Doctoral Education facing the Challenges of New Knowledge Production Systems and Collaborative Research Clusters

Europe-Canada: the Future of Academic Cooperation -
European and Canadian academic leadership engaging in university collaboration

Rectors Seminar 2012; International Conference of the European Network for Canadian Studies and the Unica

Université libre de Bruxelles
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Louis Maheu, FRSC, Emeritus professor,
Department of Sociology, University of Montreal, Canada

Focus on Four Dimensions

- New Knowledge Production Systems' Challenges
- International Collaborative Networks' Strategic Role in Knowledge Production
- Doctoral Education Impact on Nowadays Nation Building
- Strategies to Master Knowledge Production Systems and Collaborative Clusters' Challenges

Socially Distributed Knowledge Production System (SDKP)

M. Gibbons et al.1994: '*The new Production of Knowledge; The Dynamics of science and research in contemporary societies',* London, Sage

- **4 Fundamental Characteristics:**
  - KP within more complex world of partners / clusters / networks = Fundamental Research (RD) and University position revisited
  - Emergence of Contextualized RD: Up / Downstream of complex problem solutions
  - Research open to 'linked' disciplines
  - KP Quality control: peers and partners

The SDKP Model Revisited

- **University Fundamental Research Roles Increased**
  - University Organized Research Units Nurturing University-Industry Partnerships
  - University Organized Research Units Patenting Fundamental Research Outcomes and Processes

R. L. Geiger. 2004. *Knowledge and Money: RD Univs and the Paradox of the Market Place*. Stanford U. Press.

- **The R&D and D Trend**
  - … we will fuel innovation and expand its impact on people's lives by focusing on what I call R, D, and D ... The second D is as important, … The second D is delivery. If we do all the R and D in the world, and it isn't delivered, it's not effective.'

Robert C. Dyles. 2006. Conference, Keynote Address *'State of the State 2006"* October 30.

  - A Case in Point: Biomedical Sciences Delivery System: Translational RD, 'From the Bench to the Bed'

Modern Research Universities' Strategic Missions

- **Multi-versity Institutions:**
  - Undergraduate and Graduate Teaching
  - Professional Training Programs
  - Research, Advanced Research Training
  - Fundamental Research's Economic Roles

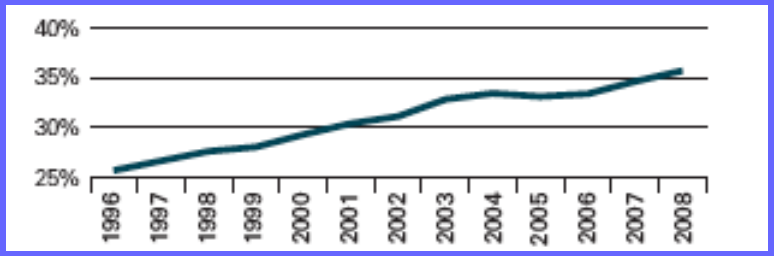
- **Modern Research Universities: Structural Accretion's Challenges (Mission Expansion / No Deletion)**

N.J. Smelser, *Dynamics of American Universities*, C. Kerr Lectures, Center for Studies in HE, UC-Berkeley

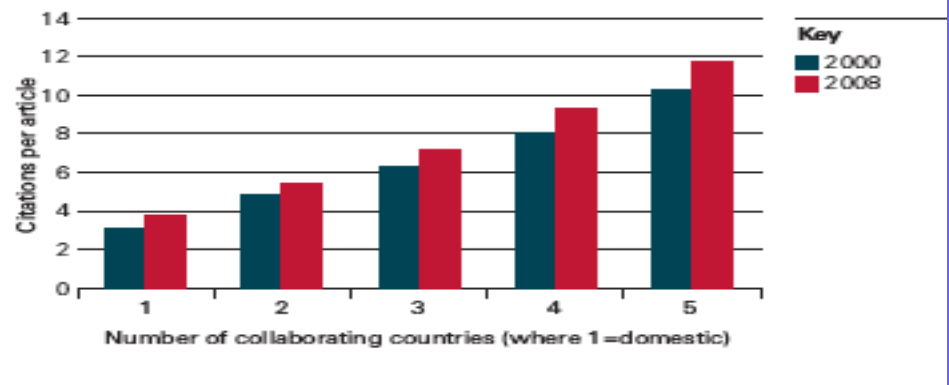
Knowledge Production Systems' Cross-Boundaries Clusters: New Trends in International Collaborative Research …

Royal Society, 2011, *Knowledge, networks and nations : Global scientific collaboration in the 21st century*

- Increased International Co-Authorships, 1996-2008



- International Co-Authorships' Impacts

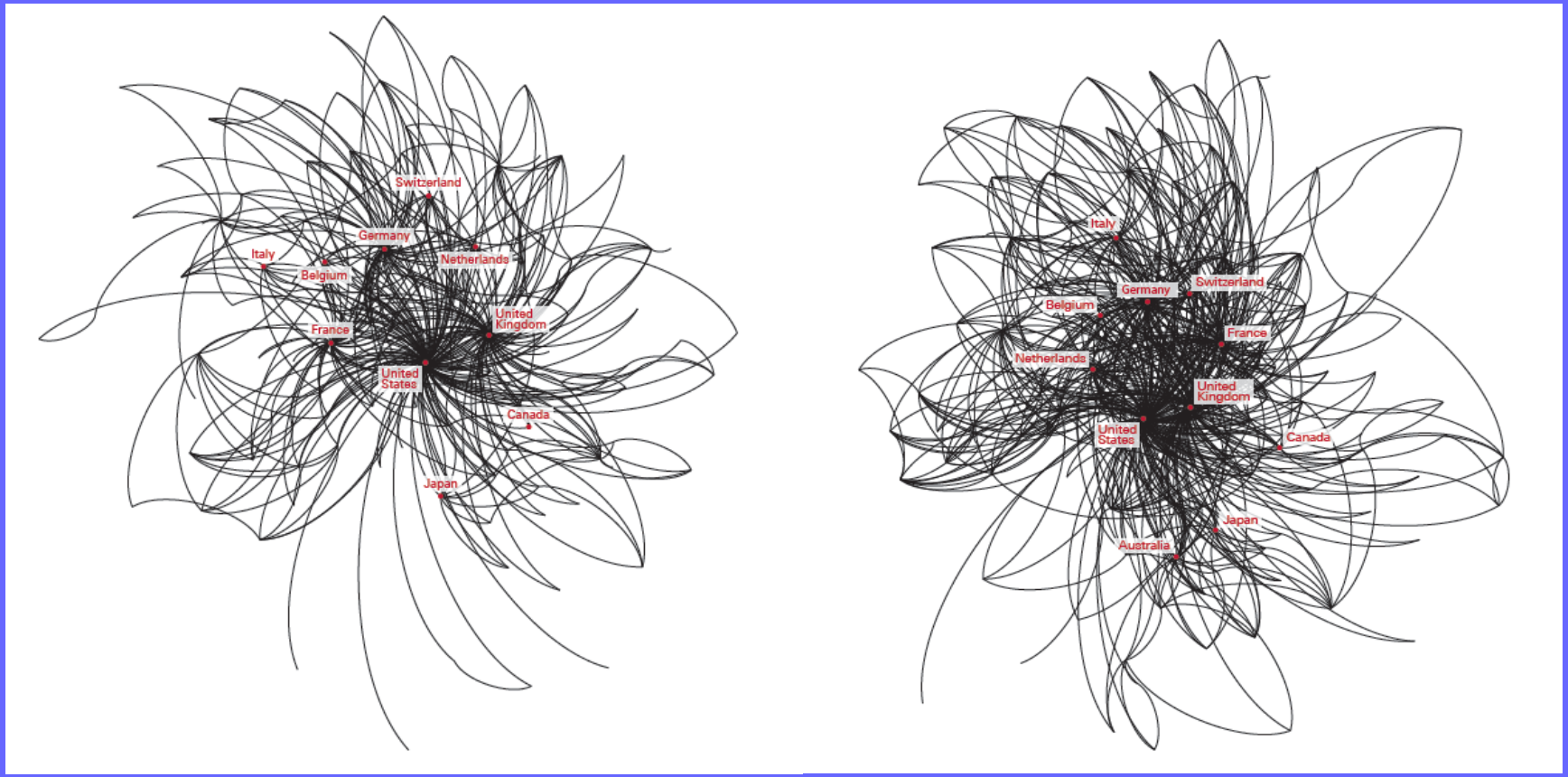


Collaborative Research Increased Effect on Domestic Publications' Impacts

(1K papers min./country, 2008)

Impact accrued by... (country y)	By collaborating with... (country x)																				
	Australia	Austria	Belgium	Canada	China	Czech Republic	Finland	France	Germany	India	Israel	Italy	Japan	South Korea	Netherlands	Norway	Russia	Spain	Sweden	Switzerland	United Kingdom	United States
Argentina																					3.2	
Australia																		3.2				
Brazil	4.5			3.1									3.7		3.9							
China			3.8					3.6	3.5	4		5			3.9		4.1	4.8	3.5	4.2	3.1	3.2
Czech Republic															3.9					3.1	3.2	
India								3.8				3.7										
Japan																		3.3		3.1		
South Korea								3.8	3													
Mexico									3.1			3.4										
Poland		3.2	3.8	3.6								3.3			4.1			3.3	3	3.9	3.5	3.1
Russia				4.7	3.4	3.4	3.4	3.2	3.1		4.8	3.7	3.6	4.5	4.4	3.6		4.2	4	4.2	4	3.6
Slovakia																						3
Spain	3.5												3.2									
Taiwan									3.2													

International Collaborative Research Networks' Increases
1996-2000 vs 2004-2008



Science & Technology Innovation Policies Channelling Knowledge Production and Collaborative Research Challenges

- **People matter more than technical / fiscal measures**

- **Competencies:**
  - Level: Graduate Education; PhD's Strategic Role
  - Disciplinary… Plus: Professional Development and Interdisciplinary Skills

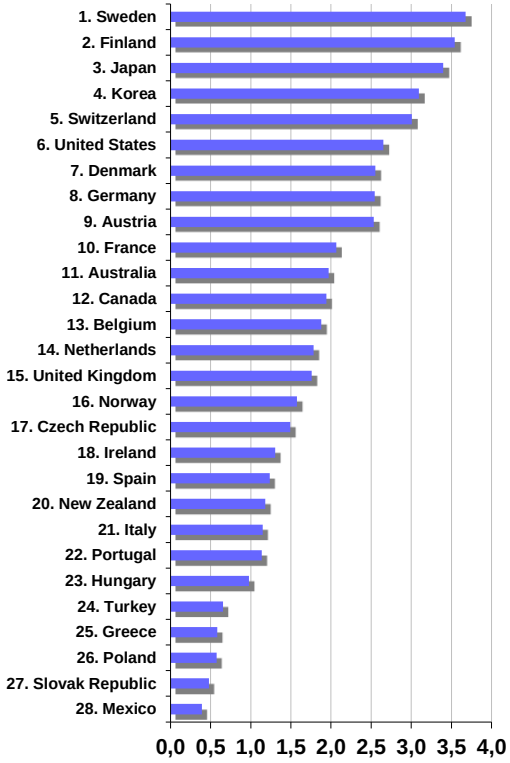
- **Clusters:**
  - Beyond Academic / Organizational Boundaries
  - Beyond National Boundaries: Regional / International Clusters

Competencies: Programs/Students Un-tackled Challenges for Coded / Intangible Knowledge Skills Beyond Disciplinary Tools

- How to Position one's Discipline vs Near-by Disciplines in RD Problem-Solving
- How to Manage Contextualised RD Projects: Out of Academe Clusters
- How to Connect with different Language/Culture Partners: International Clusters

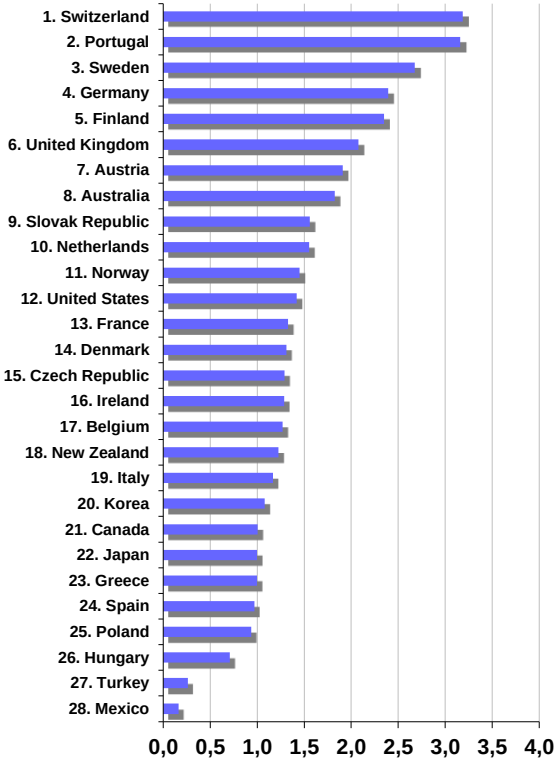
Graduation Education Level:
PhDs Do Matter for Nation Building

R & D Intensity



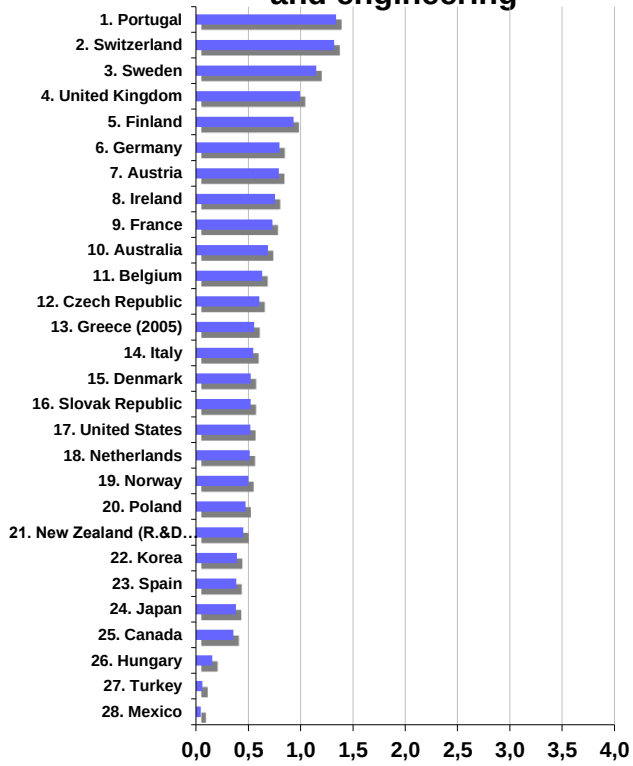
$$$ R&D as % of GDP
(Weighted Mean 2005-2008)

All doctorates



Graduation rate
(Weighted Mean 2005-2008)

Doctorates in science and engineering



Graduation rate
at doctorate level, 2006

Strategies to Master Knowledge Production Systems and Collaborative Clusters' Challenges

- **People First!**
  - Empower Academics to Build / Tap in Research / Advanced RD Training Global Network
- **Key issue: Academics' Incentives to move/collaborate physically and virtually**

Strengthen a 'Bottom-Up Approach' to International Collaborative Research (ICRD)

- **Why Academics Move/Collaborate?**
  - In Search Best Minds, Ideas, Expertise
  - Increase Quality of Work/Training
  - Improve RD Effectiveness
  - Overcome Research Programs' Problems: Data, Equipments, Costs, etc.
  - Global Challenges' Push on ICRD: not the Sole Incentive

C. Wagner. 2008. *The New invisible College: Science for Development*. Brookings Inst. Washington

- **Problematic Tension/Gap between Academics' Incentives / Choices and National Governments' Goals**
  - ICRD Programs' Decision-Makers: Far From Academia…

Enabling Conditions for Academics' Incentives to Move/Collaborate

- More Resources: Tiny Fraction of RD Granting Agencies' Current $$ for ICRD
- More Decision-Making Power to RD Granting Councils/Agencies
- Move Beyond Known 'Passive' Approaches: Information/Communication, Networking/Mobility Resources

In Need of a More Aggressive '*International Collaborative Research Master Framework*'

- **Key Component: Joint International RD and RD Advanced Training Program Proposals: Conceived / Realized Jointly**
- **Based on / Linked to Partner Universities Research and Doctoral Education Strategic Plans**
- **Managed / Funded by Consortia of National Research Granting Councils / Agencies**