Funding acknowledgments and citation stratification

The case of bibliometrics (2000–2024)

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INTRODUCTION

We study participation, collaboration, funding, and citation recognition in bibliometrics through three core journals, 2000–2024, extending work on funded bibliometric research [1], and treat these dimensions as forms of stratification [2].

RQ1: How have output and international collaboration developed?

RQ2: How unevenly are citations distributed, and how do countries' participation and citation impact compare?

RQ3: How common are funding acknowledgments, and which funders dominate?

RQ4: Are funding and international collaboration associated with high citation impact?

DATA AND METHODS

Corpus: 7,337 Scopus articles and reviews in *Scientometrics*, *Journal of Informetrics*, and *Quantitative Science Studies*, 2000–2024.

Citation impact: Year-normalized citations and membership in the within-year top 10% [3]; a global top decile, which favors older papers, for comparison.

Geography: Participation shares count affiliation occurrences; impact and collaboration use unique publication–country links.

Funding: Acknowledgments show recorded support, not amounts [4]; funder names are often ambiguous [5]. Hand-checked samples of Scopus-assigned funder records and of funder strings Scopus left unassigned (matched to ROR/Wikidata) supplied error rates for 20,000 Monte Carlo simulations, which carry funder-data uncertainty into the rankings and the RQ4 model.

Model: Logistic regression of within-year top-decile status on funding and international collaboration (journal and year fixed effects, HC3 robust standard errors [6]). For 381 publications whose funder records were all left unassigned by Scopus, funding status is uncertain, as unassigned strings may not name genuine funders; they were excluded, counted as unfunded, or counted as funded in three sensitivity scenarios.

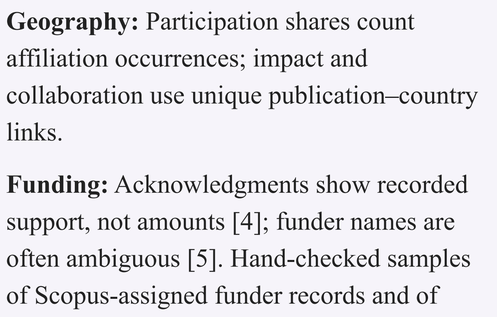


Figure 1. Accuracy of the top-ranked candidate organization in funder matching (ROR vs Wikidata, design-weighted, 95% CI).

RESULTS

RQ1 5.8-fold growth; 65 of 66 countries connected

Output grew 5.8-fold, from 82 publications in 2000 to 478 in 2024. Of publications with an identified country, 27.77% were internationally co-authored; the share rose from 8.54% in 2000 to a peak of 35.60% in 2020 (27.94% in 2024). Of the 66 countries with at least five publications, 65 form one connected collaboration network.



Figure 2. Publications per year (top) and share of internationally co-authored publications among those with an identified country (bottom), 2000–2024.

RQ2 Concentrated citations, smaller BRICS-5 gap within year

Citations are highly concentrated: the most cited 10% of papers receive 55.47% of all citations (Gini 0.664).

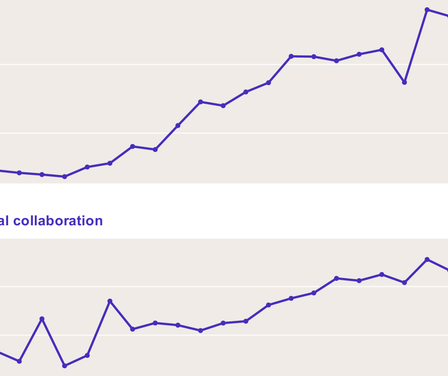


Figure 3. Lorenz curve of citations.

BRICS-5 countries hold 24.33% of affiliation occurrences but only 14.38% of those in the global top decile and 19.00% of those in the within-year top decile. Year-normalized impact (1 = same-year average): BRICS-5 0.904, EU-27 1.151, Nordic countries 1.186, United States 1.010.

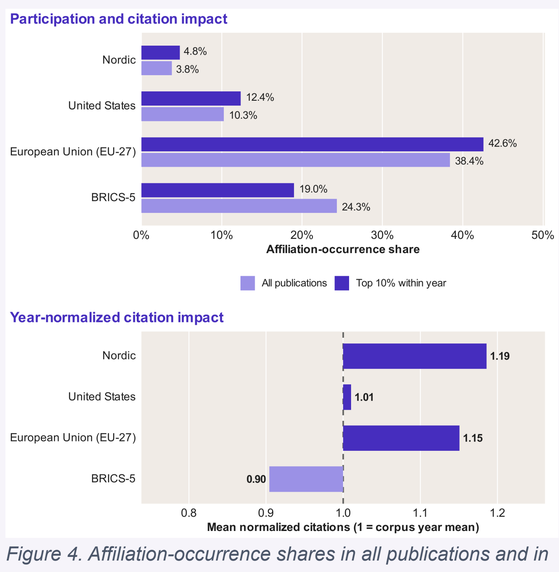


Figure 4. Affiliation-occurrence shares in all publications and in the within-year top 10% (top), and year-normalized citation impact (bottom).

RQ3 More funder records; top-4 ranking robust

Scopus records a funder for 47.84% of publications, rising from 9.76% in 2000 to 69.25% in 2024; the rise may reflect better metadata coverage rather than more funding. Allowing for error rates in assigned and unassigned records, about 44% of all publications (95% range 42–45%) have a genuine funder record.

Funder data are noisy: of 100 sampled Scopus-assigned funder records, 72 were fully correct; 22 were false positives (the assigned organization did not fund the study) and 6 linked a genuine funder to the wrong organization. Errors cluster in records without a grant number: 39 of 62 such records were fully correct, against 33 of 38 with one, and 21 of the 22 false positives had no grant number. Scopus leaves 29% of funder strings (2,455 of 8,566) unassigned; an estimated 64% (95% CI 54–74%) of these name a genuine funder.

Are the rankings robust?

Across the simulations:

Top 4 robust: NSFC (China), the European Commission (EU), the U.S. NSF, and the National Office of Philosophy and Social Sciences (China) lead; the top 3 keep their order in 99.3% of simulations, the top 5 in 90.8%.

Ranks 5–10: NRF Korea is 5th in 91% of simulations; ranks 6–10 vary (Figure 5). With Scopus-assigned records treated as correct, the top 8 keep their order in every simulation, so the variation in ranks 5–8 stems from errors in those records.

Counts are likely overestimated: Scopus credits NSFC with 761 publications, the European Commission with 327, and the U.S. NSF with 214; simulated medians are 708 (95% interval 620–763), 273 (246–294), and 169 (147–186).

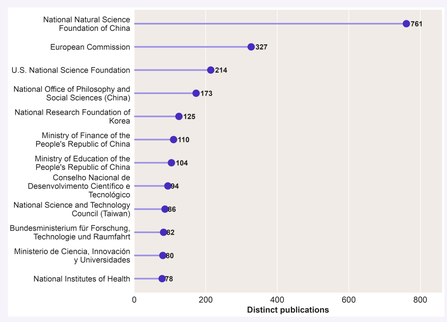


Figure 5. Leading funders (Scopus-assigned records); top 4 robust across simulations.

RQ4 Collaboration associated with high citation impact; no detectable funding association

Recorded funding shows no detectable association with within-year top-decile status: the odds ratio is 0.96–0.97 across the three sensitivity scenarios and 0.98 (95% CI 0.83–1.16) in the Monte Carlo simulations (none of 20,000 runs significant at $p < 0.05$), and every 95% CI includes 1. International collaboration is positively associated (OR 1.59, 95% CI 1.35–1.86). Raw rates point the same way: publications with and without a Scopus funder record reach the within-year top decile at almost the same rate (10.40% and 10.37%), whereas 13.74% of internationally co-authored publications do, against 9.10% of the others.

CONCLUSIONS

International collaboration is associated with high citation impact, whereas recorded funding shows no detectable association.

The BRICS-5 citation-impact gap narrows, but persists, once publication year is taken into account. Measurement choices matter: validating funder data leaves the top of the funder ranking intact but lowers the estimated counts. In this corpus, Scopus funder data can therefore support broad rankings, but their counts should be validated before they inform research evaluation or resource allocation. Records without a grant number, which held 21 of the 22 false positives in the validation sample, are where validation should start.

LIMITATIONS

The corpus covers three Scopus journals; geographic results depend on counting units [7]. Funding metadata are incomplete, and simulations rely on three validation samples, assume independent errors within grant-number strata, and exclude funder-country uncertainty. Associations are observational.

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