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University of Freiburg
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University of Helsinki
Universiteit Leiden
KU Leuven
Imperial College London
University College London
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University of Oxford
Université Paris-Sud 11
Pierre & Marie Curie University
Université de Strasbourg
Utrecht University
University of Zurich

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Research, Innovation and Education in Europe demands a Continuous Investment by Society for Society

Prof Dr Kurt Deketelaere
Secretary-General
League of European Research Universities
Professor of Energy, Environmental and Climate Law
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Today's Key Message

- The **European research base** has some of the highest levels of productivity and excellence in the world, but it is concentrated in those areas where it has been sustained by long-term national and European investment, coupled to positive interactions with industry.
- **Public investment in research is essential.** It has a demonstrably powerful social impact, from advances in medical diagnostics and therapeutics that improve health and the quality of life, to innovation and the development of new technologies essential to Europe's future competitiveness.
- Research is quite simply the foundation for **Europe's future competitiveness**. In this, the role of **universities and associated research institutes** is fundamental. Their focus on basic science lays the foundation for discovery and innovation, and their laboratories develop the human capital that businesses need for success.
- **Innovation** is a complex process, not a linear progression of basic science into new products. It is rare that the new knowledge created by scientific breakthrough has immediate practical implications. Often it is accidental.
- Frontier research requires patience, persistence and investment. **Europe's research-intensive universities** have the unique capacity to bring together the three elements that are essential to ensuring Europe's long-term competitiveness and welfare: **higher education, research and innovation**.

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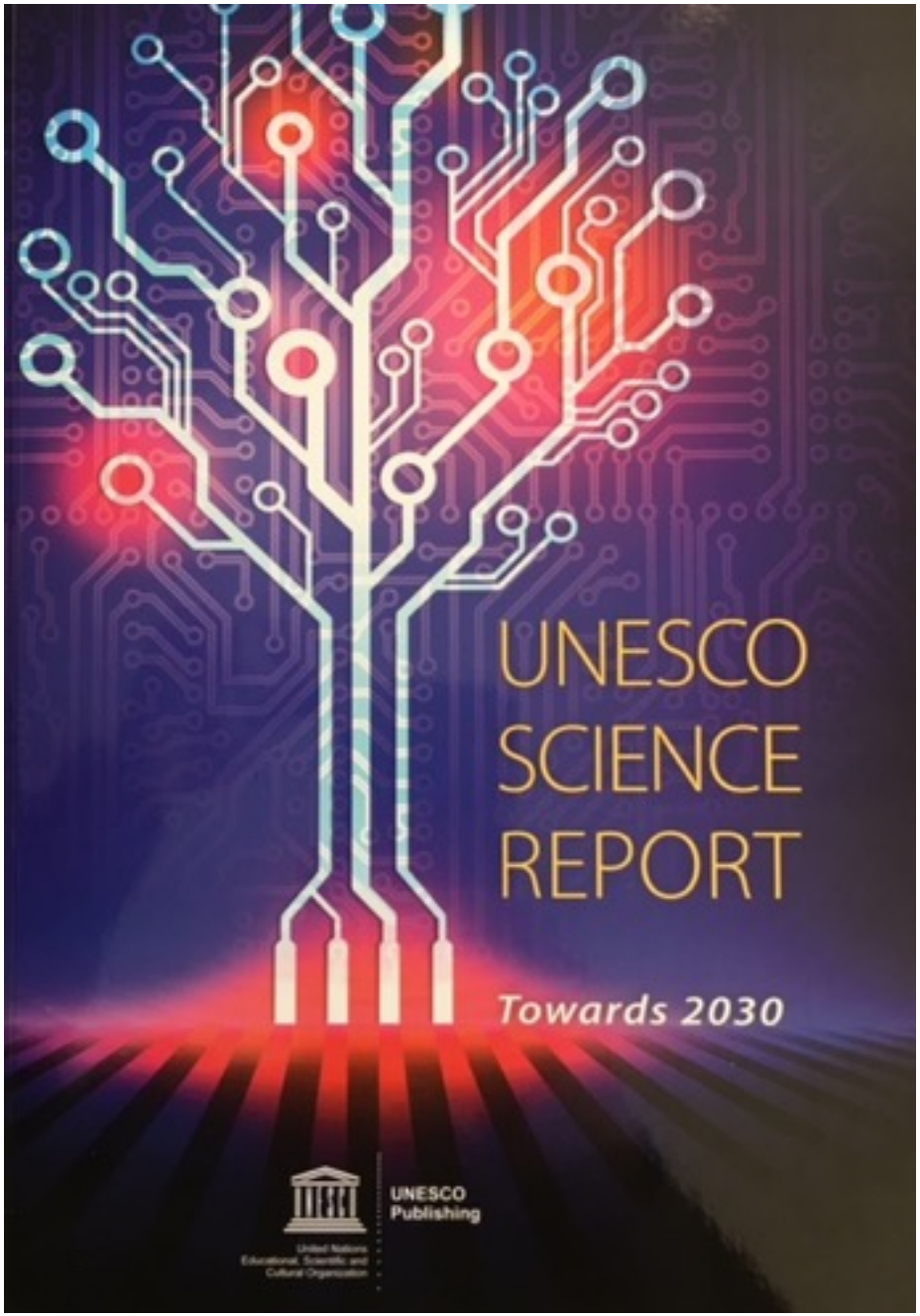

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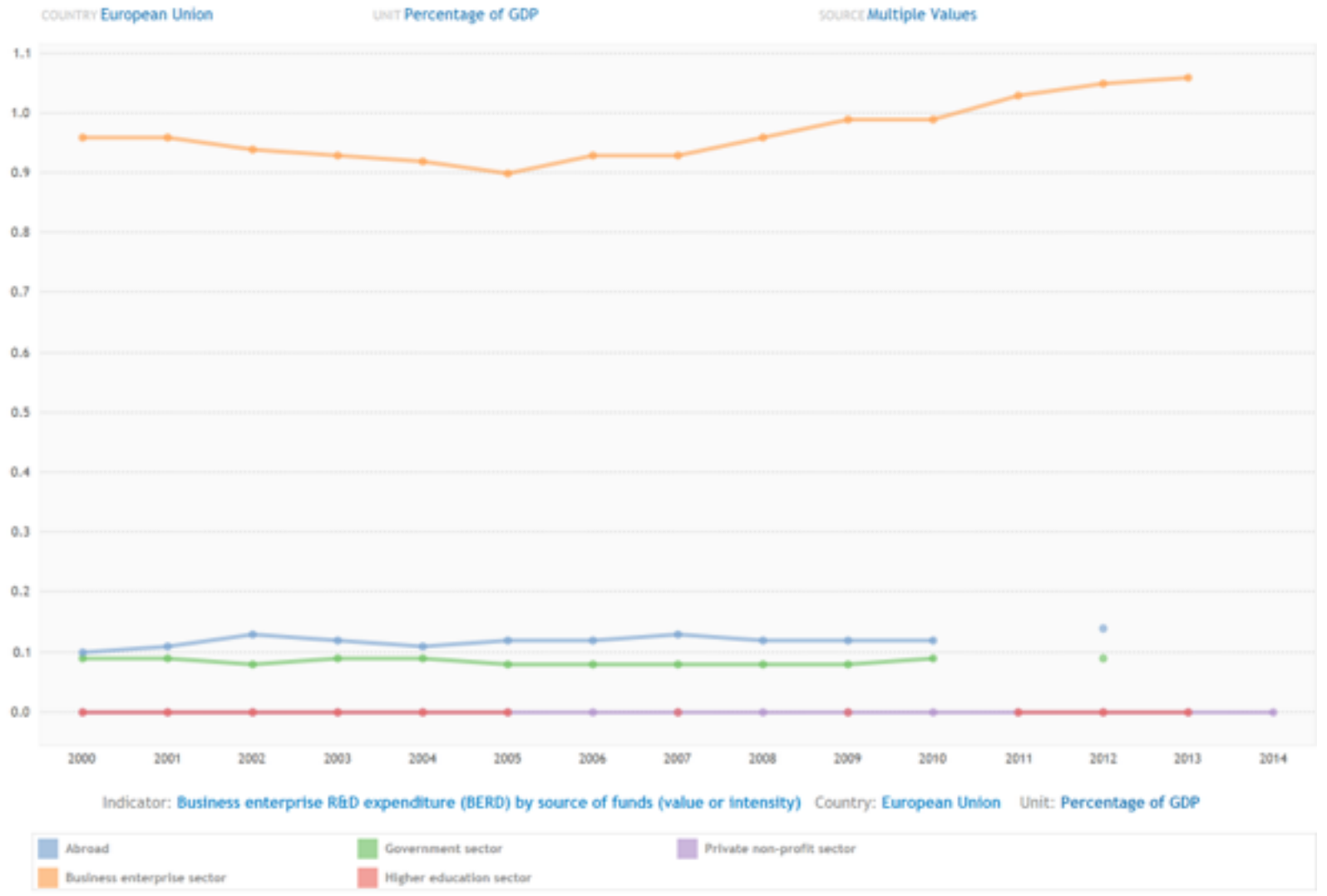

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COUNTRIES All

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria			0.68		0.69	0.71	0.69	0.71	0.79	0.82	0.85	0.83	0.84	0.85	0.86
Belgium	0.51	0.52	0.54	0.54	0.53	0.55	0.54	0.54	0.59	0.65	0.65	0.65	0.67	0.70	0.70
Bulgaria	0.39	0.35	0.38	0.38	0.36	0.35	0.33	0.30	0.31	0.35	0.29	0.26	0.24	0.25	0.27
Croatia			0.54	0.58	0.61	0.51	0.47	0.47	0.49	0.50	0.42	0.42	0.41	0.41	0.41
Cyprus	0.17	0.17	0.19	0.23	0.24	0.26	0.27	0.28	0.26	0.30	0.32	0.32	0.31	0.33	0.31
Czech Republic	0.44	0.43	0.42	0.45	0.43	0.47	0.50	0.54	0.51	0.56	0.56	0.69	0.82	0.87	0.87
Denmark	0.71	0.71	0.74	0.76	0.76	0.74	0.78	0.74	0.83	0.91	0.95	0.98	1.03	1.10	1.10
Estonia	0.45	0.45	0.46	0.48	0.50	0.48	0.60	0.54	0.69	0.74	0.77	0.84	0.89	0.90	0.81
Finland	0.92	0.91	0.96	0.95	0.97	0.95	0.94	0.90	0.90	1.05	1.10	1.05	1.05	1.00	1.00
France	0.75	0.75	0.77	0.76	0.74	0.74	0.73	0.72	0.74	0.82	0.77	0.76	0.75	0.76	0.76
Germany	0.70	0.72	0.74	0.74	0.73	0.74	0.74	0.73	0.79	0.88	0.89	0.91	0.92	0.93	0.91
Greece		0.37		0.37	0.36	0.40	0.39	0.40				0.43	0.45	0.52	0.53
Hungary	0.40	0.48	0.57	0.54	0.47	0.49	0.49	0.46	0.45	0.47	0.44	0.43	0.41	0.41	0.38
Ireland	0.31	0.32	0.33	0.37	0.41	0.42	0.41	0.43	0.49	0.51	0.51	0.47	0.45	0.42	0.41
Italy	0.50	0.53	0.55	0.55	0.54	0.50	0.52	0.50	0.50	0.53	0.52	0.51	0.55	0.55	0.54
Latvia	0.27	0.26	0.24	0.23	0.22	0.31	0.33	0.37	0.44	0.29	0.38	0.50	0.51	0.43	0.43
Lithuania					0.59	0.60	0.57	0.58	0.60	0.62	0.56	0.67	0.66	0.71	0.72
Luxembourg	0.11	0.15	0.15	0.18	0.20	0.21	0.24	0.26	0.36	0.42	0.52	0.51	0.58	0.62	0.59
Malta			0.19	0.17	0.16	0.18	0.20	0.19	0.18	0.19	0.25	0.24	0.36	0.37	0.34
Netherlands	0.80	0.83	0.83	0.86	0.84	0.84	0.81	0.80	0.82	0.89	0.90	0.83	0.84	0.87	0.87
Poland	0.41	0.39	0.44	0.39	0.40	0.39	0.37	0.39	0.41	0.48	0.53	0.52	0.56	0.48	0.49
Portugal	0.44	0.44	0.41	0.39	0.38	0.38	0.41	0.44	0.61	0.70	0.68	0.64	0.57	0.69	0.67
Romania	0.11	0.15	0.15	0.16	0.17	0.20	0.23	0.31	0.39	0.27	0.28	0.31	0.30	0.27	0.22
Slovakia	0.22	0.21	0.20	0.25	0.25	0.25	0.27	0.27	0.26	0.28	0.36	0.41	0.48	0.44	0.56
Slovenia	0.58	0.60	0.55	0.45	0.45	0.58	0.61	0.57	0.58	0.64	0.66	0.64	0.63	0.61	0.54
Spain	0.40	0.42	0.44	0.47	0.48	0.51	0.52	0.55	0.59	0.65	0.65	0.63	0.59	0.58	0.57
Sweden		0.88		0.92	0.89	0.92	0.88	0.87	0.90	1.00	1.01	0.99	1.05	1.02	1.04
United Kingdom	0.58	0.56	0.57	0.57	0.57	0.59	0.60	0.59	0.60	0.65	0.62	0.59	0.57	0.58	0.58
European Union	0.62	0.63	0.64	0.65	0.64	0.64	0.63	0.63	0.67	0.73	0.72	0.71	0.72	0.73	0.72

Indicator: **Public (government and higher education) R&D expenditure as % of GDP**

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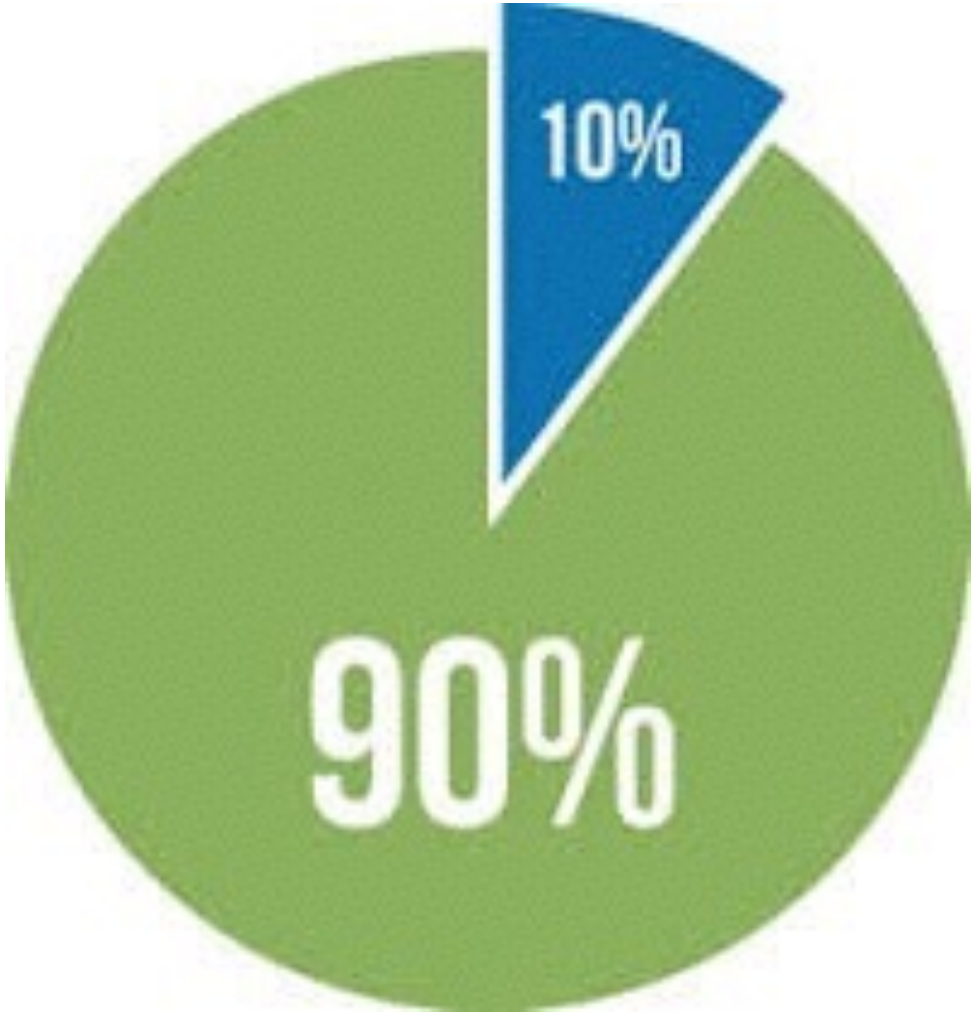

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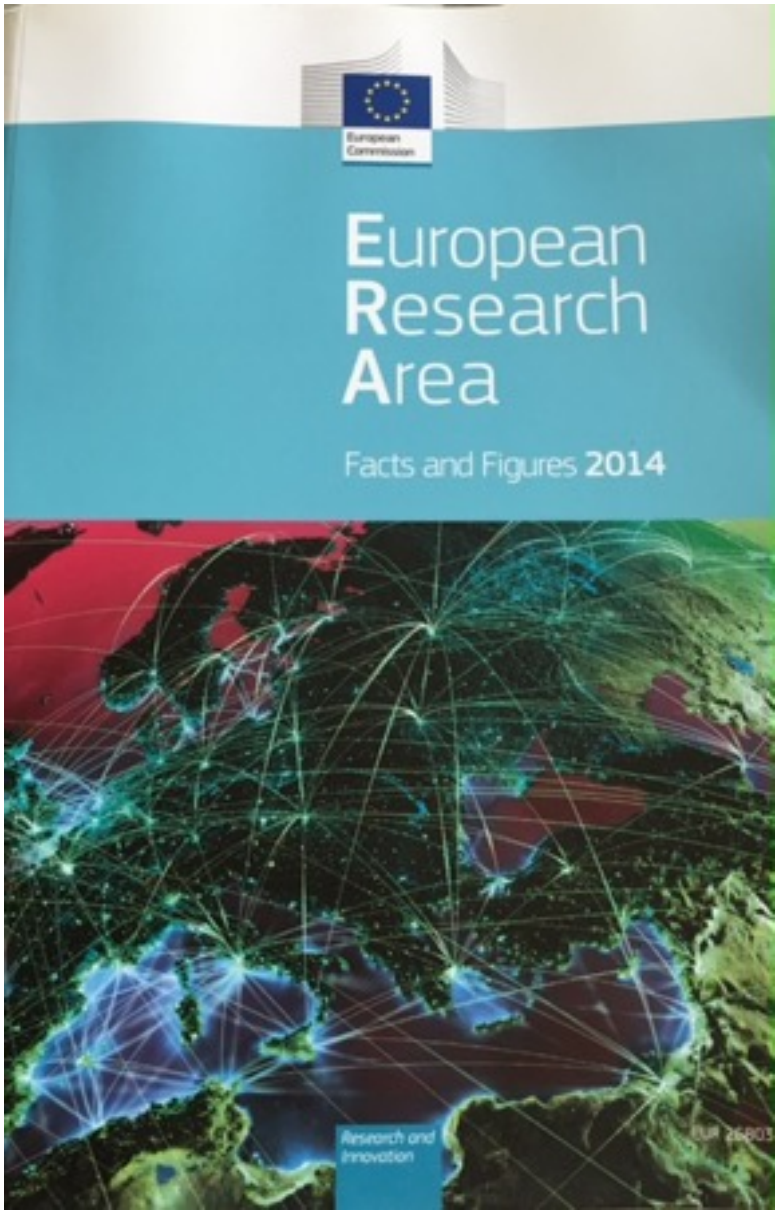

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10 priorities

01 A new boost for jobs, growth and investment.

02 A connected digital single market.

03 A resilient Energy Union with a forward-looking climate change policy.

04 A deeper and fairer internal market with a strengthened industrial base.

05 A deeper and fairer Economic and Monetary Union (EMU).

06 A reasonable and balanced free trade agreement with the United States.

07 An area of Justice and Fundamental Rights based on mutual trust.

08 Towards a new policy on migration.

09 Europe as a stronger global actor.

10 A Union of democratic change.

Sources: European Parliament, European Commission

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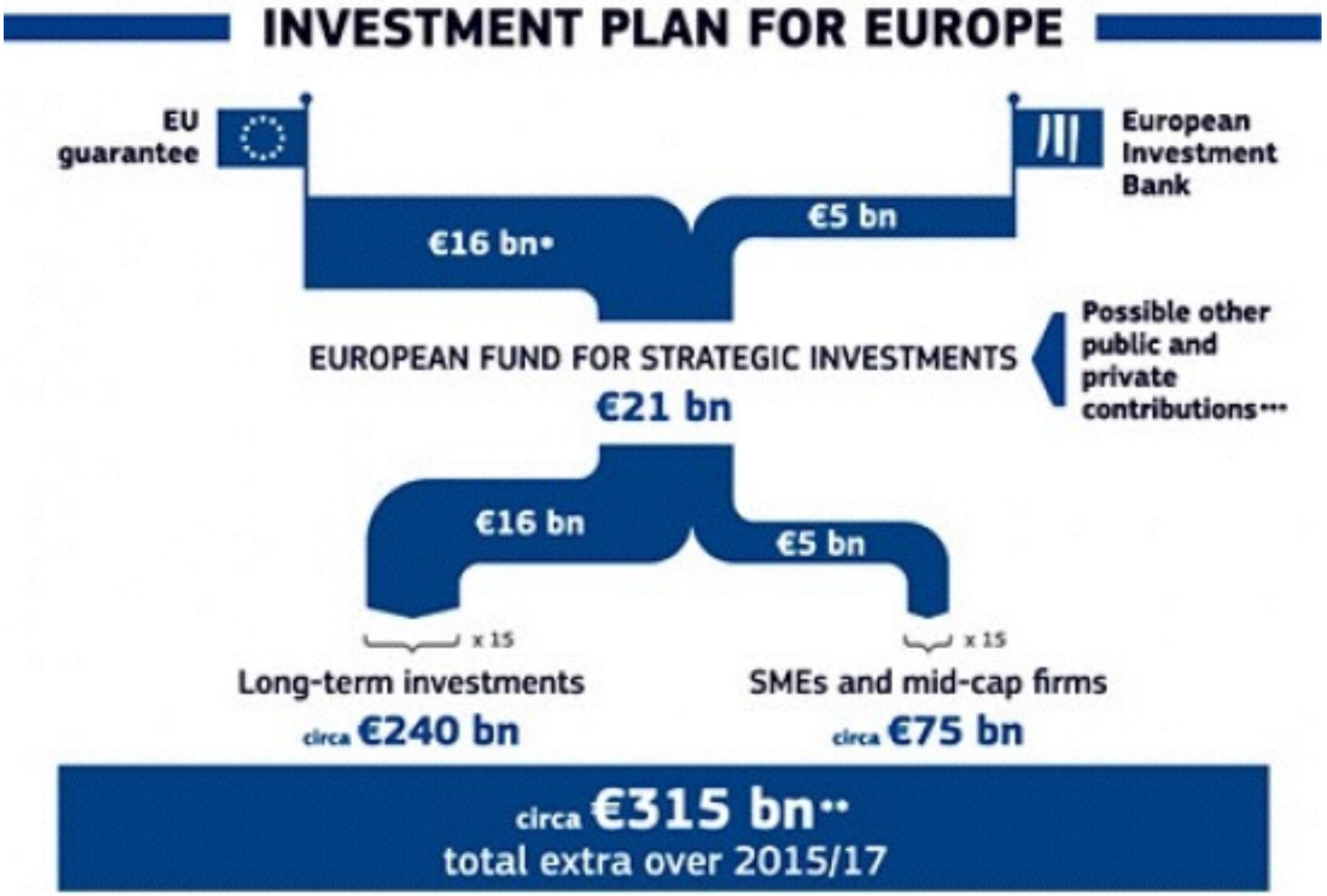

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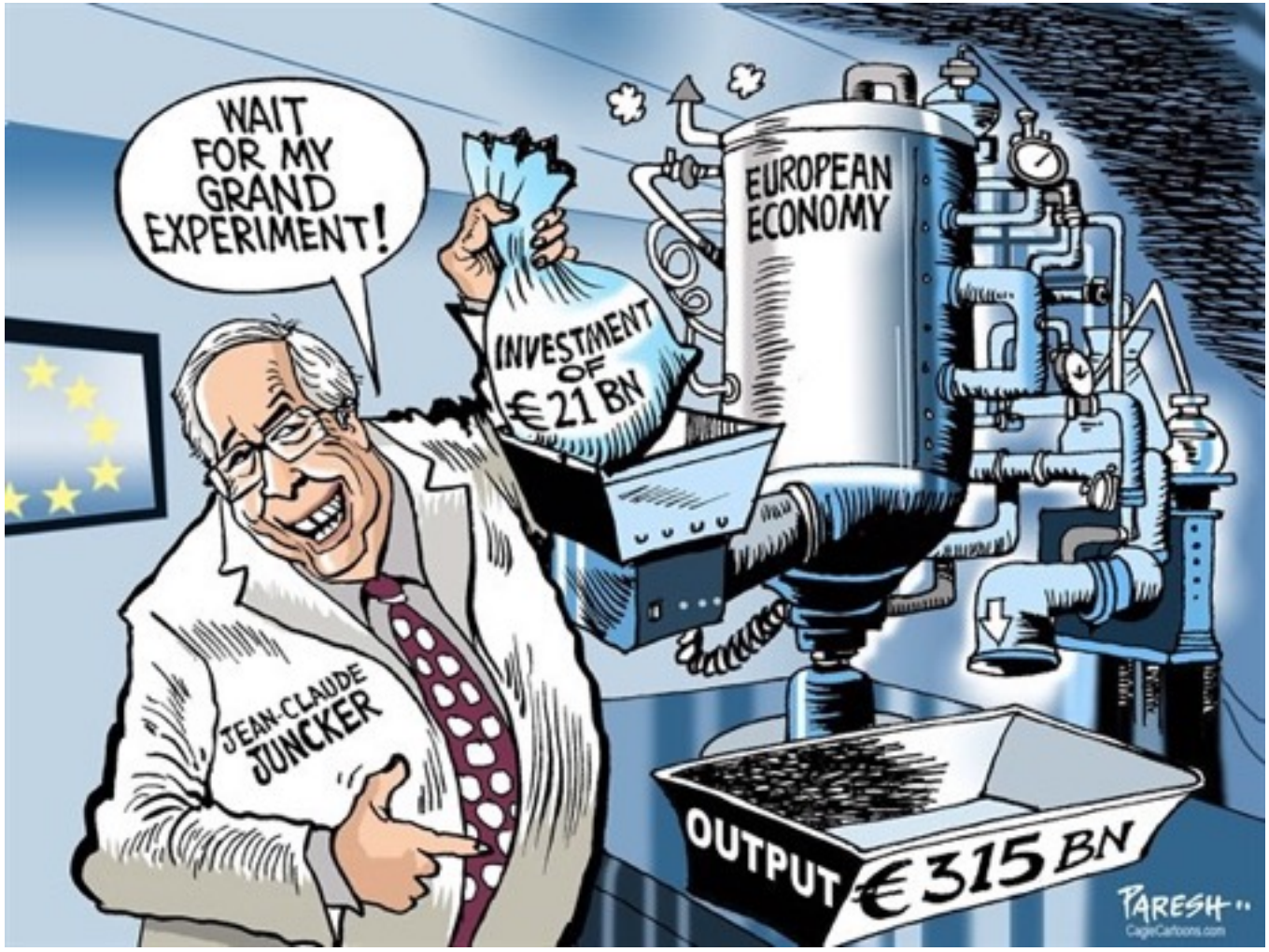

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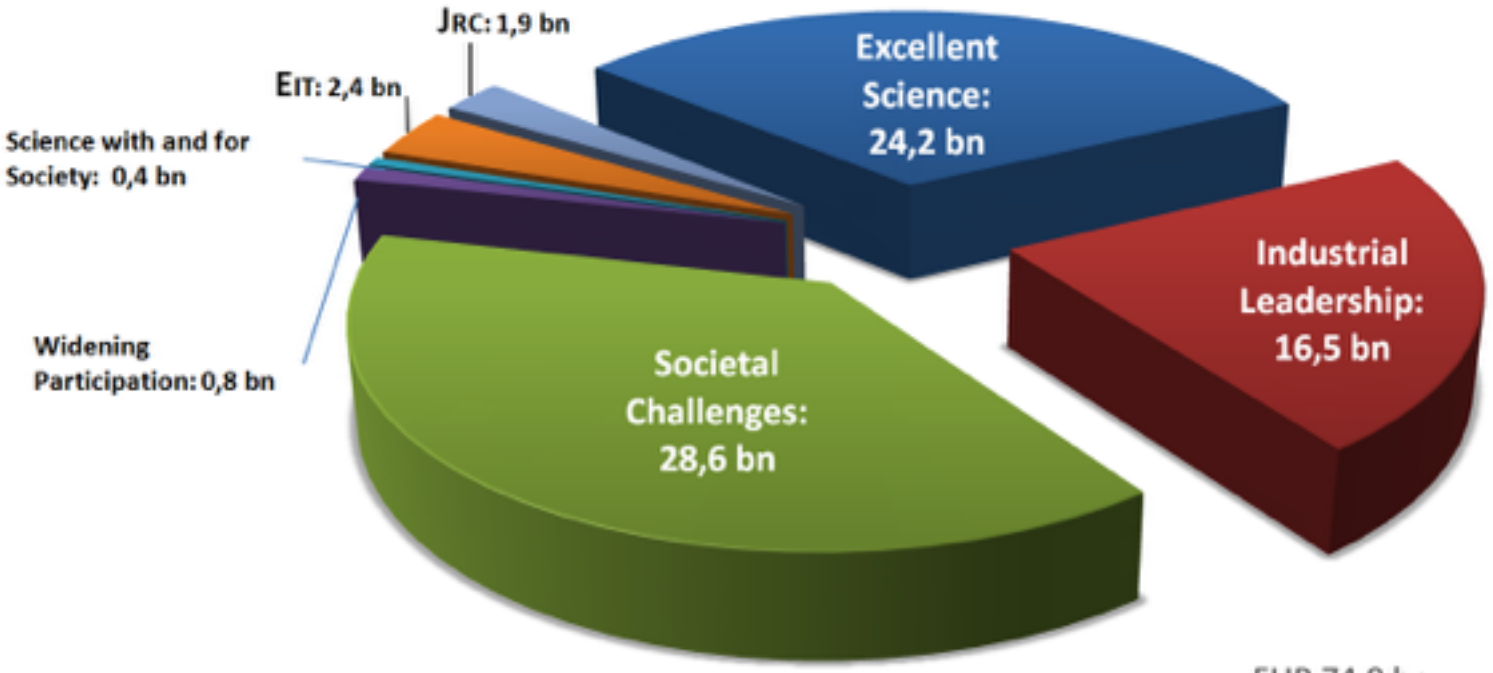
Horizon 2020 Budget



EUR 74.8 bn

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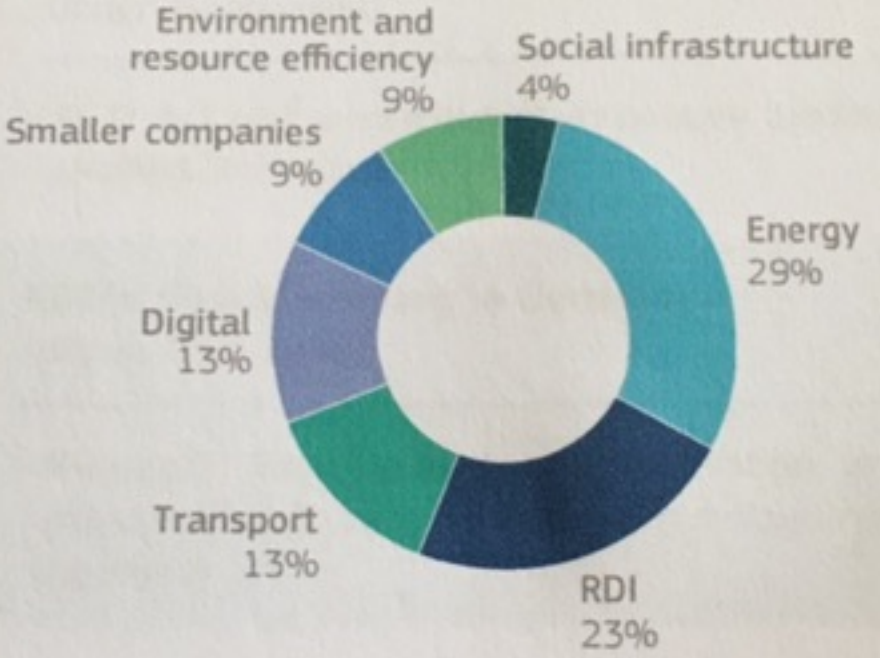
Sectoral coverage (some projects cover several sectors)



Out of the EFSI transactions approved by the European Investment Bank (EIB) so far, 23% are in the RDI sector. Two thirds of all projects have a strong RDI element.

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List of projects in the RDI sector

FI **Äänekoski bio-product mill** (signed in June 2015)

- Construction of a new bio-product mill in Äänekoski, Finland
- EIB financing under EFSI: **EUR 75 million**
- Total investment expected: **EUR 1.2 billion**
- Expected job creation: **8500**

IT **Arvedi modernisation programme** (signed in May 2015)

- Modernisation of an innovative, mid-sized steel producer in Italy
- EIB financing under EFSI: **EUR 100 million**
- Total investment expected: **EUR 227 million**
- Expected job creation: **450**

EL **Creta Farms** (signed in May 2016)

- Development of new product lines in the cold cut meat and dairy food manufacturer segments
- EIB Financing under EFSI: **EUR 15 million**
- Total investment expected **EUR 31 million**

FR **RDI in steel plants** (under assessment)

- Research, Development and Innovation on upgrading steel plants in cohesion regions

FR **Dairy production in France** (approved, not yet signed)

- Construction and operation of a dairy plant to produce UHT milk, butter and cream

ES **Grifols biosciences R&D** (signed in October 2015)

- Research and Development to improve medical treatment for conditions including Alzheimer's disease, vascular and cardiovascular surgery
- EIB financing under EFSI: **EUR 100 million**
- Total investment expected: **EUR 241 million**
- Expected job creation: **12**

Geographical coverage of Research, Development and Innovation projects supported by the EFSI

IT **Research, development and innovation in Italy** (under assessment)

- R, D & I and production of innovative bioplastics and product technology

DE **RDI in digital printing in Germany** (signed April 2016)

- Research, Development and Innovation in printing presses and digital printing in a mid-sized company in Germany

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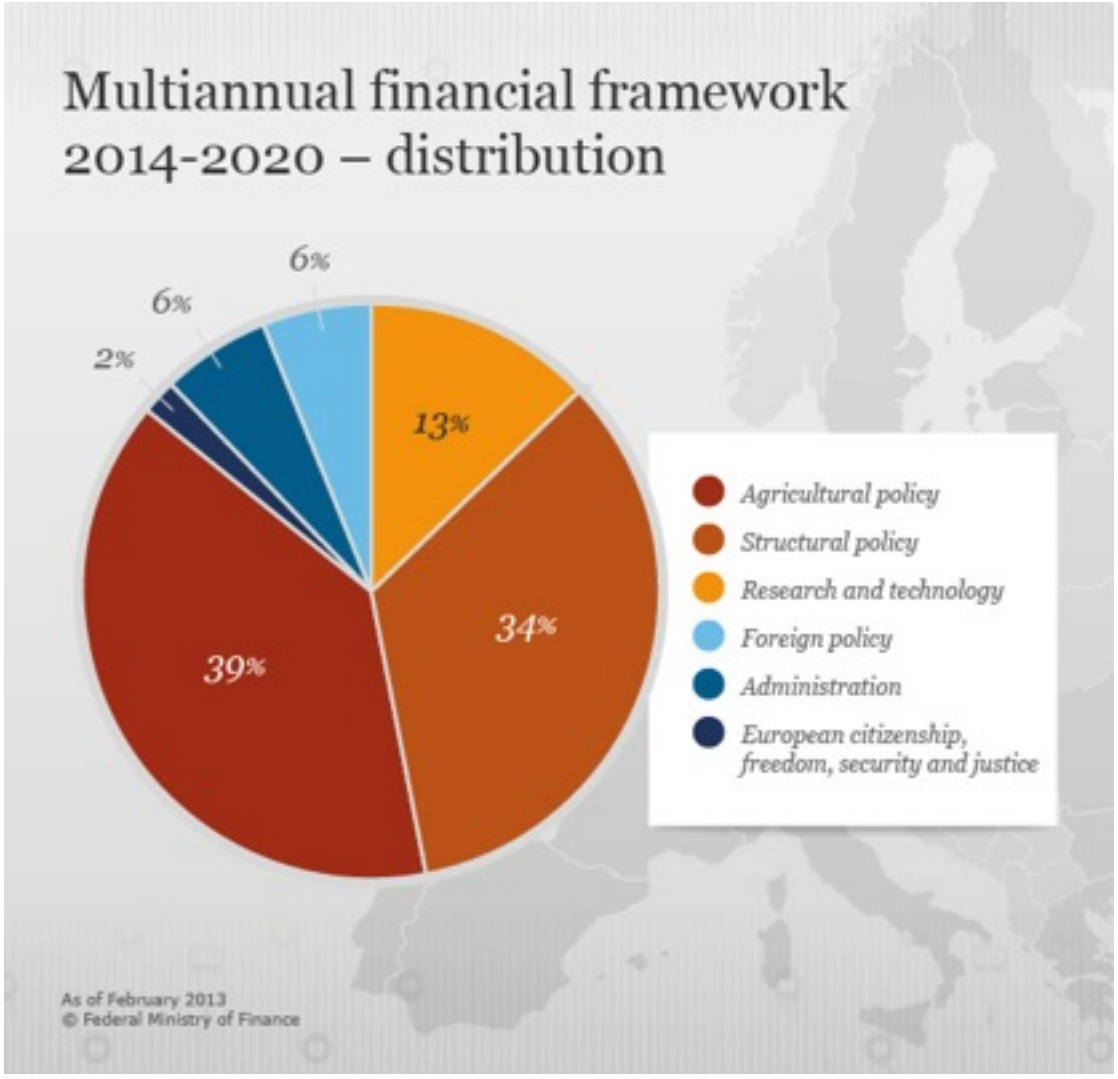

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Study Objective

To quantify the economic contribution of each LERU University and the combined group of LERU Universities to the European economy

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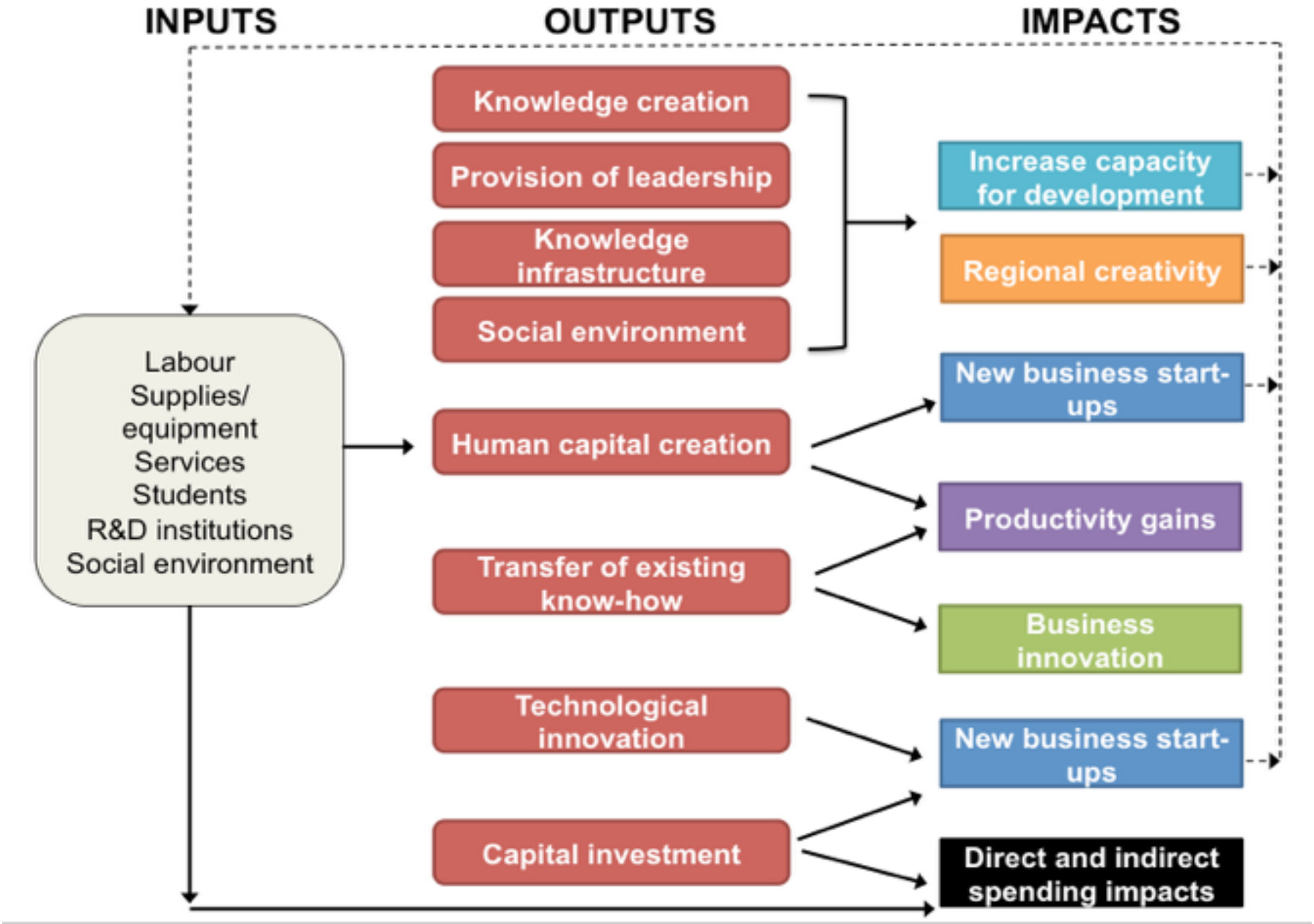
Framework

- Universities
  - ➢create intellectual capital
  - ➢provide leadership, knowledge infrastructure & a social environment for regional development
  - ➢create human capital
  - ➢transfer knowledge
  - ➢facilitate technical innovation
  - ➢attract capital investment
- Which leads to a range of economic impacts


INPUTS
OUTPUTS
IMPACTS
Knowledge creation
Provision of leadership
Knowledge infrastructure
Social environment
Increase capacity for development
Regional creativity
Labour
Supplies/ equipment
Services
Students
R&D institutions
Social environment
Human capital creation
New business start-ups
Productivity gains
Transfer of existing know-how
Business innovation
Technological innovation
New business start-ups
Capital investment
Direct and indirect spending impacts

Sources of Contribution

- Core contribution
  - ➢direct effect
  - ➢supplier effect
  - ➢staff spending
  - ➢capital spending
- Student contribution
  - ➢student spending
  - ➢student employment
  - ➢student volunteering
  - ➢student placements
- Knowledge transfer
  - ➢licensing
  - ➢consultancy
  - ➢collaborative research
  - ➢start-ups and spin-outs
  - ➢science parks
  - ➢workforce training (CPD)
  - ➢staff volunteering
- Tourism
  - ➢visits to staff and students
  - ➢conferences and events
- Graduate productivity

Research Methods

- Data supplied by the Universities
- Economic assumptions
  - ➢Eurostat Economic Ratios 2013/14 (GVA/turnover and turnover/ employment
  - ➢Input-Output Tables for Economic Multipliers, 2011
  - ➢Multipliers – Leontief Type 1 and Type 2
  - ➢Exchange rates (2014 levels)
- Previous in-house experience
- Visits to the Universities

Measures of Economic Contribution

- Economic contribution measured in terms of:
  - ➢ Gross Value Added (GVA) – a measure of the value that an organisation, company or industry adds to the economy through its operations. GVA is equal to the value of production less the value of inputs used
  - ➢ Employment – jobs supported

Headline Economic Contribution

- Economic contribution
  - ➢€55.7 billion GVA
  - ➢900,065 jobs
- Economic contribution *including future graduate productivity*
  - ➢€71.2 billion GVA
  - ➢900,065 jobs
- Wider impact on regional economic growth

Return on Investment

- Every **€1** direct GVA in the LERU Universities generate almost **€6** GVA in the European economy

- Every **1** person employed directly in the LERU Universities supports almost **6** jobs across the European economy

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Economic Contribution by Source

- Core
- Student
- Knowledge transfer
- Tourism
- Graduate productivity

LERU members...

educate

674,500 full time students

employ

186,600 staff across 21 Universities

earn

€16.3 billion turnover

Have Core Impacts of...

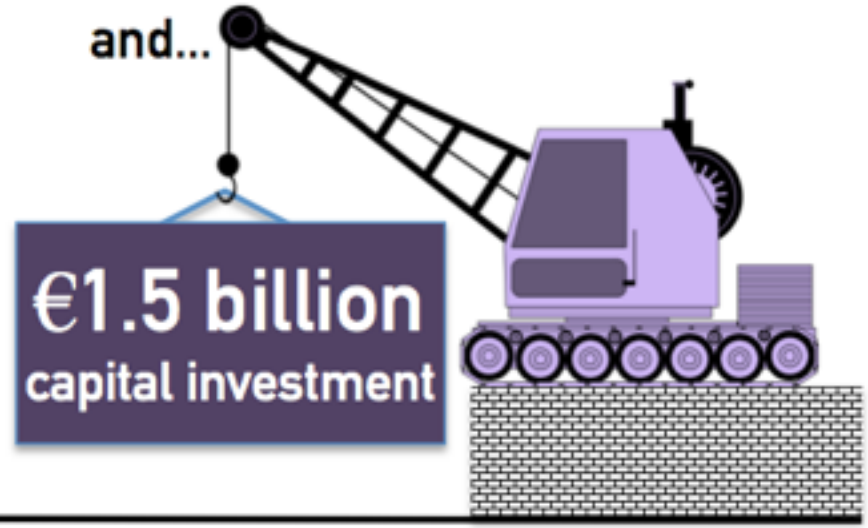
€23.9 billion GVA & 375,700 jobs

from...

direct operations, supplier chain expenditure, staff spending

and...

€1.5 billion capital investment



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The students of LERU members generate

€9.7 billion GVA

and support

220,200 jobs

Outside the University, students spent an average of

which supported

93,100 jobs

throughout Europe and generated

€5.2 billion GVA

43% of full time students worked part time during term time

These students worked an average of **11.5 hours** per week, contributing to the local labour markets

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Research and Knowledge Transfer...

activities supported **298,500** **jobs** throughout Europe and generated **€21.9 billion GVA**

Research had supported the creation of **1,065** active spin out companies, which employed **12,700 people**

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LERU members undertook **€1.5 billion** of contract research for private and third sector organisations

and won **€334 million** of consultancy contracts

BiGGAR Economics

Graduate Productivity

In 2014,
172,300
students graduated from LERU member institutions

On average these graduates will go on to earn an additional **€89,700** over their working lives as a result of their University degree

Graduate productivity contribution = £15.4 billion GVA

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Extrapolating the Impact

- Based on the study findings, estimate the impact of entire European Research Universities
  - ➢ based on ERC data & CWTS Leiden rankings LERU = 23.4% of sector, so
  - ➢ European Research Universities sector contributes
    - Over **€300 billion GVA**
    - supports **3.8 million jobs** across Europe
- Equivalent to 1.8% of all employment in the EU and 2.2% of GVA

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Wider Benefits

- Wider economic, societal, cultural, environmental, health and civic benefits of Research Universities:
  - ➢ stronger social cohesion
  - ➢ improved social mobility
  - ➢ better health & well-being
  - ➢ greater civic engagement
  - ➢ wider benefits for society from medical research
  - ➢ overall character and vibrancy of the cities the Universities are located in

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Wider Benefits

Research Universities are drivers of long term sustainable economic growth:

- By pushing the boundaries of academic discovery they increase the pool of knowledge available to society
- Equally important, they diffuse this knowledge throughout society through their commercialisation activities and high quality graduates
- This diffusion of knowledge provides the basis for productivity improvements and therefore economic growth
- They also create knowledge and innovation ecosystems which form major clusters of economic activity, attract inward investment and create the knowledge sectors of the future

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LERU ENTERPRISE AND INNOVATION COMMUNITY

OPEN FOR BUSINESS

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AAU is an association of 62 leading research universities in the United States and Canada. The 60 U.S. members of AAU:

- Educate 1.2 million undergraduate students and 570,000 graduate students each year;
- Employ more than 710,000 people, more than the population of Seattle, WA;
- Have combined annual operating budgets of about $152 billion (2013);
- Have patented and licensed thousands of innovative discoveries and technologies that have fostered new products, companies, and entire industries in such fields as medicine, public safety, food and agriculture, new materials, semiconductor devices, education, and communications;
- Issued 3,460 patents and executed 3,068 licensing agreements in 2013;
- Initiated 479 start-up companies in 2013, of which 73 percent operate in the same state as the licensing institution.

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