Citation metrics
and research quality in economics

Edinburgh, 22 October 2017

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www.jakob-kapeller.org | www.icae.at | www.heterodoxnews.com
Agenda

- Two views on *research quality and reputational stratification* in economics

- How well can we assess *the quality of individual contributions*?

- *Which signals play a role* in determining publication decisions and citation behavior?
Two perspectives on research quality and citation data
Why „two perspectives“?

- Citation data is used either positively or normatively...
  - ...to analyze the properties of scientific conversation as well the development of scientific fields: **cognitive scientometrics**
  - ...to evaluate scientific „performance“ on various levels: **evaluative scientometrics**

- **Decisive Differences:** What is a „group of highly talented geniuses“ from one perspective, might look like a „citation cartel“ from the other.
Reputational stratification in economics:
Economists’ „Top Five“ - a „good-old-boys network“?

Citation networks across top journals:
Economics (2009–2013)

- Review of Economic Studies: 4.82% journal self-citations, 24.43% citations to the other four journals
- Econometrica: 16.45% journal self-citations, 15.24% citations to the other four journals
- American Economic Review: 10.08% journal self-citations, 15.64% citations to the other four journals
- Quarterly Journal of Economics: 6.55% journal self-citations, 17.28% citations to the other four journals
- Journal of Political Economy: 6.75% journal self-citations, 20.02% citations to the other four journals

Average: 27.5%
Reputational stratification in economics
Interdisciplinary comparisons
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Citation networks across top journals:
Sociology (2009–2013)

- Sociology of Health and Illness: 5.2% (self-citations) + 1.25% (citations to other four)
- Social Networks: 9.82% (self-citations) + 8.85% (citations to other four)
- American Journal of Sociology: 5.35% (self-citations) + 7.25% (citations to other four)
- American Sociological Review: 6.52% (self-citations) + 7.17% (citations to other four)
- Annual Review of Sociology: 12.3% (self-citations) + 8.14% (citations to other four)

Average: 12.4%

Aistleitner/Kapeller/Steinerberger (2017): Citation Patterns in Economics and Beyond: ICAE-Working Paper #60
Reputational stratification in economics
Interdisciplinary comparisons

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Citation networks across top journals: Political Science (2009–2013)
- Political Analysis: 5.58%
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- American Journal of Political Science: 6.89%
- American Political Science Review: 5.35%

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Citation networks across top journals: Psychology – Multidisciplinary (2009–2013)

- Journal of Abnormal Psychology: 7.21% (journal self-citations), 7.53% (citations to the other four)
- American Psychologist: 5.59% (journal self-citations), 7.19% (citations to the other four)
- Psychological Review: 7.3% (journal self-citations), 7.07% (citations to the other four)
- Annual Review of Psychology: 3.69% (journal self-citations), 7.09% (citations to the other four)
- Psychological Bulletin: 3.69% (journal self-citations), 7.09% (citations to the other four)

Average: 7.9%

Aistleitner/Kapeller/Steinerberger (2017): Citation Patterns in Economics and Beyond: ICAE-Working Paper #60

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Two interpretations

- **cognitive scientometrics**: economic discourse at the very top of the discipline is rather self-contained, but still serves as an important authority for the rest of the field.

- **evaluative scientometrics**: economics has a small set of highly regarded journals, which are able to select the papers with the highest merits. Hence, high-quality research is easy to locate and intensely referenced.
„Selecting the paper with the highest merits“
Does it work?
The fate of top papers?

- An agent-based model

\[ \text{Population of authors with normally distributed talent} \rightarrow \text{Manuscripts with quality following talent} \]

\[ \text{Referee assessment} \leftarrow \text{Submission decision} \leftarrow \text{Self-assessment of manuscript quality} \]

\[ \text{Publication?} \]
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Kapeller/Steinerberger (2016): Emergent phenomena in scientific publishing. Research Policy
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Journal landscape and quality in an ideal world  
+ a slight degree of error  
+ a modest dose of ambition  
= Journal landscape and quality in a slightly less ideal world

more than 40% of the papers with the highest quality remain unpublished

Kapeller/Steinerberger (2016): Emergent phenomena in scientific publishing. Research Policy
Which papers to publish? Which papers to cite?  
The role of signals

- „only intrinsic quality matters“ is implausible — instead we find that signaling plays a decisive role.

- Relevant signals that serve as a proxy for manuscript „quality“
  - Signaling social capital: evidence that professional contacts affect publication prospects (Collussi 2017, ReEconStat).
  - Signaling competence: evidence that the „Top 5“ are cited, because of their prominent position in the discipline (Aistleitner et al. 2017).
  - Signaling origin: evidence that certain PhD-origin and affiliation matter
  - Signaling membership: prejudice against heterodox contribution
Signaling origin
## Institutional representation in AER, QJE and JPE
### Top 10 Institutions by PhD-origin and affiliation (2014)

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Institutional signals as selection mechanism

![Graph showing number of top 20% papers](image)
Signaling membership
Diversity and interparadigmatic competition: A large-scale sample

Interparadigmatic Discourse in Economics (1969-2013): Analyzing a large-scale sample

Aistleitner/Kapeller/Steinerberger (2017): Citation Patterns in Economics and Beyond: Assessing the Peculiarities of Economics from Two Scientometric Perspectives. ICAE-Working Paper #60
Diversity and interparadigmatic competition:
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Paradigmatic orientation as selection mechanism

Aistleitner/Kapeller/Steinerberger (2017): Citation Patterns in Economics and Beyond:
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The neglect of heterodoxy: Prejudice or bad research?
Conditional impact of heterodox references in mainstream papers

Aistleitner/Kapeller/Steinerberger (2017): Citation Patterns in Economics and Beyond: Assessing the Peculiarities of Economics from Two Scientometric Perspectives. ICAE-Working Paper #60
Wrap-Up

- Two views on research quality & citation-data: quality vs. social structures

- Selecting papers purely on merits?
  - Does not work out; even in a very ideal setting.
  - Model shows some **perverse effects** - at least one seems rather important: many high-quality contributions are ignored.

- **Ignorance regarding high-quality contributions is not random!**
  - Signaling of social capital, origin, competence and membership
  - Signaling can be at odds with true quality
Backup
Signaling competence
Reputational stratification and signals of competence

- Citations to the top 5 as a “signal of competence”?
Reputational stratification and signals of competence

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Citation behavior of authors as selection mechanism

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Reputational stratification and signals of competence

- Citations to the top 5 as a „signal of competence“?

  Citation behavior of authors as selection mechanism

- Signaling competence by referring to the top 5 should work **across the whole discipline.**
Signaling competence as reactivity

- Signaling competence tied to the introduction of journal rankings
  - Both factors redistribute prestige and attention from single authors and contributions to journals.
  - As a consequence self-reinforcing effects related to attention in academia (Merton’s „Matthew Effects”), should affect journals more strongly
- Which change in citation patterns do we expect?
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![Graph showing citation distribution in the American Economic Review (1981–1985)]
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Signaling competence as reactivity in numbers

- Change in citation patterns within the articles published in top-journals

  - Economics vs. the average of other fields (political science, psychology, sociology and physics; five top-journals per field)
  - Basic idea: Measuring the intensity of „signaling competence“ and „reactivity to rankings“.

Change in share of references received by articles in top-journals (1981-1985/1990 vs. 2004-2008/2013)

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