

Maximising the value of the UK strengths in research, innovation and higher education

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Knowledge and Innovation

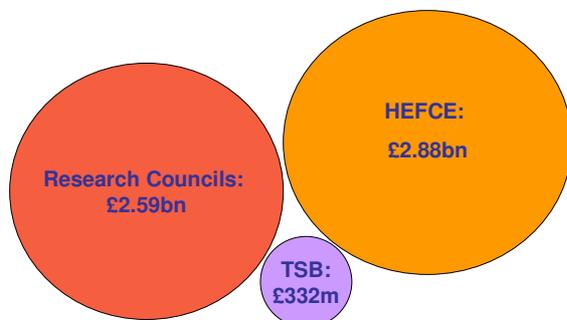
- Research Base
- Innovation
- Higher Education

Coherence and completeness



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Knowledge & innovation funding streams are complementary, and incentivise other investment



HEFCE:

- Supports the higher costs of teaching some (STEM) subjects and taught postgraduates
- Supporting widening participation, and social mobility through Higher Education
- Provides a flexible block grant allowing universities to invest strategically in inquiry-driven research and respond to emerging priorities
- Provides infrastructure for knowledge transfer activities

Research Councils:

- Fund only the very best projects
- Set strategic research priorities and encourage larger, multi-disciplinary projects
- Often collaborate with business and TSB

Technology Strategy Board:

- Provides funding to business directly
- Supports business innovation – often but not always based on university research



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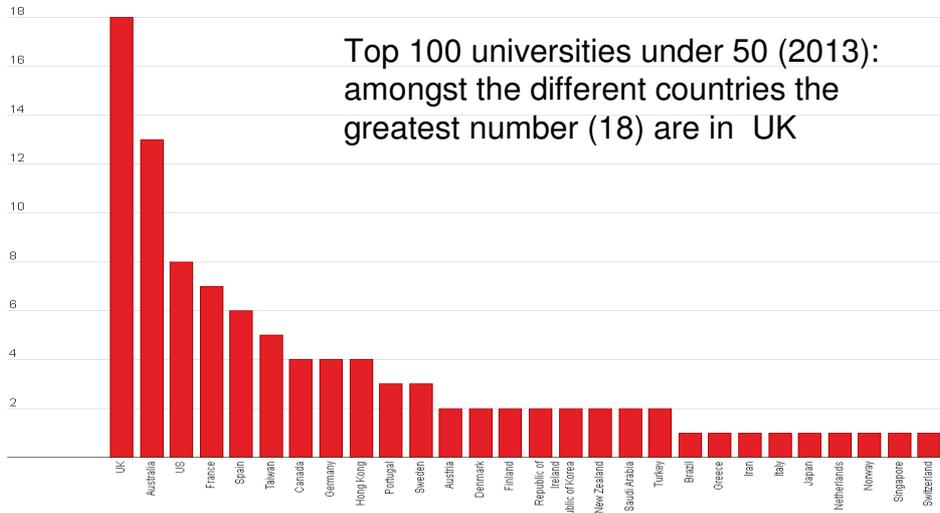
UK universities: international excellence (1)

Rank	Shanghai Jiaotong	THE	QS
1	Harvard	CalTech	MIT
2	Stanford	Stanford	Cambridge
3	MIT	Oxford	Harvard
4	UC Berkeley	Harvard	UCL
5	Cambridge	MIT	Oxford
6	CalTech	Princeton	Imperial
7	Princeton	Cambridge	Yale
8	Columbia	Imperial	Chicago
9	Chicago	UC Berkeley	Princeton
10	Oxford	Chicago	CalTech



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UK universities: international excellence (2)



Source: Times Higher Education / The Guardian 2013



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Characteristics of the UK Research Base



"I am up for the challenge ... of making Britain the best place in the world to do science"

The Rt. Hon. George Osborne MP
Chancellor of the Exchequer
9 November 2012

- UK investment in Research:

- The Haldane Principle
 - Ring-fenced funding
 - Dual support
 - Strong competition
- "We have protected cash spending on science and research with a £4.6billion ring-fenced budget"
- "We understand that cutting edge science requires cutting edge facilities and equipment"
- "We have announced a science capital package of £1.1Bn, rising with inflation to 2021 which nearly doubles our long-term investment."



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Science is international



*“Science and the arts belong to the whole world.
The barriers of nationality vanish before them.”*

Johann Wolfgang Goethe

*“There is no national science, just as there is
no national multiplication table.”*

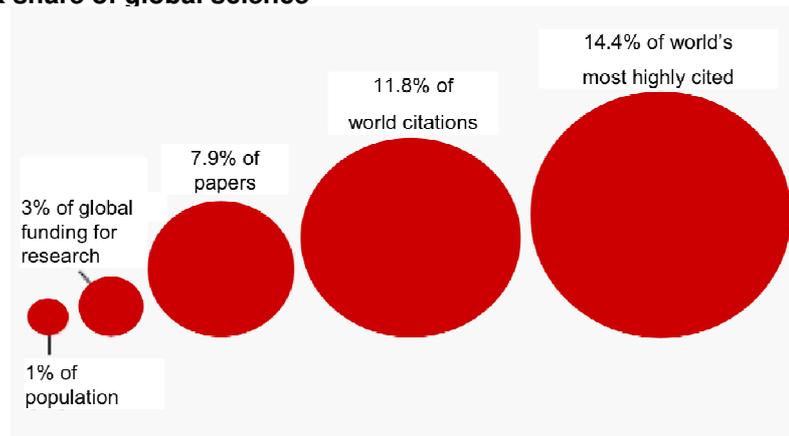
Anton Chekhov



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Strength of the UK research base

UK share of global science



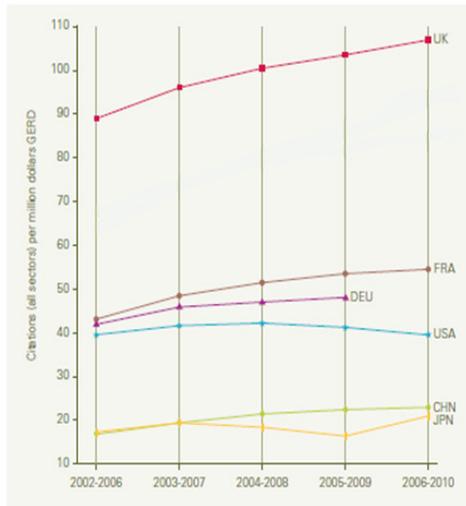
Source: Elsevier



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Strength of the UK research base

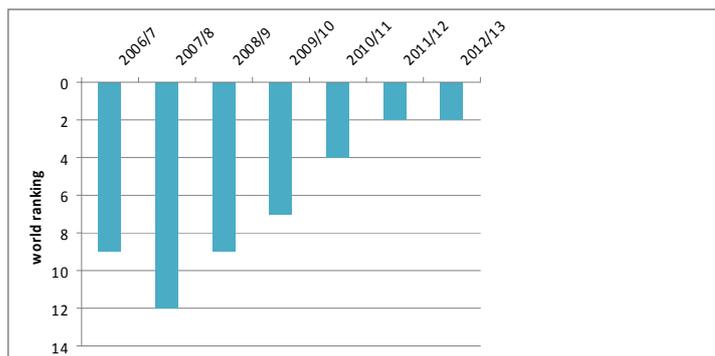
Citations (all sectors) per unit spend on GERD for UK and comparators (2006-10)



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Conditions for Innovation

UK Strength in Collaboration advanced



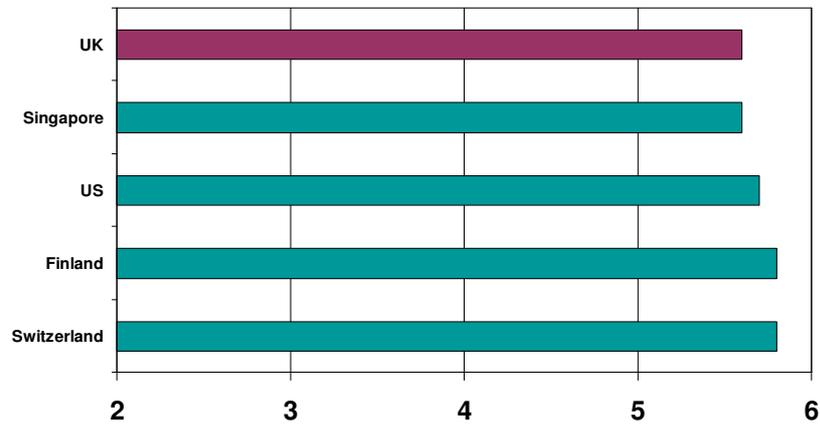
The World Economic Forum ranks the UK second in university- industry collaboration, ahead of the US and second only to Switzerland



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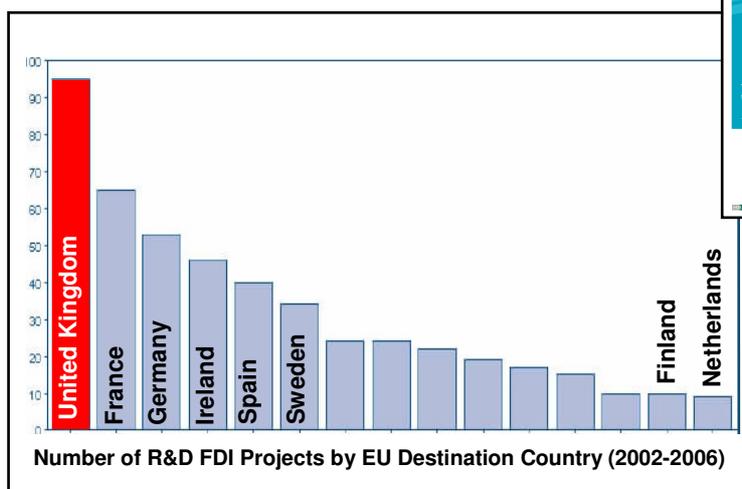
University – industry collaboration

The World Economic Forum ranks the UK in the top five tightly grouped countries



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The UK attracts R&D investment from global business



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Business R&D has held up well

- **Business enterprise investment in R&D (BERD) held up relatively well in 2011, given the economic context. This may suggest a strong impact from leveraging public investment in research.**
- **BERD usually only grows significantly in periods of rapid economic growth**
- **6% real-terms increase in BERD in 2011**



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Innovation

GE Global Innovation Score Card

Top Quartile Countries – Innovation Scorecard

Canada
 Finland Germany
 Hong Kong
 Israel
 Netherlands
 Norway
 Singapore
 Sweden
 Switzerland
 United Kingdom
 United States

N.B. Top Quartile, listed algebraically not ranked

The countries that fall into the top quartile are considered leaders in laying out the kind of environment necessary to promote innovation

WIPO Innovation Ranking

Country	2012	2013
Switzerland	1	1
Sweden	2	2
UK	5	3
Netherlands	6	4
USA	10	5
Finland	4	6
Hong Kong	8	7
Singapore	3	8
Denmark	7	9
Ireland	9	10



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Industrial Strategy: Government and Industry in partnership



HM Government

- A **spectrum of support** for all sectors;



Light touch

Government sets business environment (eg tax, intellectual property rights, skills)
No sector-specific policies

Action

Sustained coordination

Government provides sector-specific regulation, support and coordination

Strategic partnership

Government shapes, procures and oversees

- Supporting **emerging technologies** including the “8 Great”;
- Working with business to help develop **skills** that businesses will need;
- Working to improve **access to finance** for businesses;
- Giving confidence to business by publishing a forward look of government contracts.



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The 11 sectors



HM Government

 <p>Life Science Strategy (Dec 2011) and one year on update (Dec 2012) Aim: To make the UK the global hub for life sciences</p>	 <p>Nuclear (March 2013) Aim: Grow the global market share; set out role that nuclear plays in UK energy mix</p>	 <p>Construction (July 2013) Aim: make the UK the global leader in sustainable construction</p>
 <p>Aerospace (March 2013) Aim: Maintain existing UK market share; secure UK employment</p>	 <p>Oil and Gas (March 2013) Aim: Increase inward investment in energy supply chain</p>	 <p>Agri-tech (July 2013) Aim: increase inward investment and exports</p>
 <p>Professional Business Services (July 2013) Aim: make the UK the global hub of expertise</p>	 <p>Automotive (July 2013) Aim: Investment in R&D; grow and develop UK supply chain</p>	 <p>Offshore wind (August 2013) Aim: Build competitive and innovative UK supply chain</p>
 <p>Education (July 2013) Aim: Increase the UK's education exports</p>	 <p>Information Economy (June 2013) Aim: to seize the opportunities from new ICT technology</p>	 <p>Eight Great Technologies</p>



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Eight Great Technologies



HM Government

<p>Big Data <u>£189 m</u> £34 m</p>	<p>Satellites <u>£25 m</u></p>	<p>Robotics <u>£35 m</u> £44 m</p>	<p>Synthetic Biology <u>£50 m</u> £3.5m</p>
<p>Regenerative Medicine <u>£20 m</u> £25m</p>	<p>Agri-Science <u>£30 m</u> £70 m</p>	<p>Advanced Materials <u>£73 m</u> £10 m</p>	<p>Energy Storage <u>£30 m</u></p>
<p>Research campuses: <u>£35 m</u>, Advanced Metrology Lab: <u>£25 m</u>, Transformative Infrastructure: <u>£50 m</u>, Pharmavision: <u>£38 m</u></p>			<p>Total: <u>£600 million 2012</u> & £186 million 2013</p>



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Next steps?

- Continued pressure on public spending
- Consistent support for knowledge and innovation
- The case must be made persuasively
- How to respond to challenges?

A shared endeavour



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Survival of the fittest?

“It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change”

*“ON THE ORIGIN OF SPECIES
and the role of natural selection”*



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Thank you

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