



# **Societal impact and societal responsibility of doctoral education**

## **A vision from Catalonia**

**Prof. Francesc Xavier Grau**  
**Secretary for Universities and Research**  
**Ministry of Business and Knowledge**  
**Government of Catalonia - Spain**

June 14th 2019

# Impact of Higher Education



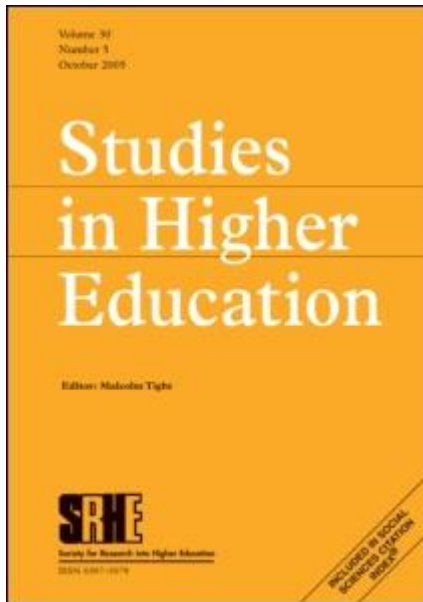
## The market and wider benefits of higher education to individuals and society

		SOCIETY	
NON-MARKET			
			MARKET
		<ul style="list-style-type: none"> <li>• <a href="#">Greater social cohesion, trust and tolerance</a></li> <li>• <a href="#">Less crime</a></li> <li>• <a href="#">Political stability</a></li> <li>• <a href="#">Greater social mobility</a></li> <li>• <a href="#">Greater social capital</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Increased tax revenues</a></li> <li>• <a href="#">Faster economic growth</a></li> <li>• <a href="#">Greater innovation and labour market flexibility</a></li> <li>• <a href="#">Increased productivity of co-workers</a></li> <li>• <a href="#">Reduced burden on public finances from co-ordination between policy areas such as health and crime prevention</a></li> </ul>
		<ul style="list-style-type: none"> <li>• <a href="#">Greater propensity to vote</a></li> <li>• <a href="#">Greater propensity to volunteer</a></li> <li>• <a href="#">Greater propensity to trust and tolerate others</a></li> <li>• <a href="#">Lower propensity to commit (non-violent) crime</a></li> <li>• <a href="#">Better educational parenting</a></li> <li>• <a href="#">Longer life expectancy</a></li> <li>• <a href="#">Less likely to smoke</a></li> <li>• <a href="#">Less likely to drink excessively</a></li> <li>• <a href="#">Less likely to be obese</a></li> <li>• <a href="#">More likely to engage in preventative care</a></li> <li>• <a href="#">Better mental health</a></li> <li>• <a href="#">Greater life satisfaction</a></li> <li>• <a href="#">Better general health</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Higher earnings</a></li> <li>• <a href="#">Less exposure to unemployment</a></li> <li>• <a href="#">Increased employability and skills development</a></li> <li>• <a href="#">Increased entrepreneurial activity and productivity</a></li> </ul>



# Impact of Doctoral Education?

- Higher impact?, both on individual and on society?
- Subject of study in HE, development policies, social development, ...



## EDITORIAL

### The impact of the doctorate

Christine Halse and Susan Mowbray

*Centre for Educational Research, University of Western Sydney, Australia*

Keywords: doctorate; graduates; research impact; knowledge economy

## Introduction

The purpose of this special issue of *Studies in Higher Education* is to stimulate more nuanced thinking about the impact, effects and contributions of the doctorate in a context of rapid and diverse changes in the policies, processes and products of doctoral education around the world. Doctoral research plays a 'crucial role in driving innovation and growth' of nation states and is a significant contributor to national and international knowledge generation and research outputs (Smith 2010, 4) but there is a striking absence of systematic research into the multi-dimensional impact of the doctorate. Underlining this point in relation to the impact of PhD graduates in the United Kingdom (UK), Raddon and Sung (2009) note the lack of any:



# Impact of Doctoral Education?

- Higher impact?, both on individual and on society?
- Subject of study in HE, development policies, social development, ...

*“..With little known about the medium term career paths and destinations of doctoral graduates the study provides new insight into the impact they have when working outside of higher education. The research examines their current role and career history, value to employers, contribution to innovation and wider socio-economic impact.”*



## The impact of doctoral careers

## Final Report

Date: November 2014 | Author: CFE Research  
Dr Abigail Diamond, Dr Charlie Ball, Dr Tim Vorley,  
Tristram Hughes, Rachel Moreton, Peter Howe, Tej Nathwani

# Outcomes of Doctoral Education

*(from The impact of doctoral careers)*

- Doctoral training enhances graduates' earning capacity
- Doctoral training enables individuals to pursue their chosen career path and to fulfil their ambitions
- Completing a doctorate enhances graduates' quality of life
- Employers place a higher value on the contribution of doctoral graduates
- Doctoral graduates role's allow them to draw upon their doctoral experience, use their research skills and exploit their expertise effectively
- Doctoral graduates exhibit influence and leadership within their organisation, encouraging others to strive to excel and consequently raising the productivity of those without a doctorate with whom they work
- Doctoral graduates support others they work alongside to be more creative and/or productive
- Skills developed by doctoral graduates during their research degree study enable them to contribute to innovation in their workplaces
- Doctoral graduates introduce new methods, ways of organising systems and products within the organisation leading to changes in working practices, culture, service, quality, markets and products.
- Doctoral graduates contribute to the absorptive capacity of the organisations that employ them and enables it to transform or imitate new technologies and ideas

## IMPACT ON

Individual

Employers

Society at large

# Impacts of Doctoral Education

*(from The impact of doctoral careers)*

## Individuals

Individuals who have undertaken doctoral training are enabled to fulfil their ambitions, experiencing a high quality of life, and use their skills, knowledge and intellectual abilities to perform roles both within and outside employment, with a high level of professionalism, effectiveness, influence and impact

Employers of doctoral graduates are better able to access, develop and use ideas, technologies and processes, making them more productive and competitive both directly in terms of innovation, knowledge transfer, absorptive capacity and productivity benefits; and indirectly through influence on supply chain linkages, customer and partner relationships

## Employers

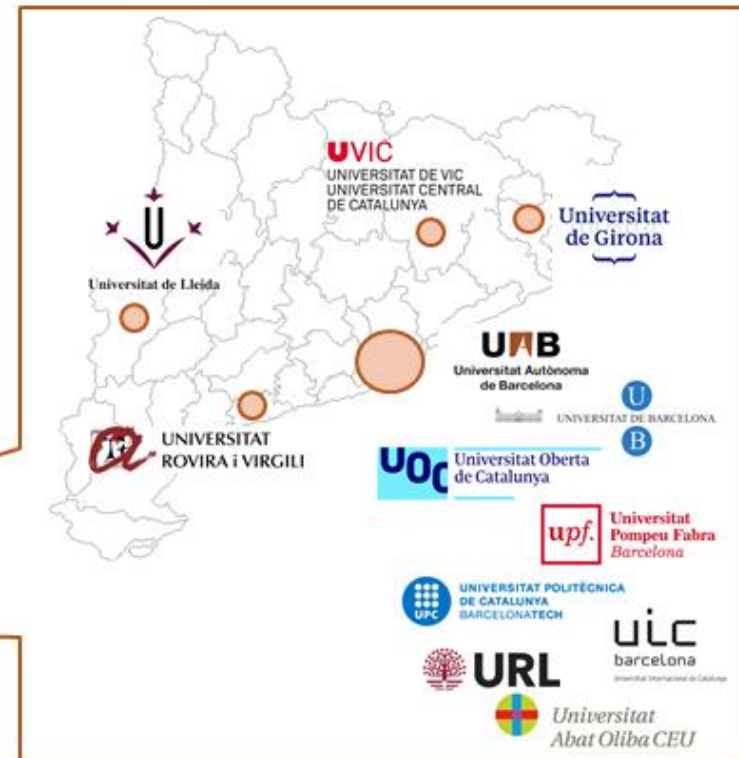
## Society at large

Motivated and highly skilled individuals and productive and competitive organisations deliver wider economic, environmental and societal benefits which contribute to improved social wellbeing and enhance the long term competitiveness of UK (read **your country**)



# A vision from Catalonia

- 12 universities (7 public, 1 public/private on-line, 4 private non-for-profit)
- 265,000 students, of whom 17.300 PhD students
- 19,800 faculty and researchers





# Doctoral Education: a continuous tension



**NATURE, VOL 472, 21 APR 2011**

**S**cientists who attain a PhD are rightly proud — they have gained entry to an academic elite. But it is not as elite as it once was. The number of science doctorates earned each year grew by nearly 40% between 1998 and 2008, to some 34,000, in countries that are members of the Organisation for Economic Co-operation and Development (OECD). The growth shows no sign of slowing: most countries are building up their higher-education systems because they see educated workers as a key to economic growth (see ‘The rise of doctorates’). But in much of the world, science PhD graduates may never get a chance to take full advantage of their qualifications.





# European perspective: Challenges and Recommendations

2005 - 2010



## Salzburg Principles and recommendations

- Salzburg Principles from 2005 – outcomes of an EUA-led project and a Bologna seminar
  - The doctorate is **research-based**
  - Importance of institutional strategies
  - Diversity
- Salzburg recommendations 2010 – from consultations with CDE members
  - **Research** as the 'basis and the difference' from the other two cycles
  - Space for **individual development**
  - **Autonomy** for the institution to choose mission and strategy and to set up the appropriate structures



...12...



*...the core component of the doctorate is the **advancement of knowledge**, while recognizing the need to prepare for widening employment opportunities beyond academia...*

2019



*...it is fair to say that current doctoral education in Europe truly reflects the principles and guidelines developed in the three Salzburg Principles and Recommendations...*

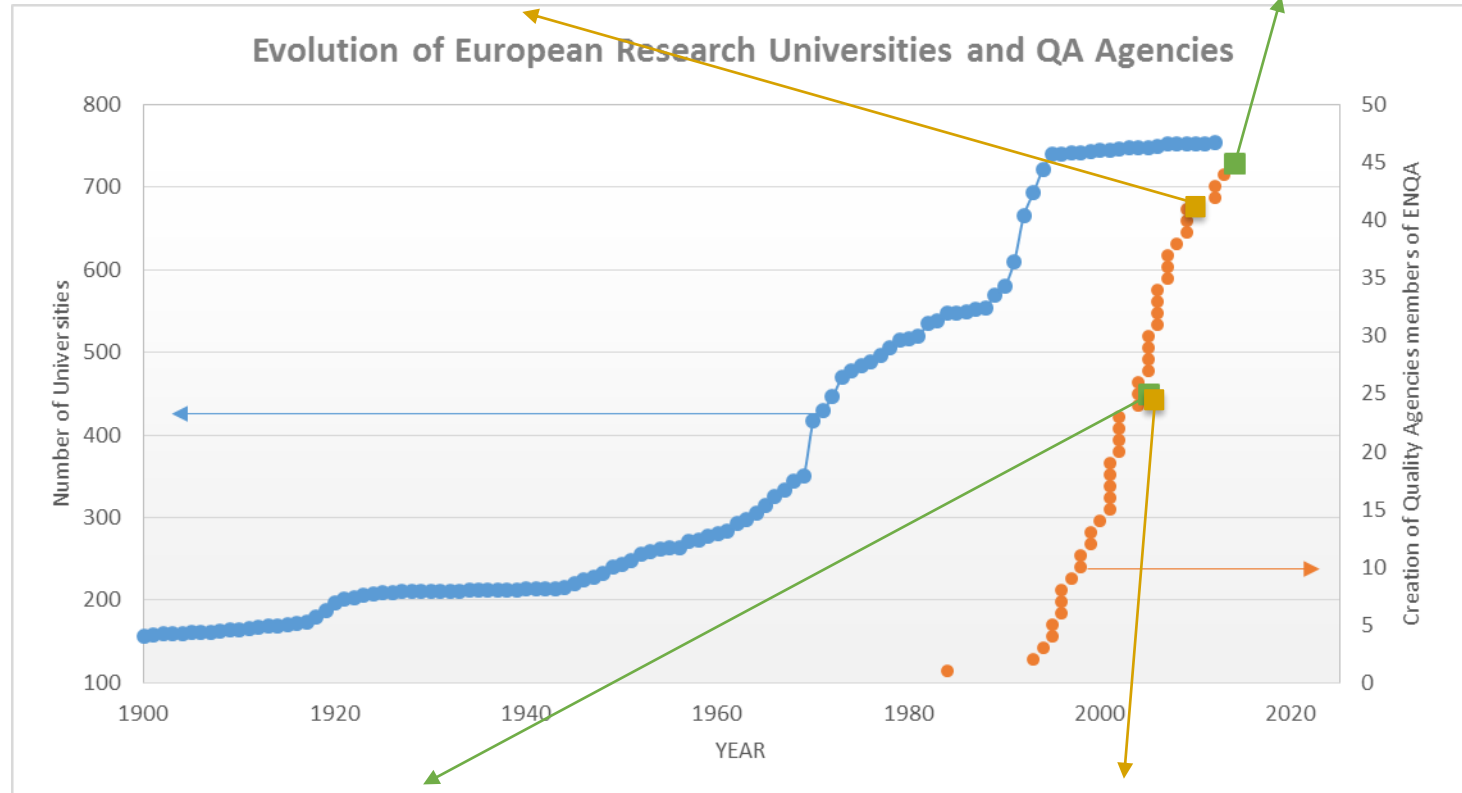


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# Evolution of HE – Research Universities in Europe

Salzbourg II Recommendations adoption (2010)

Open, transparent and merit-based recruitment (OTM-R; 2015)



The European Charter for Researchers (2005)

The Code of Conduct for the Recruitment of Researchers (2005)

“Doctoral Programmes for the European Knowledge Society”

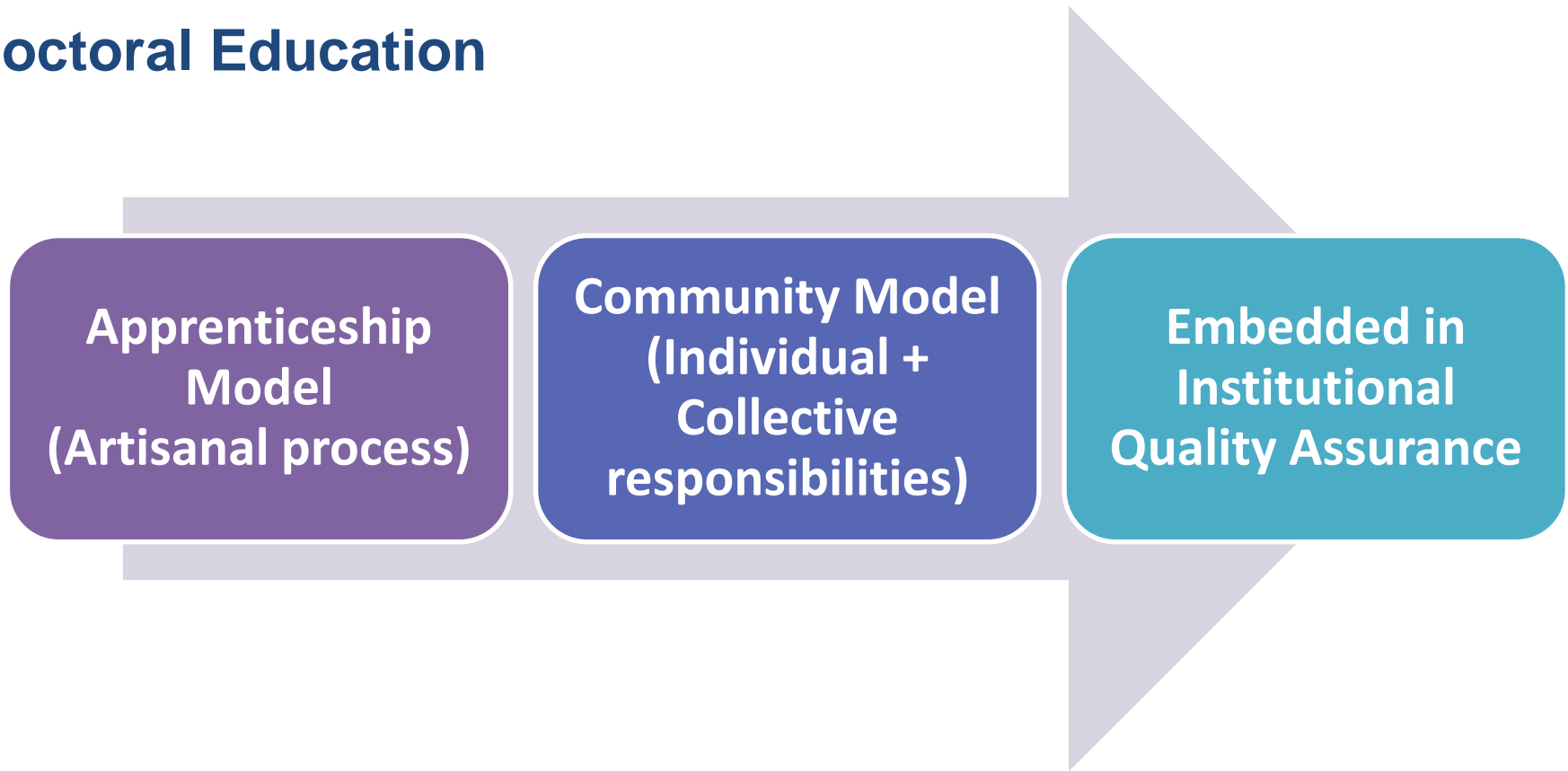
Salzbourg Recommendations (2005)



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# Evolution of HE – Research Universities in Europe

## Doctoral Education



# From Lisbon to E2020 and beyond: adding/profiling objectives

## Lisbon Strategy (2001)

University



Research



## Europe 2020 (2010)

University

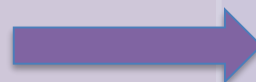


Innovation



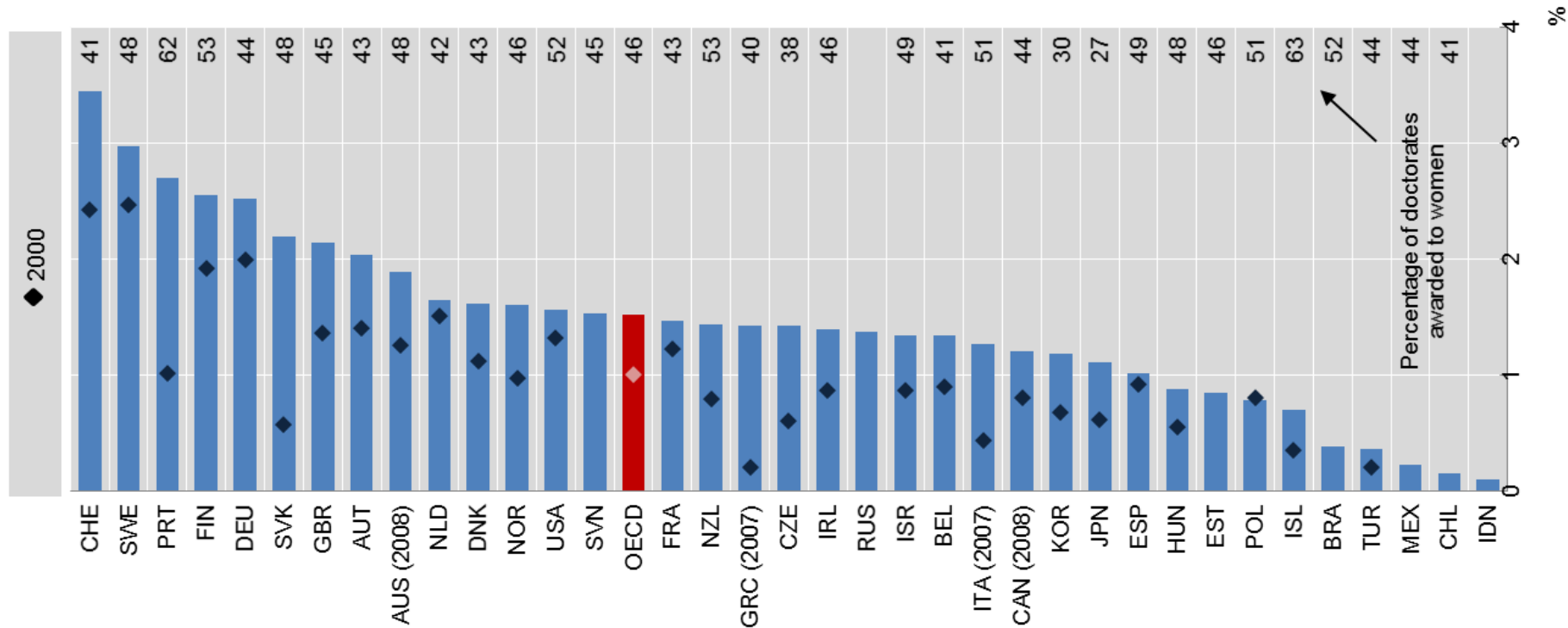
## Europe 2030

University



Social impact sustainability

# Graduation rates at doctoral level (OECD)



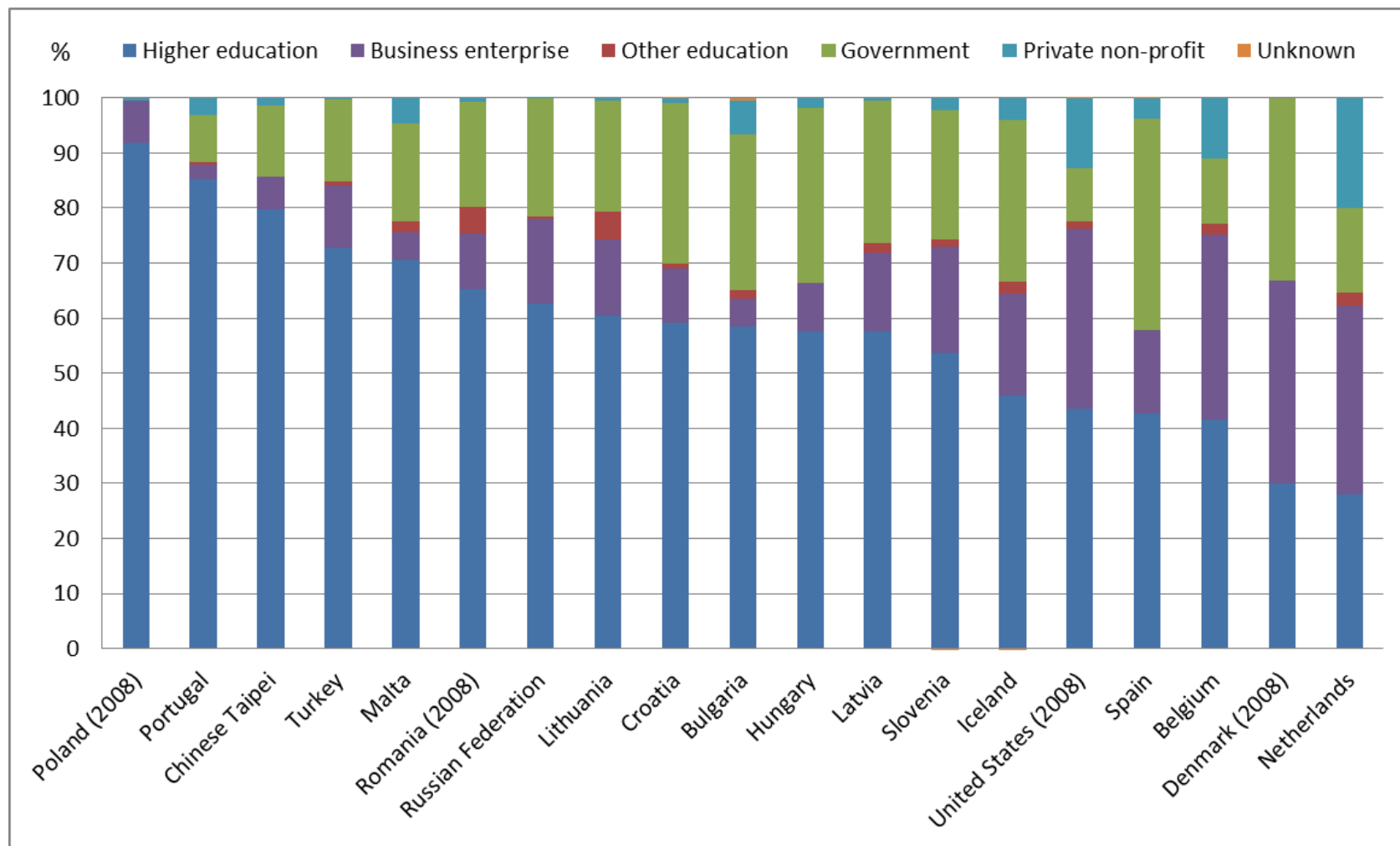
Data 2000 and 2009 as a percentage of population in reference age cohort

Education at a Glance 2011: OECD Indicators and (2009) Education at a Glance 2009: OECD Indicators, OECD, Paris.

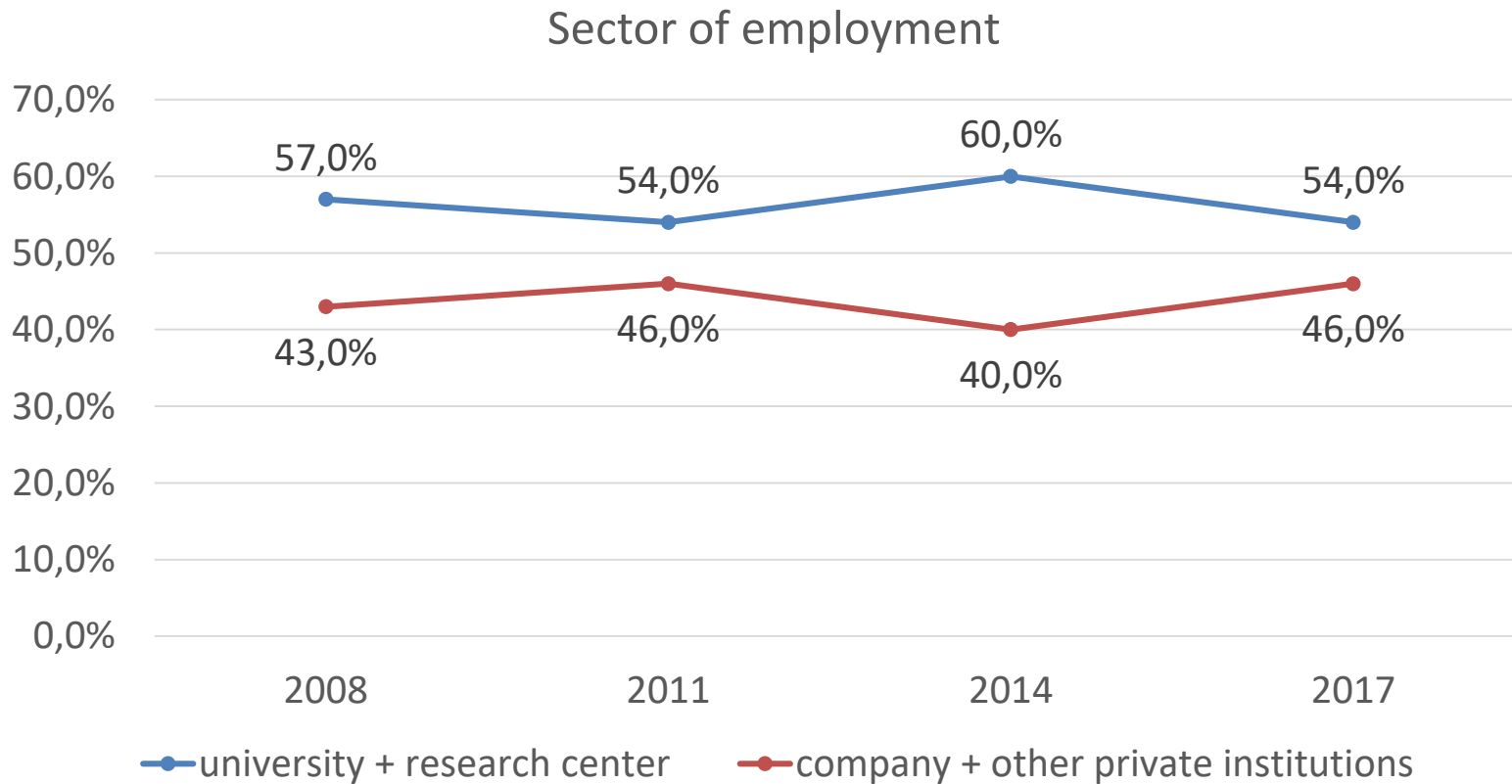
Auriol, L., M. Misu and R. A. Freeman (2013), "Careers of Doctorate Holders: Analysis of Labour Market and Mobility Indicators", OECD Science, Technology and Industry Working Papers, 2013/04, OECD Publishing. <http://dx.doi.org/10.1787/5k43nxgs289w-en>



# University – industry: Sector of employment by doctorate field: OECD perspective



# University – industry: Catalan perspective

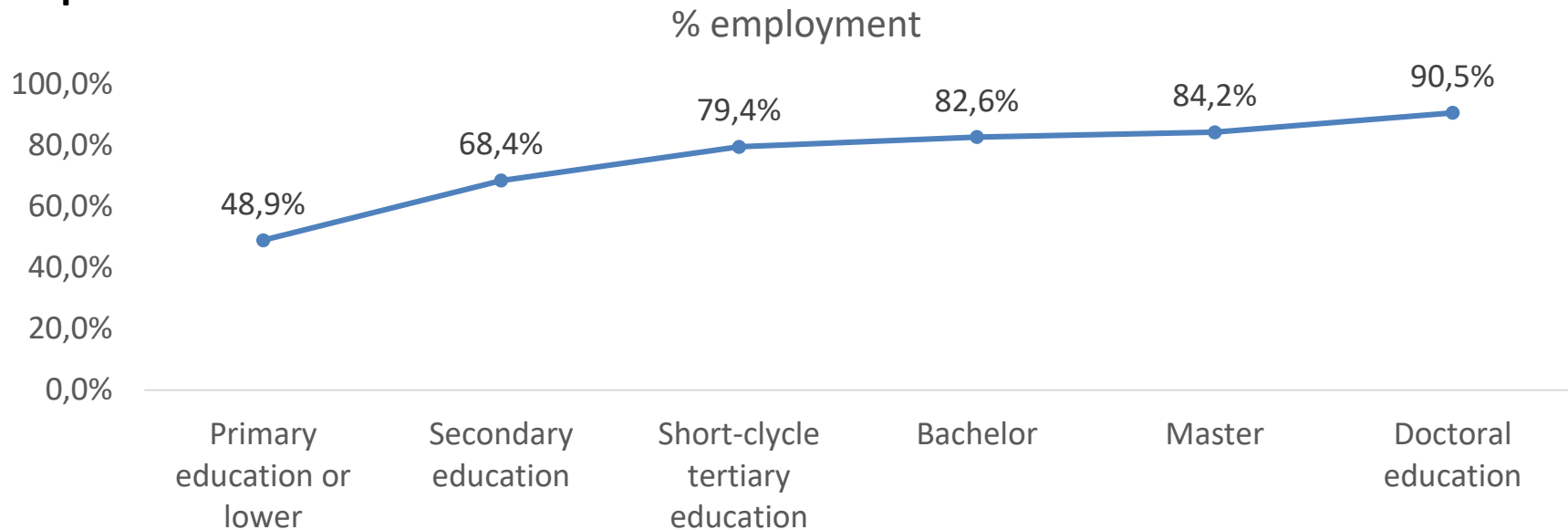




# Employment by years of schooling

## Spain 2017

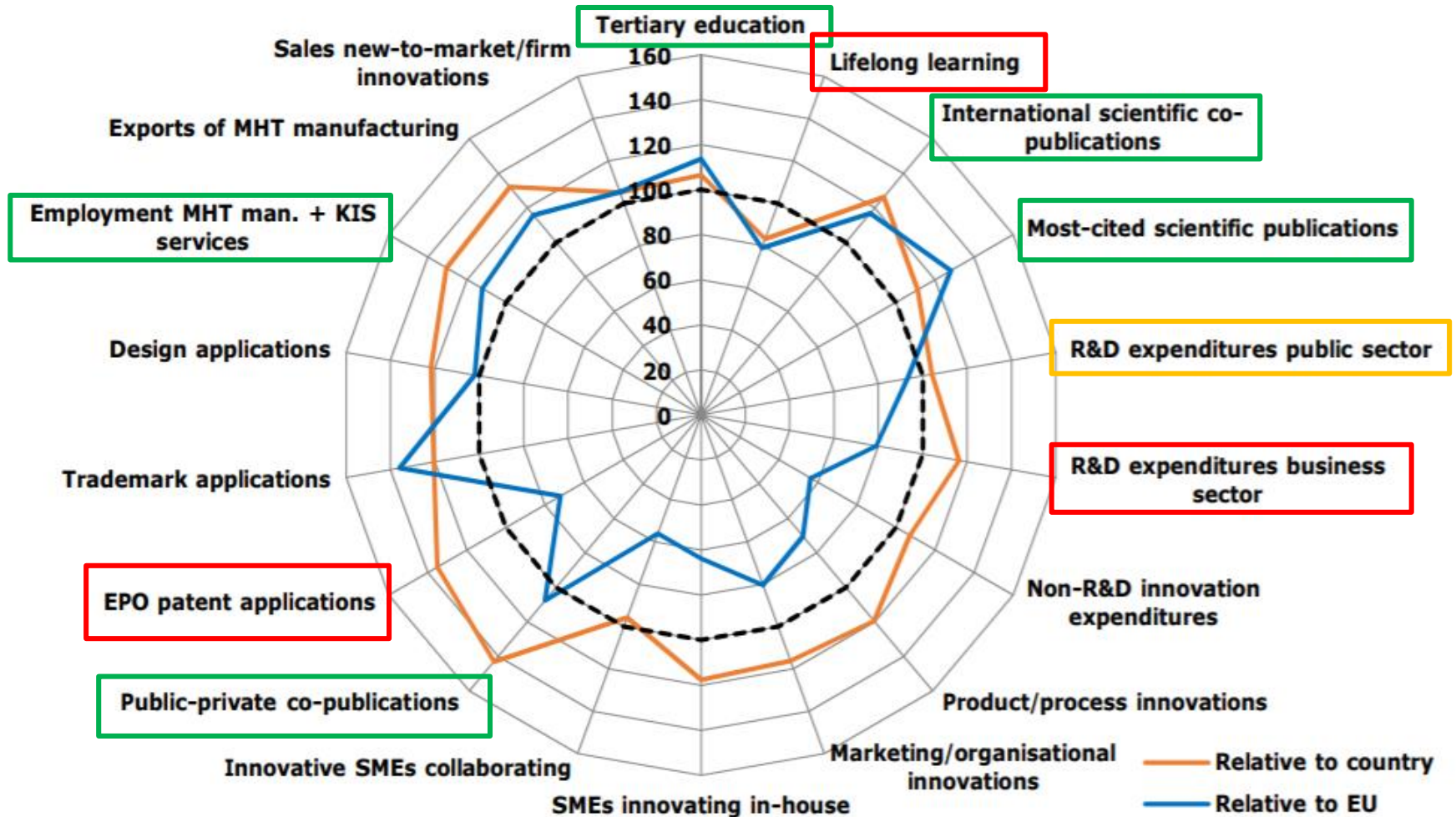
Source: National Institute of Statistics



- Owning a higher education degree favors employment and protects against unemployment.
- Spain is, among OECD countries, one where the difference of employment rate between the highest and lowest educational level is higher: 28 percentage points (pp), while the OECD is 7 pp in average (OECD, 2016) → **High unemployment + Over-qualification problems**



# Catalonia, a moderately innovative region (from *Regional Innovation Scoreboard 2017*)

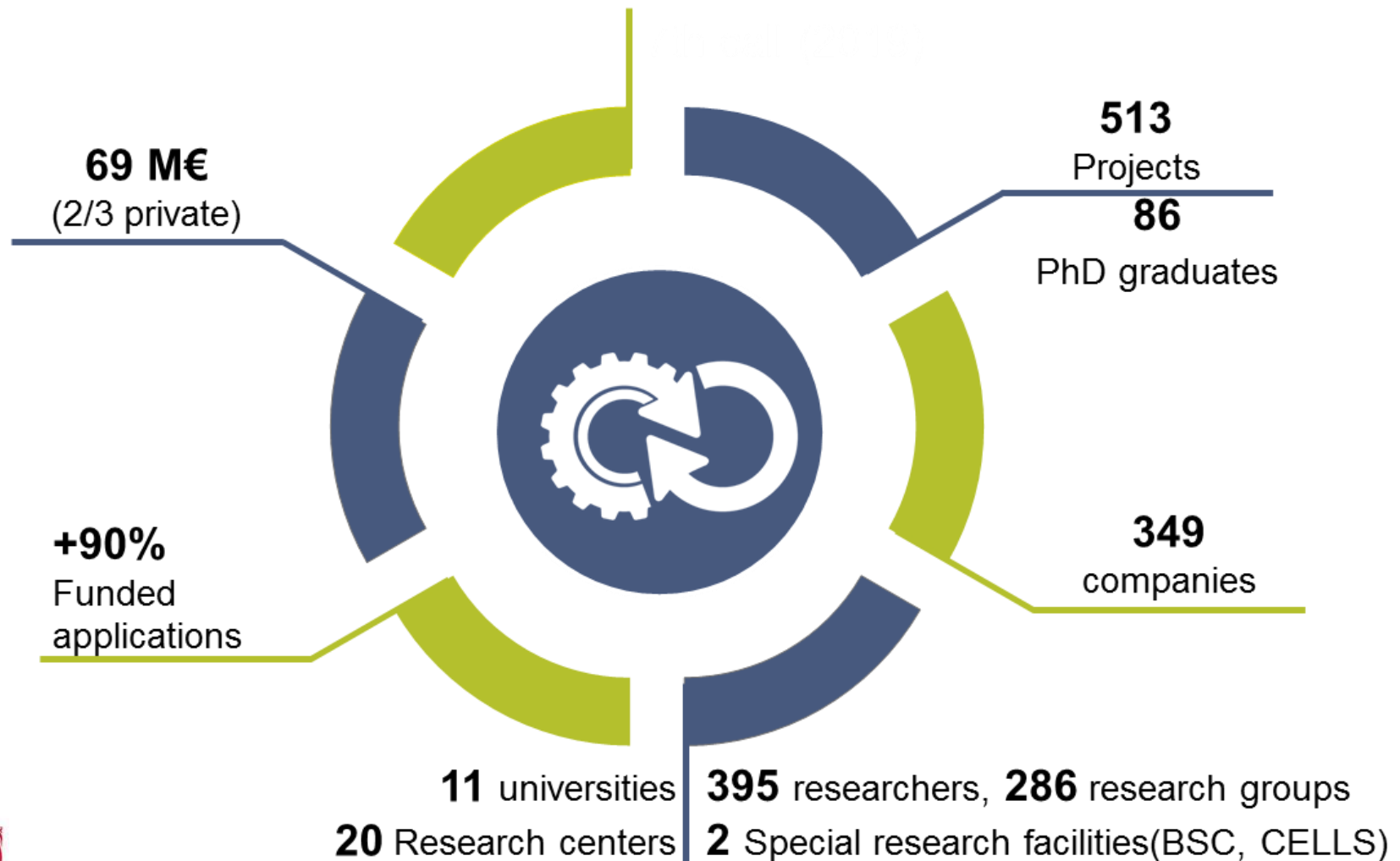


# Industrial doctorate program, enhancing university-industry collaboration in research



# Industrial doctorate program, enhancing university-industry collaboration in research

## MAIN RESULTS 2012-2018

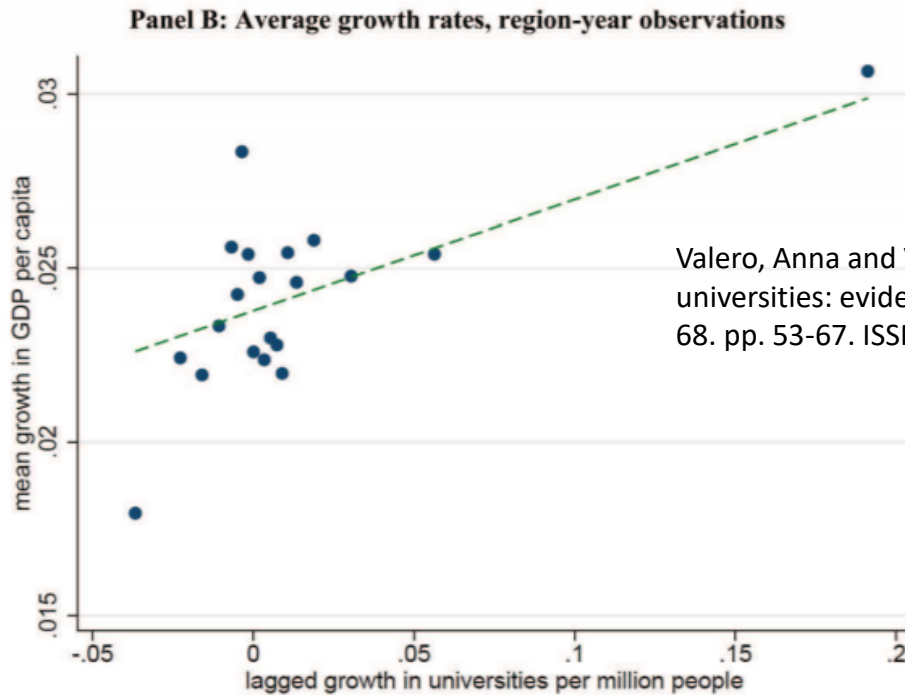


**Thank you for your attention**



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**Secretaria d'Universitats i Recerca**

# Some final thoughts on impact of education and particularly, higher education



Valero, Anna and Van Reenen, John (2018) The economic impact of universities: evidence from across the globe. *Economics of Education Review*, 68. pp. 53-67. ISSN 0272-7757

Some conclusions in Valero's:

- ... there are strong correlations between universities and average years of schooling, patent applications and democracy...
- ... higher university density is associated with higher GDP per capita levels...
- PhD granting institutions are significant with Regional Growth of GDP per capita...



# Which Recommendations? (Salzburg 2005)

## Ten Basic Principles from Bologna Seminar on “Doctoral Programmes for the European Knowledge Society” (Salzburg)

(Salzburg, 3-5 February 2005)

1. The core component of doctoral training is the advancement of knowledge through original research (also meet the needs of employment market).
2. Universities need to assume responsibility for ensuring that programmes they offer are designed to meet new challenges.
3. The rich diversity of doctoral programmes in Europe is a strength which has to be underpinned by quality.
4. Doctoral candidates should be recognised as professionals who make a key contribution to the creation of new knowledge.
5. Arrangements for supervision and assessment should be based on a transparent contractual framework of shared responsibilities.
6. Doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice
7. Doctoral programmes should operate within appropriate time duration.
8. Innovative structures to meet the challenge of interdisciplinary training.
9. Doctoral programmes should seek to offer geographical as well as interdisciplinary and intersectoral mobility
10. Quality doctoral programmes requires appropriate and sustainable funding.





# Another perspective:

## “Realizing the European Higher Education Area”

(Conference of Ministers Berlin, 19 September 2003)

- From the conclusions of the European Councils in Lisbon (2000) and Barcelona (2002): Europe “the most competitive and dynamic knowledge-based economy in the world, .
- Necessary to go beyond the focus on two main cycles of higher education to include the doctoral level as the third cycle in the Bologna Process.
- Need to promote closer links between the EHEA and the ERA in a Europe of Knowledge: importance of research and research training.
- Networks at doctoral level should be given support to stimulate the development of excellence and to become one of the hallmarks of the European Higher Education Area.



# Adoption of Salzburg Recommendations in 2010

## Salzburg II Recommendations (2010)

**Development of institutional structures for doctoral education and importance of original research in making doctoral education distinct**

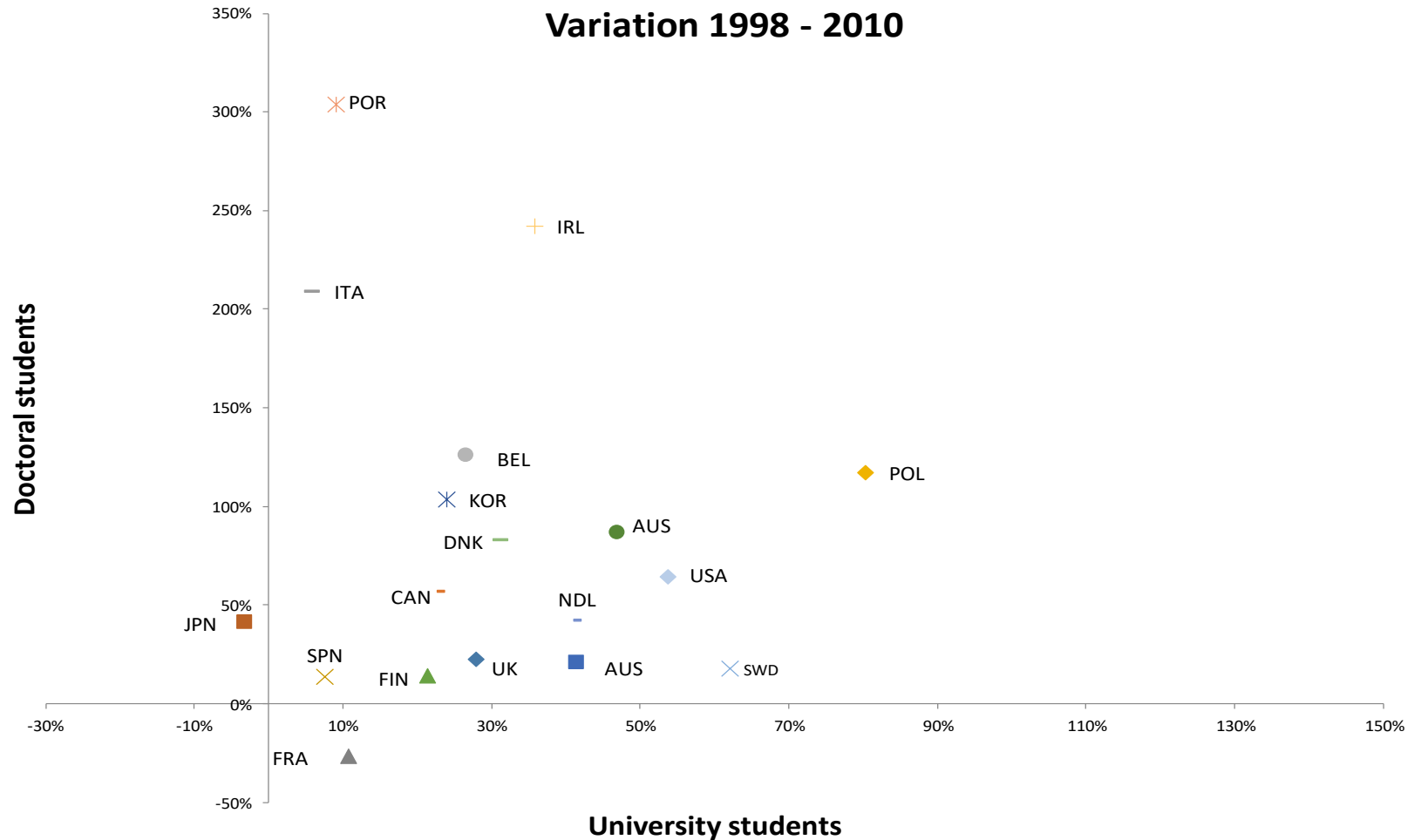
- Emphasis on the importance of research, intellectual autonomy, originality. It's an individual journey.
- Shared responsibilities between doctoral candidates, supervisors and the institution.
- Structures improve the process, conveys institutional responsibility BUT flexible, not produce uniformity or predictability...
- Structures should not be imposed on or within the institution.

**Five years later, in 2015, a new set of recommendations was published, “Taking Salzburg Forward – Implementation and New Challenges”.**



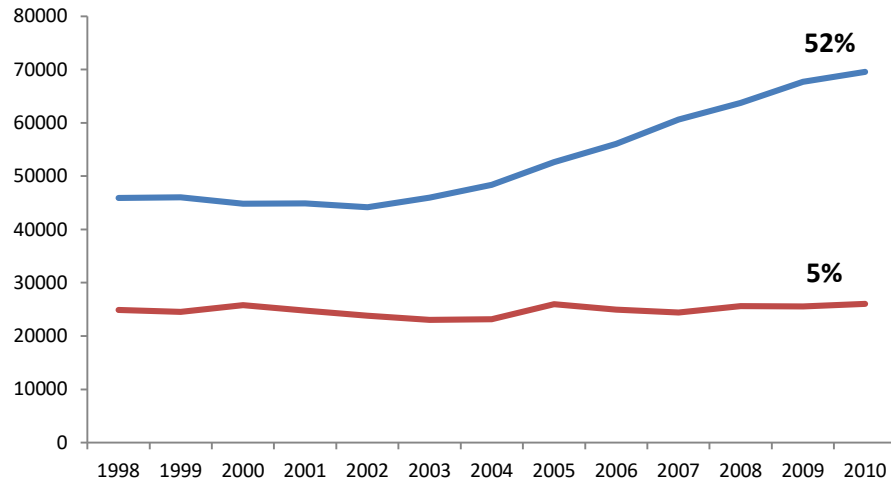
# Evolution of Doctoral Education

Relative increase of doctoral students by countries

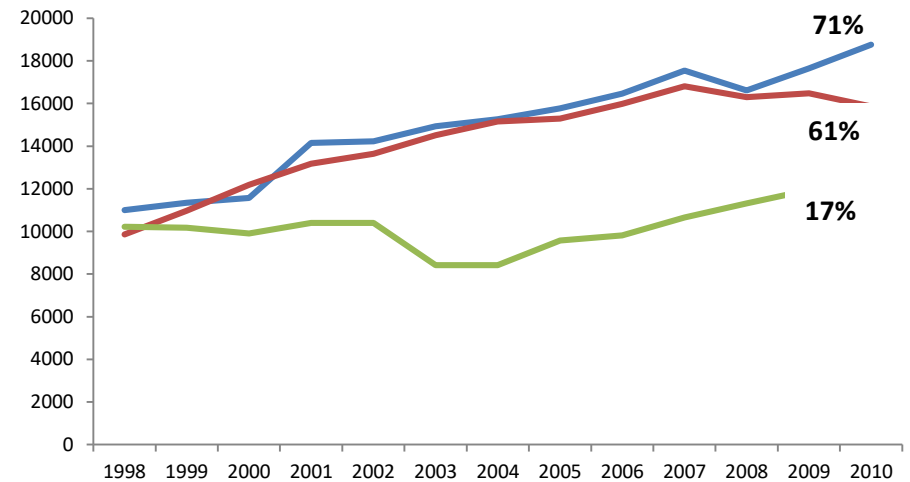


# Evolution of Doctoral Education

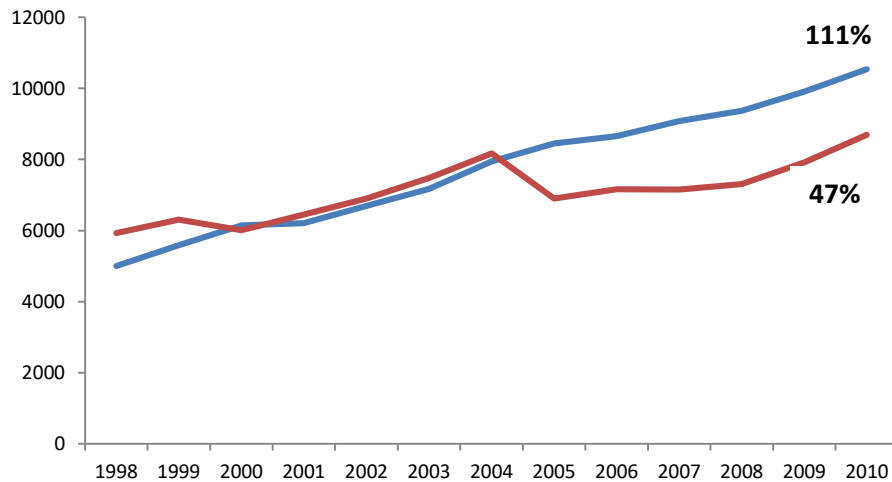
United States Germany



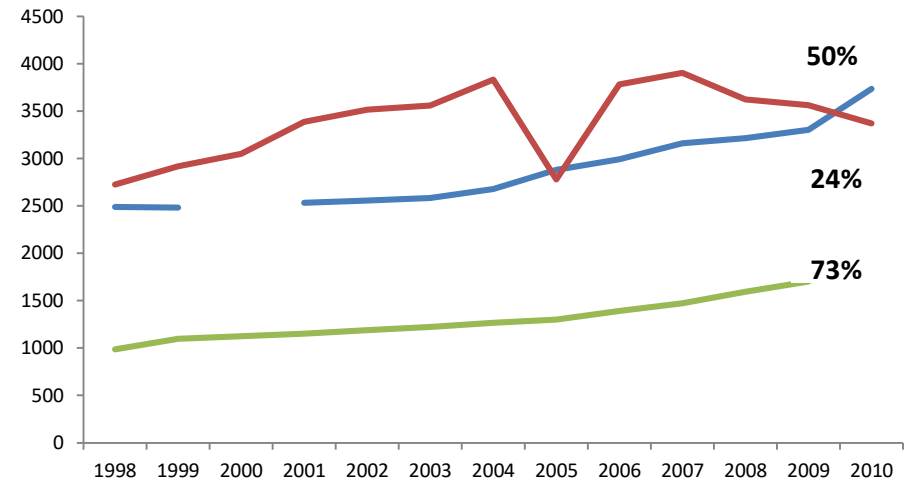
United Kingdom Japan France



Korea Spain



Netherlands Sweden Catalonia



# Key points on quality assurance in doctoral education with an external employment contract

Key Points by the General Assembly of the German Rectors' Conference (HRK)  
on 14 November 2017

- Transparent access
- Supervision and academic environment
- Assessment and publication
- Copyright and rights of use
- Good scientific practice and conflict resolution



# Are we following recommendations? (Catalan perspective)



- 😊 Policies and programs to reform doctorates in different countries
- 😊 Alignment of EU Programs (Erasmus Mundus, Marie Curie, KIC's...)
- 😊 Creation of Doctoral Schools
- 😊 Research as the basis of doctoral training

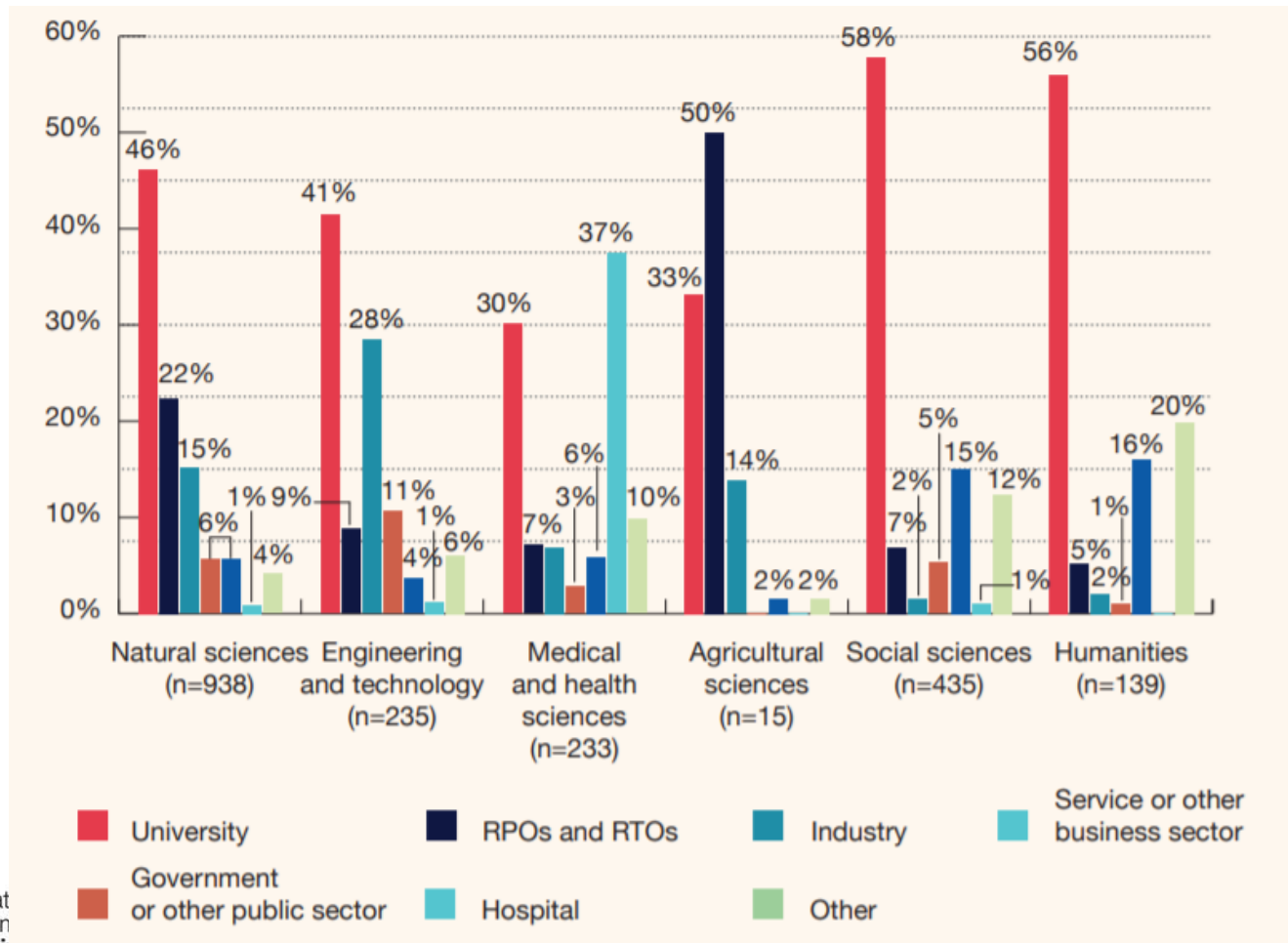


- 😞 Increase of cross/inter disciplinary programs
- 😞 Advancement in more harmonized duration
- 😞 Differences in rates, intensities ...
- 😞 Risk of bureaucratization and loss of ownership by academia (tendency towards uniformity)



# University – industry: Sector of employment by doctorate field: European (ESF) perspective

2017 Career Tracking Survey  
of Doctorate Holders European Science Foundation (ESF)





# Conclusions

## Are we on the right track... YES!

1. ... doing what we agreed to do
2. ... to achieve the proposed goals
3. ... to attain newly identified objectives

In Europe



In Catalonia



# Some Recommendations

## **Provide adequate mentoring**

Written guidelines / Allow for multiple mentors / Adequate preparation for mentoring (research about effective mentoring practices).

## **Provide exposure to wide variety of career options**

Show the careers for PhDs that exist on campuses, in business and industry, in government, in non-governmental organizations and train students on different missions

Provide visits from professionals outside the University.

## **Prepare students to teach in a variety of settings**

Students need to acquire competence to teach in a very broad sense.

## **Produce scholar-citizens whose training is connected more closely to the needs of society**

Provide occasions for graduate students to explore the dramatic changes facing the academy, the implications for their own careers, the changes in the broader society and internationally



# Some Recommendations

**Balance the deep learning of the disciplinary doctorate with the variety of interdisciplinary challenges.**

Provide more opportunities for students to work across disciplinary lines.

Work with more than one mentor in different disciplines.

Continue development of inter-disciplinary, multi-disciplinary, cross-disciplinary programs.

**Create partnerships with all involved in doctoral education:**

Research-intensive universities,

Government,

Foundations,

Business and industry,

Teaching-intensive universities,

Research Institutes,

Non-governmental organizations

**Involve partners in developing transversal skills:**

Entrepreneurship

Innovation culture

”Industrial” doctorates in all areas.



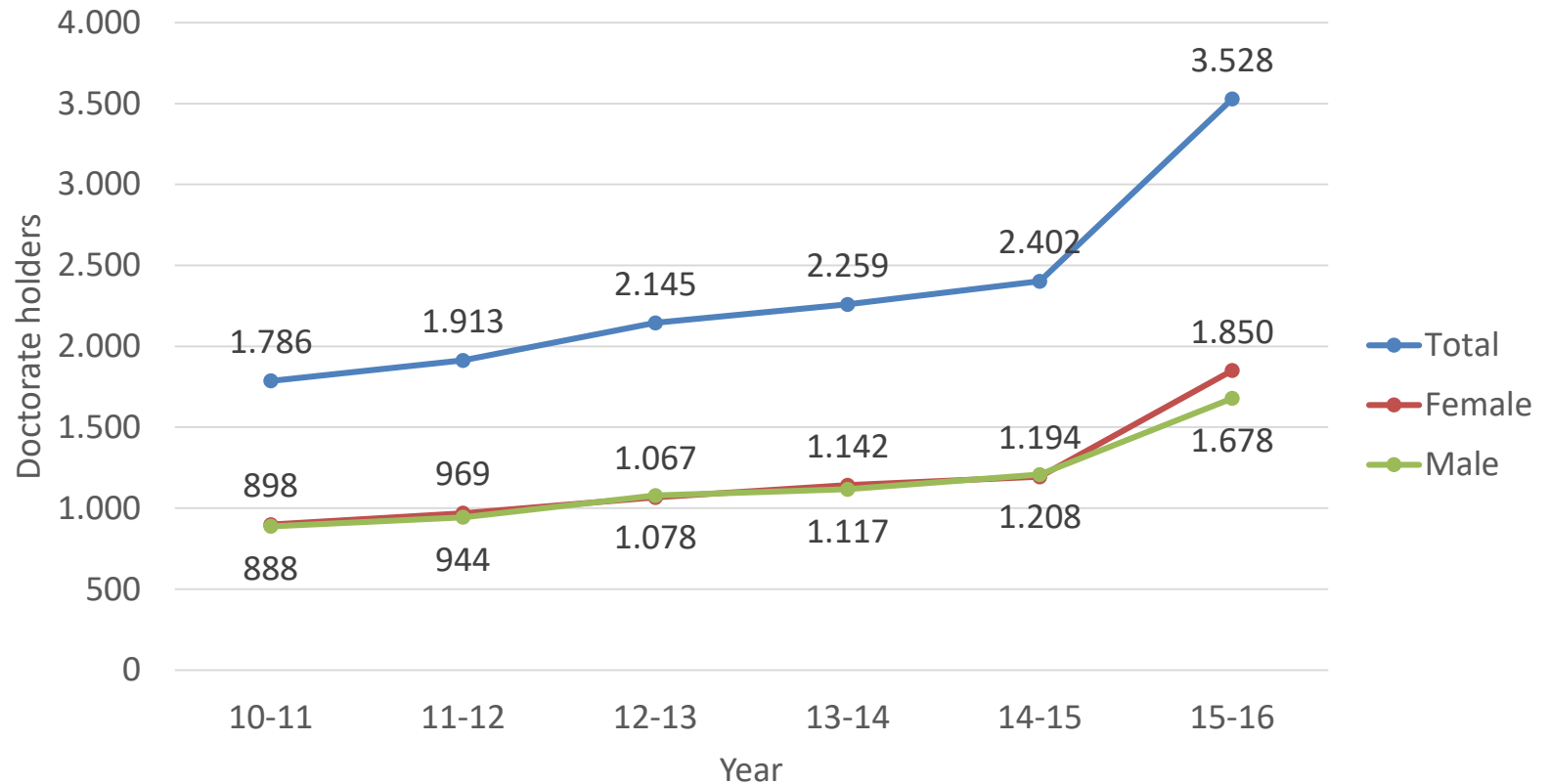
# “Taking Salzburg Forward – Implementation and New Challenges”

## Doctoral education – taking Salzburg forward: Implementation and new challenges(2015)

- **Doctoral education reform should continue**
- Make structures more coherent
- Create space for dialogue
- Nurture talent
- Gain ownership from all parts of the institution
- Research integrity and research ethics are important areas for action within institutions
- Challenges in digitalization: universities must develop coherent policies and infrastructures for online sharing and learning in doctoral education
- Being globally active and identifiable is a strategic priority for university leadership, and doctoral education is an important component in this strategy.



# Evolution of doctoral graduates in Catalonia



Source: Uneix

