

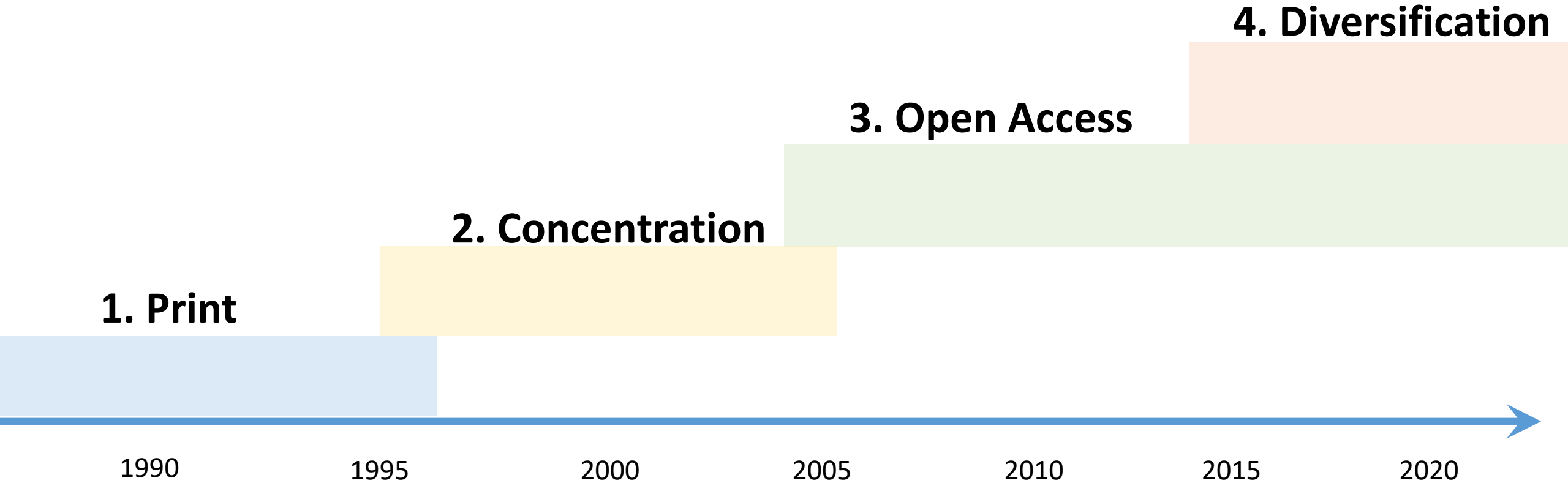
The evolution of scientific publishing and its drivers

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October 14th, 2025, U-CARE Venue - *'Smarter Science – How can we conduct high-quality healthcare research more efficiently?'*

Four phases in the scientific publishing market



Phase 1 – Print (until mid 90s)

Phase 1 – Print



1. Printed journals, submissions and reviews by mail
2. Fragmented market
3. **Business Model: subscription fee based**

Phase 2 – Concentration (mid 90s-mid 00s)

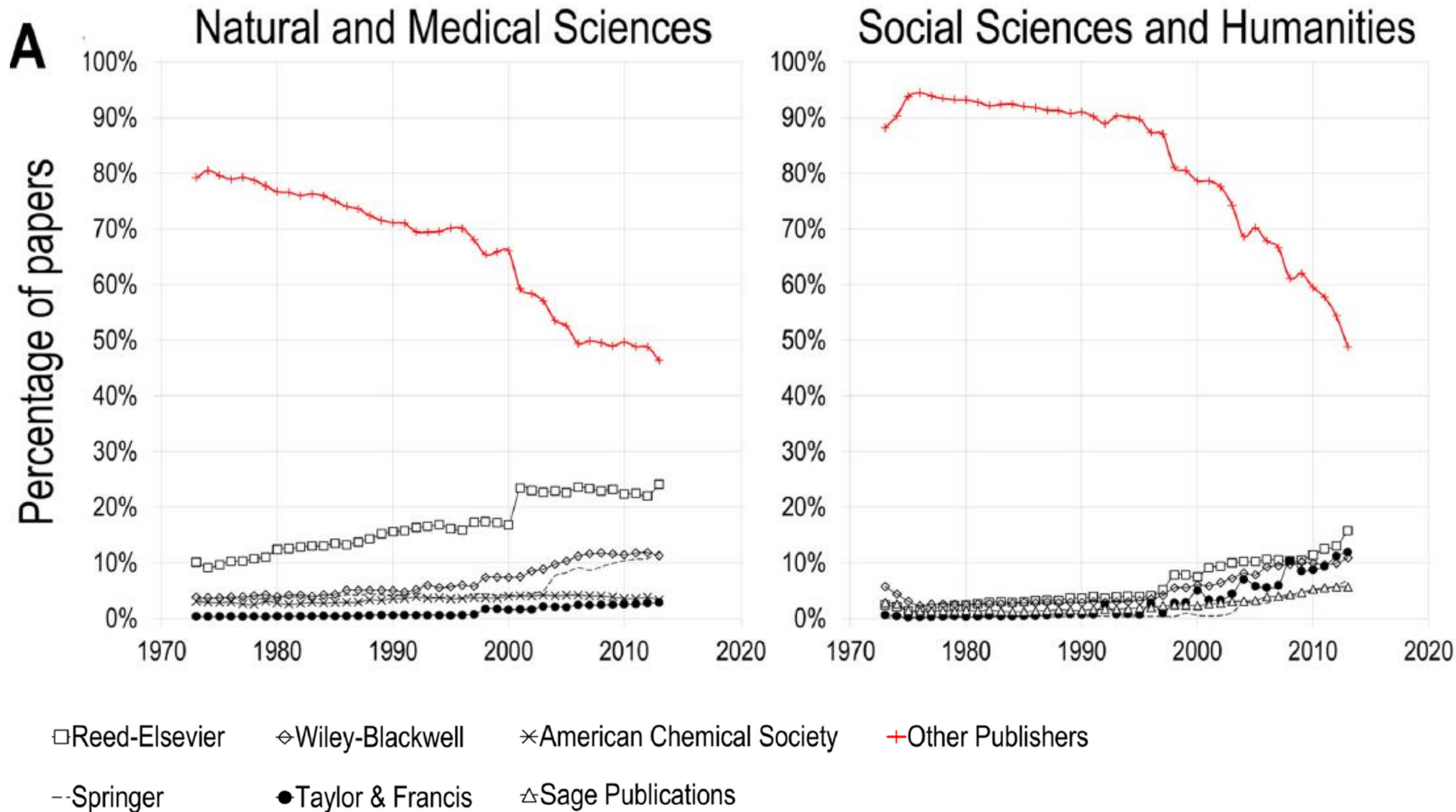
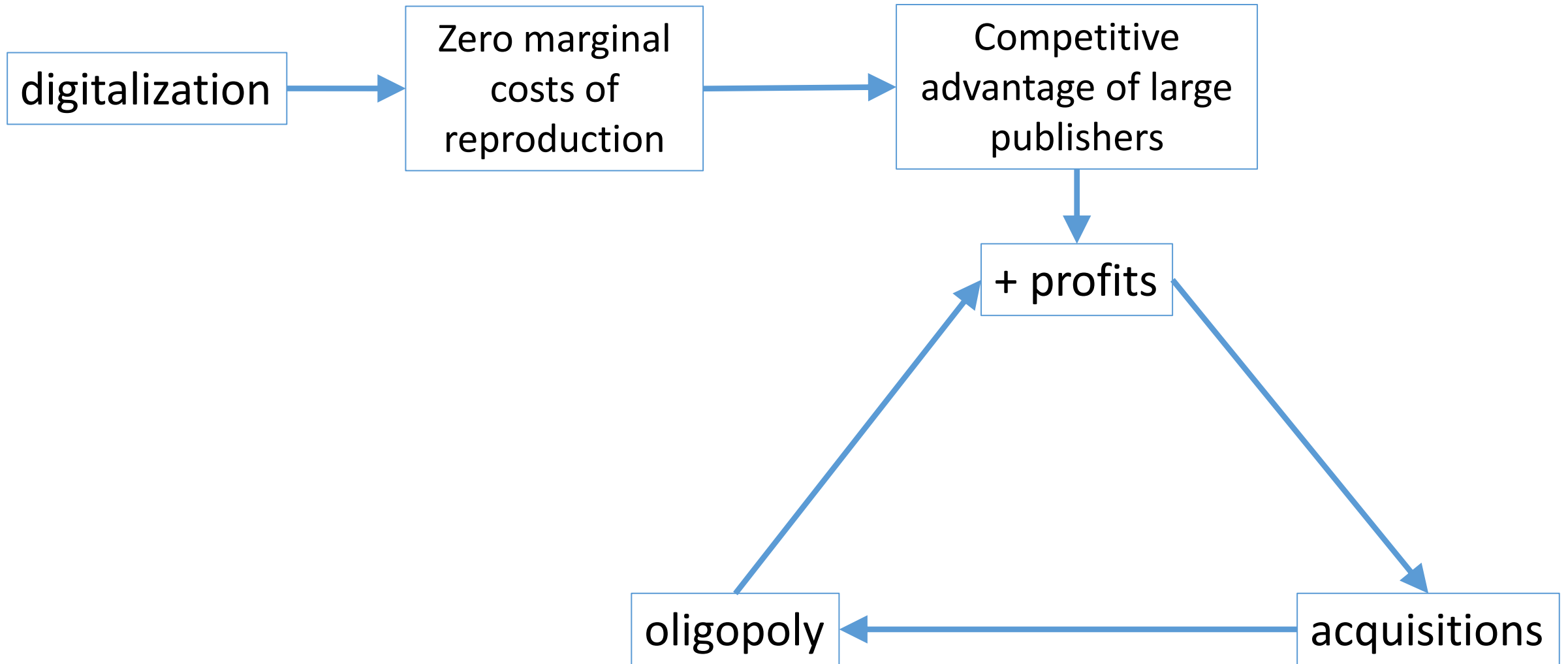


Fig 1. Percentage of Natural and Medical Sciences (left panel) and Social Sciences and Humanities (right panel) papers published by the top 5 publishers, 1973–2013.



Phase 2 – Concentration

1. move away from paper, at all stages
2. accelerate market concentration
3. oligopoly: the big five control over 50% of the market
4. **Business Model: subscription fees – very expensive !**

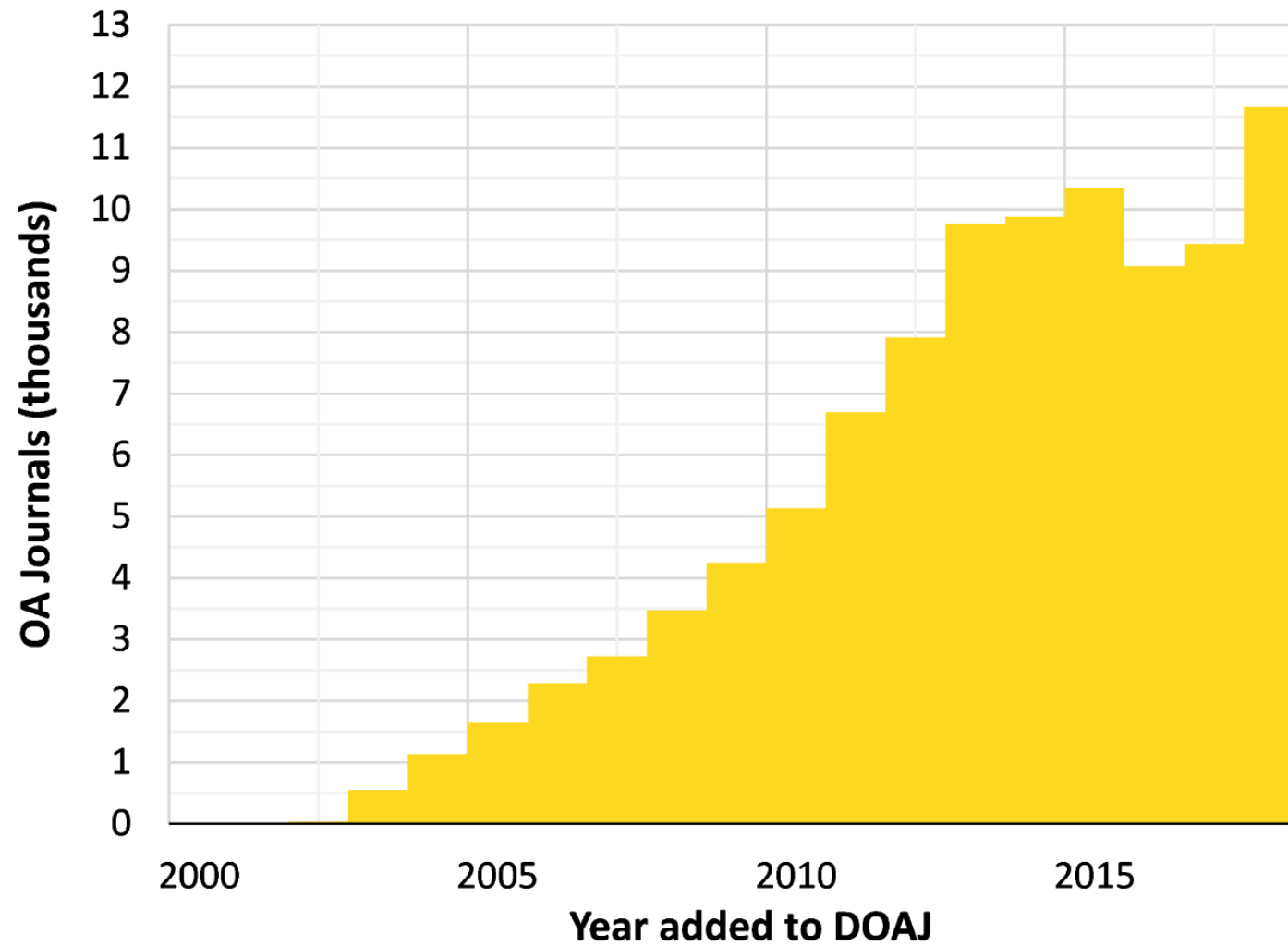
Phase 3 – Open Access (mid 00s - ongoing)

Librarians Protest Elsevier Merger

Science, October 2000

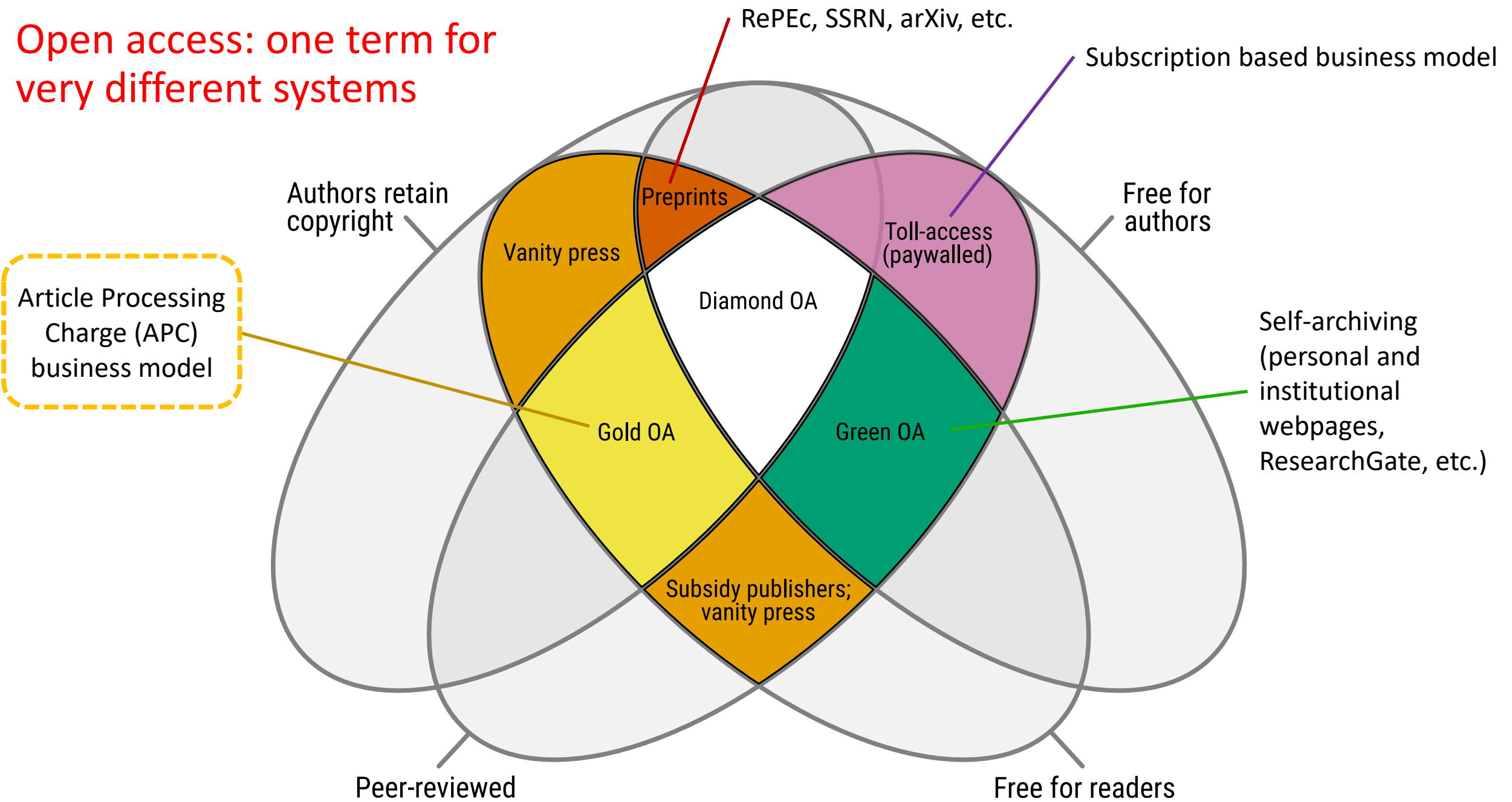
Digitalization → open access movement

- Goal: to reduce barriers to knowledge in the internet era → free access to scientific publications
- **2002 Budapest OA Initiative: support OA journals, free of charge for the reader**



Number of OA journals over time

Open access: one term for very different systems



Gold Open Access

Non-Profit →
(& learned societies)



For-Profit →



revenues only from APC

Traditional
For-Profit →
(& learned societies)



revenues from APC and/or
subscription fees

When in the same journal: “Hybrid Model”
→ “double dipping”

comparing the two main
business models in scientific publishing

- **Traditional: Subscription Fees**
- **Emergent: Article Processing Charge (APC)**

traditional model → revenues from subscription fees

Who is the client?

•the **reader**

the reader wants high quality content

Publisher → goal: profit → subscriptions → quality

Journals' Editors are scientists → goal: prestige → quality

Alignment of incentives towards quality

→ common interest in rigorous, selective peer review

Article Processing Charge (APC) model a.k.a. “Gold open access”

Revenues: from authors who publish articles

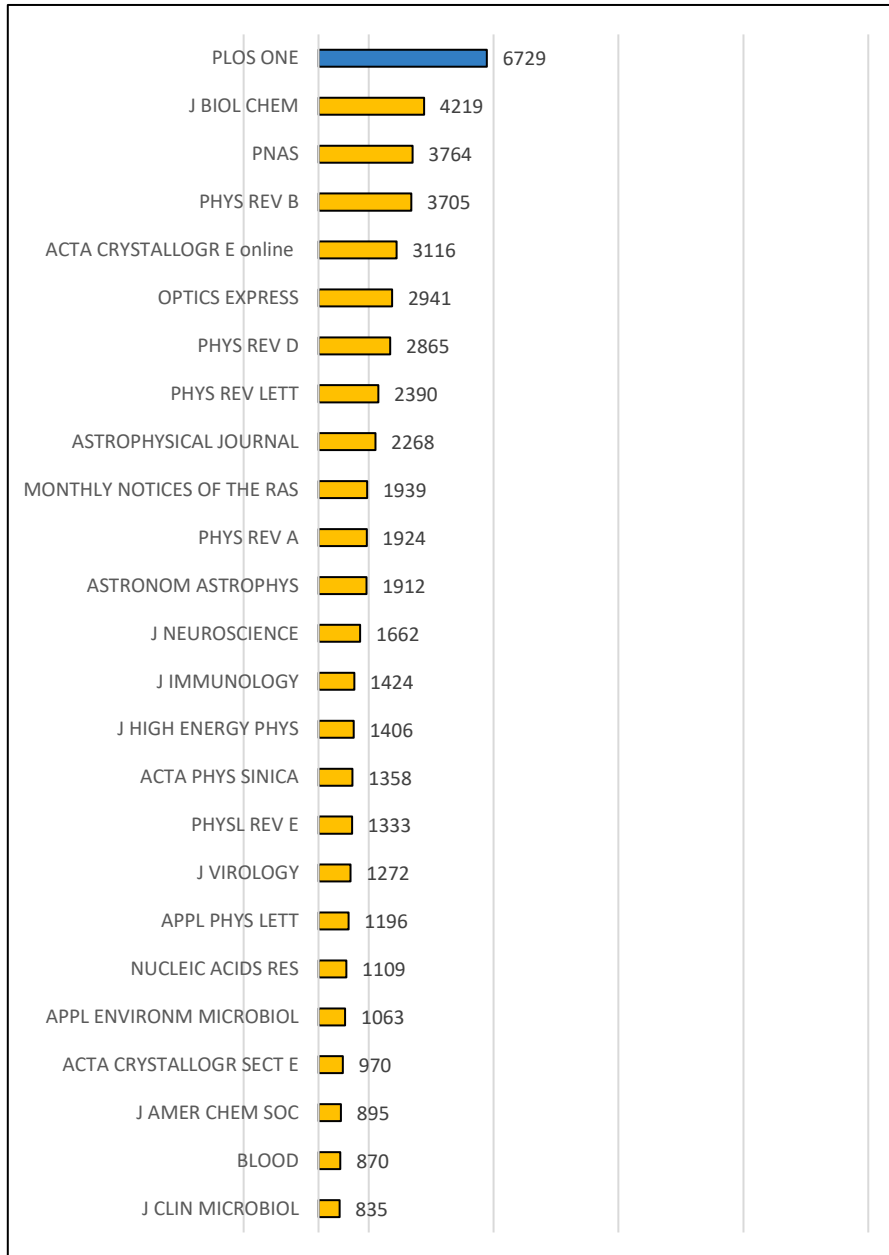
Client: the **author** → goal: publish

Publisher profit: from authors publishing articles

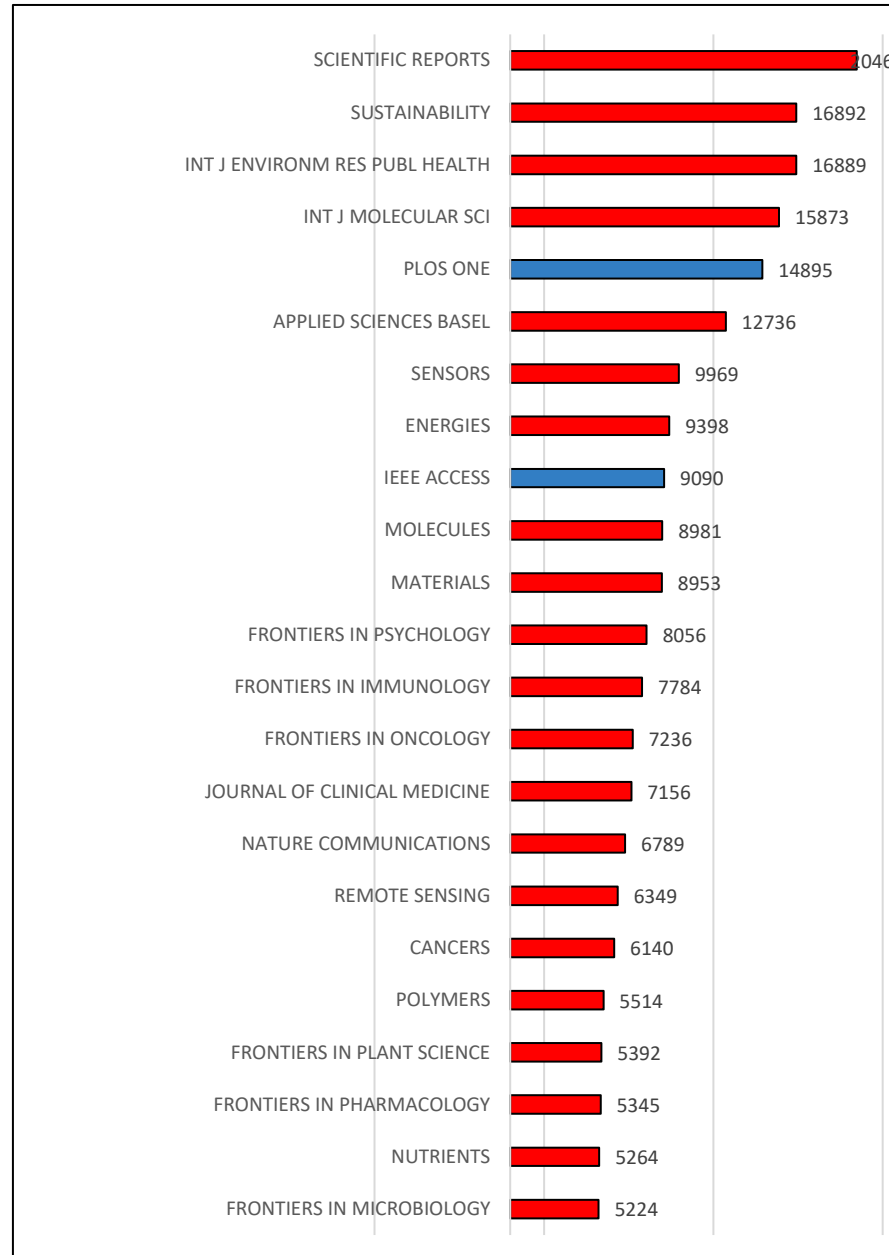
→ **Quantity** → extreme growth of APC publishers

Largest Scientific Journals in the world in 2010 and in 2022 in Web of Science *

2010



2022



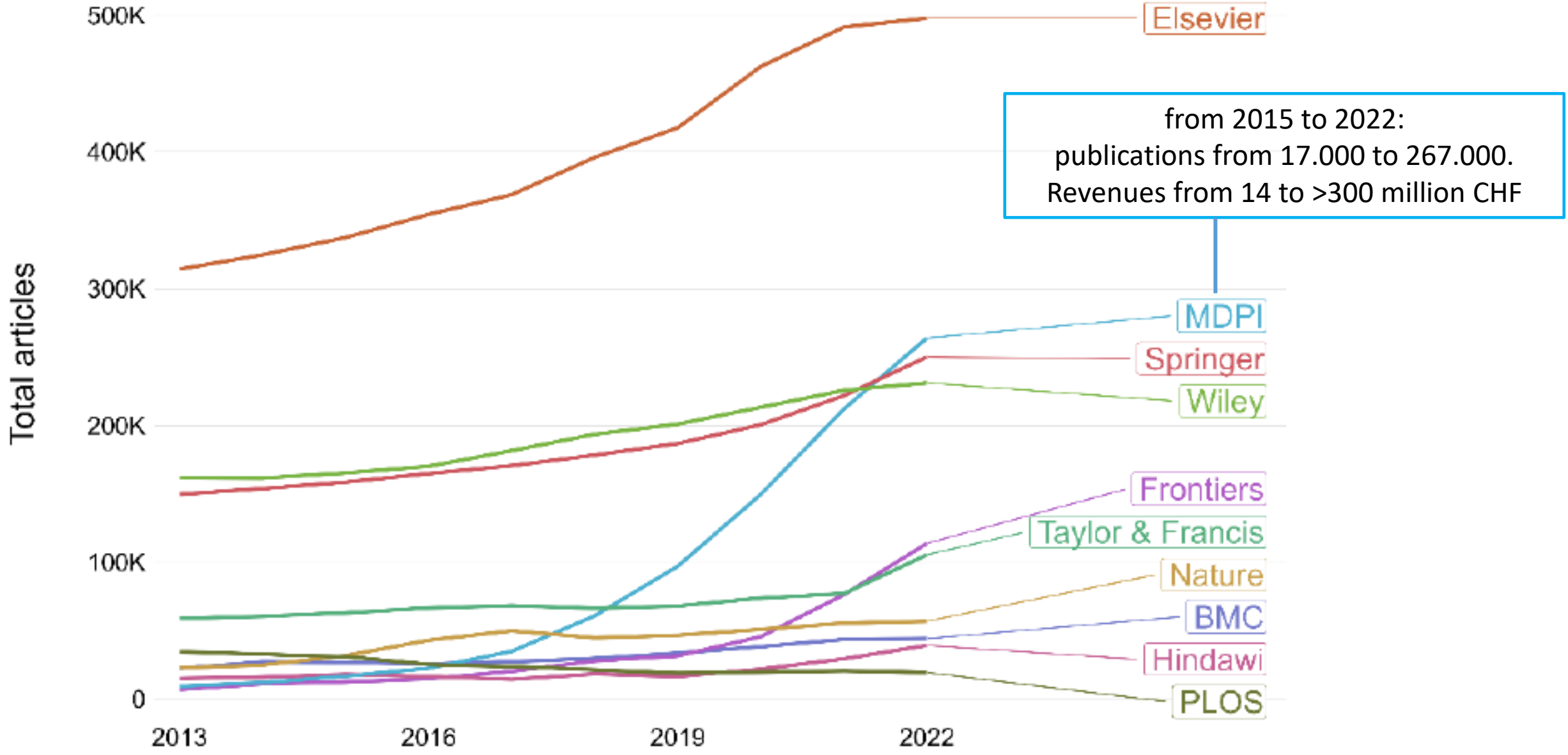
Subscription based

Open access nonprofit

Open access for profit

*adapted from Sivertsen, 2023

B



Risks of Gold OA model

Publisher's PROFIT: from authors publishing articles → **quantity**

Journal Editors' (scientists) goal: reputation → quality → **selectivity**

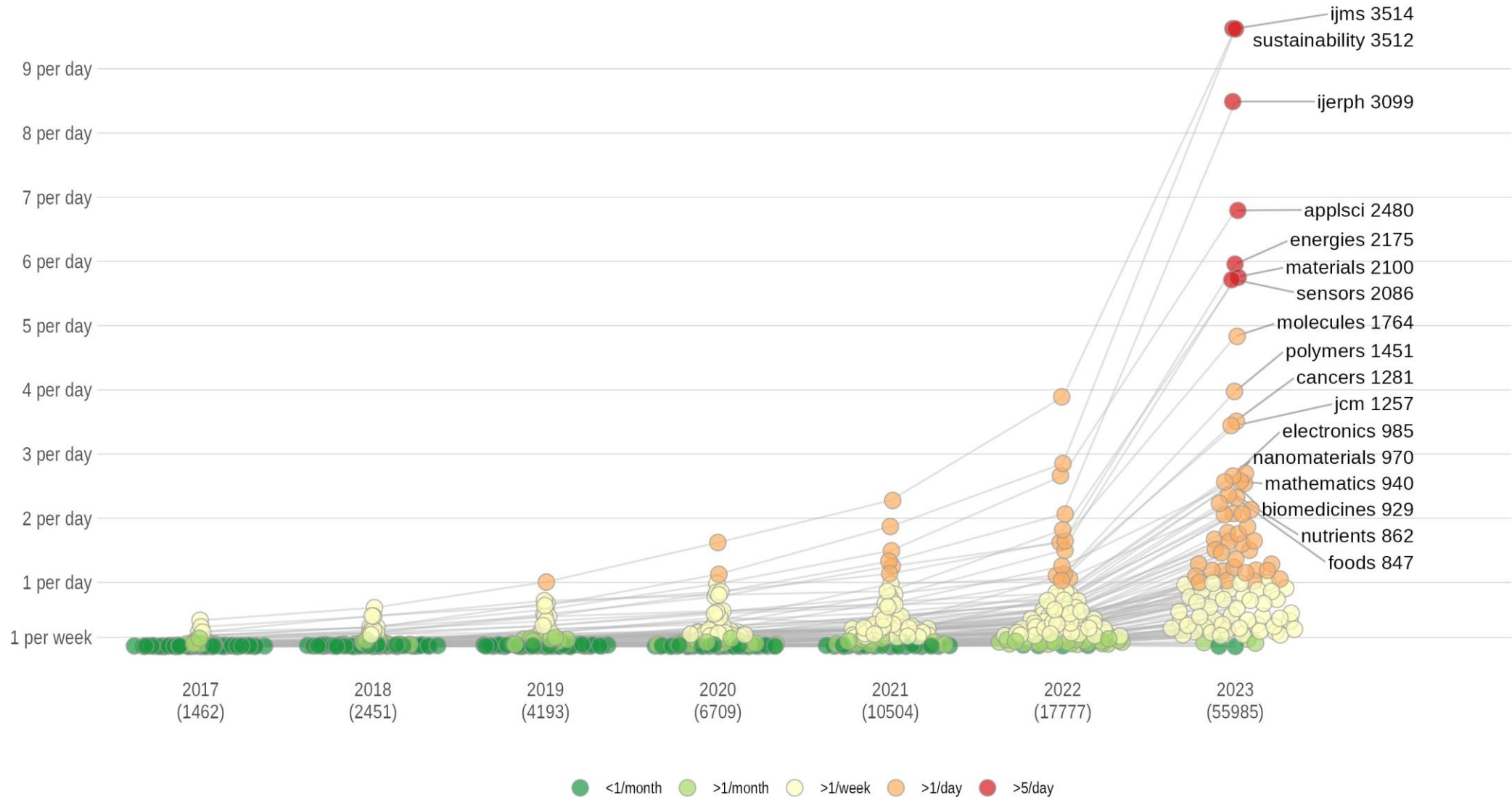
Clash of goals!

→ Editors are often less experienced academics, or even non-academics

→ **PEER REVIEW AS FICUS LEAF**

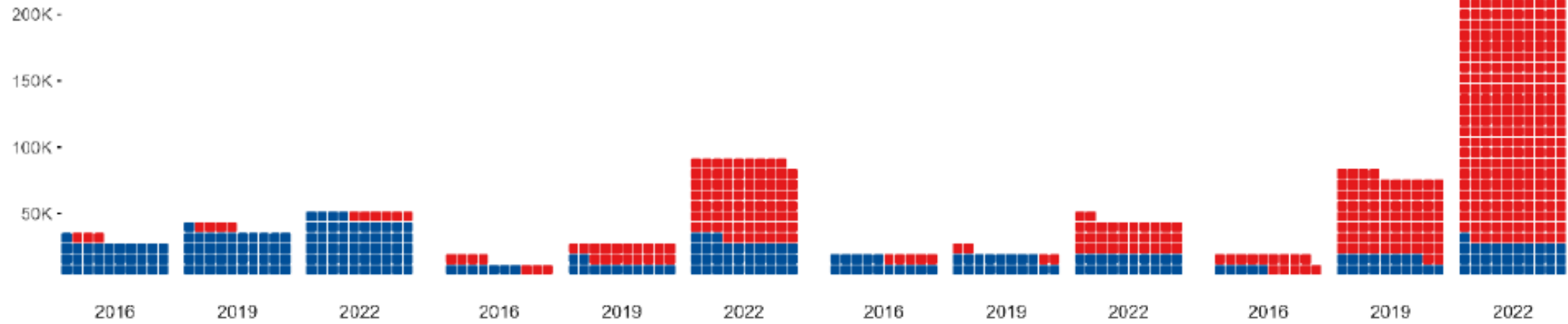
Number of Special Issues at MDPI: 2017-22

98 journals with an Impact Factor



Number of papers published in regular vs special issues, 2016-22

One square = 800 articles

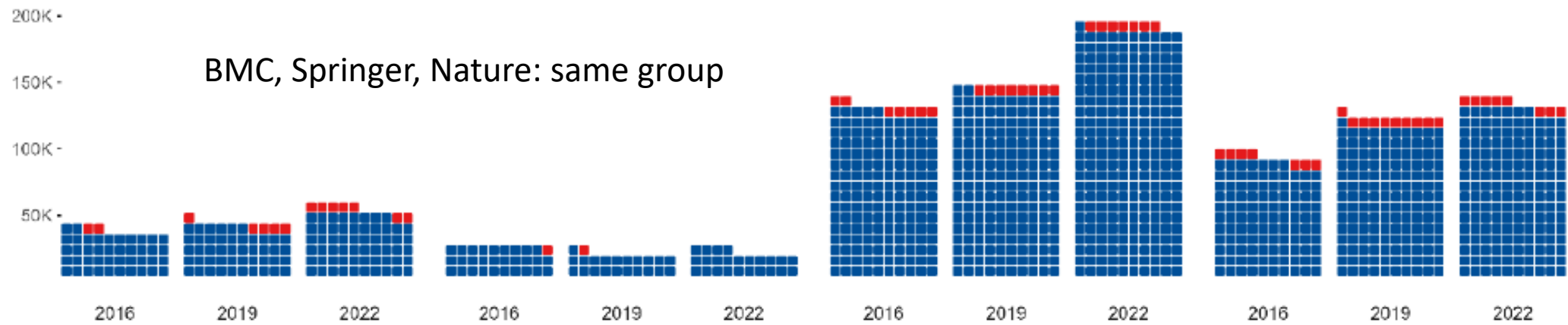


BMC
Profit OA

Frontiers
Profit OA

Hindawi
Profit OA

MDPI
Profit OA



BMC, Springer, Nature: same group

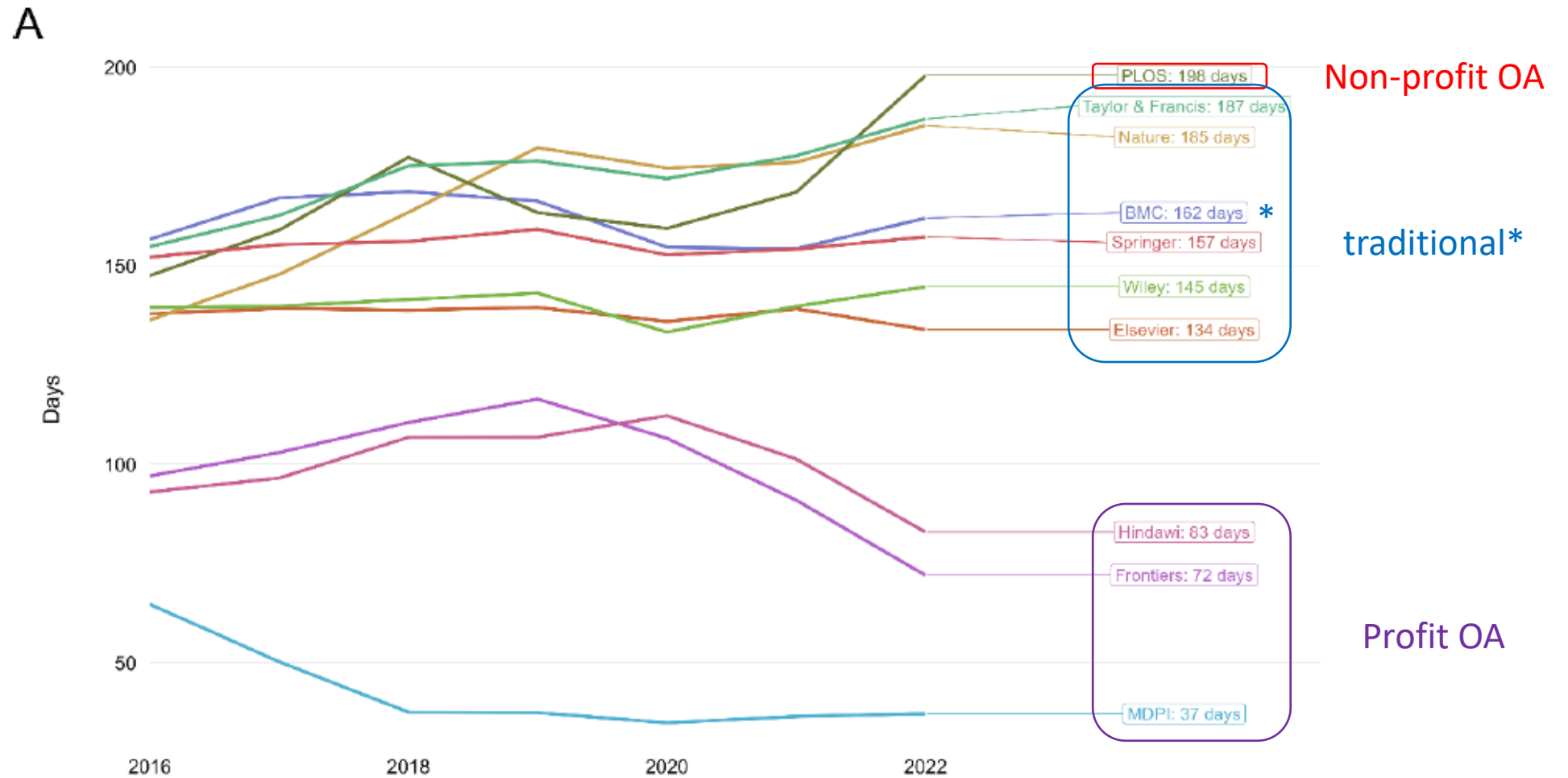
Nature
HYBRID*

PLOS
Non-profit OA

Springer
HYBRID*

Wiley
HYBRID*

Days from submission to acceptance



Phase 4 – Diversification (from mid 2010s)

APC model requires to **constantly increase publishing**

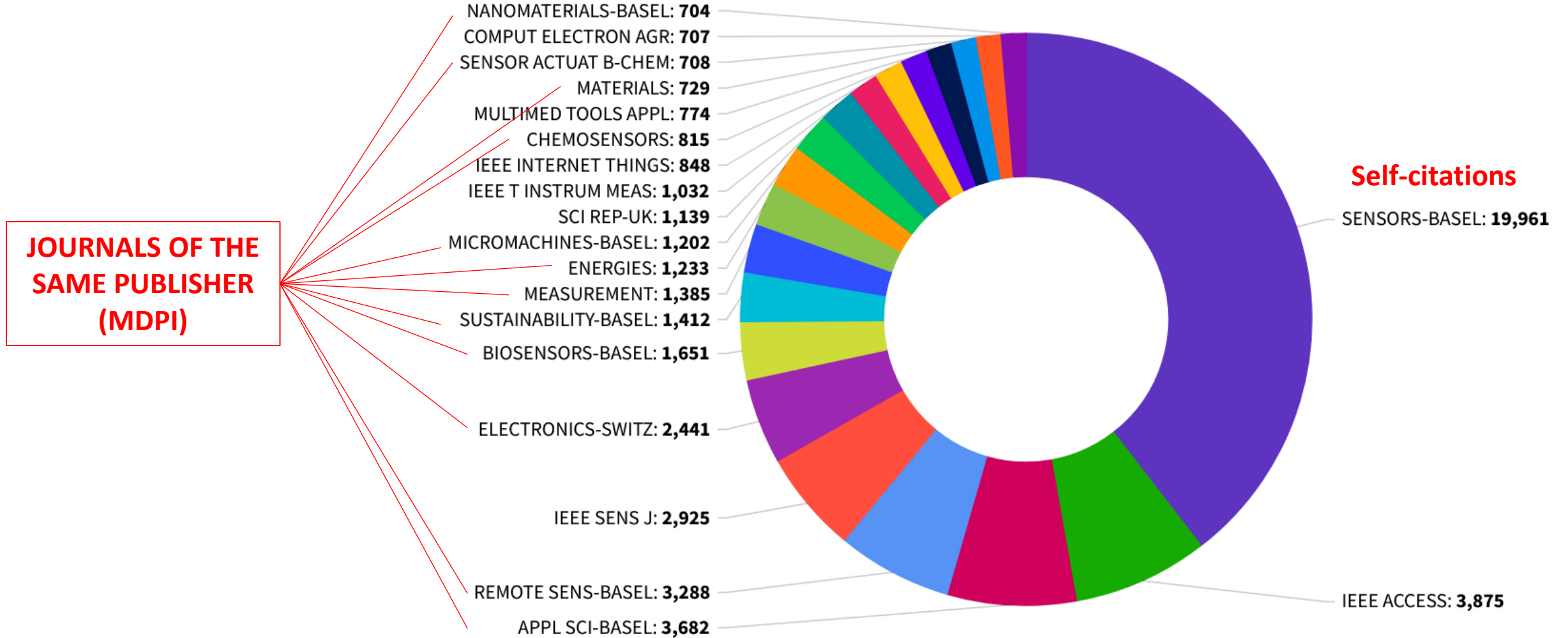
Lower selectivity → + publishing → + profit!

RISK OF VICIOUS CYCLE!

**lower selectivity → decrease quality, impact,
prestige → → fewer submissions, publications → less
profit**

How to escape this selectivity – reputation trade-off?

Example: top 20 journals citing SENSORS – the largest journal in Chemistry, owned by MDPI



Traditional publishers try to “conquer” the APC market segment → 3 tactics

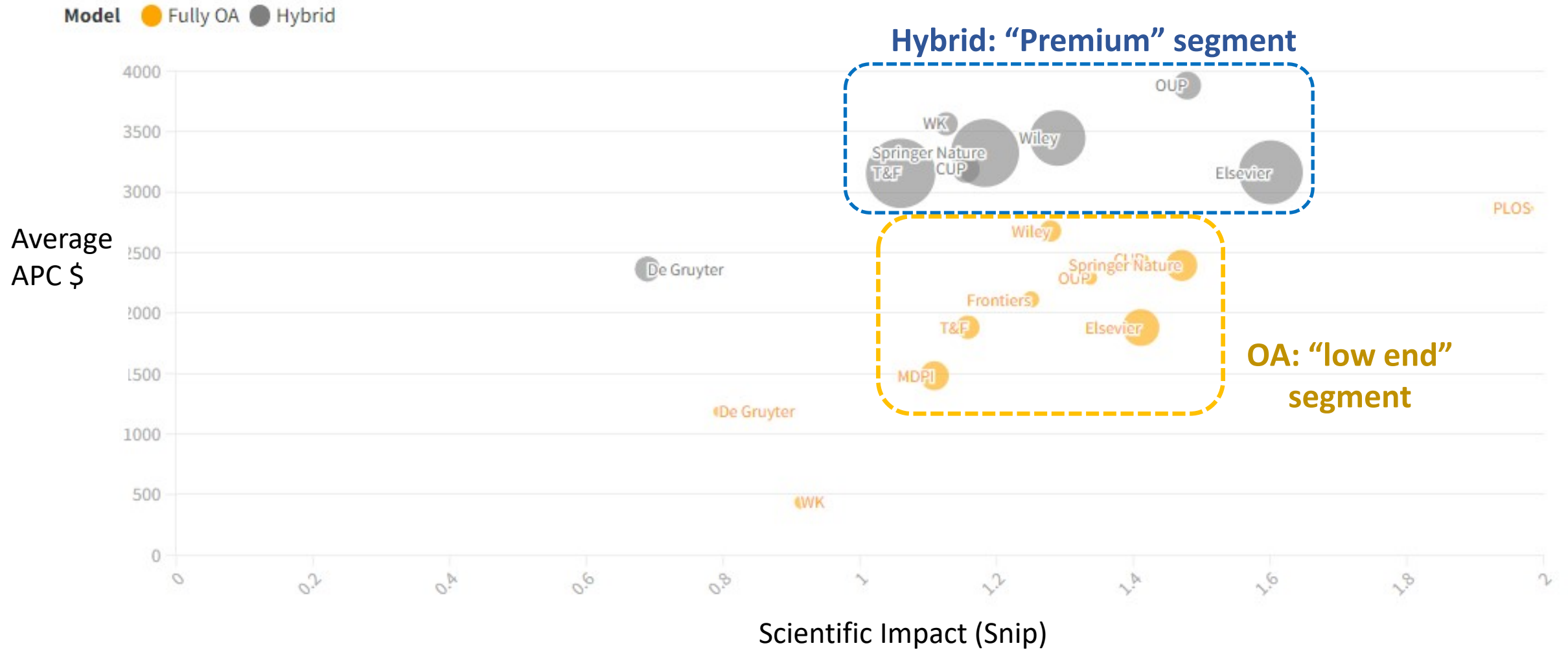
1st acquisitions

Wiley → Hindawi

Springer Nature → BMC

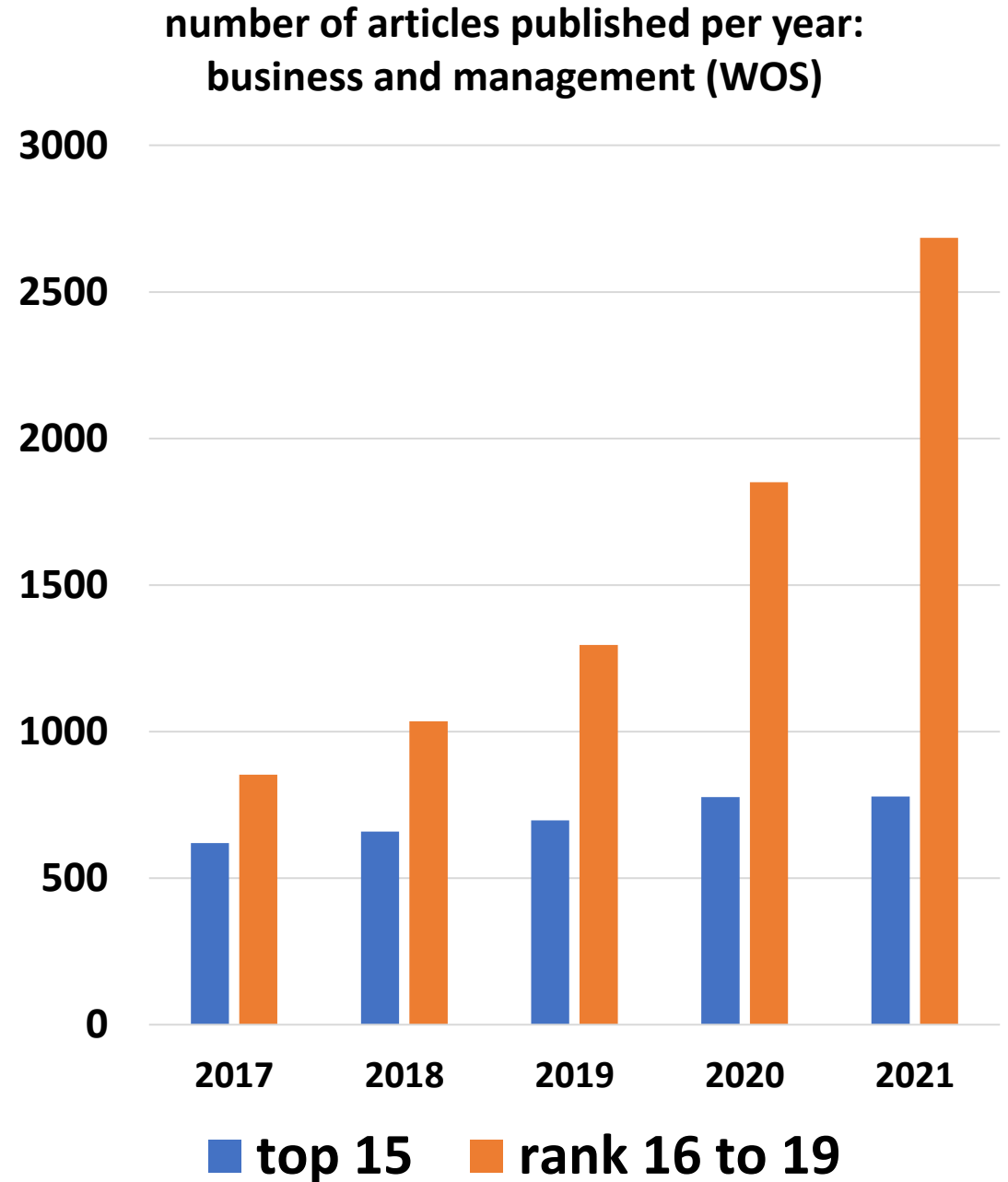
Taylor & Francis → F1000

2nd establish new OA journals



3rd urge editors to publish more

Example: the case of business and management journals



Growth of illegitimate businesses

- predatory publishers
- paper mills

Sabel et al. 2023

→ >300,000 fake publications out of 1.3 million biomedical Scimago-listed publications in 2020

→ Russia, Turkey, China, Egypt, and India (39 %-48%) of fake publications

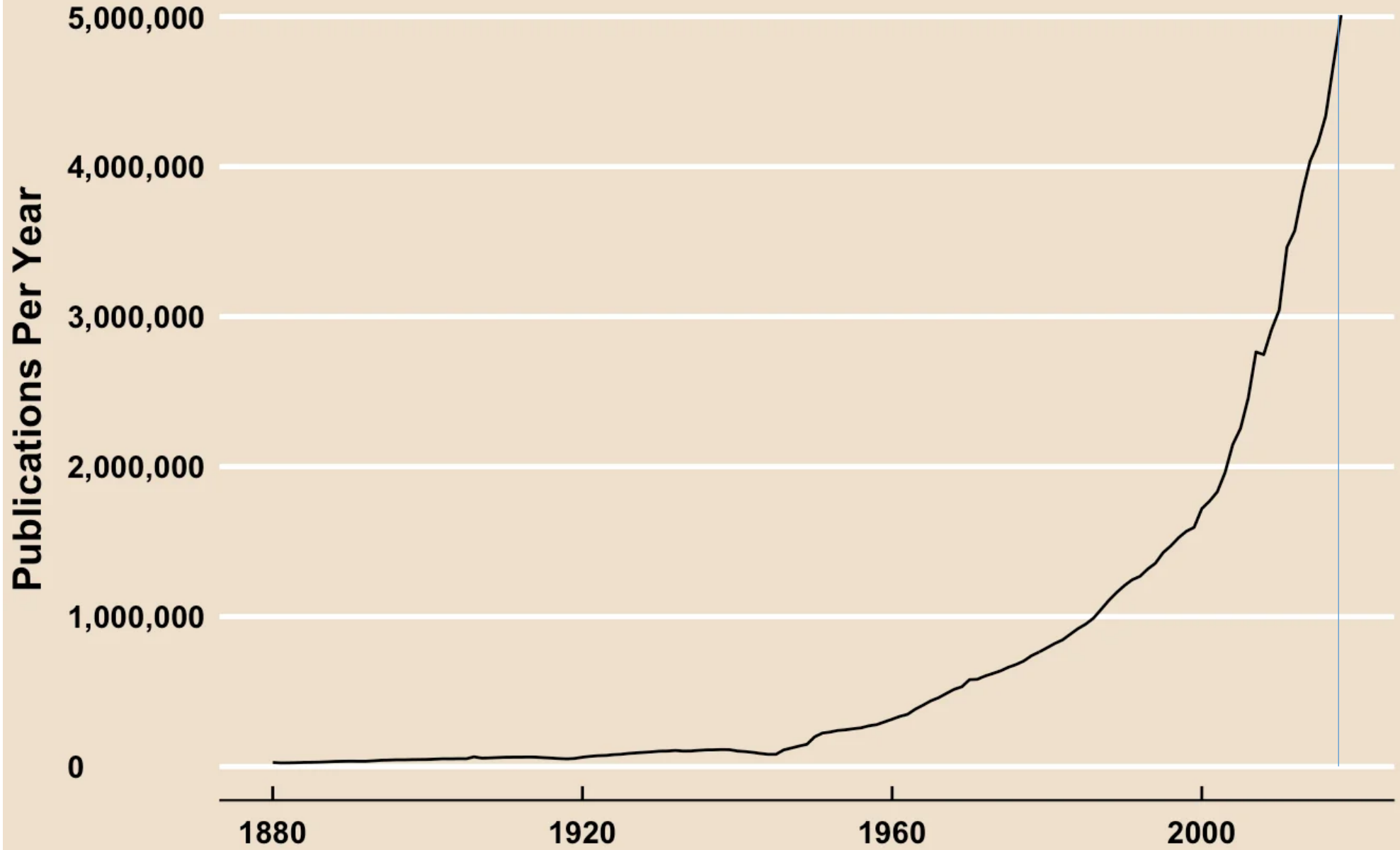
Why talking about
publishing in this workshop?

$$\text{efficiency} = \frac{\text{output}}{\text{input}}$$

input → **process** → output

$$\text{efficiency in research} = \frac{\text{knowledge}}{\text{resources}} = \frac{\text{publications}}{\text{resources}}$$

Scientific Publications Per Year

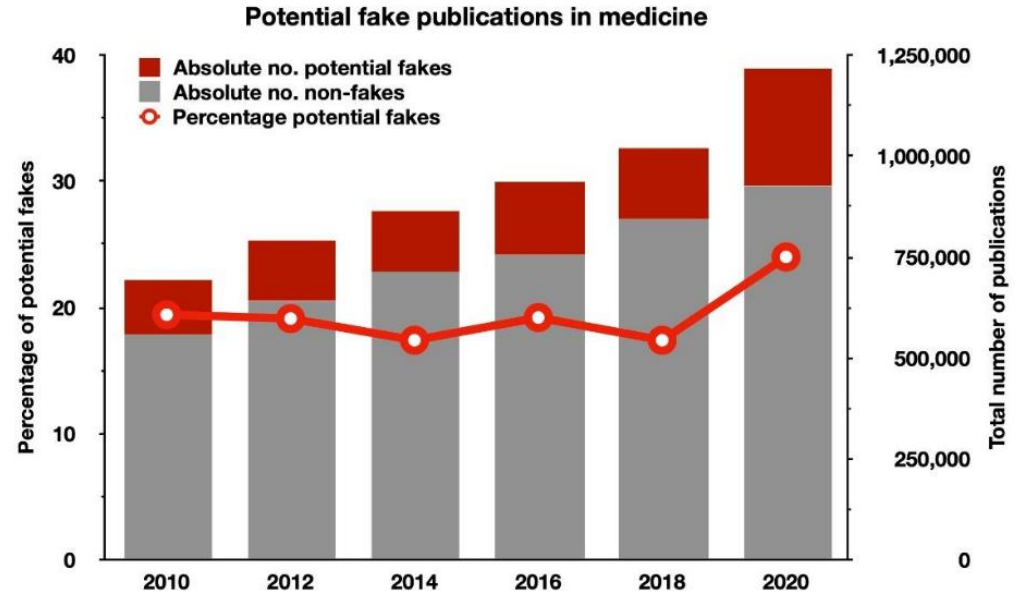
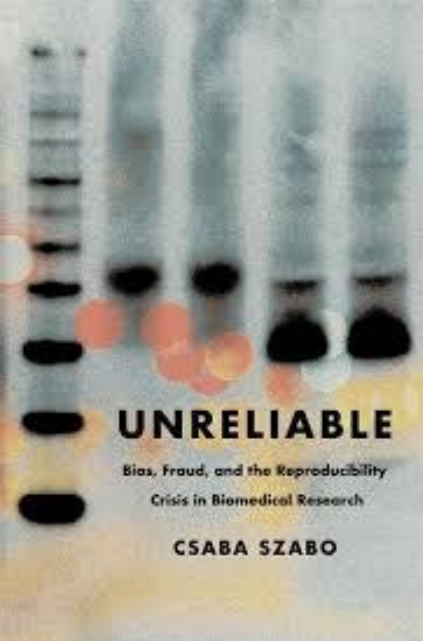


Data: Bornmann et al. | Graphic: FreakTakes

Goodhart law: *When a measure becomes a target, it ceases to be a good measure*

$$\text{efficiency in research} = \frac{\text{knowledge}}{\text{resources}} = \frac{\text{publications}}{\text{resources}}$$

What is in the numerator?



Thank you for your attention

Questions?

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Changes in scientific publishing and possible impact on authors' choice of journals

Lecture Text | [Open access](#) | Published: 29 May 2024

Volume 10, article number 5, (2024) | [Cite this article](#)



QISS - Quality in Scientific Scholarship



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Policy role in publication (and APC) growth

- National policies linking resources to publications
- Career criteria stressing productivity
- EU mandatory open access articles for all projects receiving Horizon 2020 funding