Talent in Academia
The Research-Teaching Nexus

Pierre-Michel MENGÉR
College de France, Ehess & PSL

Workshop : STI in the Era of Uncertainty
Nanyang Technological University
Singapore, 2017-11-27-28
Link between teaching and research in a context of heightened competition between and within universities

Complementarity under asymmetry: how viable?

Complementarity:
- Positive? Negative?

Teaching: A Gaussian distribution of performance

Research: A Paretian distribution of performance

Talent: a mosaic or a matter of sheer vertical differentiation?
Positive complementarity

The bidirectional perspective:

• A matter of conditional necessity

• Away from specialization

Positive complementarity is egalitarian: a mosaic of talents
Negative complementarity

The scarcity of resources

- Teaching load / Time left for research
- Differential valuation of the two tasks: the issue of multi-tasking
The common assumption of the two views

A normal distribution of ability in both tasks

=> Role strain and incentives

=> A pillar of the academic culture: complementarity as the default option
Nil correlation between teaching quality and research performance?

How to go about this?

1) A closer look at the characteristics of the two tasks

2) The contextualization variables : level of teaching
A puzzling issue: if research has higher value, what makes it so different from teaching?

1. Characteristics

- **Uncertainty**
  ⇒ Contract on input in teaching
  ⇒ Contract on output in research

- **Inequality**
  Research: a Paretian profile of productivity
  Teaching: a Gaussian profile of performance
Figure 5. Pareto cumulative distributions of papers and citations, using all professors and professors who published at least a paper (active) as denominators by discipline, 2000–2007.
Notes: Perceived effectiveness is evaluated on a 7 point scale, and averaged across all first year students who took the same instructor. The figure shows the distribution of mean perceived instructor effectiveness for the set of instructors who are lecturers (paid primarily to teach), assistant or associate professors, full professors, or other (mostly part-time sessional instructors).
A puzzling issue: if research has higher value, what makes it so different from teaching?

**An explanatory model**

- Job stratification: organizational and individual risk management

- The multiplicative (additive) nature of the production function in research (teaching) ⇔ Correlation with non-routine (routine)

- The scope of the two tasks
The talent issue

1. Research productivity as the outcome of a number of features that interact multiplicatively rather than additively
   - **Example**: A list of factors explaining the propensity to publish papers
     - Shockley, 1957
       - the ability to find a good problem to explore
       - the ability to explore it
       - the ability to recognize a fertile result when it appears
       - the ability to know when to stop and to write up results
       - the ability to write one’s article well
       - the ability to learn from criticism (to be constructive rather than defensive)
       - the determination to submit one’s article to a scientific journal
       - perseverance to make changes and to react to the observations of the journal’s referees.
       - The ability to manage a team, to set up efficient networks of cooperation, to raise funds, etc.
   - A log-normal distribution resulting from the interaction of factors distributed normally: **the less routine the task, the greater the number of factors involved**
A puzzling issue: if research has higher value, what makes it so different from teaching?

2. **Assortative matching and teaching level**

- A cog of the cumulative advantage mechanism
- Its multiplicative effect
- Selective matching applies to doctoral students
- Higher education as a customer-input technology
Fig. 2. Internationalization at country level. X axis: attractiveness. Y axis: % of foreign academic staff (left) and of foreign PhD students (right).

Lepori, Seeber, Bonaccorsi 2015: Competition for talent. Country and organizational-level effects in the internationalization of European higher education institutions.
The proportion of postgraduate students, particularly doctoral, on total undergraduate education in a university is informative about the strategic choices open to the university. Doctoral students compete with undergraduates for the time of professors, and for laboratory and other space. In fields characterized by international competition and mobility of PhD candidates, universities are attractive to potential PhD students only if they have dedicated staff time and facilities, and teach courses in English. Consequently, a university that wants to compete internationally in doctoral education must maintain the ratio between PhD and undergraduates at a certain threshold.

Daraio et al. The European university landscape: A micro characterization ... 2011
Conclusion

• No way to escape asymmetry
• Complementarity under asymmetry: how it works
• Coupling
  • Helps explain tolerance of inequality in the academic world
  • Acts as an insurance mechanism
• Likelihood of uncoupling: greater at the bottom than at the top of the hierarchy of universities
• The superiority of implicit incentives
References

• Bonaccorsi, Andrea, Daraio, Cinzia, Lepori, Benedetto, Slipersreter, Stig, 2007, Indicators on individual higher education institutions: addressing data problems and comparability issues, Research Evaluation, 16, 2: 66-78.
• David Martimort
• Larivière, Vincent, Macaluso, Benoît, Archambault, Eric, Gingras, Yves, 2010, Which scientific elites? On the concentration of research funds, publications and citations, Research Evaluation, 19, 1: 45-53.
• Pierre-Michel Menger, Economics of Creativity, Harvard University Press, 2014