



# Knowledge Agents and Intangible Assets

Edward M Bergman

Vienna University of Economics and Business



EUROPEAN COMMISSION  
European Research Area



SEVENTH FRAMEWORK  
PROGRAMME

Funded under Socio-economic Sciences & Humanities



IAREG  
intangible assets &  
regional economic growth

**Conceptualization of  
Intangible Assets**

**MPIoE**  
Max Planck Institute  
Of Economic  
Germany

**UTA**  
University of Tampere  
Finland

**UoS**  
University of Sussex  
UK

**INGENIO**  
Institute of Innovation and  
Knowledge Management  
Spain

**UTARTU**  
University of Tartu  
Estonia

**Econometric modelisation**

**UB-AQR**  
Regional Quantitative Analysis  
Group. Universitat de Barcelona  
Spain

**CRENOS**  
Centre for North and South  
Economic Research  
Italy

**UJM-CREUSET**  
Economic Research Centre of  
the University of Saint-Etienne  
France

**DIW**  
German Institute for Economic  
Research  
Germany

**Geographical dimension and  
regional implications**

**GKK**  
Centre for Research in Economic  
Policy  
University of Pécs  
Hungary

**WU-WIEN**  
Institute of Regional and  
Environmental Economy  
Austria

**LUH**  
Institute for Economic and  
Cultural Geography. Leibniz  
University of Hannover  
Germany

**Multidisciplinary expertise**

Policy recommendations

Regional, National and European stakeholders contacting  
Dissemination



- **IAREG: 12 partner universities, 61 researchers**
- 60 working papers, of which:
  - 15 published, 2 forthcoming, 15 accepted,  
2 revise & resubmit, 20 under review.
- 5 policy reports
- 13 policy briefs
- 1 Executive Summary
- 1 Final Policy Guide
- Many workshop, seminar, conference presentations



## OBJECTIVES

- Analyse **the role played by IA** in the generation of **innovation** and consequently **economic growth**. **Regional level**. **Geographical space**.
- Specific objectives:
  - Develop **new indicators** for improving the measurement of IA
  - Analyse **knowledge generation, flow, usage and effects among economic agents**
  - Examine *IA and knowledge interactions with: 1. firms, 2. universities, 3. knowledge agents (KA), 4. workers (human capital) and 5. entrepreneurs*
  - Model effects of IA on regional total factor productivity
  - Extract **policy guidelines** for regional innovation strategies and report results **to policy makers** at EU, national and regional levels.



# Knowledge Capital and Regions

- Spatial Knowledge spillovers are not systematic and **proximity alone** is insufficient to produce knowledge flows among regions...
  - Interpersonal relationships, based on **face to face contact and labour mobility**, do play a crucial role in the local diffusion of knowledge.
  - Social proximity and the **integration within local and global scientific networks** is therefore a key determinant of knowledge diffusion.
  - **institutional, cultural or political factors** can impede cross border diffusion
  - The magnitude of knowledge flows also depend on the **size of the regional economies** of origin and destination
  - Knowledge flows from bordering EU15 regions progressively **avored EU10 regions closer to their common border** between mid-80s and 2004.
- Great **diversity** at the local and sectoral context.

Regional policies should be **adapted to each regional context**. This requires a good understanding of the local characteristics and sensitive local monitoring tools.



# Knowledge Capital and Firms

- **Crucial role of research partnerships for knowledge accumulation within firms**
  - Pre-competitive stages: collaboration with *competitors*; Introduction of new products and processes: collaboration with *buyers and suppliers*
  - The most innovative firms are more likely to participate in *collaborative networks* with other firms and research groups, often pre-competitive
  - Large MNEs seek *basic findings* from universities, rather than intellectual property
- **Organizational innovations and IA** in firms were shown to accumulate useful knowledge by *doing, using and interacting*, by relying on *parallel development teams, semiautonomous work teams, and reduced management layers* → introduce more products faster to the market
- Firms' productivity does not only depend on internal features, but also on the **knowledge flows available in their regional environment**
- **MNEs offer unique diffusion** opportunities to regional firms & research institutions to benefit and contribute to global networks.



# Knowledge Capital and Universities

- Universities can heavily **influence regional, national and global knowledge** accumulation processes.
- **University collaboration with multinationals** is strong but could be improved, while collaboration with universities needed most by SMEs .
- Geographical proximity is relevant, but not per se the main driver of collaboration choices. Collaboration depends more on **firm, network and university characteristics**.
- **Network characteristics** have emerged as crucial in determining academic knowledge transfer: the better the access to international networks, the higher the patenting activity, hence the knowledge transfer to industry
- **Faculty in Europe's top 200 research universities** commercialise their marketable discoveries and research at varying rates and for reasons that can be addressed by policy changes (illustrated on subsequent slides).



# Knowledge Capital and Mobile KAs

- **Mobile star scientists (ISI)** are key *knowledge agents* (KAs).
  - Europe suffers *net loss* of star scientists, even if some return/recirculate
  - Reasons for *initial mobility* are not only direct financial advantages (material, personnel, equipment...)
  - *Personal and family factors* are often decisive in decisions to return
  - Innovation activities of star scientists are *NOT regionally embedded*.
- **Europe's strongest research university faculty** are presently mobile (70%)
  - 60% of mobile now favour *non-EU* destinations → more "brain drain"?
  - Movers ***unlikely to select an EU destination*** if holding academic post with permanent contract **or** if seeking: 1. stronger colleagues & students, 2. better research opportunities, 3. more prestigious universities, 4. reduced teaching load, or 5. higher salary.
  - Policies to improve retention of KAs can be devised at several levels.



# Knowledge and Human Capital (HK)

- HK increases worker productivity & a **pre-condition for technical progress**
  - Formal education + working skills through job related training
- HK's effects on **regional productivity are not homogeneous** across or even within the same countries
- In industries with an **intensive use of HK**, improved conditions of work imply productivity gains
- Regions with “overeducated” workforces help stimulate qualified job creation
- Evidence supports policies **stimulating accumulation of HK**
  - Social benefit > individual benefits (wage)
  - Absent public policies: regional **underinvestment** in HK
  - Returns **higher in regions with low endowments** of HK
  - Higher HK levels reduce the cost of **absorbing technology spillovers**



# Knowledge Capital and Entrepreneurs

- **Knowledge and entrepreneurship capital** are both **predictive of regional productivity (TFP)**, while national entrepreneurial attitudes are predictive of **regional entrepreneurship capital**.
- Factors that **positively affect** entrepreneurship
  - Incumbent firms of the **same industry** (“Marshallian Effect”)
  - Age and **age distribution** in the region of entrepreneur residence (inverse U-shaped relationship: **40 peak age**)
  - **Parental and school peer influence** → both imply possibility to create regional entrepreneurship capital
  - Availability of **venture capital** in region



## 10 Findings & Policies to stimulate EU *university* commercialisation

**Universities that support commercialization and engagement with local industries stimulate more commercialization efforts among their academics.**

- 1. Universities should inform faculty of active policies to support commercialization.**

**Facility with English in other-language countries is closely related to chances that academics commercialize, perhaps due to its role in global commerce**

- 2. Universities should incent academics to publish actively in international journals and to engage in international research projects and conferences.**

**Engagement with non-university social or community organizations appears to stimulate commercialization, perhaps due to network effects of multiple contacts**

- 3. Universities should consider rewarding public service and „3rd Mission“ activities**



**Previous collaboration with industry research stimulates academic commercialization**

- 4. Universities and research funding agencies should adopt policies that promote collaborative research projects between academics and industry**

**Women are less likely to commercialize than men**

- 5. Research funding agencies should revise outreach practices to attract and support female applicants for collaborative industry projects**

**The most experienced academics are likelier to have commercialized previously and to continue pursuing commercialization efforts in future.**

- 6. *The role of experienced academics in the commercialization of research should be recognized and rewarded for actively mentoring junior colleagues.***

**Involvement of business and regional government officials in developing university commercialization policies increases the chance of academic commercialization.**

- 7. *University officials should engage local industry leaders and regional governmental officials in the design and management of university commercialization policies.***



The greater the number of classes taught, the less likely academics are to maintain or increase commercialization efforts.

***8. Reduction of high teaching-loads should be considered as an incentive for academics who actively work with TTOs to pursue commercialization opportunities.***

Academics whose research is published scientifically are more likely to continue or increase commercialization efforts.

***9. Financial or in-kind incentives should be offered to academics who publish actively in recognized scientific or scholarly journals.***

Social science academics receive relatively higher compensation than applied or pure scientists from their commercialization activities.

***10. Universities should consider promoting commercialization activities among all potentially relevant disciplines, not just pure or applied physical-natural sciences.***

From: "Marshall's Dilemma: Commercialization of European Research"



Reports and Working  
Papers Available at:

**<http://www.iareg.org>**



# **Illustrated Findings for Mobility Destinations**



## A.O. Hirschman's Universities and Faculty Mobility: *Exit (Mobility), Voice & Loyalty*

- Institutions in transition (e.g., EU Unis) may retain **Loyally**-satisfied or otherwise immobile staff; the signals necessary for transitional improvement of unsatisfactory conditions come from **Voice** or **Exit** activists.
- **Voice** arises from those who elect to stay and attempt to reform the institution from within, perhaps leading to its eventual improvement. So long as Voice is seen as effective, exit is deferred.
- **Exit** is the last choice made by those who see the likely pace of improvements will not benefit them. **For academics, this requires mobility to another university and—often in Europe—to another country.**

“Would you accept a university post in a different region, assuming improved conditions?”

**Where To?**

“Assuming certain improvements in important career or living conditions were met, I would consider a university post in”:

No

N=1708

**Yes  
(70%)**

N=1280

**Under which Condition(s)?**

„Important career or living improvements that would support the favorable consideration of a post in a new region are“ (select 3 most important)

Significant increase in salary

Promotion to a higher or permanent university position

Better working conditions

Ability to work in language(s) I know

More prestigious university or institute

Fewer teaching and instructional obligations

Less pressure for research and publication

Stronger faculty colleagues and networks in my discipline

More intellectually engaged/ better trained student body

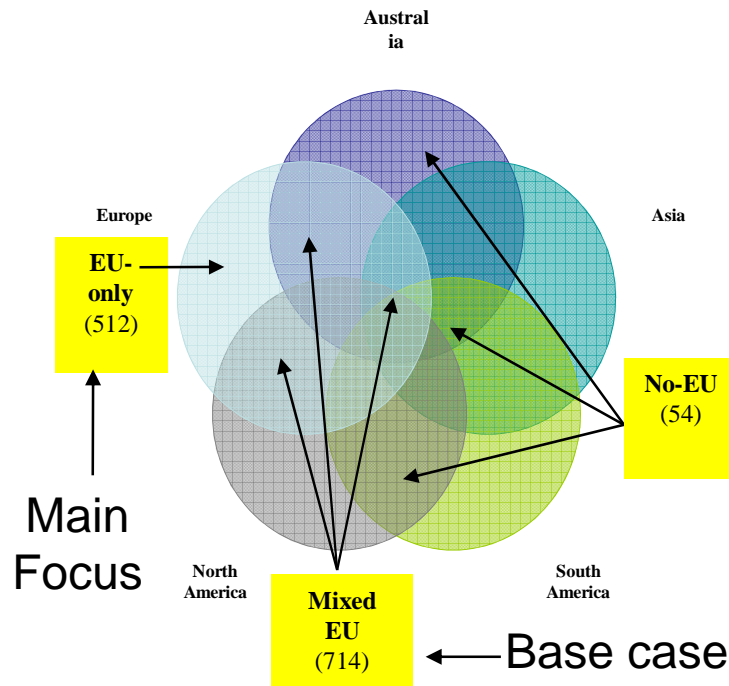
Equivalent or better pension and/or health benefits available

Greater opportunities for pursuing my research

Better living situation for me/ my family

Improves opportunities to work with firms or research organizations

Fewer obligations in administration or committees



Main Focus

Base case (multinomial logit)



## Why Mobile to *ERA-only*? A Global Mobility Comparison (multinomial logistic regression/RRR\* N=1412)

- National Uni Systems, 14/19 (UK, CH, SE, ES, PO, NL, IT, IR, H, GR, F, DK, BE, AT: ERA 2x-18x)
  - Basic science unthreatened by Uni commercialization (ERA1.2x)
- 
- Improved research opportunities (ERA 0.8x)
    - Improved salary objective (ERA 0.7x)
    - Reduce teaching burdens (ERA 0.7x)
  - Stronger, more challenging colleagues (ERA 0.7x)
    - Stronger, better prepared students (ERA 0.7x)
      - Prestige of new post (ERA 0.6x)

\*RRR=relative risk ratio



Conclusions Concerning Academic Mobility *within ERA*:

- more likely* from 14 of 19 EU Uni Systems and by those unconcerned with commercialization risks to science
- less likely* if conditions offered by most competitive Uni systems are important decision factors → What Policies?