



# The Doctoral Space Revisited

**Maria da Graça Carvalho**  
**KVAB Thinker's Programme**  
**Brussels, 7 November 2016**



## Content of the Presentation

- *Achieving a Knowledge Society*
- *The situation in Flanders*
- *The Doctoral Space*
- *The Future*
- *Recommendations*

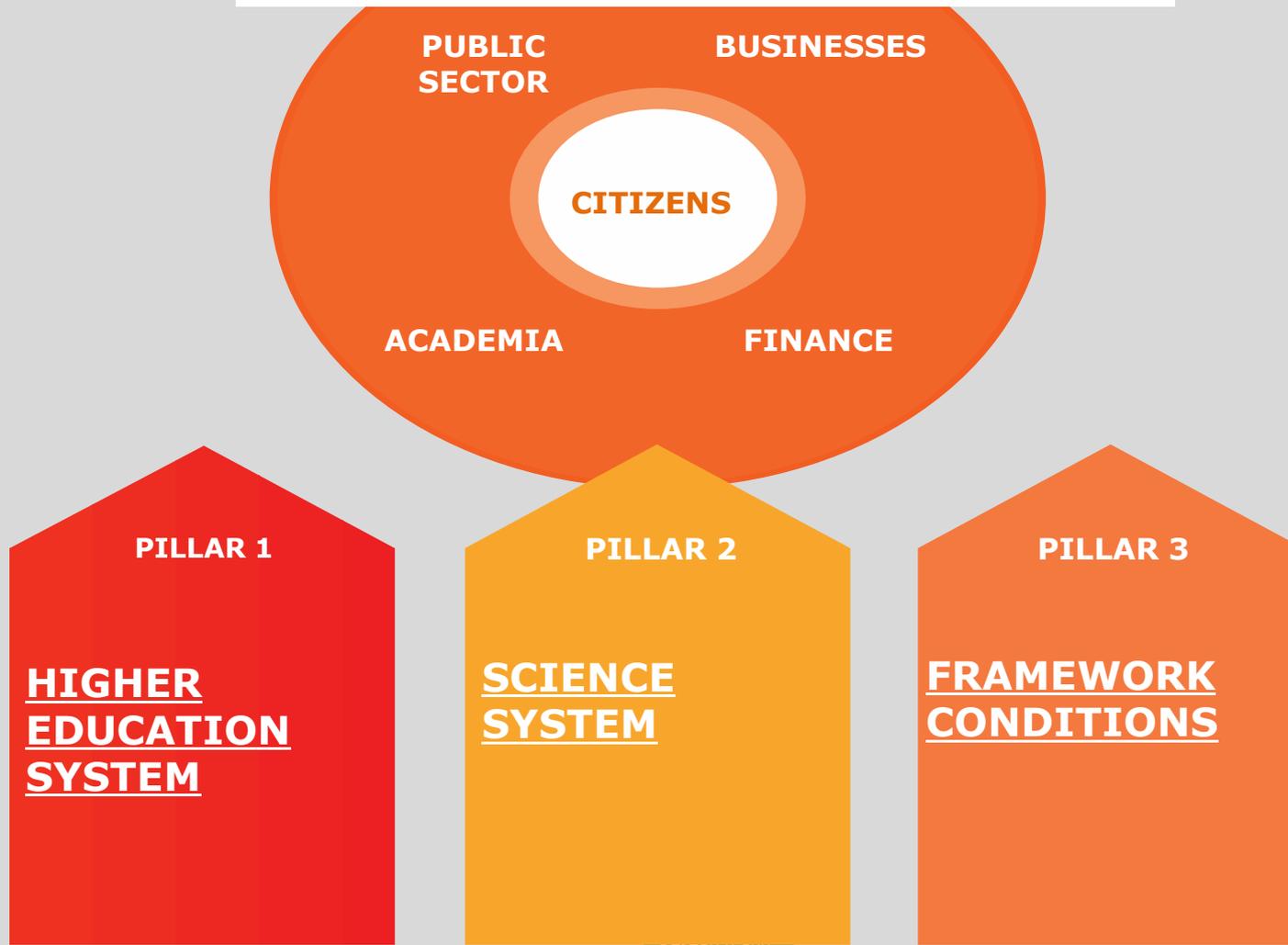


# Achieving a Knowledge Society

*Research and  
Innovation*

# Achieving a Knowledge Society

## INNOVATION ECOSYSTEM





## Challenges of Higher Education

***Opening access to the knowledge base:***  
*(see Policy paper M. Heitor)*

- *Broadening the basis of knowledge pyramid (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Bologna cycles)*
- *Pull up the top of the knowledge pyramid*





## Open up and Challenges of Higher Education

- *To promote advanced qualification (e g, the need for restructuring the doctoral education)*
- *To promote excellence*
- *To attract the best minds*
- *To open up to the economy and society*
- *To open up to the world whilst rooted in the region*
- *To diversify missions*
- *To make the knowledge triangle work*
- *To diversify the sources of funding and improve governance*
- *To ensure autonomy and integrity*





# Towards 'better science' – Good, efficient and Open Science

## research governance changes

- declaring competing interests
- replication & reproducibility
- meaningful assessment
- effective quality checks
- credit where it is due
- no fraud, plagiarism

## GOOD

## technical changes & standards

- connected tools & platforms
- no publ. size restrictions
- null result publishing
- speed of publication
- (web)standards, IDs

## EFFICIENT

## OPEN

- open peer review
- open (lab)notes
- plain language
- open drafting
- open access

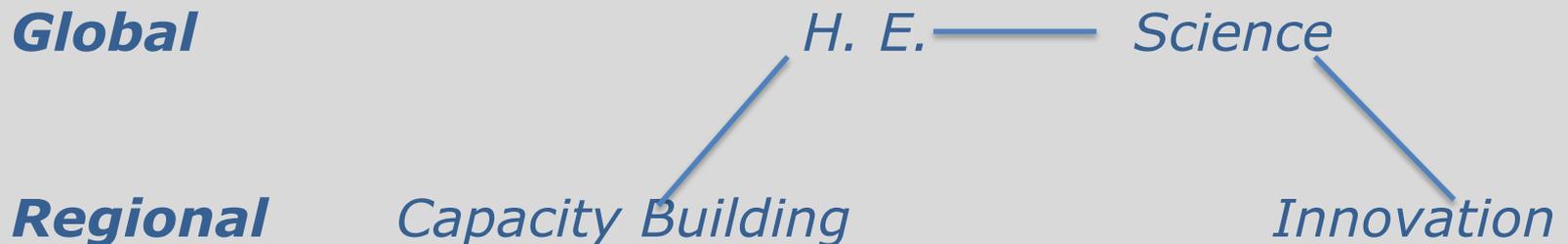
## economic & copyright changes





## **H E Area and Research Area: Open to the World**

*Science and Higher Education: Need to act globally, to promote global networks through structured collaboration*





## Framework Conditions

To ensure that the **appropriate framework conditions for innovation** are in place. These are:

- **Regulatory Environment** (competition rules, properly functioning market, tax policy, efficiency, highly skilled services sector...)
- **Availability of Private Investment**





## Market Failure in Innovation

*Europe performs well on some measures of innovation (e.g. generation of scientific knowledge, leadership in some technology fields)*

*a key weakness relates to **the lack of 'market-creating innovation' and scale-ups***

***Action needed (for example E. C. has announced the EIC)***



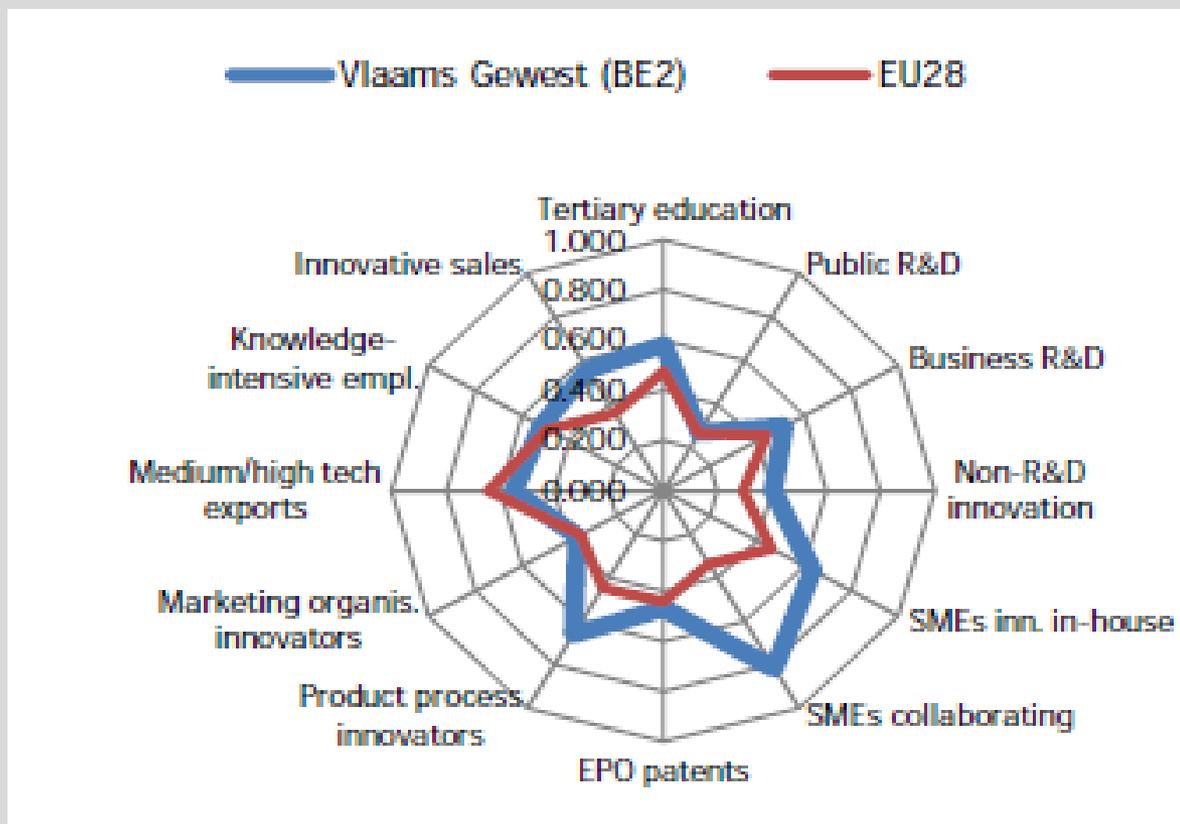


# Situation in Flanders

*Research and  
Innovation*



# INNOVATION SCORE BOARD (2016)





## Strengths and Weakness

- *The radar graph shows that **relative strengths compared to the EU28** are in Innovative SMEs collaborating with others, Sales due to new product innovations, and SMEs with product or process innovations.*
- ***Relative weaknesses** are in Public R&D expenditures and medium to high tech exports.*





## Main Indicators in Flanders

- *Flanders has a **well-educated workforce**, which is a direct result of its well-developed education system. In 2013, 40.5% of the (residing) workforce had had tertiary education.*
- *Flanders performs **more poorly in terms of lifelong learning**. In 2013, 7.1% of the adult population participates in lifelong learning. With respect to all 134 EU regions Flanders occupies 85th place, which is well within the bottom half. This is a clear deterioration compared to 2002 (33rd).*
- ***Total expenditures for research and development (R&D)** at 2.42% of GDP in 2012, of which 1.62 ppt came from the private sector (business) and 0.80 ppt from the public sector (government, higher education and non-profit).*





## Main Indicators in Flanders

- *For an economy to be innovative, a sufficient number of people must be working in knowledge-intensive companies or branches. In 2013, **8.9% of the Flemish workforce works in knowledge-intensive branches** . Compared to all 134 EU regions, Flanders was in 40th place in 2013, well within the second quartile.*
- *Flanders performs relatively **better in the subcategory of medium-high-tech and high-tech industry**, occupying 9th place with 5.5% in 2013.*
- *Flanders ranks 8th in terms **of knowledge-intensive services** (13.4% in 2013), which comprise high-tech, market and financial services.*





## Main Indicators in Flanders

- *In 2013, 15.4% of the Flemish **labour force is thus working in creative industries. In the broader** ranking of all EU regions, Flanders is in 31st position.*
- *Flanders counts 443 patent applications per million inhabitants over the period 2008-2012. In the list of all 134 EU regions, Flanders is ranked 26th, which is well within the first quarter of best performing regions. **Flanders has fewer patent applications than Belgium as a whole.***





## Results FP7 and Horizon 2020

	<i>ERC</i>	<i>Marie Curie</i>	<i>EU Financial Contr.</i>	<i>Popul</i>
<i>Flanders FP7</i>	122	383	1 044 100	6,4
<i>Flanders H2020</i>	52	182	402 486	
<i>Belgium FP7</i>	177	616	1 831 120	11,2
<i>Belgium H2020</i>	77	254	835 386	
<i>Portugal FP7</i>	46	380	521 852	10,4
<i>Portugal H2020</i>	31	141	300 016	
<i>Netherlands FP7</i>	482	1145	3 388 341	16,8
<i>Netherlands H2020</i>	217	513	1 373 517	





## PhD s in Flandres

- ***Most Ph.D. students embark on a research career out of a passion for scientific research. An important share also consider the Ph.D. training phase as the first phase of an academic career.***
- ***About 1 in 5 Ph.D. graduates at a Flemish university obtain an academic post as professor at the same or a different Flemish university***
- ***The number of Ph.D. graduates in Flanders is not evenly spread across disciplines: far more Ph.D. degrees are awarded in engineering, natural sciences and biomedical sciences than in social sciences and humanities***

*Noëmi Debacker, Karen Vandevælde. ECOOM (2016)*





## Employment of PhDs holders in Flanders

- 1. Accumulation of postdocs inside the Universities looking for an opportunity to enter an academic career*
- 2. Mismatch between the post-doc and available tenured posts at Universities*
- 3. Market sees little advantage in hiring PhDs*



**No easy solution: efficient innovation ecosystem**





## PhDs entering in the market

- 1. Smooth flow from PhD Schools to the economy and society (Entrepreneurship, start ups, SME ´s, service sector, creative sector....)*
- 2. Alternative careers associated to research projects/ research centers*
- 3. The case of Portugal*





# The Doctoral Space

*Research and  
Innovation*



## Characteristics of PhDs Programmes

- *International research*
- *Multidisciplinary*
- *Mobility*
- *Entrepreneurship*
- *New Skills.*





## Bratislava Declaration of Young Researchers

1. *To enable great people **to realise their ideas** to understand and improve the world.*
2. *Sustainable and transparent **career** trajectories.*
3. *A diverse, collaborative, inter-disciplinary, open, and ethical **research environment**.*
4. *A healthy **work-life balance***





## Bratislava Declaration of Young Researchers

1. *To enable great people **to realise their ideas** to understand and improve the world:*
  - *Funding agencies should radically reorganise funding streams to trust and **empower young researchers**, enabling them to pursue their ideas.*
  - *M.S. should **incorporate research and scientific skills into high-school education** through radical reform of curricula and methods of assessment*





## Bratislava Declaration of Young Researchers

### 2. *Sustainable and transparent **career** trajectories:*

- *M. S. to realise employment-stability, and **criteria for career progression***
- *M. S. to provide structured opportunities for non-traditional career trajectories and mechanisms for **better mobility***
- *P. I. and research institutions to fulfil their **duty-of-care** with respect to the training and career development of young researchers.*





## Bratislava Declaration of Young Researchers

3. *A diverse, collaborative, inter-disciplinary, open, and ethical **research environment**:*
- *to **empower young researchers** (this would involve reorganising funding schemes and the research environment)*
  - *to enforce free **sharing of data and ideas** (e.g., open access publications and open data) and **ethical behaviour** (e.g. identification of individual contributions, post-publication peer review).*





## Bratislava Declaration of Young Researchers

### 4. A healthy *work-life balance*:

- *to implement supportive and better childcare provisions, parental care, flexible working practices and provide dual-career opportunities.*



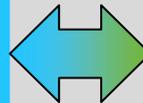
# EITcatalyst for a step change in HE

## EDUCATION

Promoting excellent education for creativity, innovation and entrepreneurship by high quality EIT labelled degree programmes, fostering a vibrant EIT student & alumni community.

## ENTREPRENEURSHIP

Promoting an entrepreneurial mindset and culture, including risk taking, by creating more favourable environments for passionate entrepreneurial talent and entrepreneurship-driven innovation to flourish.



## WORLD-CLASS INNOVATION

Developing innovative ecosystems to create and grow world-class, breakthrough innovations by exploiting KIC synergies and complementarities.



The Future

Research and  
Innovation



## The Future

- ***The digital revolution*** (a fusion of technologies between physical, digital and biological spheres) will require:
  - ***A reform of the entire Education System***
  - ***Profound reform in the Higher Education***
  - ***Rethinking the future of work and redistribution of wealth mechanisms***





# Recommendations

*Research and  
Innovation*



## Recommendations

- 1. Reform Education (new skills, entrepreneurship....)***
- 2. Open up Science and H E systems (open access, open data, open to economy and society, open to the world)***
- 3. Up skill and retraining***
- 4. Better Innovation Framework conditions***
- 5. Actions to promote market creating innovation***
- 6. Communicate Science to society (special emphasis to youngsters particularly girls)***





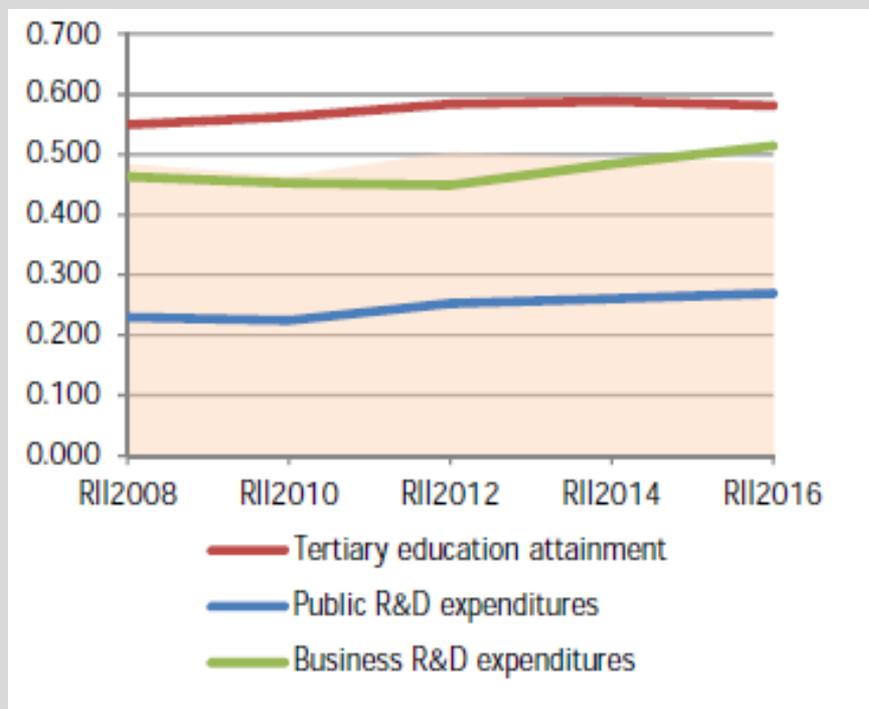
**Thanks for your attention!**

Maria da Graça Carvalho

Maria-da-graca.carvalho1@ec.europa.eu

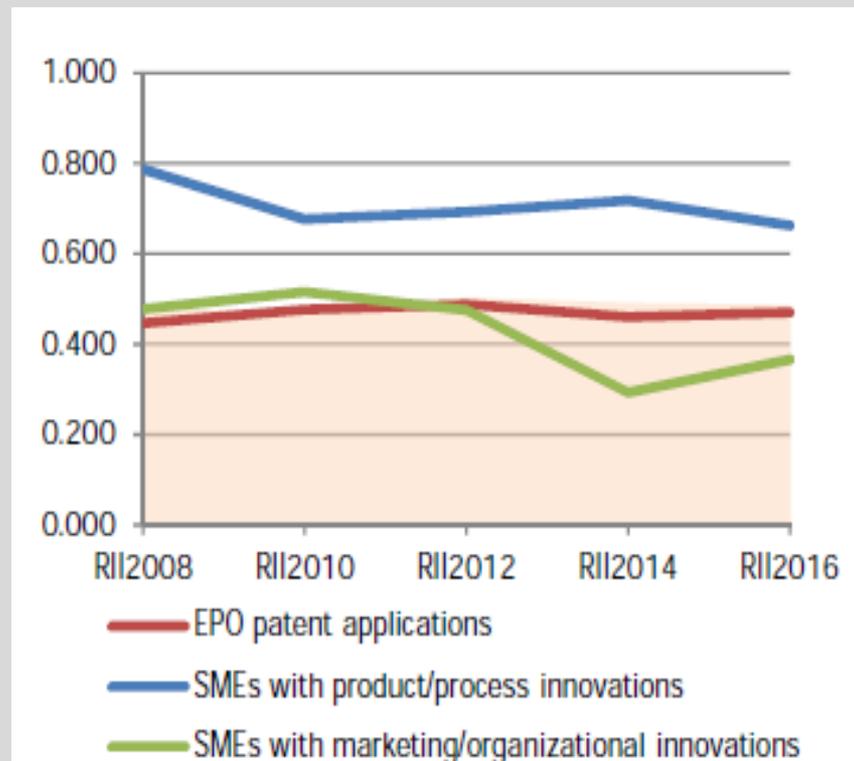


## INNOVATION SCORE BOARD (2016)





## INNOVATION SCORE BOARD (2016)





## INNOVATION SCORE BOARD (2016)

