


# ‘The Power of Consortia: how can Universities solve the global grand research challenge’ Unleashing Innovation



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## ***Strength of Research in UK***

**Universities support innovative firms directly and indirectly through strength of research base.**

**Research productivity is three-and-a-half times the world average and through direct interaction and by producing highly skilled graduates, they create Jobs.**

**What are the internal and external conditions that unleash innovation?**

**Who are the people that unleash innovation?**

**How do we structure/develop universities to unleash innovation?**

- **It is important to align the answers to these three questions in order to make a significant difference**
- **PT 1 the External conditions**
- **PT 2 the people and the structures**

- **Some economists have used formal theoretical models to understand the behaviour of Universities, governments and individual academics.**
- **They use models which try to capture the incentives of Universities as institutions and to understand how they organise themselves internally, given the incentives of their academics**
- **They also use models of how governments might interact with universities where the two parties have competing objectives**
- **Main problem: no general model can be produced; too many objectives; too many strategic actors; too many control variables**
- **Typically most models focus on a single issue: e.g. Beath et al. (2003, 2005) and Gauthier and Wauthy (2007)**

- **Analyses the impact on the ‘outputs’ of Universities in Europe and the USA of a compound measure of ‘autonomy’ and ‘competition’**
- **Finds a strong positive association of University performance in both Europe and the USA of greater ‘autonomy’ and ‘competition’.**
- **However, the causal analysis linking individual universities’ output through the patents and research publications produced in their state to the degree of autonomy and competition**
- **Main finding is that exogenous increases in expenditures of US universities generate more patents if the universities in question are more autonomous and face more local competition (for resources, faculty, and students) from private universities. This in turn generates economic growth.**
- **Additional research since shows that budget per student in Europe generates additional ‘research output’ but this is positively affected by accountability/competition**

**The Shanghai index puts weights on 6 criteria:**

- 1. Alumni winning Nobel Prizes and Fields Medals (10%)**
- 2. Faculty winning Nobel Prizes and Fields Medals (physics, chemistry, medicine and economics) and Field Medals in mathematics (20%)**
- 3. Articles published in Nature and Science (20%)**
- 4. Articles in Science Citation Index-expanded and Social Science Citation Index (20%)**
- 5. Highly cited researchers in 21 broad subject categories (20%),**
- 6. Academic performance with respect to the size of an institution (10%)**

**The ranking is oriented towards pure science, as opposed to applied science, social science, or the humanities.**

**However, correlation is high with other league tables e.g. QS, HEEACT, Webometrics**

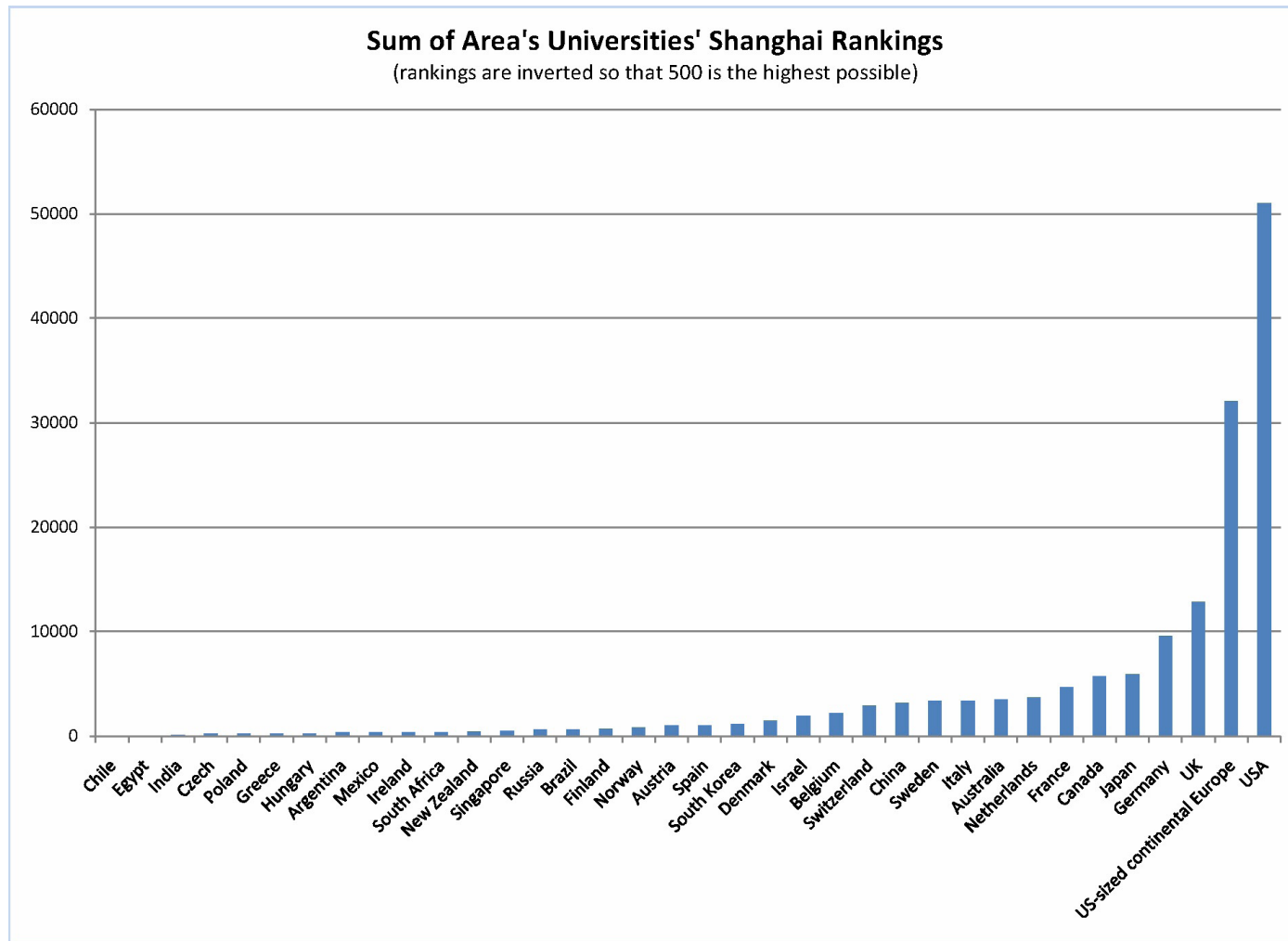
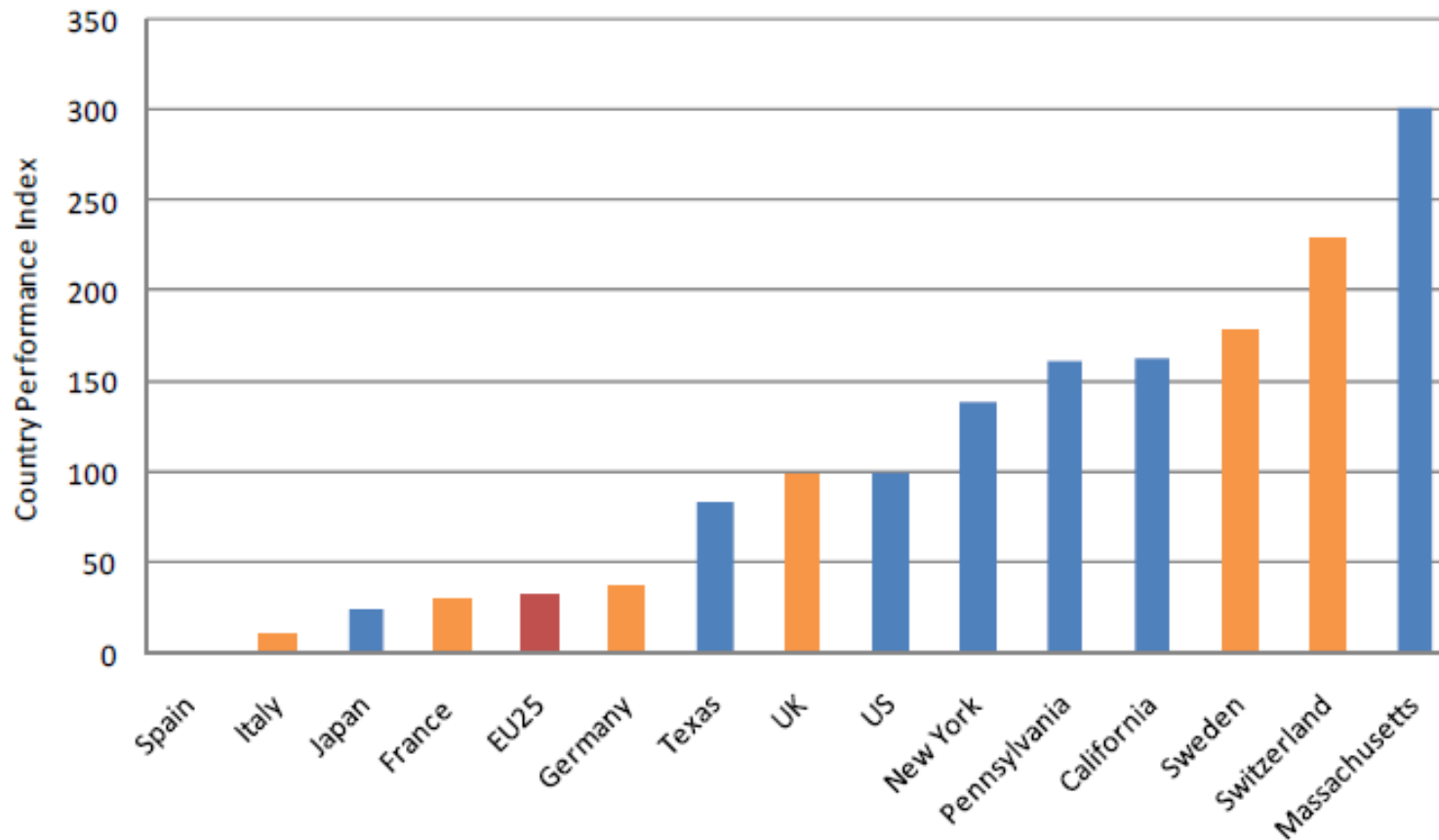
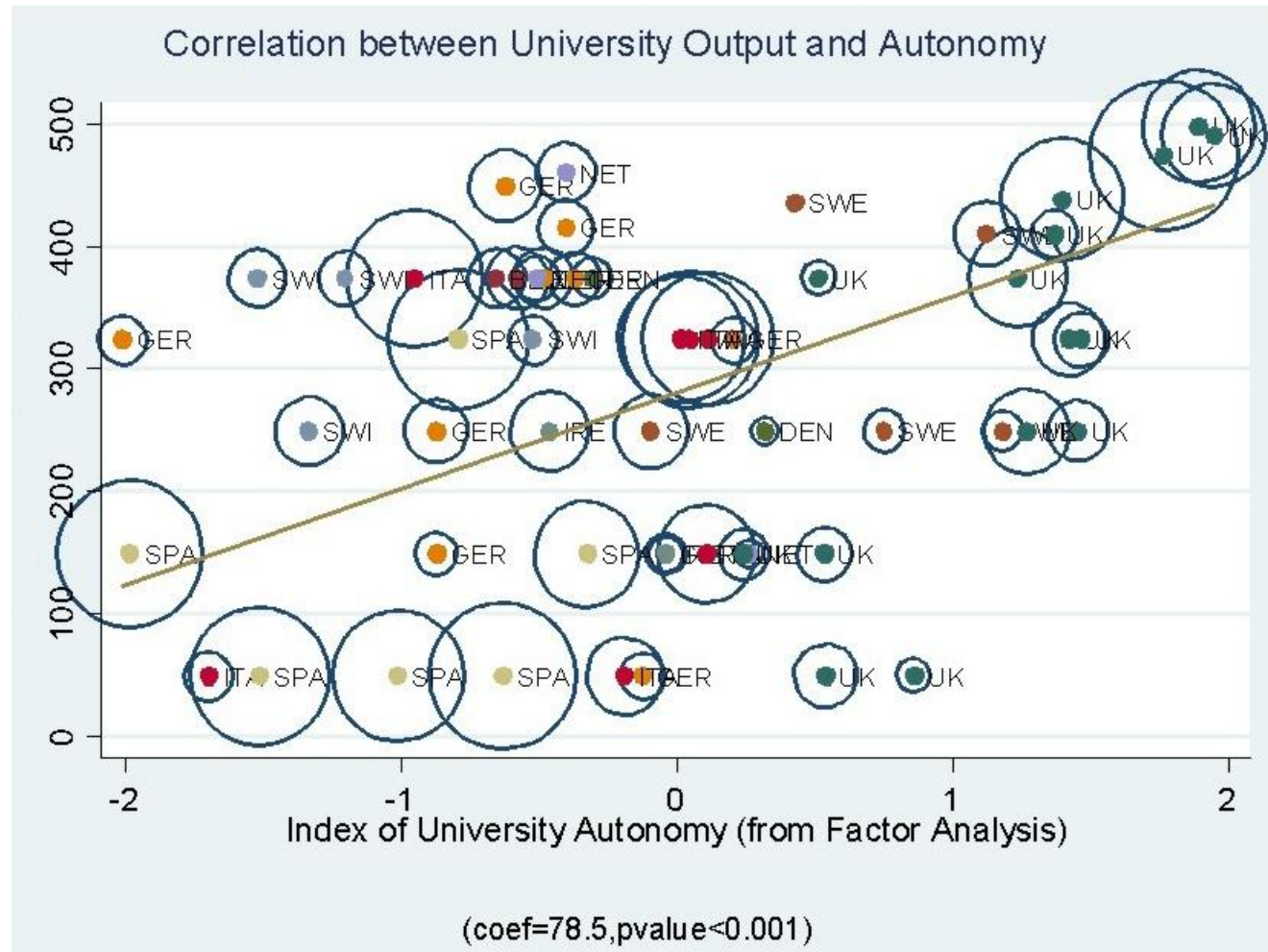


Figure 1: the EU-US performance gap for Shanghai Top 100 universities (US=100)







# What freedoms conduce to innovation?

- Does the university set its own curriculum?
- Does the university select its own students or is there centralized allocation?
- To what extent does the university select its own professors?
- How much does the state intervene in setting wages?
- Are all professors with the same seniority and rank paid the same wage?
- Does the university's budget need to be approved by the government?
- What share of the university's budget comes from core government funding?
- What share comes from research grants for which the university must compete?

**Data focused on top-500 SJT European Universities (196 Universities responded in 14 countries) Similar data was used for public US research Universities**

- **‘.... Add... value by securing and coordinating funding from multiple sources as well as leveraging relatively small amounts of public funding into much larger investments, [from]...private sector or from Europe. Universities successfully bid for and integrate funding from the research councils, TSB, HEIF, RGF, RPIF, City Deals, Enterprise Zones and ERDF to name but a few.’ (UUK Response to Witty Report)**
- **Bridge the so-called ‘Valley of Death’ between promising early-stage research discovery and the process of commercialisation. Govt support particularly important to the national R&D enterprise.**

- **How do UK Universities compete for funding?**
- **Full competition for project-based research funding  
(Research Councils and Charities – mainly funding biomedical research)**
- **Full competition for core public funding in support of research  
(driven by externally assessed quality of research outputs and volume)**
- **Introduction of Impact drives greater inter-connectivity with commerce  
and industry**
- **Full competition at postgraduate (Masters/PhD) level and for non-EU  
students,  
with liberalised fee regime**

- **UK ranks first in the OECD for the proportion of R&D funded from abroad;**
- **ranks 2nd in world for business collaboration – up from 9<sup>th</sup> in 2006;**
- **63% of UK researchers are affiliated to a non-UK institution**

## Scotland

- **just over 90% of higher education institutions have enquiry points for SMEs**
  - **and in 2011–12, despite the challenging economic environment, managed to:**
    - **generate a 15% increase in the number of SMEs using facilities and equipment-related services**
- and*
- **a 20% increase in income from CPD activity with SMEs.**

- **Horizon 2020 framework programme first tranche focused on addressing economic slow down through innovation - emphasis on technological solutions**
- *But*
- **Understanding the nature of the problem is likely to be social**
- *Therefore*
- **Need to out together research vectors or ciphers (e.g. ‘The Disenfranchised Urban Citizen’- large multidisciplinary groups**
- *Hence*
- **Nurture individual talent**

- **EU's Institute of Innovation and Technology (EIT), which is often cited as the quintessential model for 'unleashing innovation'.**
  - Knowledge and Innovation Communities (KICs)
  - A model based around the full integration of all three sides of the Knowledge Triangle (higher education, research and business). <http://eit.europa.eu/>
- **Business partnerships – e.g. GLAZgo Discovery Unit – £4M research collaboration established with AstraZeneca to support 10 full-time staff and PhD students, as well as two-way secondments between GU and AstraZeneca with the aim of securing long-term, strategic support from AstraZeneca.**

- **Academics do not want to be the victims of ‘over-engineered’ administrative systems.**
- **New European Team (2 Technical Bid Writers, three EU advisers; professional project manager; 3 post award finance officers) - create a centralised self-funding professional project management/support team**
- **Supported 24 bids for ERC Starter and Consolidator Grants in 2014. 15 invited to Brussels for the final part of the selection process.**
- **Internal promotional campaigns was undertaken around the launch of Horizon 2020- EU Team managing high number of events with every College and Institute / School and agreeing targets for future EU activity.**



**Innovation does not appear as by magic nor can it always be 'bought in'**

**Important to ensure a talent pipeline**

- **Marie- Skydowska-Curie Fellowships**
- **Columbia and HKU- doctoral and post-doctoral schemes**

**Avoiding the temptation to produce 'acolytes' or followers.**

**175 applications submitted for EU funding in 2013/2014 no deadlines for 6 months due to changed from FP7 to Horizon 2020), including over 100 in first 5 months of Horizon 2020.**

**3 Advanced Grants awarded from the European Research Council (ERC) - Prof Miles Padget (TWISTS, £1.3M), Prof John Cooper (Bio-Phononics, £1.7M) and Prof Andy Baker (VascmiR, £1.9M)**

## **A number of empirical studies on the performance of Universities and their linkages to economic growth:**

- **“The governance and performance of universities: evidence from Europe and the US”;** P. Aghion, M. Dewatripont, C.Hoxby, A. Mas-Colell and A. Sapir, *Economic Policy*, Jan 2010
- **“Higher aspirations: An agenda for reforming European universities”;** P. Aghion, M. Dewatripont, C.Hoxby, A. Mas-Colell and A. Sapir, *Bruegel Blueprint n.5*, 2008
- **“The Causal Impact of Education on Economic Growth: Evidence from U.S.”;** P. Aghion , L. Boustan , C. Hoxby, J. Vandenbussche ; Harvard, mimeo.