



The Atlas of Ideas: new geography

- Can competitors collaborate?
- What are the benefits of science/innovation collaboration?
- How can we most effectively collaborate?
- UK/China as a case study
- Comment on Demos proposals

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FCO Science and Innovation network in China

Grown rapidly since 2001

13 people in 4 cities: Beijing, Shanghai, Guangzhou, Chongqing

Second largest FCO S&I Network after the US

Promote collaboration

Work with many UK stakeholders: Research Councils, Royal Society, government departments





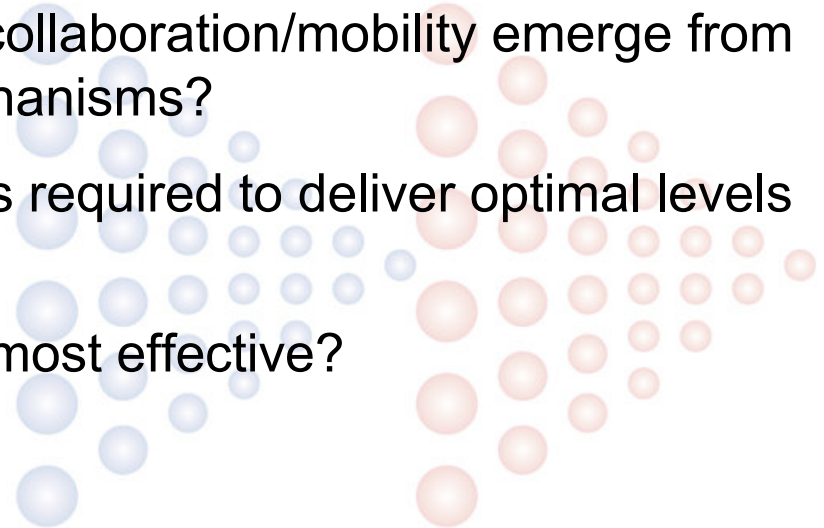
Benefits of collaboration

- Increases talent flows/brain circulation
- Increases global flows of knowledge/skills
- Creates distributed innovation networks, good for globalised markets
- Minimises wasteful duplication: eg human genome project
- Enables pooled resourcing for huge projects: eg ITER
- Provides access to facilities and expertise/fields undeveloped at home
- Potential to accelerate uptake/development of global goods for global problems – energy, climate change, infectious disease

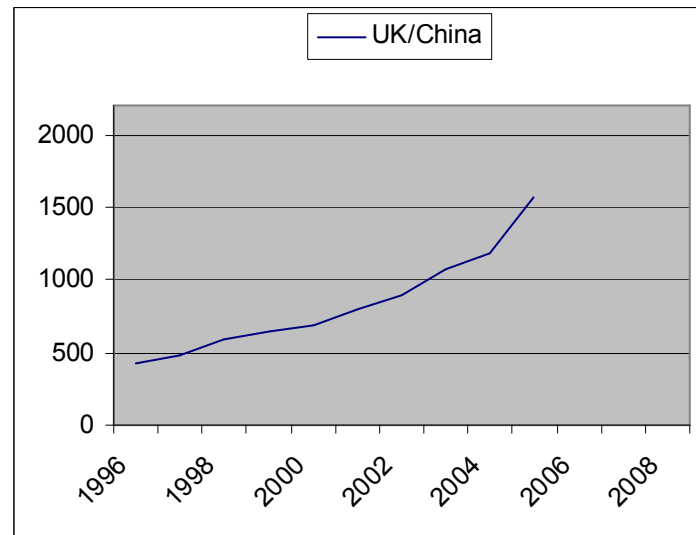
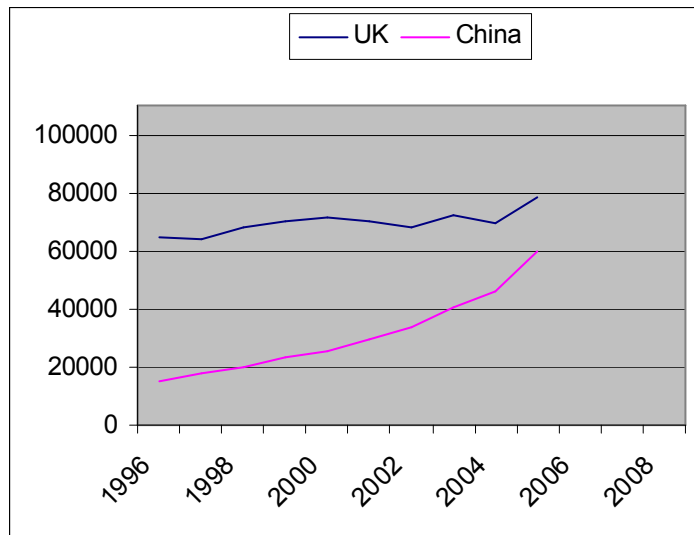


To direct or not to direct...

- All agree that some collaboration is good
- All agree that active impediments to collaboration are bad
 - researchers free to compete for jobs overseas
 - nationality should not restrict access to research funding
 - nationality should not restrict access to journals
- But will sufficient international collaboration/mobility emerge from response-mode/bottom-up mechanisms?
- How much active intervention is required to deliver optimal levels of collaboration/mobility?
- What types of intervention are most effective?



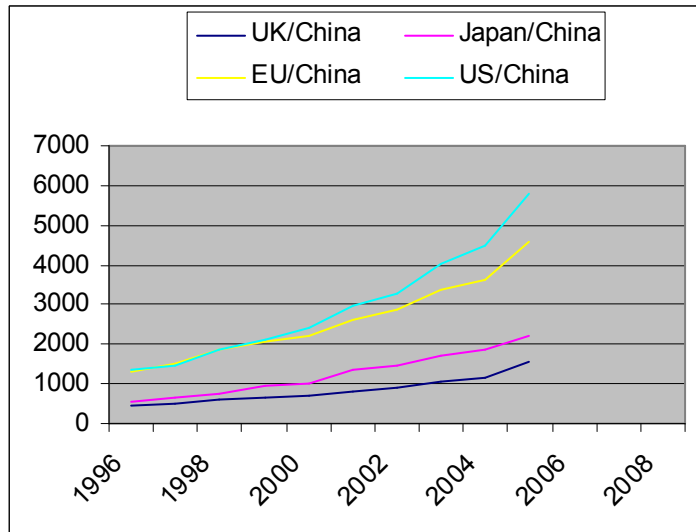
What the papers say...



- China's output of papers increased 4-fold in decade to 2005
- UK's output increased < 20 per cent
- Output of UK/China papers increased 3.5-fold
- % UK total output co-authored with China: up from 0.66 to 1.98

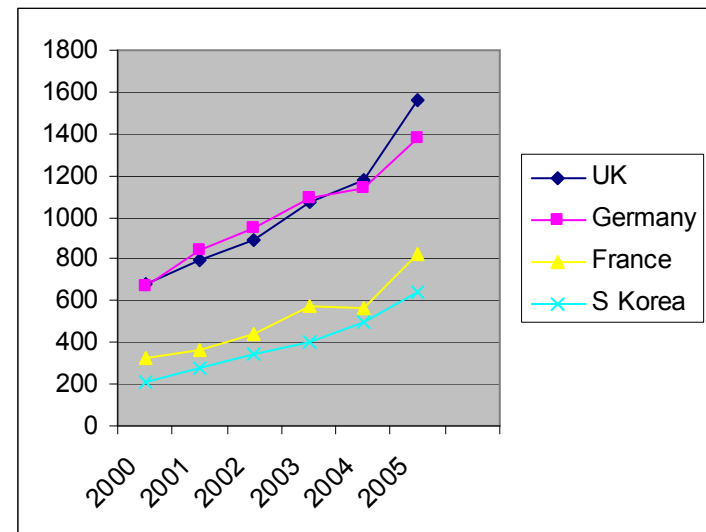
Analysis of research outputs: Evidence Ltd, Thomson Scientific

Bad news, good news

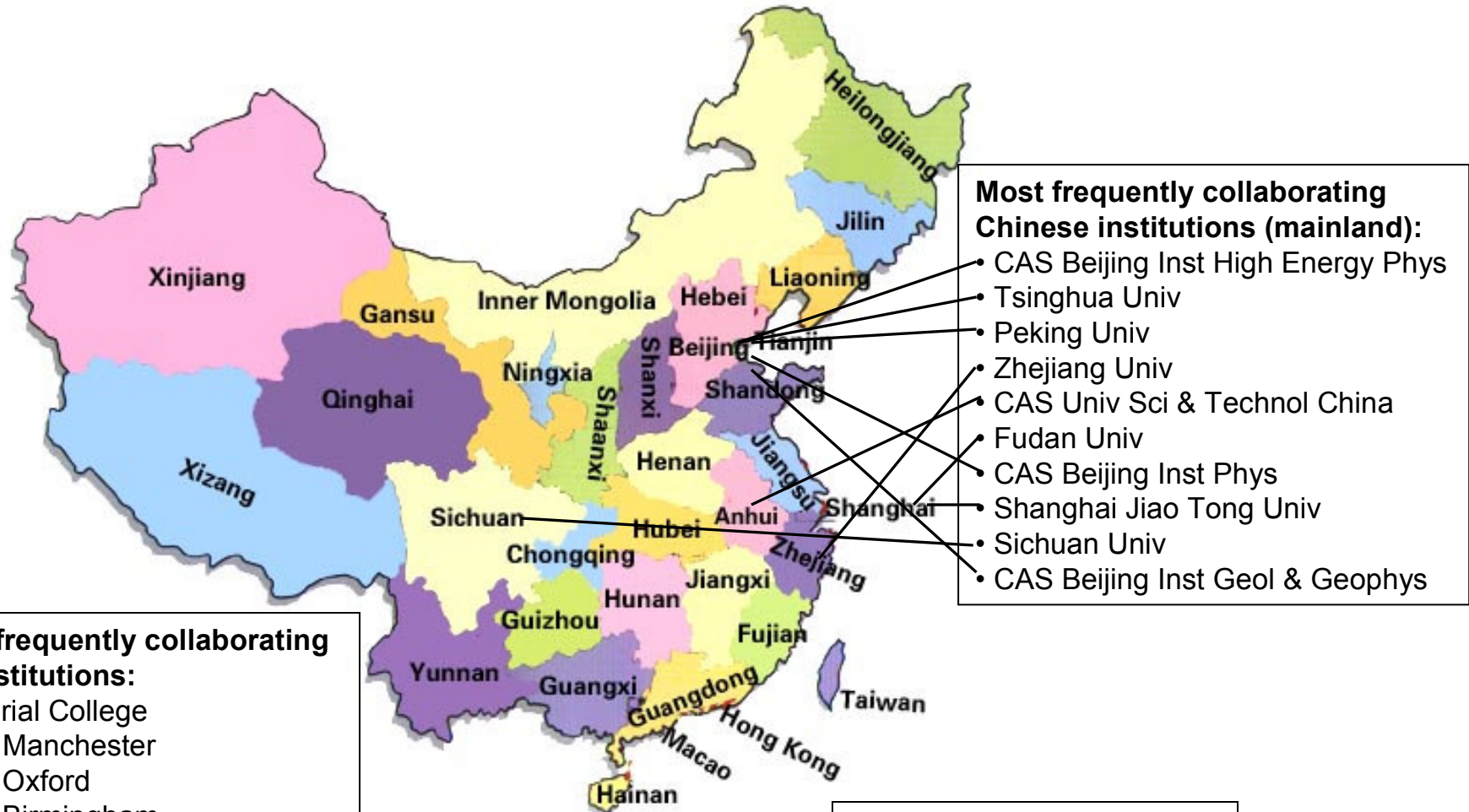


EU losing ground to US and Japan in co-authorship with China

UK and Germany lead co-authorship with China in EU



Institutional research collaboration between the UK and China



- Most frequently collaborating UK institutions:**
- Imperial College
 - Univ Manchester
 - Univ Oxford
 - Univ Birmingham
 - Univ Cambridge
 - CCLRC Rutherford Appleton
 - Royal Holloway Univ London
 - Univ Edinburgh
 - Univ Liverpool
 - Univ Sheffield

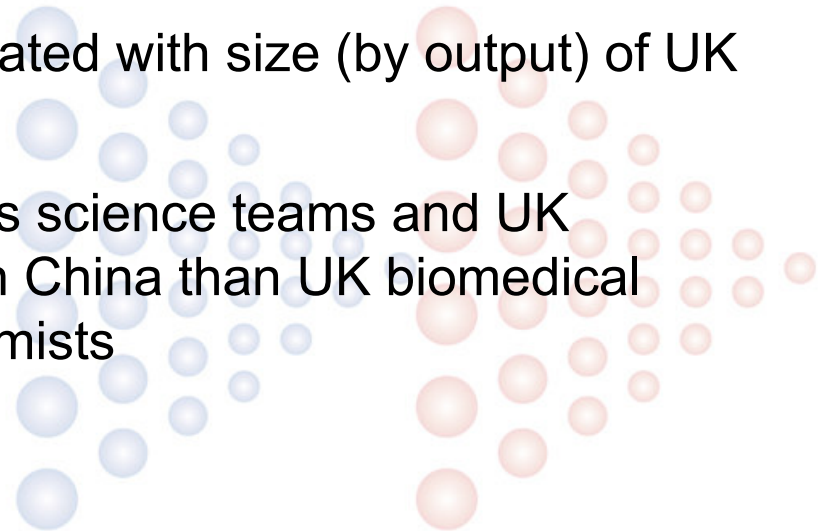
- Most frequently collaborating Chinese institutions (mainland):**
- CAS Beijing Inst High Energy Phys
 - Tsinghua Univ
 - Peking Univ
 - Zhejiang Univ
 - CAS Univ Sci & Technol China
 - Fudan Univ
 - CAS Beijing Inst Phys
 - Shanghai Jiao Tong Univ
 - Sichuan Univ
 - CAS Beijing Inst Geol & Geophys

- Hong Kong SAR:**
- Univ Hong Kong
 - Chinese Univ Hong Kong
 - Hong Kong Polytech Univ



UK/China collaboration: what fields?

- Pattern shows concentration in particular fields
- Engineering, materials science, physics: around 4% of UK total output is co-authored with China
- Biological and medical sciences: 1-2% of UK total output is coauthored with China
- Growth rate in decade to 2005 in both categories roughly the same
- Volume of collaboration not correlated with size (by output) of UK research field
- Higher proportions of UK materials science teams and UK engineering teams collaborate with China than UK biomedical teams, molecular biologists or chemists





UK/China collaboration outputs: conclusions

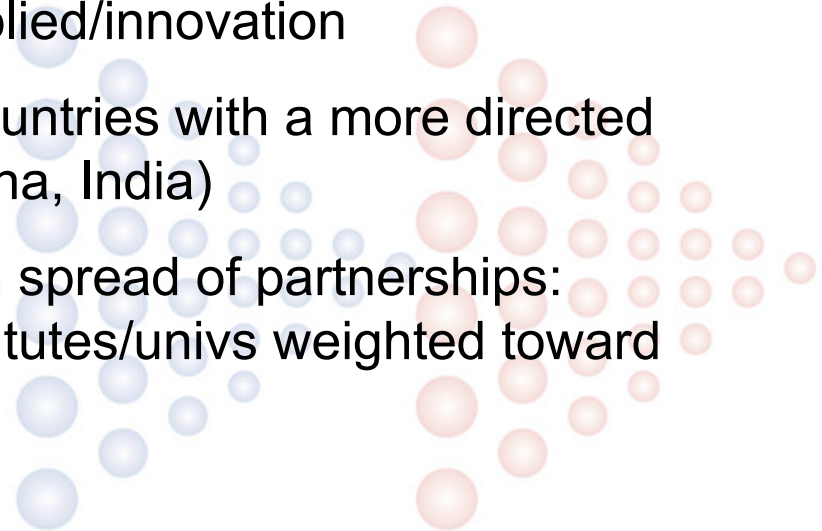
- Most UK/China joint papers result from undirected collaboration
- Volume of this collaboration good by EU standards: UK has a chance to establish itself as China's most frequent partner in EU
- Some evidence that UK/China seek/play to particular strengths: eg biomedicine in UK, materials science in China
- China collaborates more frequently with EU than US in physical sciences but more with the US in biomedical sciences.
- Within EU, UK's collaboration pattern with China stands out as closer to the US. UK has greatest EU share of collaborations in biomedical and engineering sciences, Germany physical sciences

... overall, a good basis. But is it sufficient to optimise levels/effectiveness/benefits of UK/China collaboration?



Where bottom-up underachieves...

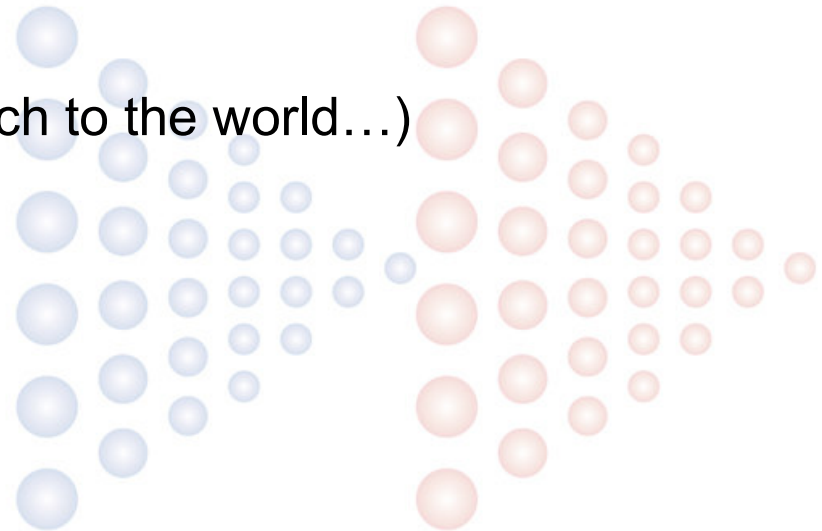
- Diffuse outputs, hard to assess value, not necessarily in fields of mutual strategic interest (climate change, energy, infectious disease, sustainable development...)
- Requires two parallel bids for funding: double jeopardy
- Does not create diversity of UK/China partnerships eg public-private, business-academic projects
- Better for basic research than applied/innovation
- Attracts less interest/funding in countries with a more directed approach to research funding (China, India)
- Does not necessarily lead to even spread of partnerships: UK/China top 10 collaborating institutes/univs weighted toward Hong Kong





Demos report calls for more...

- Unleash mass collaboration
- Magnet for talent, Darwin Fellowships (postdoc, mid-career)
- Build knowledge banks (eg strengthening FCO S&I Network, gather systematic data on collaboration)
- Lead global science towards global goals (eg low-carbon tech, disease prevention, global good equivalent of Innocentive marketplace)
- Get our story straight (one-line pitch to the world...)





UK/China: current and planned interventions

Current interventions to promote(direct) UK/China collaboration:

- Networking scheme – Royal Society, funded by OSI
- Research Councils – China partnering awards, workshops
- UK/China Partners in Science – FCO plus UK stakeholders, OSI funding

Current directed/pre-selected projects:

- Phase I of Near Zero Emissions Carbon (Defra, MOST)
- Impacts of climate change on agriculture (Defra, MOST)
- Foresight: China's future Flood and Coastal Defence needs (OSI, NERC, MOST)
- E-science: collaboration between China and UK national/coordinated programmes





UK/China: current and planned interventions

UK/China agreed in 2006 to prioritise on the following fields:

- Clean and renewable energy
- Climate change, environment, sustainable development
- Infectious disease
- Space technology
- Materials science
- Biomedicine and modernisation of traditional medicines

Interventions in the pipeline:

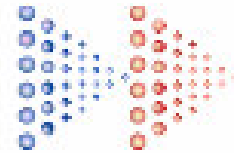
- Energy research projects under discussion (DTI, EPSRC, MOST)
- Innovation China/UK: focus on joint research with commercial potential
- Bridges: extend to China a version of scheme in US (GSIF proposal)
- Research Councils proposed office in Beijing



UK/China: designing future mechanisms

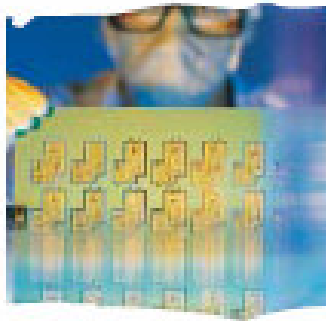
- **Top down vs bottom up: spectrum issue not a dichotomy**
- **Scale of research economy, structure of research economy**
- **How developed research economy is**
- **What drives/motivates government**
- **What drives motivates research practitioners**
- **Understanding what bottom is delivering**
- **Using bottom up collaborations as input for strategic partnerships**





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UK-CHINA
Partners in Science

Two nations joined through science
英中互联 科技无限





Thank you...

... for listening and participating

