



On the use of science and technology for society and defence



Prof. Dr. Ir. Bart De Moor
Vice-rector International Policy

Mission

Excellence in academic education



Excellence in research



Relevant contributions and service to society

KU Leuven Organisational Chart

3 groups, 15 faculties

Including the Bachelor's Campus in Kortrijk



3 scientific groups: 3 vice-rectors
 4 cross-group authorities: 4 vice-rectors: Education, Research, Student Affairs, International Policy
 1 vice-rector KU Leuven Kulak

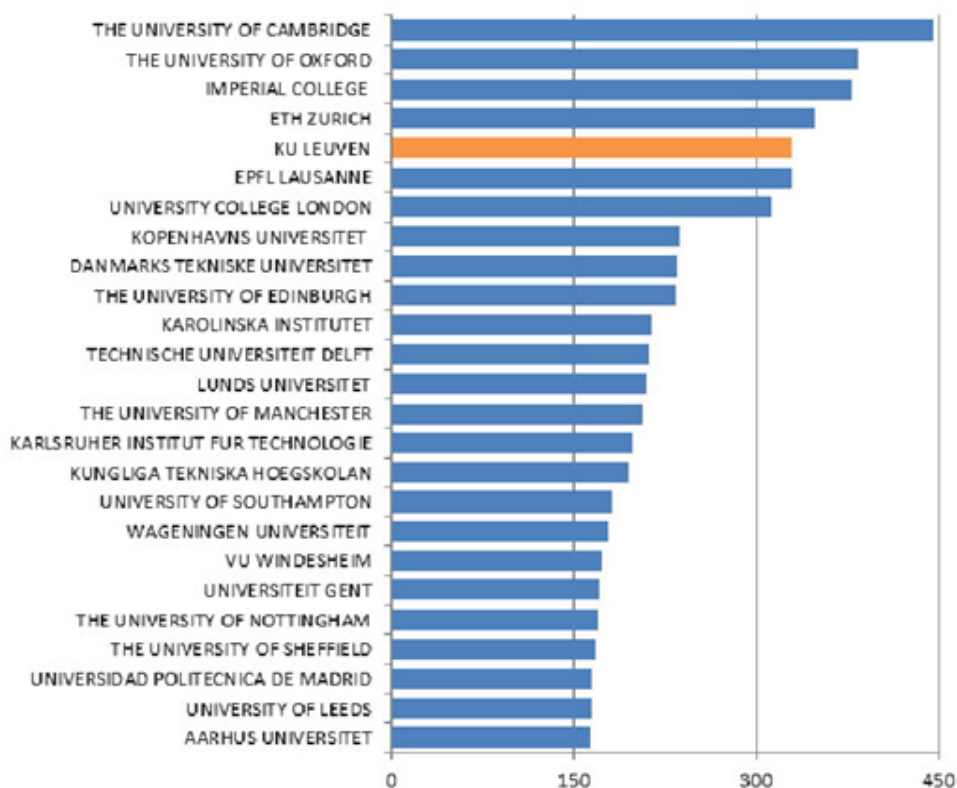
Figures: february 2012

Research: European excellence

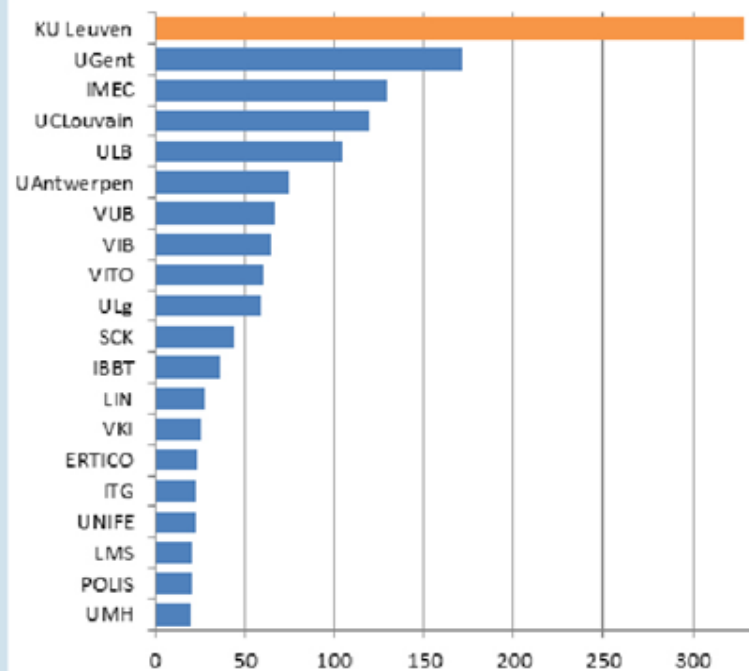
Prominent research university in European context



5th place in the HES ranking #FP7 contracts
(2007-March 2012)



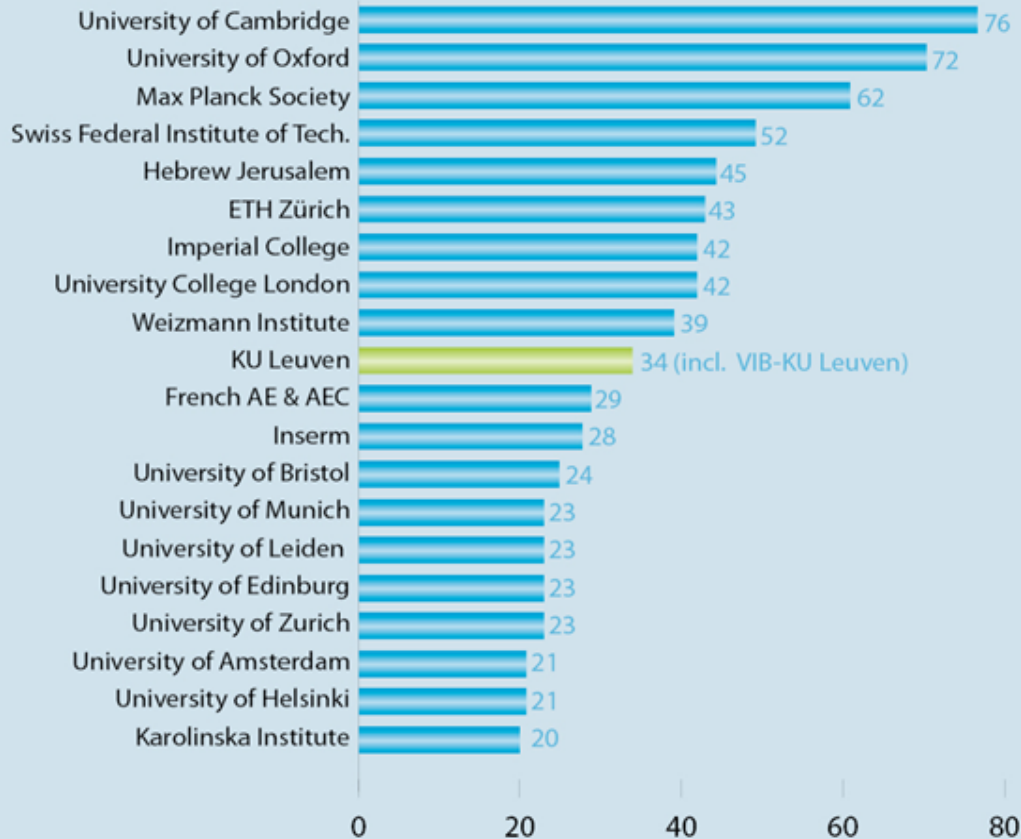
Numer of FP7 contracts (up to March 2012)



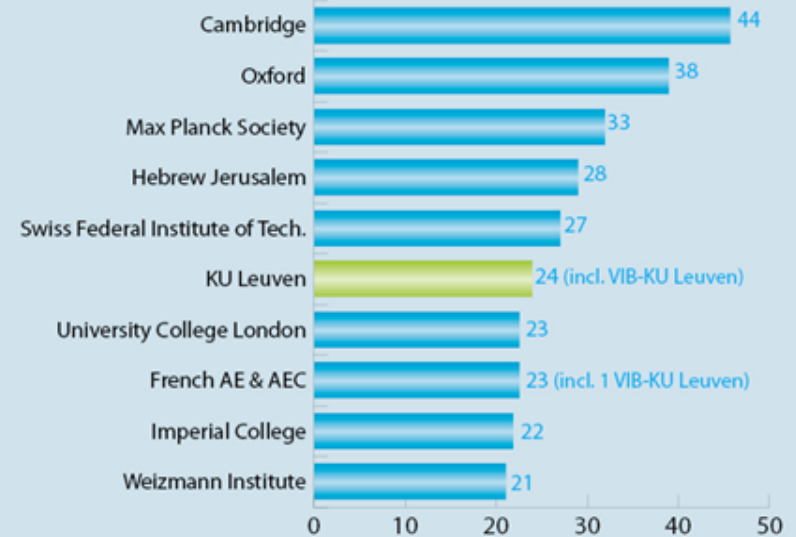
Research: European excellence



Total number of ERC grants
(starting & advanced 2007-2011)

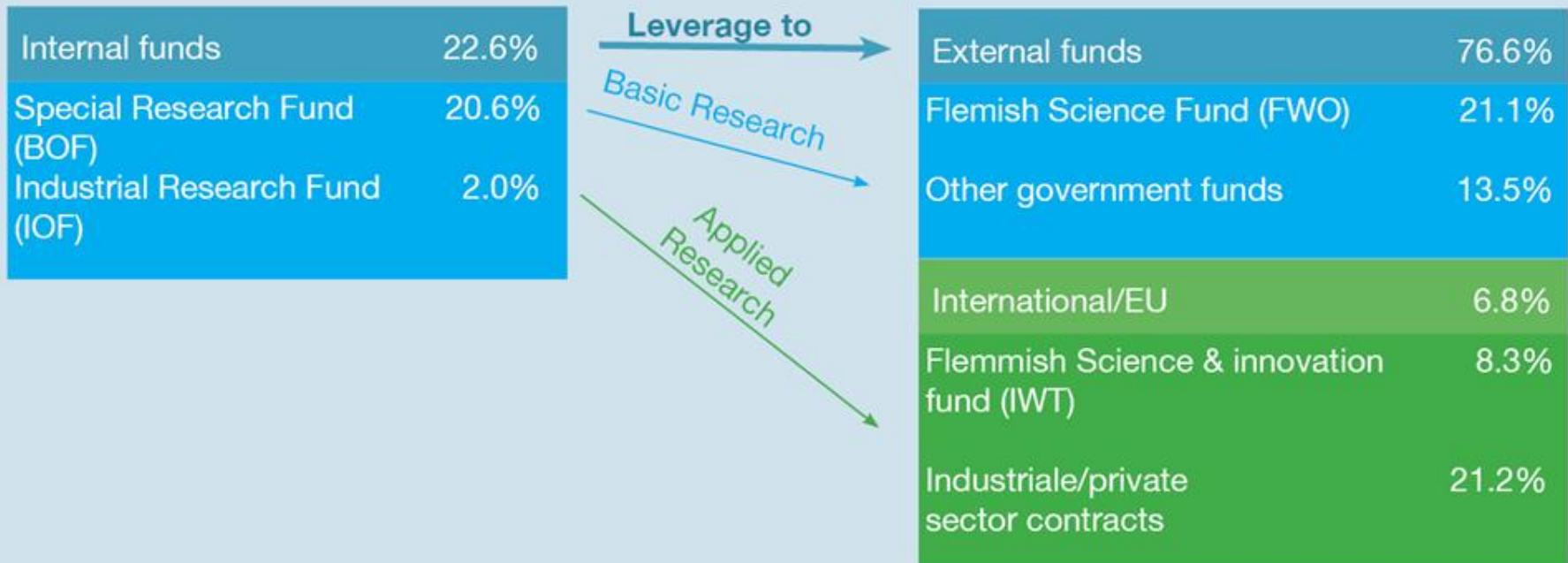


ERC starting grants
(2007-2011)

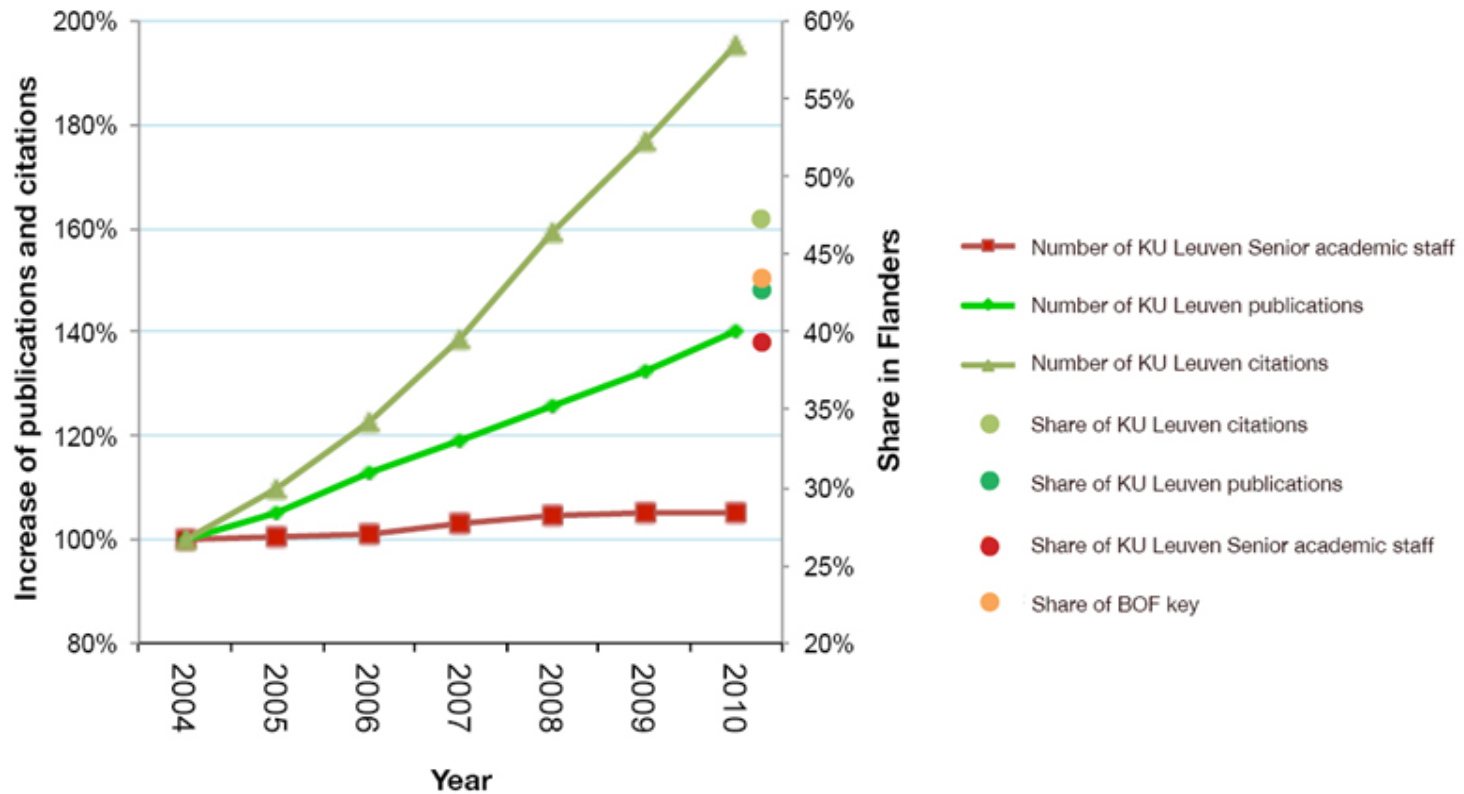


Research: input

Research funding expenses 2011: € 365 million



Research output



508,871 SCIE citations

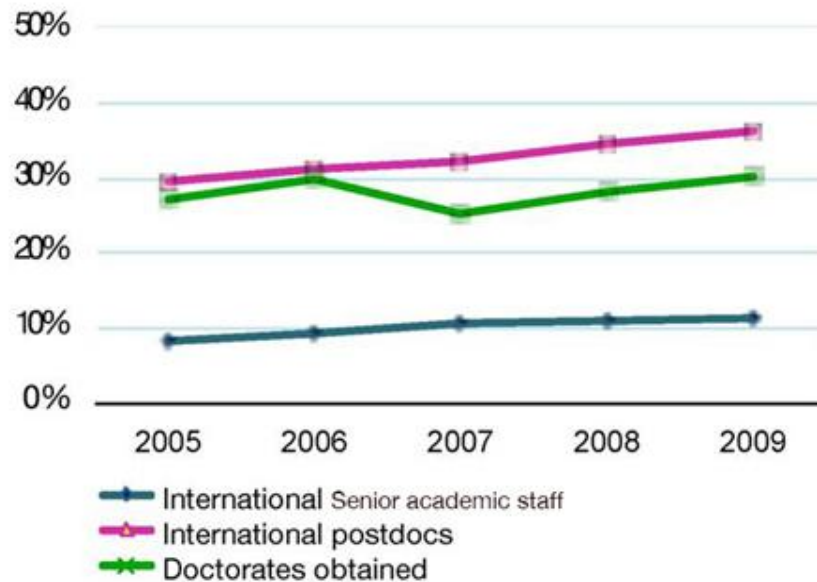
35,072 SCIE publications

Research: Staff

Professors	1,022 FTE (9% international)
Postdocs	1,067 FTE (36% international)
Doctoral students	4,590 (39% international)

Doctorates obtained: annually ~625

Share of international researchers



International Students

KU Leuven = more than 140 nationalities

6,248 international students

16% international students

36% advanced Master's and doctoral students

Top 5: EU students

the Netherlands	1,417
Italy	298
Germany	246
Spain	242
Poland	151

Top 5: Non EU students

China	497
India	308
United States	209
Iran	178
Turkey	121

Figures: 1 february 2012



KU Leuven Research & Development

- Established in 1972
- One of the first university technology transfer offices in Europe

Profitable management of the economic potential of research results by means of:

Contract research

Managing intellectual property rights

Founding spin-off companies

Promoting entrepreneurship and innovation

Supporting regional development

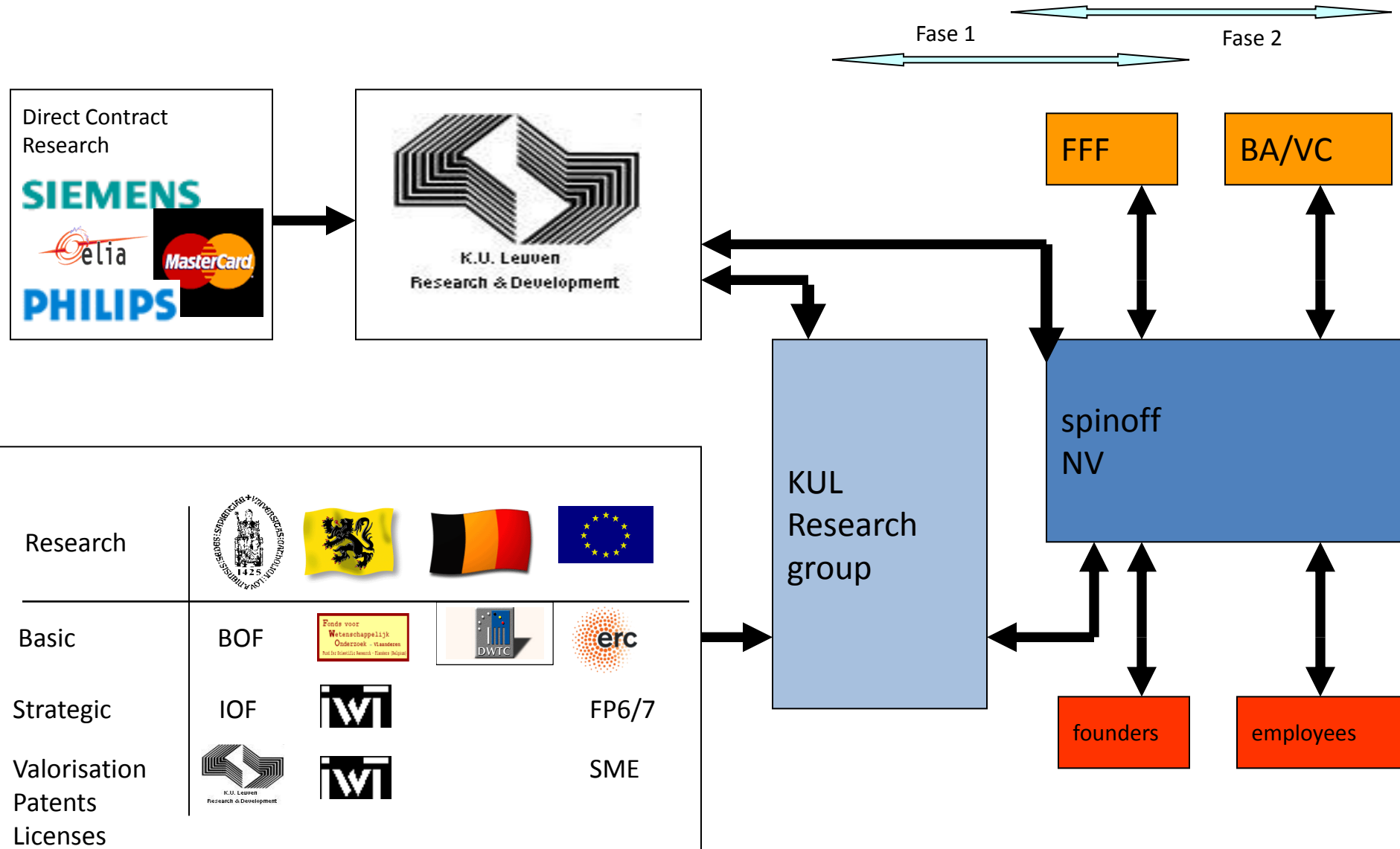
LRD in Figures

2011: 1,300 new contracts managed

2011: € 60 million revenue from intellectual property

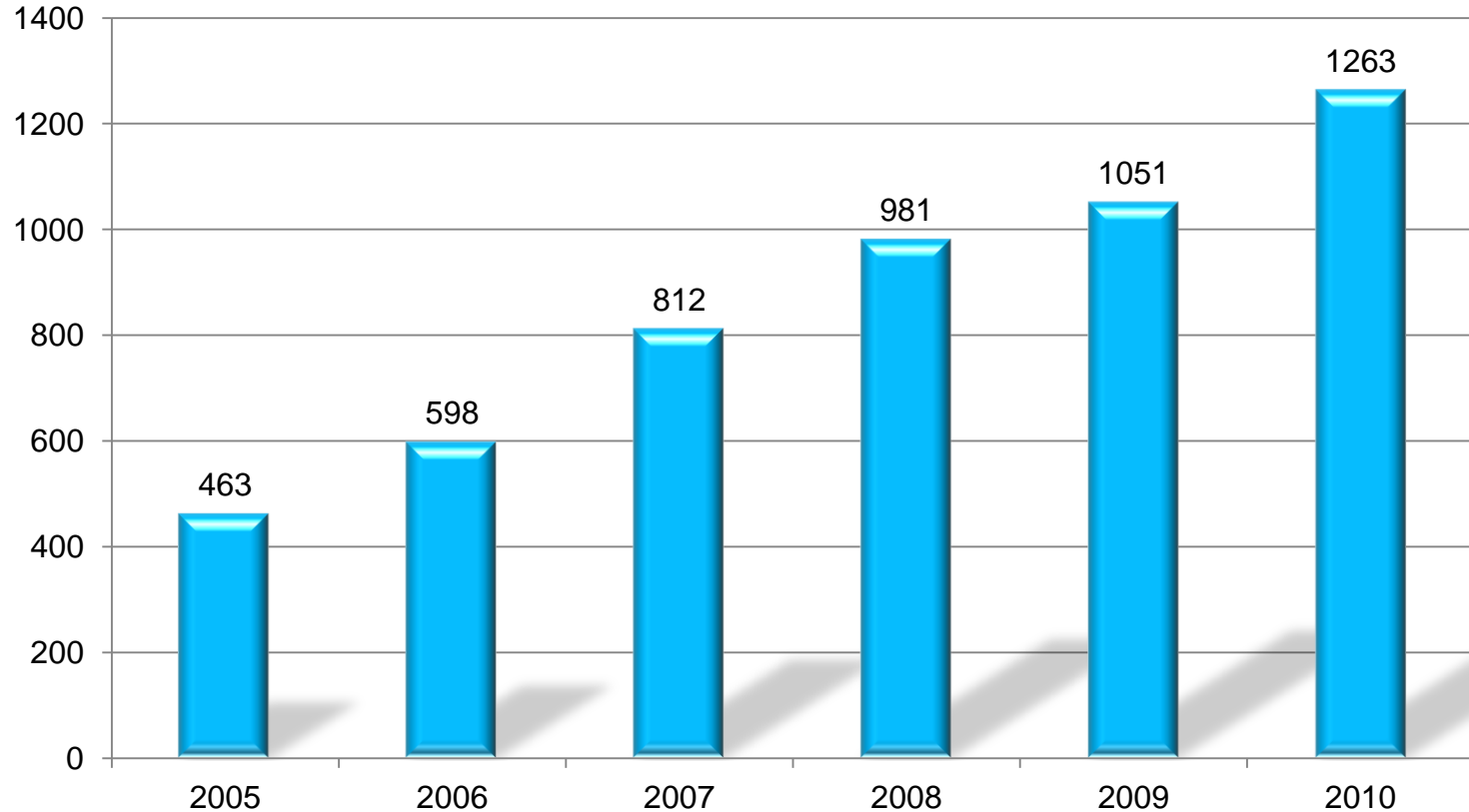
2005-2011: € 527 million external capital investment in spin-off portfolio

The technology transfer engine



Research collaboration income

- 95 million euro income from research collaboration
- 1,263 new agreements (2010)



Intellectual property

- 146 patent applications in 2010
 - 454 active patent families
 - 44 PCTs

In numbers	2010
Reported findings	180
Priority submissions	146
New patents	22

- 53 million euro license-income

Spin-off Companies

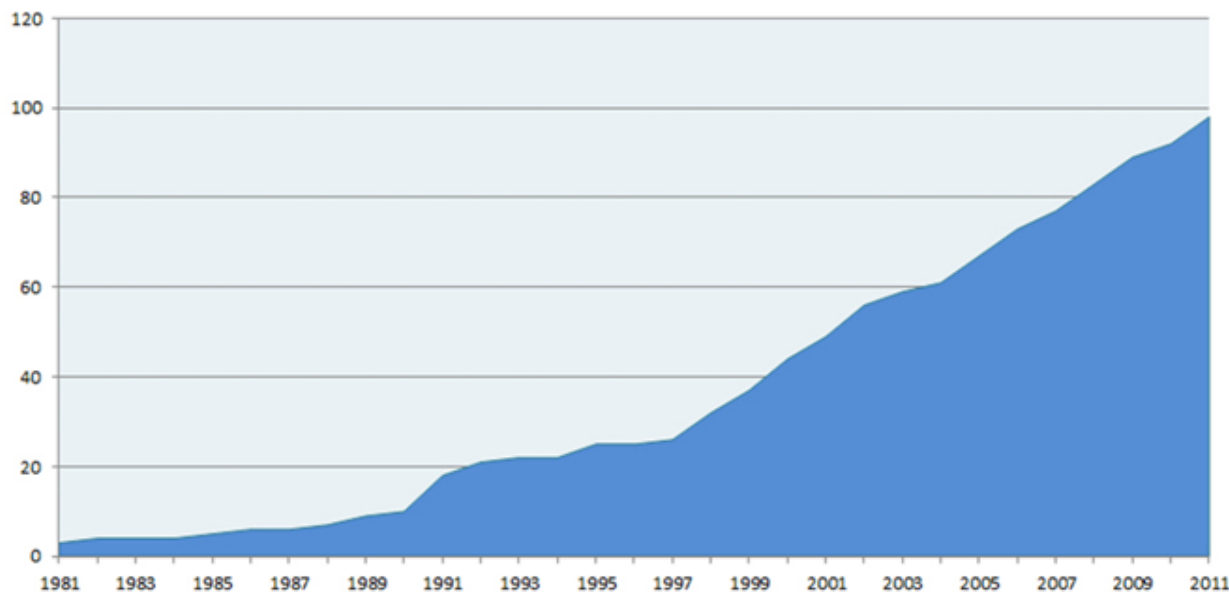
By late-2011

98 spin-off companies

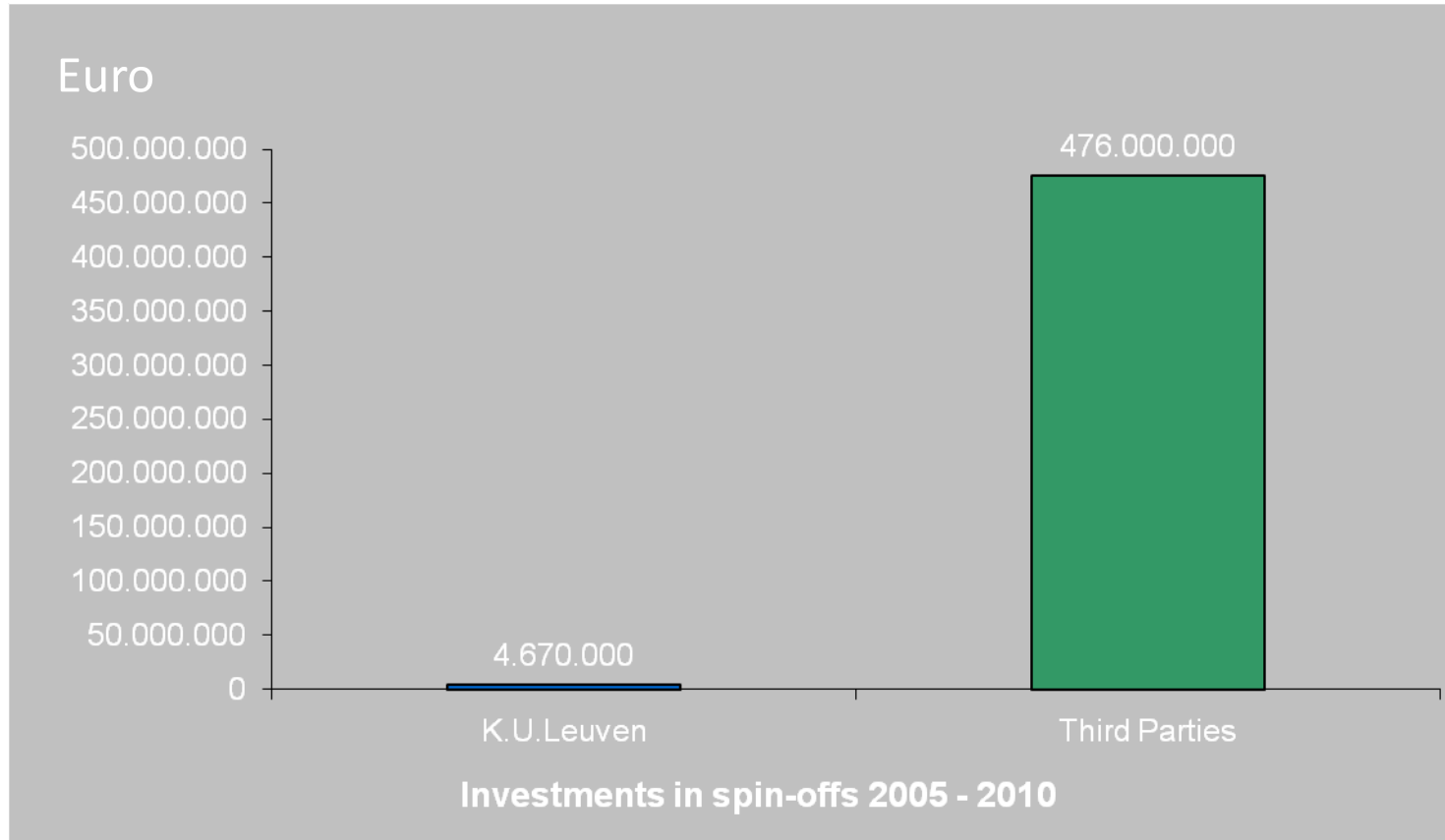
3,500 direct jobs

6 IPOs (Initial Public Offering)

Cummulative number of spin-offs created



Investment leverage



Some thoughts and considerations

- **KU Leuven is comprehensive university:**
 - ‘sensitive’ developments everywhere (control theory, ICT, synthetic biology, psychology, ...)
 - dual use issue everywhere (e.g. drones)
 - Notion of a ‘just war’ (rechtvaardige oorlog): ‘bellum iustum’ Thomas Of Aquino
- **Increasing internationalisation**
 - Individuals (admission restrictions ? Monitoring ?)
 - Institutional: code-of-conduct w.r.t. human rights ?
- **Increasing deficits due to increasing impact/relevance of S&T**
 - **Democratic:** what do decision makers ‘understand’
 - **Legal:** how are laws being made and applied about difficult S&T problems
 - **Ethical:** Assuming technologically that everything is possible, then the question is *not how, but what to do ?*
 - Need for ethical committees:**
 - in biomedical sciences (dealing with patients)
 - in fund raising (credentials of the donor ?)
 - in science for defence ?
- **S & T for society: Technology transfer**
 - Decree 1995
 - ‘money driven contracts’, not ‘result driven’

Some thoughts and considerations

- DoD (Department of Defense) and DARPA (Defense Advanced Research Projects Agency) started active scouting, and in the US also support fundamental research
- IMA Conference on Maths in Defence (data analysis, modeling and estimation, operational analysis, security, signal processing, statistical methods and machine learning)
- Do we need active screening of such projects ?
- For IWT funded projects
 - Dual use regulations apply
- For EU funded projects:
 - Screening happens w.r.t. 'dual use'
 - 'Dual use' is a continuum
 - Guidelines on ... potential misuse of research in EU funded research ...
 - ... misuse for criminal, terrorist or unethical military purposes
- Sensitive and delicate discussions within an academic environment
- Conclusion: need to develop a code-of-conduct