

# *Towards an Education for Balanced Gender Career Evolution in Materials Science and Engineering Institutions*



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## *Elementary school*

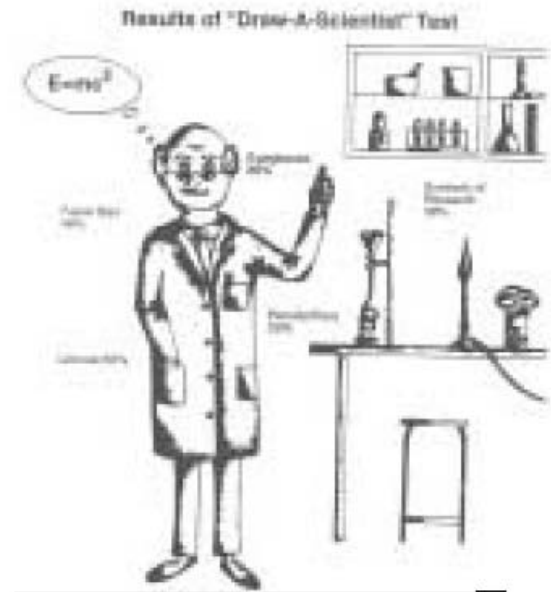
*Not a role but generally:*

### Girls

Make calligraphic letters

Are good in language, orthography ...

Are good in philology, philosophy, history .....



Cartoon of typical male scientist drawn by children.

Schiebinger (1999, p 74; original source Kahle 1987).

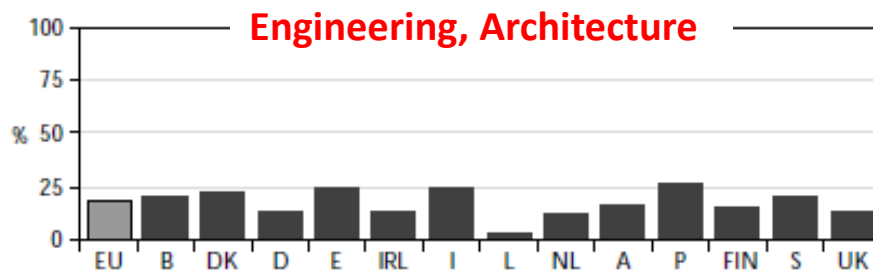
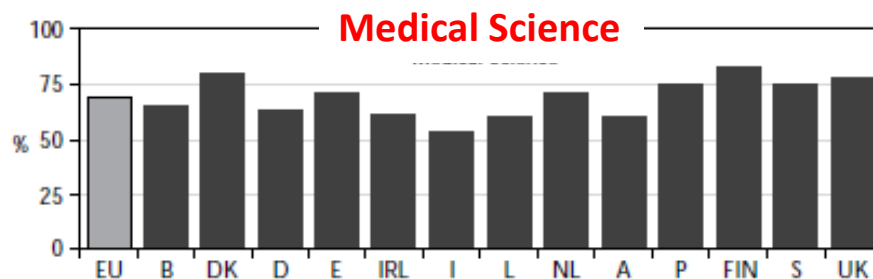
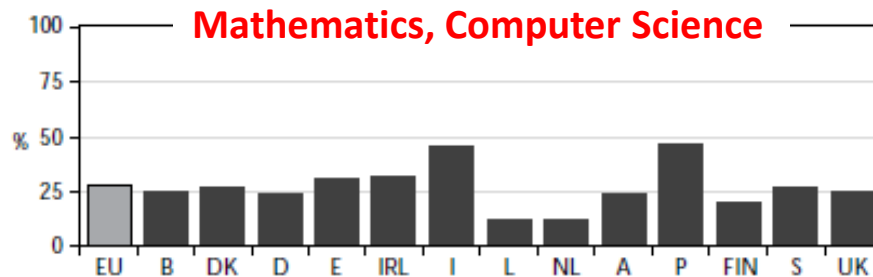
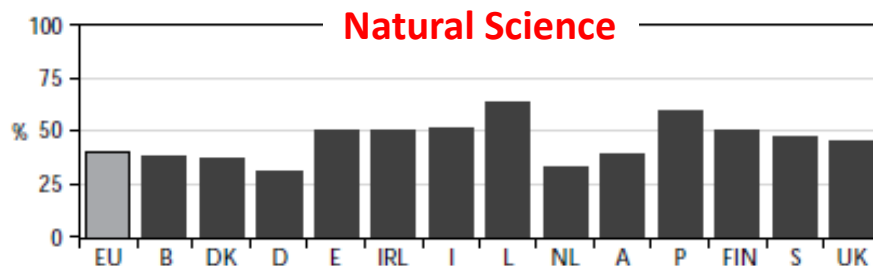


### Boys

Are more practical, aggressive, play war

Are good in mathematics, physics, chemistry ...

# Percentage of students in higher education that are female by field of study 1994-95 in the EU Member States



# European Workshop "Leadership positions: How accessible are they for women in materials research?"

May 19-21, 2010, Barcelona, Spain

Organisers:

Prof. Maria Dolors Baró, Dr. Eva Pellicer (UAB)

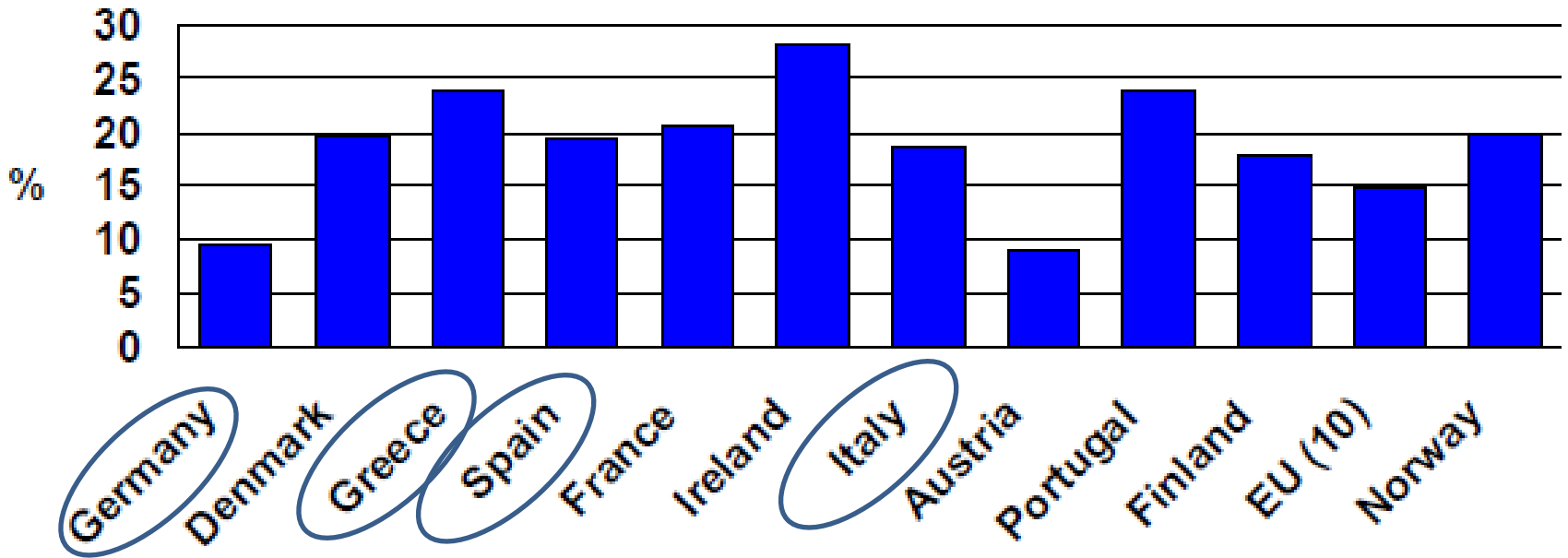
Barcelona, May 19-21st, 2010



Women in Industrial Research:  
the good approach?

Carmen Vela Olmo  
President - AMIT ( Spanish Association of  
Women Scientist and Technologist)  
Manager Director-INGENASA

## mujeres investigadoras en el sector industrial



# Gender equality policies

# European-level policy for gender equality in science

- **Treaty of Amsterdam (1997):** equal opportunities between women and men / one of the European's Union objectives.
- **Women and science - Mobilising women to enrich European Research (1999):** the severe under-representation of women in science → action plan to promote gender equality in science → **research by, for and about women!**
- **European Technology Assessment Network (ETAN) on Women and Science -EC Report - Promoting excellence through mainstreaming gender equality\* (2000)**
- **Helsinki Group on Women and Science (2000)**  
national reports on the situation of women scientists
- **ENWISE Expert Group - Enlarge the Women and Science Initiative to East (2002)**
- **WIRDEM report - MAPPING THE MAZE: Getting more women to the top in research, EC, (2008)**



# Gender equality policies

## Greece

The **Gender Equality Principle** was introduced in the Greek Constitution in **1975** and established in **Eighties** with the creation of a legal framework that addresses equality between men and women.

The **National Collective Labour Agreements of 2002-2004**, affecting employees in the public and private sector, introduced **gender equality practices including paternity and parental leave**.



## Slovakia

The Gender equality agenda has been an official institutional agenda in the Slovak Republic since the **1990s**.

First time that the term “gender policies” became part of the political structure was in **2005** when “equal opportunity” department was again transformed into the *Department for Family and Gender Policy*.

# Gender equality policies



## Legal framework

**Since 1947**, The Italian Constitution ensures parity between male and female workers. **In 1997 a law defined the framework for equal treatment for men and women at work.** In **1991** measures for positive action were introduced to ensure equal opportunities in the workplace. In **2006** all the existing laws on equal opportunity converged into one all-inclusive legislative decree.

## Commitment to Gender Mainstreaming

Italy is committed to gender mainstreaming since 1996.

The Ministry for Equal Opportunity, established in 1997, has a specific office on the issue. The Government has recently issued a specific Directive for mainstreaming in the Public Administration.

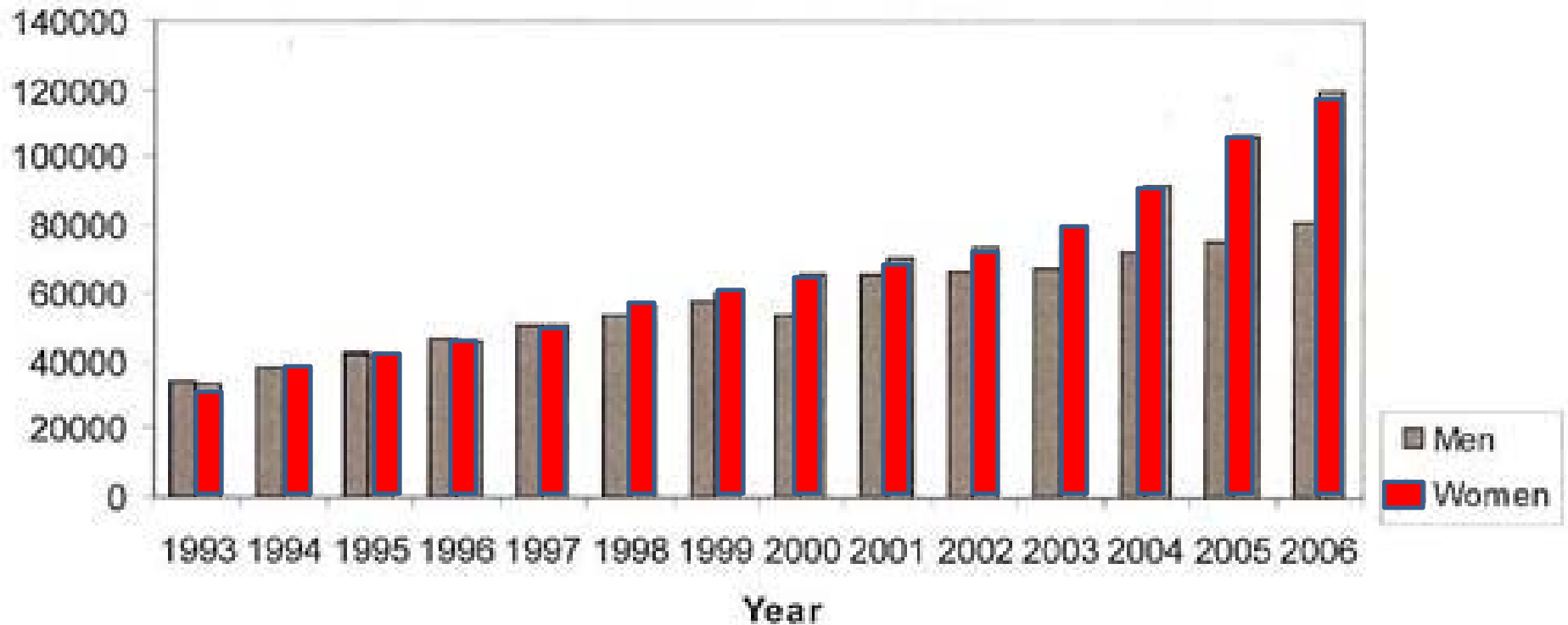
**What is the situation in education ?**





# Slovakia

## University students in Slovakia



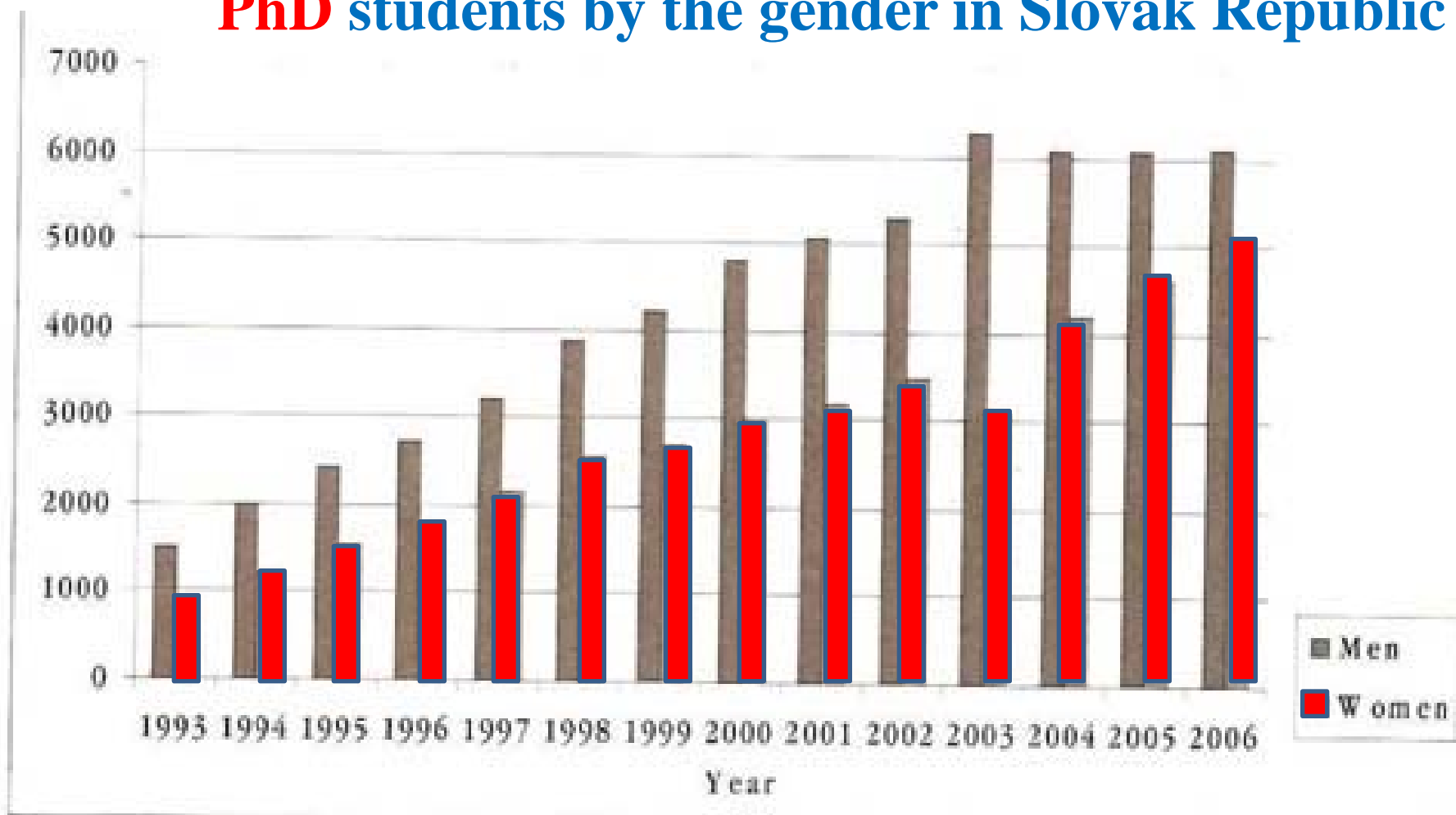
*Remark: Data covers university students in all forms of study. Some students could be enrolled in more than one university.*

*Source: The Institute of Information and Forecasting on Education, <http://www.uips.sk/statist/index.html>*



# Slovakia

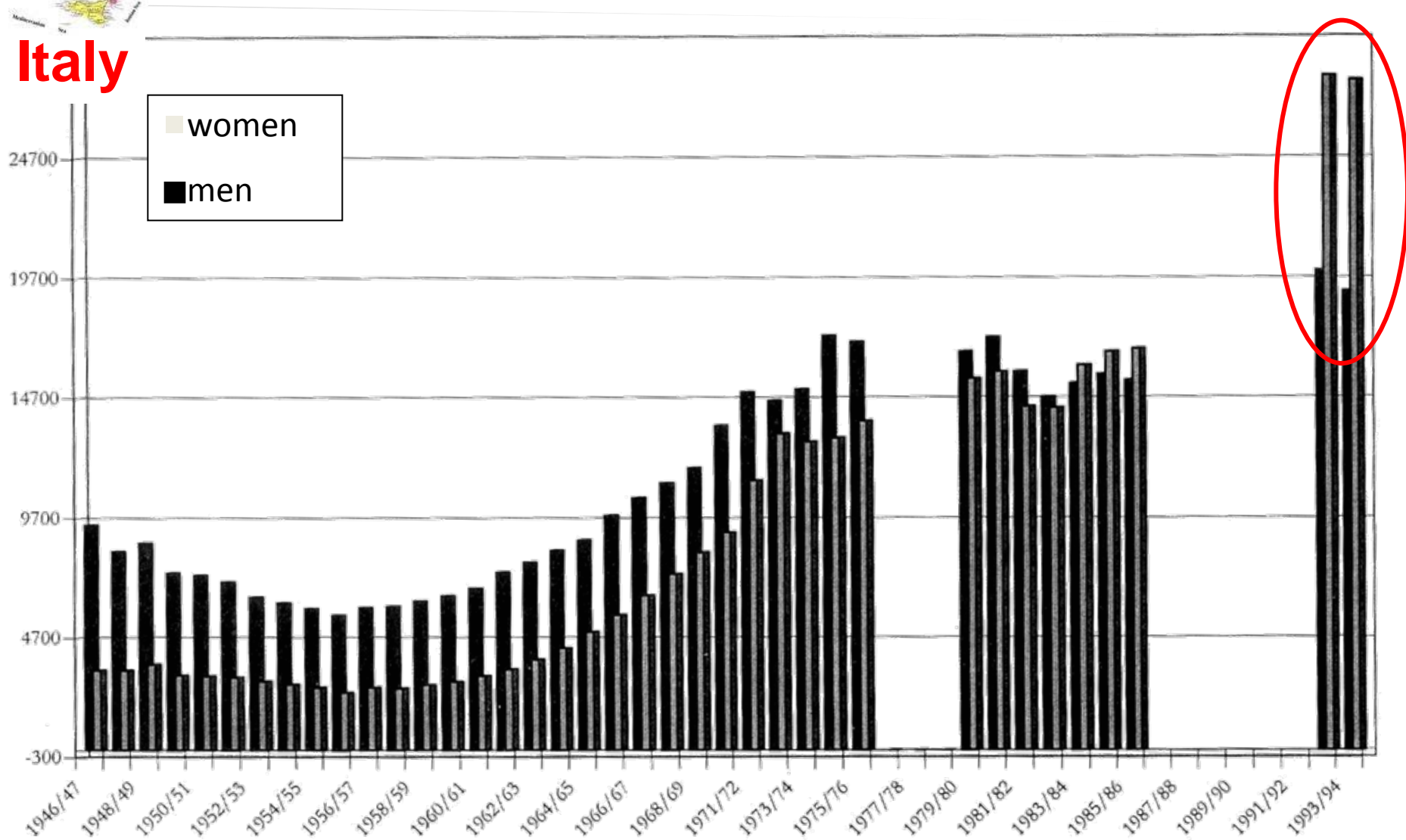
## PhD students by the gender in Slovak Republic



Source: The Institute of Information and Forecasting on Education, <http://www.uips.sk/statistika/index.html>

# Registered students at the University of Torino (1947-1993)

Italy



Science faculty 2010: males 3226; females 2490

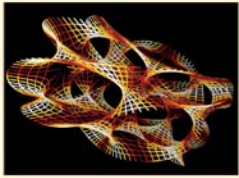


# Greece

Percentage (%) of the number of male and female as a function of **BS, MS and PhD** degrees from 2002 to 2006 in Greece.

<i>Academic year</i>	<i>Bs</i>		<i>Ms</i>		<i>PhD</i>	
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
<i>2002-2003</i>	<i>37.01</i>	<i>62.99</i>	<i>45.95</i>	<i>54.05</i>	<i>62.94</i>	<i>37.06</i>
<i>2003-2004</i>	<i>36.00</i>	<i>64.00</i>	<i>42.66</i>	<i>57.34</i>	<i>65.02</i>	<i>34.98</i>
<i>2004-2005</i>	<i>35.71</i>	<i>64.29</i>	<i>47.65</i>	<i>52.35</i>	<i>72.06</i>	<i>27.94</i>
<i>2005-2006</i>	<i>35.67</i>	<i>64.33</i>	<i>41.03</i>	<i>58.97</i>	<i>59.65</i>	<i>40.35</i>

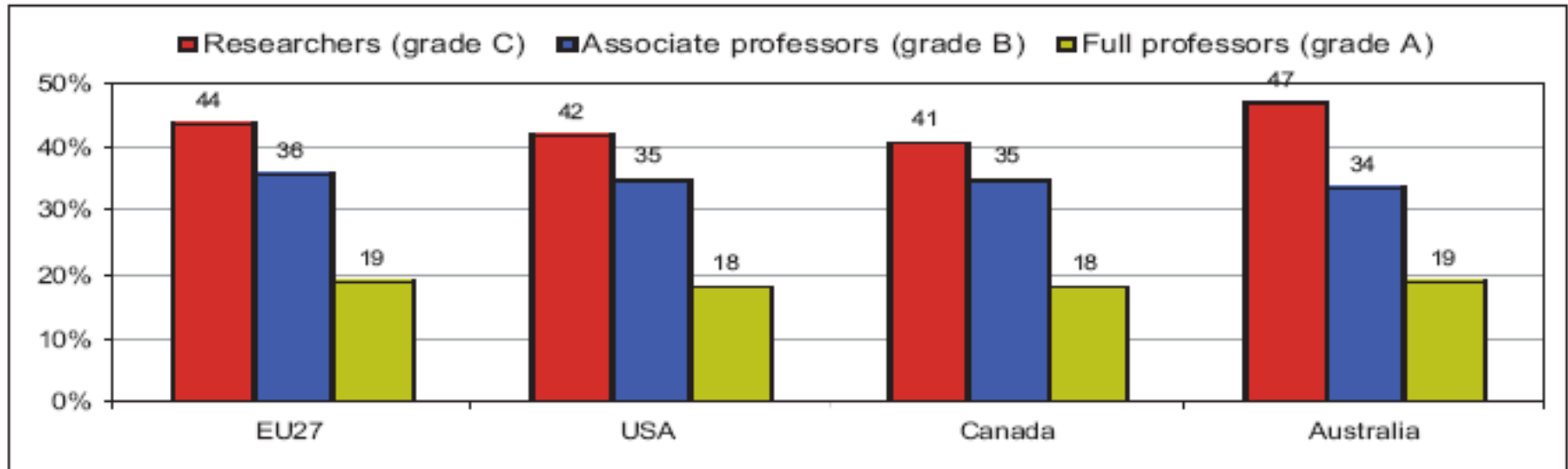
# **Academic positions**



# Keys cause for concern



– Female participation among researchers, associate and full professors in EU-27 countries, USA, Canada, Australia, 2007 (%)



Source: European Commission, 2009; American Association of University Professors, 2004; Canadian Association of University Professors, 2007; DEST, 2002

## Project Prages

### (Practising Gender Equality in Science)

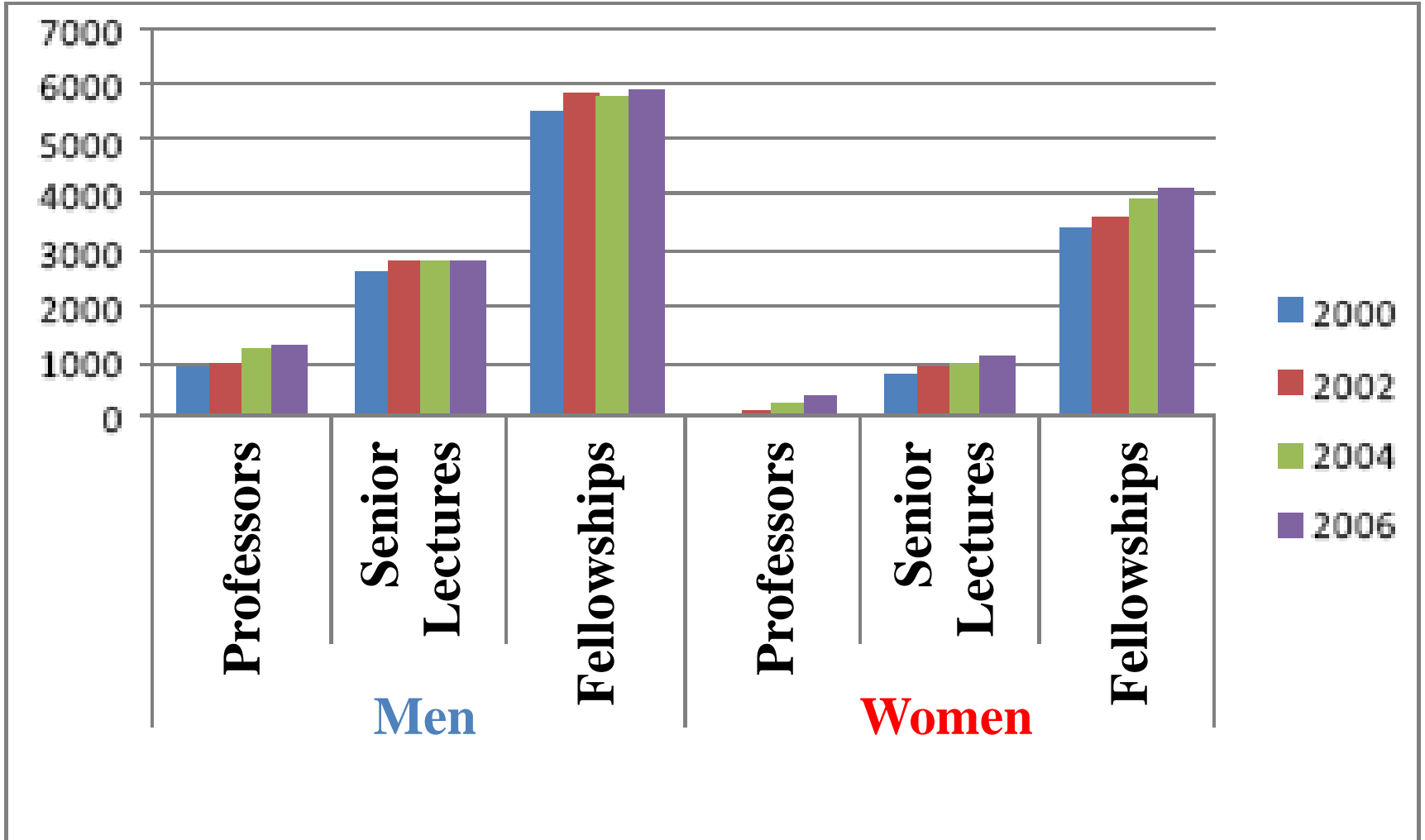
**Female participation** among researchers, associate and full professors in EU 27, **2007 (%)**

Country	Research-ers (grade C)	Associate professors (grade B)	Full professors (grade A)
Bulgaria	:	38	24
Romania	:	49	32
Estonia	57	37	17
Finland	56	49	23
Latvia	54	42	14
Lithuania	54	42	14
Iceland	53	32	19
Slovak Republic	50	35	20
Spain	48	36	18
United Kingdom	47	37	17
Ireland	47	40	10
Norway	46	34	18
Slovenia	46	30	17
Cypr	46	20	10
Hungary	45	32	19
Italy	45	34	19
Portugal	43	34	21
Poland	43	28	20
Sweden	42	47	18
Austria	40	19	14
Switzerland	38	24	22
Denmark	37	25	12
Israel	36	22	13
France	34	39	19
Germany	33	18	12
Greece	32	23	11
The Netherlands	32	18	11
Czech Republic	31	31	13
Luxemburg	31	29	9
Belgium	31	25	11
Malta	14	32	2
<b>EU27</b>	<b>44</b>	<b>36</b>	<b>19</b>

Country	Researchers	Associate Prof.	Full Prof.
Spain	46	36	18
United Kindom	47	37	17
Slovakia	50	35	20
Italy	45	34	19
Sweden	42	47	18
France	34	39	19
Germany	33	18	12
Greece	32	23	11
EU27	44	36	19



# **Slovakia**      A gender structure of **academic positions**

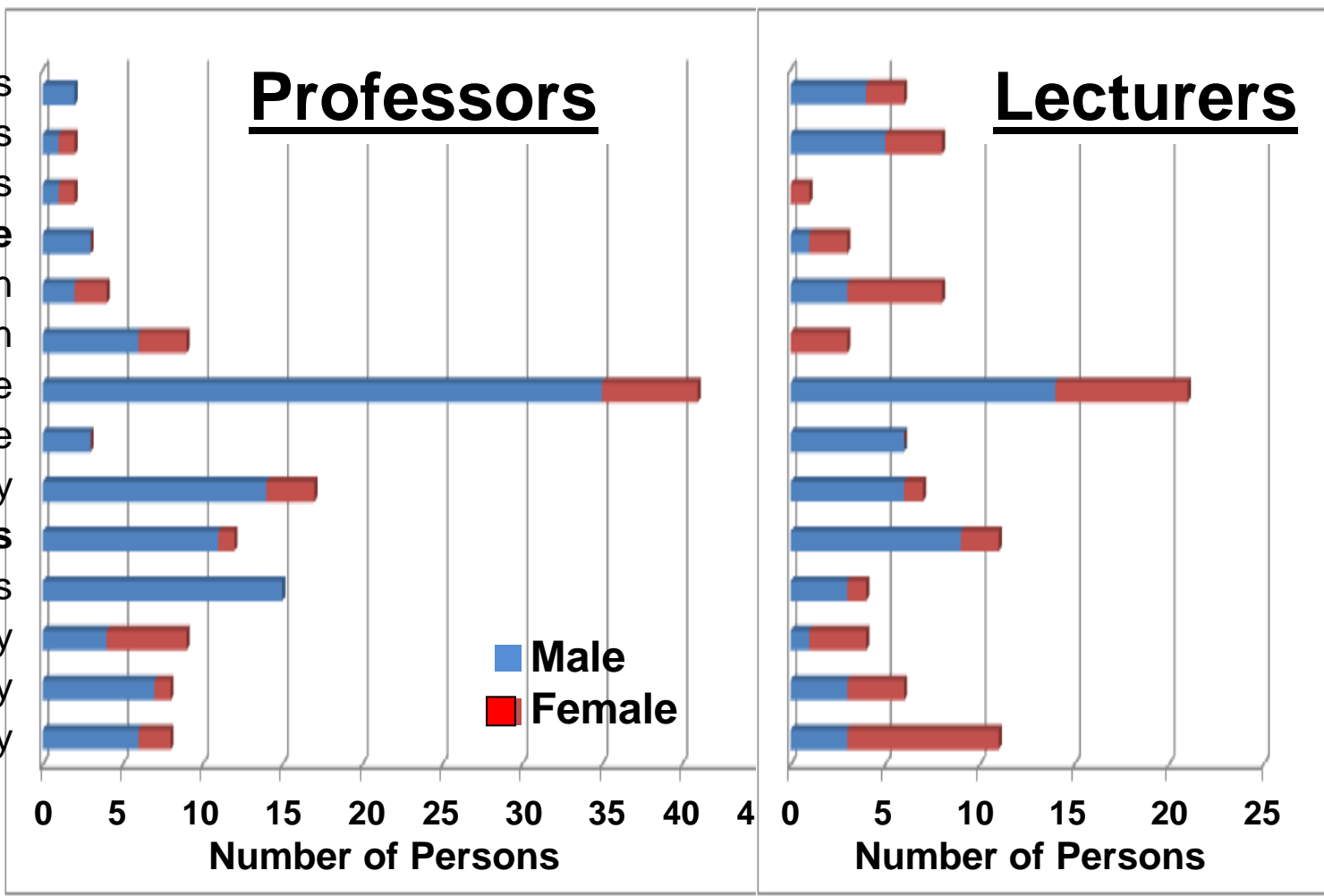




**Greece**

# A gender structure of academic positions at the University of Ioannina

- of Agricultural Products
- tal & Natural Resources
- ations and Technologies
- Materials Science**
- Pre-School Education
- Primary School Education
- Medicine
- Computer Science
- Chemistry
- Physics**
- Mathematics
- History and Archaeology
- Education & Psychology
- Philology



May 2009

# *Scissors diagrams*

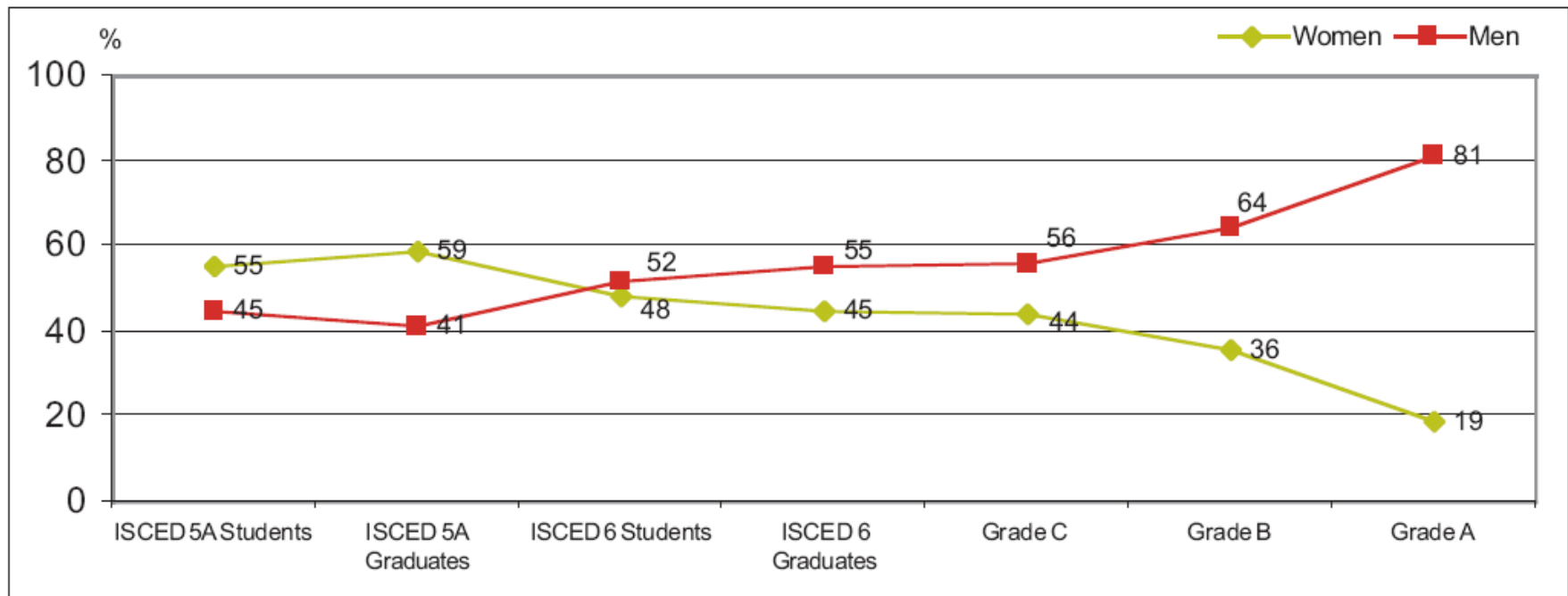


# Keys cause for concern

## 'Scissors' diagram



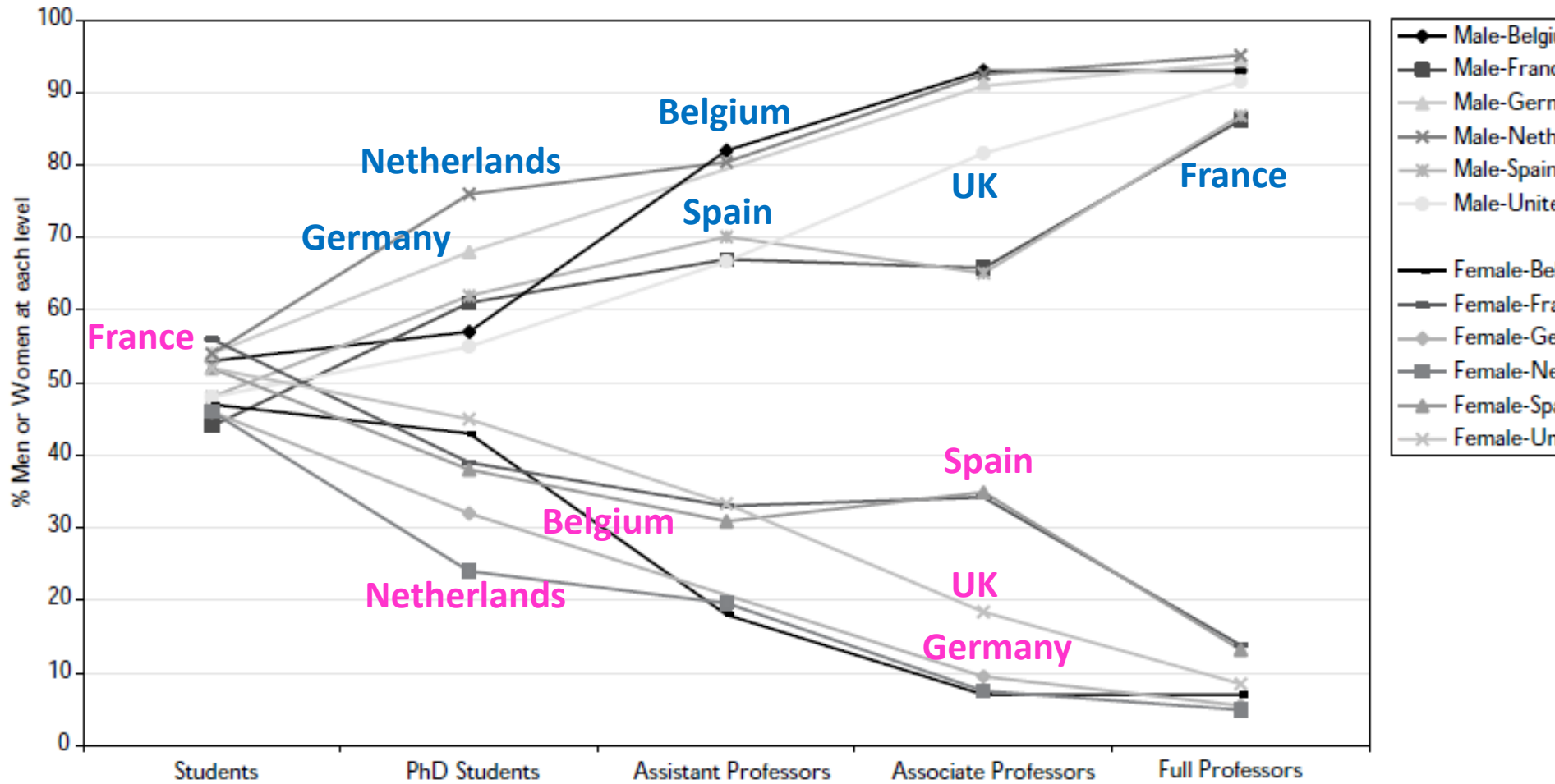
– Proportion of men and women in a typical academic career, students and academic staff, EU-27, 2006 (%)

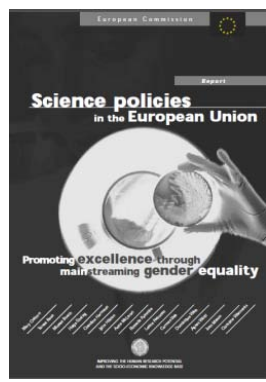


Source: European Commission, 2009



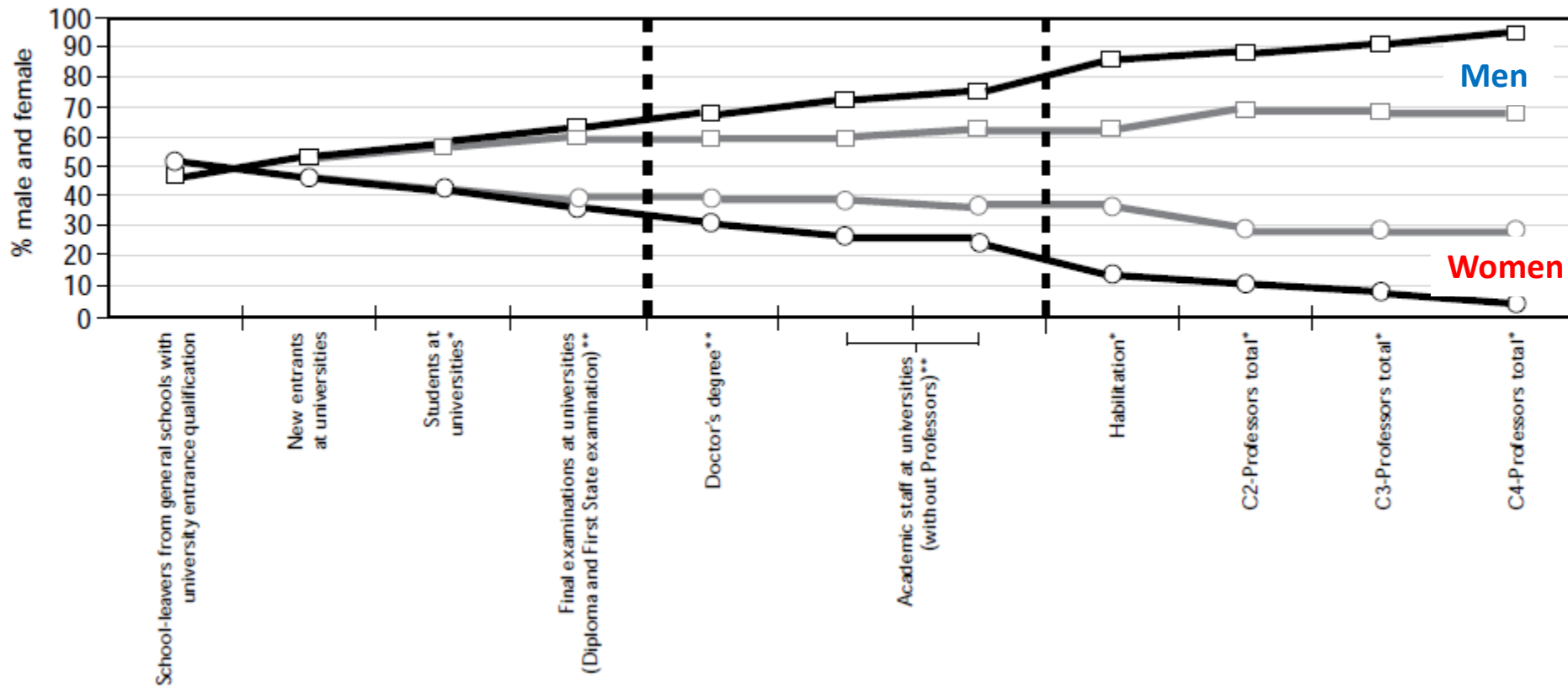
## Women and men in academia in six Member States (1997)





# Germany

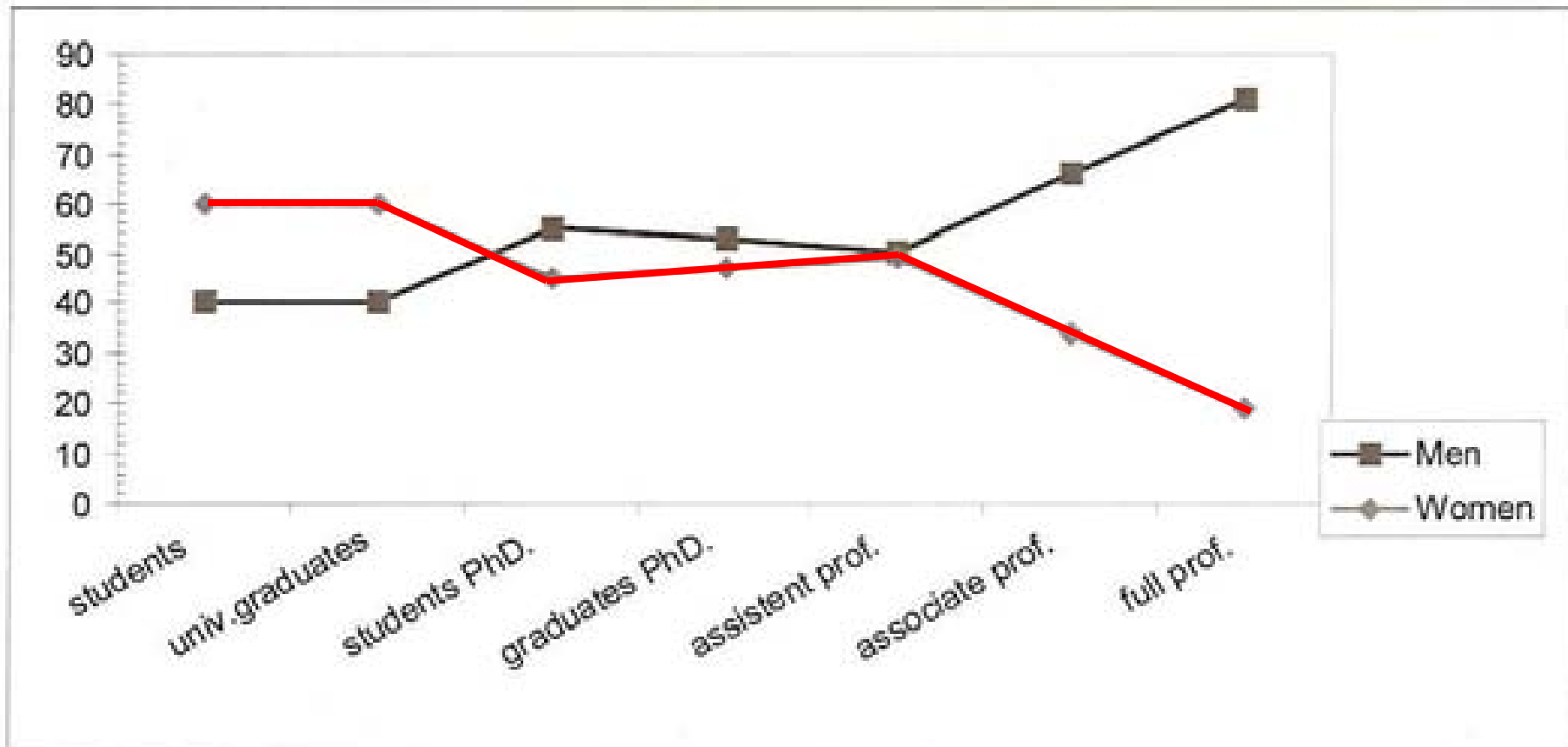
## Women and men in academia in Germany: the scissors diagram (1995-96)





# Slovakia

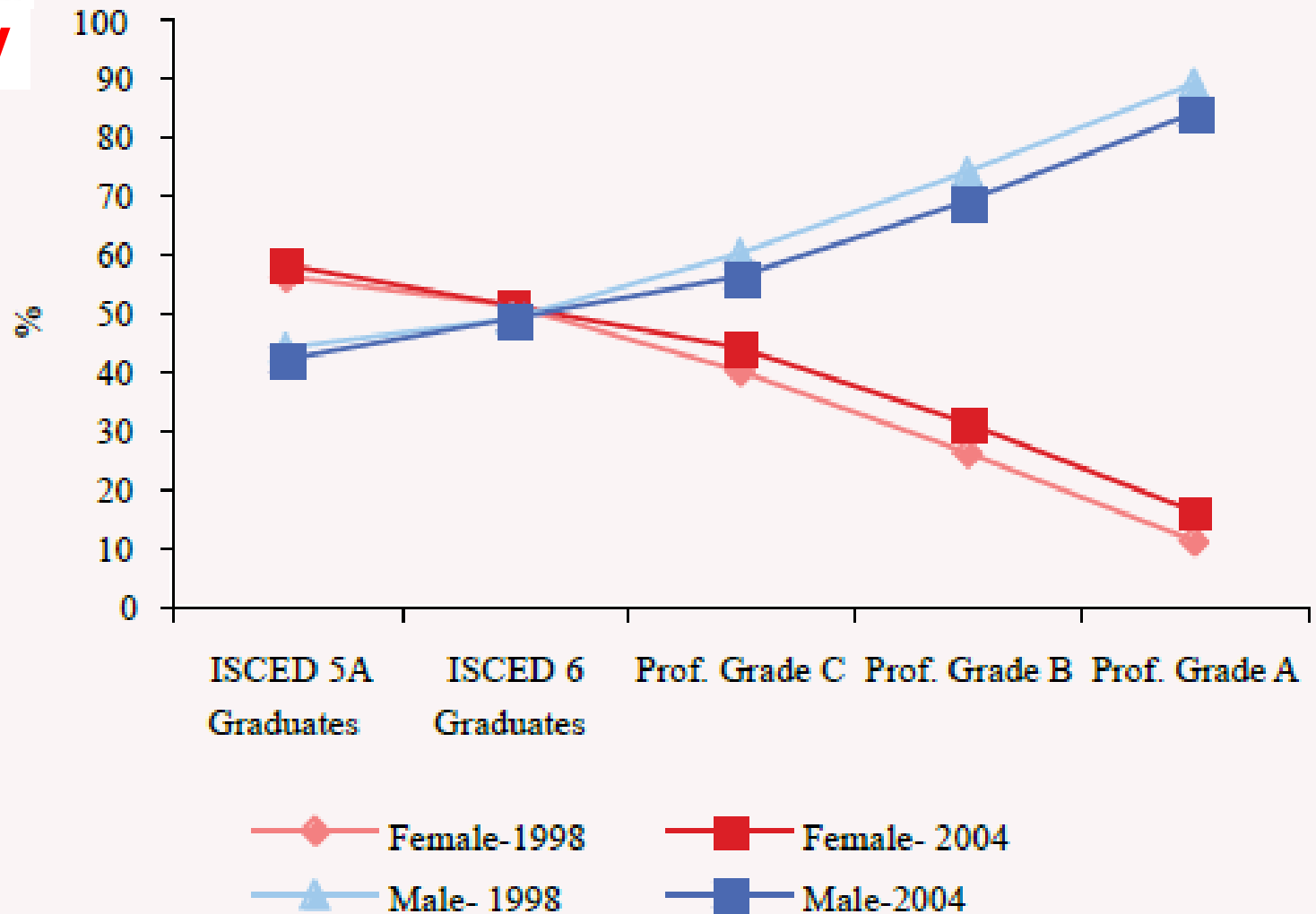
## Scissors diagram of men and women academic careers in 2006



Source: The Institute of Information and Forecasting on Education, <http://www.uips.sk/statist/index.html>

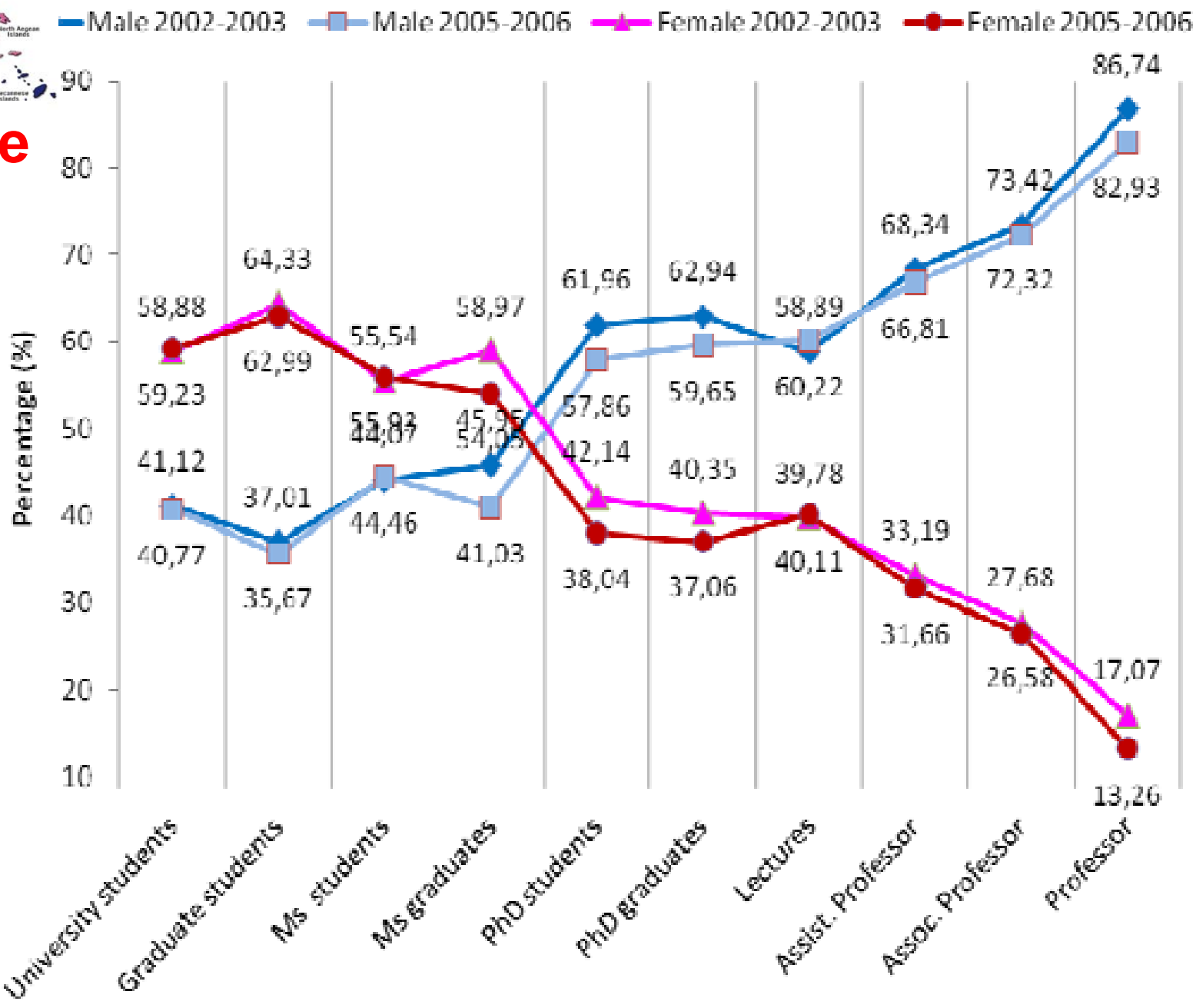


Italy



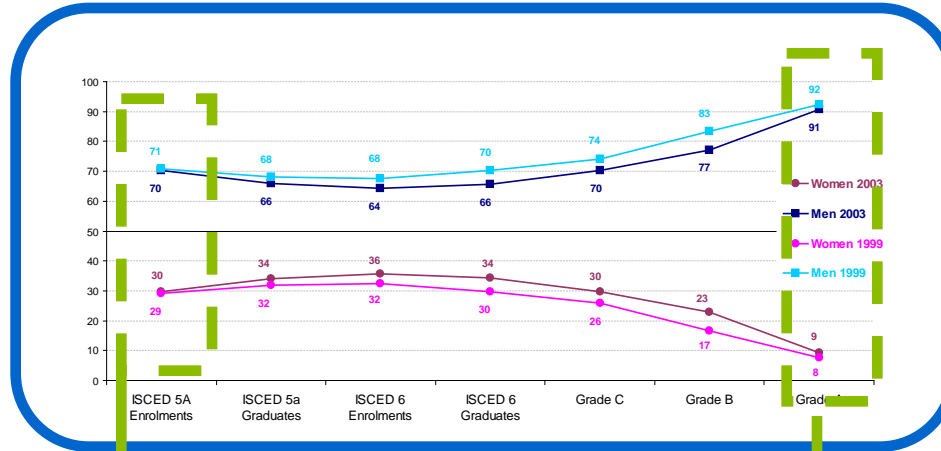


# Greece



# MATERIALS SCIENCE

- Challenging Research Field
- Great Career Opportunities



Attracting youth to scientific careers  
(role models and mentoring)

Getting more women in decision-making

**WomenInNano**  
(FP6 SA project)

Science in Society

**DIVERSITY**  
(FP7 SA project)

**raising awareness about gender and research !**



# DIVERSITY Consortium

**13 partners from 10 countries**

IFW Dresden

*Dr. Oliver Gutfleisch  
Prof. Mariana Calin*

WU Vienna

*Prof. Wolfgang Mayrhofer*

CNRS Grenoble/Nancy

*Prof. Dominique Givord  
Prof. Jean-Marie Dubois*

GA University Göttingen

*Prof. Konrad Samwer*

UA Barcelona

*Prof. María Dolores Baró  
Dr. Eva Pelicer*

JSI Ljubljana

*Prof. Spomenka Kobe*

INT FZK Karlsruhe

*Prof. Horst Hahn  
Dr. Yulia Ivanicenko*

Chalmers TU Gothenburg

*Prof. Uta Klement*

University of Turin

*Prof. Livio Battezzati  
Dr. Paola Rizzi*

University of Oxford

*Dr. Nicole Grobert*

STU Bratislava

*Prof. Oliver Moravčík  
Dr.D.Cagánová/Dr.J.Štefánková  
Dr. Christina Lekka*

University Ioannina

*Prof. G.A. Evangelakis*

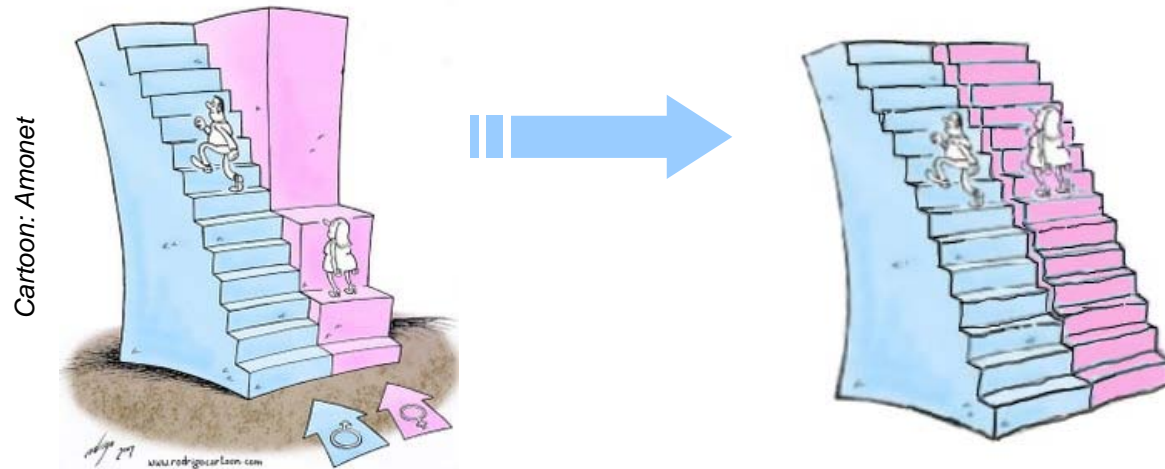
Saxon Ministry of Science

*Prof. Sabine von Schorlemer*



# DIVERSITY: Objectives, Concept & Strategy

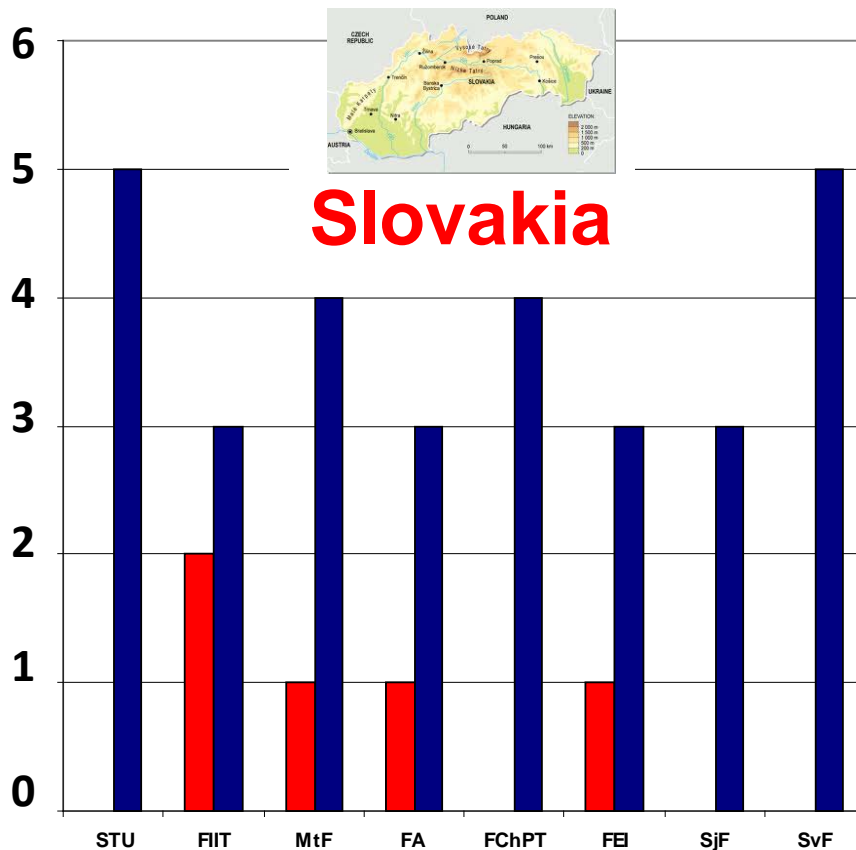
## Getting More Women to the Top in Research!



**Create a 'level playing field' in research for men and women!**

- Commitment anchored at the topmost political and institutional level
- Involvement of men (male decision makers)
- Interdisciplinary team (materials scientists, HR and gender experts, politicians)
- Well defined work program containing support activities (6 WPs)

# Ratio of Women in University Leadership Positions



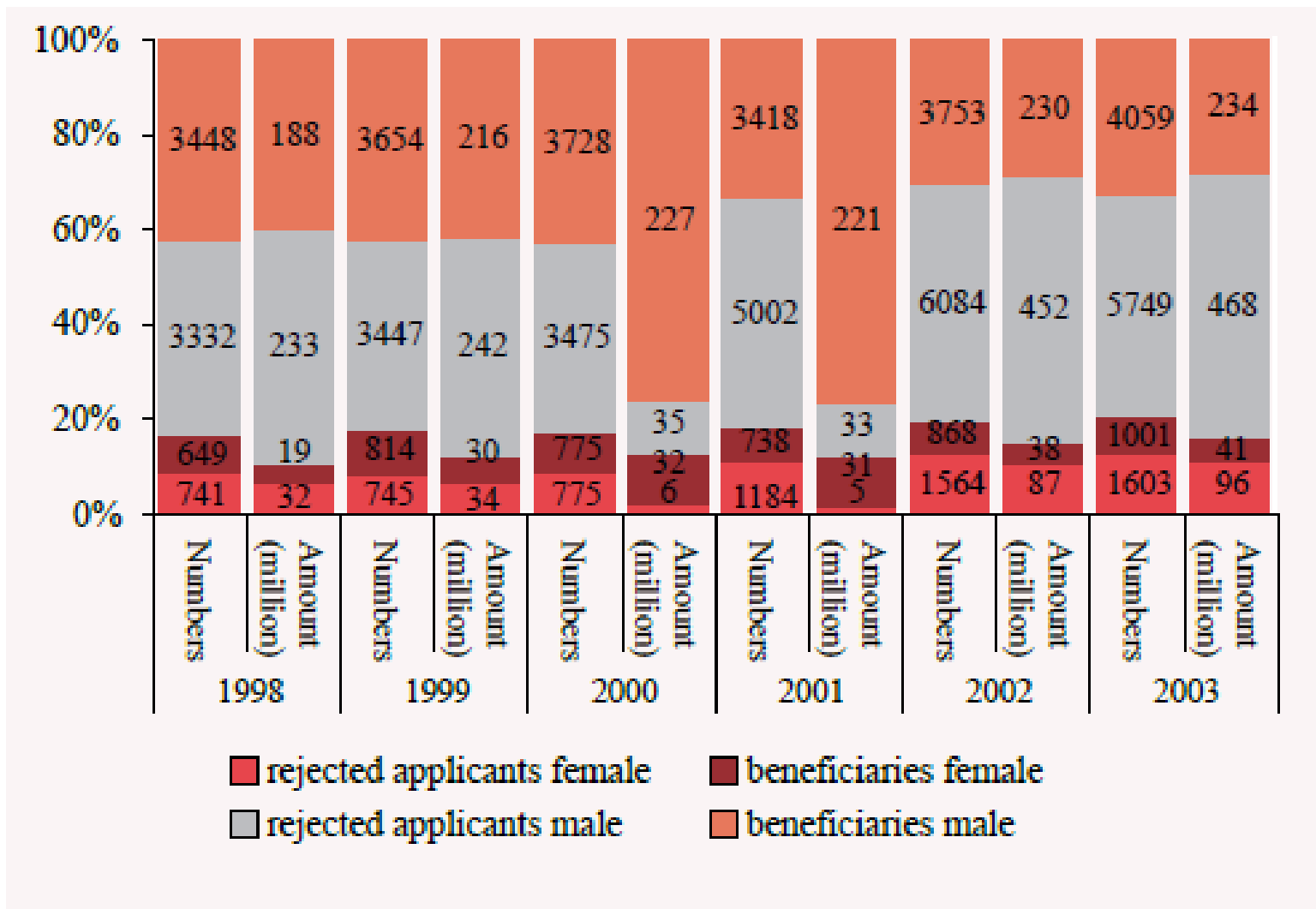
## Greece

### No. of decision-makers

University	male	female	total
Ioannina	4	0	4
Thessaloniki	3	1	4
Patras	4	0	4
of Crete	4	0	4
	<b>15</b>	<b>1</b>	<b>16</b>



## Funding applicants and beneficiaries



The majority of funding applications are made by men that are also the majority of beneficiaries

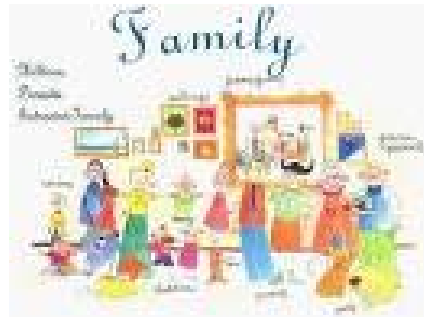
# Who is responsible ?



**Could it be because women are not so competitive as men?**

**Do they prefer to make family and children?**

**Are there any traditional and cultural stereotypes?**





**Italy**

## Grazia Deledda



1926 **Nobel Prize** in Literature

## Rita Levi Montalcini



1986 **Nobel Prize** in Medicine





Italy

If not now,  
when?

1 milion people in the  
streets against bunga bunga  
defending the woman  
dignity





## *Education in Sweden*



### **Statistics Sweden**

*Education in Sweden* is an accessible, pocket-sized booklet published in different languages including English by Statistics Sweden. It gives a statistical overview on educational attainment, pre-school, compulsory school, upper secondary school, higher education, education, labour market, adult education, educational expenditure and international outlook. Almost all the statistics are broken down by gender. It contains easily understandable diagrams and comments. The picture shows the cover of the 1997 English edition.

The booklet can be ordered from Statistics Sweden, Publication Services, S-70189 Örebro, Sweden. Fax 46 19 17 6444.

# CONCLUSIONS

## **Education :**

- envisions **brain with ideas** rather than filling it with data.
- acts as an **experience** that has a formative **effect** on the **mind, character or physical ability** of an individual
- is the **process** through which **society transmits** its accumulated **knowledge, skills and values** from **one generation to another**.



Scholar education ↔ Cultural education

**Affect the mentality** of both men and women – altering the **traditionally** established social recognition **stereotypes** - **starting from family**



Break down the **scissor diagram** and **gender disseminations**



**Thank you very much for your kind  
attention !**

**Acknowledgments:**

**This work was supported by the FP7-SiS-2008-1 (No 230253), 2009-2011, “Improving the gender diversity management in materials research institutions”,  
**Diversity project.****