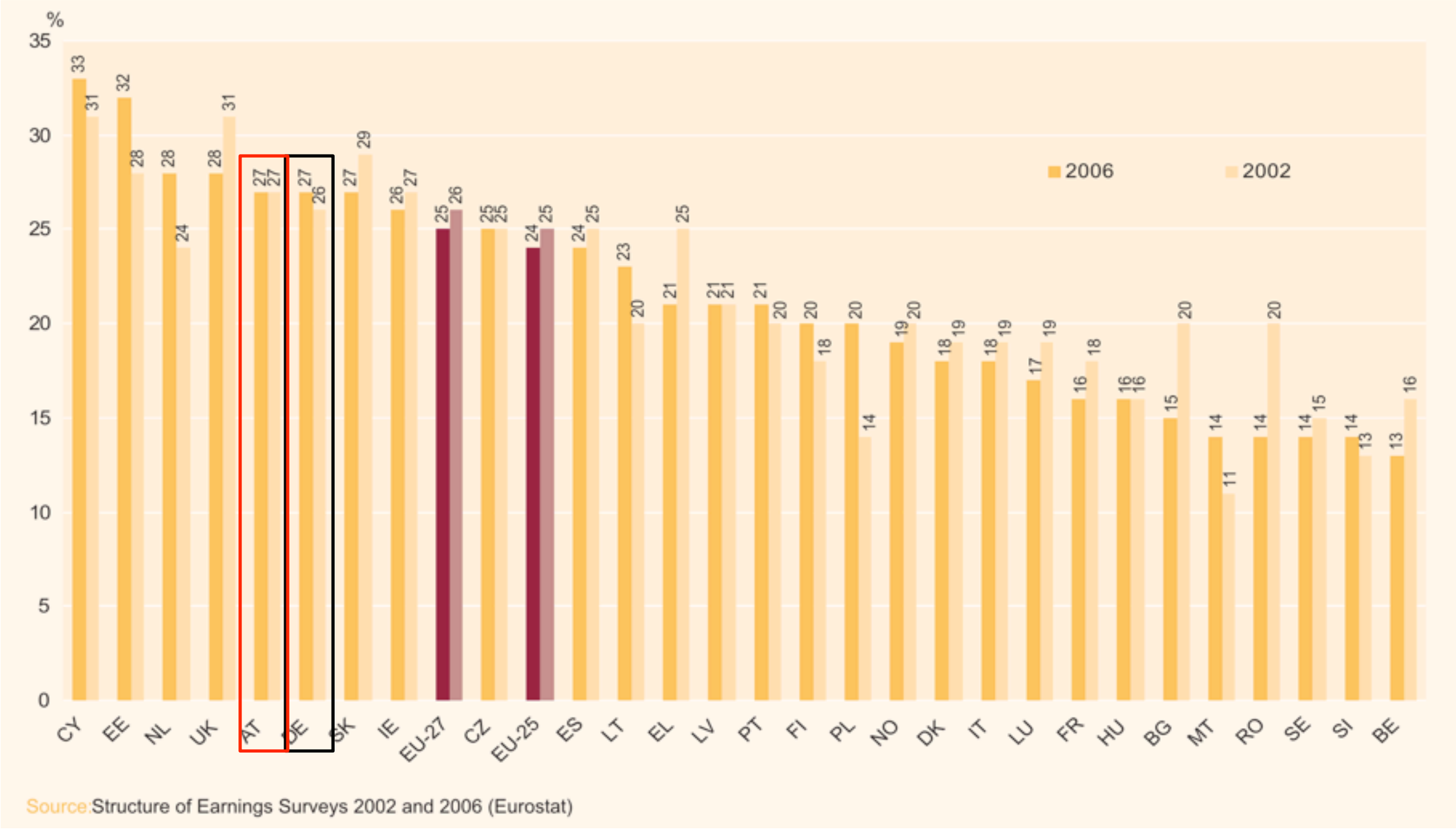
$$\mathrm{GPG} = \frac{\mathrm{GHE}_m - \mathrm{GHE}_f}{\mathrm{GHE}_m}$$

average Gross Hourly Earnings
(non details provided)

- Considered: enterprises > 10 employees, working periods of more than 30 weeks through reference year

- No data on ‚exogenous' factors (e.g. labour market experience)

Pay Gap – entire economy



Source: Structure of Earnings Surveys 2002 and 2006 (Eurostat)

Pay Gap – occupational breakdown

- ISCO 100:
  - senior officials, legislators, managers → no reliable data
  - corporate managers
  - small enterprise managers
- ISCO 200
  - (210) Engineering, physical & math. professionals (e.g. engineers, geologists, actuaries)
  - (220,230,240) Health care, teaching, and other professionals (e.g. doctors, teachers, financial consultants)

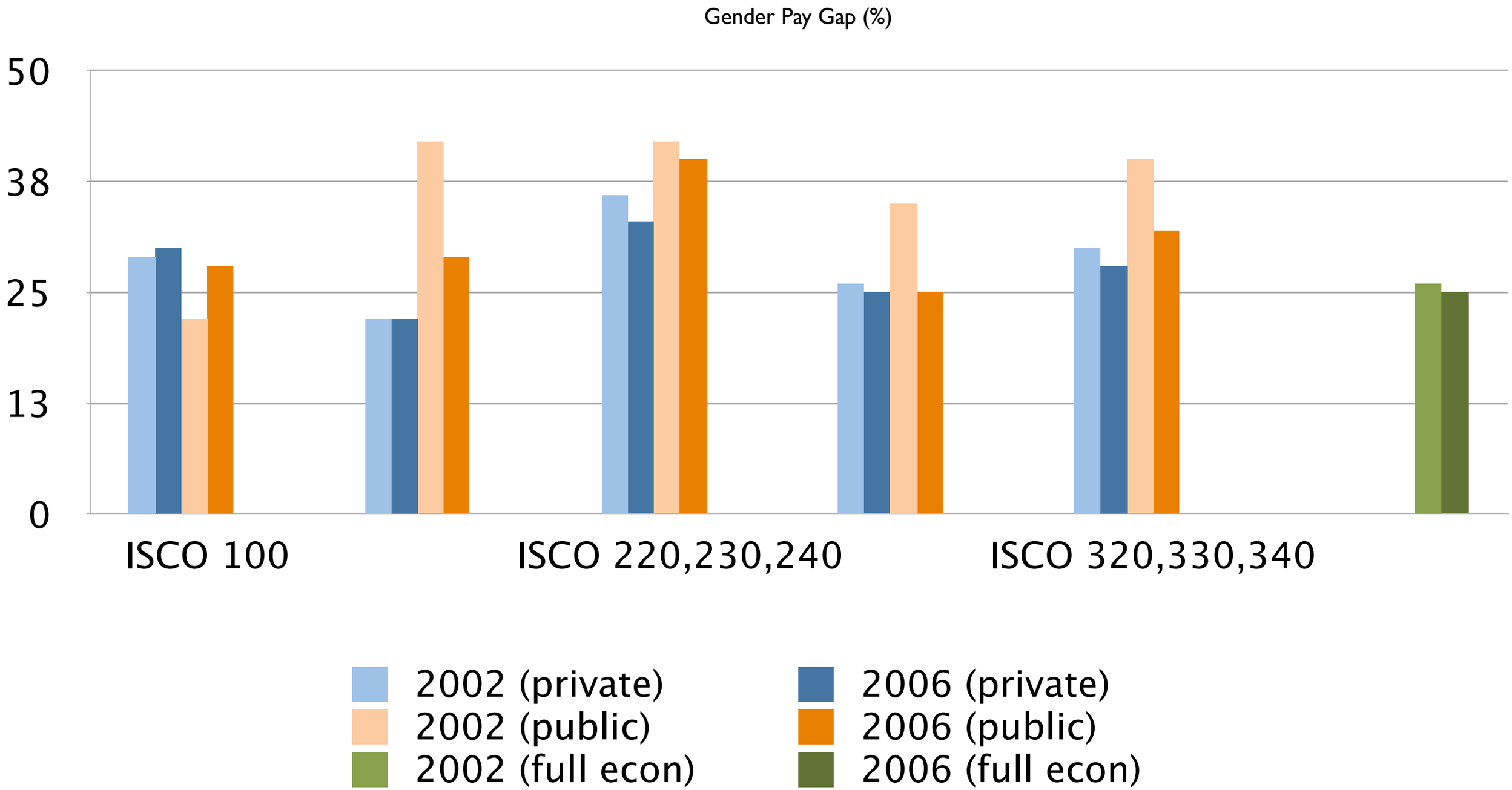
ISCO: International Standard Classification of Occupation

Pay Gap – occupational breakdown

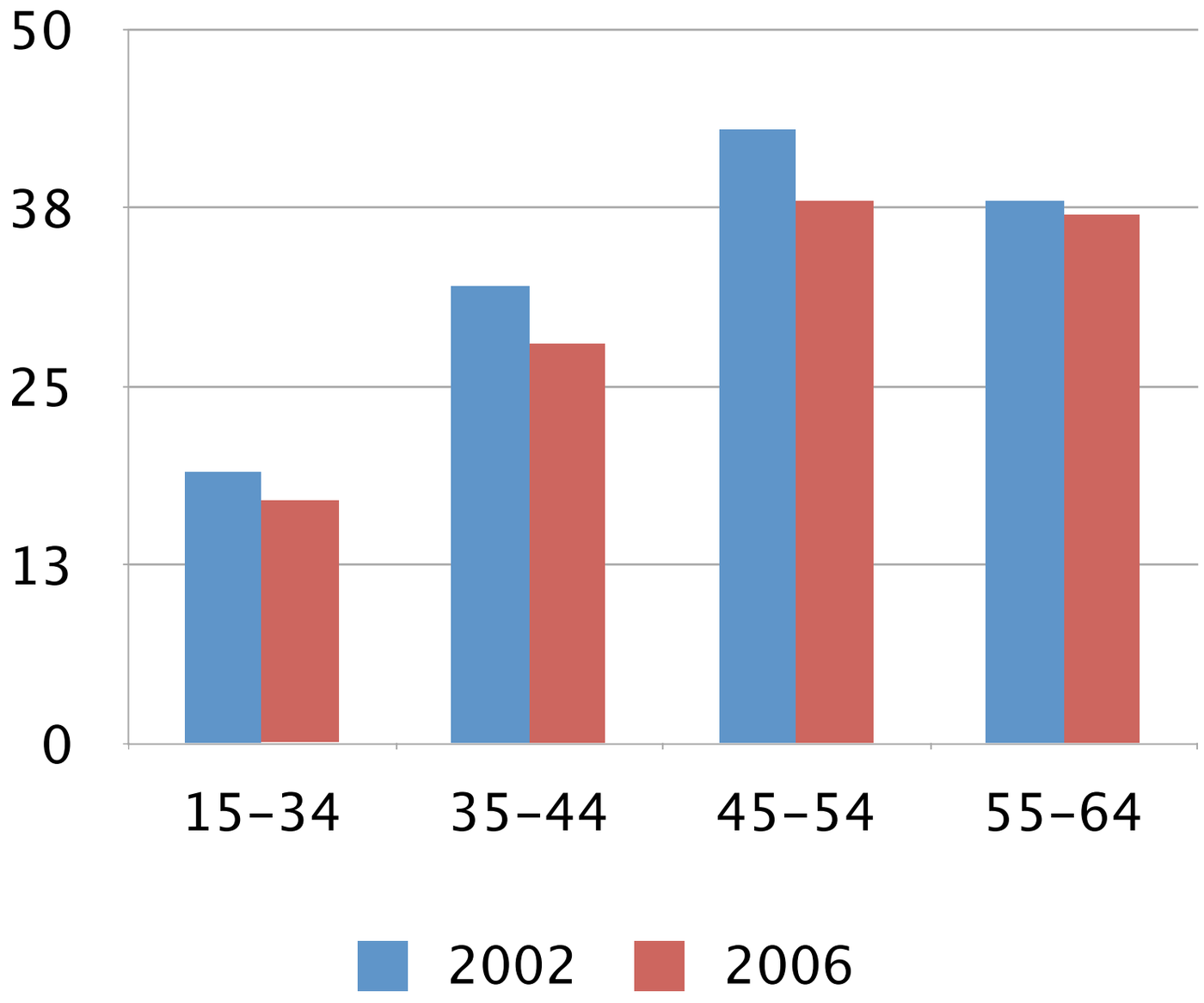
- ISCO 300
  - (310) Physical and engineering science associate professionals (e.g. construction supervisors, lab assistants)
  - (320,330,340) Health care, administration and other associate professionals (e.g. nurses, medical assistants, insurance agents, secretaries , administration officials)

ISCO: International Standard Classification of Occupation

Pay Gap – occupational breakdown



Pay gap – age breakdown



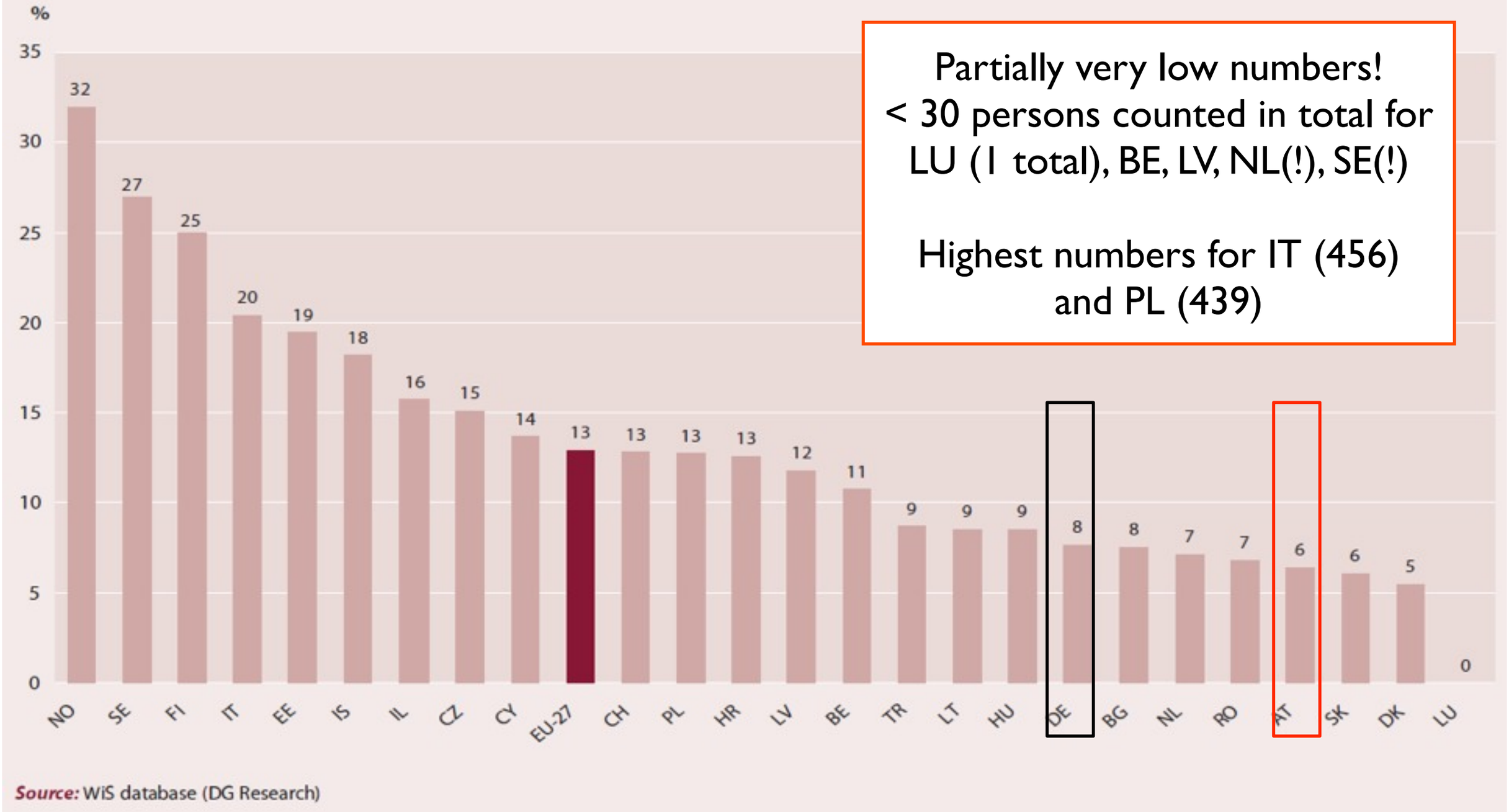
Pay Gap - conclusions

- 25 % pay gap between women and men
- Gap wider in public sector
- slight improvement from 2002→2006

Setting the Scientific Agenda
Outline

- Women in top positions
  - Higher education sector (HES)
    - Women on Boards
- Research funding success rates
- Number of female researchers in relation to research expenditure

Proportion of HES - Institutes headed by women

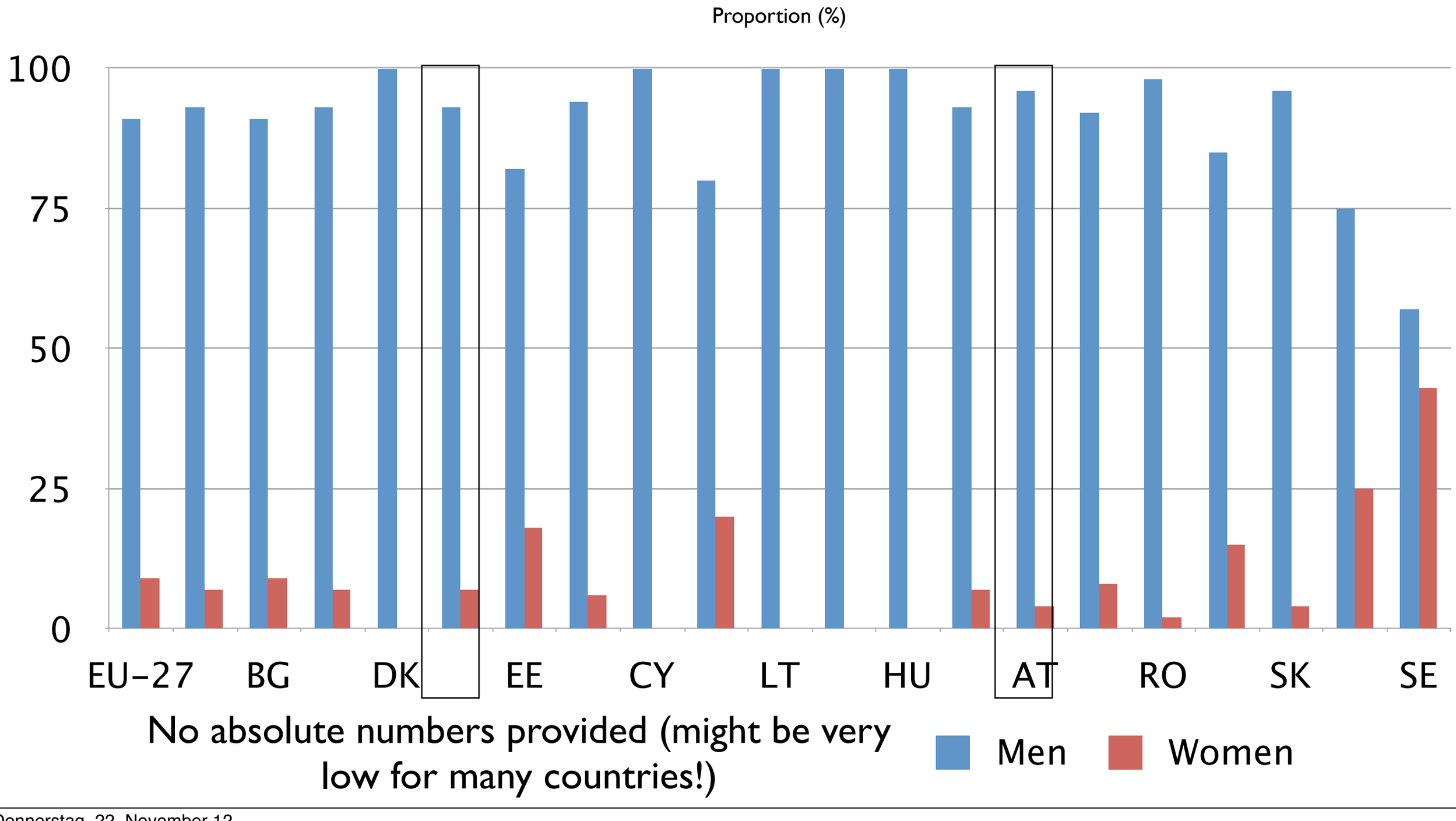


Partially very low numbers!
< 30 persons counted in total for LU (1 total), BE, LV, NL(!), SE(!)

Highest numbers for IT (456) and PL (439)

Source: WiS database (DG Research)

Female heads of institutions that can award PhDs (typ. universities)



Proportion of women on boards

- Counting as ‚boards‘: scientific commissions, R&D commissions, boards, councils, committees and foundations, academy assemblies and councils
- Example Germany
  - Higher Education Institutions
  - Public Research Institutions
  - Deutsche Forschungsgemeinschaft (DFG)
  - German Science Council (Wissenschaftsrat)

Proportion of women on boards (2007)

Source: WiS database (DG Research)

Research funding - success rates

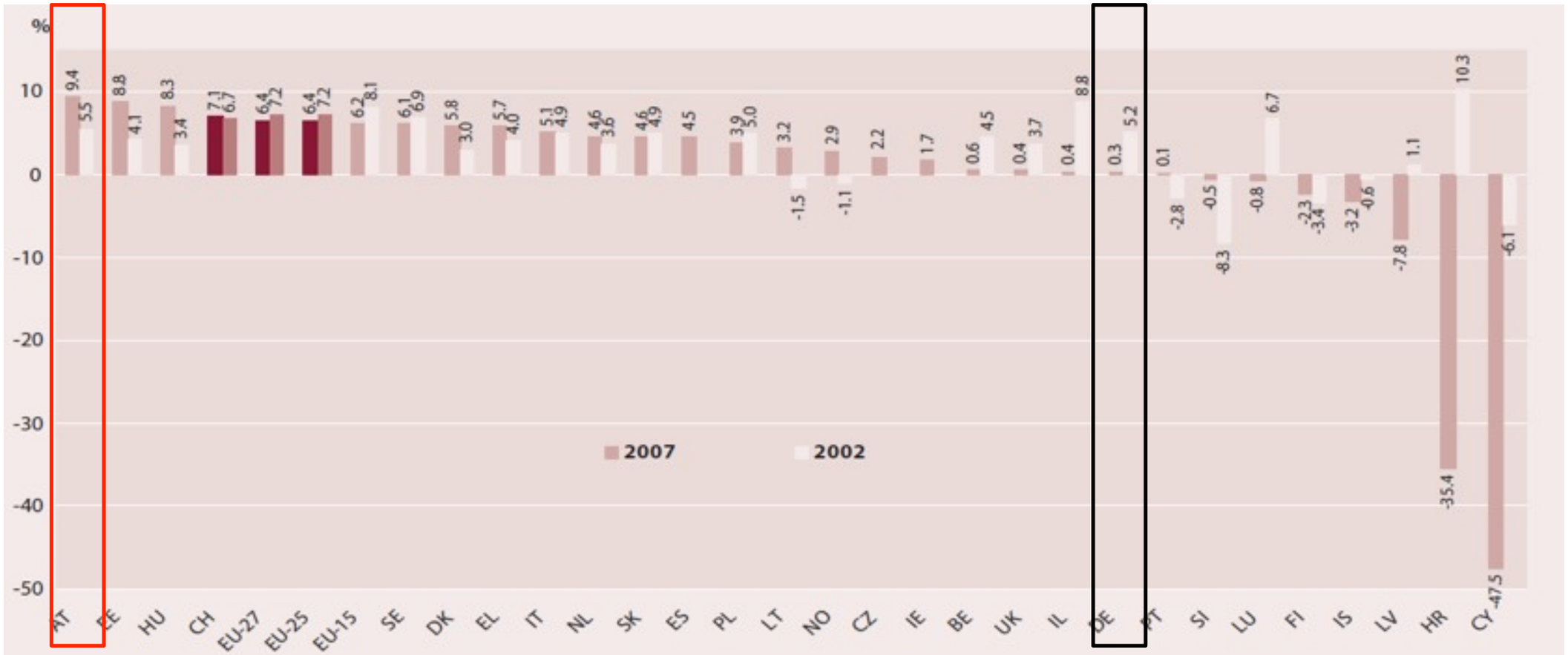
$$\Delta R = \left(\frac{N_B}{N_A}\right)_m - \left(\frac{N_B}{N_A}\right)_f$$

Difference in number of beneficiaries vs. applicants for male and female

- Big difference between number and types of funds considered.

- E.g. DK: 11 different funds (7 before 2004, 4 different ones from then on), PL: only ‚government' funds (for full period)

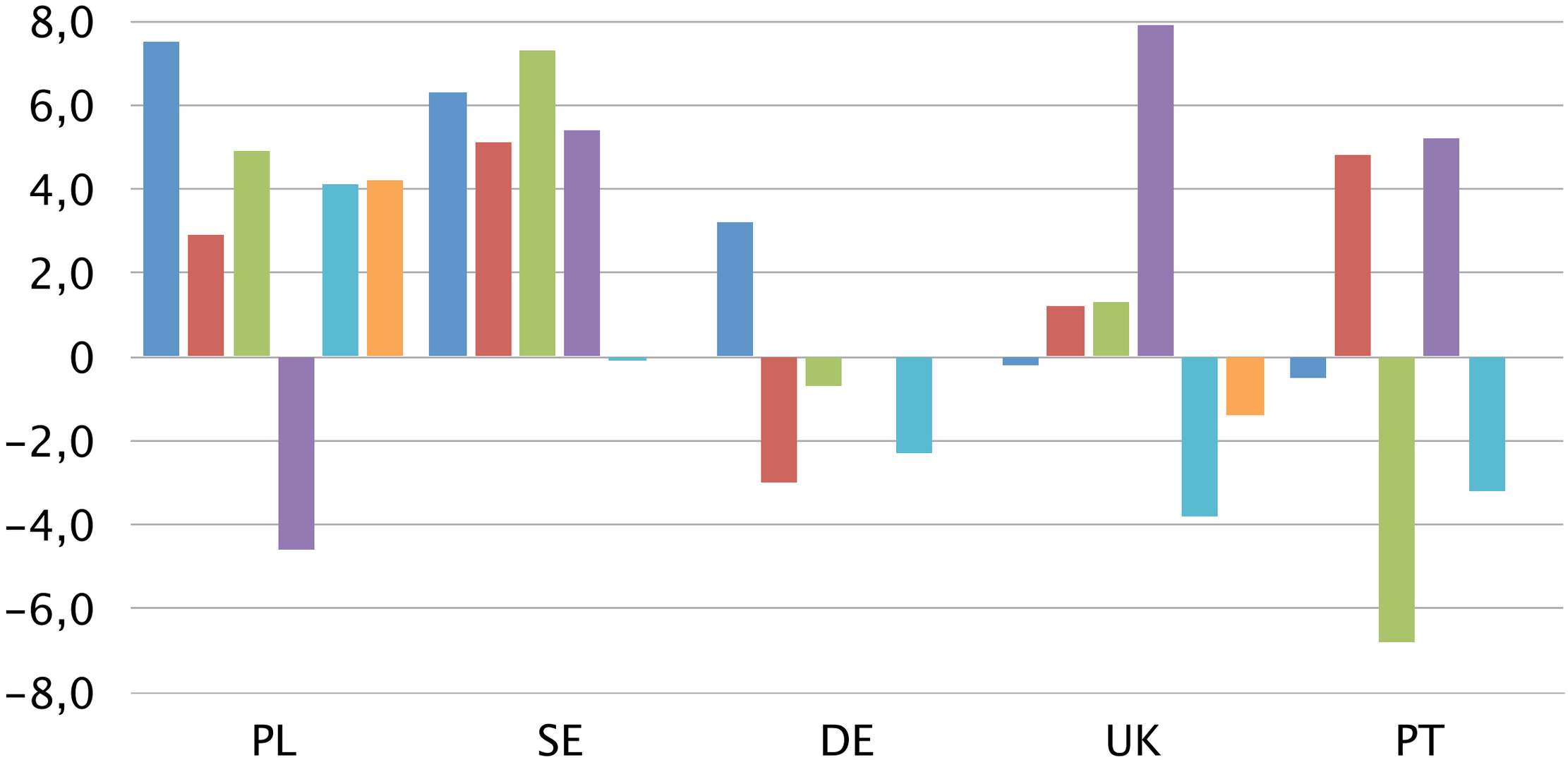
Research funding success rates



Source: WiS database (DG Research)

There is no common definition of funds
The total number of funds varies considerably between countries and over the period considered
Male success rate minus female success rate
BE data refer to Dutch-speaking community

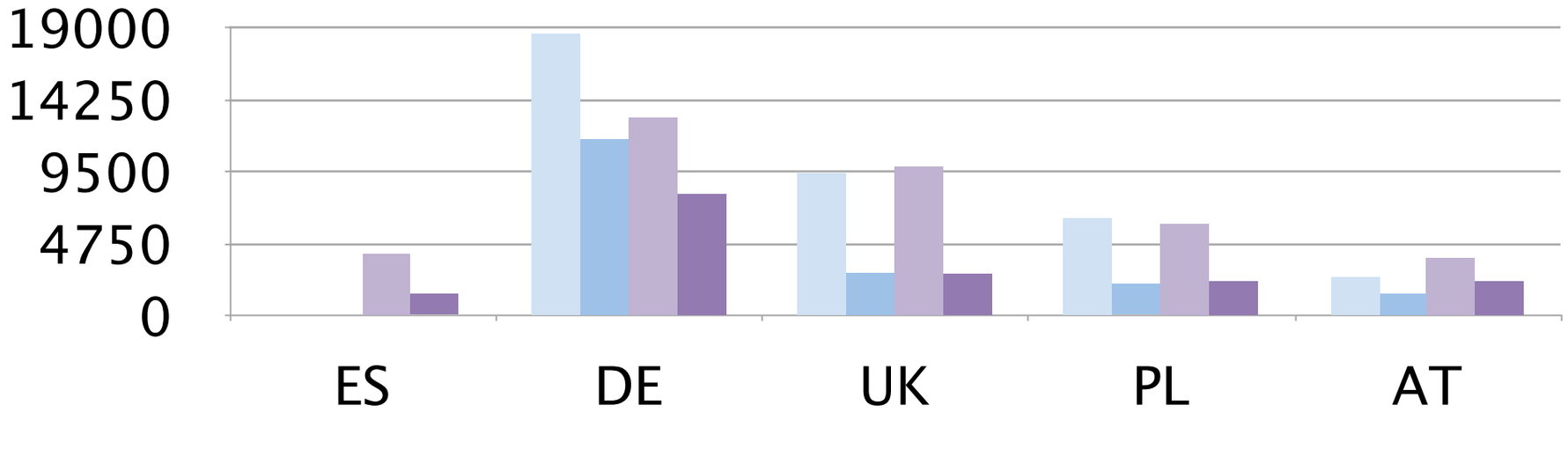
Research funding success rate differences by field of science (2007)



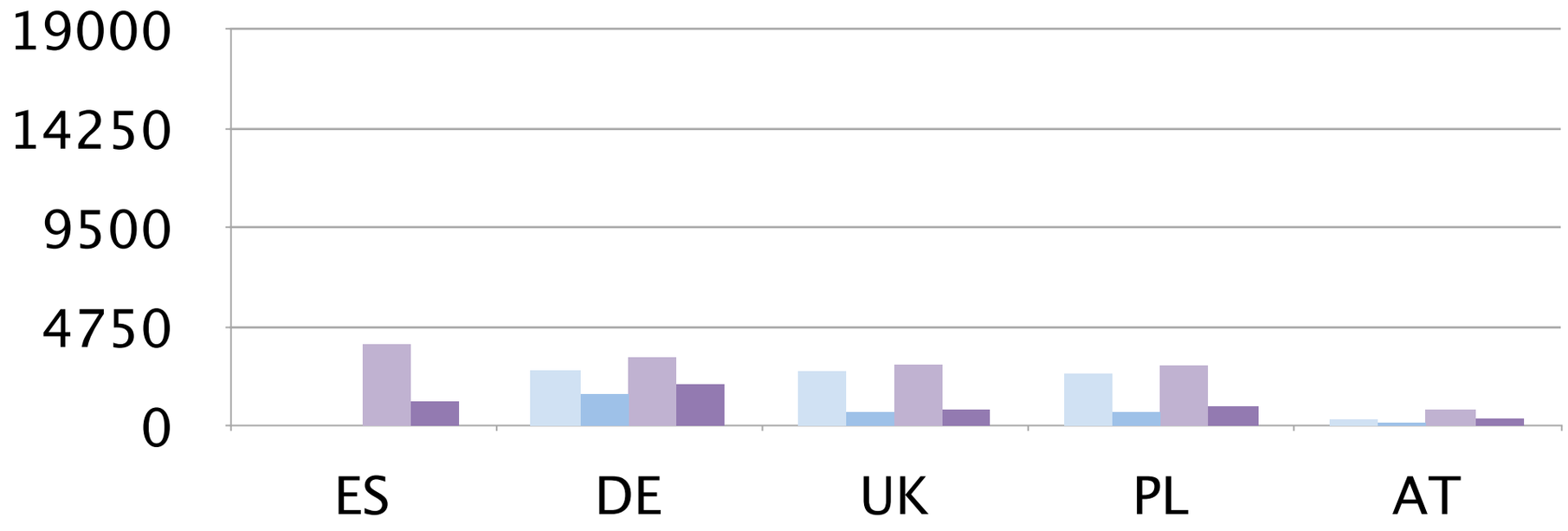
Only countries with **>1000 female applicants** are shown.

Beneficiaries versus applicants

Men



Women



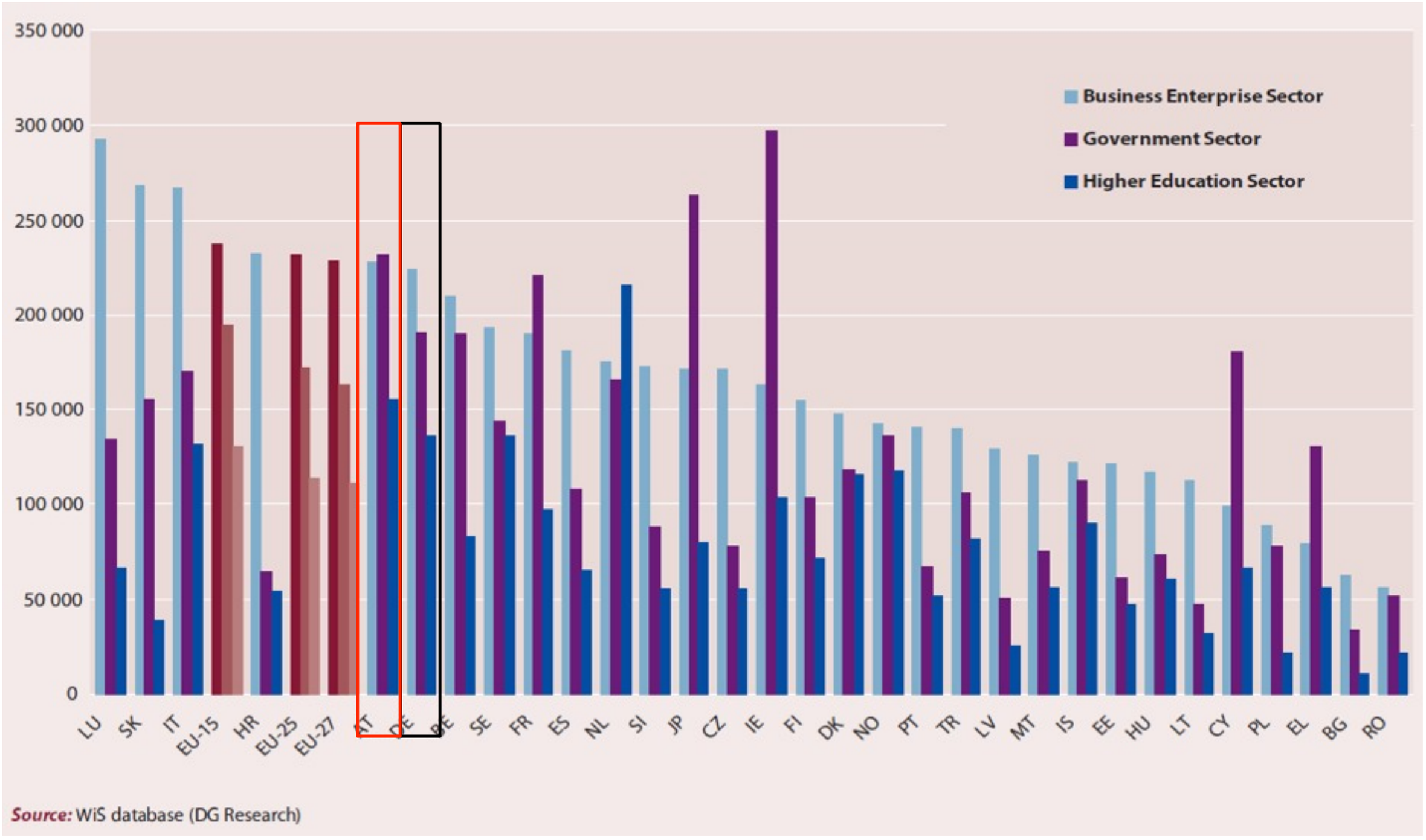
4 countries with most applicants + AT are shown

Female researcher proportion compared to research expenditure

- Purchasing power standards (PPS): artificial currency, used to eliminate differences in price levels

Female researcher proportion compared to research expenditure

Research expenditure by sector (2006)



Source: WiS database (DG Research)

Setting the Scientific Agenda - conclusions

- Only a small number of women in top positions in science and research
- Research funding success rates slightly higher for men ca. 6% gap
- Research expenditure: anti-correlated with proportion of female researchers

She Figures 2009

Seniority & Setting the Scientific Agenda

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